ALBERTA UTILITIES COMMISSION

Application No. 29377-A001, 29377-A002
Proceeding ID No. 29377

OYEN WIND POWER PROJECT

P R O C E E D I N G S

Volume 2
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Proceedings taken at the Alberta Utilities Commission via videoconference.

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(PROCEEDINGS COMMENCED AT 9:00 A.M.)

THE CHAIR: Good morning. I believe we have everyone here. So welcome to day 2 of part 1 of the Oyen wind power project hearing. And today, we have the expert witness panel for the OLG, and so we'll begin with -- well, first I'll ask if there are any preliminary matters before we begin this morning.

I see a hand is raised there by the -- oh, no.

THE INTERPRETER: Yes, I am the interpreter who was hired for today, and I really just wanted to check in

with you how you would like me to proceed with interpretation. I'm hired for consecutive interpretation.

Am I interpreting everything into German for Dr. Bellut, or am I only interpreting what she is saying in German into English, or how would you like me to work today?

THE CHAIR: So it's an excellent question. Go ahead. Is it Dr. -- it's Dr. Bellut; is that right? Did you -- I saw you raised your hand.

DR. BELLUT-STAECK: Yes. I have a suggestion that if I feel able to make the report in English, I can do that, especially in the introduction, in the findings, in the response, but if I need the interpreter, I would like to make a sign, and I think for the cross-examination, I will use the interpreter for whole the session, then, if that's okay.

THE CHAIR: That makes sense. So just so that we understand, then, so for your direct evidence, unless you need the interpreter, your plan is to go forward and do that in English, and then during the cross-examination, you will use the interpreter?

DR. BELLUT-STAECK: Yes.

THE CHAIR: Okay. I think that's fine.

THE INTERPRETER: Thank you. Understood. Okay. So

I will be ready to jump in if you need my help. Okay.

THE CHAIR: Okay. Perfect. And then your counsel, your lawyers, will also be of assistance. So I'll turn it over to them to begin the direct.

Actually, first you'll need to be sworn in. But I'll turn it over to counsel for the OLG.

MS. OKOYE: Yes, good morning, Chair Price. I was just going to clarify how that was going to work. But thank you for getting that clarified.

So this morning, we have for the OLG expert panel, we've got Cliff Wallis, James Farquharson, Chris Tenszen, and Dr. Ursula Bellut-Staeck. I will handle the direct for all of the expert witnesses except Dr. Ursula Bellut-Staeck. That will be handled by my colleague, Chinedu Kema. So if Madam Court Reporter could swear or affirm the witnesses.

C. EICHBAUER, affirmed as interpreter in the German language

C. WALLIS, J. FARQUHARSON, R. BARCLAY, U. BELLUT-STAECK, C. TENSZEN (For Oyen Landowners Group), sworn/affirmed

MS. OKOYE EXAMINES THE PANEL:

Q. So starting first with Mr. Cliff Wallis. Chair Price, Mr. Cliff Wallis is well known to the Commission, so I

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won't say much about introducing him.
Mr. Wallis's affidavit adopting his report and CV has been filed as Exhibit 122.
Ms. Adebayo, if you could please pull up Mr. Wallis's opening statement, Exhibit 141, and once that is up, Mr. Wallis, you can proceed.
A. MR. WALLIS: All right. Good morning, Chair Price, Commissioner Slawinski, AUC staff and all participants at this hearing. Could we go to the next slide, please, Ms. Adebayo?
The project will be located in the dry mixedgrass natural subregion, which was a part of the Northern Great Plains and a global priority for conservation. There are 84 infringements of wetlands setbacks from the rotor-swept areas 53 turbines and some wetlands are under the rotor-swept areas.
The air prints impact on birds has not been fully explored or mitigated. AEPA thinks the project poses a high risk to wetland habitats and amphibians, which is only partially mitigated. Of 27 project area bird species that have experienced large population declines since 1970, over one-third have recorded mortalities at Alberta wind projects in eastern Alberta. The pronghorn migration area was also not dealt with by RES.

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Next slide, please, Ms. Adebayo. I make several recommendations if the project is approved: Use the prescribed wetlands setbacks, lay the groundwork for cumulative effects work, start exploring the potential of radar to reduce bird mortality, have a mitigation framework that is effective for birds, develop a protocol for snakes and extend the duration of the monitoring program.
Thank you. That concludes my opening statement.
Q. So, Mr. Wallis, have you had an opportunity to listen in or review the transcripts of the proceedings to date, especially as it relates to the cross-examination of Ms. Sare on environmental and biodiversity impacts?
A. MR. WALLIS: Yes, I have a few points to make and I'll confine my remarks to what I heard in testimony.
Q. Okay, please proceed.
A. MR. WALLIS: Regarding pronghorn, on transcript page 53, Ms. Sare says they followed the requirements of the directive. Despite what is actually required in the wildlife directive about sensitive and migratory wildlife, Ms. Sare indicated on transcript page 52 that they had not used the 2013 sensitive species inventory guidelines for pronghorn, nor indeed any protocols.
On transcript page 53, Ms. Sare indicated their

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pronghorn information consists of only incidental observations. This is a species that she agrees is provincially listed as sensitive. There have been at least two AUC hearings, Aira solar and the Wild Rose 2 amendment, where the subject of pronghorn and renewable energy project impacts has been discussed extensively.
I was surprised that Ms. Sare was not even aware of Jakes' seminal work on pronghorn. After the Gates paper and Jakes' work on pronghorn migration through that area -- that's the Wild Rose 2 area -- were published, Ms. Sare was project manager and wildlife lead on an earlier incarnation of that project.
On transcript page 54, Ms. Sare agreed that they used cultivated landscapes, that is pronghorn, but prefer native ones. The observations provided in the undertaking show that cultivation is indeed used. They cross open cultivated areas where there is sometimes fewer fences that would otherwise create barriers to movement in order to get to their more favoured habitat. They will also preferentially use cultivated areas at certain times of year if there is reduced snow cover and early green-up.
While Ms. Sare acknowledged on transcript pages 56 and 57 that pronghorn have behavioural shifts related to wind facilities, she characterized them as slight

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and that they do not result in lowered survival.
In the only paper that deals with the subject and discussed in my report, one should not characterize the situation that way. Milligan 2022 says that while wind projects are not a barrier to migration, pronghorn make important behavioural adjustments, particularly during the spring migration that likely reduce the functional benefits of their seasonal migrations, which is a critical time for individuals to access food to support birthing.
In his 2021 paper, Milligan indicated that the accumulation of development, including wind turbines, roads, and fences can both limit movement and fragment habitat potentially reaching a critical threshold, beyond which populations are negatively impacted.
Turning to wetlands, on page 59 of transcript, Ms. Sare acknowledges that eight turbines will overlap seasonal or higher permanence wet lands and also that such wetlands are very important habitats for migrating and breeding birds. She then goes on to downplay the significance by saying only a small amount of wetland is impacted.
6.7 hectares of wetlands and waterbodies are affected by the air print, and she notes on page 60 of transcript an additional 2.38 hectares of footprint if

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you include all the drainages, waterbodies, and wetlands.

The concern is that these habitats support a diversity of birds at different times of the year, and the rotor-swept area will be directly above these areas. This adds to the concerns that many turbines have relaxed setbacks. I can see why AEPA thinks things are only partially mitigated. The directive setbacks are meant to deal with all the potential risks from such developments.

On page 68 of transcript, Ms. Sare acknowledges the benefits of siting projects away from productive wildlife habitats, and she indicates that RES went to great lengths to site turbines outside of the setbacks, including the rotor-swept area. That does not reflect the truth about the project's airprint. As I note in my report, there are 84 infringements of Class 3 and higher wetland setbacks from 53 of the turbines' rotor-swept areas.

As a bit of an aside, I thought that Mr. Cuthbert's observation on AEPA's referral report was interesting on page 191 of transcript, when he acknowledged AEPA 's elevated ranking of high risk for wetlands, but still they gave it an overall low risk rating for the project.

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It's easy to see how regulators like the AUC will now get presented with misleading information from AEPA. They've gone from providing more insightful, multi-subject, multipage referral reports and has now brought all that information down into one page, one-size-fits-all ranking of risk. Even though you may have significant concerns in one area like wetland which is can now get masked in the iteration of referral reports. At least in this one, we can see it.

Turning to radar and nocturnal migration and its potential, at transcript page 63, Ms. Sare uses the context and policy in Alberta and the relatively small part that wind turbines play in bird mortality as reasons why she doesn't believe that radar work would be a useful addition. In my professional opinion, all mortalities of declining species are a problem, even if wind energy is not yet the most important factor.

At transcript page 65, Ms. Sare agrees that within Canada, the estimated bird fatalities at wind facilities are in the hundreds of thousands of birds a year, with even larger amounts in the U.S. It is troubling that we don't seem to be concerned enough about this to more actively pursue innovative technologies like radar.

As noted in any report, the Canadian Wildlife

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Service has considered use of radar important enough to require it, given the increasing heights of turbines that reach into the nocturnal flight corridor of songbirds. Radar is being used for identifying both local bird movements as well as over the whole continent.

And lastly, on regional impacts or regional cumulative impacts, on page 71 of transcript, it was good to see Ms. Sare follow in the footsteps of other projects and not be opposed to cumulative effects work. It would certainly help all of us. And that concludes my going over the cross.

Q. Thank you, Mr. Wallis.

So we now go over to Dr. Robert Barclay. Same, Dr. Barclay is known to the panel, so I will not go into a description -- or, yeah, an introduction.

Dr. Barclay's affidavit adopting his report, his CV and his response -- and his information response has been filed as Exhibit 124.

Ms. Adebayo, could you please pull up Dr. Barclay's opening statement? And once that is on, Dr. Barclay, you can proceed.

A. DR. BARCLAY: Thank you very much. I was asked to address the risk to bats posed by the proposed Oyen wind facility. Next slide, please.

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And you might ask why bats. Both bats and birds are killed by wind turbines, and in Alberta and across North America, the number of bats killed is generally greater than the number of birds, but more importantly, the number of bats killed per species is far greater than the number of birds killed per species. Estimates are in the hundreds of thousands of bats killed per year by turbines across North America.

Next slide, please. Of the nine species of bats we have here in Alberta, three migratory species make up the majority of fatalities. These are the hoary bat, silver-haired bat and eastern red bat. All three occur across North America, and they're listed as sensitive in Alberta and have been recommended to be listed as endangered in Canada by the committee on the status of endangered wildlife in Canada.

Another species, the little brown bat, down in the lower right, is also killed, and it is listed as endangered in Canada. All of these are insect-eating species of bats, and they contribute to the consumption of many species of agricultural pests.

Next slide, please. Like all bats, these species are unusual small mammals in that they have a slow life history, by which I mean they can live long lives, up to 30 years or more, and they have slow reproductive

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rates, typically one or two young per year, and what this means is that if the populations decline, they are slow to recover, if recovery is possible.

Next slide, please. Bats are killed at turbines via two ways. First of all, they can be hit by the spinning blades, but they can also be killed by what's called barotrauma. They fly through a zone of low air pressure that surrounds the spinning blades, and that causes their lungs to suddenly expand, causing internal injuries. Birds have a very different respiratory system and are not impacted by barotrauma.

Next slide, please. Evidence indicates that populations of the three migratory species of bats are declining. Here are some data from Ontario indicating a drop in populations of the three species. Modelling estimates -- modelling estimates a 50 percent decline in hoary bat population across North America in the next decade or so, even with low build-out of wind energy facilities.

