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The Waubra Foundation
Closing Statement to VCAT re Cherry Tree Wind Farm
Peter R. Mitchell, AM BChE
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Thank you for allowing the Waubra Foundation to make a closing statement. I wish to start with acknowledging the remarks made by the Tribunal on Wednesday 6 March 2013 that:

> ***"There is clearly an association between wind farms and the symptoms that have been described. The question is whether there is a causal link."***

In forming the conclusion of association and in formulating the question about causal link, Tribunal Members observed:

> ***"there is some direct evidence and much anecdotal evidence that people living in proximity to wind farms experience deleterious health effects, and those effects are of the same type, being sleep disturbance, increased anxiety, headaches, and pressure at the base of the neck."***

Considering Evidence

In considering evidence, the word 'anecdotal' has a history of being used by public health officials and academics to downgrade field work not only when it has been proper to do so, but also when it might be in their interests. In common parlance, anecdotal generally means a short account of an entertaining or interesting incident and really just a story and is nothing beyond that; in medicine it has been variously defined as:

- information that is not based on facts or careful study;

- reports or observations of usually unscientific observers;
- casual observations or indications rather than rigorous or scientific analysis;
- information that has been passed along by word of mouth but not documented scientifically.

Anecdotal evidence can have varying degrees of formality, for instance, in medicine, published anecdotal evidence by a trained observer (doctor) is called a case report.

In the above characterisation of "***anecdotal***" we contend that the information we have gathered is based on ***careful study***, it was gathered by a ***scientific observer,*** is not composed of ***casual observations***; but we do acknowledge our data is not yet been formally documented scientifically. This is a priority if and when resources become available. However we think that the careful, professional, field driven accumulation of multiple adverse events by the Foundation is beyond anecdotal; and in the league of clear evidence of a serious and widespread problem (refer to Dr. Laurie's Annexure 11 "Properly Interpreting the Epidemiological Evidence about the Health effects of Industrial Wind Turbines on Nearby Residents" by Dr Carl Phillips, 2011). This paper is extremely important in that it confirms both effects and causality.

In two and a half years Dr Laurie has listened to over 100 individuals with problems. We hope the Tribunal Members will consider our collection of data around wind projects as ***field evidence reported directly to a professional***. A useful analogy would be a patient reporting symptoms to a GP, and the GP, after evaluating, and where necessary filtering, the patient's reporting, then passing the information on as a briefing to a specialist.

Whilst dealing with word use we also think the purely qualitative word "***annoyance"***, used by acousticians to describe the problems of those being affected by noise ranging from mild irritation through to the most serious impacts, is inadequate and confusing. This word, without a quantitative modifier, and because of its everyday meaning, also tends to minimise the problem. We note that all of the 100 or so individuals that have sought us out were, in our professional opinion, suffering serious impacts.

Also moving from a clear ***association*** between the operation of wind turbines and the appearance of health problems in nearby residents to a ***causal link*** is perhaps not as difficult as it seems. Dr Laurie took the tribunal through Bradford Hill's criteria for causation. One can interpret these 9 or so criteria as hurdles to jump to ***infer*** causality and as appropriate where there is no simple proof. A quick search of the meaning of causality indicates that it is sufficient if a change in one variable makes a change in

another. So to move from association to causal link, may be as simple as identifying a differing intensity of symptoms with a change in wind speed or direction.

The Foundation has multiple reports from sufferers who can tell by their symptoms, even when they cannot see the turbines, that there has been a change in turbine speed or wind direction; and from others that have long identified a change in wind direction as an indicator of worse or better symptoms.

Residents at Mt. Bryan and Glenthompson can testify that the ultimate change, being a shutdown of turbines at night, reduces symptoms dramatically.

> ***We therefore are confident in stating that there is not just an association, but there is a causal link.***

It has taken a herculean effort by Dr Laurie and by farmers prepared to go public with their personal problems, not generally something farmers like doing, to gather this data and to be confident of the causal link between operating turbines and the suffering of neighbours.

I hope it is clear to the Tribunal Members that the Waubra Foundation has not only had its CEO, a very experienced and knowledgeable GP, out in the field; but we have also helped and supported acoustic and psychological work by professionals who have, in our opinion, demonstrated both their superior technical skills and their independence of the wind industry. All of the acousticians have contributed their own time to help get these studies completed. The work by other disciplines has helped greatly in forming our views.

The Waubra Foundation's Current Position

Aerofoil shapes have been used in many industries for many years, and therefore the principle of diminishing returns will almost certainly apply and ongoing improvements are therefore likely to be at the margin. The existing turbines are quite efficient in converting the kinetic, or movement, energy in the incoming wind which is largely in laminar, or smooth, flow. When the moving air mass encounters the turbine aerofoil, the aerofoil by effectively having to be forced out of the way, extracts kinetic energy from the air mass. This kinetic energy in the air mass is converted to rotational mechanical energy which is in turn converted to electrical energy in the generator with the substantially exhausted air mass exiting the aerofoil at reduced speed and in turbulent flow.

