

# **SUBMISSION TO THE SENATE ENVIRONMENT AND COMMUNICATIONS LEGISLATION COMMITTEE**

## ***Renewable Energy (Electricity) Amendment (Excessive Noise from Wind Farms) Bill 2012***

Submission prepared by:

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I wish to SUPPORT the proposed amendment to require publication of operational data for wind farms.

The current approach in Australia to the assessment of noise from wind turbines, and wind farms in general, is both over complicated and oversimplified. This statement appears to be contradictory, however, we have an assessment approach that is too difficult for the average person to understand and that same assessment approach is based on some very simple, yet possibly incorrect, assumptions.

Notwithstanding any criticisms of the assessment process, we have a legal framework that culminates in development approvals being granted to wind farms. Those development approvals contain sections pertaining to noise emissions that have been deemed by the relevant authorities to be a reasonable balance between the rights of an industry to operate and the rights of individuals to be protected from excessive noise. I also note that the assessment of the balance in setting development conditions for noise has only been in terms of the A-weighted parameter and that to-date there are no criteria applied for low frequency or infrasound emissions from wind farms.

My submission details experiences over recent years where I have attempted to obtain operational data from wind farm developers and operators. Of particular relevance is the wind speed data from the wind farm meteorological mast(s) that is required: to determine the target baseline sound emission targets prior to construction and operation of a wind farm, and; to check compliance for an operating wind farm.

It has been demonstrated time and again in VCAT hearings and in the SA Environment Court that background sound surveys used to set compliance noise limits for wind farm developments have lacked credibility. For example: VCAT hearings for Stockyard Hill Wind Farm, Moorabool Wind Farm and Yaloak South Wind Farm, and; the Allendale Wind Farm in SA where the experts agreed that the equipment used for the background surveys was not suitable for the task.

It is understandable that residents potentially affected by noise from a wind farm development are sceptical of background survey data used to set their noise level targets if such data has not been peer reviewed. Likewise, the lack of peer review of compliance reports is of concern.

Residents also become concerned when equipment deployed at their property fails due to operator error or battery failure and when there are electrical connectors on cables to microphones that are exposed to rain. This is a common occurrence. Incorrect data collection at this stage directly affects the allowable external noise from a wind farm at the residence. If unusual noise events or rain artificially elevates the recorded sound levels then the target compliance noise levels may be set too high.

I have been asked on many occasions by residents to deploy sound monitoring equipment as an independent check on the integrity of data collected by consultants working for wind farm developers. Sometimes, the data has been collected in parallel and at other times the data is collected over similar representative periods. The type of data I have collected includes sound from background and operational conditions at a number of wind farm sites.

Many residents have requested from the developers a copy of the data collected by their consultants at their property. Invariably, the data provided is in the form of a scatter chart showing wind speed and sound level. Unfortunately, this form of data presentation is not suitable for a peer review to be completed. The data required to complete a peer review is the unedited wind speed and sound levels recorded as a time chart, prior to presentation as a scatter chart. The scatter chart loses the time-line information.

The wind speed data must be from a mast that is representative of wind at the turbines nearest to a dwelling and this mast(s) is located generally within the boundary of the wind farm. The requirement to use this wind speed data allows the wind farm operators or developers to dictate and control the choice of consultant to whom they provide this data. There is no way that a compliance assessment can be made without this wind speed data.

Other wind farm operating conditions are also useful in testing compliance. Wind turbines are sophisticated devices with electronic control and data logging. Modern wind turbines have the ability to change the blade pitch angle continuously throughout each single revolution. Data logging at each wind turbine shows, as a minimum, wind speed at hub height, power generation, blade pitch and blade rotation speed. This data is continuously logged in SCADA systems for each turbine and can be used to determine if the turbine is set into low noise mode, for example.

It would obviously be inappropriate to set a wind farm into one of the low noise modes available to modern turbines during a compliance assessment. Low noise modes may be required if noise targets are not met but they should not be used for initial compliance assessment purposes.

The following examples describe my experience of how difficult it has been to obtain wind and noise data for peer review, allow the preparation of a noise target curve from background data or complete a compliance assessment.

