

**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF SOUTH DAKOTA**

**IN THE MATTER OF THE APPLICATION OF
CROWNED RIDGE, LLC II FOR A FACILITIES PERMIT TO
CONSTRUCTION 300.6 MEGAWATT WIND FACILITY**

Docket No. EL19-027

**REBUTTAL TESTIMONY AND EXHIBITS
OF CHRISTOPHER OLLSON**

January 8, 2020

INTRODUCTION

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Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Chris Ollson. My business address is 37 Hepworth Crescent, Ancaster, Ontario, Canada.

Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?

A. I am the sole proprietor of Ollson Environmental Health Management.

Q. WHAT ARE YOUR RESPONSIBILITIES?

A. I am a consultant to Crowned Ridge Wind, II LLC (“CRW II”) on the scientific literature related to sound and shadow/flicker and proper siting of wind turbines to ensure the protection of health of residents.

Q. ARE YOU THE SAME CHRISTOPHER OLLSON WHO SUBMITTED SUPPLEMENTAL TESTIMONY ON SEPTEMBER 20, 2020?

A. Yes.

Q. HAS THIS REBUTTAL TESTIMONY BEEN PREPARED BY YOU OR UNDER YOUR DIRECT SUPERVISION?

A. Yes.

Q. PLEASE DESCRIBE THE PURPOSE OF YOUR REBUTTAL TESTIMONY.

A. The purpose of my rebuttal testimony is to address the testimony of Staff witness Hessler and Intervener witnesses Steven Greber, Amy Rall, Garry Ehlebracht, and Laretta Kranz on health and welfare issues.

HEALTH AND WELFARE

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2 **Q. STAFF WITNESS HESSLER (PAGE 5, LINES 6-7) ASSERTS THAT YOUR**
3 **TESTIMONY IS AN ATTEMPT TO DISMISS ANNOYANCE AS SOMETHING**
4 **THAT DOES NOT EXIST OR DISMISS AS SOMETHING THAT CANNOT BE**
5 **QUALIFIED. DO YOU AGREE WITH THIS ASSESSMENT OF YOUR**
6 **TESTIMONY?**

7 A. I do not agree with Mr. Hessler's assessment and characterization of my testimony. The
8 international literature on living in proximity of wind turbines has universally indicated
9 that there will be a percentage of residents reporting high annoyance living in proximity
10 to wind turbines. This was clearly reported in my Direct Testimony. However, Mr.
11 Hessler appears to have misinterpreted discrete sections on annoyance in my Direct
12 Testimony.

13 For example, on Hessler Page 4, Lines 6-7, after discussing non-participating
14 landowner annoyance Mr. Hessler incorrectly indicates that I argued that annoyance
15 would be zero for this group of residents. However, this is not the case at all. In my
16 Direct Testimony I was asked how participating landowners with up to 50 dBA of sound
17 at the exterior of their homes would react to the project. On page 10, line 4-7 (Ollson
18 Direct Testimony), I quoted a Health Canada study (Exhibit CO-S-6) "Aggregate
19 annoyance was effectively 0 (i.e., least squares mean – 0.11) among the 100
20 participants.." The fact that participating landowners do not report annoyance living
21 around wind turbines has been reported in the literature for over two decades. Mr. Hessler
22 has appeared to have confused my testimony on distinguishing between annoyance of
23 participating and non-participating homes.

1 Mr. Hessler correctly points out that the Health Canada study (Exhibit CO-S-2) that I
 2 used to report that the percentage of complaints across sound levels also provides the
 3 percentage of noise high annoyance for each sound grouping. This alone indicates that I
 4 am not attempting to trivialize reported annoyance for those living around wind projects.
 5 I also provided the percentage of visual high annoyance for each sound grouping. I have
 6 reproduced the table here:

TABLE IV. Perception of community noise and related variables.

Variable	Wind Turbine Noise (dB)					Overall	CMH p-value ^b
	<25	[25-30)	[30-35)	[35-40)	[40-46]		
Formal complaint ^f	2 (2.4)	2 (2.1)	3 (1.0)	22 (4.2)	6 (2.6)	35 (2.8)	0.2578
Reporting a high (very or extreme) level of annoyance to wind turbine features, n (%)							
Noise	0 (0.0)	2 (2.1)	3 (1.0)	52 (10.0)	32 (13.7)	89 (7.2)	<0.0001
Visual	2 (2.4)	15 (16.0)	17 (5.6)	81 (15.5)	44 (18.9)	159 (12.9)	

7
 8 I am in no way trying to suggest that there will not be an increase in the percentage of
 9 highly annoyed people living in proximity to wind farms. However, the international
 10 literature has concluded time and again that the percentage of highly annoyed individuals
 11 is not well correlated to sound level, but, rather, it is more tied to the visual aspect of the
 12 project and attitude of those towards the project. Table IV above clearly indicates that the
 13 percentage of visual highly annoyed is a larger factor than noise. For example, the
 14 percentage of visual highly annoyed at 25-30 dBA was 16% and the percentage of noise
 15 highly annoyed was 2.1%, while at 40-46 dBA the percentage of visual highly annoyed
 16 was 18.9% and only 13.7% noise highly annoyed. Thus, one cannot rely on the
 17 percentage of noise highly annoyed to set permitted sound levels for a wind project.
 18 Again, this table also shows that complaints are not driven by the percentage of noise
 19 highly annoyed, but, instead, that there is no statistical difference between complaints at
 20 <25 dBA and those living between 40-46 dBA.

