



**association to protect
AMHERST ISLAND**

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Summary prepared by APAI

**ERB 012-0774 - Critique of Algonquin Power Co.'s Position on Adverse Health Effects of
Wind Turbine Noise**

by Robert McMurtry, CM, MD, FRSCS, FACS

HEALTH ASSESSMENT

This summary has been prepared by the Association to Protect Amherst Island which takes responsibility for any errors and omissions. Dr. McMurtry's critique is fully referenced and contains important appendices.

Algonquin Power Co. (APCo) has a contract with Intrinsic Environmental Sciences Inc. to review the adverse health effects of wind turbine noise. The review was based upon a peer-reviewed paper written by L. D. Knopper and C. A. Ollson and published in Environmental Health in 2011. The review was presented in poster-board form at the December 2011 Windlectric public meetings and again at the second open house in March 2013.

Dr. McMurtry has written a 2-part critique of the Knopper-Ollson paper (K & O) and its conclusions. In Part I, Dr. McMurtry confronts the paper itself. Part II details errors of omissions, errors of commission and reviews of literature not available when the 2011 paper was written and which may or may not be included in the presentation at the second public meeting. There follows a number of appendices.

Dr. McMurtry's critique was written following the second Windlectric open house held in March 2013. It was submitted to the Ministry of the Environment as a response to the draft Renewable Energy Approval documents. Please see the APAI 2014 critique of the Windlectric position on the adverse health impacts of turbine noise for more recent publications.

Part I

Dr. McMurtry first makes the point that although Drs. Knopper and Ollson have a credible basis of scholarship to review scientific literature they are not licensed health care practitioners or clinician scientists and should not have ventured into the sphere of health-care practitioners (e.g. diagnosis, pathogenesis and treatment recommendations).

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After a general introduction to the strengths and weaknesses of the paper Dr. McMurtry turns to the 5 key points raised by Knopper and Ollson.

1. K&O acknowledge that past research showed that annoyance increases linearly with the sound pressure level at the home. However, they write that there is not the same linear dependence of sleep disturbance. Dr. McMurtry makes the point here that sleep disturbance is difficult to self-report. A sleep specialist has noted that people are not aware of arousals that occur during the night.
2. K & O follow up speculation by an author that “the causal relationship between wind turbine noise and stress may be explained by cognitive stress theory” to the more emphatic assertion “that it is the change in the environment that is associated with the self-reported health effects, not the presence of the wind turbines themselves”. Dr. McMurtry takes exception to this assertion on the grounds that the authors are not in a position to make a diagnosis and that in any case there has been no direct evaluation of those adversely affected.
3. K & O try to diminish the impact of the observed linear relationship between annoyance and turbine noise by invoking attitude to visual impact and attitude to wind turbines. As support for the latter, they quote the much reduced reporting of annoyance by participating home-owners (those with a signed lease on their land). Dr. McMurtry does not find this surprising. He lists occupations (NFL players, miners ...) with risks that are knowingly accepted. He notes that complaints may be fewer but it cannot be claimed that there will not be adverse health effects in the future. The attitude to visual impact is a smoke-screen.
4. Dr. McMurtry acknowledges that wind turbines are not likely to induce photo-induced fits in epileptics.
5. Concerning infrasound and low frequency noise (ILFN), K & O quote just one study that measured IFLN in two houses and found it to be below the regulated level. Dr. McMurtry asks why the extensive review by Howe et al. for the Ontario government was not discussed. This would have been available to K & O.

Other points that Dr. McMurtry makes in Part 1 include the following:

- K & O's notion that the study by Nissenbaum et al. in Maine is flawed has been laid to rest by its subsequent publication in a peer-reviewed scientific journal. This study demonstrated that residents living within 1.4 km of a turbine had worse sleep, were sleepier during the day and had worse mental health scores compared to those living further away.

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- Dr. McMurtry disagrees with K & O's claim that IFLN has been accounted for by using the dBA scale to describe turbine noise. He backs up his argument by quoting from a 2003 paper by Geoff Leventhall¹:
“When prominent low frequency components are present, noise measures based on A-weighting are inappropriate.”
“It should be noted that a large proportion of low frequency components in a noise may increase considerably the adverse effects on health.”
- In their conclusion K & O state that there is no peer-reviewed demonstration of direct physiological effects from living in proximity to turbines. In addition to the discussion above Dr. McMurtry finds the conclusion to be flawed on the following ground: Given the wealth of anecdotal evidence and the precautionary principle, the correct response is that absence of evidence does not mean that there will not be evidence in the future. There is need for further research. Fortunately, since the publication of K & O, this research is well underway.

