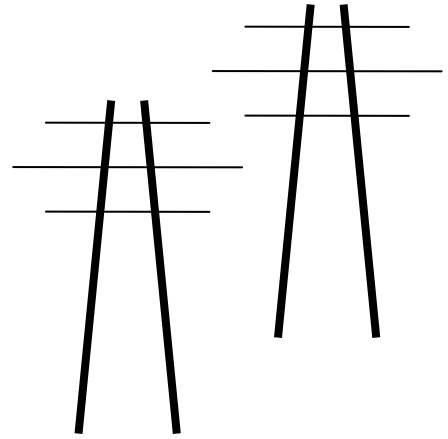


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Daniel Wolf, Executive Secretary  
Minnesota Public Utilities Commission  
121 – 7<sup>th</sup> Place East, Suite 350  
St. Paul, MN 55101

via email and eDockets

John Wachtler, Energy Program Director  
Commerce – EERA  
85 – 7<sup>th</sup> Place East, Suite 500  
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via email and eDockets

**RE: Improper Ground Factors Skew Modeling and Misrepresent Probability of Compliance in ALL 13 Projects Identified by EERA as “LWECS In Permitting Process” or “LWECS Permitted”**

Nobles 2 (WS-17-597)  
Freeborn (WS-17-410)  
Blazing Star (WS-16-686)  
Lake Benton II (WS-18-179)  
Community Wind North (WS-08-1494)  
Jeffers Wind (WS-05-1220)  
Fenton Wind (WS-05-1707)  
Buffalo Ridge (WS-19-394)  
Three Waters (WS-19-576)  
Plum Creek (WS-18-700)  
Mower County (WS-06-91)  
Dodge County (WS-17-307)  
Bitter Root/Flying Cow (WS-17-749)

Dear Mr. Wolf and Mr. Wachtler:

In reviewing the EERA 2019 Project Status handout for the Power Plant Siting Act Annual Hearing,<sup>1</sup> I’ve noticed that every project listed by Commerce-EERA as “LWECS Permitted” and “LWECS in the Permitting Process” all utilize, improperly, ground factors of 0.5, and in three

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<https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&documentId={90D27E6E-0000-C116-8738-B4CA09BD8487}&documentTitle=201911-157604-01>

instances, an absurd 0.7 ground factor. This is not acceptable. Why is this occurring? It's not hard to guess. In both Minnesota and Wisconsin, projects utilizing the appropriate ground factor of 0.0 were not able to demonstrate compliance with the states' noise standards, and subsequently, the developers provided modeling at 0.5 ground factor in those dockets.

A ground factor of 0.0 is to be used for wind modeling because the wind noise source is elevated high in the air, and ground conditions do not impede the direct path from a greatly elevated source to the "receptor." See attached testimony of Dr. Paul D. Schomer, from the Highland Wind CPCN proceeding (WI PSC Docket 2535-CE-100) and testimony of Mike Hankard, from the Badger Creek Solar CPCN proceeding (WI PSC Docket 9697-CE-100).

Below are the 13 projects listed in the "EERA 2019 Project Status" handout for the PPSA Annual Hearing, pps 3-4 (not including the withdrawn Bitter Root project), and I've listed the dockets, by name and number, the ground factor used, and the citation:

Name	Docket	G.F.	Cite	eDockets ID
Nobles 2	WS-17-597	0.5	p 3, Appendix C	201710-136496-03
Freeborn Wind	WS-17-410	0.5	p 7, Attachment E	20198-155331-04
Blazing Star	WS-16-686	0.7	p 52, Attachment B	20189-146376-01
Lake Benton II	WS-18-179	0.5	p 6-4, Appendix C	20185-142740-01
Community Wind	WS-08-1494	0.5	p 2, Appendix F	20193-151362-03
Jeffers Wind	WS-05-1220	0.5	p 2, Appendix F	20193-151486-04
Fenton Wind	WS-05-1707	0.5	p 2,4 Attachment 6	20191-149027-08
Buffalo Ridge	WS-19-394	0.5	p 6-5, Appendix C	20197-154454-07
Three Waters	WS-19-576	0.7	p 8-13, 43, Appendix D	201910-156475-03
Plum Creek	WS-18-700	0.7	p 48, Appendix B	201911-157475-05 201911-157475-06
Mower County	WS-06-91	0.5	p D-5, Appendix D	201912-157979-03
Dodge County	WS-17-307	0.5	p 6-4, Appendix C	201910-156623-03
Bitter Root	WS-17-749	0.5	P 8, Part 4	20184-141999-08 20184-141999-04