Next slide, please. When bats are killed is very important in terms of how we might mitigate. The migratory species are killed primarily during fall migration. In Alberta, that's August and early September. They're night flyers, so they're only killed at night, and they're killed especially when

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it's warm, when it's not raining, and the wind is light. And this all opens up ways to gain the benefits of wind energy but reduce bat fatalities.

Next slide, please. The main method to reduce bat fatalities is called blanket operational curtailment. Essentially increase the cut-in wind speed, the wind speed at which the blades start spinning at night, during fall migration, and when the wind speed is low. And doing that, this paper that I'm citing here, the average reduction in bat fatalities is 63 percent. And the cost in terms of energy production is low. It's less than 2 percent.

Next slide, please. There are other methods that have been developed more recently to reduce bat fatalities, what's called smart curtailment in which you simply include more than just wind speed in terms of when the curtailment occurs. So only when it's warm, only when it's not raining. And that means there is less energy loss, and the study by Hayes in 2022 estimated that in Alberta, there was a less than 1 percent loss of energy production using this method to reduce bat fatalities.

Next slide, please. At Oyen, the preconstruction -- or, sorry, the Alberta bat mitigation framework for wind power development

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specifically states that cumulative effects of nearby sites must be taken into account. So here is a map which we saw yesterday as well, indicating the various operating wind facilities in the Oyen area, and I focused my report on Sharp Hills and Lanfine, the two sites directly north and directly south of the proposed Oyen facility.

At Oyen -- next slide, please. At Oyen, we have not only the most number of turbines proposed, 83, of the various sites near Oyen but also the tallest, the largest turbines, with a tip height of 210 metres above the ground.

Next slide, please. And studies indicate that taller turbines kill more of each of these three migratory species of bats, as in this paper published in 2022.

Next slide, please. The Alberta mitigation framework also talks about cumulative effects, and it states that bat fatalities in the range of 500 bats per development per year is concerning and goes on to say that because some wind power developments are in close proximity to one another, ESRD will track cumulative bat fatalities due to wind turbine operations in an area and evaluate the need for additional postconstruction mitigation.

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Next slide, please. So here are the pre and postconstruction data for Oyen and the two close sites, Lanfine and Sharp Hills, and first of all, you can see the preconstruction acoustic migratory bat detections at the one and only high or raised microphone at Oyen or .05 migratory bats per detector night was considerably higher than the preconstruction rates at both Lanfine and Sharp Hills.

And then we look at the mortalities per turbine, and at Lanfine, as outlined in green here, four migratory bats per turbine were killed in 2023, and at Sharp Hills, almost 16 migratory bats were killed per turbine in 2024. Those are at or above the levels considered concerning to the Alberta government and require consideration of mitigation, and in fact, Sharp Hills had operational mitigation in place, and despite that, almost 16 migratory bats were killed per turbine.

Next slide, please. So the cumulative impact on bats of these three sites, the fatalities at Lanfine plus Sharp Hills, is over 11,000 migratory bats killed per year. If Oyen has the average fatality rate between those two operating facilities, 9.97 migratory bats per turbine, the 83 turbines will kill an additional 827 migratory bats per year for an overall total of 1,934 migratory bats per year.

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Next slide, please. And I believe the Oyen total is likely an underestimate because it had higher preconstruction migratory bat activity than the other two sites. It has taller turbines, reaching up more into the flight space of the migrating species, and Sharp Hills had operational mitigation in place. In my opinion, the cumulative fatality rate is not sustainable.

Next slide, please. So my conclusions are the following: The proposed Oyen wind facility is large, with large turbines being considered, and those features predict that the facility will have a large impact on bats. The high bat activity at the raised detector and high average activity among the low detectors exceed the minimum level requiring discussion regarding operational mitigation. The high fatality rate at the two close wind facilities, despite operational mitigation at Sharp Hills, suggests that the bat fatality rate at Oyen will also be high.

Next slide, please. Cumulatively, the fatalities at Sharp Hills and Lanfine, in addition to those that will occur at Oyen, are a serious concern. Discussions regarding the Oyen facility need to take place and actions taken to reduce the risk to bat populations. Even the current fatality rates at Lanfine and Sharp

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Hills are not sustainable, in my opinion.

If Oyen is approved, I thus recommend that operational mitigation to reduce bat fatalities be instituted immediately upon the start of operation rather than waiting to assess what the bat fatality rates are. And in my opinion, operational mitigation should initially involve blanket curtailment during the fall migration period at all turbines.

Next slide, please. Postconstruction fatality monitoring should be conducted from the start of operation of Oyen to assess fatality rates and the effectiveness of curtailment, and depending on the results of fatality monitoring at the three sites, further operational mitigation may be necessary.

And that concludes my opening statement.

Q. Thank you, Dr. Barclay. Have you had opportunity to listen in or review the transcripts of the proceeding to date, especially as it relates to my cross-examination of Ms. Sare on the impacts of the project on bats and mitigation measures?

A. DR. BARCLAY: Yes, I have.

Q. Do you have any comments to make regarding her responses to my cross-examination questions?

A. DR. BARCLAY: I have a couple of comments. When asked whether one raised bat detector is sufficient to

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assess the risk of the Oyen facility to bats, Ms. Sare said yes. To me, for a project as large as the Oyen facility, with 83 turbines over 95 square kilometres and a diverse landscape, one raised detector is not sufficient, especially given the variation in activity among the 10 ground-level bat detectors and the fact that raised detectors detect bats in the blade-swept area and at heights the migratory bats tend to fly at.

It was also noted that both Lanfine and Sharp Hills had operational mitigation in place during their first years of operation, and yet bat fatality rates were high. Ms. Sare also noted that the bat activity recorded at the Oyen site resulted in a classification of high risk to bats, yet it was stated that WSP will wait to see what the bat fatality rate is at Oyen before discussing potential operational mitigation.

I'm not sure why that is appropriate given the rating as high risk, the high cumulative fatalities already in the Oyen area, the large number of large turbines proposed for Oyen, and the demonstrated low cost of operational mitigation. As I note in my report, I recommend that operational mitigation be in place from the start of operation of Oyen.

Q. So one more question for you, Dr. Barclay. In my cross of Ms. Sare yesterday on whether increasing bat

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fatalities will cause a decline in population of migratory bats, she deferred to your opinion, stating I should ask you that question, as she's not the expert on bats.

What is your opinion on this? Will an increase in bat fatalities cause a decline in migratory bat population and consequently an adverse impact to the ecosystem?

A. DR. BARCLAY: Yes, thank you. As I noted in my report, there's already evidence that populations of the migratory species of bats have declined, and a large decline in the population of hoary bats in particular is predicted by the end of this decade.

As I stated in my report, I do not believe the fatality rates at the combined Lanfine and Sharp Hills are sustainable, and Oyen, with a large number of large turbines, will only add to that unsustainable fatality rate.

I'll also note that there's a relevant recently published paper in the journal Science, one of the top scientific journals, regarding the environmental impact of declines in some bat species. In this case, they were looking at declines in species due to a fungal disease called white nose syndrome, and in that paper, areas in North America with large bat population

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declines had a corresponding increase in use of pesticides for agriculture, essentially because the bats were not there to control pest insects themselves. So an increased cost to farmers. If we see a decline in the migratory species, it's likely that that benefit that bats provide for agriculture will also be lost here in Alberta.

Interestingly, in that paper, there was also an increase in human infant mortality rates in those areas with bat declines, which the authors related to increased pesticide use. I have provided Ms. Okoye with a copy of that paper should it be needed to be placed online.

Q. Thank you, Dr. Barclay.

I will now go over to Mr. Farquharson. Again, Mr. Farquharson is known to the Panel. Mr. Farquharson's affidavit adopting his report and CV has been filed as Exhibit 123.

Mr. Farquharson, have you had opportunity to listen in or review the transcripts of the proceedings to date, especially as it relates to the cross-examination of Mr. Faszer on noise impact assessment?

A. MR. FARQUHARSON: Yes, I have.

Q. Okay. Do you have any comments to make regarding

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Mr. Faszer's responses to the cross-examination questions in relation to noise impacts?

A. MR. FARQUHARSON: Yes, I have. I'd like to take us to Exhibit 146, which was Aid To Cross Number 5 yesterday. So it presents the -- if we could bring up that exhibit, please. Yes. And there it brings up a map of the corner where the traffic count is done for the control segment at Highways 9 and 41.

So in both a trip to the area this spring and what's easily seen on street view in Google is that at this corner, we have some activities. So of note here is just to the north of the intersection along Highway 41, there is an approach or an entry onto the highway from a series of commercial premises that go to the west along Highway 9.

So there's a cardlock, there's a fuel station, there's a farm agri supply centre. There's a filling station, a convenience store, an A&W. These particular businesses can be accessed easily from Highway 41. There's only one entry for these businesses, plus a hotel and a campground, that goes onto Highway 9.

And so we could have vehicles that would be in the count for this intersection that are primarily using these businesses that are northwest of the intersection that are accessing them via Highway 41 and creating a

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higher count at that intersection.

Also to the east of the intersection, there is -- there was a -- looks like an Alberta tourism facility, a welcoming station there. Currently, it's blocked off on my visit out there from use. There was a restaurant/pub venture as well that's accessed off of Highway 41 as well.

So when we look at the traffic at this corner, one end of the control segment and the other end of the control segment, we look at -- when we have a count where we have a large discrepancy in numbers between the two and where we're crossing our nighttime threshold, Mr. Faszer, in his testimony, you know, assumed kind of in summary of a progression of the vehicles from businesses.

We would assume that initially, but we would also look along that control section to see if there's any commercial ventures that would draw more traffic. Is there any centres of habitation that would create more traffic to flow one way on the route or not?

So kind of in review of that, you know, what concerns me is we do have a centre of activity here right close to the intersection where the count was done. I mean, the only count the vehicles that are going through the intersection and the directions they

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may take, they don't necessarily look beyond that and say, well, that vehicle turned into the cardlock or, you know, it originated from south on 41 and went into the cardlock as well or into the -- into the farm agri centre there.

So, you know, without a traffic count along, you know, say, a point halfway along this control section or a traffic count near the residences in question here, especially I think it's residence 8 and 8A, we don't have -- in my opinion, we don't have great evidence that indeed we have a vehicle count that's over the nighttime threshold for this area. So the -- this exhibit can be taken down.

So I heard that, and that would revert the placement of these four homes back into Category 1, and although Mr. Faszer was committed to undertake to provide new results with the Category 1 application of the PSL, the ambient adjustment, we haven't seen those, I believe, as of yet, but just some review by myself is that we would be -- have nighttime cumulative sound levels from the development of 41 at three of the four homes.

So this places the facility in exceedance, unless we pursue some form of mitigation, either by removal of turbines so they don't become stranded assets, or

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through some method that was discussed yesterday and that I've also discussed as some sort of reduced noise mode operational condition, but we -- we're left to wonder what that might do in this case.

That concludes my review of yesterday's testimony.

Q. Thank you, Mr. Farquharson.

Going now to Chris Tenszen. Chris Tenszen is a partner and the practice area lead for reclamation and restoration at Trace Associates Inc. His areas of expertise are land reclamation and ecological restoration with a focus on natural area land uses such as forested land, native grasslands, and peat lands. He's a registered professional agrologist in Alberta and a member of the Canadian Land Reclamation Association and the Society for Ecological Restoration. He prepared a report on decommissioning and reclamation, and this is his first time appearing before the commission.

Mr. Tenszen's affidavit adopting his report and CV has been filed as Exhibit 121.

Mr. Tenszen, have you had opportunity to listen in or review the transcripts of proceedings to date, especially as it relates to the cross-examination of Mr. Cuthbert on reclamation?