1 Consequently, the peer reviewed scientific literature supports that the percentage
2 of highly annoyed living around wind turbines is more strongly tied to visual cue and
3 attitude and not to the wind turbine sound itself. This is why it is important to review all
4 of the other literature on potential health impacts, sleep disturbance and Quality of Life of
5 those who are reporting annoyance and place it into appropriate context, which I did in
6 my Direct Testimony.

7 Further, Mr. Hessler (page 5, line 1-5) indicates his belief that there would be 49
8 non-participants above 40 dBA for CRW II and states “Those are large numbers and
9 percentages of residents highly annoyed by sound levels...”. However, only a small
10 percentage of these non-participants would potentially be highly annoyed. Mr. Hessler
11 indicates on page 4, line 16-17 that the percentage of highly annoyed between 40-46 dBA
12 would only be 14%. Therefore, for the CRW II project, based on 49 non-participating
13 receptors, this would be at best 7 homes that would experience such levels of annoyance,
14 and that their annoyance would be more tied to visual cue and attitude. On this point, it is
15 important to emphasize that the peer reviewed scientific literature shows that the percent
16 of people who may actually file a complaint on the project would be the same regardless
17 of the permitted sound level. For example, the most recent 2019 paper on wind turbine
18 sound and stress based on United States residents (Exhibit CO-S-10) states “Average
19 annoyance levels of residents near wind farms in Europe and the U.S. were low with the
20 levels for noise similar across both samples, with European levels slightly higher for
21 shadow flicker, lighting and landscape change. In all cases the annoyance levels were
22 comparable to the levels associated with traffic noise.” Therefore, contrary to Mr.
23 Hessler’s observations about my Direct Testimony, I did not avoid the issue of

1 annoyance, but, rather, explained annoyance in the context of the peer reviewed scientific
2 literature.

3 **Q. INTERVENER WITNESS KRANTZ (PAGE 2, LINES 7-8) ASSERTS THAT THE**
4 **LOW FREQUENCY NOISE AND INFRASOUND FROM THE PROJECT IS**
5 **UNWELCOME. WITNESS GREBER (PAGE 3, LINE 27 TO PAGE 4, LINE 5)**
6 **ALSO ASSERTS THAT INFRASOUND AND LOW FREQUENCY NOISE FROM**
7 **THE WIND TURBINES WILL IMPACT SLEEP, REST, AND TOLERANCE**
8 **FROM SOUND THAT IS FELT VERSUS HEARD. DO THE SCIENTIFIC PEER-**
9 **REVIEWED STUDIES SUPPORT THESE ASSERTIONS?**

10 A. No. While I agree with Mr. Greber that large cargo vessels can be a source of high levels
11 of low frequency noise and infrasound, these levels are significantly greater than would
12 be found at even the base of a wind turbine. Page 10, Line 15 to Page 12 line 10 of my
13 Direct Testimony discusses the international literature on measured low frequency noise
14 and infrasound emitted from wind turbines. The levels related to wind turbines are so low
15 that they would not impact sleep, rest, or tolerance of those living near the CRW II wind
16 turbines. In addition, the levels of infrasound and low frequency noise emitted from the
17 wind turbines are below a level that would be “felt” by Ms. Kranz or Mr. Greber.

18
19 **Q. EACH OF THE INTERVENER WITNESSES CLAIM THAT THE OPERATION**
20 **OF CRW II WILL SO IMPACT THEIR QUALITY OF LIFE AS THEY WILL**
21 **NOT WISH TO RESIDE IN THEIR CURRENT RESIDENCE. DOES THE**
22 **SCIENTIFIC PEER-REVIEWED STUDIES SUPPORT WHETHER THEIR**
23 **CLAIMS WILL BE REALIZED?**

1 A. No. Again, there will be nothing emitted from the wind turbines (e.g., sound, infrasound,
2 low frequency noise, vibrations, or shadow flicker) that would cause anyone's home in
3 the project area to be unlivable. The international research has clearly demonstrated that
4 wind turbines do not affect local residents quality of life (Ollson Direct Testimony Page
5 12, Line 16 to Page 14, Line 13). At a design goal of 45 dBA for non-participating
6 landowners and significant setback distances to their homes the wind turbines will not
7 impact the Interveners' health, welfare, sleep or quality of life. Therefore, there would be
8 nothing from a scientific basis that would cause them to leave their homes.

9
10 **Q. DOES THIS CONCLUDE YOUR REBUTTAL TESTIMONY?**

11 A. Yes, it does.

Burlington, Ontario)
Halton County) ss
)

I, Chris Ollson, being duly sworn on oath, depose and state that I am the witness identified in the foregoing prepared testimony and I am familiar with its contents, and that the facts set forth are true to the best of my knowledge, information and belief.


Chris Ollson

Subscribed and sworn to before me this 7th day of Jan 2020.

SEAL


Notary Public

My Commission Expires _____

Benhur Nissan
Barrister & Solicitor
Notary Public and Commissioner of Oaths
in and for the Province of Ontario.
My commission is of unlimited duration.
No legal advice given

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