Below is a slightly edited summary of wind modeling ground factor that I'd initially filed in the Power Plant Annual Siting Act Annual Hearing record, explaining why ground factor matters:

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**I. BECAUSE NOISE MODELING WOULD DEMONSTRATE LWECS IN THE SITING PROCESS ARE LIKELY TO VIOLATE STATE NOISE STANDARDS, DEVELOPERS ARE USING WRONG GROUND FACTOR FOR MODELING, GIVING FALSE IMPRESSION OF PROBABLE COMPLIANCE.**

Freeborn Wind (PUC Docket 17-410) was the first wind project to be sited acknowledging application of the PPSA, and more importantly, the first contested case for siting. Two prior contested cases were held on wind projects, one a territorial dispute between developers circa 1995, and more recently, the Goodhue Wind project and applicability of county ordinance under Minn. Stat. §216F.081.

The ALJ's Recommendation in the Freeborn Wind case was that the permit be denied:

#### **SUMMARY OF RECOMMENDATIONS**

The Administrative Law Judge concludes that Freeborn Wind has failed to demonstrate that the proposed Project will meet the requirements of Minn. R. 7030.0040, the applicable Minnesota Noise Standards. Therefore, the Administrative Law Judge respectfully recommends that the Commission either deny Freeborn Wind's Application for a Site Permit, or in the alternative, provide Freeborn Wind with a period of time to submit a plan demonstrating how it will comply with Minnesota's Noise Standards at all times throughout the footprint of the Freeborn Wind Project.

The wind promotional lobby was horrified that they might have to demonstrate compliance with the rules, and flat out stated they could not:

### **[Judge's ruling against Minnesota wind farm causes alarm for advocates](#)<sup>2</sup>**

From that article:

*Freeborn Wind's developer, Invenergy, has objected, saying Schlatter's interpretation of state noise rules would be "impossible" to meet. Last week, two wind-industry trade groups and three of Invenergy's competitors also filed objections to Schlatter's recommendation, as did four clean-energy and environmental groups.*

*The judge's "interpretation of the Minnesota Pollution Control Agency's (MPCA) noise standards would have a detrimental impact on other current and future wind-energy projects throughout the state," the Minnesota Center for Environmental Advocacy wrote in its objection.*

### **[Wind industry says Minnesota pollution control stance will stifle its growth](#)<sup>3</sup>**

And from that article:

*The wind-energy industry said an opinion filed by Minnesota pollution-control regulators defining wind-turbine noise will stifle its growth.*

*The Minnesota Pollution Control Agency (MPCA) said the state's limit for wind-farm noise applies not only to sounds from turbines but also should include background noise such as road traffic, said the filing with the Minnesota Public Utilities Commission (PUC).*

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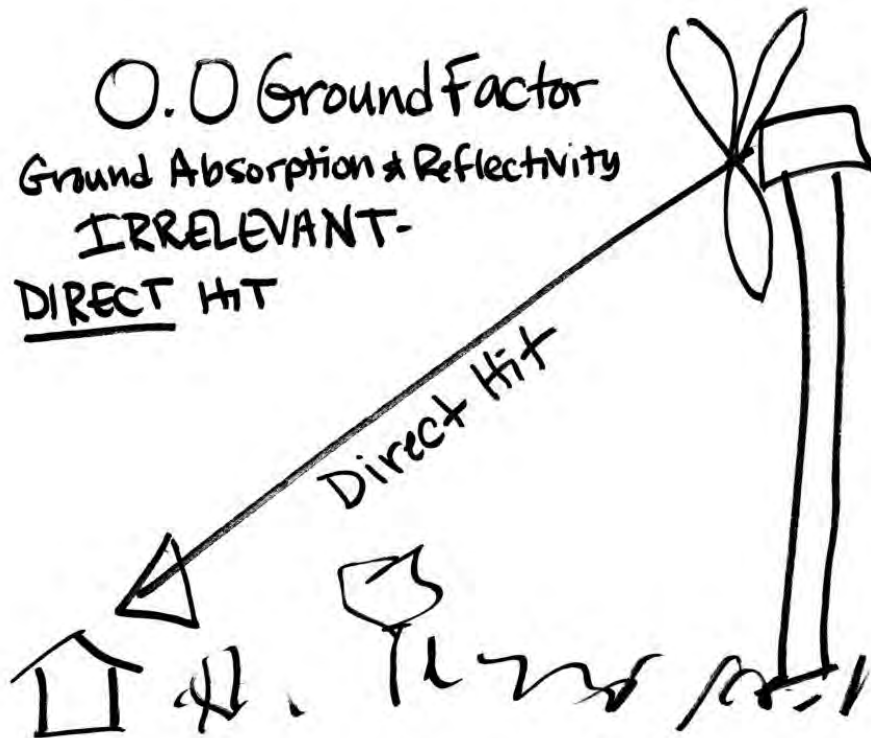
<sup>2</sup> <http://www.startribune.com/judge-s-ruling-against-minnesota-wind-farm-causes-alarm-for-advocates/485312391/>