A. MR. TENSZEN: Yes, I did.

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Q. And bearing in mind the Commission's ruling that -- the Panel's ruling yesterday, they do not want to hear about reclamation security costs, do you have any comments to make regarding Mr. Cuthbert's responses to cross-examination questions in relation to reclamation generally?

A. MR. TENSZEN: Yeah, I do still have one concern that I'd like to discuss as it relates to the reclamation method surrounding the foundation removal.

So I'd like to draw attention -- it's PDF page 95 of the transcript. Mr. Cuthbert made the comment that it's appropriate to assume that the 1.2-metre partial removal depth would be sufficient for the purpose of the CNR plan.

I'd like to draw attention to the Commission, you know, when considering the application and the public interest for this, concerns about that foundation removal depth. Aid To Cross, I believe it's number 10, the CNR directive, we looked at it yesterday. I -- is it necessary to pull it up again if I want to refer to that?

Q. No, you can just talk about it generally.

A. MR. TENSZEN: Okay. I have it open here, so I'll just paraphrase.

It's clear it says infrastructure being left in

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place below the final reclaimed surface, the operator must demonstrate that the remaining infrastructure will not result in an adverse effect. Goes on to say will not interfere with restoring the site to equivalent land capability, including but not limited to impacts to surface or subsurface drainage or crop growth.

So it introduces an uncertainty there that I want to really focus on, and that's to date, to the best of my knowledge, no turbine site in Alberta has been -- has yet to receive a reclamation certificate. So we don't have a body of evidence that's directly applicable to demonstrate that no adverse effect.

And in addition to the potential impacts to land operability that are mentioned in that paragraph, there's also the potential to reduce future land uses, as Ms. Okoye brought up yesterday when she was asking about agricultural use dugouts, potential restriction to those activities in the future.

There's a limited amount of information available online about some recent reclamation and decommissioning projects, in 2022 in Pincher Creek, in 2023 in South Dakota, but they don't provide any details about reclamation status or success yet, and those things take a few years to demonstrate, so it's too early yet to show that.

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So what I want to draw attention to is in Exhibit 8, which is the environmental evaluation, there's mention of turbine removal, and to paraphrase, it says -- or I guess to quote, it says: (as read)

"The wind turbine's concrete foundation will be removed to a depth of 1.2 metres below surface, and the excavation backfilled with subsoil to match the natural grade. Removal of below-ground concrete structures to a depth of 1.2 metres is expected to provide a sufficient profile to allow successful revegetation and typical land use practices despite the underlying remnant concrete foundation."

Now, my concern with that is it doesn't acknowledge the uncertainty. It's speaking in expectations, not quite absolutes, but it doesn't acknowledge the fact that we don't have any body of knowledge to prove that no adverse effect has been achieved to date, nor does it acknowledge the uncertainty that's, you know, directly alluded to in the directive.

And then the recent code of practice also states that a CNR plan has to be prepared that's in accordance with the CNR directive, and the CNR plan submitted by

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RES, which is Exhibit 11, it actually makes no mention of foundation removal.

So in summary, I guess just I want to draw attention to the significance of this foundation issue because as we see, you know, thousands -- potentially thousands of these things across the landscape, and they're large, like upwards of 5,000 tonnes of concrete. My professional opinion is that I foresee these becoming one of the more contentious issues as these turbine farms approach an end-of-life and decommissioning phase.

So if the project is approved, I strongly recommend that this uncertainty around the appropriate removal depth, you know, be acknowledged in the approval conditions or in the CNR plan, acknowledging that level of uncertainty that's presented in the CNR directive. That's what I -- that's what I have to say. Thanks.

MS. OKOYE: Thank you, Mr. Tenszen, and I'll hand it over to my colleague Mr. Kema to complete the direct of our expert panel.

MR. KEMA EXAMINES THE PANEL:

Q. Thank you, Ms. Okoye. Good morning, Mr. Chair. I'll be handling the examination-in-chief for Dr. Bellut-Staeck.

Dr. Bellut-Staeck is a medical doctor specializing in general practice and emergency medicine with a focus

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on cardiovascular diseases, microcirculation, and endothelial functions, vascular biology, and stress medicine. Dr. Bellut-Staeck is a member of the scientific advisory board of the German Society for the Prevention of Noise-Induced Illnesses.

Dr. Bellut-Staeck prepared a report which focusses on the impacts of infrasound frequencies and vibrations from wind turbines on human health. This is her first time appearing before the Commission.

Dr. Bellut-Staeck's affidavit adopting her report, her CV, and her information response has been filed as Exhibit 125.

Ms. Adebayo, please pull up Dr. Bellut-Staeck's opening statement.

A. DR. BELLUT-STAECK:Can you support me with this opening statement?

Q. I don't think -- Ms. Adebayo, I don't think -- okay. Thank you very much.

Please proceed, Dr. Bellut-Staeck.

A. DR. BELLUT-STAECK:Yes, hello. Just a moment. Okay.

Yes, this is my first file, so it means that we had in the research of microcirculation, this is the capillary vessel system, which support each organism with nutrition, mainly, that we have a lot of increased research results, especially in the last 15 years.

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The point is that this is a very small region, in the nano and micrometre area, so it was not possible before 2000 to see the structure or function of microcirculation, little capillaries with the endothelial cells as in a layer. In former times, people thought, also in medicine, it was also my studying still in this time before 2000, that it's only a layer like -- like to hold the fluid inside, but since 2000, we know much more about.

So two important research results. We have since about 2010, not before, which play a big role now what we can understand that the body is able to feel and hear not only with the ear but with inner receptors in the -- this capillary system, including also the skin, and these receptors are called mechano-sensors. So they are sensors for forces.

And this is most of the important discovery of the last years, I think also for the whole medicine because this was a really new level of perception important for all organism. And so Mr. Ardem Patapoutian was awarded with the Nobel Prize in medicine for that in 2021. The research about these most important channels, the most important are the PIEZO channels is beginning in 2010 about, so we can find beginning research in PIEZO channels then, but this award was a reward to say this

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new level is so important for all organism because organism need to have a perception for air pressure, for proprioception, for pressure as a whole, for sound due to the fact that also sound is a physical force.

Ardem Patapoutian classified PIEZO channels as currently the most important group of mechano-sensors, a crucially newly recognized level of perception of physical forces and sound in all living things. You will find them in all multicellular organisms. You will also find PIEZO channels in the new research in plants.

As a second very important research point, for especially our theme, is that vital functions are ruled by coordinated forces in the bloodstream. We are looking in the capillaries in a flowing bloodstream, and I will show you later on a graphic. You can have a better impression how we can imagine that forces act there to organize to rule some vital regulations.

These coordinated forces causes thrust forces to act on the endothelial membrane. I also told you that all vessels, especially also the capillary system, has an inner layer of endothelial cells. These forces moves sideways on the membrane and opens the PIEZO channel. You will see it in the graphic how it can be demonstrated in a schematic picture.

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This movement is perceived by different receptors of forces. They are more than one, but like I told you, PIEZO channels in this case in the vessels are PIEZO-1 channels, and the most important, they are embedded in the membrane of the endothelial cells.

Next slide, please. Now there is a picture. It's already to be seen in German in my -- or in English, I also told it in my evidence. It's in my book Essentials of Springer Nature, and this is to be explained what we can expect in the vessels. And this is really now a nano area.

This is the surface of the endothelial cell. You imagine that here is the blood flow. This is the vascular area, and we find some structures on these membranes. And what you can see in the middle of the picture is a PIEZO-1 channel embedded in this layer of the endothelial cell.

And now it's not -- it's quite complex, but if you see that you can perhaps understand that driving forces, the blood flow itself, is a mechanical force which can work on this membrane. It can work as this that these PIEZO channel opened its plates and let calcium ions through the membrane.

PIEZO, we know from the electricity is the transformation of forces in electric information. When

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this information is coming in, then it leads to a biological information.

So what are vital functions, you will know? More and more we are clear that on this level of the microcirculation in the little capillaries, most of our vital function are organized. So I will show you later on a slide that you can see which functions these are, and we know all organisms are dependent in their vital functions from laminar forces. Laminar means that there is a laminar streaming in the vascular inner side of the capillary.

The second precondition for a good performance of these functions is that the endothelium itself -- this is only the surface -- is in a healthy state and without introduction of the laminar flows. And what Ardem Patapoutian also said, all organisms need to have a perception for external forces like proprioception, air pressure, and so on. So we need that air pressure can go through and make informations on this level.

Please the next slide. So it is out -- taken out also of my Essential book for Springer Natured where I looked in the -- all the new research advances of the last 15 years, and this cannot be complete because this is still ongoing research. But what I can tell you and I highlighted in yellow, our endothelium inner side of

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the capillary vessels are like semipermeable membranes, and like switch holders to decide what they let through.

So in this place, there is the exchange of nutritions and oxygen. There is also the regulation of the width of the vessels, and therefore, you can imagine if you have an autotune regulation, it's always guaranteed that you get enough substrate and nutritions on the place it is afford for.

So you can -- if you are running, you need more energy in your muscles, so the endothelial regulation will support the perfusion in the muscles and lead the blood to there to support the best way.

Another very important regulation is growth, the normal growth of a child or embryological functions. You have to imagine that on this level, there is the beginning of the vascular kinases, and in the developing embryo, before all the structures is built, the vascular system is the first, and the forces in the vascular stream are the forces will lead to the development of the first growth of the embryo.

All you can see, it is also the transport system for hormones, for medications. Yes, sometimes also for toxin we take in. Then it is the homeostasis for fluids. It decided if the fluid is -- let it in or

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out. It is the most important place for regulation our -- of our immune system.

It deals with inflammation. You have to imagine, we need inflammation because we have to restore -- if there is an injury, we have to restore the tissue and the structure, and in this phase -- in this phase, what is meaning in English, phase?

THE INTERPRETER: Phase.

A. DR. BELLUT-STAECK:Yeah, in this phase, the immune cells out of the vessel is going into the tissue and make a certain development and then the structure in the best way is in a -- is leading to a -- (German spoken), in complete healing.

So this is an overview just -- the endothelium can secrete chemokines, cytokines, mediators. You see this is really at once of the last 15 years, and it will last perhaps 5 years or 10 years more so that the public interest is more on this really basic -- basic of life foundations.

So the next slide, please. This is the slide -- the first slide. I asked for -- this one, yes.

What I told you till now is state of the art in medicine is generally accepted all over the world, in universities, and it's a fixed state now, and when you now see that a foreign external forces like infrasound

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with specific properties, and all of you will agree that infrasound has the property to go through every viscoelastic material. Also we in our tissue are viscoelastic.

So also, by the way, roofs or houses' walls are viscoelastic, so the deeper the frequency, the more infrasound is going and transmitted as energy transport through everything.

By the way, the deeper the frequency, the longer the waves, the more the bendings, and the less to be dammed infrasound. You need -- you cannot dam infrasound in these regions under 10 hertz because it is not possible just to make a wall as big as infrasound can be dammed.

So if you see now that it's possible that infrasound is going through organism, why shouldn't it go to the level of the endothelial cell in the bloodstream, because this is what we can see in the results of the studies I did the research on. And this what you can see here is the only part of my hypothesis, all what I told you before is the state of the art already.

And I was the first to think about because I compared the symptoms of the people and the animals. With my wisdom -- I did since 20 years microcirculation

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research -- with my wisdom that the symptoms are showing me that there is something bad with the microcirculation, and up to this point, I began to study it.

What you can see here is one of the pulse of infrasound pulse, as it's known from a wind turbine, and this is important because in biological systems, we know that a stressor which has an acceleration is much more leading to a biological information than a steady state stressor.

Compare, please, what you know from the nose. When we smell something, after some time, we don't smell it anymore. So this is to be comparable, and I also can show you later on that is found in the sources, and it's in my papers, that researchers got out already that the -- exactly this.

