

to meet the required Condition, that indicates that *the project was/is a failure at three properties at the very least*; however, other adversely affected properties in the area did not have the benefit of monitoring equipment and, as a result, there are almost certainly other neighboring persons/properties being assaulted by the noise as well as those three properties which had the benefit of the professional equipment in/on neighboring yards. The history of this second sound study, the first project complete post-construction study, is important as background to the third sound study. It should also be noted on the second study that Mr. Hessler testified to the Commission that one of the properties studied, did not have the equipment 25' from the home as required by Condition No. 26; instead, it was improperly placed farther from the home (to/for CRW's benefit). Hessler failed to identify which property that was, but that directly leads to the question of whether, in fact, there is a possibility that a fourth property, had the equipment been properly positioned according to the parameters of the permit Condition, could have also similarly been over the permitted noise limitation of Condition 26.

Especially troubling in the 2020 sound study, was the neighboring property of Robert Welder, known as Location 3A. Mr. Welder is a non-participant and thus his noise limit permitted by the PUC is 45dBA. Mr. Welder's noise associated with the 2020 sound study was astonishingly **OVER 50 dBA**, even higher than the limit permitted for participants of the wind project.

As previously noted to the Commission, Mr. Welder does not have a mutually agreed upon waiver allowing excessive noise on his property. Not only does he not agree to a participant level of 50dBA, but even if that would be agreed to, the turbines still exceeded that value in the second study, and his property was not studied in the third sound study to determine if the issue has been corrected or remains.

Also troubling in the 2020 sound study, is ANSI S12.9, Part 3 was not applied to the sound study results. Leaf rustle and insect contamination was a large factor in the noise profile at Location 6, my home, as the recording equipment was placed in my tree line which was leafed, and highly contaminated by leaf rustle. No true turbine sound profile was thus gathered.

This third study, the study of 2021 has the same issue, the lack of application of ANSI S12.9, Part 3, to eliminate the leaf rustle and insect noise contamination. I have provided a picture of the equipment sited on my property showing leaved trees in my shelterbelt, and you can see the shadow of the tree the equipment is placed next to and that shadow is of a fully leafed birch tree, leaves that caused much leaf rustle. Epsilon Associates included a picture in their report of another section of my shelterbelt, a section of the trees to the west, which are also leaved. ****Condition 26, Item A requires: "The post construction monitoring survey shall be conducted following applicable ANSI methods."** ANSI S12.9, Part 3 is applicable; however, it was inexplicably and unacceptably not applied. Leaf and tree noise is mentioned by Epsilon and Hessler, yet neither applied the applicable and required ANSI method of background noise filtering.

Because of the 50% or more failure rate of the sound study of 2020, the Commission ordered a sound study to be conducted in 2021 during a similar time and hopefully similar weather conditions as the 2020 study. The three failed sound locations of the second study were not re-studied for compliance, (please recall Mr. Welder's home being OVER the permitted level for participants) however, the Lindgren property was added as a test location, and the Christenson property was changed from a property line test location, to the 25' from the home equipment placement location as per Condition 26 requirements.

These points listed below, from the Formal Complaint filed which lead to this hearing, are the points of failure of Crowned Ridge to follow the Mitigation Plan. I will refer to the Complaint to discuss each of these points and adopt our formal Complaint as part of my testimony. (At the hearing in October, I will be discussing each point of the Complaint and providing exhibits to corroborate each flaw of the study.)

1. The Sound Study failed to meet requirements of the Mitigation Plan approved by the Commission.

- There is no mutually agreed upon waiver between all parties
- Did not comply with the shutdown requirement to shut down at the specified times, 4 times per day in the two week period. Specifically the times specified in the Mitigation Plan: 1:00, 7:00, 13:00, 19:00.
- Did not comply with Page 3 of the Mitigation Memorandum submitted to the docket 1/19/21, CRW states they will perform the study in the fall of 2021 during similar weather patterns and wind turbine output ranges that were present in October of 2020.
- Did not comply with page 6, item 3, in Mitigation Memorandum, according to ANSI S12.18, the sound measurements are to be during a wind direction under which the measurement location is + or - 45 within the downwind direction of the sound source.
- Did not comply with the protocol extending from the second sound study, the study of 2020, in which the protocol states: On page 5, Sep 16, 2020, "The final decision requires that compliance evaluation periods be when the five closest wind turbines to the measurement locations are operating and when the absolute closest wind turbine is operating at a maximum sound power (within 1.0 dba)..." There was no action by the PUC to remove that requirement in the 2021 protocol.

