NOISE

Assessment

The wind farm sound analysis has been based on the requirements of NZS6808:1998, Acoustics – The Assessment and Measurement of Sound from Wind Turbine Generators.

When close to the turbines (within approximately 50m) the characteristic beat as the turbine blades turn is audible. However, based on field measurements, at distances of more than approximately 300m, the noise becomes steady and the beat reduces significantly. Assuming a stall turbine design is not used (and this will be the case for the WEL project), with more than one turbine operating, the cumulative noise is a steady sound subject to any variation that may be caused by wind turbulence. Noise from wind turbine generators does not have any significant directivity characteristics, so the directions that the turbines face are not critical in the analysis of the noise effects.

The noise has been predicted using the sound spectrum of the wind turbine as provided by a typical wind turbine manufacturer. Based on this information, and a three dimensional ground contour model, a computer model has been used. The model takes into account effects such as distance, topographical screening, atmospheric absorption and meteorological effects (such as wind direction), to predict the noise level at the closer houses around the proposed wind turbine farm. A cross check was made based on information collected at existing wind farms, such as in the Tararua Ranges (near Palmerston North). This information shows that the levels from a wind farm using the computer model is expected to be within ±2dBA. This is within the degree of accuracy expected when predicting noise levels.

Results

Based on the predicted noise levels and field measurements of the existing noise environment the requirements of NZS6808:1998, Acoustics – The Assessment and Measurement of Sound from wind turbines will be complied with at all of the dwellings near the proposed wind farm, including a factor of safety.

During the construction of the proposed wind farm the noise levels must comply with the requirements of NZS 6803:1999 Acoustics – Construction Noise at all times. The analysis shows this is practical with a good factor of safety.

When taking into account that the requirements of both NZS 6803:1999 Acoustics – Construction Noise and NZS6808:1998, Acoustics – The Assessment and Measurement of Sound from Wind Turbine Generators the proposed wind farm development will achieve the design limits at all times. On that basis, in terms of the requirements of the Resource Management Act, the overall effects of the proposed wind farm will be no more than minor.