They did research about this impulsive stressor, and they realized that this is one of the things that makes the situation so dangerous, because we have continuously stressors all the way.

You have to know, microcirculation normally would recover soon. It has a big recover possibility, but if you have a chronic stressor, you agree with me, then recoverment (sic) is nearly not possible.

The next slide, please. Now we are -- meanwhile,

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on the other side, this is already proven research science. It is long established in the autoregulated system of the microcirculation that nitric oxide is emitted adequately. This is the most important situation because we do not make anything. Our system realizes where its need for NO and adequately to NO emission, the vascular width is getting bigger.

What we know since many years, if NO is not adequately emitted at the right time in the right place and in the correct amount, oxidative stress increases. And you can see also in my papers, that is known that oxidative stress, if it is going on chronically, is one of the basics condition for development of arthrosclerosis and all of the following diseases like stroke, like cardiac attack.

And what you can see in this list, this source is also in my two papers, that normally NO, nitric oxide, has protective effects. It's most important normally antioxidant. It inhibits leukocytes and platelet adhesion. I do not read whole, but -- all those things, but I can tell you if NO is not adequately emitted, it has deleterious effects, and that, from my point of view, is one of the bases why we have here a situation that NO is emitted not adequately, and what we can show in the studies I also added in my papers

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that there is an increase of lipid peroxidation of oxygen radicals. And we have a situation here also of more susceptibility for radiation, toxic metals, alkylating substances. This is state of the art already since long time.

Please the next slide. What are the consequences? When we imagine that infrasound might come to the endothelial level and it's leading to irregular inflammation about irregular sensation on the mechano-sensors, mainly the PIEZO channel, then it's a consequence that we have functional disorders of the microcirculation, and that's what we can see worldwide.

We find signs of energy loss. We find dizziness. We find headaches. We find tinnitus. We find weak muscles. We find thoracic pressure. And if there is a long-term impact, then we must expect increased oxidative and also oscillatory stress.

This is the condition for an inflammatory state of the endothelium, and then you remember now a lot of functions of endothelial functions like regulations of inflammation, like growth, like coagulation, like regulation of blood pressure, embryological function, then you will understand that if there are irregular inflammations that we are in a situation of stress for one of the bases of life.

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So inflammation of the endothelium tends to lead to high blood pressure, vascular diseases, heart attacks, strokes. But nobody can say if you are in a state of these illnesses and go to your doctor and say I think also the wind turbine added to my illnesses, nobody can prove.

So we had to get out a pathophysiological way to say this is a dangerous situation for people in the near and also I must say for animals, also insects, also whales in the sea, that we have something manmade done which is not comparable with an earthquake or with driving a car or with -- have long flights. Then we can really have also signs, symptoms of infrasound long impactment, but this is our own decision. But if we do that in the houses of people, we have a protected room, and the people cannot protect themselves because you know infrasound is not dammable.

Please -- I think there's another one, please, the next. Yes, this is one of my conclusions after years of research, I am in this research since -- I'm in the theme of microcirculation since 24,000 -- 2004, and since 2015, I'm in the research why infrasound probably can affect organism.

All organism are equipped with mechano-sensors, in particular PIEZO channels. For this reason, all

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organisms could be impacted by manmade infrasound. Therefore, the impacts of infrasound frequencies and vibrations on people residing in close proximity to industrial wind turbines cannot be simply dismissed based on old studies.

We have to accept that science is changing. The wisdom is not changing but the wisdom about and with the increased possibilities of what we had after 2000, these functions could be evaluated. So findings from new studies must be considered in this situation.

A cautionary approach to establishing the setback for an industrial wind turbine project should be adopted. The distance at which serious health disturbances may be avoided is to be determined scientifically and not based on old studies.

Factors such as the descending fundamental frequencies due to the increasing size of rotor diameter, the main wind direction and wind speeds, the interaction of emissions from several wind turbines, the possible interference between different wind farms and the topography must be considered.

Before establishing safe distances, various low-frequency forces need urgently to be reevaluated in terms of their effects before establishing safe distances could occur.

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Q. Thank you, Dr. Bellut-Staeck. Have you had an opportunity to listen in or review the transcripts of the proceedings to date, especially as it relates to my cross-examination of Dr. Ollson on infrasound from wind turbines?

A. DR. BELLUT-STAECK:Yes, I had the possibility.

Q. Great. Do you have any comments to make, and if you --

A. DR. BELLUT-STAECK:I have some comments, yes.

Q. And if you do, please can you briefly provide your comments? I know our time is up, so can you briefly summarize your comments that you have. Thank you.

A. DR. BELLUT-STAECK:M-hm. I have a comment. So if we can open the transcript from yesterday with Dr. Ollson, can you...

Then on the side, 131. This is I think -- yes, I think this is not the time to go into the details, so I will try to summarize.

So when I see the statement when Mr. Kema asked Dr. Ollson if it is a common misunderstanding that infrasound is inaudible, levels of infrasound emitted from wind turbines are orders of magnitude below -- below the infrasound audibility threshold, and his answer, "So yes, as you can see if you were to look at the paragraph below the picture," so I will ask for my evidence. There we can see the graph I have to show --

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it's in my evidence, X0096.

I will show you the page. Yeah, it's on page 17. Yes, that's it. That's the first graph. I will speak also to another because Dr. Ollson used.

So Dr. Ollson is most of the time telling from studies in the 2012, '14, '16, like the Michaud study, and I think in this time, it was really quite normal to take the dBA, but what I can show you here, we know meanwhile also in these weightenings more how we can really show the exact SPL levels of infrasound under 20 hertz, because if you can see, the A weightening, you can see that it's going just under 10 hertz, and you cannot prove between 0 and 10.

So with dBA, you will go into the infrasound but not enough because, as we know, wind turbines emit mostly between 0.2 and 12 hertz, so it's this part they emit, and also what he spoke about, the G, there you can see this curve is going far in the infrasound part, but you can see what is about the reduction of SPL.

So I show you the only weightening, what you can do to calculate infrasound in the real extent. So it is the set -- the unweightened or 0 weightening. This is my answer to the first comment here, also to some others because he told it's enough just to say I will pick up the dBA and then I will pick up also -- it's a

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little bit -- I have to...

Also, the dB -- yes, okay. Yes. Also the dBC. So you can see, if you see that it's more than 20, so we know there must be infrasound. But this is not the measurement, yeah? This is not sufficient to say something about this part.

And so I will show you -- this is a very clear graphic that you can really see dBA is really suitable for acoustic sound, and the created dBG is not sufficient to show the values here, and dBC, you see the same. You can only see if there is a difference, there is infrasound.

And then I must go on another graph, because also yesterday, I realized that Dr. Ollson talked sometimes in the infrasound part, we only have 10 or 15 hertz. So this can come from the situation that he uses weightenings which cannot so -- show the real values, you see?

So I show you other graphs. It's in my -- just a moment. First I'll show you -- I can show you this one. It's on the page -- on the page 26, please, the graph.

Picture number -- yes, in the -- yes, in this part. It's also you recognize this graph also Dr. Ollson used, but the -- the decisive point, what I

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will say, you will see that in the infrasound part up to here, this is the increasing level of infrasound, and you can see this is set -- this is zero weightening, and these are the real SPL of infrasound, so we have levels between 50 and 80, and you know, with a bigger -- with the taller wind turbines, it's more.

So this is a graph from 2016, and from 2016 to now, we have really taller wind turbines, and as you know, if you increase the rotors, you get deeper frequency, and you get more emissions, and you get higher values.

It's not only the electricity production which is getting higher, it's also the emission which is getting higher. And as you also know, perhaps, it's not a double. It's a -- what can you say it in English? It's the potential minus 3 of increasing the production and also the emissions.

And if we say that we have to respect the part of infrasound, then you cannot say it's important where our threshold of ear, of -- of hearing, acoustic threshold is. If we have a perception on another part of the body, the perception threshold cannot be anymore the threshold for the working of infrasound.

So we have really for my side -- and I have a lot of reviews meanwhile also, contacts to the foreign

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countries, we see that we have to respect and to reevaluate what these infrasound is making in the -- (German spoken).

THE INTERPRETER: In dealing with the various organisms.

A. DR. BELLUT-STAECK:Yes, thank you. Thank you.

So I have a look, a second look in the testimony of Dr. Ollson from yesterday because I signed what is important. Yeah. Yeah.

He mentioned here in -- it's slide 160. He mentioned that he has conducted primary research on the impact of wind turbines on individuals. This was the question from Mr. Kema, and he told us that he did some studies.

We can find him -- the studies in number -- in the expert report from Dr. Ollson from 26 of May 2025. And I looked in the studies, but it's about -- all of the studies about health assessment and not about infrasound.

And to be short, in his statements yesterday in the testimony, he also looked -- told us that from his side of view, there are since 2020 no more studies about infrasound which can show there are severe health effects, and from my side of view, this is not right because I realized in the same time as I was on the

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research that a lot of studies came up in this time since 2017, and I can only show, you know, a few which are important to understand that there are studies which show there is an impact, and I therefore will call the Weichenberger study -- it's in my evidence of the 14 of April with the number X0096.

And you can see in my references, under number 9, this is a study from 2017 that Weichenberger, et al, could show that altered cortical and subcortical connectivity to infrasound administered near the hearing threshold. So what I can explain you to the study, this was made from the University of Hamburg and Charité Berlin.

People were impacted with infrasound in a double blind study, either with infrasound under the hearing threshold or with nothing, and at the same time, and this is the important thing, an MRT was made, a so-called FRMT, and the result in this study was that three parts of the brain were signalling that they were active, and these parts of the brain were centres for emotion, centres of anxiety, and centres of fear, and also another one who is responsible also for blood pressure and pulse frequency.

So this was a really decisive studies to show that under the impact of not audible infrasound, this is a

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definition also, infrasound is not audible. The impact was a signalling activity in the brain, and there have to be more research, but from my side of view, it can be that it's one of the reason why people have sleep disorders.

If you have an activation in the night in your anxiety centre, you cannot sleep. This is comparable with -- I should -- it's an old study, but elephants have comparably sensitivity for earthquakes, so they realize over their skin and there is a direct connection to the brain and so they will go away from the place, similar to goats.

So we can see also from animal side, infrasound is perceived, but it's not important, it's not acoustic situation, it's perception of receptors which are not known before 2000.

I will say a second thing. Yes. I told you that Dr. Ollson told that there are no studies about infrasound. In my reference lists, I will point on some studies which I also took in my paper.

Q. Yeah, thank you, doctor. If you could please summarize. I just want to note that our time is up, but if you could summarize, thank you.

A. DR. BELLUT-STAECK:Yeah, I know. Okay, it's so complex, so it could be say really a lot about. But

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it's very stringent and consequent now.

But just a last word, it's the study, point 20 till 70 -- 26, there are six studies which mainly took place in China, and these are studies with infrasound, and they could realize that tissues are reacting, cells are reacting to this.

MR. KEMA: Thank you very much, Dr. Bellut-Staeck.

Mr. Chair, the OLG's expert panel is available for cross-examination. Thank you.

THE CHAIR: Okay. Thank you. What we'll do is we'll take our morning break. We're at 10:35, so we'll be back -- let's come back at 10 to 11, so 10:50.

(ADJOURNMENT)

THE CHAIR: I think we're just waiting for Mr. Farquharson.

And while we're waiting, there was one matter that was brought to my attention, and that is that the opening statement for Ms. Ballut-Staeck has not been marked as an exhibit, and so we'll add that to the record, and we'll mark that as Exhibit 153.

