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10<sup>th</sup> August, 2014

Mr Diego Loredan, Chairman,  
Ms Katarina Dea Zetko,  
[Civil Initiative for the Protection of Senožeška Brda](#)

Dear Mr Loredan,

I have been asked by Ms Katarina Dea Zetko to write to you, concerning the proposals to site large industrial wind turbines, 130 metres high, sited as close as 800 metres to homes in rural Slovenia. You are welcome to use this letter to educate others, and to make it publicly available.

**In my opinion, based on my first hand knowledge of what has happened to wind turbine neighbours in Australia and elsewhere internationally, this is a recklessly irresponsible and dangerous plan and will inevitably result in serious adverse health effects for citizens of Slovenia who are neighbours of such turbines, out to significant distances.** This is happening around the world, and I know of no reason why Slovenian citizens will not have the same adverse health impacts being reported internationally.

### **Breaches of UN Convention Against Torture**

Decisions made by public officials to approve such an unsafe development, or to allow a development to continue to operate in spite of directly causing adverse health consequences such as sleep deprivation and “sensory bombardment from noise”, could be held to be breaches of the UN Convention Against Torture.<sup>1</sup> Both “**sleep deprivation**” and “**sensory bombardment from noise**” have been acknowledged as methods of torture by the Physicians for Human Rights.<sup>2</sup> The UN Committee Against Torture has also specifically acknowledged that sleep deprivation is used as a method of torture.<sup>3</sup>

<sup>1</sup> UN Convention Against Torture and Other Cruel Inhuman Or Degrading Treatment or Punishment is reproduced here: <http://waubrafoundation.org.au/resources/un-convention-against-torture/>

<sup>2</sup> “Leave No Marks” by the Physicians Against Torture, pp 22 -2 6  
<http://physiciansforhumanrights.org/library/reports/leave-no-marks-report-2007.html>

<sup>3</sup> <http://waubrafoundation.org.au/resources/un-convention-against-torture/>

***“The Committee against Torture (CAT) has noted that sleep deprivation used for prolonged periods constitutes a breach of the CAT, and is primarily used to break down the will of the detainee. Sleep deprivation can cause impaired memory and cognitive functioning, decreased short term memory, speech impairment, hallucinations, psychosis, lowered immunity, headaches, high blood pressure, cardiovascular disease, stress, anxiety and depression.”***

Consequently, behaviour by public officials including specifically elected politicians and public servants in Slovenia, such as approving such a dangerous development, or allowing a wind development to continue to operate, **whilst knowing that the turbines are causing adverse health effects from sleep deprivation and sensory bombardment with noise** could be held to be a breaches of the UN Convention Against Torture and other Cruel, Inhuman and Degrading Treatment, which I note Slovenia is a signatory to. Article 2 of the UN Convention Against Torture states: <sup>4</sup>

**1. Each State Party shall take effective legislative, administrative, judicial or other measures to prevent acts of torture in any territory under its jurisdiction.**

**2. No exceptional circumstances whatsoever, whether a state of war or a threat of war, internal political instability or any other public emergency, may be invoked as a justification of torture.**

**3. An order from a superior officer or a public authority may not be invoked as a justification of torture.**

## **Background**

By way of background, I am the CEO of the Waubra Foundation, which is a not for profit charity, established in Australia in 2010, to advocate for independent multidisciplinary research to investigate the reported health problems being reported by people exposed to infrasound and low frequency noise. <sup>5</sup> Sources of that environmental noise include machinery used in coal mining, turbines used in gas fired power stations, compressors used in refrigeration units and field compressors used in extraction and transportation of gas, as well as industrial horizontal bladed wind turbines. I have worked full time, pro bono for the Foundation since July 2010.

My previous occupation and professional training was in rural general practice, where I worked as a medical practitioner in rural and remote environments in Australia. <sup>6</sup>

I have been accepted to give expert evidence in legal tribunals on this subject in both my own country, Australia, and Canada, and have given evidence at multiple parliamentary inquiries in Australia. <sup>7 8 9</sup> I have been involved in facilitating multidisciplinary research and acoustic data collection in Australia, and have been actively collaborating with concerned health practitioners, researchers and acousticians internationally for four years.

## **What Distance Is Safe?**

We don't know.

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<sup>4</sup> <http://waubrafoundation.org.au/resources/un-convention-against-torture/>

<sup>5</sup> The objectives of the Waubra Foundation can be found here: <http://waubrafoundation.org.au/about/objectives/>

<sup>6</sup> <http://waubrafoundation.org.au/about/people/>

<sup>7</sup> <http://waubrafoundation.org.au/resources/senate-inquiry-social-economic-effect-rural-wind-farms/>

<sup>8</sup> <http://waubrafoundation.org.au/2011/waubra-foundation-evidence-first-senate-inquiry/>

<sup>9</sup> <http://waubrafoundation.org.au/2012/ceo-gives-evidence-at-senate-inquiry/>

The necessary research has not yet been done. Unlike most other products, where prior product safety is established, the wind industry has never been required to show there are no adverse health effects. It will become evident, below, that in fact the wind industry are well aware of the serious health problems their products directly cause, and indeed that they have known for thirty years.

