

Results of Noise Study

Big Blue Wind Farm, Faribault County, Minnesota

2/5/2013

On Tuesday, February 6, 2013, Michael Rutledge and David Plagge of Fagen Engineering visited Big Blue Wind Farm to measure the noise levels generated by the 18 newly installed Gamesa G97 2MW wind turbines. The equipment used was a Extech Instruments Model 407736 Sound Level Meter. Real time wind speeds were obtained using an app on an Android smart phone and verified later using actual met tower data.

The Sound Level Warranty listed in the Turbine Supply Agreement specifies that the sound level of the turbines shall not exceed the Lwd value specified in Exhibit Z of the Agreement.

The following table shows estimates of aero-acoustic noise emitted by the rotor or the G97 2MW turbine, with wind speed measured 10 meters above ground level, listed in Exhibit Z.

Wind Speed (m/s)	dB
3	95.3
4	95.9
5	99.6
6	103.0
7	105.6
8	105.8
9	105.8
10	105.8

The tables below contain results of actual noise measurements taken at each turbine at Big Blue Wind Farm. Measurements were made with a hand-held instrument, 2 meters above ground level with corresponding wind speeds measured 2 meters above ground level. Wind was from the NNW and noise level measurements were taken at the SW side of the tower base.

Actual Noise Measurements

Turbine	Wind Speed (m/s)	dB
1	10.7	75
2	10.9	80
3	10.0	80
4	11.1	75
5	10.3	85
6	9.1	75
7	11.3	75
8	9.0	70
9	9.3	75

Turbine	Wind Speed (m/s)	dB
10	10.9	75
11	11.1	75
12	10.6	80
13	11.5	80
14	10.8	75
15	10.3	75
16	10.8	75
17	11.3	75
18	11.1	80