EXHIBIT 153 - OPENING STATEMENT OF DR. BALLUT-STAECK

THE CHAIR: Okay. I see Mr. Farquharson. So now the next step is to allow for RES cross-examination

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of the OLG expert witness panel. I'll turn it over to counsel for the applicant.

MS. OLENIUK CROSS-EXAMINES THE PANEL:

Q. Good morning, Chair. So just in terms of a roadmap for our cross-examination, I can advise that we do not have any questions for Mr. Wallis or Mr. Tenszen.

I have a few questions for Mr. Farquharson and Dr. Barclay and then my colleague Ms. Bouey has some questions for Dr. Bellut-Staeck.

So just turning to you first, Mr. Farquharson, so in your direct evidence this morning, you referred to an aid to cross provided to Mr. Faszer marked as Exhibit 146 for identification purposes. Do you recall that?

A. MR. FARQUHARSON: Yes, I do.

Q. And in your direct evidence, you questioned Mr. Faszer's opinion in the noise impact assessment regarding whether a PSL adjustment was warranted for four receptors near Highway 41 and 9 due to proximity to a heavily travelled road; correct?

A. MR. FARQUHARSON: That's correct.

Q. So in your report, which is Exhibit 86, can you point me to where you raised this issue or challenged Mr. Faszer's opinion on traffic and the classification of these four receptors?

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A. MR. FARQUHARSON: No, I did not. I did not look at the traffic at that time. It was -- it was an oversight by myself. I apologize to the Commission for that.

Q. Okay. So your observations today about traffic and businesses located long Highways 9 and 41 and your view that these four receptors may not warrant a higher PSL, those are new? You haven't previously provided that information to the Commission in this proceeding?

A. MR. FARQUHARSON: No, I did not.

Q. And, Mr. Farquharson, were the 2015 to 2024 traffic counts presented in the aid to cross published by Transportation Alberta just this past weekend, or was it available to you before then?

A. MR. FARQUHARSON: It was available before then.

Q. So you could have -- you could have included those traffic counts in your evidence, then, sir?

A. MR. FARQUHARSON: I could have if I -- if I delved into the traffic issue. I was -- I got caught up in delving into other issues on this particular file, and it was an oversight on the traffic.

Q. Okay. And you'd agree with me, sir, that if you had included it in your evidence, Mr. Faszer would have had an opportunity to respond to it in his reply evidence; correct? That's the process?

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A. MR. FARQUHARSON: Yes, that's the process.
MS. OLENIUK: Okay. Thank you.
So, Chair, just in terms of process, I'm not sure if now's the appropriate time before I move to Dr. Barclay or if it's something you'd rather hear at the end of our cross-examination, but I think you can probably anticipate we're going to object to Mr. Farquharson's evidence that he provided with respect to this topic this morning.
If the OLG had wanted to challenge the higher PSL for those four receptors, they had an opportunity to do so, and as you heard from Mr. Farquharson, they didn't, and this contravenes, of course, the Commission's practice note on the use of aids, the practice note on direct evidence, and our view is the Commission should disregard Mr. Farquharson's evidence.
So I'm in your hands, sir, as to whether you want to take that away and we continue or we deal with it now.
THE CHAIR: Why don't I hear the position of Ms. Okoye, and then we'll provide an opportunity for your reply, and we can either rule on that now or provide a ruling after -- after our lunch break.
MS. OKOYE: Just one moment, Mr. Chair. I'll start off by saying Mr. Farquharson did note in his

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responses to Ms. Oleniuk's questions that it was an oversight on his part. He would have brought that up if he had dealt -- had some time to delve into the highway traffic issue.
But I do note that in his report, that Mr. Farquharson did not state that the NIA that was done was compliant with the AUC Rule 12, and I'll say that if -- given that there are some indications that there are some issues that may make the amounts presented in the NIA not to be accurate, my suggestion will be that the Commission still considers it, even though he didn't -- we didn't -- he didn't follow the proper due process in bringing it up in his report, and he has apologized for that oversight on his part.
THE CHAIR: Ms. Oleniuk?
MS. OLENIUK: Thank you, sir. I don't think any of those submissions change our position, and while we certainly appreciate Mr. Farquharson acknowledging his oversight, it doesn't resolve the prejudice that would be suffered by RES if this late information was adduced without a proper opportunity for Mr. Faszer to respond to it.
So our request that the Commission disregard the evidence provided by Mr. Farquharson on this issue this morning stands.

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THE CHAIR: Okay. One moment.
We're going to adjourn for 5 minutes, so we'll be back -- we'll be back -- well, let's take 10 minutes. So we'll be back at 10 after 11, okay?
(ADJOURNMENT)
THE CHAIR: We've considered the submissions from counsel, and based on procedural fairness, we agree with the applicant, and so that testimony from Mr. Farquharson and -- that testimony from Mr. Farquharson will be disregarded.
Continue with the cross-examination.
MS. OLENIUK: Thank you, Chair.
Q. MS. OLENIUK: And, Mr. Farquharson, I just wanted to thank you for your candor in response to my questions this morning. I appreciate that.
A. MR. FARQUHARSON: Thank you.
Q. Dr. Barclay, good morning.
A. DR. BARCLAY: Yes, good morning. We meet again.
Q. We seem to meet like this quite often.
A. DR. BARCLAY: Yes.
Q. So I just have a few questions for you, sir. If we could please pull up your opening statement, which is Exhibit 140, Ms. Adebayo. And if we could turn to PDF 17, please. Thank you.

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So, Dr. Barclay, in your opening statement here at PDF 17, you state that the high bat fatality rates at the nearest operating wind facilities, being Lanfine and Sharp Hills, despite the implementation of operational mitigation at Sharp Hills suggests that the fatality rate at the proposed Oyen project will also be high; correct?
A. DR. BARCLAY: Correct.
Q. And if we can just go to PDF 14, please. At PDF 14 here, you note that the postconstruction mortality rate at Lanfine is 4.2 bats per turbine; correct?
A. DR. BARCLAY: For all bats, yes.
Q. Yes, and 4.0 for migratory; correct?
A. DR. BARCLAY: Correct.
Q. And is it your understanding that Alberta Environment and Protected Areas, or AEPA, has not currently required operational mitigation for Lanfine?
A. DR. BARCLAY: I'm not aware whether it has or has not been.
I'll also point out that the 2024 data that was presented I didn't have access to at the time of writing my report, and those 2024 migratory bat fatalities at Lanfine were 4.8.
Q. Okay. And I think you said, sir, that you're not aware if AEPA is requiring operational mitigation for Lanfine

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or not?
A. DR. BARCLAY: Yeah, I'm -- I don't know.
Q. Okay. If the operational mortality rate at the Oyen project during its first year is more similar to Lanfine in that it's near AEPA's acceptable threshold, would you agree that it's possible that AEPA may not require operational curtailment at all?
A. DR. BARCLAY: I suppose that's a possibility, although the cumulative impact, I assume, would come into play, and the cumulative impact of Sharp Hills, Lanfine, and Oyen is well above the 500 migratory bat fatality rate that they consider to be a concern.
Q. But you're not sure if it came into play for AEPA currently as it relates to the 2023 and the 2024 results for Lanfine and Sharp Hills?
A. DR. BARCLAY: So Sharp Hills had mitigation in place. I think that started during that first year of operation, when they discovered that the bat fatality rate seemed to be high early on in the monitoring season.
I don't know whether AEPA has invoked the 500 cumulative number in terms of Lanfine and Sharp Hills.
Q. Okay. Thank you. If we can just go to PDF page 10 of your opening statement. Thank you.
So on this map here that you've depicted, it shows

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the Lanfine project located directly south of the Oyen project and Sharp Hills to the north; correct?
A. DR. BARCLAY: Correct.
Q. Okay. And based on that map, it looks like Lanfine maybe is just slightly closer to the Oyen project than Sharp Hills?
A. DR. BARCLAY: Yeah, the top end of Lanfine is closer to Oyen than Sharp Hills, yes.
Q. And in your direct evidence this morning, you indicated that you had the opportunity I think to either listen to Ms. Sare's testimony yesterday, or you reviewed the transcripts; is that correct?
A. DR. BARCLAY: Yes, I reviewed the transcripts.
Q. Do you recall her stating that one key difference between the Lanfine and Sharp Hills sites is that Sharp Hills partially overlaps with a high value landscape, whereas Lanfine does not?
A. DR. BARCLAY: I don't recall that, but if you say so, I will accept that.
Q. Okay.
A. DR. BARCLAY: My question is high value in terms of migratory bats or bats in general?
Q. That was my question for you. If -- could we please pull up the transcript. It might be helpful just to see the quote in context, if that's available.

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And so I have it at page 37. I don't know what the PDF number is it, unfortunately. Right there. Perfect.
So that just starts at lines 6 to 14. So if you want a moment just to review that.
A. DR. BARCLAY: So again, I'm not sure what "high value landscape" is referring to. I believe, if I recall correctly in the discussion, that's forested areas or wetlands? Is that correct?
Q. I'm not sure. I don't think -- I don't think that -- I don't -- I don't think so because I don't think Sharp Hills is in a forested -- a forested area, but my question -- and I think you may have already answered this -- is in coming to your opinion on the -- your -- the potential for mortalities at the Oyen project, did you consider the siting of the project in this respect, with respect to the high value landscape?
A. DR. BARCLAY: No, I looked at the sites, the two facilities north and south and looked at the average fatality rate between those two.
Q. Okay. Thank you. We can take that down.
In your evidence -- I don't think we have to turn this up -- but you posed the question of whether preconstruction bat activity rates accurately predict postconstruction fatality rates and wind turbines, and

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you refer to the Solick paper that found no evidence of a correlation.
So, sir, is it fair to say that Lanfine and Sharp Hills are a good example of this, given that Lanfine had higher preconstruction recorded bat activity than Sharp Hills, but fatality rates are three times lower than Sharp Hills?
A. DR. BARCLAY: Yes, obviously there's not a direct correlation, a one-to-one correlation. We do have to keep in mind that that paper by Donald Solick and others didn't consider variables that I think are important; for example, the type of detector used varies amongst projects, and those may detect more or less bats.
Also, they measured the fatality rate in terms of per megawatt production of the particular facility, and different-sized turbines can have equal megawatt capabilities, and size of turbines is important in terms of the risk to bats. Taller turbines have a higher risk.
So using megawatts as opposed to turbine size, for example, might be important in looking at that correlation between preconstruction activity and postconstruction fatalities.
So to my mind, the paper certainly showed that

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there was not a correlation in the analysis that they did, but a number of variables I think could be added to that analysis to determine whether, in a more rigorous sense, there is that lack of strong correlation.

Q. Okay. Do you know, Dr. Barclay, if the bat detectors varied between Lanfine and Sharp Hills?

A. DR. BARCLAY: They were the same.

Q. Okay. And I understand based on the table that you provided in your opening statement at PDF 11 that Lanfine and Sharp Hills, while having a different number of turbines, the turbines have the same rotor-swept area?

A. DR. BARCLAY: And being old and not overly technically advanced, I'll use a paper copy. Where is that?

Q. So I have PDF 11. But I don't think there's paper -- paper numbers on it. Page numbers.

A. DR. BARCLAY: Rotor diameter -- yeah, rotor diameter is the same at Lanfine and Sharp Hills at 150 compared to the 170 metres at Oyen, at least the proposed turbines at Oyen.

Q. Yeah. And so the rotor-swept area for Lanfine and Sharp Hills is identical?

A. DR. BARCLAY: Correct.

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Q. Okay. Thank you. And would you also agree that there's the potential for variation for fatalities across turbines in a particular project?

A. DR. BARCLAY: Absolutely, yes. We certainly found that when we looked at fatality rates in the Pincher Creek area. And I will also say it'll vary from year to year, depending on weather and other factors.