Clinically, we know the impacts of chronic sleep deprivation and chronic stress increase over time with cumulative exposure. These effects from exposure to excessive environmental noise especially at night are very well known, and have been the subject of numerous reports from the World Health Organisation.<sup>10</sup>

We also know that serious adverse health effects including chronic severe sleep deprivation are being reported by residents living up to 10km away from 37 VESTAS V 90 wind turbines (approximately 130 metres from tower base to blade tip) located along a ridge top in Australia, at Waterloo Wind Development.<sup>11</sup> At that location, I am personally aware of the occupants of five households who have either permanently left their homes, or are forced to leave regularly in order to regain their health, some under the instruction of their treating health professionals, who have included local general practitioners (family physicians) or cardiologist. The turbines have been operating almost four years.

We also know that as wind turbines become more powerful power generators (taller towers and longer blades) that their sound energy shifts down to lower frequencies, below 200 Hz. As Danish Professor Henrik Moller pointed out in his paper in 2011, this will predictably cause more “annoyance” symptoms for the neighbours.<sup>12</sup> **Therefore a larger buffer distance will be required, if larger wind turbines are used, in order to protect people’s physical and mental health and sleep.**

We also know that when wind turbines are sited too close together, with insufficient inter turbine separation distances, that this will increase the generation of infrasound and low frequency noise from upwind bladed wind turbines,<sup>13</sup> and will therefore additionally increase the adverse health effects from “annoyance” symptoms, including repetitive sleep disturbance, which are directly caused by the infrasound and low frequency noise.

The recommended inter turbine spacing separation distance to minimize the generation of turbulence, accepted by acousticians based on aeronautical engineering knowledge has historically been 5 – 8 rotor diameters.<sup>14</sup> The three sites in Australia where population noise impact surveys have been conducted have all had almost all inter turbine separation distances significantly less than the recommended 5 – 8 rotor diameters. Those surveys are at Waterloo<sup>15</sup> (by Mrs Mary Morris), at Macarthur<sup>16</sup> (by Mrs Anne Schafer) and at Cullerin Range<sup>17</sup> (by Mrs Patina Schneider). This may partly explain the number of reports of sleep disturbance from the operating wind turbines, and the distance of impact.

This distance of 10km for reported acoustic impacts is consistent with my knowledge of the acoustic impact zone, from individual residents reports to me, which resulted in our Explicit Cautionary Notice in June 2011 with a ten km suggested buffer zone between wind turbines and homes.<sup>18</sup> Since then, residents who have

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<sup>10</sup> many of these important WHO literature reviews and others are accessible here:

<http://waubrafoundation.org.au/information/acousticians-noise-regulators/literature-reviews/>

<sup>11</sup> <http://waubrafoundation.org.au/resources/waterloo-wind-farm-survey-2012/>

<sup>12</sup> <http://waubrafoundation.org.au/resources/moller-pedersen-low-frequency-noise-from-large-wind-turbines/>

<sup>13</sup> <http://waubrafoundation.org.au/resources/shepherd-k-hubbard-h-noise-radiation-characteristics-westinghouse-wwg-0600-wind-turbine-generator/>

<sup>14</sup> personal communication with Dr Malcolm Swinbanks, UK Acoustician and confirmed with other acousticians from the US and Australia. 5-8 rotor diameters was accepted in the NSW Government’s Wind Energy Handbook in 2002

<http://waubrafoundation.org.au/resources/nsw-wind-energy-handbook-2002/>

<sup>15</sup> <http://waubrafoundation.org.au/resources/waterloo-wind-farm-survey-2012/>

<sup>16</sup> <http://waubrafoundation.org.au/resources/macarthur-wind-energy-facility-preliminary-survey/>

<sup>17</sup> <http://waubrafoundation.org.au/resources/schneider-p-cullerin-range-wind-farm-survey-follow-up-july-august-2013/>

<sup>18</sup> <http://waubrafoundation.org.au/about/explicit-cautionary-notice/>

become sensitized to these frequencies have reported they are noticing impacts out to 17 – 20 km<sup>19</sup> and in some instances even further, particularly at night, when they are downwind, when there is heavy cloud cover, or very cold air and a temperature inversion effect, and where there are multiple wind turbines. These are all acoustic and weather factors long known to acousticians to facilitate sound energy propagation. The residents' reports are consistent with this knowledge, yet most of the residents (who are generally farmers) have no background knowledge in acoustics – they simply report what they experience and the wind and weather conditions at the time.

