

Responsible Setbacks

Protecting Albertans From Industrial Wind Turbines



Infrasound is “a huge problem for all forms of organisms,” and that “With ever larger wind turbines, the frequencies are getting lower and lower. This makes infrasound more problematic and dangerous” and is “a huge, previously unrecognized threat to the entire biodiversity.”

—Dr. Ursula Bellut-Staeck, *Epoch Times*, March 23, 2024

The Law

Alberta’s Environmental Protection and Enhancement Act explicitly applies to an:

“adverse effect” [causing] impairment of or damage to the environment, human health or safety or property’ [Sec 1, Definitions (b)] (via)... any sound, vibration, heat, radiation or other form of energy....” [Sec. 1, (ii), mmm]

The Facts

Industrial Wind Turbines (IWTs) generate not only audible sound but *infrasound*, which is felt but not heard.¹ These inaudible pulsations have been detected from wind “farms” up to 90km away.²

Infrasound from IWTs has been definitively associated with adverse health effects (AHEs) on humans and animals alike according to numerous studies and court cases:³⁴⁵⁶⁷⁸

Bradford Hill (BH) criteria have been widely used to establish causality between an environmental agent and risk of disease or disability... Applying the BH criteria to the IWT-related clinical, biological, and experimental data

¹ <https://www.windconcernsontario.ca/wp-content/uploads/2021/04/Report-on-Noise-Complaint-Response-2018-FINAL.pdf>

² “On infrasound generated by wind farms and its propagation in low-altitude tropospheric waveguides”, August 21, 2015, Marcillo et al

³ <https://www.connexionfrance.com/news/french-court-finds-wind-farm-as-source-of-health-issues-for-residents/445287>

⁴ <https://www.theage.com.au/national/victoria/farmers-win-wind-farm-battle-court-rules-turbines-too-noisy-20220325-p5a7ve.html>

⁵ <https://www.earthisland.org/journal/index.php/articles/entry/indigenous-sami-win-landmark-case-against-wind-power/>

⁶ <https://www.irisht Examiner.com/news/arid-30970057.html>

⁷ <https://www.independent.ie/irish-news/landmark-wind-turbine-noise-ruling-from-high-court-referred-to-attorney-general/a596207135.html#:~:text=The%20ruling%20found%20that%20turbine,their%20homes%20and%20daily%20lives.>

⁸ <https://www.windconcerns.com/france-historic-decision-halts-wind-development/>

demonstrates that the exposure to IWTs is associated with an increased risk of AHEs. This analysis concludes that living or working near IWTs can result in AHEs in both people and animals. — *Wind turbines and adverse health effects - Applying Bradford Hill's criteria for Causation*, 2021, Dumbrille et al⁹

Twelve different health problems associated with WTS [Wind Turbine Syndrome] range from tachycardia, sleep disturbance, headaches, tinnitus, nausea, visual blurring, panic attacks with sensations of internal quivering to more general irritability. AHEs in animals that have been attributed to proximity of IWTs include reproduction and teratogenic effects in the USA, Canada, Denmark, and Japan; deformities in Portugal; mortalities in Canada, France, and Taiwan; stress in the UK; and other effects.¹⁰¹¹

In an environmental review in Ontario in 2011, the Tribunal determined:

...the debate should not be simplified to one about whether wind turbines can cause harm to humans. The evidence presented to the Tribunal demonstrates that they can, if facilities are placed too close to residents. The debate has now evolved to one of degree. The question that should be asked is: What protections, such as permissible noise levels or setback distances, are appropriate to protect human health? — Environmental Review Tribunal, Case Nos.: 10-121/10-122 Erickson v. Director, Ministry of the Environment, July 18, 2011, p. 207

⁹ https://journals.lww.com/endi/fulltext/2021/06030/wind_turbines_and_adverse_health_effects__applying.1.aspx

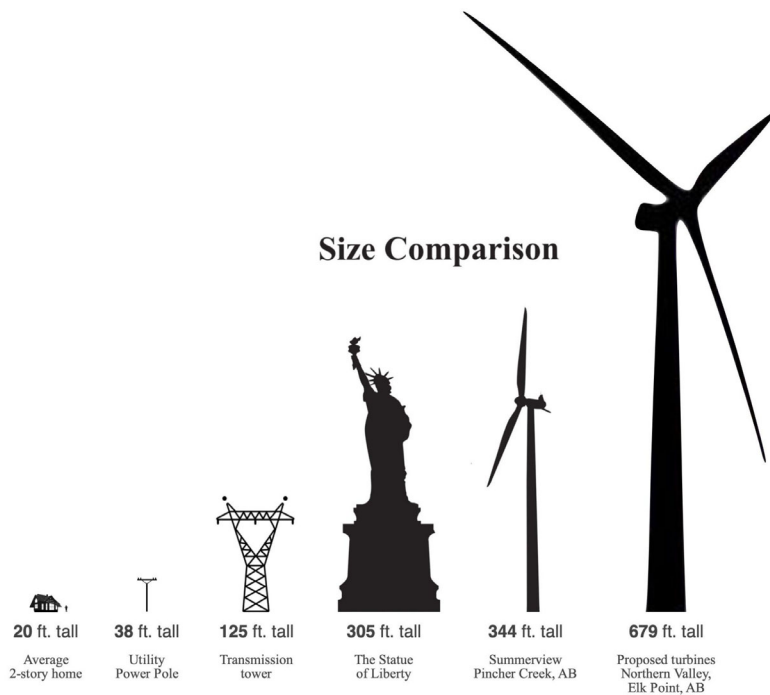
¹⁰ https://journals.lww.com/endi/fulltext/2021/06030/wind_turbines_and_adverse_health_effects__applying.1.aspx

