

**IN RE : HERITAGE WIND PROJECT**

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**PUBLIC INFORMATION MEETING**

*February 28, 2019*

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1 HERITAGE WIND PROJECT COMMUNITY FORUM  
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 4 Public Information Meeting  
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 9 Location: Carl Bergerson Middle School  
 10 254 East Avenue  
 11 Albion, New York 14411  
 12  
 13  
 14 Date: February 28, 2019  
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 16  
 17 Time: 7:30 p.m.  
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 20  
 21  
 22 Reported By: MICHELLE MUNDT ROCHA  
 23 Alliance Court Reporting, Inc.  
 24 120 East Avenue, Suite 200  
 25 Rochester, New York 14604

1 A P P E A R A N C E S  
 2 Moderator:  
 3 Rita Coleman-Graham  
 4  
 5 Apex Clean Energy Representatives:  
 6 Neil Habig  
 7 Ben Yazman  
 8 Greg Liberman  
 9 Marcel Mibus  
 10 Tracy Butler  
 11 Rob O'Neal  
 12 Jim Muscato  
 13  
 14 \* \* \*  
 15  
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1 HERITAGE WIND PROJECT  
 2 THURSDAY, FEBRUARY 28, 2019;  
 3 (Proceedings in the above-titled matter  
 4 commencing at 7:30 p.m.)  
 5 \* \* \*  
 6 MS. COLEMAN-GRAHAM: Okay, I want to  
 7 welcome everybody. And if you haven't already, come  
 8 on in, take a seat. We've got lots of empty seats up  
 9 front here.  
 10 Good evening, and thank you for attending  
 11 tonight's public informational meeting regarding wind  
 12 energy and the Heritage Wind Project proposed by Apex  
 13 Clean Energy.  
 14 My name is Rita Graham. I'm an  
 15 independent consultant from south of Pittsburgh,  
 16 Pennsylvania; and I am the meeting moderator tonight.  
 17 My role is to facilitate the meeting, and I'm going to  
 18 be presenting your questions to the panelists over  
 19 here for responses during the Q and A session.  
 20 Now, Apex Clean Energy comes here tonight  
 21 with three main goals. Okay, the first goal is to  
 22 present updated project information.  
 23 The second goal is to have technical  
 24 experts over here provide information on wind energy  
 25 projects; including their development, their

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 2 construction, their operation and their  
 3 decommissioning.  
 4 The third goal is to provide as many  
 5 questions as needed to allow for a clear understanding  
 6 of wind energy development and the Heritage Wind  
 7 Project and then to provide answers and clarification  
 8 to those questions.  
 9 Now, this meeting is not a regulatory  
 10 required meeting. Apex chose to hold this meeting to  
 11 better inform the community on wind energy development  
 12 and to solicit and respond to community questions  
 13 regarding wind energy.  
 14 In addition, Apex chose to videotape and  
 15 transcribe the presentations and the Q and A session.  
 16 That way the material can be readily available to  
 17 maybe some of your neighbors who couldn't be here  
 18 tonight or other interested communities. It will be  
 19 as if they were here tonight getting the same  
 20 information.  
 21 Now, let's take a look at the agenda, and  
 22 we can go over the format for tonight. The agenda was  
 23 on the back of this program. In a few minutes the  
 24 panelists are going to briefly introduce themselves,  
 25 and then your handouts include additional bio

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 2 information on each of the speakers.  
 3 Then we're going to move in to the  
 4 information presentation part, which brings me to  
 5 discussing these (indicating). You all should have  
 6 gotten several 4x6 cards. If you didn't, raise your  
 7 hand, and a couple of the runners will give them to  
 8 you. These are your question cards.  
 9 As the panelists are speaking, I'm going  
 10 to ask each of you to jot down your questions for that  
 11 panelist on these cards. And I need you to write them  
 12 clearly enough so that I can read them, because I'll  
 13 present your questions to them during the Q and A  
 14 session. Now, these need to be questions, not a  
 15 declaration or a statement, because we want to engage  
 16 the panel while we have them here.  
 17 After each speaker, I'm going to then ask  
 18 you to pass your cards to the aisle ways. And we have  
 19 two runners. You probably met them out front.  
 20 They're back at the door. There's Kaitlyn and Amber,  
 21 and they're going to collect those cards after each  
 22 speaker. Then they're going to bring them up here and  
 23 give them to the ladies at the table here, Carmen and  
 24 Jessica.  
 25 And what they're going to do is they're

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 2 ensure that your neighbors or other interested  
 3 communities are going to have both a good audio and a  
 4 good video of tonight's proceeding, so that they can  
 5 get as much information from it as you are here  
 6 tonight.  
 7 Now, after the last speaker, what I'll do  
 8 then is I will present the audience questions by  
 9 reading your question cards to the panelists. What  
 10 I'll do is I'll read two or three questions to each  
 11 speaker -- I'm going to work my way down the table --  
 12 and then I'll come back around and do the same thing  
 13 until about 9:40. And that's when we'll move into the  
 14 next steps, so we can adjourn at 9:45.  
 15 Now, we did build in about ten minutes  
 16 extra question time, because we realized we have a lot  
 17 of panelists and a lot of information to share with  
 18 you, figuring to give you a lot of time for questions  
 19 and answers. The one thing is the school has asked  
 20 that we be out of here, all of us, by 10. So that's  
 21 one constraint we're working with.  
 22 Now, one last thing before we move into  
 23 the panel session. I've found it very useful for  
 24 meetings to have meeting ground rules, and that's what  
 25 you see over here to my right on that white plaque. I

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 2 going to sort through those, and we put them in the  
 3 boxes for the correct speaker. And in doing that,  
 4 what I try to do is I try to group any questions that  
 5 might be identical or very similar together. So you  
 6 might see us fiddling around with them, because we're  
 7 putting paper clips on them and grouping them  
 8 together. I'm trying to be as efficient as I can to  
 9 get as many questions asked and answered tonight. The  
 10 most frequently asked questions, of course, will be  
 11 asked first.  
 12 Now, if we run out of time before we run  
 13 out of questions, Apex has agreed to post questions  
 14 and answers on their website.  
 15 Now, as I mentioned, the video camera is  
 16 going to be capturing all of this activity. So we  
 17 need to do the question generation and that card  
 18 collection without a lot of disruption. I ask that  
 19 you please don't wave the cards around. Instead, in  
 20 between the speakers I will prompt you to pass them to  
 21 the aisle for collection. And if you run out of  
 22 question cards, just raise your hand, and the girls  
 23 will take that as an indication to come see you to  
 24 give you some more cards.  
 25 Now, everyone's cooperation is going to

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 2 want to just go it over them real quickly.  
 3 The first one is listen without  
 4 interruption. We have a lot to cover here tonight,  
 5 and I want to give a sufficient amount of time to your  
 6 questions getting answered by the panel. Disruptions  
 7 are going to prevent me from asking your question or  
 8 will prevent somebody else from hearing a response.  
 9 Second, again, we need to have the  
 10 questions written on the cards. And boy, my eyes  
 11 aren't what they used to be; so neatly, so that I can  
 12 actually read them. And again, they need to be  
 13 questions, not statements or declarations. We want to  
 14 engage these gentlemen over there.  
 15 No banners or signs in the room. Thank  
 16 you. I appreciate that. I do that for safety reasons  
 17 and for visibility, so that everybody can see well.  
 18 And lastly, respect each other. You know,  
 19 I realize that emotions may be high for some people  
 20 here tonight; and, you know, that's understandable.  
 21 We just need everybody to work together and to be  
 22 courteous and respectful, so that everyone gets the  
 23 maximum benefit from this meeting.  
 24 So with that, I'm going to ask you to  
 25 please silence your cell phones and refrain from any

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 2 heckling or disruptions.  
 3 Oh, one other thing, just for the record,  
 4 so you know. I'm sure you've seen the gentlemen.  
 5 When I have large meetings like this, I always have  
 6 security on-site. It helps if there are any  
 7 disruptions; but more importantly, in this day and  
 8 age, we know what can happen when there's a large  
 9 group of people together. And I want everybody to  
 10 feel safe. So I've never had to engage security; and  
 11 I don't plan to have to tonight, as long as you work  
 12 with me and don't break my record.  
 13 So now I'm going to ask the panelists to  
 14 go through one at a time, to stand up, give their  
 15 name, their topic and who they're with, starting with  
 16 Neil.  
 17 MR. HABIG: Neil Habig, Apex Clean Energy.  
 18 MR. YAZMAN: Ben Yazman, Apex Clean  
 19 Energy.  
 20 MR. LIBERMAN: Greg Liberman with  
 21 Environmental Design & Research.  
 22 MR. MIBUS: Marcel Mibus, Apex Clean  
 23 Energy.  
 24 MR. BUTLER: Tracy Butler with Apex Clean  
 25 Energy.

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 2 operation of major electric-generating facilities.  
 3 It's basically the primary construction  
 4 permit for any electric-generating plant being built  
 5 in New York State that's greater than 25 megawatts in  
 6 capacity. Whether that fuel is wind, solar, natural  
 7 gas or biogas, if it's built out, it has to go through  
 8 a review process called Article 10.  
 9 So as I was saying, the Heritage Wind  
 10 Project began development in 2016. 2017 we initiated  
 11 the first of two years of studies measuring bird  
 12 habitation and migration in the area, which my  
 13 colleague Greg will discuss shortly, and began working  
 14 with landowners in the Town of Barre to sign leases.  
 15 Since we can only develop and ultimately  
 16 build on land that is under agreement with the  
 17 project, success in land leasing has been critical.  
 18 That success has allowed us to design and share the  
 19 facility layouts like the one you saw walking in  
 20 today.  
 21 We published an initial preliminary layout  
 22 with our Article 10 Preliminary Scoping Statement in  
 23 March 2018, and we are sharing this preliminary layout  
 24 now with the caveat that an updated facility layout  
 25 will be published in our Article 10 application later

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 2 MR. O'NEAL: Rob O'Neal from Epsilon  
 3 Associates. I'm going to talk about sound.  
 4 MR. MUSCATO: Jim Muscato from the law  
 5 firm of Young/Sommer, permitting counsel for Apex.  
 6 MS. COLEMAN-GRAHAM: Okay. Now, is it  
 7 Neil or Ben that's starting off here? Ben, okay. As  
 8 Ben's getting up here and getting ready to go,  
 9 remember to get your index cards out and be ready to  
 10 jot your questions down for Ben.  
 11 MR. YAZMAN: The Heritage Wind Project  
 12 began in 2016 with a series of open houses, addresses  
 13 to the Town of Barre and the county, the opening of  
 14 our project office in Albion, and the first step in  
 15 the project's path to an Article 10 permit with the  
 16 filing of our Public Involvement Program or PIP.  
 17 I'll speak a little bit more about the  
 18 project's status and Article 10 permitting in a few  
 19 slides; but in case anybody here does not know what  
 20 that is, I want to mention that it is a portion of New  
 21 York State Public Service Law which creates the New  
 22 York State Board on Electric Generation Siting and the  
 23 Environment, also known as the Siting Board. And they  
 24 issue certificates of environmental compatibility and  
 25 public need, which authorize the construction and

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 2 this year.  
 3 I'd like to talk a little bit now about  
 4 how wind farms are designed with consideration to  
 5 operational safety and community impact. Across the  
 6 industry wind developers apply what I'll refer to as  
 7 setbacks to establish distances from wind turbines to  
 8 different features, such as roads and houses.  
 9 On the next few slides I'll walk you  
 10 through an exercise showing you how some of those  
 11 setbacks are applied. But this list here details what  
 12 a few of them are as applied to this array, the one  
 13 you saw outside.  
 14 So this shows the application of a couple  
 15 spatial setbacks applied to a section of Barre just  
 16 over two square miles. The shaded areas are removed  
 17 from buildable area due to the setback requirement.  
 18 You can see how one is placed on top of another with  
 19 smaller setback to barns being eclipsed by the larger  
 20 setback to homes.  
 21 In this slide we applied two setbacks that  
 22 are based on the dimensions of turbines we ultimately  
 23 choose on top of the other setbacks we just discussed.  
 24 For setbacks to nonparticipating parcels or parcels  
 25 that are not under lease we apply a setback of 1.5

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 2 times the tip height of the turbine we're modeling.  
 3 The tip height, of course, is the height that the  
 4 blade reaches at the tallest point in its rotation.  
 5 For a turbine with a 500 foot tip height  
 6 we'd assume a setback of 750 feet; for a 600 hundred  
 7 foot turbine we would use a setback of 900 feet and so  
 8 on.  
 9 To all parcel boundaries, unless both  
 10 parcels are owned by the same individual, we use a  
 11 setback equal to the length of the turbine's blade to  
 12 prevent a turbine from being sited on one parcel and  
 13 having a blade hang over onto another. Even if both  
 14 are participating.  
 15 So the important thing here is to  
 16 understand that as we consider different turbine  
 17 models, that consideration impacts the setbacks  
 18 applied and some of these models' dimensions.  
 19 Again, we -- this slide shows  
 20 identification of wetlands and streams, which are  
 21 delineated as part of our site evaluations. These  
 22 areas are similarly exempted from buildable area, and  
 23 you can see that as they're added to the list of  
 24 setbacks applied, buildable area is further reduced.  
 25 Then after applying all the setbacks, what

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 2 of services for their constituents.  
 3 These community benefits payments can be  
 4 packaged in a couple of different types of agreements.  
 5 Typically they would include a payment in lieu of  
 6 taxes, or a PILOT agreement, coordinated by the IDA or  
 7 EDA and sometimes a host community agreement with a  
 8 municipality that hosts a project, so in this case the  
 9 Town of Barre.  
 10 Either way, the goal of these agreements  
 11 is to lay out what the project would be paying each  
 12 taxing jurisdiction for a set period of time,  
 13 typically 15 to 30 years. And this would allow both  
 14 project owners and the taxing jurisdiction alike to do  
 15 financial planning.  
 16 We've compiled a list of community  
 17 benefits paid by wind farms all over New York state.  
 18 Here are just a few. But based on the history of  
 19 PILOTs in the state, Apex would expect to pay around  
 20 \$7,500 per megawatt of the plant's capacity. So  
 21 speaking conservatively, using the 158 megawatt array  
 22 we shared tonight, we would estimate that Heritage  
 23 would bring in over \$1.1 million to the community each  
 24 year.  
 25 That's a significant revenue stream, an

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 2 we're left with is a map of just buildable area. Some  
 3 of you may remember that a preliminary buildable area  
 4 scenario was published with our PIP. That buildable  
 5 area scenario would be fed into an engineering  
 6 software called an optimizer, which takes wind data  
 7 and creates an optimized layout that best captures the  
 8 wind resource, and that's how we arrive at an array.  
 9 So I just want to reiterate that this  
 10 array is subject to change when we finalize our  
 11 project plans and Article 10 application, but it is  
 12 our most current map of turbine points. So I hope  
 13 that is informative. You can view this layout again  
 14 on the easel in the lobby. And as Rita said, this  
 15 presentation will be posted on our website at the end  
 16 of March along with the video and transcription.  
 17 Now I want to talk a little bit about the  
 18 community benefits of the Heritage Wind Project. When  
 19 this project advances to operation, it will bring with  
 20 it substantial investment in the community. Obviously  
 21 landowners who host facility components will benefit  
 22 from lease payments directly; but taxing  
 23 jurisdictions -- namely the Town of Barre, the Albion  
 24 Central School District and Orleans County -- will  
 25 also receive payments which they can use for a variety