Other important items pertaining to the Mitigation Plan:

- WIOM has no proven or claimed effect on noise reduction (Supported by GE Fact Sheet, copyright date of 2012, and GE Letter provided by CRW. (Attachment 3 and Attachment 4, respectively)
- We do not know why there was project wide sound exceedance in the 2020 study. An offered speculation was blade stall due to icing or frost.
- Frost and/or icing is **NOT** an anomaly, it is common. (supported by GE Fact Sheet)
- In the 2020 Sound Study, Location 3 (Mr. Welder) on October 22-23, the project was over 50 dBA, **out of compliance by over 5 dBA** for a non-participant home. Turbines were at full, or nearly full, power output when the high exceedance occurred. {See Attachments 5a and 5b of this Complaint.) Thus, *WIOM would do NOTHING to alleviate excessive noise because the turbines were NOT at low power, they were full, or nearly full, output.*

The Mitigation Plan offered by Crowned Ridge Wind was approved by the Commission at the April 1, 2021, Commission meeting. During that meeting on April 1, 2021, Mr. Murphy, counsel for Crowned Ridge Wind, told the Commission that he did not know where Winter Icing Operation Mode (“WIOM”) software was elsewhere being used by Next Era Energy in their wind portfolio, he also told the Commission that “there is no other data other than what we provided.” The letter by GE provided to the Commission by Crowned Ridge Wind states they (GE) have no data to quantify any noise reduction. Further, on the fact sheet provided by Crowned Ridge regarding WIOM software (Fact Sheet Copyright 2012), WIOM’s use is for improving power output. The fact sheet says, “will become active when icing *via low power* is detected.” The turbines in the vicinity of Mr. Welder’s residence during the 2020 sound study were at, or nearly at, full power, not low power when they breached the over 50 dBA noise level. Consequently, during the third sound study, the few moments that WIOM did engage, were *during low power output, not high power output*, just as information provided by GE designates would be the case. There is NOTHING in the third sound study that provides any data showing WIOM will be effective in solving the excessive noise issues in the project area. That is, only curtailment or waivers can solve Crowned Ridge’s Condition No. 26 noise exceedance problem.

During the April 1, 2021 Commission meeting, according to the Order of April 9, 2021, “*After considering comments received orally during the Commission meeting and in writing prior to the meeting, the Commission voted unanimously to approve Crowned Ridge Wind's Mitigation Plan...*”

The Commission relied on Crowned Ridge Wind's counsel, Mr. Murphy, telling the Commission that during the next (the third) sound study, *"we're looking forward to collaborating with GE."* I therefore asked in a data request for Crowned Ridge to *"provide all information assembled and resulting analysis and conclusions from the collaboration of Crowned Ridge Wind, LLC and GE during the fall 2021 sound study with regard to WIOM impact on noise reduction."*, their answer was, *"There was no collaboration between Crowned Ridge Wind, LLC ("Crowned Ridge") and General Electric ("GE") on the Fall 2021 sound study. Therefore, Crowned Ridge has no document that is responsive to this request."* Crowned Ridge also responded in that same data request to my request for GE/CRW correspondence, *"Please provide any/all correspondence with GE regarding the use of WIOM in the CRW project before, during and after the 2021 sound study. Response: Attached as Attachment 1 to DR 1 -2 is the correspondence with GE regarding the use of WIOM on the Crowned Ridge Project."* There is no other correspondence, according to Crowned Ridge Wind, with GE other than the GE letter which makes no claim of noise reduction benefit by the use of WIOM.

The Mitigation Plan/protocol for the third study relied on WIOM to rectify the chance of further noise exceedances in the Crowned Ridge project. There is no other remedy offered by Crowned Ridge other than the WIOM software, which we now know has no application to remedy the high power output noise issues of the 2020 sound study.

As stated in our Complaint, Crowned Ridge Wind did NOT follow the necessary and ordered shutdown protocol as specifically required in the Mitigation Plan approved by the Commission.

Crowned Ridge has given conflicting answers in data responses. When asked which turbines were shut down (when and for how long) during the sound study, Crowned Ridge Wind supplied a table on May 11, 2022 with turbine numbers and corresponding out of service times. Turbine 71, as you will see on my exhibit, CRW was listed on the maintenance table as out of service for eighteen hours and 8 minutes. That is substantial and a crucial time period because of it being a potential icing period, yet CRW answered a discovery/data request of mine on April 3, 2023, with a response that, *"There was no maintenance performed on Turbine 71 during the time period of the 2021 sound study."*