However the side effect of this conversion is that other forms of non-useful energy are produced, including various vibrations principally noise, mainly caused by air mass interaction with leading and trailing edges and tips of the aerofoil and by blade pass of the tower. Another potential source of additional noise and vibrational energy is wake interference between turbines. Vibration of machinery including the tower is another source of energy loss.

Perhaps it would be helpful if I briefly summarise the Foundation's current position:

- we know wind turbines generate audible, low frequency and infrasound noise and vibration;

- we know and have measured infrasound and low frequency sound inside sufferers' homes.

- we know health problems (totally new; or old afflictions aggravated) start to appear around wind projects sited in most rural settings with turbines of say 0.6MW or larger, co-incident with the start up of operations;

- we know that the health problems continue to emerge in more people and intensify as time exposure increases;

- we know that increasing turbine blade length and power generating capacity increases both total noise emitted and the percentage of that noise present as low frequency noise and infrasound; which makes problems such as sleep disturbance more likely to occur in more households out to greater distances from the turbine (refer to Dr. Laurie's Annexure 10, "Low Frequency Noise from Large Turbines", Moller and Pedersen, 2011);

- we know that the appearance and intensity of symptoms diminish with distance from turbines, a crude but consistent indicator of a dose response effect in the few studies with systematic data collection;

- we know that similar effects or symptom clusters have been identified in many projects in Australia and overseas, and around other sources of infrasound and low frequency noise;

- we know sleep disturbance followed by sleep deprivation is the commonest problem reported by wind project neighbours, with devastating effects on long

term health and wellbeing and productivity;

- we know that the symptoms can be extremely serious. We know there is an increased risk of permanent damage to mental and physical health from the clinical cases we have observed;

- we know there is an increased risk of certain life threatening events, including heart attack, stroke and suicide from severe sleep deprivation, which is supported by recent and longstanding current knowledge within the peer reviewed medical literature;

- we know that some 40 families have abandoned their houses or sold to developers in Victoria, NSW and South Australia, because they or their families became so ill whilst living in their homes. We have interviewed well over 100 sufferers, and the pattern of their suffering is identical, even if the specific cluster of symptoms experienced may differ in detail between sufferers;

- we know that if turbines are not operating due to insufficient wind, sufferers start to feel and sleep better;

- we know, from reports at Glenthompson and Mt Bryan, if turbines are shut down at night, peoples' health and sleep improves;

- we know if sufferers move away almost all the symptoms fade and disappear;

- we know if sufferers move back and the turbines are operating, the symptoms recur;

- we know that neither sleeping pills nor tranquilisers nor earplugs nor double glazing nor house insulation is of help with reducing episodes of sleep disturbance; an indicator of the presence of low frequency noise and infrasound;

- we have formed a professional view that the sufferers are neither hypochondriacs, nor casual of the truth, nor terrified; but are typical farmers; enduring of hardship and injury, uncomplaining and patient. We are certain that they are suffering and describing real symptoms and, in no way, exaggerating their pain.

These conclusions have been the result of nearly three years of field observations, comparing results with other medical and acoustics professionals and researchers around the world, and extensive reading. That work continues.

Contributions of Other Professionals

Others have gone into the field before or contemporaneously with us; Doctors such as Iser, Harry, Mitric-Andjic, McMurtry, Nissenbaum, Pierpont, Reider, Spring, and psychologist Peter Trask. All are health practitioners, four of those listed here are from Victoria, who have reached the same conclusions as the Foundation. Acousticians Ambrose, Rand, Walker, Schomer, Hessler D., Hessler G., Huson, Cooper and Thorne have all identified noise inside sick homes above the current dB(A) standards.

So far we consider the problem has been well defined and causal link has been established. There is good progress being made, albeit with quite inadequate research funding, on critical noise frequencies and levels and on human pathways. Some of these partial and preliminary results are quite difficult for not directly involved professionals to comprehend. We notice this amongst previously unexposed GPs, State Chief Health Officers, State Departments of Health and State Environmental Protection Agencies. Some progress is being made, but the phrase "scaling the walls of casual or sometimes deliberate indifference" still aptly describes our experience.

The Other View

Evidence, or perhaps more correctly, opinions have been offered by Messrs Turnbull and Drs Burgemeister and Black that attempt to show that our conclusions and those of independent acousticians are not ***plausible*** from either an acoustic or medical view. We reject those opinions and saw nothing from Turnbull and Black to overturn our research and conclusions. We did note that Burgemeister criticised Cooper for actually only recording microphone noise below 7 hertz, the acoustical equivalent of a schoolboy howler. Cooper of course did no such thing, and he has dealt with that assertion elsewhere.