Q. Would conducting one year of postconstruction monitoring and then determining whether operational mitigation is required provide a consistent approach and baseline data for AEPA in considering all wind projects in the Oyen area?

A. DR. BARCLAY: As I mentioned in my report, given the relatively high fatalities in the neighbouring facilities and AEPA's view of cumulative impacts, I think the costs of waiting for a year in terms of bat fatalities is greater than the cost of lower energy production, which as I've said is very minimal.

So I would -- as I did in my report, I would argue that mitigation should be in place from the get-go and see what it's like and then if, after that first year of mitigated operation, it is below a concerning level, then discussion can take place with AEPA about changing the mitigation or eliminating it.

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Q. How can the effectiveness of blanket curtailment be assessed if it's applied to all turbines at the outset of operations, and there's no baseline unmitigated data gathered?

A. DR. BARCLAY: You're right. If all turbines were mitigated, then you don't have a comparison within the same facility in the same year to determine how effective mitigation is.

I think there are enough studies that show that mitigation is highly effective, and I cited a number of those. So adding one more data point I don't think is as important as conserving the population of bats.

Q. If postconstruction monitoring for the first year of Oyen operation shows unacceptable mortality rates, is it your understanding that AEPA will require operational mitigation regardless of the project's risk ranking for bats or the preconstruction bat pass numbers?

A. DR. BARCLAY: Yes, that's my -- my understanding.

Q. Okay. And just one final question. Would your opinion on implementing operational mitigation from the get-go on this project be different if at the point when this project commences operation if the Sharp Hills numbers have been accepted to an acceptable limit?

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A. DR. BARCLAY: If they've been reduced to an acceptable limit using mitigation, my view would still be the same. Without mitigation, evidence suggests to me at least that the fatality rate at Oyen would be high, especially given the number of turbines involved.

So let's remember it's total number of bats that's a concern, not just the number per turbine. So if operational mitigation is changed for Lanfine and the numbers come down or at Sharp Hills and the numbers come down, great, but I would still recommend that operational mitigation be instituted at Oyen from the -- from the start.

MS. OLENIUK: Thank you, Dr. Barclay. Those are all the questions that I have.

A. DR. BARCLAY: Okay. Thank you very much.

MS. BOUEY CROSS-EXAMINES THE PANEL:

Q. Okay. We're going to change to some questions now for Dr. Bellut-Staeck. Can you hear me okay? I just switched my audio source.

A. DR. BELLUT-STAECK:(Through interpreter) Yes, I can hear you well.

Q. Right, thank you, and I understand that you obviously have an English language translator so if there is a question that you don't understand or if I'm speaking too quickly, please just let me know, and I can repeat

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that question for the translator, and I will do my best to keep a slower pace.
A. DR. BELLUT-STAECK:(Through interpreter) Yes, I understand.
Q. Wonderful. And will you require the translator for every question?
A. DR. BELLUT-STAECK:Yes.
Q. Okay. I will start with some questions about the professional qualifications and experience outlined in Exhibit 107, if we can pull that up.
And to confirm, you prepared these responses, Dr. Bellut-Staeck?
A. DR. BELLUT-STAECK:Yes. (Through interpreter) Yes, I have.
Q. And if we turn to PDF page 4, you list regular university exchange with a number of professors with the topic being possible infrasound effects on biological systems.
A. DR. BELLUT-STAECK:(Through interpreter) Yes, I can confirm that.
Q. And to confirm, you are not an adjunct or a full-time professor at a university or other post-secondary institution. Is that correct?
THE INTERPRETER: Would you like me to interpret this part?

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A. DR. BELLUT-STAECK:No, excuse me. Yes (German spoken). (Through interpreter) Yes, that's correct.
Q. And on the following page, if we scroll down, you note that you are a member in the maritime working group for the establishment of guidelines in cruise medicine.
Have you been involved in establishing any guidelines for risk assessment or siting criteria related to wind turbines for any government in any jurisdiction?
A. DR. BELLUT-STAECK:(Through interpreter) No, so far, I have not. I have specialized exclusively in the research in this context. I would like to also make an additional comment to that.
Q. Okay.
A. DR. BELLUT-STAECK:(Through interpreter) I would like to just comment here that I have been working as a scientific consultant for the last 6 years in the German sound -- so I will just translate this literally. The German Protection Society Against Acoustic Injuries of Humans and animals, and there, I've been working in an advisory function advising the main members and working on developing questionnaires -- question -- questionnaires and also working on various symptoms, realizing what the symptoms are and providing overviews on the infrasound

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aspects and illnesses in this regard.
So just to add another comment, that as part of my function as part of this association, we also make reports or consult vis-à-vis governmental bodies and supervisory or regulatory bodies as well as ministries.
Q. Okay. Thank you. And, Dr. Bellut-Staeck, I am going to try to limit the amount of additional commentary because we will encounter some time issues, given that we have a translator involved as well.
So I appreciate the additional context, but going forward, I'm going to try to limit the additional commentary if possible to just respond to the question that's asked.
A. DR. BELLUT-STAECK:(Through interpreter) Okay.
Q. So you mentioned the German Protection Society Against Acoustic Injuries or something along those lines. Just to confirm, this is not a government agency; correct?
A. DR. BELLUT-STAECK:(Through interpreter) Yes, correct. It is a registered association which corresponds to a nonprofit association.
Q. Thank you. I'm going to turn to some questions regarding your evidence in the proceeding.
On a general level, my understanding is the hypothesis put forward in your evidence is that infrasound emitted from wind turbines can cause

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microcirculation disorders; is that correct?
A. DR. BELLUT-STAECK:(Through interpreter) Yes, that's correct.
Q. And this is responsible for serious health effects for those living in proximity to turbines, such as high blood pressure, vascular diseases, heart attacks and strokes; is that correct?
A. DR. BELLUT-STAECK:(Through interpreter) Yes, and it is important to note that the stressors are not short term, and they do lead to functional impairments, and so, for example, if they're moving away from there and then returning, it will still continue. So for example, with headaches, tinnitus, longer-term impacts in terms of cardiovascular diseases and so on.
Q. Okay. And this -- or your hypothesis is related to the disruption of the PIEZO-1 channel embedded in the membrane of the endothelial cell; is that correct?
THE INTERPRETER: I just asked if I may jump in to interpret shorter segments for accuracy.
A. DR. BELLUT-STAECK:(Through interpreter) Yes, so this is correct, and plus there is ongoing research that there may be additional consequences of such kind of activation of the PIEZO channel, and this may also lead to additional diagnoses.
Q. So is your hypothesis regarding the impact or potential

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impact of infrasound from wind turbines supported by any cellular level model or laboratory testing?

A. DR. BELLUT-STAECK:(Through interpreter) Yes. This hypothesis is supported primarily from -- with studies from China. So these concern the impact of infrasound leading to sickening and additional fibroses at this level of the cell.

Q. And what is the level of infrasound included in those studies you're referring to?

A. DR. BELLUT-STAECK:(Through interpreter) I will look up the sources for a moment.

Q. My understanding is that those studies from China are based on exposure of infrasound at levels of 130 dB; is that correct?

A. DR. BELLUT-STAECK:(Through interpreter) I would have to verify, but I do realize that some higher levels were used.

So we also have the live situation, for example, in the nurse cohort study. So the impact of wind turbines on the rhythm and also the myocard changes, so the level there is between 70 to 80 dB of infrasound leading to changes at the cellular level.

Q. So to confirm, is it your understanding that levels of infrasound emitted from wind turbines is between 60 to 70 dBG?

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A. DR. BELLUT-STAECK:(Through interpreter) So yes, I can confirm that, and also looking at systems like yesterday, mentioned in the testimony of Dr. Ollson, where we have the basis frequency of 0.6 hertz that would then lead -- have -- we have then a sound level that is the infrasound level between 60 to 90 dB.

Just to make a minor correction here is the SPL level of dB, which is under 1 hertz, and then leads to 60 to 70 dBG.

Q. You understand that the ranges referred to in Dr. Ollson's testimony were for a distance of approximately 300 metres from a wind turbine; is that --

A. DR. BELLUT-STAECK:(Through interpreter) Yes, I remember the 300 metres being mentioned, but I don't know what findings he had with respect to that. So when we're talking about the 60 to 80 dB, it corresponds to a distance of up to 1,000 metres.

Q. It might help to pull up the relevant exhibit. If we turn to Exhibit 116 at PDF page 49. And you'll see the notation at the bottom of this graphic that says: (as read)

"Level range of the measured wind turbines, distance approximately 300 metres."

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You see that there?

A. DR. BELLUT-STAECK:(Through interpreter) Yes, I see this, but it is a characteristic of infrasound that you don't have a lessening of the infrasound in this area but rather that in -- up to a distance of 1,000 metres, you still see certain dB values.

Q. Do you know the closest distance between a wind turbine and OLG member residences or your clients' residences?

A. DR. BELLUT-STAECK:(Through interpreter) Yes, I do. From what I remember, it is a distance of 850 metres.

Q. And on the basis of your hypothesis, what do you think is a safe setback from a wind turbine?

A. DR. BELLUT-STAECK:(Through interpreter) So I can mention here as I also mentioned in my evidence and based on the various studies cited there that a safe distance would be over 10 kilometres, given the size and the frequencies emitted.

Oh, sorry, I missed one part. I would like to cite a source for you. Just a moment. Under number 28 in the literature cited, X0096.

So in this study by Stefan Garthe, et al, from Kiel, they were looking at large-scale effect of offshore turbines. I know that -- I realize that here we're looking at onshore turbines, but it was looking at the air infrasound effects on animals -- on birds

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and the bird population.

Q. And I'm wondering --

THE INTERPRETER: She's still continuing.

Q. I think that's okay for now. I think we can move on to the next question.

Are you familiar with the requirements of Alberta Utilities Commission Rule 12?

A. DR. BELLUT-STAECK:(Through interpreter) So I have this package in front of me here on Rule 12. It is an extensive package of requirements which deals with noise effect and is also -- includes possible updates or is available for possible updates, and in the current form as I see it here, it is only dealing with the audible part, therefore not dealing with the infrasound part and the infrasound effects.

So there is a section here on page 26 dealing with low frequency noise, but what is not being considered is infrasound as a physical energy and the scientific findings that relate to that that should also be considered now.

Q. I'm wondering if you are aware that a noise impact assessment was prepared for the project application in accordance with Rule 12.

A. DR. BELLUT-STAECK:(Through interpreter) Yes. I also know that infrasound in the overall assessment was

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the -- was not done on -- was not done on the C and A assessment. So when -- I was just citing from this that the measurements from this particular piece of writing, measurements must be conducted in both C and A weighting scales concurrently, but I know that the C and A weighting scales in terms of the distance results in more than 20.

So as I showed in my graphic, that the infrasound has to be -- we must continue to assess the infrasound without this kind of weighting.

Q. No, Dr. Bellut-Staeck, before you begin, sorry, this isn't actually related to my question. My question is, are you familiar with the noise impact assessment that was prepared for this project? There was a noise impact assessment filed for this project. I believe it's as Exhibit 12.

A. DR. BELLUT-STAECK:(Through interpreter) At the current time, I don't -- I'm not aware of the precise wording, but I would like to ask you to maybe pull it up and share the document.

Q. Sure. If you could pull up Exhibit 12, which is the noise impact assessment prepared for the project.

So to confirm, are you familiar with this exhibit and this assessment that was prepared for the project?

A. DR. BELLUT-STAECK:(Through interpreter) I recognize

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the title page, but I am not familiar with the current contents under this title.