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 2 increase in funding for the town; and as I said  
 3 before, that amount would be divided between taxing  
 4 jurisdictions in these PILOT as community agreements  
 5 which we're hoping to solidify in the coming months.  
 6 That means that Heritage Wind can generate more than  
 7 \$30 million for these jurisdictions over the life of  
 8 the project.  
 9 So Heritage is poised to submit its full  
 10 Article 10 application this year. In collaboration  
 11 with our colleagues at EDR, Epsilon Associates,  
 12 Young/Sommer and other groups of subject matter  
 13 experts around from New York.  
 14 The application is another Article 10  
 15 milestone, at which a batch of intervener funds will  
 16 become available. Intervener funds have provided  
 17 resources for the Town of Barre and citizens groups to  
 18 participate in a review and evaluation of the project.  
 19 Importantly the application will detail a final  
 20 facility layout with collection lines, access roads,  
 21 substation location and other components as well as  
 22 details on turbine models under consideration.  
 23 While we have not selected a turbine model  
 24 yet, I do want to discuss a little bit about what  
 25 these considerations look like for project

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 2 stakeholders, because they have been changing over the  
 3 past few years. In 2016 when this project started,  
 4 the largest turbines on the market were those like the  
 5 Vestas V136, which has a tip height of just under 500  
 6 feet.  
 7 In 2018 which approached the Town of  
 8 Barre, first in January and then more formally in the  
 9 summer, to communicate that we'd be considering newer  
 10 turbines with tip heights up to 600 feet, because  
 11 their output would mean that each turbine would have  
 12 significantly greater collection capacity.  
 13 In the last year wind turbine technology  
 14 has continued to advance. New turbine technologies  
 15 will ensure that the project remains competitive,  
 16 because it will make power generation by the project  
 17 even cheaper, ultimately helping to reduce energy  
 18 costs for New York energy consumers. We have the  
 19 ability and the need to take advantage of newer  
 20 turbines that are much more efficient, but which also  
 21 decrease the number of turbines needed for the  
 22 project.  
 23 In order to make these improvements,  
 24 Heritage Wind must use modern turbines, which means  
 25 turbines that are taller than the 500 and 600 foot

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 2 height of approximately 677 feet. The N149 was used  
 3 in the array that you see outside that we're  
 4 representing today.  
 5 While we believe that fewer taller  
 6 turbines will ultimately help this project address  
 7 many of the requests of community members, we also  
 8 recognize that this is a change from what's been  
 9 previously proposed. But the benefits are numerous.  
 10 And as the boards in the lobby show, it's difficult to  
 11 gauge the difference between these and older shorter  
 12 models with the naked eye. And these newer taller  
 13 turbines are more reliable and less variable,  
 14 capturing a better more consistent wind resource and  
 15 out competing other wind resources on wholesale energy  
 16 markets.  
 17 We'll continue to provide updates on our  
 18 facility operations as we move forward, and we look  
 19 forward to detailing a full facility layout in the  
 20 Article 10 application.  
 21 That's all for me. I'm going to turn  
 22 things over to my colleague Greg.  
 23 MS. COLEMAN-GRAHAM: Thank you, Ben.  
 24 And as Greg is coming to get set up, I  
 25 want to remind you this is the time where you pass

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 2 turbines that we considered in the past. Innovations  
 3 in turbine technology have shifted the market,  
 4 requiring that wind projects utilize them in order to  
 5 remain competitive in the current energy market. In  
 6 order for Heritage Wind to be built, it must use these  
 7 newer taller turbines.  
 8 I ask you to consider the benefits of  
 9 newer turbines. Whereas our layout released last year  
 10 called for up to 47 turbines, with newer turbine  
 11 models we're looking at approximately 33, which is a  
 12 30 percent reduction in the number of turbines  
 13 themselves. Increases in turbine size also correspond  
 14 directly to increases in capacity. And capacity being  
 15 the basis of community benefits payments means that  
 16 larger turbines, which are more efficient, pay more  
 17 into the community.  
 18 Increasing turbine height also results in  
 19 larger setbacks based on tip height, meaning that  
 20 these larger turbines can produce more energy, and  
 21 therefore increase community benefit payments, while  
 22 still operating safely.  
 23 This year we've become aware of turbines  
 24 like the Nordex N149, which has a tip height of  
 25 approximately 655 feet and the Vestas V162 with a tip

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 2 your question cards to the aisle, and the two ladies  
 3 will pick them up and bring them up to us so we can  
 4 get ready for the Q and A session later.  
 5 MR. LIBERMAN: Good evening, everybody.  
 6 My name is Greg Liberman. I'm a senior project  
 7 manager with Environmental Design and Research. We  
 8 are the lead Article 10 consultant working with Apex  
 9 on this project. And I just want to leave this slide  
 10 up for a quick second, just so the folks can get a  
 11 sense of where we are on the process.  
 12 As Ben mentioned, the preliminary Public  
 13 Involvement Program plan was filed some time ago and  
 14 set in motion this Article 10 process that we're in  
 15 right now. Looking ahead to an actual application  
 16 filing later in the year 2019, where we are today is  
 17 right in the middle phase here.  
 18 In other words, a Preliminary Scoping  
 19 Statement has been filed. That was filed in the  
 20 spring of 2018. The scoping statement outlines the  
 21 methodologies, the amounts of studies that will be  
 22 prepared, and really provides what I would consider a  
 23 road map for what the application will look like as we  
 24 kind of move through this process. So hopefully that  
 25 kind of puts things into a little bit of context.

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2           And with respect to some of the studies

3 that have been outlined in the Preliminary Scoping

4 Statement, I'll talk with you today a little bit about

5 some of the environmental studies and the wildlife

6 studies that have been proposed, many of which are in

7 the process of being performed now. Specifically

8 we'll talk about some of the environmental studies

9 that will support Exhibits 22 and 23.

10          The Article 10 application when it gets

11 submitted will contain over 40 individual exhibits,

12 many of which will have various support studies.

13 Exhibit 22 focuses on terrestrial ecology in wetlands,

14 where Exhibit 23 focuses on surface water resources.

15          So having said that, there are a range of

16 studies that are being performed now via wildlife

17 surveys, vernal pool surveys, wetland and stream

18 delineations habitat analyses, invasive species

19 surveys, etcetera, that will be used to help guide and

20 inform the facility design which is currently

21 underway. So for instance, siting of turbine

22 locations and/or a construction road to get to that

23 turbine can be sited in a manner that avoids, say, for

24 instance, a wetland resource, because we're doing

25 those studies at this point in time.

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2           The Avian Risk Assessment Report will

3 assess impacts as specified in the Preliminary Scoping

4 Statement, including an assessment of collision and

5 mortality and a cumulative impact assessment for

6 eagles out to I believe it was 100 miles. That

7 information will then inform what's called a Net

8 Conservation Benefit Plan. That plan will be included

9 in the Article 10 application and will outline any

10 mitigation measures needed for any potential impacts

11 that may arise from the design.

12          One thing that is unique to the Article 10

13 process is there's a lot of opportunity for public

14 interaction and a lot of opportunity for agency

15 correspondence. So, for instance, through the review

16 of the Preliminary Scoping Statement, vernal pools

17 were identified as a resource that should be evaluated

18 and studied in this application.

19          And I'd like to note that typical projects

20 that get reviewed by the New York State DEC under

21 their wetland regulation, which is Article 24, or

22 stream regulation, which is their Article 15,

23 typically don't regulate vernal pools. So this is a

24 little bit of an additional level of environmental

25 analysis.

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1           HERITAGE WIND PROJECT

2           With respect to some of the ongoing

3 wildlife studies, there were a variety of plans

4 outlined in the Preliminary Scoping Statement that

5 were developed with the input from the New York State

6 Department of Environmental Conservation; and many of

7 those studies have been initiated. In fact, they were

8 completed between the fall of 2016 and the end of

9 2018.

10          Specific studies included small and large

11 bird use studies, eagle use, fall migratory raptor

12 surveys, winter raptor surveys, spring migratory

13 raptor surveys and breeding bird survey. And in fact,

14 in the Preliminary Scoping Statement that was issued

15 in the spring of 2018, the winter grassland studies,

16 the breeding bird studies and the spring migratory

17 studies were included in that Preliminary Scoping

18 Statement for public review.

19          Other studies which are ongoing -- for

20 instance, the eagle use surveys are ongoing. The data

21 was collected in calendar years 2017 through 2018.

22 The data is still being processed now and will

23 actually be used to assess potential impact as the

24 final layout's defined, and what will be prepared is

25 called an Avian Risk Assessment Report.

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2           So for folks that may not know, a vernal

3 pool is a type of wetland condition in the landscape

4 that's typically characterized as a shallow depression

5 that retains water during the early spring, early part

6 of the growing season, and that will dry out in the

7 summer. And that affords them a little bit of a

8 unique quality in that they support the various type

9 of wildlife habitat, because they are a unique

10 feature.

11          So a vernal pool assessment was performed

12 within the facility site of the Heritage Wind Project.

13 That was performed in the early growing season of

14 2018. And essentially those have been identified and

15 can be incorporated into the design process so that

16 impacts to vernal pools can be avoided.

17          **A major component of this -- of the**

18 **environmental analysis for this and really any project**

19 **in Upstate New York focuses on wetland and stream**

20 **delineations. These were initiated in the late**

21 **growing season, late summer, 2018 for this project.**

22 **They'll be completed in the spring of 2019. We're**

23 **obviously not out there today. These have to be done**

24 **during growing season, so that we can identify the**

25 **available plant species and comply with the Army Corps**

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1                   **HERITAGE WIND PROJECT**  
 2 of Engineers and New York State DEC delineation  
 3 methodologies.  
 4           And what's important to note here is  
 5 wetland delineations are being performed out to a  
 6 distance of 500 feet from areas of potential ground  
 7 disturbance. So in other words, where an access road  
 8 may be proposed or a turbine facility may be proposed,  
 9 any area of potential ground disturbance we're looking  
 10 out 500 feet from that area on both sides. So that's  
 11 essentially -- in certain areas it's a 1,000-foot-wide  
 12 swath of wetland and streams that are being  
 13 delineated. But there's a positive to that in that we  
 14 can have that information now, so that design  
 15 decisions can be made to avoid those wetlands.  
 16           Another thing to note that's unique to  
 17 Article 10 is when the wetland delineation and stream  
 18 report, which will be appended to the Article 10  
 19 application, will also include what's called a  
 20 functions and values assessment. It will look at each  
 21 individual wetland and identify what the major  
 22 functions are of that wetland; so that when we go  
 23 ahead and assess the impacts, we're actually able to  
 24 assess the functional impacts and then provide  
 25 appropriate levels of mitigation if needed.

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1                   **HERITAGE WIND PROJECT**  
 2 various best management practices that are approved by  
 3 New York State DEC for controlling the spread of these  
 4 invasive species during constriction. So the Article  
 5 10 application will include the baseline survey, and  
 6 it will include the invasive species control plan to  
 7 make sure that the spread of invasive species does not  
 8 occur.  
 9           And the last component that I want to  
 10 touch upon simply is that the Article 10 application  
 11 will include an inventory of all plant and wildlife  
 12 species observed on the site during our studies; it  
 13 will include a list of species which may utilize  
 14 various cover types, forest, grassland, etcetera,  
 15 within the site; and it will also outline a list of  
 16 species based on public available information, say,  
 17 from the DEC.  
 18           So that concludes the environmental  
 19 portion of my talk, but I did want to indicate one  
 20 last thing. Environmental Design and Research is also  
 21 working on what's called Exhibit 24, which is a visual  
 22 impact assessment. As part of that, a visual impact  
 23 analysis report will be prepared and included with the  
 24 application. The first step in preparing a visual  
 25 impact assessment is soliciting input from you folks

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1                   **HERITAGE WIND PROJECT**  
 2           Another aspect of the Article 10 process  
 3 is called a habitat fragmentation analysis. And  
 4 essentially this is a GIS exercise that looks at the  
 5 proposal development, the proposed limits of work, and  
 6 looks at direct impacts to grasslands and forested  
 7 area. In addition, it will also look at indirect  
 8 impacts which may result as a result of the proposed  
 9 project.  
 10           Our wetland crews that have been out there  
 11 doing the vernal pool assessment and doing the wetland  
 12 assessment will also be out there to do what's called  
 13 an invasive species baseline survey. For those of you  
 14 that may not know, an invasive species is a plant  
 15 species that is typically not native to an area. It  
 16 can be pretty aggressive. It can be -- you know, you  
 17 see phragmites in a lot of different places on  
 18 roadside ditches.  
 19           So we go out and map these areas, and we  
 20 use what we call a density code to identify areas of  
 21 sparse, patchy, dense or monocultures. I would  
 22 consider this to be a monoculture. That data is then  
 23 fed into what's called an invasive species control  
 24 plan.  
 25           Essentially the control plan outlines

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1                   **HERITAGE WIND PROJECT**  
 2 and from the local community.  
 3           So in accordance with the Article 10  
 4 regulations, we're in the process now of sending out a  
 5 mailer to various municipal planning agencies, various  
 6 cultural institutions locally, state agencies to  
 7 solicit input on potentially visually sensitive  
 8 resources. State parks, town parks, areas where  
 9 people gather, areas that we think may have a  
 10 potential concern.  
 11           And in addition to soliciting the  
 12 information from municipal planning representatives  
 13 and various state agencies, there's going to be some  
 14 information made available at Apex's main office here  
 15 in Albion. There will be a set of maps with some  
 16 information based on sensitive sites that have been  
 17 gathered from publicly available data sets, but really  
 18 the missing piece is information from the local  
 19 community about things that we may have missed.  
 20           So there will be an information card and a  
 21 map set available during Apex's business hours at the  
 22 office in Albion where you can go and make your  
 23 comments known and say, you know what, I think you  
 24 need to take into account this place or this place.  
 25 And that will help us kind of pull all of that



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1           **HERITAGE WIND PROJECT**  
2 **information in to have a pretty robust set of**  
3 **information as we move forward on the visual impact**  
4 **assessment.**  
5           **Thank you.**  
6           MS. COLEMAN-GRAHAM: Thank you, Greg.  
7           Same thing with the cards. Please pass  
8 them to the aisles. And if you need some more cards  
9 for the next speakers, raise your hand, and the girls  
10 will give you some additional cards.  
11           Okay. So now it is Marcel.  
12           MR. MIBUS: Good evening. My name is  
13 Marcel Mibus, and I'm an energy analyst at Apex Clean  
14 Energy.  
15           So before getting into some specifics, I  
16 just want to give you a context of what I do and how  
17 it is incorporated with what some of the other  
18 speakers talked about. So I do some site design and  
19 figure out where turbines are placed.  
20           And that is based in part of what Ben said  
21 where you have physical setbacks where we create  
22 certain distances from roads, homes. Then there is  
23 the environmental setbacks, and then there's two other  
24 aspects about siting that come with the turbines more  
25 specifically. And one of them is sound, which Rob

