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*South Dakota*

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March 2, 2021

Patricia Van Gerpen  
Executive Director  
SD Public Utilities Commission  
500 E. Capitol Ave.  
Pierre, SD 57501

RE: Docket EL19-003, *Crowned Ridge Wind Final Operational Sound Test Data Review and Assessment*  
Completed by Hessler Associates Inc.

Ms. Van Gerpen,

Attached for filing is a plot that Staff's witness Mr. David Hessler plans to present during the March 5, 2021 Commission meeting to facilitate the discussion regarding Mr. Hessler's *Crowned Ridge Wind Final Operational Sound Test Data Review and Assessment*. The plot illustrates the variable nature of the sound emissions from wind turbine projects at typical setback distances and how there is normally a wide scatter about the long-term average sound level, or central trend line through the data. Note that the central trend line sound level corresponds to the modeled performance at various wind speeds, which is a common finding not unique to this example.

More specifically, the plot shows the apparent project-only 10 minute average sound level vs. wind speed at a residence within a large wind project with GE turbines in New York state<sup>1</sup>. Each black dot is the sound level after correction for background noise, which was measured on a continuous basis through the two week survey at several monitoring stations a mile or two beyond the project boundaries and averaged to yield the likely background sound level at the on-site measurement locations. The project-only sound level was calculated by subtracting the estimated background level from the total measured level. The plot generally shows that there is a common variance of about +/- 5 dBA about the mean with many additional measurements outside of this envelope, including several around 3.5 m/s that are more than 10 dBA above average.

In Mr. Hessler's experience, those kinds of outlying measurements are found in small numbers in nearly every survey of operational wind turbines and, from a practical standpoint, appear to be a largely unavoidable consequence of varying atmospheric conditions. Mr. Hessler also notes that the aerodynamic sound emissions of a typical wind turbine essentially remain constant at any given wind speed and it is only the intervening atmospheric conditions, such as thermal or wind gradients, cloud cover, or wind direction, that change the sound level observed thousands of feet away. Therefore, as long as the measured excursions above the applicable regulatory limit are fewer than about 5% of the total measurements it has historically been Mr.

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<sup>1</sup> The Crowned Ridge Wind Farm uses GE turbines, as well. Therefore, one can reasonably assume that the data from the New York wind farm would be comparable to the Crowned Ridge Project.

Hessler's position to conclude that the project has met the intent of the permit noise limit and was effectively in compliance.

Sincerely,

A handwritten signature in black ink, appearing to read "Darren Kearney", with a long, sweeping flourish extending to the right.

Darren Kearney  
Utility Analyst  
SD PUC Staff