Part II

This part starts with eleven significant omissions that were available at the time that the K & O paper was written:

- Transcript of evidence by Dr. Rachamin from the Chatham Tribunal (which was referenced).
- That the Ontario noise regulation allows a noise limit of up to 51 dBA.
- That the World Health Organization 40 dBA noise limit was based upon traffic noise and not wind turbine noise.
- Acknowledgement in the America/Canadian Wind Energy Association sponsored report that reported wind turbine symptoms are “well-known stress effects of exposure to noise”.
- Omission from the 2011 Wind Turbine Noise Conference post-conference report of the following: “Work is required to understand why low levels of wind turbine noise may produce affects which are greater than might be expected from their levels”
- The conclusion by Dr. Amanda Harry that “people living near wind turbines are genuinely suffering”.
- The results of the preliminary study by Phipps et al.: “Visual and Noise Effects Reported by Residents Living Close to Manawatu Wind Farms”.
- The statement: “More needs to be understood regarding the effects of low frequency noise on humans” from the 2007 report of the National Research Council Committee on Environmental Impact of Wind Energy Projects.

¹ Dr. Leventhall is a prominent acoustician who consults for the wind industry far and wide.

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- The statement: “annoyance is an adverse health effect” from the 2005 Health Canada report: Community Noise Annoyance, It is Your Health.
- The conclusion: “... neighbourhood noise must be classified as a serious health endangerment for adults” from the published pan-European study by Niemann et al.
- Reference to the reports from the Acoustic Ecology Institute, a steadfastly neutral source used by the wind industry.

In addition to the criticisms listed in Part I, under errors of commission in statements by K & O discussed above, Dr. McMurtry notes the following:

- The arguments that they present to show that: “health effects from annoyance have been shown to be mitigated through behavioural and cognitive interventions...” cannot be substantiated.

Since the paper by Knopper and Ollson was published, a great deal more has been learned about the adverse health effects of turbine noise. Dr. McMurtry discusses the following studies:

- Møller and Pedersen have demonstrated that the turbine noise moves down in frequency as turbines get larger thus enhancing the annoyance.
- Shepherd and colleagues have published the results of self-administered questionnaires which compare the lives of residents within 2 km of a turbine with those beyond 2 km. Those close to the turbines report lower overall quality of life, physical quality of life and environmental quality of life. They also reported significantly lower sleep quality. Dr. McMurtry would have liked to see the addition of diagnostic health studies.
- In March 2012, health professionals Hanning and Evans published an editorial in the prestigious British Medical Journal. The editorial summarized the most recent evidence for the adverse health effects of wind turbine noise. The conclusion is that at distances and noise limits permitted in most jurisdictions, wind turbines disturb sleep and impair health.
- The field study by Nissenbaum and colleagues on the effect of wind turbine noise on health and sleep has now been published. Dr. McMurtry points out that sleep disturbance and self-reported health was significantly worse for those close to turbines (375 metres – 1.4km) than for those further away (3.3 – 6.6 km).
- The Danish Society for Occupational and Environmental Health (DASAM) offers a well-documented rationale for decreasing the Danish noise limit from 39 dBA to 35 dBA. Dr. McMurtry reports that this recommendation expresses the world-wide concern of health professionals that present regulations are based upon engineering analysis and not evaluation by health professionals.

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- Dr. McMurtry welcomes the proposed Health Canada study, even with the limitation that it is not a longitudinal study (following health over a number of years). Nevertheless it will include face-to-face interviews, detailed history taking and physiological monitoring.

Dr. McMurtry is former Dean of Medicine and Dentistry at Western University, former Assistant Deputy Minister at Health Canada, Special Adviser to the Romanow Commission and in 2011 was admitted to the Order of Canada.

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Attachments:

McMurtry Part 1

McMurtry Part 2

McMurtry Appendix A

McMurtry Appendix B

McMurtry Appendix C

McMurtry Appendix D

McMurtry Appendix E