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1           **HERITAGE WIND PROJECT**  
2           So geometry of the sun. So basically  
3 there's three important angles that we need to take  
4 into account. And I'm just highlighting this. The  
5 equation is marginally not important. We walk  
6 through -- there's three angles that come out of this.  
7 It's how the earth is rotating around the sun, the  
8 latitude of where we are on earth, and then the time  
9 of day. And from that information, we actually know  
10 very explicitly where the sun is for the area. Now,  
11 that is the first step in determining, obviously,  
12 where can shadows be.  
13           So this is just a rough idea of a model at  
14 some location of a turbine, and then it has the shadow  
15 flicker wings highlighted in different colors in  
16 minutes. So we can walk through, and you go from the  
17 pink, and it's pretty long; and that's where you get  
18 the most small amount of minutes. And that's because  
19 there's -- many times of year you have small segments  
20 of minutes that really accumulate into these giant  
21 areas. And then as you get closer to the turbine,  
22 obviously you get more shadow flicker.  
23           So it's really a time problem. Now, so  
24 this is a simulation of -- you see the dot in the  
25 upper left corner there of that pink area; and then at

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1           **HERITAGE WIND PROJECT**  
2 will talk about; and the other is shadow flicker,  
3 which is what I will discuss. So those are the  
4 additional aspects of siting with the physical  
5 setbacks, plus the meteorological data to try to  
6 design the best and effective project for this area.  
7           So shadow flicker occurs from the sun  
8 being perpendicular to the spinning blades. And the  
9 good thing is we know very well how to model it and  
10 site accordingly.  
11           So modern wind turbines have a rotational  
12 per minute up to somewhere around 12 to 13 RPM; and  
13 that is a variable speed, obviously, as it moves with  
14 the wind. And the amount of shadow flicker diminishes  
15 rapidly with distance. Roughly 10 rotor diameter from  
16 the turbine is academically what has been determined  
17 as the maximum shadow flicker distance.  
18           So math. So there's really three  
19 parameters that I kind of want to highlight. You  
20 understand that there's a structure, the turbine with  
21 the tip, and then there's the sun behind it. And then  
22 that's basically how we determine the distance of  
23 where the shadow flicker is. So really the question  
24 is to understand this, we need to understand where the  
25 sun is and how does it relate to the turbine.

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1           **HERITAGE WIND PROJECT**  
2 the bottom you have the time of day, the year, the  
3 months on the bottom axis, and then your time of day  
4 in the vertical axis.  
5           So those brown things show -- the brown  
6 filled-in part simulates when shadow flicker could  
7 occur from this turbine in that orientation. And this  
8 assumes clearly that it happens every day and you have  
9 basically a glass house from that angle. So it  
10 doesn't take into account if the turbine is looking in  
11 your direction or if there's clouds or if they're at  
12 low wind speed, shut down. So it has just this  
13 evening sunset version.  
14           And then conversely you have the same in  
15 the opposite case where this would only be possible in  
16 the small segment of time at sunrise in the summer if  
17 it were located on the other side. So it's a very  
18 time-specific -- time-of-year-specific obstacle.  
19           So again, this is some of the basic  
20 aspects. It doesn't take into account the orientation  
21 to your house, if you have walls facing that  
22 orientation, if you have tree cover of that  
23 orientation. And then the turbine has to be in that  
24 wind direction to create a shadow in that direction.  
25 And then at very low angles the sun is very diffuse.

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1 HERITAGE WIND PROJECT

2 So if you think of a sunset on the horizon, you get an

3 orange glow. It's not a pointed feature.

4 So the question, then, is how do we site

5 for shadow flicker to ensure that we minimize it on

6 homes. So in the model like we cut out areas for

7 physical setbacks, we limit areas for turbines to be

8 placed for shadow flicker. So if you see here, this

9 black area basically is a cutout where we say that if

10 this is the amount of minutes where shadow flicker

11 were to occur on this residence, that would not be in

12 compliance. So anything within that black area a

13 turbine couldn't be sited.

14 And if you can see the shape, it's

15 vertical compared to the actual wings where you had

16 the majority coming down towards the residence in that

17 one. So based on this, and then in conjunction with

18 the sound modeling, we site the turbines. And with

19 the physical setbacks.

20 So I hope that gives you some context

21 about the thought process of how we site our turbines

22 and the impacts that we study accordingly.

23 MS. COLEMAN-GRAHAM: Thank you, Marcel.

24 And as we have Tracy coming up, again,

25 same deal. Pass your cards to the aisles, if you

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2 turbines that we're contemplating here that tower may

3 be three, four or even five tubular stacked up pieces.

4 So that's the turbine itself.

5 And as was mentioned, we're contemplating

6 up to 33 turbines here. So how does that work? Well,

7 they get sited, as was discussed, based on setbacks

8 and wind resource. And then once they're sited and

9 it's time to go into construction, they're built. And

10 they're connected via a series of underground cables.

11 And that's kind of depicted here.

12 So the cables take the power from the

13 generator in the turbine, and that's at a generation,

14 voltage, it depends on the model, but it gets bumped

15 up to 34.5 kilovolts. And that runs through -- and

16 it's called median voltage, and that runs through all

17 the cables. And those cables collect it and bring it

18 to a central substation, which is indicated over

19 there.

20 Now, the substation has a transformer

21 there where it ups the voltage from 34.5 to 115

22 kilovolts in this case, and that's the voltage of the

23 transmission grid in the area. So the power, there

24 again, from the generators, down the towers, through

25 the collection system, around to the substation where

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2 would. The ladies will pick them up. And raise your

3 hand if you need more cards.

4 MR. BUTLER: Hi there. I'm Tracy Butler.

5 I'm the director of civil engineering for Apex Clean

6 Energy. I'm going to chat about engineering and

7 construction of the wind farm.

8 So this first slide is kind of busy, but

9 basically I want to start with what a wind turbine is

10 and how a wind farm kind of comes together physically;

11 and then we'll go into how we actually physically do

12 that.

13 So if you look over here on the right,

14 there's a diagram here of a wind turbine, and the

15 principle is pretty sensible, just like an old

16 windmill from hundreds of years ago. The wind blows

17 through these blades, or rotor blades we call them.

18 They spin, and there's a generator here within the

19 cell that creates electricity. And that's the basic

20 principle.

21 Obviously there's some complexities to it;

22 but the turbine itself, there again, is several

23 components. Blades, the cell and the rotor and

24 generator, and then a tower. And the towers are

25 actually multiple segments as well. So for the

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2 it gets up voltage; and then it gets plugged onto the

3 existing transmission grid.

4 Here in this project the transmission line

5 runs through the project, so there really isn't a need

6 to build any additional transmission line except for a

7 little piece to connect our substation to the line.

8 So that's that.

9 Also, too, here I just kind of glazed over

10 what these guys are standing on; but down here at the

11 bottom they're standing on a large concrete

12 foundation. This foundation could be approximately 70

13 feet in diameter at the base, which is all the way

14 underground here about 11 feet deep. And it's tapered

15 up so that near the surface there's a pedestal. And

16 the pedestal is approximately 18 feet in diameter, and

17 that's what pops up out of the surface.

18 So at the ground you would see about 6

19 inches high and 18 feet in diameter a concrete

20 pedestal that the turbine would then bolt onto. There

21 would be a series of bolts in a ring buried --

22 embedded in the foundation, and that's what the

23 turbine bolts onto. That supports the turbine.

24 So that's how it's laid out, but how do we

25 build it? In some regards it's a large construction

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 2 project to get these large turbines in. For  
 3 reference, some of the models that were discussed have  
 4 rotors where just one blade is over 200 feet long. So  
 5 that's quite a project to get that blade into the  
 6 site.  
 7 To do that, we need to build access roads  
 8 to where we want to build turbines, and we need to  
 9 look at whether the existing public roads need to be  
 10 improved and have turn radian increased or what not to  
 11 get them so...  
 12 But the first step really in the  
 13 construction process is the mobilization to the site.  
 14 So crews come in, create a laydown yard where they  
 15 would do their field offices and store some components  
 16 and some materials; and that's kind of the central hub  
 17 with all the construction activity. Once that's up  
 18 and running, then it's really the access roads get  
 19 started.  
 20 So as was mentioned, there's a setback  
 21 from existing roads to where the turbine can be. So  
 22 all the turbines are out in fields, so we need to  
 23 build a road to get out there. The components are  
 24 large, and some of them are quite heavy. The cell can  
 25 way up to a hundred tons. So it's substantial. And

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 2 happening as well.  
 3 Then at the same time the collection cable  
 4 is going to be installed. And it may be hard to see  
 5 from there, but it's basically a piece of equipment  
 6 about the size of a bulldozer. It's a trencher, and  
 7 it runs along and has a trenching saw that digs a  
 8 trench that's approximately a foot wide, maybe 18  
 9 inches wide. And while it's doing that, it's placing  
 10 the collection cable into the trench.  
 11 And the power -- the collection cable that  
 12 carries the power, it's three cables that carry the  
 13 power, it's a ground cable and a fiber optic cable;  
 14 and they're all going in the trench at the same time.  
 15 So that installation, it's pretty smooth.  
 16 I should note, too, that in agricultural  
 17 fields the topsoil is usually pushed to one side first  
 18 before the trencher comes through. Then the trencher  
 19 comes through, spits the underlying soils to the other  
 20 side, the cable goes in, those underlying soils get  
 21 put back in and topsoil on top. So they stay  
 22 separated.  
 23 I should also note, too, that if there's  
 24 drain tile in the field that is at a depth where this  
 25 would hit it, fragments would come up here in the

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 2 these access roads are designed to accommodate that  
 3 construction traffic.  
 4 After construction, there will be a  
 5 16-foot-wide road maybe 6 or 8 inches deep of stone;  
 6 but during construction they'll be much wider.  
 7 They'll be 40 feet wide. But the majority of that  
 8 will be the compacted shoulders on the edges of this  
 9 road. So gravel road down the middle, compacted  
 10 shoulder, so we can get the bigger trucks through, the  
 11 cranes and all that. After construction, those  
 12 compacted edges will be de-compacted so that the crops  
 13 and such can grow right up to the road.  
 14 I should also note, too, that there is at  
 15 the end of the road a little gravel beauty ring that  
 16 goes around the turbine. That's usually 10 to 20 feet  
 17 across so that the pickup trucks during operations can  
 18 pull up, turn around. And farming just goes right  
 19 back up to there. So you can really just work the  
 20 land right up to that beauty ring. So that's the  
 21 access roads to get to the turbines and get them  
 22 built.  
 23 Also, you know, as those roads are getting  
 24 built -- it's not really shown here, but the  
 25 excavation to put in those foundations is going to be

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 2 trench, immediately gets tracked with a GPS  
 3 coordinate, and then repair crews come fix that. And  
 4 that would be under the warranty of the contract and  
 5 the lease for, I think, several years to make sure  
 6 those drain tiles are repaired properly.  
 7 So while that's going on -- I'm kind of  
 8 jumping around here -- the substation is also going to  
 9 be in progress. As I said, that's central to the  
 10 project and will be located along the existing  
 11 transmission lines. So here there's various circuit  
 12 breakers that are built, a transformer gets brought in  
 13 and brings the voltage up, the transmission voltage.  
 14 So that's something similar to what you've seen around  
 15 locally with a substation.  
 16 Then the turbines themselves, I mentioned  
 17 that there are various components, the rotors, the  
 18 towers and such. And that process is once the  
 19 foundation is laid and cured, the bottom two tower  
 20 sections, the base and the bottom mid, they get set by  
 21 crane, bolted in. And then a larger crane, which you  
 22 see there, the top-out crane, will come in and stack  
 23 the rest of the tower up and bring the cell that goes  
 24 on top of that, which is where the generator is at,  
 25 and then attach the rotor.

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2 In this case most likely the rotor would

3 be built in the air. So one blade you could lift it

4 up and then the next blade and the next blade. So

5 that's generally the construction.

6 Once the turbines are up and there's power

7 back fed to the facility, the generators will be

8 commissioned. So teams of commissioners will be

9 running through the turbines, going through a pretty

10 extensive checklist to make sure everything's up and

11 running perfectly, all the safety functions are going

12 and it's operating.

13 Now, I don't have a slide for the next

14 thing I want to talk about, but decommissioning. So

15 at the end of the useful life of the farm, which is --

16 you know, depending on the farm, could be 30 years or

17 25 years, there's decommissioning. And Article 10

18 process actually requires us to come up with a

19 decommissioning plan and a financial security to pay

20 for that decommissioning.

21 And the decommissioning is basically this

22 slide in reverse. Crews come in and start to take the

23 turbines down, the substation will get dismantled,

24 roads get reclaimed. So the stone gets taken out,

25 everything gets decompacted and turned back into

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2 I'm going to touch on five basic topics related to

3 sound.

4 The first one is a quick sound 101 primer.

5 Second is talking about how you measure existing

6 sound. Third topic is predicting future sound from

7 the wind farm. Fourth topic I'm going to touch on is

8 a question that comes up a lot, and it's low frequency

9 and infrasound. And finally talk briefly about

10 criteria or design goals for the wind farm project.

11 So sound 101. Two sound sources of equal

12 measure, and sound is measured in decibels. What we

13 hear are A-weighted decibels, and I'll talk about that

14 in a minute.

15 So two sound sources of equal measure add

16 up to be 3 decibels higher, because sound is

17 logarithmic. So our cricket at 30 decibels and fan at

18 30 decibels together would be 33 decibels, not 60

19 decibels. So it's logarithmic math.

20 Likewise, two sources of sound where one

21 is 10 decibels or more higher than the other -- so in

22 this example that same cricket at 30 but an air

23 conditioner at 40, the two of those together would

24 really be 40 decibels -- the louder source dominates.

25 It's not 70 decibels.

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2 whatever the use was, a farm or pasture or what not.

3 I believe here in these leases the depth

4 of removal of the foundation is 4 feet. So anything 4

5 feet and above will get jackhammered out. The cable

6 as well, if that's above that, that would come out.

7 If it's below that limit, it can stay in the ground.

8 But that's basically the way the decommissioning

9 works. So the intent is that after that happens, you

10 can't really tell it was there, for all practical

11 purposes.

12 That's got me covered.

13 MS. COLEMAN-GRAHAM: Okay, Tracy. Thank

14 you.

15 Again, same thing with the cards. Pass

16 them to the aisles, if you would. Ask for more cards

17 if you need them. And Rob O'Neal is up next.

18 MR. O'NEAL: Thank you, Rita.

19 Again, my name is Rob O'Neal, from Epsilon

20 Associates. And I've been doing community sound

21 studies for about 30 years now, and the last 15 years

22 or so I've worked on approximately 150 different wind

23 turbine wind farm projects doing sound studies. So

24 I've seen quite a few of these. Tonight I'm going to

25 touch on -- I've only got about 15, 20 minutes, but

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2 So if you remember your old stereo system

3 from back in the day, you might have had a graphic

4 equalizer in it, which allowed you to control the

5 different frequencies. And that's what sound is; it's

6 made up of different frequencies. You've got that low

7 base, middle frequencies, high frequencies.