Canvassing induced fear, the nocebo effect, income envy and general annoyance as significant are, to be complimentary, weak and dissembling arguments and for which there is no evidential support. Some reasons for dismissing the nocebo effect are canvassed in *Attachment 1 Nocebo Nonsense or the Power of Shallow Thinking, Waubra Foundation 2012*

So far we have not heard one plausible alternative cause of the identified symptoms.

The Industry's Task Surely?

Our view is that the situation has now reached the point that it is no longer (and never should have been), the task of citizens to prove the wind industry unsafe and a danger to its neighbours. Whilst it is long overdue, the industry must now act responsibly to the clear proof that the industry is a danger to the health and well being of its neighbours.

The industry has already tried the 4Ds: deny, dissemble, delay and discredit; practised spin in various forms including partial truths and misleading statements; and used its massive resources to confound or influence politicians, bureaucrats and some professionals. In our view they cannot, in good conscience, continue to deny or belittle the health damage around wind projects.

However if they wish to deny the causal link, then it is time the industry hypothesised a thoroughly plausible possible cause and vigorously research that hypothesis; or if no plausible alternative can be hypothesised, select the remaining option of ***separating, both new and approved but unbuilt wind towers, from people***. The option of remaining staying in the harmful mode is fast disappearing.

If the Members agree, then this hearing is an excellent opportunity to start the industry on that path. (*Attachment 2 "How to Apply the Precautionary Principle to Wind Energy Projects" Waubra Foundation, may be helpful in this regard.)*

Research

The universal call from all but the industry itself is for research. Some calls are genuine but when made by governments or politicians often eager to keep the wind industry myths alive, are merely pro forma and need to be challenged. No money has yet been produced by any government or government body to measure the impact of wind turbine noise on humans.

The Foundation both advocates and supports research, but our resources, by any measure other than commitment, are quite limited. The South Australian EPA study if thoroughly executed, and performed by acousticians with the instruments, knowledge and independence, will be most useful for Responsible Authorities and courts and to force the attention of the "don't want to knows".

We recognise that it would be of immediate use if we could prove a safe distance and or a decibel limit for dangerous and sleep limiting frequencies inside nearby homes. At

this stage we can only talk of precautionary distances and that precaution has to be of the order of 10km. There are of course multiple operating sites where data is immediately collectable and enough independent professionals to get this work started. All that is needed is funding, robust experiment design, knowledgeable managers and the cooperation of the wind industry.

The Foundation and its advisors have clear views on the initial objectives of a properly funded research program to move our current conclusions the next step.

Focus

So on the basis of very strong probabilities and common sense, may we suggest that in relation to noise, health and well being, Members ***focus on the simple fact that wind turbines cause unacceptable health damage to neighbours.*** Put simply, Responsible Authorities, and VCAT is now through this Appeal, effectively in that position, face, if nothing else, a ***Moral Dilemma.*** (*Attachment 3: Wind Projects, the Moral Dilemma – A Rational Solution, Waubra Foundation).*

What About Waiting for Literature Studies?

Literature studies ***reflect the past***; and the more stringent the hurdles of the study, the less information that is left to assess; and the older the qualifying data is likely to be, simply because the process of peer review and publishing in the right journal takes time. Every literature study has a cut-off date, and important up to the minute information in this rapidly emerging health and well being problem thereby missed.

Nevertheless the recently published literature study by Arra and Lynn is more than helpful in that it is independently supportive of the Foundation's position.

In contrast to the endless literature searches the Waubra Foundation is, in present time observing and recording a calamitous and deplorable but easily remedied and preventable public health problem. A problem that is spreading rapidly. We know of no disease or condition that waits to be thoroughly researched, peer reviewed and published before it begins to do damage to health.

So until the information and research flows slow, which will only happen when the authorities or the industry make research funds available and those funds are transformed into research results, decision makers should expect little and for the time being, look more to perhaps academically imperfect but real field work.