1. I have attached a proposed confidentiality deed that was offered for me to sign before wind and noise data could be released for peer review purposes at the Victorian Civil and Administrative Tribunal (VCAT) hearing for the Yaloak South wind farm in 2010. This document was significantly modified from the original outlandish and unreasonable draft that was addressed to me personally, rather than my company. However, the document still had sections that I could not agree with unless further modifications were made. The end result of the requirement for a confidentiality deed delayed matters in the proceedings such that it became impossible to complete a peer review in the time available and the confidentiality deed was never executed.
2. In 2011 I completed a background survey for a resident near to the proposed Rugby wind farm development in NSW. After repeated requests for wind data Suzlon acquiesced and provided wind speed data from their met mast. Unfortunately, although the period by month was correct the data provided was for the previous year and was of no use. Subsequent requests failed to produce the correct data.
3. After the Leonards Hill wind turbines became operational in mid 2011 I was asked to gather noise data at a resident located only 700m from the two turbines. I have now completed a number of surveys at this residence, both indoors and outside (in accordance with the permit requirements) from the latter part of 2011 to the early part of 2012 at the time when other

compliance testing was being completed in the area by the developer's acoustical consultants. I have attached a letter from me written to the residents who forwarded a copy to Hepburn Shire Council (in which the wind farm is located) and to Moorabool Shire Council (in which their property is located). The letter simply requests data that only the wind farm operators can provide to allow me to complete my investigations but which was, I understand, verbally refused. After a few months Moorabool Shire Council took statements from the residents in respect to their health complaints that are believed to be the result of excessive noise, but they have yet to receive a response. The residents did receive a response from the Hepburn Shire Council that included a letter from EPA Victoria (all attached) stating that the compliance report prepared by the developer's acoustical consultants had been prepared in accordance with NZS6080:1998 as required in the planning permit. It is interesting to note that the letter from EPA Victoria has not passed any judgment on the compliance aspects of the report they reviewed, only that a process has been followed correctly and notes that the 'planning framework provides the statutory mechanism to manage compliance with wind turbine noise standards in Victoria.' I have yet been unable to contact [redacted] of EPA Victoria (he was unavailable in Melbourne when I called) to ask if any raw data was provided for their review and who did the review. Another letter was written by the residents to Hepburn Shire Council on 10 October 2012 and the response dated 16 October 2012 is also provided for information. The last letter from Hepburn Shire Council goes to the heart of the matter in that they do not have any evidence of non-compliance and that if such evidence is available that any enforcement case should be directed to the VCAT. **Catch 22.** If wind speed data and other basic operating condition data will not be provided by the wind farm operators, how can any evidence be prepared? This is fully understood by the wind farm operators and is the reason why this bill is so important.

4. In the middle of 2012 I completed a noise survey at a residence opposite Hallett 2 in SA. Formal requests were made to get wind speed and general operating data suitable for me to complete a noise compliance assessment and this was refused by the developer. Only after the issue was raised in the Court was a judgment handed down requiring the operational data and noise data to be exchanged between the respective experts. The development application for Hallett 3 (this application related to operational noise issues associated with Hallett 2) was withdrawn shortly before the data was to be exchanged. Again, I have been thwarted in my attempt to complete a compliance assessment simply because operational data has not been supplied. This experience is yet another reason for supporting the bill.
5. I have more recently (past 4 months) been asked to provide monitoring next to a number of loggers deployed by Acciona's acoustical consultants surrounding the approved, but yet to be constructed, Mortlake South wind farm in Victoria. The objective was to provide an additional check against the data that will form the target noise criterion curves for five residences surrounding this wind farm. It has been well covered in the local Press that the meteorological logger on the wind farm site unfortunately broke down during the time of my survey and that a number of the loggers provided by Acciona's acoustical consultants had various battery failures. It will be interesting to find out if Acciona will provide wind data for any future surveys I may complete. I have been requested to provide a proposal to one of the residents near this development to erect an independent meteorological mast on the boundary of the wind farm. The resident has requested that Acciona pay for the meteorological met mast during the future noise monitoring survey to gather background noise data, in accordance with the permit for the development. Acciona has refused to reimburse the resident for such a temporary met mast.

There is strong resistance from wind farm developers and operators to provide data suitable for anyone, other than their chosen acoustical consultants, to complete a random noise compliance check or background monitoring, from which a target compliance noise curve is generated, at a residence.

This bill will put in place a framework to ensure that data required to complete an acoustic assessment for a wind farm is possible by other acoustical professionals, not favoured by the wind farm industry.

In the interest of openness and fairness this bill is long overdue.

## **DEFINITION OF EXCESSIVE NOISE**

I SUPPORT the requirement to define ‘excessive noise’ although not in the form presented in the bill.

Australia has already recommended the use of the World Health Organisation’s Guidelines for Community Noise 1999 as a primary reference for environmental noise levels below which no health effects are expected. Recommendations made in “The health effects of environmental noise - other than hearing loss”: May 2004 by enHealth (Australian Government Department of Health and Ageing) describe the health effects of noise across a range of frequencies that include low frequency and infrasound. Item 3 of the executive summary is relevant for planning as it recommends: “Review current noise control practices and how to further integrate noise control into planning processes, for all levels of government (with attention to future noise research findings).”