8 This graph here on the bottom it shows you

9 those frequencies starting on the left here in the

10 infrasound region down around 4 hertz. Infrasound

11 goes up to 20 hertz, low frequency is 20 to 200, and

12 then middle and high frequencies are 200 hertz and

13 above. And then the Y axis is sound levels in

14 decibels for each frequency band.

15 And this graph here is an audibility

16 graph. In other words, the point of this graph is

17 that we don't hear infrasound. The amount of energy

18 you need to hear it is too high. You have to have

19 over 100 decibels in those low, low frequencies for us

20 to hear it. And really you don't have those things

21 typically out there in nature or in our world, unless

22 you're standing on the tarmac with a jet engine

23 running, which we shouldn't be.

24 This last graph here I'm going to show you

25 on sound is how the A-weighting frequency works. So

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2 A-weighting is the standard convention used in the

3 acoustics world to represent how a human ear responds

4 to sound. And again, it's sort of the inverse to what

5 I just showed you in the previous graph in that we

6 hear the middle frequencies really well. So there's

7 no correction to that.

8 So 1,000 hertz we hear very well. These

9 low, low frequencies in the infrasound region over

10 here we don't hear well at all. So there's a huge,

11 huge correction that's applied there. They don't

12 contribute essentially anything to the A-weighted

13 sound levels. But A-weighting is what we hear and how

14 we hear. So that's the standard that we use in wind

15 turbine sound studies and most any sound study.

16 Second topic, measuring sound. As part of

17 the Article 10 process, the state requires two seasons

18 of existing sound level measurements here in the

19 community, one during summer, one during winter.

20 Those have actually been completed now. I'll show you

21 some information on that in a minute.

22 These are just a couple of examples of the

23 equipment we use. We have a lot of sound level

24 meters, which is the upper right-hand photograph there

25 in the protective cases. We also measure the

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2 a year ago today -- into mid-March. And what you see

3 in the top series of lines are the eight locations

4 with their sound levels overlaid on each other. And

5 as you can see, there's a lot of similarity, which is

6 what we'd expect in a large agricultural community.

7 And the point of that is to show the

8 variability. Remember, again, there's no wind

9 turbines around here. But the sound today when the

10 wind is absolutely still during the nighttime hours

11 could be as low as maybe 16, 17 decibels. But a lot

12 of the time it is up here, 50, 60, approaching 70

13 decibels.

14 What's plotted on the bottom here in gray

15 is the wind speed data from that meteorological tower

16 that I showed you in the previous photograph. So

17 that's ground level wind speed and the scale for that

18 on the far right-hand side. And there's usually a

19 very strong correlation -- you see it here, too --

20 when the wind speeds are high, such as this data right

21 here or this data over here, sound levels high. Not

22 surprising.

23 But there's also a lot of other things

24 influencing sound today in town, whether it's the

25 wind, it's traffic, it's planes, it's insect noise,

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2 concurrent wind speed. Because the wind itself is a

3 very important factor in terms of generating sound.

4 As you know from this past week if you

5 were outside during some of those windy days, that's

6 pretty much all you heard was the wind whistling past

7 you. So as part of our studies, the lower left-hand

8 photograph shows a picture of one of our

9 meteorological towers that we measure the wind speed

10 with wound studies.

11 All this equipment that we use is

12 compliant with American National Standards, ANSI

13 standards; and we also use ANSI standards to analyze

14 the sound level data that goes into the Article 10

15 application.

16 So this graph here has a lot of

17 information. Graphs like this will be part of the

18 application when it's turned in later this year that

19 you'll be able to really study. This graph represents

20 about 15 days of existing condition measurements here

21 in the project area. We had eight different sound

22 level meters spread out amongst the community in

23 different spots.

24 This particular graph is the wintertime

25 measurement, so it goes from late February -- so about

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2 plane noise. A variety of mechanical equipment on the

3 farms and so forth all contribute to the variety of

4 sound levels here, which can vary by at least 50

5 decibels over course of a day at the same location.

6 The third topic I was going to touch on is

7 predicting sound. So in other words, once Ben and

8 Marcel have completed the layout of where they think

9 the turbines are going to go, we then take that

10 information along with a lot of other information,

11 which I listed up here, and we put that into our sound

12 model.

13 There's a very rigorous standard called

14 the ANSI -- sorry, the ISO 9613-2 standard for

15 propagation of sound. That's what's used to take

16 sound from all the different wind turbines as well as

17 the substation and propagate that out, or calculate

18 that out, to every home in the community in the study

19 area.

20 There's a lot of other information that

21 goes into the sound modeling. Any terrain -- it's

22 pretty gentle terrain here, but any terrain data goes

23 into the model, the heights of the wind turbines are

24 put into the model, the meteorology -- worst-case

25 meteorological conditions go into the model; and all

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 2 the distances are calculated using the software.  
 3 The fourth item right here is one I want  
 4 to touch on for a minute, maximum sound level from  
 5 each wind turbine. So depending which manufacturer is  
 6 used for the project, we'll get a technical  
 7 specification sheet from that manufacturer, whether  
 8 it's General Electric or Vestas or Nordex. Any of the  
 9 big manufacturers have very detailed sound data  
 10 they've taken of these types of wind turbines.  
 11 And the sound data is going to vary as a  
 12 function of wind speed. So at very low wind speeds  
 13 the sound levels are very low. And they gradually go  
 14 up and up until it reaches maximum wind speed, at  
 15 which point even if the wind speed increases, the  
 16 sound levels from the turbines will not increase.  
 17 They plateau. The blades will start to feather, and  
 18 the sound will not increase after that.  
 19 So that maximum sound level that the  
 20 turbines can generate from whatever wind speed that is  
 21 is what goes into the model, and that's what we use to  
 22 calculate those potential worst-case sound levels that  
 23 could occur at any one of the homes in the community.  
 24 I don't expect you to read this graph from  
 25 the audience, but this type of map will be in the

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1 HERITAGE WIND PROJECT  
 2 8,760 hourly wind speeds plotted on this graph from  
 3 January 1st to December 31st. And the speed is over  
 4 here on the Y axis going from zero. And it's in  
 5 meters per second, which is the way things are done in  
 6 the wind industry. It's a holdover from Europe.  
 7 But the cut-in wind speed for most  
 8 turbines is around 3 meters per second, which is about  
 9 7 miles per hour. So below 7 miles per hour the  
 10 turbines won't spin. They won't turn; therefore,  
 11 there's no sound from the wind turbines. And as you  
 12 can see from this graph here, that would be all these  
 13 hours down approximately here. So the turbines won't  
 14 be turning, so there will be no sound. So that's  
 15 certainly sometime in the year.  
 16 And then the maximum sound is usually  
 17 around 9 or 10 meters per second up here, where you  
 18 get that sort of maximum sound; and everything below  
 19 that is going to be something in between. So again,  
 20 the point is the sound levels from a wind turbine over  
 21 the course of a year are going to vary. It's not  
 22 going to be the sort of worst-case sound level for the  
 23 entire year.  
 24 This next graph is going to illustrate  
 25 that for you. This is taking a similar type of annual

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1 HERITAGE WIND PROJECT  
 2 application. This is a map from another project  
 3 that's in the public record, the 8 Point Wind Project  
 4 in Steuben County in the Southern Tier. We'll use a  
 5 similar map for the Heritage Wind Project.  
 6 There's a lot of information on here,  
 7 where the turbines are, where the homes are, and then  
 8 the calculated sound levels. And each one of these  
 9 has a very detailed inset where you can go and see  
 10 your home if you're in the project area in a lot more  
 11 detail. That's what this map here shows. It's one of  
 12 these inset maps. And again, don't worry about seeing  
 13 all the detail tonight, but this is the type of  
 14 information that will be included as part of the  
 15 Article 10 application. The home, sound levels,  
 16 etcetera.  
 17 I was explaining before about sound levels  
 18 vary as a function of wind speed. What this graph  
 19 here shows you is representative. It's not from the  
 20 Heritage site, but it's another site in New York  
 21 State. So I expect it to be not dissimilar to a site  
 22 here.  
 23 But this is one year's worth of hub height  
 24 wind speed data. So it's hourly data. So in a  
 25 year -- there's 8,760 hours in a year, so there's

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1 HERITAGE WIND PROJECT  
 2 data set. This is, again, one year's worth from  
 3 January 1st on the left here to December 31st on the  
 4 right. It's hourly sound levels this time. And as  
 5 you can see, these are sound levels here from zero.  
 6 Those are all those hours during the year where the  
 7 wind is below cut-in speed, so those are all hours  
 8 where the wind farm is not making any sound.  
 9 As soon as the blades start turning, then  
 10 the sound level will jump up from anywhere from 15 to  
 11 as high as 40. 40 would be those times of that  
 12 worst-case wind speed I was talking about before.  
 13 So again, the take-away from this is that  
 14 sound levels will vary, you know, during the course of  
 15 the year. They're not always going to be at that  
 16 worst case, which is kind of what we stress in the  
 17 application; but the message is that it's not always  
 18 at that level. As you can see from this, it's very  
 19 frequently a lot lower than that.  
 20 **A question I get a lot of times on the**  
 21 **modeling predictions is "Are they any good?" "Why**  
 22 **should I believe you guys?" And that's a fair**  
 23 **question, and the answer is they're accurate. We've**  
 24 **learned enough over time now, we've put in**  
 25 **conservative model assumptions, and they're accurate.**

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1           **HERITAGE WIND PROJECT**  
 2           We've done a lot of post-construction  
 3 testing. There's over 50,000 wind turbines operating  
 4 today in the United States, and a lot of them have  
 5 been tested; they've been measured for sound. And  
 6 what we find is that if we can measure those  
 7 worst-case conditions where we reach that maximum  
 8 speed at the hub, it's not too windy at the ground.  
 9 So the wind's -- the turbine's being drowned out, that  
 10 we find the actual sound levels are often a couple  
 11 decibels less than we actually predicted.  
 12           These next two slides are just covers from  
 13 a couple of technical reports that I've worked on  
 14 which back that up. This is a technical conference  
 15 paper that I would where I did the modeling. I did  
 16 the post-construction compliance measurements. We  
 17 found out that the actual measured sound levels after  
 18 the fact were 1 to 3 decibels lower than what we had  
 19 estimated pre-construction.  
 20           And this is the cover of another report, a  
 21 commissioned study by the State of Massachusetts where  
 22 our firm was involved, and we studied a lot of  
 23 different things. And that was also one of the  
 24 conclusions we came to preparing models versus  
 25 measuring data.

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1           **HERITAGE WIND PROJECT**  
 2 1,000 and 1,500 feet from turbines at a number of  
 3 homes, and all the levels were below those criteria  
 4 that I showed you earlier.  
 5           This is a graph showing three different  
 6 actual sound level measurements. The lower one here  
 7 in red is an area with no wind turbines and light  
 8 winds. This is the area of infrasound right here to  
 9 the left of the dotted line, as you can see this  
 10 infrasound. The blue line is also an area with no  
 11 wind turbines, but a moderate wind, now 6 to 8 miles  
 12 per hour. Again, plenty of infrasound. And finally,  
 13 the top graph is an area -- it's not here in New York  
 14 State, but it's an area that does have wind turbines  
 15 under very high winds, 12 meters per second. It's  
 16 about 25 miles per hour. And once again, you've of  
 17 course got some infrasound that's a little bit higher,  
 18 but it's downgraded by the wind itself. That's what's  
 19 generating that large part of the infrasound.  
 20           Last infrasound slide here is one I took  
 21 of my own air-conditioner. Again, the infrasound is  
 22 down here to the left of the solid line. That's  
 23 anywhere from 40 to 50 decibels at those various  
 24 frequencies. Typical air-conditioner that you might  
 25 have in your house. This is the audibility line, this

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1           **HERITAGE WIND PROJECT**  
 2           Fourth topic is low-frequency infrasound.  
 3 You may have heard about it, you may not have. People  
 4 talk about it, or they may not understand it. Wind  
 5 turbines generate low-frequency infrasound. If you  
 6 remember that graph I showed you early tonight where  
 7 it's just part of the spectrum, and it's just part of  
 8 any mechanical device. There's low-frequency and  
 9 infrasound sound in the auditorium here tonight that  
 10 we're all experiencing right now. It's in our homes,  
 11 it's every day. And wind turbines generate it, too.  
 12 They're no different.  
 13           There's several ANSI standards that I list  
 14 up here. Those will be looked at as part of Article  
 15 10, because there are some general guidelines and  
 16 criteria that are in there to ensure that the sound  
 17 levels from low frequency are not so high they're  
 18 going to cause things to vibrate and rattle. That's a  
 19 question that comes up. So we'll be looking at that  
 20 and making sure they comply with those limits.  
 21           We were commissioned several years ago to  
 22 do a research study on low frequency and infrasound.  
 23 This is a cover of that study where the results were  
 24 peer reviewed, and the conclusion was yes, there is  
 25 low frequency and infrasound. We measured that at

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1           **HERITAGE WIND PROJECT**  
 2 slanted line here. Again, it's inaudible in the  
 3 infrasound. Once you get to low frequency, it goes to  
 4 the right of that. That just means it becomes  
 5 audible. Not that I recognize it as low frequency, it  
 6 just means I can hear my air-conditioner. That's all  
 7 that means.  
 8           Final slide is just touching briefly on  
 9 noise design goals or criteria for projects here. The  
 10 sleep disturbance at the outside of a home is 45  
 11 decibels; and that's going to be the design goal for  
 12 this project at every home, 45 decibels or less. As I  
 13 mentioned, the low frequency and infrasound have ANSI  
 14 guidelines. Those will be used to enforce and inform  
 15 design goals to keep them below those limits that  
 16 cause any vibration or rattle or disturbance from low  
 17 frequency and from.  
 18           And finally -- I didn't really touch on  
 19 this -- a tonal noise. It really isn't an issue from  
 20 wind turbines. Substations, perhaps, can be a source  
 21 of tonal sound. Those will be looked at as well and  
 22 will not be allowed to generate any tonal sound.  
 23 Tonal is that sort of pure tone, any hum or whining  
 24 you might recognize as sort of a distinct tone you  
 25 might hear.

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1           **HERITAGE WIND PROJECT**  
2           **So those types of criteria will be part of**  
3 **the project and part of the criteria that we design to**  
4 **meet those criteria.**  
5           **So with that, Rita, I believe that**  
6 **concludes my slides.**  
7           MS. COLEMAN-GRAHAM: Thank you.  
8           Again, if you would pass your cards to the  
9 center aisles, we'll go ahead and pick them up and add  
10 them to our growing pile here.  
11           What I'm going to do now is do the  
12 questions for the panelists reading from your question  
13 cards. Okay. The first ones are for probably Neil.  
14           If the Heritage Wind Project were to be  
15 sold and Apex not hired to manage the facility, how  
16 does Apex ensure that environmental compliance is met?  
17           MR. HABIG: Well, the permit -- and Jim  
18 can comment on this as well. The Article 10 results  
19 in a certificate of public good, and it has a number  
20 of conditions that are in effect for the duration of  
21 the operation of the project. So whether it be Apex  
22 operating the project or another operator of the  
23 project, they would still be bound by the same  
24 conditions and requirements.  
25           Jim, did you have anything else on that?