<sup>3</sup> <http://www.startribune.com/wind-industry-says-minnesota-pollution-control-stance-will-stifle-its-growth/493181151/>

The MPCA comment referred to in this article is attached.

Ground factor, a primary input assumption for noise modeling, was set at 0.0, and all evidence and testimony regarding the predictive modeling was based on this 0.0 ground factor.

In an admission that wind projects cannot comply with noise standards and cannot demonstrate compliance through modeling utilizing a 0.0 ground factor, the industry is now improperly utilizing a 0.5 or 0.7 ground factor. Why is this improper? Because wind turbines are elevated, and the sound goes directly to the “receptor” on the ground:



Ground factor represents conditions on the ground and things that can come between the noise source and the “receptor.” See ISO 9613-2 (standards for noise modeling):

### 7.3 Ground effect ( $A_{gr}$ )

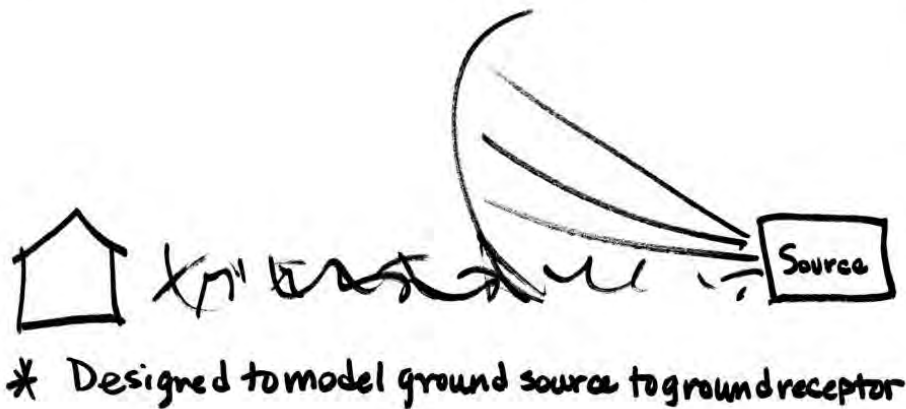
#### 7.3.1 General method of calculation

Ground attenuation,  $A_{gr}$ , is mainly the result of sound reflected by the ground surface interfering with the sound propagating directly from source to receiver.

Here's a depiction of how that works:

# 0.5 Ground Factor

## Ground Absorption & Reflectivity Matters



The Commerce-EERA PPSA handout listed projects in the permitting process:

### LWECS IN THE PERMITTING PROCESS

- Buffalo Ridge 109.2 MW Wind Energy (WS-19-394)
- Three Waters 200 MW Wind Farm (WS-19-576)
- Plum Creek 400 MW Wind Farm (WS-18-700)
- Mower County 98.9 MW Wind (WS-05-1707); Repowering Permit Amendment
- Dodge County 170 MW Wind Project (WS-17-307); Pending
- Bitter Root 150 MW Wind Project (WS-17-749); Withdrawn

Looking at ground factors utilized in the permitting of these projects, here's the disturbing trend:

### LWECS IN THE PERMITTING PROCESS

- Buffalo Ridge (WS-19-394) – 0.5 ground factor, p. 6-5 of Appendix C
- Three Waters (WS-19-576) – 0.7 ground factor, p. 8-13, Appendix D
- Plum Creek (WS-18-700) – 0.7 ground factor, p. 48, Appendix B
- Mower County (WS-05-1707) – 0.5 ground factor, p. 2, 4, Attachment 6
- Dodge County (WS-17-307) – 0.5 ground factor, p. 6-4, Appendix C

The use 0.0 of ground factor for wind is standard practice, and that a 0.5 ground factor is NOT appropriate for wind because the source is elevated. This was inadvertently confirmed by

Applicant's Mike Hankard in the [Badger Hollow solar docket, also in Wisconsin \(PSC Docket 9697-CE-100\)](#)<sup>4</sup>:

7 A The model that we use has been shown to predict  
8 conservatively with 0.5. I mean, 0.5 ground factor  
9 is used in probably -- well, with the exception  
10 perhaps of wind turbine projects which are different  
11 because the source is elevated. But for projects  
12 like a typical power plant, a solar plant where the  
13 sources are relatively close to the ground, I would  
14 say 90 to 99 percent of the studies use 0.5. And  
15 when consultants like myself go out and measure these  
16 plants after they're constructed to verify our  
17 modeling assumptions, that assumption checks out as  
18 being, if anything, overpredicting the levels. So  
19 there's no need to -- there would be no justification  
20 to use something like a .2 or .3 which would predict  
21 yet higher levels because we're already demonstrating  
22 that the model is probably overpredicting. So that  
23 would not be justified for those reasons.  
24 MR. NOWICKI: Thank you. No further  
25 questions.

The testimony of Dr. Charles Schomer in the Wisconsin Highland Wind docket<sup>5</sup> elaborates on the development of ISO 9613-2, that it is for measuring a ground source to a ground "receptor," and not designed for elevated noise sources with a direct path to "receptors," the purpose and use of the ISO 9613-2 standard and modeling assumptions, and the inappropriateness of use of a 0.5 ground factor for modeling predicted noise from wind turbines. Attached. I have also attached the AFCL Comment in the Freeborn Wind docket (WS-17-410) that addresses 0.5 ground factor improperly used in that docket.

The statements of probable compliance and justifications made in the noise modeling "studies" for the projects listed above are false and misleading, as are statements by Commerce-EERA that 0.5 is the generally accepted ground factor.

Like the Freeborn Wind project, the Highland Wind project could not meet Wisconsin's state noise standards (45 dB(A) in Wisconsin) using the 0.0 ground factor assumption, and so the developers moved the goal posts and produced noise modeling using a 0.5 ground factor with a

<sup>4</sup> <http://apps.psc.wi.gov/vs2017/dockets/content/detail.aspx?id=9697&case=CE&num=100>

<sup>5</sup> Online, selected pages from hearing transcript: [https://legalelectric.org/f/2019/11/Schomer\\_Pages-from-Transcript-Schomer-see-p-572.pdf](https://legalelectric.org/f/2019/11/Schomer_Pages-from-Transcript-Schomer-see-p-572.pdf)

claim that the project did meet state noise standards. This is deception, garbage in-garbage out modeling, backwards engineering.

I have asked the Commissioners, on the record, whether they understand what 0.5 ground factor means, and have received repeated, and feisty, assurances that yes, they do know what it means. If they do know, they are accepting this deception and inflicting sound exceedences on those living near the turbines. Going forward, they cannot credibly claim ignorance, nor can Commission or Commerce-EERA staff.

In Bent Tree, we've seen buyouts of two landowner families due to noise exceedences, achieved after SEVEN years of complaining with no action by the Commission until pushed by landowner complaints. Unfortunately, the rights of landowners are funneled through an ineffective and inadequate Complaint process, reliant on landowner complaints and extreme persistence, rather than the Commission holding applicants to state standards. In allowing use of a 0.5 ground factor, in permitting projects that are sited despite inability to demonstrate that they can meet the noise standards, the Commission is inviting further legal action.

Worse yet than acceptance of modeling based on a 0.5 ground factor is the utter absurdity of use of a 0.7 ground factor, as is seen for the Three Waters (WS-19-576) and Plum Creek (WS-18-700). There is no excuse for this.

The Power Plant Siting Act's directive regarding public participation, applicable to siting of wind projects, is particularly important, as the Commission is failing to deal with the need for compliance with noise standards, leaving it to the public to address this failure. Landowners and residents are at a severe disadvantage, as most members of the public have no way to identify this problem, and certainly cannot afford to intervene, much less hire expert witnesses to address this deception.

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I am filing this letter in all of the above-identified dockets to provide actual and constructive notice of the deceptions present in each of them. Minn. R. 7829.0250.

It should not fall to the public to spot this, or other, deceptions – that is the job of the Commission and Commerce-EERA. Further, no project should be permitted without agency vetting, independent verification of studies, particularly noise and shadow flicker, and public and contested case hearings to cross-examine witnesses presenting the studies. It is the Commission's job to regulate utilities, not site projects, without regard for the consequences.

Very truly yours



Carol A. Overland  
Attorney at Law

cc: All parties to all above-identified dockets via eDockets