As a property owner/taxpayer and South Dakota voter I'm deeply concerned and, as elected representatives of South Dakota citizens, this Commission should be as well, by the missed shutdowns and the project curtailment during the sound study. Crowned Ridge says the missed shutdowns are not concerning because other periods in the study let them draw conclusions regarding compliance. The missed shutdown on November 11th is important because the project was running at or nearly at full power and the conditions were suitable for a comparison with the Welder overage in the 2020 study. CRW's decision to ignore this Commission's ordered mitigation plan/protocol during this crucial time was and is chilling. CRW's direct or indirect actions were and are a manipulation of the data collection process. CRW may disingenuously attempt to claim that it had enough samples, but we only had two weeks to professionally

monitor the background noise vs turbine noise, and they stole that opportunity from us. That is, it's clear that CRW sought to cherry-pick the data during the bluebird days and low power output times, but when the turbines were roaring, I believe they worked to turn a blind-eye and a deaf-ear, so to speak, and in that way, worked to not let the citizens get a sample of the background noise vs turbine noise right now – because, of course, it would not have turned out well for CRW in showing (additional) noise overages. To be clear, not only did CRW miss shutdowns (directly in opposite to what was required of it by this Commission's Order), but the curtailment of the project for such a huge block of time during the sound study also robbed us as neighboring citizens and taxpayers of valuable samples in the short window of time allotted for the sound study. In that respect, it's important to note that the missed shutdowns of November 7th and November 11th were especially harmful to the (flawed and failed) study determinations of compliance vs non-compliance.

In sum, the entire windfarm being curtailed repeatedly and often during the study period served to spoil the entire study. Epsilon Associates, in its filed sound study report filed in docket EL 19-003, states multiple times that the wind farm was running abnormally. The turbines were curtailed, according to Epsilon Associates, a whopping 10-days out of the 14-day study. 10-DAYS; or, over 71% of the time of the study. That is, there was only two weeks within which to monitor the wind farm and draw data, and that time period was substantially reduced by curtailments, missed shutdowns and maintenance issues. Obviously, to be fair to the neighboring property owners, the study should have been extended due to the issues mentioned here. In fact, it should be recalled that the sound study in 2020 was extended an additional week (for CRW's benefit) because CRW was OVER the sound permitted by Condition 26; however, yet during the 2021 study, the entire wind farm was not operating as 'typical' and the study was therefore substantially flawed/spoiled. The missed shutdowns during high output, potential icing periods, and long periods of curtailment tainted this study. CRW will likely attempt to claim that they tried to collect enough valid samples; however, those samples were taken in the fall – which, once again, is NOT the noisiest and most problematic time for adversely affected persons/properties near the wind farm. Moreover, the samples taken conveniently (and, as must be noted: exclusively to the benefit of CRW) do NOT include the same conditions that caused the exceedances in the 2020 study, because the turbines were off or the shutdowns missed.

As written the Compliant, there were times when the turbine which would have affected my property, and caused a noise exceedance, was turned off. The wind direction which most affects my property and wind speed were causing a noise issue and I was out making personal observations and gathering data, and the turbine was suddenly shut down, ruining the sample for the study.

I made many personal observations and noted the turbines were louder than the background noise, but in the Epsilon report, those times were noted as 'masked.' I tell you they were not masked, because I was there. The Commission, as part of the 2021 sound study, required Epsilon to stay in the area and make daily personal observations because we all agreed that personal observations are superior to recordings. I also want to remind the Commission that we don't hear in 'averages'. We

hear those pulses and spikes and a microphone with a recording is NOT the same as standing next to a microphone making a personal observation. Also, a microphone is in a fixed position. The area to the west of my house functions has an alleyway of noise during most turbine/noise conditions and is much louder than the area to the east of my home where the microphone was placed.

As related to deceptive averages, Mr. Hessler, in his cursory analysis, deceptively and wrongfully attempts to combine two (2) ten minute periods to then deceptively attempt to "average the averages" of the ten minute period(s) in order to essentially shoehorn the noise levels down to 45dBA at the Lindgren property is both erroneous (i.e., to thereby "water down" the overall sound violations by averaging-on-averaging), AND, it improperly works to try to disguise the sound overage violation(s) under the permit requirements and serves to thereby falsely mislead the Commission into believing that the unacceptable and violative sound overages are not really - when averaged and re-averaged - prohibited sound overages.

Lastly, I want to stress to the Commission that we have always wanted a winter study and we stress the Commission the importance of such a study. Winter studies are possible and are done in cold, snowy climates. Epsilon has conducted winter studies in northern climates, such as New Hampshire in February, with equipment mounted in the snow. (Exhibit) The majority of noise issues at my property occur and are compounded in the winter. Our winters are long and we endure nearly intolerable wind farm excessive noise pollution especially during those months. Heavy, damp air and hoar frost are common in our area all winter long; those periods are noisy, excruciatingly noisy.

I am providing exhibits to support my testimony and will supplement my testimony and exhibits as discovery and further information becomes available. I attest that the photos submitted in Exhibit AC20 are photos taken by me with my equipment.

I plan to be available to also present testimony and exhibits and to respond to questions during the formal hearing in October 2023.

In addition to and in conjunction with all that's noted and outlined in my Complaint, at present, the foregoing constitutes my pre-filed testimony.



Amber Christenson

Subscribed and sworn before me this 30 day of June, 2023.



Notary Public – South Dakota

My Commission Expires: December 5, 2025