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1           **HERITAGE WIND PROJECT**  
2 officials as well as talked to the landowners, did not  
3 try to keep it a secret. But we -- at that stage we  
4 did not know what landowners were interested in  
5 participating and didn't have much configuration -- or  
6 any configuration details at all.  
7           MS. COLEMAN-GRAHAM: Is this project being  
8 proposed in a manner that meets or exceeds in a  
9 beneficial manner all current Town of Barre  
10 ordinances?  
11           MR. HABIG: In particular the tip height,  
12 I believe the Town of Barre wind ordinance was  
13 established in 2009 or 2007 -- several years ago -- at  
14 which time the 500-foot height restriction was  
15 adequate to cover any expected turbine height at that  
16 time. Subsequently over time, turbines have gotten  
17 taller, rotor blades have gotten longer; so the tip  
18 height has increased.  
19           So it is not -- what we're proposing does  
20 not conform to the 500 feet as well. And Ben can  
21 speak to this. There's some property line setbacks as  
22 well as a few sound specification details. For  
23 example, there was a lack of specificity in the units  
24 associated with the level. Those are more corrections  
25 as opposed to changes. But I'll let Ben clarify.

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1           **HERITAGE WIND PROJECT**  
2           MR. MUSCATO: I'm afraid to. I just  
3 wanted to add. So a certificate is required to be  
4 transferred if it's sold to another entity, and that  
5 transfer has to be approved by the siting board, and  
6 the new owner would have to agree to all of the  
7 conditions in the certificate before the transfer is  
8 approved.  
9           MS. COLEMAN-GRAHAM: Thank you. There  
10 were several versions of that question, so I've read  
11 that one.  
12           Again Neil. Why aren't forums such as the  
13 one you're holding here tonight done prior to getting  
14 landowners signed up, so that the entire town is aware  
15 of your presence and your intentions? Why is it a big  
16 secret?  
17           MR. HABIG: Well, I wouldn't characterize  
18 it as a big secret. We had some open houses; we  
19 invited landowners; we spoke with public officials. A  
20 lot of what we hoped and shared tonight is a  
21 culmination of quite a bit of work in laying out the  
22 project and determining where turbines may be, where  
23 landowners have chosen to participate and so forth.  
24           So very early in the stage -- again, we  
25 didn't keep it as a secret. We went to the Town

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1           **HERITAGE WIND PROJECT**  
2           MR. YAZMAN: There's a number of setback  
3 provisions that we've discussed with the Town of Barre  
4 in a proposal to amend their Zoning Ordinance, and I  
5 would propose that we just detail those in response to  
6 this question on our website responses.  
7           MS. COLEMAN-GRAHAM: Last question for  
8 Neil for this round.  
9           How many times has Apex Clean Energy  
10 walked away from a proposed site when they discovered  
11 that there would be significant environmental impacts.  
12           MR. HABIG: Well, I don't have a specific  
13 answer to that. When you say "walked away," that  
14 seems to imply that you were somewhat committed to  
15 that site. But one of the early stage steps in  
16 evaluating a project is a fatal flaw.  
17           So before a project actually even becomes  
18 a project, there's quite a bit of analysis that goes  
19 into it. We have a 50-or-60-slide deck that looks at  
20 all these different things, including wildlife issues.  
21 So we would work with a firm like EDR as well as our  
22 own internal permitting experts or environmental  
23 experts to look at some of the sensitive habitats that  
24 we know. Some of those are not appearing until  
25 studies are done, but I'd have to check with folks



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2 internally to see what the answer to that is as far as

3 numbers.

4 MS. COLEMAN-GRAHAM: Okay. Let's move on

5 to Ben.

6 Ben, how far do the wind turbines have to

7 be from the airport?

8 MR. YAZMAN: Well, ultimately that will be

9 a determination that the FAA makes. The turbines

10 sited on this map are no closer than 2 and a half

11 nautical miles to the airport.

12 MS. COLEMAN-GRAHAM: What was that number

13 again?

14 MR. YAZMAN: 2.5 nautical miles.

15 MS. COLEMAN-GRAHAM: Thank you. I'm not

16 sure if this one should be you or not, Ben, but we'll

17 give it a try.

18 What are the readings of the current three

19 meteorological towers in the town?

20 MR. YAZMAN: We don't publish

21 comprehensive wind data from those meteorological

22 towers. We do submit reports on their functionality

23 to the town, but I can say that they confirm that the

24 Town of Barre has what the IIEC has classified as a

25 class 3 wind speed.

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1 HERITAGE WIND PROJECT

2 schools, the county, so forth.

3 MR. YAZMAN: That's really going to be up

4 to the taxing jurisdictions and their leadership to

5 determine what to do with the money that comes from

6 the project. But we can, you know, estimate what we

7 would be paying into a community benefits pool, which

8 as I said before we assume to be about \$7,500 per

9 rated megawatt of the plant.

10 MS. COLEMAN-GRAHAM: Okay. And last one

11 for you.

12 What is the value of this proposed

13 project? It might be Neil.

14 MR. HABIG: Something over \$200 million.

15 It depends specifically on the final turbine chosen

16 and final configuration, but it would be in excess of

17 \$200 million of project cost.

18 MS. COLEMAN-GRAHAM: Okay. Moving on to

19 Greg.

20 Who determines the value of the wetland?

21 MR. LIBERMAN: The methodology that's been

22 documented in the Preliminary Scoping Statement and

23 agreed to by the New York State DEC is called the

24 United States Army Corps of Engineers Highway

25 Methodology. It's a methodology established by the

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1 HERITAGE WIND PROJECT

2 MS. COLEMAN-GRAHAM: I have four that are

3 very similar, so I'm going to try to group it as one

4 question here. It deals with the proposed jobs in the

5 local area. The questions are getting at what is the

6 number of permanent jobs that could be expected for

7 this area and what type of wages.

8 MR. YAZMAN: We would expect up to eight

9 high-paying technical jobs to be permanently attached

10 to the project.

11 MS. COLEMAN-GRAHAM: And those would be

12 full-time jobs?

13 MR. YAZMAN: Full-time jobs, yeah.

14 MS. COLEMAN-GRAHAM: Okay. How many years

15 will the proposed jobs by the developer for the local

16 community exist?

17 MR. YAZMAN: I would expect they would

18 exist for the life of the project. As an example, I'm

19 thinking about a wind turbine technician. It's a

20 high-paying skilled labor job that would be required

21 throughout the life of the project.

22 MS. COLEMAN-GRAHAM: This deals more to

23 the economic benefits.

24 What percentage tax decrease do you

25 anticipate for Barre residents? And then it goes on

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1 HERITAGE WIND PROJECT

2 Federal government to essentially come up with a

3 standardized approach on how to assess functions and

4 values, because it can be subjective.

5 So through the process of developing the

6 scoping statement, there's been agreement to use the

7 highway methodology, and that's been consistent with

8 several other Article 10 projects as well.

9 MS. COLEMAN-GRAHAM: When was the species

10 inventory started?

11 MR. LIBERMAN: Species inventory was

12 initiated in 2016 with some of the initial wildlife

13 studies and is continuing through all facets of

14 fieldwork, whether it's through wetland delineations,

15 vernal pool assessment or upcoming wetland

16 delineations that will occur in 2019.

17 MS. COLEMAN-GRAHAM: Okay. You may have

18 just touched on this.

19 Other than birds and bats, what other

20 environmental studies are being done?

21 MR. LIBERMAN: Great question. There will

22 be several in support of Exhibit 22 and 23. The

23 biggest is probably the wetland stream delineation

24 report. There will be an invasive species control

25 plan, the invasive species baseline survey. There

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1 HERITAGE WIND PROJECT  
 2 will be habitat fragmentation analysis, net  
 3 conservation benefit plan per species, an avian risk  
 4 assessment. There will be a vernal pool assessment.  
 5 There will be scope, prevention and  
 6 counter control measures, a water quality report along  
 7 with a stone water pollution prevention plan.  
 8 And I'm -- there may be others, and I'm  
 9 happy to kind of provide in writing maybe a response  
 10 of what was outlined in the Preliminary Scoping  
 11 Statement in terms of all the supporting studies, just  
 12 because of the volume of 40 exhibits with probably  
 13 upwards of 60 appendices. But those are the big ones.  
 14 MS. COLEMAN-GRAHAM: Okay. One more.  
 15 Why is there only one vernal pool study in  
 16 the spring of 2018? Why not this spring as well?  
 17 Shouldn't these studies be done for at least two  
 18 years?  
 19 MR. LIBERMAN: Good question. So the  
 20 methodology used for the vernal pool study was based  
 21 on -- New York State does not have a vernal pool  
 22 identification standard. Several other states do. So  
 23 there was a collection -- a review of various other  
 24 states, Pennsylvania and Massachusetts, that were used  
 25 as the guideline for that. And it doesn't -- it has

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1 HERITAGE WIND PROJECT  
 2 the standard there?  
 3 MR. MIBUS: I believe we fall back to our  
 4 internal Apex standard, which is 40 hours per year.  
 5 MS. COLEMAN-GRAHAM: What was the number  
 6 again?  
 7 MR. MIBUS: It's 40 hours per year per the  
 8 internal company standard.  
 9 MS. COLEMAN-GRAHAM: Okay. Shadow  
 10 flicker. You say distance matters. So say that a  
 11 cloud goes in front of the sun. Would seem to make a  
 12 shadow on the ground. But you say it doesn't? I  
 13 think they want clarification as to that.  
 14 MR. MIBUS: I think I was referring that  
 15 the shadow flicker from the turbine is blocked by  
 16 clouds. But if it's cloudy, you'll have sunshine  
 17 behind the turbine to have the flickering.  
 18 MS. COLEMAN-GRAHAM: Has shadow flicker  
 19 study been conducted to help site the turbines?  
 20 MR. MIBUS: That is normally done once the  
 21 layout is finalized, and it is then done through an  
 22 independent group to confirm that we are meeting the  
 23 regulations.  
 24 MS. COLEMAN-GRAHAM: Okay. This one's a  
 25 little longer.

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1 HERITAGE WIND PROJECT  
 2 to have a two-step component. And I apologize for not  
 3 being explicit in the discussion.  
 4 And it's not so much about the year as  
 5 much as it's about looking at it in the early spring  
 6 and then going back in the summer to make sure that  
 7 the vernal pool is in fact dried up. And that work  
 8 has occurred. And as part of the delineation work  
 9 that will happen in early 2019, we'll be  
 10 double-checking the vernal pool assessment performed  
 11 in 2018. But as far as the standards that exist, it's  
 12 not a two-year standard.  
 13 MS. COLEMAN-GRAHAM: Okay. Let's move on  
 14 and give some to Marcel.  
 15 So is shadow flicker just minutes a day  
 16 certain times of the year?  
 17 MR. MIBUS: I mean, it depends greatly on  
 18 how you look at the geometry of where a home is to  
 19 where the turbine is. Generally, especially with the  
 20 distance that the turbines are from homes here, they  
 21 are largely just in the minutes per day. And then  
 22 that obviously just depends on the time of year.  
 23 MS. COLEMAN-GRAHAM: Okay. This one --  
 24 how many hours for participating parties or  
 25 leaseholders -- I think they're getting at -- what's

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1 HERITAGE WIND PROJECT  
 2 On a flat area how far will shadow flicker  
 3 transmit during sunrise and sunset with the potential  
 4 of maximum sunlight?  
 5 MR. MIBUS: Well, I think I would have  
 6 to -- for any specific numbers I would have to  
 7 actually look at it and then report the numbers back  
 8 specifically. But there is an aspect of the near  
 9 horizon diffuse light that limits the maximum number.  
 10 But for very specifics I'd have to report back in to  
 11 the website.  
 12 MS. COLEMAN-GRAHAM: Okay. There was a  
 13 second part to this one.  
 14 If a tower is situated beyond the limits,  
 15 what happens?  
 16 MR. MIBUS: So there's two potential. We  
 17 either work on siting the turbine or -- to adjust for  
 18 that, or we curtail the turbine at very specific time  
 19 periods to limit the shadow flicker during the  
 20 expected windows.  
 21 MS. COLEMAN-GRAHAM: Okay. And last  
 22 question for you. And I'm sure I'm not going to  
 23 pronounce this correctly. You can tell I'm neutral  
 24 and not in the wind industry.  
 25 Iberdrola told our town in 2008 that there

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1 HERITAGE WIND PROJECT  
 2 wasn't enough wind in Barre to make it successful and  
 3 consequently pulled out. So what's changed in 11  
 4 years?  
 5 MR. HABIG: The turbine blades have gotten  
 6 quite a bit longer, and so the minimal threshold wind  
 7 speed for viable wind projects has gone down over the  
 8 last 12 years.  
 9 MS. COLEMAN-GRAHAM: Okay. Let's move on  
 10 to Tracy.  
 11 Will multiple sites be under construction  
 12 simultaneously?  
 13 MR. BUTLER: Yes. Yeah, absolutely. So,  
 14 you know, there's typically a plan of installation  
 15 that would have the roads coming in and then the  
 16 foundations behind that and then the turbines coming  
 17 behind that. And that would work its way across the  
 18 project such that the cranes could just move in one  
 19 direction and don't have to backtrack.  
 20 But yeah, you'd have several foundations  
 21 being poured at once and several turbines being  
 22 erected at once.  
 23 MS. COLEMAN-GRAHAM: This next one has  
 24 been asked in a couple different ways by people, so  
 25 I'm going to pick this cards.

