

An Examination of
**The Health Impact of Wind Turbines: A Review of the Current White,
Grey, and Published Literature**

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Compiled by Wayne Gulden
wayne@amherstislandwindinfo.com
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In June 2008 Dr. David Colby, in response to a request from the Chatham-Kent Council, produced a paper that purported to be a review of the literature regarding various health issues relating to wind turbines. From its introduction:

“This report will enable the Chatham-Kent Board of Health to make an evidence-based decision regarding the known health impacts of wind turbines from the current literature...”

As his report indicates, Dr. Colby is not himself a wind turbine health expert and thus he relied upon being able to research opinions from those “for and against wind power”. The references used to produce the conclusion thus become critical. In his conclusion he states “it is my opinion that there will be negligible adverse health impacts on Chatham-Kent citizens. This examination takes the most contentious and arguably the most important health area he covered (out of five sections), *Noise and Sound Concerns*, and takes a detailed look at the quality of his references in an effort to understand how his conclusions were arrived at.

I have more details at the end, but in summary there is no scientific technique I’m aware of to get from these references to his conclusions. It is hard to express just how poorly this research was done. It’s not that I agree or disagree with the conclusions - people of good will can arguably still do that. It’s that the references were uniformly some combination of irrelevant, erroneous, non-illuminating and biased. And I didn’t write the preceding sentence lightly. What is most disappointing is that this report is portrayed as being authoritative, as evidenced by the local newspaper, at <http://www.wind-watch.org/news/2009/04/17/annoyance-factor-exists/> and the CBC (the entire 25 minutes is illuminating, the Colby reference is 21 minutes into it) at <http://amherstislandwindinfo.com/cbc-radio-current-health.mp3>. He has even been referred to as “the nation’s foremost expert” at <http://amherstislandwindinfo.com/colby-chatham-dn-article.pdf>.

In *Noise and Sound Concerns*, there are six paragraphs, a total of 28 sentences (I’ve numbered P1S1 through P6S5) and a total of 32 footnotes (numbered 33 through 65 and missing #46). The entire text of the section is reproduced below in *italics*, one sentence at a time, headed by the paragraph and sentence number. I don’t want to be

accused of cherry-picking, so you have the entire section. Where a sentence is not particularly controversial there is no commentary following it. Where a sentence is either controversial or has a reference I have added comments below it.

I have also annotated each reference with a category: PR = Peer Reviewed, LO = Lobbyist Organization, IP = Interested Party, GV = Government.

All the footnotes that could be found (29 of the 32) were reviewed in detail to see to what extent they were:

- 1) supportive of the report's conclusion,
- 2) relevant to the point being made,
- 3) from a disinterested party,
- 4) scientifically justified.

Dr. Colby's report can be accessed at:

<http://wind-works.org/LargeTurbines/Health%20and%20Wind%20by%20C-K%20Health%20Unit.pdf>, and it is also saved at: http://amherstislandwindinfo.com/c-k_health_and_wind_report.pdf

Paragraph One

P1S1) Wind turbines produce noise from two distinct sources; the sound of rotor blades as they rotate (aerodynamic effect) in the wind and the motor noise from within the turbine unit itself (mechanical operations).

P1S2) The sound wind turbines emit is described as audible or as infrasound, that which is inaudible to the human ear.

P1S3) The health impact of the noise created by wind turbines has been studied and debated for decades with no definitive evidence supporting harm to the human ear.
33,34,35,36.37.38

In the early days of asbestos, cigarettes, thalidomide, etc., proponents often used the “no definitive evidence” or maybe “no scientific proof” as defenses. Note the “harm to the human ear” qualifier. None of the six references even discuss harm to the human ear, nor do any of them discuss human health in any substantial manner. None of them are health studies, none of them were written by medical personnel. Here they are:

#33 – Leventhall (PR), saved at: <http://amherstislandwindinfo.com/leventhall.pdf>. Here's the entire abstract from this article.

“Infrasound is discussed in terms of what it actually is, how the media has dealt with it and what those with limited knowledge say about it. The perception of infrasound occurs at levels higher than the levels produced by wind turbines

and there is now agreement amongst acousticians that infrasound from wind turbines is not a problem. Statements on infrasound from objectors are considered and it is shown how these may have caused avoidable distress to residents near wind turbines and also diverted attention from the main noise source, which is the repeating sound of the blades interacting with the tower. This is the noise which requires attention, both to reduce it and to develop optimum assessment methods.”