Q. Okay. Thank you. And also just to confirm, are you aware that there is about a 25-year history of wind turbine development in Alberta?

A. DR. BELLUT-STAECK:(Through interpreter) Yes, I am familiar with this timeframe. It is similar to Germany, where one of the first wind turbines was created.

So yeah, from the start of the beginning of the wind turbines, when they were being constructed, the impact has to be seen differently now or assessed differently now also due to the size and all the different characteristics, in particular in respect to the depths of the frequency.

So this is the main critical point, really, is that the equipment or the turbines built back in 2010 cannot be compared to the ones from 2025.

Q. So there has been a lot of evidence and testimony on the significant amount of research in this area. Are you aware of whether any jurisdiction around the globe has adopted a 10-kilometre setback on the basis of potential infrasound or noise impacts?

A. DR. BELLUT-STAECK:(Through interpreter) So I am not aware of this in detail, but I think the main reason is

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that, you know, is the current work that is actually ongoing in this area.

So in particular, the studies and the work that is being done from 2023 and 2024 that is already existing, so that is my research and then the confirmation from abroad, and it is probably the case that this hasn't not -- has not been received yet at the various jurisdictional levels.

Q. Okay. Thank you, Dr. Bellut-Staeck. That concludes my questioning, and thank you as well to your translator, Claudia. I appreciate your work today as well.

A. DR. BELLUT-STAECK:(Through interpreter) Thank you.

MS. BOUEY: And, Chair, that concludes our questioning for the OLG witness panel today.

THE CHAIR: Okay. Thank you. We'll break for lunch and we'll come back with questions from the Commission. Let's come back at quarter after 1, please.

(PROCEEDINGS ADJOURNED AT 12:09 P.M.)

PROCEEDINGS ADJOURNED TO 1:15 P.M.

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Volume 2

June 10, 2025

P.M. Session

(PROCEEDINGS RESUMED AT 1:17 P.M.)

THE CHAIR: We'll now proceed to questions from the Commission. We'll begin with questions from Commission counsel.

MS. GRAHAM QUESTIONS THE PANEL:

Q. Thank you. My first questions are for Dr. Bellut-Staeck.

At PDF pages 11 and 12 of your evidence -- and I'll read a bit of it, so if I need to repeat it for the translator, please let me know: (as read)

"At low frequencies, a reassessment and reevaluation of their effects on humans, animals, and plants is urgently needed to avert damage."

And you go on to recommend that appropriate precautions must be taken until all scientific questions have been definitively answered.

What are the appropriate precautions that you recommend the Commission take in relation to the project?

A. DR. BELLUT-STAECK:(Through interpreter) Yes, I can

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confirm, and with respect to these measures that could be taken, first of all, the approval of additional systems or equipment should wait until the scientific evaluation has been completed.

Q. How long do you expect it to take for all scientific questions on the topic to be definitively answered?

A. DR. BELLUT-STAECK:(Through interpreter) Okay. From my side, I would say approximately 1 to 2 years because the evidence is quite high, and I already made a recommendation in my papers in terms of the direct findings.

So the direct findings could be done in conjunction as proposed with a direct examination of the impact or influence of infrasound onto the microcirculation.

So already -- I would like to continue here. Already there are suitable studies that are existing where, for example, in living tissues, for example, in animal tests, we can see the influence or the impact that can be determined.

Q. Would infrasound evaluation or monitoring be helpful for the Commission's understanding of wind turbine infrasound and health impacts?

A. DR. BELLUT-STAECK:(Through interpreter) Yes, I would like to confirm that.

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Q. And if the Commission were interested in doing infrasound monitoring, what methods and instruments would you recommend?

THE INTERPRETER: I'm just saying I will jump in so we can have shorter segments for accuracy of interpretation.

A. DR. BELLUT-STAECK:(Through interpreter) And in terms of the infrasound, I would recommend to conduct unweighted dBZ measurements, and I will also quickly mention -- I'll get back to that later -- that there was a minor misunderstanding earlier before the break, but I'll return to that later.

So in terms of those values that can be gathered, so although certain studies exist, it is not international really recognized yet or included yet that in terms of the values that should be measured and that is -- that is being recommended here, the values should not just be measured outside of the houses or the buildings but also inside because the values inside tend to be higher.

Okay. So this is related to the possibility that airborne infrasound and groundborne ultrasound can then lead to resonancy within the buildings. So these can lead to a decrease or also an increase of infrasound load, and would in reality would then mean a higher

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impact in parts of the -- or some areas of the protective areas of the houses, of the buildings.

So in this respect, I can cite a study from the German Umweltbundesamt (indiscernible) federal office of the environment out of the -- from the year 2014, which is also cited in my paper, the study conducted by Professor Krahé.

So it deals exactly with this development of the resonancy and -- between the infrasound as well as the bodily, body sound.

Q. Is there an acceptable limit for infrasound from wind turbines considering human health?

A. DR. BELLUT-STAECK:(Through interpreter) In the vicinity which is being impacted, there is no possibility because their characteristics do not offer such a possibility.

It can be only the distance that actually protects human beings, and this distance should be investigated in scientific examinations.

Q. Is there a way to screen out background infrasound levels so that you could determine what's the infrasound being caused by a turbine versus what infrasound may be -- have other causes?

A. DR. BELLUT-STAECK:(Through interpreter) So yes, I can confirm that. It is the specific profile that each

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turbine has. So this is what I was showing you earlier in terms of the pulses emitted and that can be seen in the sensoric information for the turbine.

Q. Thank you. I'm going to move on to questions for Mr. Farquharson.

Given that RES committed that once the project commences operation, in the event of noncompliance with Rule 12, it will implement noise-reduced operating modes for select turbines to reduce sound levels at receptors, does that alleviate your concerns about project compliance and noise mitigation?

A. MR. FARQUHARSON: Past history with the noise-reduced operating modes indicates that they -- they should be sufficient in this case. It would be good for the Commission and our clients to understand what level of reduction was achieved from this.

So, you know, if we needed 1 dB, is somebody willing to state that that's what the mode will provide, versus just for a noise reduction mode and no statement as to quantification of that value?

Q. Thank you. I'm going to move to some questions for Dr. Barclay regarding bats.

Regarding migratory bat distribution, are there pockets of increased density for these bat species within their greater ranges?

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A. DR. BARCLAY: Ooh, there's a tricky question. Because they're migratory, they come up in -- so they're not here in the winter. Let's put it that way. They're only here from sometime in May through into September.

As they're migrating, the density will obviously change geographically. During the time at which the females are giving birth and the young are growing and figuring out how to fly, they roost in trees.

So prairie, large scale areas of prairie, there will not be a lot of them. They need trees for the females and the young to roost in.

But otherwise, in Alberta, we find them into the Rocky Mountains, into the Kananaskis area, for example. We find them all the way up to northern Alberta. So the only areas would be large-scale prairie treeless areas that there would be few, if any, during the midsummer period.

Q. The bat mitigation framework for wind power developments recommends engagement with AEPA when bat mortalities exceed 4 to 8 mortalities per turbine per year.

Are there any other metrics that would be helpful in assessing bat mortalities caused by turbines?

A. DR. BARCLAY: Not sure I fully understand. So

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the only metric -- the only measure of what the fatalities are are the postconstruction fatality counts using either people or people and dogs, for example. Otherwise, I don't know of any other ways of measuring the fatality levels at a particular wind facility, for example.

Q. There are a number of factors that contribute to bat population declines, including cumulative impacts and slow reproductive rates.

Do you have any views on the contribution of turbines to those declines relative to other factors?

A. DR. BARCLAY: Obviously climate change, change in insect abundance, particularly nocturnal insect abundance, have had impacts on birds, for example, insect-eating birds. The change in insect abundance will presumably have an effect on bats or is having an effect on bats.

The fungal disease that I mentioned earlier today, white nose syndrome, is the disease caused by a fungus, it does not affect the migratory species. It affects hibernating species of bats. So the three migratory species, which are the ones most often killed by turbines, are not impacted by that particular disease.

Q. So would you say turbines is one of the major contributing causes or just a cause?

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A. DR. BARCLAY: I would say it's probably the major cause of population declines.

Q. Given some of the factors we've discussed, the slow reproductive rates for Alberta bats and the international distribution ranges for some of Alberta's migratory bat species, would there need to be an international agreement, coordination, or action to reduce the level of bat mortalities to a sustainable level?

A. DR. BARCLAY: That's a very good point, because obviously the bats moving through Alberta and wind facilities in Alberta will also encounter wind facilities in Montana and further south as they go to the southern U.S. or even Mexico.

There are international groups looking at the impact of wind energy in general continentally, but there are no -- that I'm aware of, there are no government or multigovernment international agreements as to how to assess and mitigate fatalities of these migratory species. So it would certainly be useful to have that so that we could look continentally at what the populations are likely doing given fatality rates across the continent.

Q. You mentioned earlier today that studies indicate that taller turbines kill more of each of the three

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migratory species of bats. Do you know if the taller turbines are responsible for more mortalities because they have a greater rotor-swept area, the height of the blades is higher, or is there some other reason?

A. DR. BARCLAY: I'd say there are three reasons. So tip height seems to be, from the studies that have been done, an important contributor to the increasing fatality rate. Another is how far off the ground the blade spin comes. So the closer it is to the ground, the more bat fatalities there are.

Size of the turbine is going to be obviously important. The bigger the rotor-swept area, the bigger the area that bats have to avoid. One thing we don't know is whether bats are attracted to the turbines. There's some evidence that suggests they are. Whether different-sized turbines are more or less attractive, as I have mentioned, these species are tree roosting, and if they perceive that a turbine tower is a treelike structure, they might be attracted to it looking for somewhere to roost, and taller turbines might then be more attractive. I don't know of any studies that have tested those sorts of hypotheses.

Q. Given the mortality metric for curtailment in Alberta is mortalities per turbine, as turbines get larger, would the results be fewer bat mortalities per unit of

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energy?
A. DR. BARCLAY: So turbines have evolved to become more efficient at low wind speeds, for example, so they operate -- the blades spin at lower wind speeds than they used to and produce energy. That would potentially increase the fatality rate.
THE COURT REPORTER: Sorry to interrupt. I just got an error on my software and I need to make sure something's working here. Just had a thing that said "out of memory" and then everything stopped.
THE CHAIR: Okay. We'll just stop, then, and you let us know when you're able to continue.
THE COURT REPORTER: Thanks.
A. DR. BARCLAY: Doesn't sound good.
A. MR. WALLIS: At our age, Robert, that would be our excuse.
A. DR. BARCLAY: I assume handwriting the comments is not an option.
THE COURT REPORTER: No. Okay, it looks like we're working again now.
THE CHAIR: Okay. Proceed.
Q. MS. GRAHAM: Would you like me to repeat the question?
A. DR. BARCLAY: I was about to ask if you could do that, Ms. Graham. Thank you.

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Q. Given the mortality metric for curtailment in Alberta is mortalities per turbine, as turbines get larger, would the results be fewer bat mortalities per unit of energy?
A. DR. BARCLAY: I'm not sure I understand the question.

So part of my answer would be as the Alberta documents indicate, cumulative effects, not just the per turbine number but the total numbers, either of a particular facility or nearby facilities are also considered to be important.

So if the question is should we be concerned with the megawatts of energy produced per bat fatality, to my mind, it's the total number of fatalities that's important, and if bigger turbines kill the same number, which they don't, as smaller turbines, then the output of megawatts per bat fatality would go down. But those bigger, taller turbines also kill more bats per year.
Q. You mentioned earlier that wind turbines were the primary cause of migratory bat mortality. Do you know if that applies to appropriately curtailed turbines, or is it mostly in relation to turbines that lack curtailment or are improperly curtailed?
A. DR. BARCLAY: So obviously there are natural -- what I'll call natural mortalities of bats. They hang

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in trees, and various sorts of predators can find them and consume them. Accidents will happen.