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1 HERITAGE WIND PROJECT  
 2 definitely an iterative back-and-forth process.  
 3 MS. COLEMAN-GRAHAM: Tracy, are the  
 4 nacelles rotational, or will they be in a fixed  
 5 position.  
 6 MR. BUTLER: That's a good question that  
 7 we didn't touch on. So the nacelle has anemometers on  
 8 top and wind direction wind veins on top. So the  
 9 nacelle will rotate to line up to face the wind. And  
 10 also, you know, the blades themselves, they rotate as  
 11 well.  
 12 So when it's non-operating, the blades can  
 13 be feathered back so they're not catching the wind;  
 14 and then as the wind speed comes up, they can engage,  
 15 start to rotate. And then as we reach high wind  
 16 speeds where it needs to cut out, the blades can  
 17 feather again.  
 18 But exactly, yeah, the nacelle can rotate,  
 19 spin all the way around.  
 20 MS. COLEMAN-GRAHAM: Last one for you this  
 21 round.  
 22 If the proposed project is approved, to  
 23 whose satisfaction are the roads repaired after  
 24 construction?  
 25 MR. BUTLER: That would be also a good

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1 HERITAGE WIND PROJECT  
 2 Will the collection cables in wooded  
 3 areas -- will they be tracked by the shortest distance  
 4 or parallel to an access road?  
 5 I think they're getting at minimizing the  
 6 disturbance to a wooded area.  
 7 MR. BUTLER: Sure. So that's where some  
 8 of the wetlands information that Greg was talking  
 9 about comes into play. Because there are some forests  
 10 wetlands here where we do need to go under them in the  
 11 shortest way possible with a bore or bore around them.  
 12 We've got to look at each one specifically to see if  
 13 it makes sense to try to find a way to go around or  
 14 bore underneath.  
 15 MR. LIBERMAN: And I would even add to  
 16 that that it is a bit of an iterative process. In  
 17 other words, there's been a lot of discussions with  
 18 some of the preliminary layout information and some of  
 19 the preliminary environmental information to avoid to  
 20 the extent practicable. And then that information  
 21 gets documented, and it will be provided in the  
 22 Exhibit 9 of the Article 10 application. All of these  
 23 measures to avoid impacts siting these facilities in  
 24 ways that will maximize the avoidance of minimization  
 25 will all be documented in the application, but it's

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1 HERITAGE WIND PROJECT  
 2 question to bring Ben in on. Because there is a  
 3 road-use agreement that would have to be agreed to  
 4 through the town, and usually that agreement then is  
 5 required to do a pre-construction survey of the roads  
 6 and then a post-construction survey of the roads to  
 7 make sure they've been repaired per the road-use  
 8 agreement.  
 9 MR. YAZMAN: I'd just add that the  
 10 standards of that road-use agreement would be to leave  
 11 roads in same or better condition as we found them,  
 12 essentially.  
 13 MS. COLEMAN-GRAHAM: Okay. Let's move on  
 14 to Rob.  
 15 Rob, how was the 45-decibel setback used  
 16 previously determined?  
 17 MR. O'NEAL: I'm not sure I understand the  
 18 question.  
 19 MS. COLEMAN-GRAHAM: I think they're  
 20 looking at what's the basis of 45 as the number.  
 21 MR. O'NEAL: Okay. So the 45 has been  
 22 used as a guideline to prevent sleep disturbance  
 23 that's exterior to a home. That's been used as a  
 24 number to -- 45 or less, so there will not be sleep  
 25 disturbance at night.

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 2 MS. COLEMAN-GRAHAM: For measuring sound  
 3 are you using averages or immediate sound levels?  
 4 MR. O'NEAL: So the instrumentation is  
 5 constantly recording and sampling. Obviously it's  
 6 going to record a lot of different statistics, and for  
 7 the baseline condition we're reporting it in terms of  
 8 ten-minute increments. So those ten-minute periods  
 9 will have equivalent sound level average or an LEQ  
 10 average.  
 11 It's not an average, however. What it is  
 12 it's the energy average which is dominated by the  
 13 highest possible sounds over that ten-minute period.  
 14 MS. COLEMAN-GRAHAM: If we don't hear it,  
 15 can it still injure our hearing? Can it impact our  
 16 health?  
 17 MR. O'NEAL: So I assume the question is  
 18 referring perhaps to infrasound and low-frequency  
 19 sound, because that would be the only thing I think  
 20 that people might be thinking of. So the audible  
 21 frequencies, there's no issue there. And the many,  
 22 many peer-reviewed studies that have come out on  
 23 health from studied wind turbines have shown there is  
 24 no medical impact from wind turbines, from operating  
 25 wind turbines, whether it's from infrasound or

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 2 it's the only source, it's not being up and down, up  
 3 and down, but background, it could be steady.  
 4 MS. COLEMAN-GRAHAM: Okay. Let's move on  
 5 to Jim.  
 6 What is the projected timeline for the  
 7 Article 10 process?  
 8 MR. MUSCATO: Well, from the date that we  
 9 file the application, the siting board has to render a  
 10 decision on the application within 12 months.  
 11 MS. COLEMAN-GRAHAM: Who takes legal  
 12 responsibility if a new company is not complying with  
 13 the signed agreement?  
 14 MR. MUSCATO: So if that means with  
 15 respect to the certificate, the permit conditions,  
 16 then in that instance the siting board has the  
 17 Department of Public Service staff who can enforce the  
 18 conditions in the certificate. And so therefore, DPS  
 19 staff, a state agency, would enforce the certificate  
 20 conditions.  
 21 MS. COLEMAN-GRAHAM: Okay. I'm trying to  
 22 decide an order here.  
 23 Does the Article 10 process have any  
 24 requirement that the developer or project remain  
 25 active for a minimum amount of operational time?

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 2 anything else.  
 3 MS. COLEMAN-GRAHAM: Okay. And last one  
 4 for you this round.  
 5 Does your sound decibel graph show  
 6 duration of sound? And then there's an "and" after  
 7 that one, but I'll stop there for that one.  
 8 MR. O'NEAL: So probably the way to answer  
 9 that is the data that I showed tonight in the slide  
 10 from the project site, those are ten-minute points, if  
 11 you will. So that's a summation of every ten minutes  
 12 over a two-week period.  
 13 MS. COLEMAN-GRAHAM: Are wind turbine  
 14 sounds consistent, or does it change similar to a  
 15 current day here?  
 16 MR. O'NEAL: So the variation I showed  
 17 tonight that occurs today, you'll never see that from  
 18 a wind turbine. In other words, you'll never go from  
 19 16 decibels to 65 decibels from a wind turbine.  
 20 When a turbine is operating and that's the  
 21 dominant source of sound, you'll have a much narrower  
 22 range of sound from that turbine generally anywhere  
 23 from -- depending how far away you are from it,  
 24 anywhere from 25 up to perhaps 45 decibels. But it  
 25 will be -- once it's operating and it's operating and

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 2 MR. MUSCATO: No, Article 10 does not have  
 3 a minimum in terms of at what point an inoperable unit  
 4 would have to be decommissioned or anything like that.  
 5 That's going to be subject to the  
 6 individual decommissioning plan that's going to be  
 7 submitted as part of the Article 10 application that I  
 8 think Tracy mentioned earlier. That plan is likely to  
 9 have time frames for inoperability and at what point  
 10 the turbines would be considered to be decommissioned.  
 11 MS. COLEMAN-GRAHAM: Does the Article 10  
 12 process have any requirement for studies to be  
 13 performed after a project has been approved? And if  
 14 so, who regulates that process?  
 15 MR. MUSCATO: So there's a number of  
 16 studies that would be performed after the project is  
 17 operational. One that I can think of off the top of  
 18 my head would be a post-construction noise study that  
 19 Rob mentioned earlier. And the enforcement of that  
 20 and the review of that and approval of the compliance  
 21 filing associated with the post-construction noise  
 22 plan is going to be the Department of Public Service  
 23 staff. Again, the state agency regulating Article 10.  
 24 MS. COLEMAN-GRAHAM: Okay. The next  
 25 question is for me, since we're about to go back

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 2 around.  
 3 The question is when you are organizing  
 4 the questions that are to be answered, are you  
 5 removing any questions to definitely not be answered  
 6 this evening; and then will all questions including  
 7 this one be answered online in March.  
 8 Okay. Any of the questions that we have  
 9 here you can see -- and that's why we're doing it up  
 10 here in the clear boxes -- you can see we're trying to  
 11 figure out who's the best person on the panel to  
 12 answer that. So they are all going in the boxes. And  
 13 some are more conducive to fairly short kind of  
 14 answers that we can have here.  
 15 So if we see something that has multiple  
 16 questions in it where it wants recording of a lot of  
 17 factual information to back it up, then that one  
 18 doesn't come to the surface to be asked one on one  
 19 with the time constraints that we have.  
 20 But they're all in the boxes, and they all  
 21 remain -- all questions are going to have answers, and  
 22 the remaining ones we don't get to today will be  
 23 included on the website of the project that's in the  
 24 program that you have by March 28th. So we are  
 25 addressing all questions either tonight or online.

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 2 approval, will Apex or its successors purchase that  
 3 property from the owner for that appraised value?  
 4 MR. HABIG: We don't have any program like  
 5 that; but again, there are 25 operating wind farms in  
 6 the state that have been well accepted in communities,  
 7 and the evidence doesn't support that that is an  
 8 issue.  
 9 MS. COLEMAN-GRAHAM: If Apex sells to  
 10 another energy company, do new contracts have to be  
 11 drawn up, or are the previous ones transferred to the  
 12 new company?  
 13 MR. HABIG: No, they're assignable under  
 14 the terms of the contract. So they would be assigned  
 15 to the new owner of the company. And the project  
 16 company itself could be sold; and therefore, the  
 17 agreement would still be with the same party.  
 18 MS. COLEMAN-GRAHAM: Okay. Having  
 19 developed multiple projects in New England and New  
 20 York that are now in operation -- and that's taken  
 21 from the form handouts -- how many projects exactly  
 22 are multiple projects that are operational now in New  
 23 England and New York? I think they're looking for  
 24 numbers.  
 25 MR. HABIG: A project that I've been

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 2 Okay. Now we're coming back around to  
 3 Neil.  
 4 Since nonparticipants have no choice in  
 5 whether turbines are erected in our community, are you  
 6 giving the residents a written guarantee that our  
 7 assessments won't plummet once the turbines are  
 8 erected?  
 9 MR. HABIG: There have been a number of  
 10 studies showing that property values are not  
 11 negatively affected. There's been some studies that  
 12 show -- indicate otherwise, but the vast majority of  
 13 studies show that there is no negative impact on  
 14 property values in proximity to turbines. And not  
 15 just by number of studies, but by number of homes or  
 16 transactions considered.  
 17 So the data suggesting that there is no  
 18 negative correlation vastly outweighs any indication  
 19 that there would be a negative impact. But it's been  
 20 studied extensively.  
 21 MS. COLEMAN-GRAHAM: Okay. There's, like,  
 22 a segue question to this one.  
 23 Should the proposed project be approved  
 24 and a property owner is unable to sell their property  
 25 for an appraised value that was given just prior to

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 2 involved in, there's two in New York, one in Vermont  
 3 and one in Massachusetts.  
 4 MS. COLEMAN-GRAHAM: Okay. Tip height.  
 5 How do current models compare to Orangeville? I don't  
 6 know if that was one of the examples in Ben's slides.  
 7 MR. YAZMAN: I'm not sure which turbine  
 8 model they're using in Orangeville. Anybody?  
 9 MS. COLEMAN-GRAHAM: Okay. So that will  
 10 be something --  
 11 MR. YAZMAN: We'll have to look at that.  
 12 MS. COLEMAN-GRAHAM: -- addressed in the  
 13 written comments. I'm going to put that back in here.  
 14 Last one here, Neil or Ben.  
 15 Can a turbine cause health issues such as  
 16 headaches, heart attacks or miscarriages?  
 17 MR. HABIG: As Rob said, there's been  
 18 numerous studies -- peer-reviewed studies done that  
 19 indicate there's no correlation to health impacts.  
 20 Turbine -- there's no correlation with turbines and  
 21 health impacts.  
 22 MS. COLEMAN-GRAHAM: Okay. Let's move on  
 23 to Ben here. This is a two-parter, so I'll give you  
 24 the first part.  
 25 What are five separate ways the community

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 2 benefits?  
 3 MR. YAZMAN: The primary community  
 4 benefits that I discussed earlier are payments to the  
 5 taxing jurisdictions and then secondly payment to  
 6 landowners who are the economic drivers of the  
 7 community. I would leave it at those two as our  
 8 primary community benefits.  
 9 MS. COLEMAN-GRAHAM: How exactly are  
 10 these -- I'm sorry. How exactly are all the windmills  
 11 connected to the grid? That was on the same card. It  
 12 might be a Tracy question.  
 13 MR. YAZMAN: Yeah, I think Tracy did talk  
 14 a little bit about that. I'll answer it quickly.  
 15 Turbines are connected one to the other by  
 16 underground transmission back to a central project  
 17 substation, and then that substation is connected to  
 18 existing grid infrastructure.  
 19 MS. COLEMAN-GRAHAM: Worldwide scientists  
 20 say unless you cut our carbon use, we will be beyond  
 21 the ability to make a difference in ten years. When  
 22 is the earliest your project will be online?  
 23 MR. YAZMAN: The earliest we'd expect to  
 24 be online is 2021.  
 25 MS. COLEMAN-GRAHAM: Okay. How can Apex

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 2 MR. YAZMAN: No.  
 3 MS. COLEMAN-GRAHAM: Are lessees permitted  
 4 to publicly oppose any variance applications? Are  
 5 lessees permitted to publicly oppose any variance  
 6 applications?  
 7 MR. MUSCATO: I would say theoretically if  
 8 a variance application was submitted just by a legal  
 9 standard, typically the landowner would indicate its  
 10 support for that variance application. It's usually a  
 11 requirement of the local code.  
 12 MS. COLEMAN-GRAHAM: Now we're moving to  
 13 Greg.  
 14 Are turbines -- no. I'm sorry. As  
 15 turbines are being built, how much habitat/trees would  
 16 be cut down?  
 17 MR. LIBERMAN: We don't know the answer to  
 18 that as of yet. In the Preliminary Scoping Statement  
 19 there is a table that indicates by project component  
 20 how large a potential work area would be. The area  
 21 around each turbine, I believe, for the PSS was 250  
 22 foot area of land disturbance. So there's the  
 23 potential for forest impact, potential for grassland  
 24 impact. That will be fully borne out in the  
 25 application once the final layout is determined.

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 2 reassure residents that their TV, radio and cell phone  
 3 service won't be interrupted or ruined by the  
 4 industrial wind turbines?  
 5 MR. YAZMAN: Greg may have more to add  
 6 here, but that would be the subject of part of our  
 7 Article 10 application, evaluation of impact to those  
 8 facilities.  
 9 MR. LIBERMAN: Exhibit 26 of the Article  
 10 10 application will be an assessment of the project on  
 11 potential communication systems, AM/FM, microwave,  
 12 cellular, etcetera. And there are -- those studies  
 13 are currently in process. That will be summarized in  
 14 the application, and there will be mechanisms for  
 15 addressing complaint resolution should this come up.  
 16 So that topic will be discussed in detail in Exhibit  
 17 26 of the application.  
 18 MS. COLEMAN-GRAHAM: There's multiple  
 19 questions here. Is there a building in Western New  
 20 York as tall as your tallest tower? I think they mean  
 21 turbine.  
 22 MR. YAZMAN: I'm not aware of any  
 23 buildings in Western New York that are 655 feet tall.  
 24 MS. COLEMAN-GRAHAM: Have you ever applied  
 25 for variances to the setback restrictions?

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 2 MS. COLEMAN-GRAHAM: Why is the mailer not  
 3 being sent to every resident of Barre for visual  
 4 impacts? Why make the busy working residents come to  
 5 you?  
 6 MR. LIBERMAN: Understood. The Article 10  
 7 regulations are pretty clear in terms of how the  
 8 consultation and whom should be consulted for visual  
 9 impacts, and it states municipal planning  
 10 representatives and various state agencies.  
 11 And I think there was some logic in that  
 12 in that we -- I apologize for the quick sidebar here,  
 13 but there's other studies that will result in direct  
 14 mailers to community residents, one of which will be a  
 15 private well survey.  
 16 And what we've seen is the response rate  
 17 is not very good for that information. So by sending  
 18 it directly to municipal planning representatives --  
 19 in this case town planners, town historians, town  
 20 executives -- the idea is that we're casting a pretty  
 21 wide net with a shorter group of people to provide us  
 22 information. And then by providing the opportunity  
 23 for daily interaction at the Apex office is a way to  
 24 help solicit that information. We feel we'll get  
 25 better information back, more meaningful information

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2 back through that mechanism.