In the recent Hurunui wind farm development hearing in the New Zealand Environment Court it was agreed by the three experts (two of whom were on the NZ Standards committee that prepared NZS6808, one being the Chairman) as follows: “We agree that 30 dB  $L_{Aeq}$  is generally appropriate to provide protection from sleep disturbance for an average person inside bedrooms. We agree that this criterion does not necessarily protect vulnerable people and does not necessarily address special audible characteristics or low frequency noise.”

NZS6808 forms the planning basis for Victoria and SA requires the same target of 30 dB  $L_{Aeq}$  for the bedrooms inside dwellings of turbine hosts.

I believe that ‘excessive noise’ should as a minimum be based on the target noise level inside a bedroom of 30 dB  $L_{Aeq}$  for an average person, modified to protect vulnerable people and adjusted to address special audible characteristics and low frequency noise.

The choice of an internal sound level target makes the long-winded measurement methodology outdoors in the wind obsolete since there are no wind effects to cause spurious microphone measurement errors. The advantage is also that a compliance assessment can be made quickly, without the need for long-term noise monitoring.

External noise levels are both an amenity and health issue for which a Background plus 10 dB criterion may not provide adequate protection. Consideration should be given to setting low frequency and infrasound levels too.

## **PERSONAL EXPERIENCE**

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## **QUALIFICATIONS**

BSc (Hons) Applied Physics, UK 1975  
MSc Noise and Vibration Studies, Institute of Sound and Vibration Research, Southampton, UK  
1977

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## **PROFESSIONAL AFFILIATIONS**

Chartered Physicist, UK  
Member of the Institute of Physics, UK  
Member of the Institute of Acoustics, UK  
Member of the Australian Acoustical Society  
Member of the Environment Institute of Australia and New Zealand  
Member of the AV3 and AV4 acoustics working groups for Standards Australia  
Australian representative for the International Institute of Noise Control Engineers (I-INCE)  
Technical Study Group 5 A *GLOBAL APPROACH TO NOISE CONTROL POLICY* (Now disbanded after completion of the scope of work defining this group – see <http://www.i-ince.org/data/iince061.pdf>)

My company, L Huson & Associates Pty Ltd, is a member firm of the Association of Australian Acoustical Consultants and the Association of Noise Consultants

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## **EXPERIENCE**

Since graduating I have been involved in a number of scientific areas of research and development. My early experience was in constructing a microwave device to measure the temperature of plasma inside a nuclear fusion experimentation device at the UKAEA, Culham Laboratory in the UK. I then worked in research and development of thermal imaging devices prior to completing my Masters in Sound and Vibration Studies. My work since then (1977) has been primarily associated with acoustics and vibration both terrestrial and underwater.

For the past 22 years I have worked in Australia as a noise and vibration consultant and have operated through my own consultancy firm for the past 16 years. I am experienced in modelling acoustic propagation from a variety of sources such as railways, roads, aircraft, underwater ordnance, pile driving, blasting and numerous types of industry. With regard to industry, for example, I have prepared many noise sections of environmental impact statements for coal terminals and power stations (e.g. Tarong North, Callide C, Swanbank C) and have designed and installed long term noise and meteorological monitoring equipment to assess noise emissions for Kogan and Callide power stations that required analysis of data collected continuously over a period exceeding 5 years. A common theme to my work is to assess compliance with noise conditions and where such compliance is not met suggest options to reduce noise emissions to meet compliance objectives.

Of particular relevance to the evidence provided here is the work I completed for the Toora Wind Farm which involved detailed analysis of pre and post construction noise data using NZS6808 1998 to check compliance with license conditions. My experiences in the analysis of wind farm noise data led to a paper that was presented at the joint Australia and New Zealand Acoustics conference in 2006 titled “Review of the Application of NZS6808 to wind farms in Australia.” This paper highlighted the sources of error that were implicit/allowed in the NZS6808, 1998 standard. The latest version of the NZS6808 standard (2010) addresses a number, but not all, of the data analysis error concerns described in my paper.

I have also provided expert evidence regarding wind farm noise in Victorian Civil and Administrative Tribunals for the Stockyard Hill Wind Farm, Moorabool Wind Farm, Yaloak South Wind Farm and the Allendale Wind Farm in South Australia in their Environment Court. I have recently provided expert evidence for the proposed Hurunui wind farm development in New Zealand.

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