I note that one of the acoustic consulting firms environmental assessment for a recent wind project proposal in Australia has acknowledged a distance of 10km from cumulative impacts. Marshall Day Acoustics in their report for RATCH re the Mt Emerald wind development have recently referred to 10km in the context of cumulative impacts from other wind developments, and they are now specifically referencing infrasound and low frequency noise. In section 5.6 they stated in their section "review of cumulative impact" (my emphasis in red):<sup>20</sup>

*"Separate wind farm developments that are in close proximity to each other have the potential to impact on the same receiver. It is therefore necessary to assess any potential cumulative noise impact on receivers, where such circumstances exist*  
*We understand that there are no other wind farm developments currently planned or operating **within 10km** of the proposed MEWF. On this basis, cumulative impacts of noise from more than one operating wind farm are not considered further."*

The existence of adverse health effects including repetitive sleep disturbance out to 10km has therefore been specifically confirmed with three population impact surveys conducted in Australia at the Cullerin Range, Waterloo and Macarthur wind developments, which were all presented as evidence in the Cherry Tree legal case in Victoria in October 2013. In that case, the two tribunal members specifically acknowledged the existence of adverse health effects including sleep deprivation in their comments,<sup>21</sup> despite eventually approving the development, "because it was government policy". In their orders in April 2013, they stated:

***" 116 There is evidence before the Tribunal that a number of people living close to wind farms suffer deleterious health effects. The evidence is both direct and anecdotal. There is a uniformity of description of these effects across a number of wind farms, both in south east Australia and North America. Residents complain of suffering sleep disturbance, feelings of anxiety upon awakening, headaches, pressure at the base of the neck and in the head and ears, nausea and loss of balance.***

***117 In some cases the impacts have been of such gravity that residents have been forced to abandon their homes.***

***118 On the basis of this evidence it is clear that some residents who live in close proximity to a wind farm experience the symptoms described, and that the experience is not simply imagined."***

The 2012 Waterloo survey by Mrs Morris submitted to the Cherry Tree Tribunal hearing was accepted as the only Australian research included in the recent National Health and Medical Research Council's (NHMRC) 2014 Systematic Literature Review. The other surveys, conducted in an identical manner by Schneider and Schafer for the Cherry Tree case were not completed in time for the NHMRC nominated cut off date for inclusion in its review (September, 2012), although that rule was inconsistently applied in the final NHMRC Literature review document.<sup>22</sup>

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<sup>19</sup> personal communication, wind turbine host David Mortimer, and Mrs Mary Morris

<sup>20</sup> [http://mtemeraldwindfarm.com.au/updates/mewf\\_eis\\_docs/R72894%20EIS%20MEWF%20Volume%203%20-%20Appendix%207%20-%20Mt%20Emerald%20Wind%20Farm%20-%20Noise%20Impact%20Assessment.pdf](http://mtemeraldwindfarm.com.au/updates/mewf_eis_docs/R72894%20EIS%20MEWF%20Volume%203%20-%20Appendix%207%20-%20Mt%20Emerald%20Wind%20Farm%20-%20Noise%20Impact%20Assessment.pdf)

<sup>21</sup> <http://waubrafoundation.org.au/resources/vcat-cherry-tree-wind-farm-hearing-orders/>

<sup>22</sup> <http://waubrafoundation.org.au/resources/waubra-foundation-open-letter-nhmrc-re-systematic-literature-review/>

Whilst there are serious concerns about the NHMRC 2014 Literature Review, with respect to the misclassification and exclusion of relevant studies, **the 2014 NHMRC systematic literature review did concede that there is research evidence of sleep disturbance / deprivation, “annoyance” symptoms and poorer quality of life in wind turbine neighbours.**<sup>23</sup>

Conflict of interest issues concerning a number of members of the NHMRC literature review panel have been identified, and remain unresolved. It would appear these conflicts of interest have indeed had an impact on some of the decisions made by that panel, particularly with respect to directing that certain research should not be considered by the literature review authors.<sup>24</sup>

These conflicts of interest are a serious matter, and were exposed in Parliament by two Federal Senators; Senator John Madigan<sup>25</sup> and Senator Chris Back,<sup>26</sup> who are both directly well aware of the adverse health effects experienced by wind turbine neighbours in Australia.

Other supportive relevant evidence, professional opinions and affidavits used in legal proceedings relating to the distance of impact issue are listed in Appendix 1, at the end of this letter.