¹¹ A landmark German study (2017) which found “changes of brain activity across several regions in response to prolonged near-threshold IS (infrasound sound)” associated with “formation of several full-blown medical symptoms ranging from sleep disturbances, headache and dizziness, over tinnitus and hyperacusis, to panic attacks and depression, which have been reported to occur more frequently in people living close to wind parks.” (Altered cortical and subcortical connectivity due to infrasound administered near the hearing threshold – Evidence from fMRI; <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5389622/>)

Setbacks — Size Matters

Danish Acousticians Moller & Pedersen published in the peer reviewed *Journal of the Acoustical Society of America* that **larger turbines emit more low frequency**

noise proportionately compared to smaller turbines, based on actual noise measurements, rather than models.¹²



Professor Mariana Alves-Pereira, an expert on infrasound, observed that **people who live near the bigger wind turbines develop more quickly and more intense health problems than people who live near smaller wind turbines** putting people into “impossible situations”.¹³

Most earlier studies are on much smaller turbines (120-150m) rather than those slated for new projects in Alberta where tower sizes are reaching over 200m, and planned to be erected close to acreages and generational farmhouses. This is essentially an experiment on Albertans.

¹² “The relative amount of low-frequency noise is higher for large turbines (2.3–3.6 MW) than for small turbines (≤ 2 MW), and the difference is statistically significant...”. Moller H, Pedersen CS, Low Frequency Noise from Large Wind Turbines in J. Acous. Soc. of Am. 129 (6) June 2011 pp 3727-3744

¹³ ¹³ Professor Mariana Alves-Pereira, “Infrasound and Low Frequency Noise (ILFN)”, cf. <https://youtu.be/M83SReL9WrI?t=942>

Setbacks — A Science-Based Answer

How far away, then, should industrial wind turbines be set back from human and animal populations? The science on...

15-20km

- Wind Turbine Syndrome was found to cause ill health effects **up to 15km and diminishing up to 20km in a recent study** by the Finnish Association for Environmental Health in 2016-2019.¹⁴
- Professor Mariana Alves-Pereira, PhD: **“I personally would not live 20km away from them... We have identified the wind turbine acoustic signature in a home 12km away from the closest wind turbine.”**¹⁵

German study documents infrasound to 20km.¹⁶

5-10km

- Dr. Sarah Laurie, MD found “Specifically, **hypertension in conjunction with turbine operation up to 5km away, and body vibrations and nocturnal wakening in a panicked state up to 10km away**” and called for **“an immediate temporary halt in construction of wind turbines closer than 10km to human habitation.”**¹⁷

¹⁴ Mehtätalo et al. 2019, <https://suomenymparistoterveys.files.wordpress.com/2019/01/syte-pilot-study-2016-2.pdf>

¹⁵ Professor Mariana Alves-Pereira, PhD, Environmental sciences expert: “Infrasound and Low Frequency Noise (ILFN)”

¹⁶ “Wind turbine infrasound as a weapon”, 2019; <https://www.youtube.com/watch?v=ibsxVKU6B8s>

¹⁷ ¹⁷ Dr. Sarah Laurie, MD, February 10, 2011, cf. “Submission to the Australian Federal Senate Inquiry on Rural Wind Farms”, p. 8

- Acoustician Steven Cooper of the European Acoustics Association Technical Committee on Noise “found residents could identify pulsations [infrasound] from the wind farm even though it could not be heard.” “If one restricts the **catchment area for a community to be within 10 km of a wind farm...** then on the restricted catchment area on a statistical basis there is a high proportion of the community being affected.”¹⁸
- Supporting a minimum five kilometre setback: “Distance to wind turbines was also found to be strongly associated with increased annoyance... This suggests that the odds of reporting being annoyed by a turbine are reduced by about 20% for every kilometer a person lives further away from a wind turbine.”¹⁹
- “Self-reporting health surveys in Australia, Canada, the Netherlands, New Zealand, the United Kingdom, and the USA have also been conducted. **Individuals residing up to 7.5 km from IWTs reported similar AHEs in the different countries.**”²⁰
- “...there is increasing evidence that the adverse events reported by those living at least 10 km from IWTs could in part be the result of infrasound emitted by the turbines.”²¹

¹⁸ <https://www.masterresource.org/windpower-health-effects/sensing-not-hearing-problem-wind-turbine-noise-interview-acoustician-steven-cooper-au/>

¹⁹ “Using residential proximity to wind turbines as an alternative exposure measure to investigate the association between wind turbines and human health”, Rebecca Barry; Sandra I. Sulsky; Nancy Kreiger; <https://pubs.aip.org/asa/jasa/article-abstract/143/6/3278/913570/Using-residential-proximity-to-wind-turbines-as-an>

²⁰ https://journals.lww.com/endi/fulltext/2021/06030/wind_turbines_and_adverse_health_effects__applying.1.aspx

²¹ https://journals.lww.com/endi/fulltext/2021/06030/wind_turbines_and_adverse_health_effects__applying.1.aspx

How Far Away is Safe?

Given the aforementioned studies, warnings, and successful court cases, and given the adverse impacts on wildlife, there is really no safe place for industrial wind turbines other than completely barren lands or desert regions.

According to the most current science, given the current offshore-sized turbines being proposed in rural Alberta communities, an absolute minimum of **5km would push industrial wind turbines away from most human populations**, while **15km would ensure the safety of Albertans forced to live in the vicinity of industrial wind**.

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