3 MS. COLEMAN-GRAHAM: Okay. This deals

4 with the wetlands and stream delineations. They were

5 initiated during the growing season of 2018 to be

6 completed this spring. How is less than a year an

7 effective time frame to gather necessary data?

8 MR. LIBERMAN: It moves pretty quick.

9 Again, we're talking about a 500-foot corridor along

10 the project components. And we go out in groups of

11 two for safety reasons, and we're able to piggy-back.

12 And the wetland delineation effort from a ground study

13 standpoint can be done fairly quickly, so it doesn't

14 take an entire year to do that level of study.

15 So the work that was done in the fall

16 growing season of 2018, roughly 20 to 30 percent of

17 the facility site, and the remaining balance will be

18 completed this spring.

19 MS. COLEMAN-GRAHAM: What are the current

20 requirements in New York State for wind developers to

21 monitor and report bird and bat fatalities?

22 MR. LIBERMAN: That will be borne out

23 through this process. In other words, I don't know

24 that there's -- there will be an environmental

25 monitoring program outlined in the net conservation

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2 assumed present aspect to the bats where we're looking

3 at adaptive management and various curtailment regimes

4 to avoid impact to bats. So that information will be

5 provided in Exhibit 22.

6 MS. COLEMAN-GRAHAM: The next two

7 questions deal with some information that Dave

8 Phillips had supplied at a recent meeting.

9 At the environmental presentation that

10 Dave Phillips did on January 16, 2019, he mentioned

11 that bird deaths around industrial wind turbines have

12 been significantly higher than projected. What steps

13 have been taken to identify the bat population in the

14 Town of Barre and protect this population?

15 MR. LIBERMAN: I apologize. Is it

16 referring to bats?

17 MS. COLEMAN-GRAHAM: Yes.

18 MR. LIBERMAN: So with respect to

19 protecting the bat species for this project, there

20 will be an adaptive management plan worked through the

21 Article 10 process and in agreement with the New York

22 State DEC. And there are several steps that can be

23 implemented over the operations of the project to

24 limit impacts to bat species.

25 **A primary component would be, say,**

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2 benefit plan and the avian risk assessment that will

3 be reviewed by and agreed upon by the DEC, and their

4 input will be directly put into it. So that on a

5 project-by-project basis the specifics for

6 post-construction monitoring can be vetted and agreed

7 upon.

8 MR. MUSCATO: I would add, too, the state

9 has guidelines for post-construction monitoring, and

10 those guidelines would be a condition of the

11 certificate.

12 MS. COLEMAN-GRAHAM: During the migration

13 seasons, Canadian snow geese, bats and many smaller

14 species of birds fly over a huge area here. Shouldn't

15 these species be protected? And what happens to

16 migration patterns? We look forward to seeing this

17 migration every year.

18 MR. LIBERMAN: Great question. With

19 respect to migration, there's been several studies

20 already performed that were included in the

21 Preliminary Scoping Statement. Those will be assessed

22 in relation to the proposed layout, and potential

23 impacts will be described in Exhibit 22.

24 With respect to bat species, they're --

25 we've been in discussion with the DEC, and there is an

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2 **curtailment, which means that certain wind speeds at**

3 **certain times of the year the turbines would not spin,**

4 **thus avoiding impacts. So through ongoing discussions**

5 **with the DEC and looking at various adaptive**

6 **management regimens, impacts can be avoided or**

7 **minimized.**

8 MS. COLEMAN-GRAHAM: Another one about

9 Dave's talk. He shared at a previous environmental

10 open house that birds adapt and avoid an area with

11 industrial wind turbines.

12 Would that mean that the entire project

13 area would be considered a loss of habitat for that

14 species? And please explain. And that dealt with

15 birds.

16 MR. LIBERMAN: That's a -- so I think

17 that's something I would want to look into, just

18 because I'm not familiar with what Dave was alluding

19 to at that conversation. So I think that's for March

20 28th.

21 MS. COLEMAN-GRAHAM: Okay. Thank you.

22 Moving on to Marcel.

23 If the date and time of possible flicker

24 can be identified using your computer system, will you

25 make the residents aware of those potential times, so

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 2 that they can plan accordingly?  
 3 MR. MIBUS: I believe in the Article 10  
 4 application we filed the shadow flicker report that  
 5 the time that the turbines are on the residences is  
 6 reported.  
 7 MS. COLEMAN-GRAHAM: Is recorded?  
 8 MR. MIBUS: Reported.  
 9 MR. HABIG: Yeah, the study looks -- every  
 10 day of the year it will tell you on March 22nd that  
 11 flicker has the potential of occurring. Of course,  
 12 the wind direction has to be correct, and it has to be  
 13 a sunny day. But it will say the start time and the  
 14 end time, and it will be a calendar that will show  
 15 every day that it has the potential to occur.  
 16 MS. COLEMAN-GRAHAM: Okay. Marcel. You  
 17 mentioned that modern turbines have XYZ, but Ben just  
 18 spoke that the turbines now being proposed are the  
 19 newest brand-new model.  
 20 Would this increase the distance of shadow  
 21 flicker? With a bigger model, what new issues does  
 22 shadow flicker pose?  
 23 MR. MIBUS: Well, I mean, shadow flicker  
 24 is geometry. So directly the taller turbine would  
 25 have a longer shadow. So it would require us to site

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 2 perceive the whole of your window being blocked out.  
 3 So if there was something that had a window or -- that  
 4 would be a receptor that we would be modeling.  
 5 MS. COLEMAN-GRAHAM: This deals with wind  
 6 speeds. There are three different questions here,  
 7 each a little different.  
 8 What is the maximum wind speed for the  
 9 turbines that you're proposing?  
 10 MR. MIBUS: The maximum wind speed is  
 11 roughly, depending on the turbine model, somewhere  
 12 around 22 to 24 meters per second, which is about 2.2  
 13 times for miles per hour, so 55.  
 14 MS. COLEMAN-GRAHAM: So what was the last  
 15 number?  
 16 MR. MIBUS: 55 miles per hour, roughly.  
 17 MS. COLEMAN-GRAHAM: What would the  
 18 minimum wind speed be needed for the turbines that  
 19 you're proposing?  
 20 MR. MIBUS: So the cut-in for all these  
 21 turbines is at 3 meters per second, which would be 6.6  
 22 miles per hour.  
 23 MS. COLEMAN-GRAHAM: And I think you just  
 24 answered the first part of this one. For the proposed  
 25 turbines, at what wind speeds will the turbines be

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 2 more conservatively.  
 3 MS. COLEMAN-GRAHAM: Why is the shadow  
 4 flicker setback just for residents and not for the  
 5 property owners and not the property? I think, if I  
 6 get it right, the nonparticipating property owner was  
 7 the value you had on your slide.  
 8 MR. YAZMAN: Shadow flicker has to be  
 9 measured at a receptor. So that's why homes are used  
 10 rather than, say, in the middle of a cornfield where  
 11 nobody would be to experience shadow flicker.  
 12 MS. COLEMAN-GRAHAM: And then it goes on  
 13 to ask the nonparticipating property owner should have  
 14 rights to use their entire property and not be  
 15 impacted by shadow flicker. Wasn't in the form of a  
 16 question, but could you address the impact of shadow  
 17 flicker on...  
 18 MR. BUTLER: Yeah, I can speak to that a  
 19 little bit. So the shadow flicker is more apparent  
 20 when it's coming through a window, because the concept  
 21 is a window would have light coming through it, and it  
 22 would get blocked out by the shadow.  
 23 So in the case where you're in a field or  
 24 an open place, that's not really -- I mean, you  
 25 certainly can see the shadow coming, but you don't

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 2 started?  
 3 MR. MIBUS: Same answer.  
 4 MS. COLEMAN-GRAHAM: And what is the rated  
 5 rotational speed in miles per hour?  
 6 MR. BUTLER: Well, I think Marcel said it  
 7 was 12 to 13 rotations per minute; and based on the  
 8 rotor length, the speed of the tip is 180 miles an  
 9 hour or so.  
 10 MS. COLEMAN-GRAHAM: That was the next  
 11 question.  
 12 MR. BUTLER: Is that the next question?  
 13 Okay.  
 14 MR. HABIG: I think the larger newer  
 15 turbines it's actually lower than that. But we can  
 16 get a specific answer.  
 17 MS. COLEMAN-GRAHAM: Okay. Now we're on  
 18 to Tracy. Decommissioning questions.  
 19 With the tower taking up such little  
 20 usable farmland, how much is each lessee paid per  
 21 tower? The decommissioning is the third part of this  
 22 one.  
 23 MR. BUTLER: Yeah, I'd have to look to Ben  
 24 or Neil for that.  
 25 MR. YAZMAN: Leases provide for a minimum



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 2 payment of \$5,000 per rated megawatt. So again,  
 3 increases in turbine technology mean increases in  
 4 capacity mean increases in payment. That's a minimum  
 5 payment.  
 6 Leases also include a clause discussing  
 7 revenue share, which would be a payment -- a  
 8 percentage of the revenue made off the project  
 9 assuming it's above that minimum.  
 10 MS. COLEMAN-GRAHAM: This is probably back  
 11 to Tracy. What is the setback requirements for  
 12 substations?  
 13 MR. BUTLER: So the substation, I don't  
 14 know -- maybe I should actually look down here to see  
 15 if there's -- if that would fall within Article 10  
 16 requirements, or is there something special about the  
 17 substation specifically? Because really there  
 18 wouldn't be a traditional wind turbine setback for  
 19 that other than our internal setback, which would be  
 20 1.1 times the tip height.  
 21 MR. MUSCATO: Typically there's a standard  
 22 in the local law that would be applied to any type of  
 23 structure. So I don't know what it is in the Town of  
 24 Barre, but usually there's a local setback that would  
 25 apply.

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 2 and bringing the tower down piece by piece, pulling  
 3 out the top four feet of the foundations and  
 4 reclaiming the roads.  
 5 MS. COLEMAN-GRAHAM: And who would be  
 6 responsible to do that in the case of something like  
 7 that happening?  
 8 MR. BUTLER: So with that financial  
 9 security, I suppose it's the town that pulls it. Or  
 10 is it the state that holds it?  
 11 MR. MUSCATO: It would likely -- it would  
 12 depend on each of the proceedings, but it's likely  
 13 that the financial security would be for the benefit  
 14 of the towns. That's how it's been done in the  
 15 previously permitted project in the state, and that's  
 16 likely the procedure that would be had here as well.  
 17 So the towns would have access to the  
 18 financial security. There would be a decommissioning  
 19 agreement which would outline the steps that the town  
 20 would take to access that money, and that's -- the  
 21 financial security would be for or on behalf of the  
 22 towns -- or town.  
 23 MS. COLEMAN-GRAHAM: I'm not real sure  
 24 which of you this part of the question would go to.  
 25 Can Apex or Heritage sell the project or

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 2 MS. COLEMAN-GRAHAM: Decommissioning. If  
 3 you were to go bankrupt, do you know of any bankrupt  
 4 companies that do not remove the towers?  
 5 MR. BUTLER: Well, decommissioning in the  
 6 Article 10 process requires a financial security to do  
 7 that decommissioning. So regardless of the status of  
 8 the project company, that security could be pulled,  
 9 and the plant could be decommissioned.  
 10 MS. COLEMAN-GRAHAM: Have you or any of  
 11 your company taken any down?  
 12 MR. BUTLER: No, we haven't.  
 13 MS. COLEMAN-GRAHAM: And why not?  
 14 MR. BUTLER: They're young and new. The  
 15 first wind farm that we built was in 2012. So, you  
 16 know, the life-span of these farms is 25 to 30 years.  
 17 MS. COLEMAN-GRAHAM: If Apex or Heritage  
 18 ceases to operate in the town, what is the required  
 19 procedure for dismantling the towers? And what is the  
 20 requirement if either company goes bankrupt?  
 21 MR. BUTLER: There again, it's that  
 22 financial security that's -- that we have to put out  
 23 there to cover that.  
 24 And then the procedure would be, as I  
 25 mentioned, basically just the reverse of construction

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 2 lease the project without the permission of the Town  
 3 of Barre?  
 4 MR. MUSCATO: I think this is a repeat of  
 5 the question earlier. Again, if there was a transfer  
 6 of the certificate from the project company to another  
 7 entity, that transfer would require the approval of  
 8 the state siting board.  
 9 MS. COLEMAN-GRAHAM: There's a couple more  
 10 decommissioning ones, and I'm just going to pull out  
 11 what is different. The first one wants to know if the  
 12 money that's set aside for decommissioning -- is there  
 13 a percentage increase each year?  
 14 MR. BUTLER: That's a good question. So  
 15 depending on the way the decommissioning plan is  
 16 written, sometimes they are recalculated every five  
 17 years or some increment to readjust the estimate. So  
 18 the estimate -- clearly it's predicting the future,  
 19 but it's often certified by a professional engineer  
 20 who does, you know, a calculation of these exact  
 21 things using commodity data and existing data with an  
 22 escalation. It's often times adjusted as the project  
 23 goes on.  
 24 MS. COLEMAN-GRAHAM: What is the average  
 25 amount of time that wind turbines are functional

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2 during the year?

3 MR. BUTLER: I guess you can say when it's

4 windy. The NCFs for projects of this nature are in

5 the 30s. But that's really not the duration, so...

6 MR. MIBUS: NCF is more related to the

7 energy per turbine.

8 MR. HABIG: Typically from a speed

9 distribution, how often would it be below cut-in

10 speed?

11 MR. MIBUS: I think we model turbine

12 availability at roughly 96.1 percent.

13 MR. HABIG: That would be the

14 availability, but how frequently -- how many hours per

15 year would be below cut-in speed?

16 MR. MIBUS: I'd have to look at it more

17 specifically.

18 MR. HABIG: We can get a specific answer

19 on that.

20 MS. COLEMAN-GRAHAM: Last one for this

21 round, Tracy.

22 Would the 4-foot decommissioning -- I

23 think this is the depth -- still remain with the

24 larger scale turbines, or would it be increased?

25 MR. BUTLER: That would stay the same. So

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2 the modeling accounts for that, I guess.

3 MR. O'NEAL: Let me see if I can try to

4 answer that.

5 MS. COLEMAN-GRAHAM: Sorry.

6 MR. O'NEAL: That's okay. The modeling

7 calculation that's presented -- the idea is to

8 calculate what the loudest sound level would be during

9 the course of a day or night. So we look at the

10 highest wind speed and use that to calculate the

11 expected sound levels.

12 Obviously if the wind drops during the

13 course of the night, then the sounds levels will go

14 down to a lower sound level; but the maximum highest

15 sound level is based on the highest wind speed.

16 MS. COLEMAN-GRAHAM: Why is the goal of

17 sleep 45 decibels, higher than the recommendations by

18 WHO?

19 MR. O'NEAL: So keep in mind that's the

20 exterior sound level. That is a WHO recommendation.