### **Knowledge of Direct Causation Of “annoyance” Symptoms From ILFN in the 1980s**

Dr Neil Kelley’s research funded by the US Government in the 1980’s, performed in collaboration with multiple research universities and institutes including two separate branches of NASA and aeronautical faculties **established a direct causal relationship between wind turbine generated impulsive infrasound and low frequency noise and what were called “annoyance” symptoms, which included repetitive sleep disturbance and body vibrations.**<sup>27</sup>

The direct causal relationship between these frequencies and annoyance symptoms was later confirmed in a laboratory study, which Dr Neil Kelley reported to the American Wind Energy Association conference in 1987.<sup>28</sup> This research resulted in a significant change to the design of horizontal axis wind turbines from downwind bladed to upwind bladed, in order to prevent or minimize the generation of these frequencies, because of their known, established, adverse health effects.

Subsequent research by NASA researchers Shepherd and Hubbard in 1989 established that the new upwind bladed wind turbines could also generate surprisingly elevated levels of infrasound and low frequency noise, when the incoming air was turbulent.<sup>29</sup> Turbulent air is inevitable when wind turbines are sited too close together, hence the critical importance of ensuring sufficient inter turbine separation distances of at least 5-8 rotor diameters, mentioned previously.

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<sup>23</sup> further background and access to the NHMRC literature review is available here:

<http://waubrafoundation.org.au/resources/responses-nhmrc-draft-information-paper-systematic-literature-review/>

<sup>24</sup> <http://waubrafoundation.org.au/resources/waubra-foundation-open-letter-nhmrc-re-systematic-literature-review/>

<sup>25</sup> <http://waubrafoundation.org.au/resources/nhmrc-ceo-prof-anderson-questioned-about-draft-review-by-senate/>

<sup>26</sup> <http://waubrafoundation.org.au/resources/senator-chris-back-questions-evidence-from-vested-interests-at-planning-review-hearings/>

<sup>27</sup> The relevant studies can be accessed from our Explicit Warning Notice <http://waubrafoundation.org.au/2013/explicit-warning-notice/> in addition to the 1982 Kelley et al research paper comparing acoustic emissions and their impacts from a wind turbine and a gas fired power station turbine <http://waubrafoundation.org.au/resources/kelley-et-al-methodology-for-assessment-wind-turbine-noise-generation-1982/> .

<sup>28</sup> <http://waubrafoundation.org.au/resources/1987-problem-with-low-frequency-noise-from-wind-turbines-scientifically-identified/>

<sup>29</sup> <http://waubrafoundation.org.au/resources/shepherd-k-hubbard-h-noise-radiation-characteristics-westinghouse-wwg-0600-wind-turbine-generator/> further explained by UK Acoustician Dr Malcolm Swinbanks: <http://waubrafoundation.org.au/resources/swinbanks-m-nasa-langley-wind-turbine-noise-research/>

However, as you know, from experiences already reported by neighbours to turbines in Slovenia, a single smaller wind turbine can cause the generation of infrasound and low frequency noise, particularly as the blade passes the tower, so one turbine can be enough to cause serious health problems for neighbours who become sensitized to the lower frequency sound energy, if it is sited too close.

### **Are “Annoyance” Symptoms The Same As “Wind Turbine Syndrome”?**

I am aware that Dr Nina Pierpont has already written to you on this subject <sup>30</sup> and confirmed that in her opinion, “Wind Turbine Syndrome”, long denied by the wind industry and some of its vocal supporters in Public Health to exist, has the same symptoms as “annoyance” symptoms, which were reported by Dr Neil Kelley’s research participants, and which have been long known to acousticians working particularly in the area of low frequency noise.

These symptoms were listed by Dr Pierpont in her study <sup>31</sup> and the executive summary, <sup>32</sup> and include sleep deprivation, along with a variety of other disabling symptoms such as severe nausea, vertigo, tinnitus, body vibrations, anxiety symptoms, and numerous other symptoms documented consistently by the various researchers and medical practitioners who have treated these people, which also include physiological stress symptoms.

There are an increasing number of health and acoustics professionals and researchers with direct knowledge of the severity of the reported health problems who are also using the phrase “Wind Turbine Syndrome” to describe the symptoms. These include most recently Dr Colette Bonner, the Deputy Chief Medical Officer for Ireland, <sup>33</sup> and Dr Steven Rauch, Harvard Medical School Professor, and Director of the Massachusetts Eye and Ear “Clinical Balance and Vestibular Centre”. Dr Rauch was recently reported in an article as follows: <sup>34</sup>

*Dr Steven Rauch, an otologist at the Massachusetts Eye and Ear Infirmary, and a professor at Harvard Medical School, believes WTS is real. Patients who have come to him to discuss WTS suffer from a “very consistent” collection of symptoms, he says. Rauch compares WTS to migraines, adding that people who suffer from migraines are among the most susceptible to turbines. There’s no existing test of either condition but “nobody questions whether or not migraine is real.”*