A Changing Outlook

The picture changes even as the Tribunal has been considering Cherry Tree:

- the Canadian Literature Study 2013 "Association between Wind Turbine Noise and Human Distress" by Doctors Arra and Lynn, previously tendered to Tribunal Members found that **all** the peer reviewed published studies showed an association between wind turbine noise and human distress; three of the studies showed a dose response relationship, and the study authors strongly recommended further research;

- two proposed South Australian projects have been refused by local planning authorities; one the Stony Gap Project has been refused by the local Development Assessment Panel on noise and health grounds (subsequently appealed by the developer and currently before the ERD Court); and the other, Carmody's Hill, for which an extension of an existing planning permit has been refused;

- Moonies Hill, a wind development in Western Australia was recently rejected by the Development Assessment Panel, with one of the clearly stated reasons being that there was "no net community benefit", and it was clear that by 'community' the Panel Members were placing a high importance on the immediate neighbours to the project. Questioning from the Panel Members of various witnesses suggested concerns about noise pollution and the effect on neighbours were also a consideration;

- a removal of a turbine for noise/health reasons has been ordered at Falmouth in Massachusetts;

- after the Federal Senate voted 36 : 32 against the proposed Madigan Xenophon ***Excessive Noise from Wind Turbines Amendment to the Renewable Energy Act*** in late February, 2013, the Federal Coalition immediately announced they would be introducing a private member's Bill dealing with this subject of wind turbine noise and health into the lower house. The Bill will call for non compliant projects to have their Renewable Energy Certificates suspended;

- about the time that Dr Gemmell, Chair of the South Australian EPA announced that the EPA was going to undertake field research at the Waterloo project in South Australia, that same body released a joint study with Resonate, an

acoustics company well known to the wind industry – finding, of course, no problem. (*Attachment 4 refers to Steven Cooper's peer review of that study*). That study was not well received at a meeting of the NSW chapter of the Australian Acoustical Society last week by a number of acoustical peers including Steven Cooper, who were vocal about the inappropriate use of dBG as a measure for infrasound, and about other aspects of the way the report was written and the conclusions drawn from it, which were not supported by the data.

The Disaster of the NZS 6808:2010 Noise Standard

As Dr Black confirmed, there is ***no*** study that shows wind turbines are not the cause of the reported sleep and health problems. Indeed, the Arra and Lynn literature review found that **every** study showed there *was* an association between wind turbine noise and what they referred to as "human distress" which included sleep deprivation.

Effectively this can be taken to conclude that NZS6808:1998 is not competent in protecting wind project neighbours; and since the 2010 version still uses 40dB(A) or background plus 5dB(A), whichever is the less, as the guarantor of health, neither will it protect neighbours.

Whilst the other proxy for health and well being of a 2Km setback is somewhat helpful, **neither the inadequate dB(A) nor the distance proxies actually work to protect health, wellbeing and amenity, as the field evidence and population noise impact surveys at Waterloo and Cullerin have shown.**

Much as certain acousticians, mostly (but not all) those closely linked to the industry, are convinced that the standard has to, by definition, be adequate, it is difficult to ascertain the origin of the specific medical/health advice or the applicability of that advice in formulating this Standard. Apparently it is largely based, according to Burgemeister, on the very aged UK Standard (ETSU 1997) birthed at a time where little was known about adverse health impacts and wind turbines were much smaller and the WHO recommendation for an inside of dwelling noise level for sleep of 30dB(A). This level is of doubtful application to wind turbine noise in general and quiet locations in particular. We note that Dr Black does not agree with the WHO standard, and that we believe it does not apply well to quiet country environments.

Omitting any consideration of low frequency noise, which is known to be associated with sleep disturbance, is a planning and noise regulatory "blueprint" for an exhausted sick population of neighbours.

Apart from a near 100% failure rate in preventing harm to sleep and health in Victoria from existing wind developments, there are a number of other matters where the application of this standard is inadequate. ***Surely failure to protect and the certainty of grievous damage is enough for the Tribunal Members to move away from the prior total reliance on this standard as a guarantor of no harm in favour of other available and very strong evidence.***

Finally, a general search lead me to a 'SustainabilityMatters' document which discusses the revised NZ acoustic standard where one can find the following statement: "NZS 6808:2010 balances sustainable management of natural wind resources with the protection of the community". Balancing the unbalanceable. Personally I am not comfortable with a NZ Committee, representing many community interests, determining the balance between sustainable development and community health. Perhaps this is at the core of this standard's problem.

Our Conclusions

The probability that operating wind turbines are the source of many of the reported health and sleep problems is virtually 100%.

The magnitude, severity and cruelty of the health effects have been established and it is appalling that this quite shocking treatment of citizens in a democratic society has not been addressed by Responsible Authorities.

The continuing use of the NZ6808 noise standard as the sole director of health protection will guarantee that every new wind project will cause substantial and widespread harm.

Recommendation

The Waubra Foundation recommends that the Tribunal Members conclude that the residents have well researched and presented reasons to oppose the project; that the Mitchell Shire Council's unanimous rejection of the project fairly and properly represented the wishes of the residents; that there is no net community benefit in the project going forward, and indeed quite the reverse, in that the health, well being, amenity and assets of the community, being the immediate neighbours to this wind development, will be seriously damaged by this deplorably sited project.