21 That's a short-term recommendation, the 45. WHO also

22 has an annual nighttime recommendation of 40, but

23 that's for every hour of the night during the course

24 of a year.

25 So again, that's an annual number. So

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2 with the larger turbines there's nothing really that

3 changes in regards to the depth. The foundation

4 design -- you know, I mentioned this would probably be

5 10 to 11 feet deep -- that would probably be the case

6 for whether the turbine was larger or smaller.

7 If a larger turbine requires a larger

8 foundation, it's usually increased in diameter or in

9 the thickness of that base part to add more mass and

10 concrete. But it's not really deeper. So there's

11 nothing to take out that would be different.

12 MS. COLEMAN-GRAHAM: Okay. Moving on to

13 Rob.

14 In regards to the hourly sound level

15 annual sound modeling, what percentage of the year?

16 In regards to the hourly sound level annual sound

17 modeling, what percentage of the year? Well, let me

18 read the rest of it, and it may gel.

19 As a resident, the variability in sound is

20 frustrating, as this is what will wake us up at night

21 or be disturbing when we're trying to reside and to

22 enjoy.

23 So I think they're getting at the --

24 sounds like it's that fluctuation, that variability,

25 asking whether or not your hourly sound levels -- or

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2 that takes into account all the different wind speeds

3 over the course of a night in a year. So that's not

4 the same as the 45 short-term.

5 MS. COLEMAN-GRAHAM: Where were your

6 sound-measuring devices located in our community?

7 MR. O'NEAL: So the specifics of all that

8 will be in the application. I don't have the exact

9 addresses with me here tonight, but the details of

10 that will be as part of the application.

11 MS. COLEMAN-GRAHAM: And that's the

12 Article 10 application?

13 MR. O'NEAL: That's right.

14 MS. COLEMAN-GRAHAM: How long have you

15 studied various wind speeds? With the bigger turbine

16 increase, how would your data for wind account for

17 over 600-foot height change?

18 MR. O'NEAL: So in a sense, that part is

19 not as important to what I'm trying to calculate. In

20 other words, I assume that the wind speed that

21 generates that sound is achievable any time during the

22 year.

23 So we're modeling for that 45 decibels

24 based on the hub height wind speed. Whether it's at

25 500 feet, 600 feet or 650 feet, we assume that that

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 2 wind speed is achievable.  
 3 MS. COLEMAN-GRAHAM: Rob, as an expert on  
 4 sound associated with turbines, if you lived in a  
 5 rural area like Barre, New York, at what distance --  
 6 that's my three-minute warning alarm deliberately set.  
 7 If you lived in a rural area like Barre,  
 8 New York, at what distance would you be comfortable  
 9 living and sleeping from one of the over 680-foot  
 10 proposed turbines.  
 11 MR. O'NEAL: I mean, this is going to be  
 12 set up so that whatever the distance is -- and to  
 13 achieve that sound level or less will be at a  
 14 different distance. There's not one distance where  
 15 it's going to depend on the turbine configuration.  
 16 So sound is really based on the sound  
 17 level and less on the distance away. I mean, they are  
 18 related, certainly. Sound level and distance are  
 19 totally related, but it's not just one number. It's  
 20 not just, say, 1,500 feet away. It's going to be at  
 21 that sound level or less, and then you can get a good  
 22 night's sleep.  
 23 MS. COLEMAN-GRAHAM: Last one on sound,  
 24 and then I've got a couple for Jim.  
 25 For sound level prediction process, are

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 2 required to share with the community?  
 3 MR. MUSCATO: Oh, well, in terms of  
 4 sharing information with the community, the Article 10  
 5 application in full will be available both at the  
 6 local document repository, the town offices. It will  
 7 also be available publicly online on either-or both  
 8 the Heritage website as well as on the Department of  
 9 Public Services website.  
 10 All of that information will be included  
 11 as part of notices that are submitted and precede the  
 12 filing of the application. There will also be  
 13 newspaper notifications when the application is filed.  
 14 There will be notifications to the municipal officials  
 15 when the application is filed.  
 16 So there will be advance notice, and the  
 17 application will be available for individuals in the  
 18 town to view.  
 19 MS. COLEMAN-GRAHAM: Last one for you here  
 20 is other than the minimum 25 megawatt project to go  
 21 through the Article 10 process, does the Article 10  
 22 process have any requirements for the amount of  
 23 electricity that's produced by a project?  
 24 MR. MUSCATO: Article 10 is part of the  
 25 evaluation of interconnection and electric system

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 2 business locations or other sensitive receptors other  
 3 than homes used?  
 4 MR. O'NEAL: That's a great question. So  
 5 yes, the project team is in the process right now of  
 6 identifying all the sensitive receptors in the area.  
 7 I don't know if Greg wants to add anything to that,  
 8 but that inventory will be part of the application.  
 9 MR. LIBERMAN: Correct. The sensitive  
 10 receptors right now are in the process of being  
 11 formatted in accordance with the New York State Office  
 12 of Real Property tax and classification codes as  
 13 agreed to through the PSS stipulation process. And  
 14 that will include all parcels within the one mile of  
 15 the potential turbines, and it will based on the  
 16 actual tax classification code.  
 17 MS. COLEMAN-GRAHAM: Okay. The last three  
 18 are for you, Jim, and we'll have gone through the  
 19 table three times.  
 20 When do you anticipate to submit an  
 21 application for this project?  
 22 MR. MUSCATO: I think Ben said earlier  
 23 this year.  
 24 MS. COLEMAN-GRAHAM: According to the  
 25 Article 10 process, what information, if any, are you


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 2 modeling for a facility. It will look at certain  
 3 production numbers. But in terms of requirements, the  
 4 requirement for proceeding to Article 10 is that the  
 5 nameplate capacity of the facility is 25 megawatts or  
 6 more.  
 7 MS. COLEMAN-GRAHAM: All right. That ends  
 8 the time that we have.  
 9 MR. HABIG: One clarification. I think  
 10 the question before was when do we intend to submit  
 11 the application. Jim, you may have misheard it. But  
 12 assuming that was the question, the answer would be  
 13 sometime May or June of this year.  
 14 MS. COLEMAN-GRAHAM: Okay. As you can  
 15 see, there are still questions in the boxes that  
 16 haven't been asked. And like I said, all questions  
 17 are going to be asked. So these remaining questions,  
 18 along with the video of tonight's informational  
 19 meeting, will be posted on the project website by  
 20 March 28th. And your program has the actual address  
 21 for the website if you need that.  
 22 Couple quick next steps here. A reminder,  
 23 as Greg mentioned earlier, there will be some  
 24 environmental maps that are going to be available soon  
 25 at the local Heritage office, so please feel free to

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1           HERITAGE WIND PROJECT  
2 stop in, look at them and comment on them. Apex  
3 Heritage office in Albion is open Tuesdays and  
4 Thursdays from 9 a.m. to 5 p.m. And you're also  
5 welcome to stop in with any questions or feedback that  
6 you have there.  
7           Another thing. If you didn't get this  
8 flier, see somebody to get it. As noted in this flier  
9 that was on the table, Neil James, the Vice President  
10 of operations for Apex, will be in the office on March  
11 12th at 7 p.m. He's going to be discussing safety at  
12 operating sites, and all are welcome to attend.  
13           Now, with that, I want to thank you all  
14 for your participation and for your questions and your  
15 cooperation and good penmanship. I was able to read  
16 these. So the meeting is adjourned now. So please  
17 drive safely, and good night.  
18                   (TIME: 9:43 p.m.)  
19                   \* \* \*  
20  
21  
22  
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24  
25

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1                                   C E R T I F I C A T I O N  
2  
3  
4 STATE OF NEW YORK:  
5 COUNTY OF MONROE:  
6           I, MICHELLE M. ROCHA, do hereby certify  
7 that I reported in machine shorthand the above-styled  
8 cause; and that the foregoing pages were produced by  
9 computer-aided transcription (CAT) under my personal  
10 supervision and constitute a true and accurate record  
11 of the testimony in this proceeding;  
12           I further certify that I am not an  
13 attorney or counsel of any parties, nor a relative or  
14 employee of any attorney or counsel connected with the  
15 action, nor financially interested in the action;  
16           WITNESS my hand in the City of Rochester,  
17 County of Monroe, State of New York.  
18  
19  
20   
21  
22 MICHELLE M. ROCHA  
23 Freelance Court Reporter and  
24 Notary Public No. 01R05038965  
25 in and for Monroe County, New York

<p><b>\$</b></p> <p><b>\$1.1</b> 15:23</p> <p><b>\$200</b> 63:14,17</p> <p><b>\$30</b> 16:7</p> <p><b>\$5,000</b> 93:2</p> <p><b>\$7,500</b> 15:20 63:8</p> <hr/> <p><b>0</b></p> <p><b>01R05038965</b> 106:24</p> <hr/> <p><b>1</b></p> <p><b>1</b> 53:18</p> <p><b>1,000</b> 45:8 55:2</p> <p><b>1,000-foot-wide</b> 25:11</p> <p><b>1,500</b> 55:2 101:20</p> <p><b>1.1</b> 93:20</p> <p><b>1.5</b> 12:25</p> <p><b>10</b> 7:20 10:15,18 11:8,22,25 14:11 16:10,14 19:20 20:8, 14 21:10 23:9,12 25:17,18 26:2 27:5,10 28:3 30:15 38:16 41:17 43:21 45:17 46:14 50:15 51:17 54:15 57:18 64:8 70:22 75:7,23 76:2,7,11,23 82:7,10 84:6 87:21 89:3 93:15 94:6 98:5 100:12 102:25 103:4,21,24 104:4</p> <p><b>100</b> 23:6 44:19</p> <p><b>101</b> 43:4,11</p> <p><b>11</b> 36:14 69:3 98:5</p> <p><b>115</b> 35:21</p> <p><b>12</b> 30:12 55:15 69:8 75:10 92:7</p> <p><b>120</b> 1:24</p> <p><b>12th</b> 105:11</p> <p><b>13</b> 30:12 92:7</p> <p><b>14411</b> 1:10</p> <p><b>14604</b> 1:25</p> <p><b>15</b> 15:13 23:22 42:21,25</p>	<p>46:20 52:10</p> <p><b>150</b> 42:22</p> <p><b>158</b> 15:21</p> <p><b>16</b> 47:11 74:19 87:10</p> <p><b>16-foot-wide</b> 38:5</p> <p><b>17</b> 47:11</p> <p><b>18</b> 36:16,19 39:8</p> <p><b>180</b> 92:8</p> <p><b>1st</b> 51:3 52:3</p> <hr/> <p><b>2</b></p> <p><b>2</b> 61:10</p> <p><b>2.2</b> 91:12</p> <p><b>2.5</b> 61:14</p> <p><b>20</b> 38:16 42:25 44:11 85:16</p> <p><b>200</b> 1:24 37:4 44:11,12</p> <p><b>2007</b> 59:13</p> <p><b>2008</b> 68:25</p> <p><b>2009</b> 59:13</p> <p><b>2012</b> 94:15</p> <p><b>2016</b> 10:12 11:10 17:3 22:8 64:12</p> <p><b>2017</b> 11:10 22:21</p> <p><b>2018</b> 11:23 17:7 20:20 22:9, 15,21 24:14,21 65:16 66:11 85:5,16</p> <p><b>2019</b> 1:14 3:2 20:16 24:22 64:16 66:9 87:10</p> <p><b>2021</b> 81:24</p> <p><b>22</b> 21:9,13 64:22 86:23 87:5 91:12</p> <p><b>22nd</b> 89:10</p> <p><b>23</b> 21:9,14 64:22</p> <p><b>24</b> 23:21 27:21 91:12</p> <p><b>25</b> 11:5 41:17 55:16 74:24 79:5 94:16 103:20 104:5</p> <p><b>250</b> 83:21</p> <p><b>254</b> 1:10</p> <p><b>26</b> 82:9,17</p>	<p><b>28</b> 1:14 3:2</p> <p><b>28th</b> 77:24 88:20 104:20</p> <hr/> <p><b>3</b></p> <p><b>3</b> 43:16 51:8 53:18 61:25 91:21</p> <p><b>30</b> 15:13 18:12 41:16 42:21 43:17,18,22 85:16 94:16</p> <p><b>30s</b> 97:5</p> <p><b>31st</b> 51:3 52:3</p> <p><b>33</b> 18:11 35:6 43:18</p> <p><b>34.5</b> 35:15,21</p> <hr/> <p><b>4</b></p> <p><b>4</b> 42:4 44:10</p> <p><b>4-foot</b> 97:22</p> <p><b>40</b> 21:11 38:7 43:23,24 52:11 55:23 65:12 67:4,7 99:22</p> <p><b>45</b> 56:10,12 72:20,21,24 74:24 99:17,21 100:4,23</p> <p><b>45-decibel</b> 72:15</p> <p><b>47</b> 18:10</p> <p><b>4x6</b> 5:6</p> <hr/> <p><b>5</b></p> <p><b>5</b> 105:4</p> <p><b>50</b> 47:12 48:4 55:23</p> <p><b>50,000</b> 53:3</p> <p><b>50-or-60-slide</b> 60:19</p> <p><b>500</b> 13:5 17:5,25 25:6,10 59:20 100:25</p> <p><b>500-foot</b> 59:14 85:9</p> <p><b>55</b> 91:13,16</p> <hr/> <p><b>6</b></p> <p><b>6</b> 36:18 38:5 55:11</p> <p><b>6.6</b> 91:21</p> <p><b>60</b> 43:18 47:12 65:13</p>	<p><b>600</b> 13:6 17:10,25 100:25</p> <p><b>600-foot</b> 100:17</p> <p><b>65</b> 74:19</p> <p><b>650</b> 100:25</p> <p><b>655</b> 18:25 82:23</p> <p><b>677</b> 19:2</p> <p><b>680-foot</b> 101:9</p> <hr/> <p><b>7</b></p> <p><b>7</b> 51:9 105:11</p> <p><b>70</b> 36:12 43:25 47:12</p> <p><b>750</b> 13:6</p> <p><b>7:30</b> 1:17</p> <p><b>7:30 p.m</b> 3:4</p> <hr/> <p><b>8</b></p> <p><b>8</b> 38:5 50:3 55:11</p> <p><b>8,760</b> 50:25 51:2</p> <hr/> <p><b>9</b></p> <p><b>9</b> 51:17 70:22 105:4</p> <p><b>900</b> 13:7</p> <p><b>96.1</b> 97:12</p> <p><b>9613-2</b> 48:14</p> <p><b>9:40</b> 7:13</p> <p><b>9:43 p.m</b> 105:18</p> <p><b>9:45</b> 7:14</p> <hr/> <p><b>A</b></p> <p><b>A-weighted</b> 43:13 45:12</p> <p><b>A-weighting</b> 44:25 45:2,13 a.m. 105:4</p> <p><b>ability</b> 17:19 81:21</p> <p><b>above-styled</b> 106:6</p> <p><b>above-titled</b> 3:3</p> <p><b>absolutely</b> 47:10 69:13</p> <p><b>academically</b> 30:16</p>
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