*“The patients deserve the benefit of the doubt,” Rauch says. “It’s clear from the documents that come out of the industry that they’re trying very hard to suppress the notion of WTS and they’ve done it in a way that [involves] a lot of blaming the victim.”*

I note that British Acoustician Dr Geoffrey Leventhall who consults extensively for the wind industry, has acknowledged that these symptoms of “annoyance” caused by exposure to environmental noise, are identical to the symptoms of “wind turbine syndrome” and further, that the symptoms have been known to him for years. This view is reinforced by the contents of the Literature Review written by Dr Leventhall for the UK Government Department of Environment, Food and Rural Affairs (DEFRA) in 2003. <sup>35</sup>

I have heard Dr Leventhall acknowledge this specific point that the “annoyance” symptoms are identical to “wind turbine syndrome” symptoms in a presentation he gave, via video link, to a workshop run by the National Health and Medical Research Council, in June 2011 in Canberra. The link to the presentation and powerpoint presentation are available on the National Health and Medical Research Council’s website. <sup>36</sup>

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<sup>30</sup> <http://www.windturbinesyndrome.com/2014/nina-pierpont-to-slovenia-beware-of-wind-turbine-syndrome/>

<sup>31</sup> <http://waubrafoundation.org.au/resources/dr-nina-pierpont-submission-australian-senate-inquiry/>

<sup>32</sup> <http://waubrafoundation.org.au/resources/wind-turbine-syndrome-executive-summary/>

<sup>33</sup> <http://waubrafoundation.org.au/2014/warning-over-wind-turbine-syndrome-irish-deputy-chief-health-officer/>

<sup>34</sup> <http://waubrafoundation.org.au/2014/big-wind-needs-address-wind-turbine-syndrome-stop-blaming-victims/>

<sup>35</sup> <http://waubrafoundation.org.au/resources/review-published-research-low-frequency-noise-leventhall/>

<sup>36</sup> <https://www.nhmrc.gov.au/media/events/2011/wind-farms-and-human-health-scientific-forum-7-june-2011>

So, to summarise, the key points so far:

1. There is agreement amongst the leading Acoustician used by the wind industry, and a growing number of medical practitioners, including senior government medical practitioners and leading clinicians that “Wind Turbine Syndrome” symptoms exist, and are caused by wind turbine acoustic emissions, and that they include sleep disturbance.
2. There is research from 30 years ago which established a *direct causal relationship* between acoustic emissions in the infrasound and low frequency noise range and “annoyance” symptoms including sleep disturbance.
3. Sleep disturbance, if prolonged, will lead to chronic sleep deprivation.
4. The clinical consequences of sleep deprivation are well known, are deleterious for both mental and physical health, and have been well documented in the research literature including the WHO.
5. Sleep deprivation is acknowledged as a method of torture, which the UN Convention against Torture prohibits, under any circumstances, even in war, and the order of a superior cannot be used to excuse culpability for allowing it to occur, or to continue. Criminal sanctions apply.

Recent acoustic survey research by Australian independent acoustician Steven Cooper, commissioned by wind developer Pacific Hydro, and conducted in collaboration with three households at Cape Bridgewater in Victoria, has provided further confirmation of the work by Dr Neil Kelley. The preliminary results of this work are publicly available on Pacific Hydro’s website, and are explained in a recent media article by Australian journalist Graham Lloyd.<sup>37</sup> In the case of one research participant, there was 100% accuracy with her predictions about whether or not the turbines were operating, based on her perceptions inside the home. This resident is partially deaf, and like others, has become progressively more sensitized to the emissions, over the five years the turbines have been operating.<sup>38</sup>

### What About The Wind Industry Assertions About The “Nocebo Effect” causing the symptoms?

This recent Cape Bridgewater evidence from research commissioned by Pacific Hydro, conducted by Steven Cooper, and that of the US Research in the 1980’s led by Dr Neil Kelley (well known for thirty years to the global wind industry), are in direct contrast to the unproven assertions by the wind industry and some of its vocal supporters that a “nocebo effect” is responsible for the symptoms being reported by the residents.<sup>39</sup> A nocebo effect can be summarized as the assertion that publicity about the symptoms is itself causing them.