And so fatalities at turbines, even when curtailed, I would say, would be the biggest contributor to mortalities that aren't, quote-unquote, natural. I don't think we have a way of assessing what the impact of climate change and reduced insect abundance has on these species. They may be quite significant, but I know of no metrics that would put numbers on that.
MS. GRAHAM: Thank you, panel. Those are my questions, Commission Chair, Commission Panel.
THE CHAIR: Ms. Slawinski?
MS. SLAWINSKI: Thank you, Chair.
MS. SLAWINSKI QUESTIONS THE PANEL:
Q. Good afternoon, panel. I have a few follow-up questions for you, Dr. Barclay. I'll just let you keep going.
A. DR. BARCLAY: Sure. Thank you.
Q. I wanted to ask you a bit about the 2013 directive and the 500 bat per year cumulative number that we've been talking about the last couple of days.

I was wondering, have you seen -- have you seen that in action in the sense have you seen AEPA applying that in various areas of the province, or?

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A. DR. BARCLAY: I can't recall having seen it being put in -- into action, no.
Q. Do you know why that is?
A. DR. BARCLAY: I guess one answer would be the sizes of wind facilities, i.e., the number of turbines comes into play. Many of them have -- as listed in the nearby ones from Oyen, most of them have relatively few compared to the 83 proposed for Oyen turbines and thus the total number of fatalities doesn't add up to 500 or more.

And obviously, as the number of wind facilities has increased in Alberta, the proximity of neighbouring facilities becomes closer. There are good places for wind energy because of the wind, and that may be some -- so looking cumulatively across neighbouring sites may be relatively new.
Q. Okay. Thank you for that. And so I guess what you're saying, it's not really the number of projects, but it could be the number of turbines that would trigger that sort of an assessment and the resulting numbers that would cause a -- cause the concern. Okay.
A. DR. BARCLAY: Correct.
Q. So it could be two projects. It doesn't necessarily have to be three or four or some particular number.
A. DR. BARCLAY: No. As you say, it's the number

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of turbines and the mortality rate per turbine. And obviously, a facility with 200 turbines, each killing three bats, is going to be a concern given that directive.

Q. Earlier, you averaged the postconstruction fatality rates of the two projects to come up with a number. Do you think that's an accurate estimate, or what would you do to make that a more accurate estimate?

I mean, we -- keeping in mind that we talk about how difficult it is to estimate anything when it comes to --

A. DR. BARCLAY: Yes. I don't know. I mean, you could say, well, maybe it's going to be the same as Lanfine. What's the number going to be? Maybe it's going to be the same as Sharp Hills. What's the number going to be?

I think I took a more conservative approach and said, well, we've got these two facilities, the turbines are slightly different. They're in different locations. Oyen's stuck in the middle. Let's say it's at the average. I'm not sure how else to look at that, I'm afraid.

Q. Could you think of any way to factor in, say, geographic considerations?

A. DR. BARCLAY: So do you mean sort of landscape

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type --

Q. I guess so. I was looking for the term in my notes. The high value habitats, for example, that we were talking about earlier.

A. DR. BARCLAY: Yeah, and that's an issue. Obviously these bats settle during the day in a tree, and if that's -- if that's important in terms of their risk of mortality at wind turbines, then looking at whether there are lots of trees in an area might be important.

One thing we don't know is what time of the night these bats are killed because you go out during the daytime to search under the turbines, and you find some bats, and maybe they were killed while they were finishing off their nightly migration and looking for a tree to hang up in, or maybe they were killed in the middle of the night as they're moving through the area, and from what we know, and we don't know a lot about the detailed routes that they take, they're flying over all prairie. They're flying over forested area. They tend to fly fairly high, from what we know, and it's not as if they're following river courses or landscape features that we might look at and say, oh, yeah, we can paddle down that creek, or we can walk down that trail. They're flying up high, basically over all

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sorts of different habitats.

And so I'm not sure that high value landscape applies as much to these species as it does to the smaller -- smaller species of bats that are here year round and roost in trees or in caves or in buildings, for example, and are feeding down low, looking for insects often near water sources.

Q. Thank you, Dr. Barclay. That's really helpful. Let me just check my notes and make sure I've got no further questions.

A. DR. BARCLAY: Sure.

MS. SLAWINSKI: I think that's good for me. Thank you very much, panel.

THE CHAIR: Thanks.

THE CHAIR QUESTIONS THE PANEL:

Q. Dr. Barclay, I want to continue on that line also just so that I'm clear.

So if we could -- I think it's easiest if we bring up your opening statement. I don't have that exhibit number in front of me, but it's your slide presentation. That's right.

Okay. And then if we can go, there's -- I'm looking at a paper copy here, but there's a -- if you scroll down, there's a slide that starts, it says "cumulative impact on bats." That's where we are.

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Perfect.

So on this slide here, you're estimating that the fatalities at Lanfine plus Sharp Hills is 1,107 bats killed per year, and then just back to what Commissioner Slawinski was referring to, and that is I think just two slides prior, so if we just flip back two slides. Correct.

So this is from the bat mitigation framework. And it's total -- so annual total bat facilities -- or, sorry, fatalities at wind power developments in the range of 500 bats per development per year, and what essentially that says is that if that's the case, then, you know, additional postconstruction mitigation may be required by Alberta Environment or -- they were referred to as ESRD at the time.

A. DR. BARCLAY: Right.

Q. And then if we flip back again -- so forward again two slides, and we look -- so when I'm looking at that, it looks like your position is that there's over a thousand bats killed per year for Lanfine plus Sharp Hills. So we're not even considering Oyen.

But that would be -- like, is that -- is it an oversimplification to say that those are -- or at least one of those would be above the 500 --

A. DR. BARCLAY: Sharp --

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Q. -- per development per year?
A. DR. BARCLAY: Sharp Hills, with 15.93 migratory bats per turbine and 67 turbines, that's over a thousand just at that one site. I assume -- although I don't have documented evidence -- that the curtailment implemented at Sharp Hills was due to early fatality searches, and when a facility does fatality searches and starts finding lots of bats, they also report that to what was ESRD, AEPA, I guess, is now it. And that presumably resulted in the discussion about implementing turbine curtailment in that first -- first year of operation.

So just Lanfine by itself is over the 500, and then you add in the other two facilities, and we get up close to 2,000.

Q. And are those numbers after the curtailment's been implemented or before?
A. DR. BARCLAY: So the Lanfine, my understanding is it was implemented partway through the season, once they discovered high fatal -- sorry, at Sharp Hills. I get the two mixed up.

So operational mitigation was implemented partway through the season. I don't have it at my fingertips exactly when that occurred. But let's say the fatality rate would have been even higher without the

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implementation of curtailment.
Q. Okay. Thank you. We can bring this exhibit down. That's very helpful. Thank you, Dr. Barclay.

Mr. Wallis, just have one question for you. I'll just get my notes.

So I've asked you this question before in other proceedings, but I just -- I would like your insight on this again.

So you had mentioned as part of your evidence, you know, a strong recommendation for the AUC to work with AEPA to lay -- I'm just paraphrasing -- to lay the groundwork for regional cumulative effects, and you believe -- you referenced, you know, wetlands, birds, bats, but can you -- can you elaborate on a mechanism or how -- how that -- in your view, how that should be done?
A. MR. WALLIS: Yeah, well, I think, you know, there's enough experience with the various experts that have appeared before you, combined with the expertise within AEPA, to convene some sort of roundtable, but they need a convening mechanism. Government is stretched, let's put it that mildly, and you can see that in the work that comes out or how slowly it comes out sometimes.

But there's good people there with good

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information, and I think we need to work through it. Dr. Barclay's is a classic because a lot of the issues, there's overlapping issues that affect, you know, things that I was talking about like birds.

So if you've got rotor-swept area right over wetlands, you know, that's an issue. So you start to go through all -- so what are the big issues, and, you know, Ms. Sare and I can have a -- you know, go at -- you know, because she downplays, perhaps, something, and she might have good evidence for that, so say, yeah, that may be not the big issue; we've got to work on these three big issues. These are where the cumulative impacts, and we're already over the threshold in some areas, maybe, or we have no curtailment, we have no way of reducing these fatalities, so a decision has to be made if, you know, we want to preserve these species.

So you start going through these kinds of things to trying and establish what those thresholds are or if we've already surpassed them in some areas.

And that would apply to pronghorn, it would apply to birds, and then you start looking at what are the research gaps. You know, so we already know what we don't know, and so those questions may need to be answered before we can go further down the rabbit hole.

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But we're already at a concerning state, for example, with the bats, and the birds declining now in -- especially the grassland birds, you know, the numbers, and my friend and I used to say if horned larks start going down, then we're in real trouble. Well, horned larks are one of those things that now have suffered large decreases.

So, you know, every incremental impact becomes an issue, and so what are the best ways to deal with that.

THE CHAIR: Okay. Thank you. Those are all my questions. So I will turn it over to counsel for the intervener to see if there is any redirect.
MS. OKOYE: Thank you, Mr. Chair. I do not have any redirect for my witnesses.
MR. KEMA: I have just one for Dr. Bellut-Staeck.
THE CHAIR: Please proceed .
MR. KEMA RE-EXAMINES THE PANEL:
Q. Dr. Bellut-Staeck, you mentioned there was an error in the information provided during your cross-examination before the break, and that you'd like to correct that information. Can you please provide us additional information on this?
THE INTERPRETER: May I just jump in to interpret this part of what you had said, please?

A. DR. BELLUT-STAECK:(Through interpreter) So during the meeting, when we were previously talking about the 12 rule or guideline, a statement was made about dBG, and what this should be. It is not dBG but it is actually dBZ, which is unweighted, as it was mentioned. Yes.

Q. Okay. Thank you very much, Dr. Bellut-Staeck. That's all.

A. DR. BELLUT-STAECK:One moment. There was a second little misunderstoodment. When I was talking about .45 in low frequency noise, I wanted to explain that the rule according to this low frequency noise means to measure C-weighted and A-weighted and to look at the difference, not the distance, the distance between the C and A-weighted scales to detect if infrasound is present.

So I realized that perhaps this was not in my sense that there was a distance. No, it has to be the difference between C and A-weighted scales about more than 20 dB only indicate there is infrasound but do not measure it in the real sound pressure level.

MR. KEMA: Thank you very much, Dr. Bellut-Staeck.

Mr. Chair, that's all for me.

THE CHAIR: Okay. Thank you. So the panel is

released from their oaths. They can step down.

(PANEL STANDS DOWN)

THE CHAIR: We will adjourn this part 1 of this proceeding. We will continue with part 2 of the -- this proceeding on July the 7th, beginning on July the 7th, 2025, where we will hear from the OLG landowners panel, and we'll also hear argument from counsel for both parties.

So I don't -- I think we're good now, and we'll close this part of the hearing. Have a good afternoon.

(PROCEEDINGS ADJOURNED AT 2:04 P.M.)

PROCEEDINGS ADJOURNED TO JULY 7, 2025

Certificate of Transcript

We, the undersigned, hereby certify that the foregoing pages 219 to 317 are a complete and accurate transcript of the proceedings taken down by us in shorthand and transcribed from our shorthand notes to the best of our skill and ability.

Dated at the City of Edmonton, Province of Alberta, on the 10th day of June, 2025.

"Joanne Lawrence"
Joanne Lawrence, CSR(A), RPR
Official Court Reporter

"Diana Halvorsen"
Diana Halvorsen, CSR(A), RPR
Official Court Reporter

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EXHIBITS