BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE STATE OF SOUTH DAKOTA

IN THE MATTER OF THE APPLICATION BY PREVAILING WIND PARK, LLC FOR A PERMIT FOR A WIND ENERGY FACILITY IN BON HOMME, CHARLES MIX, AND HUTCHINSON COUNTIES, SOUTH DAKOTA, FOR PREVAILING WIND PARK ENERGY FACILITY

SD PUC DOCKET EL-18-026

SUPPLEMENTAL COMMENTS OF RICHARD R. JAMES

ON BEHALF OF INTERVENORS

MAY 10, 2019

Please accept the following comments and observations on two issues that have arisen since my oral testimony provided at the Oct. 11, 2019 hearing on this case. They are offered on behalf of Mr. Almond's intervenor group The first issue relates to Revision 7b of the Prevailing Winds Sound Study (3/29/2019) and whether it offers any assurance that the project will meet the 40 dBA L_{10} compliance threshold. The second issue relates to the L_{10} measurement protocols provided to assess compliance with the noise limits and how they may result in uncertainty about the results without extra precautions.

Regarding Revision 7b of the Prevailing Winds Sound Study (3/29/2019)

The revised report mischaracterizes the nature of wind turbine fluctuations that would raise sound levels above 40 dBA so as to cause an exceedance of the compliance protocol's limits based on long term L10 sound level measurements. Review of the revised sound study finds that it's predictions do not represent the potential for the L10 to be exceeded. Instead, the excerpt from the revised sound report (below) shows the model is essentially the same as what was submitted for the hearing with some minor changes to several wind turbines.

This most recent model focuses on the GE 3.8-137 wind turbine. This is the same wind turbine make and model used in the original sound study. (Excerpt below).

5.2.5 Sound Emission Data

Acoustical modeling was conducted for the entire Project. Wind turbine heights and acoustical emissions were input into the model. The expected worst-case sound power levels for the GE 3.8-137 turbines were contained in documents provided by GE and were based on various wind speeds. The sound emissions data supplied was developed using the International Electrotechnical Commission 61400-11 acoustic

And three (3) wind turbines were relocated about 250 feet from their original locations.,

It is noted that Revision 7 of the Study includes three (3) wind turbine movements relative to the previous Revision 6: turbine 4B.52 moved approximately 248 feet to the south; turbine 4B.53 moved approximately 248 feet to the north; and turbine 4B.54 moved approximately 248 feet to the south-southeast. No other turbines were moved from the previous revision.

The "revised sound model" offers no information that is new other than for the area near the three relocated wind turbines. The question is: "How does this revised sound study model demonstrate that the project will meet the 40 dBA L_{10} limit established for compliance?" The answer is: "It does not address the L_{10} limit in any meaningful manner."

First, the software used to make the predictions about sound propagation (presumably Cadna but true for all commercial sound model software) has no provisions for predicting the L_{10} of the wind project. The ISO standard (ISO 9613-2) upon which the Cadna software is based can only estimate the L_{eq}. The new report does nothing to show that the project will be in compliance, once operating, with the 40 dBA L_{10} limit. The only difference between this model and the one presented at the hearing is that some wind turbines have been moved. There is nothing in the revised model that addresses the potential for sound fluctuations from the turbines to be higher than 40 dBA.

How does the report address L_{10}? By asserting without any foundation that under worst case noise emission conditions the sound will not have any fluctuations.

5.3 Acoustical Modeling Results

Sound pressure levels were predicted for the identified receivers in the CadnaA noise modeling software using the manufacturer-specified sound power levels at each frequency and the assumptions listed above. CadnaA modeling results have been demonstrated in previous studies to conservatively approximate real-life measured noise from a source when extraneous noises are not present. For modeling purposes, it is assumed the turbines are operating at a constant maximum sound level for an extended period of time. As such, the L_{eq} and L_{10} sound levels would be equal, since the turbines are not fluctuating in sound level nor are background sounds considered in the model.