As Australia’s National Health and Research Council’s recent Systematic Literature Review acknowledged, there is no research evidence (collected from the residents reporting the symptoms), to support a “nocebo effect” being responsible for the resident’s symptoms.<sup>40</sup>

I further note Dr Michael Nissenbaum’s salutary warning that such a diagnosis of “nocebo effect” in the absence of a proper investigation to determine the cause of the reported symptoms, would lead to a charge of professional misconduct by the health practitioner making that diagnosis in most western medical systems. As Dr Nissenbaum also points out, non medical practitioners (such as some in public health who are proposing these theories) do not have such legal obligations to their patients.<sup>41</sup>

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<sup>37</sup> <http://waubrafoundation.org.au/resources/lloyd-g-headache-for-residents-after-monitoring-reveals-bad-vibes-cape-bridgewater/>

<sup>38</sup> personal communication

<sup>39</sup> <http://waubrafoundation.org.au/resources/chapmans-et-al-evidence-for-psychogenic-communicated-disease-hypothesis/>, <http://waubrafoundation.org.au/resources/crichtonf-et-al-can-expectations-produce-symptoms-infrasound-and-wind-turbines/> and <http://waubrafoundation.org.au/resources/critical-analysis-accuracy-complaints-data-from-chapman-et-al-nocebo-research/>

<sup>40</sup> p 164 of the 2014 NHMRC Systematic Literature Review, available here:

<http://waubrafoundation.org.au/resources/responses-nhmrc-draft-information-paper-systematic-literature-review/>

<sup>41</sup> <http://waubrafoundation.org.au/resources/dr-michael-nissenbaum-annoyance-nocebo-effect-sleep-deprivation/>

The leading proponent of the nocebo effect hypothesis is a Professor of Public Health at Sydney University with a background in sociology and epidemiology, and an expert advisor to the Climate and Health Alliance.<sup>42</sup> Professor Simon Chapman is not a health practitioner, and has no clinical training or legal responsibilities including a duty of care to patients.

Professor Chapman's active role in assisting a wind turbine product manufacturer (VESTAS) launch a global denial of any adverse health effects from its products, when VESTAS own engineer Erik Sloth had stated otherwise ten years earlier and had specifically mentioned the need for research and safer buffer distances, gives cause for concern.<sup>43</sup>

### **Can The Frequencies be Prevented From Entering Homes?**

There is no known way of preventing large industrial upwind bladed horizontal axis wind turbines from generating these frequencies, because they are generated every time the turbine blades pass the tower. In other words, they are an inherent design constraint of horizontal axis wind turbines.<sup>44</sup>

Steven Cooper's work<sup>45</sup> together with work by another Australian Acoustician Les Huson<sup>46</sup> has also suggested that in some locations, vibration caused by the tower resonating in the wind, without the blades turning, is also generating frequencies in the infrasound and low frequency noise range. It is possible that these frequencies may themselves also be causing symptoms and sensations for some people, as they are being reported by some particularly sensitized people when the turbine blades are not turning but the frequencies are still present.

**There is no known way currently to prevent these very low frequencies entering building structures and impacting adversely on humans.**

**The only way to prevent the symptoms including chronic sleep disturbance and consequent severe cumulative sleep deprivation from long term exposure is to ensure the wind turbines are *sited far enough away from homes and workplaces*, so people do not become progressively sensitized to the sound and vibration energy, and adversely impacted by it, especially with respect to their sleep.**

### **The Problem of Increasing Sensitisation**

Dr Leventhall<sup>47</sup> and Dr Neil Kelley<sup>48</sup> have both acknowledged historically that increasing sensitization is known to be a problem with prolonged exposure to ILFN. More recently, ENT specialist Dr Amir Farboud and his colleagues from the United Kingdom have also raised this issue, and speculated as to the possible mechanisms.<sup>49</sup>

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<sup>42</sup> <http://caha.org.au/about/governance/>

<sup>43</sup> <http://waubrafoundation.org.au/2014/public-statement-home-abandonment-due-environmental-noise-pollution/>

<sup>44</sup> <http://waubrafoundation.org.au/resources/definitive-document-wind-turbine-noise-simple-statement-facts-august-2014/>

<sup>45</sup> <http://waubrafoundation.org.au/resources/lloyd-g-headache-for-residents-after-monitoring-reveals-bad-vibes-cape-bridgewater/> and <http://www.pacifichydro.com.au/english/our-communities/communities/cape-bridgewater-acoustic-testing-presentation/?language=en>

<sup>46</sup> personal communication, presented as evidence to the Cherry Tree Tribunal hearing in October 2013.

<sup>47</sup> <http://waubrafoundation.org.au/resources/review-published-research-low-frequency-noise-leventhall/>

<sup>48</sup> <http://waubrafoundation.org.au/resources/kelley-et-al-1985-acoustic-noise-associated-with-mod-1-wind-turbine/> on page 199, see also <http://waubrafoundation.org.au/information/acousticians-noise-regulators/acoustic-field-surveys/>.

<sup>49</sup> <http://waubrafoundation.org.au/resources/wind-turbine-syndrome-fact-or-fiction-farboud-et-al/>



**In other words, people “do not get used to” or habituate to the low frequency sound energy – rather they become more adversely affected with prolonged exposure, unless they can remove themselves from the environment, OR the noise source is turned off.**

This fact adds strength to the call for adequate buffer distances, in order to protect the health of the community.

The wind industry itself acknowledged the need for adequate buffer distances in 2004, in a VESTAS presentation to the Australian Wind Energy Association, (later the Clean Energy Council). VESTAS engineer Erik Sloth conceded that the noise models used at that time were not accurate, and that there was a need for adequate buffer distances, and a need for more research.<sup>50</sup>

Industrial wind turbines have increased significantly in size since this presentation was given, ten years ago. As previously stated, Professor Henrik Moller’s research clearly showed that as the power generating capacity of the wind turbines increase, so too does the proportion of sound energy in the low frequency and infrasonic range, and therefore it can be predicted there will be more “annoyance” symptoms for the neighbours.<sup>51</sup>

### **Concluding remarks**

All Slovenian public officials, including politicians and public servants, who are involved in approving these projects, and responsible for health and noise pollution regulation subsequently, need to be mindful of the obligations of Slovenia from the UN Convention Against Torture.

They need to ensure they are aware of the very latest research in this area, as well as historical research from thirty years ago, which clearly demonstrated a direct causal link between wind turbine generated impulsive infrasound and low frequency noise and serious adverse health effects, known as “annoyance”.

**If this particular project is approved, with such large powerful wind turbines so close to homes, it is inevitable that some Slovenian residents will be seriously harmed, from the consequences of cumulative sleep disturbance and long term sleep deprivation alone. This is regardless of what other symptoms individual residents may develop because of individual pre existing vulnerabilities or risk factors, identified by Dr Pierpont’s research, and confirmed or acknowledged by others since including Dr Leventhall (namely extremes of age, migraines, motion sickness and existing inner ear pathology).**

I am happy to provide further specific information on request.

Yours sincerely



Sarah Laurie,  
Bachelor of Medicine, Bachelor of Surgery, Flinders University, 1995  
CEO, Waubra Foundation

**See following pages for the list of attachments to this letter, and for the appendix.**

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<sup>50</sup> <http://waubrafoundation.org.au/resources/what-vestas-and-wind-industry-knew-about-inadequate-noise-prediction-models-auswea-2004/>

<sup>51</sup> <http://waubrafoundation.org.au/resources/moller-pedersen-low-frequency-noise-from-large-wind-turbines/>

## Attachments (downloadable at the following links)

Waubra Foundation: Recent Summary of Adverse Health Effects, 1<sup>st</sup> June, 2014

<http://waubrafoundation.org.au/resources/wind-turbine-noise-adverse-health-effects-june-2014/>

Waubra Foundation: Open letter to NHMRC re flaws in 2014 Systematic Literature Review, 2014

<http://waubrafoundation.org.au/resources/waubra-foundation-open-letter-nhmrc-re-systematic-literature-review/>

Waubra Foundation: Submission to the Australian Federal Government RET Review, 2014

<http://waubrafoundation.org.au/resources/renewable-energy-target-review-waubra-foundation-submission-2014/>

Explicit Cautionary Notice

<http://waubrafoundation.org.au/about/explicit-cautionary-notice/>

Explicit Warning Notice

<http://waubrafoundation.org.au/2013/explicit-warning-notice/>

Letter to AMA and recent literature review, Emeritus Professor Alun Evans, Epidemiologist, Ireland, 2014

<http://waubrafoundation.org.au/resources/evans-prof-emeritus-alun-dismiss-any-adverse-effects-absurd-view-mounting-evidence/>

Letter to AMA by Swedish Otoneurologist Dr Hakan Enbom

<http://waubrafoundation.org.au/resources/enbom-h-infrasound-from-wind-turbines-can-trigger-migraine-and-related-symptoms/>

Letter to AMA from Danish Occupational Health Physician, Dr Mauri Johansson, 2014

<http://waubrafoundation.org.au/resources/johansson-dr-mauri-m-d-highly-alarming-position-paper-from-medical-association-ama/>

Letter to AMA from Professor Robert McMurtry, Canada, 2014

<http://waubrafoundation.org.au/resources/prof-robert-mcmurtry-former-dean-medicine-writes-ama/>

Letter to AMA from NZ scientist Dr Bruce Rapley, New Zealand. 2014

<http://waubrafoundation.org.au/resources/rapley-b-letter-ama-audibility-and-effects-infrasound/>

Article by Professor Salt and Professor Lichtenhan in the Winter Edition of Acoustics Today, 2014