If we assume that the model is intended to reflect what will be measured once the project is

operating, the assertion that: "*As such, the L_{eq} and L_{10} levels would be equal…*" is a completely unsupported statement that is contrary to numerous sound study reports by acousticians working for developers and those working for intervenors. That wind turbine noise fluctuates around the mean predicted sound level by ± 5 dB has been demonstrated to be true by the experiences of many people who have filed complaints and field measurements by acousticians. The excerpt below offers an inaccurate assessment of the potential for the project to exceed compliance thresholds. It ignores the well established fact that wind turbine noise is characterized by fluctuations in sound level and that measurements of the L_{10} sound levels will document the presence of these fluctuations as causing an exceedance of the compliance thresholds at locations where the predicted L_{eq} is close to the threshold.

> The maximum model-predicted L_{eq}/L_{10} sound pressure levels at each receiver (the logarithmic addition of sound levels from each frequency from every turbine) are included in Appendix C. These values represent only the constant noise emitted by the wind turbines and do not include any extraneous noises (traffic, etc.) that could be present during physical noise measurements. There are no expected exceedances of the SDPUC 40-dBA noise limit at any non-participating residence or 45-dBA noise limit at any participating residence due to operation of the proposed wind turbine locations of the Project. Extraneous sounds (grain dryers, traffic, etc.) may make the overall sound level higher than the limits in some circumstances, but the turbines alone are not expected to cause that to happen.

The assertion regarding L_{10} being the same as the L_{eq} in the revised report demonstrates either a lack of understanding about how wind turbine noise fluctuates on the part of its author or provided in the hope that a strongly worded affirmation "*…the turbines are not fluctuating in sound level…*" will be accepted as fact without critical review. That the maximums of the real-world fluctuating sound levels can be 5 or more dBA above the L_{eq} is an accepted fact by people living near wind projects and acousticians who have worked for them. Even fluctuations of only 3 dBA would raise the L_{10} at receptor sites with predicted sound levels of just under 40 dBA L_{eq} to over 42 dBA L_{10}.

The revised sound study has nothing to offer to show that the project can comply. It mainly shows that if one assumes the wind turbine noise to never fluctuate, then the project might comply. However, experience has demonstrated that wind turbine noise will fluctuate above the mean predicted sound level.

In my opinion, the SDPUC cannot rely on the revised model as a demonstration that the project will not exceed 40 dBA L_{10}. If understood correctly, it is my opinion that the revised report establishes the likelihood that this project will exceed the L_{10} threshold at some locations.

Compliance Measurements

While it is appropriate to consider the L_{10} test as an indicator of compliance there is a potential that the requirement for the long period of observation, without any requirement that the measurements be observed, could lead to the measurement being contaminated by other short-term transient sounds. The measurement protocol should require that an observer be present during the test period to document the occurrence of sounds that exceed 40 dBA that are not associated with the operation of the wind turbine. These sounds should be removed from the measurement data to assure that only the exceedances caused by the wind turbines are considered. However, that can only be done if there is an observer present who can document the time and source of any non-wind turbine exceedances.

Whether one can obtain a two-week period with full observation to assure that the measurement results are only characteristics of the project's noise will be the issue. If the measurement period had been something more manageable, for example, one (1) to four (4) hour test periods with an observer present supported by documenting the source of transient sounds over 40 dBA and with the wind turbines at full operation, the project's L_{10} would be in or out of compliance with some confidence in the measurements. The

observations would need to be backed up by correlation with the SCADA operating data for the measurement period showing the wind speed and direction at the hub, hub rpm, energy produced, blade angle and yaw. This information is needed to confirm that the wind turbines were at full operational capacity during the test period. The two-week period, without full time observation and correcting of measurements for non-wind turbine sounds, will likely result in a test that is open to challenge be either the project operator or the complainant.

Thank you for the opportunity to expand upon my original testimony to address these new issues that arise due to the revised sound study and compliance protocols.

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