<http://waubrafoundation.org.au/resources/salt-n-lichtenhan-j-t-how-does-wind-turbine-noise-affect-people/>

Physicians for Human Rights, "**Leave No Marks**" 2007 with particular reference to pp 22 – 26 relating to the use of sleep deprivation and sensory bombardment with noise as methods of torture

<http://physiciansforhumanrights.org/library/reports/leave-no-marks-report-2007.html>

## **Appendix 1 - Evidence for 10km acoustic impact zone from 2 – 3 MW turbines**

Waubra Foundation's Explicit Cautionary Notice, June 2011 first mentioned problems out to 10km  
<http://waubrafoundation.org.au/about/explicit-cautionary-notice/>

### **Acoustic evidence of wind turbine noise extending out to 10km**

NASA research from **1985** by William Willshire

<http://waubrafoundation.org.au/resources/nasa-long-range-down-wind-propagation-low-frequency-sound/>

Professor Colin Hansen's ongoing work relating to wind turbine noise out to 10km from Waterloo wind turbines is not yet published, however his opinion based on acoustic evidence was included in his letter to the Victorian Department of Health, regarding false and misleading statements about infrasound in their technical document issued in 2013

<http://waubrafoundation.org.au/resources/prof-colin-hansen-writes-victorian-dept-health-recent-wind-farms-health-doc/>

Steven Cooper's acoustic data from Waterloo wind development (8km)

<http://waubrafoundation.org.au/resources/are-wind-farms-too-close-communities/>

Mr Les Huson's expert evidence from the Cherry Tree case, relating to Macarthur, where he found that there was no attenuation of infrasound between 1.8km and 6.4 km from the nearest wind turbines, indicating that wind turbine generated infrasound will be travelling for very large distances (much greater than 10km)

<http://waubrafoundation.org.au/resources/huson-l-expert-evidence-at-vcat-cherry-tree-hearing/>

**The various population noise impact surveys done in Australia are here:**

<http://waubrafoundation.org.au/library/community-noise-impact-surveys/>

### **Waterloo, South Australia – VESTAS V 90 (37 along a ridge)**

Mrs Mary Morris's 2012 survey conducted at Waterloo in South Australia. This survey was the only Australian research included in the 2014 NHMRC Systematic Literature Review

<http://waubrafoundation.org.au/resources/waterloo-wind-farm-survey-2012/>

This 2012 survey by Mrs Morris was based on one conducted in 2011 by Frank Wang, an Adelaide University Masters student, but the population surveyed in Wang's survey was only out to 5km

<http://waubrafoundation.org.au/resources/evaluation-wind-farm-noise-policies-south-australia/>

Mrs Morris then compiled this information in 2013 showing what happened when the turbines at Waterloo were off for a week <http://waubrafoundation.org.au/resources/morris-m-waterloo-case-series-preliminary-report/>

### **Cullerin Range, NSW, 2 MW Repower turbines, sited on a ridge**

Mrs Schneider's 2012 and 2013 population noise impact surveys show the extent of the sleep deprivation. Nothing has been done about the severe night time noise related sleep disturbance and adverse health impact for these NSW residents by any NSW government department, despite many complaints which are documented in the 2013 survey.

<http://waubrafoundation.org.au/resources/cullerin-range-wind-farm-survey-august-2012/>

<http://waubrafoundation.org.au/resources/schneider-p-cullerin-range-wind-farm-survey-follow-up-july-august-2013/>

## **Macarthur Wind Development, 140 3 MW V 112 VESTAS wind turbines, sited on flat land in Victoria**

This survey was conducted only 6 months since the wind development commenced operating. Residents report being far more adversely impacted now, because of the predictable and known adverse cumulative health effects of chronic sleep deprivation and chronic stress.

<http://waubrafoundation.org.au/resources/macarthur-wind-energy-facility-preliminary-survey/>

Evidence from Macarthur Wind Development Residents and acoustician Mr Les Huson was heard during the Cherry Tree Court case before the Victorian Civil Administrative Appeal Tribunal in 2013. Links to affidavits from Macarthur residents relating to that court case are below:

Mrs Maria Linke (lives 5km away, with her husband and four children – sleep adverse affected immediately)

<http://waubrafoundation.org.au/resources/linke-m-witness-statement-vcac-cherry-tree-hearing/>

Mrs Jan Hetherington, widow, glass artist, working from her home 3km away from nearest wind turbine

<http://waubrafoundation.org.au/resources/hetherington-j-witness-statement-vcac-cherry-tree-tribunal/>

Mr Andrew Gardner, Farmer, home is 1.8km away from nearest wind turbine

<http://waubrafoundation.org.au/resources/gardner-statement-vcac-cherry-tree-hearing/> (1.8km away)