Nowhere in the larger article is harm to the human ear discussed. The phrase “there is now agreement amongst acousticians that infrasound from wind turbines is not a problem” and a similar repeat in the conclusion represent his total commentary on human health. Dr. Leventhall is not an MD. He has never been involved with health issues. But note that even he is concerned about noise – in his case, audible low-frequency noise.

#34 – CanWEA (LO), <http://www.canwea.ca>. The Canadian Wind Energy Association, a lobbying group for the wind energy industry. Hardly disinterested, plus there was no specific link.

#35 – AWEA (LO), http://www.awea.org/pubs/factsheets/WE_Noise.pdf. The American Wind Energy Association, another lobbying group. Hardly disinterested, plus the above link is broken.

#36 – BWEA (LO), <http://www.bwea.com>. The British Wind Energy Association, yet another lobbying group. Hardly disinterested, plus there was no specific link.

#37 – Warburton (PR), no link given. This was a thesis, and is one of the three references that was unavailable. But the abstract was, and it reads:

“This thesis reviews the technological and political forces that are prompting the planning profession to deal with wind energy development, synthesizes the key financial benefits and siting issues associated with hosting a turbine, and suggests initiatives that could better position planners to prepare for and help shape the evolution of Nova Scotia's wind energy industry.”

Exactly what that has to do with harm to the human ear is not clear. A recent bio states her qualifications as “a Masters Degree in Rural and Land Use Planning, natural resource education and management, and energy policy analysis...”

#38 – Jones Consulting (IP), consultants for the wind industry, saved at: http://amherstislandwindinfo.com/jones_consulting_background_report.pdf. The purpose of this report was to lay out community issues for a variety of renewable energy technologies. Nowhere in this report is harm to the human ear discussed, and there are a total of 4 content-free sentences (and no further references) dealing with noise and health in any form – starting at the bottom of page 80.

To the contrary, this report states (p.54):

“Large scale turbines, for example those with a height to the tip of the blade of 120 metres, have several impacts ranging from natural heritage to noise to visual that will extend well beyond the property line and onto off-site land uses. In many cases these impacts have the potential to extend for hundreds of metres up to and even beyond one kilometre.”

P1S4) It is unrealistic to expect any type of machinery to be noiseless; the community does not demand this from other administrative, industrial, commercial or farming operations.

P1S5) Although noise tolerance is very subjective, care should be taken to ensure a reasonable noise level exists in relation to normally occurring sounds within the environment.

Paragraph Two

P2S1) The Ontario Ministry of the Environment defines noise simply as “unwanted sound”.³⁹

#39 – MOE, interpretation (GV). Not controversial. The Colby report’s link is broken, you can use <http://amherstislandwindinfo.com/moeinterpretation.pdf>.

P2S2) Noise is measured in decibels (dB), however, environmental noise is adjusted to include the sensitivity of the human ear and is measured in dB(A).

This is not controversial. For a brief discussion of A weights, as opposed to C weights, see http://amherstislandwindinfo.com/noise_weights.htm

P2S3) The audible sound created by a wind turbine, measured at 350 meters, is approximately 35-45 dB(A).

Note that there are no references for this statement, which is in fact false, as shown by my responses to P3S4 and P5S5, below. Also note the “a wind turbine” wording. Nowhere in Ontario does one turbine stand by itself.

P2S4) In comparison, rural night-time background noise is 20-40 dB(A), a jet airplane at 250 meters is 105 dB(A), and an urban residential environment is 58-62 dB(A).

P2S5) Wind on its own, as it interacts with the environment, produces levels up to 35 dB(A).⁴⁰

#40 – AMEC (IP), <http://amherstislandwindinfo.com/amec-summerside-final-ea.pdf>. Not controversial, in fact, wind can produce higher levels if blowing hard enough.

*P2S6) The Ministry of the Environment has published technical guidelines for the protection of the environment; prior to construction, wind turbines must receive a Certificate of Approval (Air) that includes sound impacts and their effect on the environment.*⁴¹

#41 – MOE, interpretation (GV), <http://amherstislandwindinfo.com/moeinterpretation.pdf>. This statement is not in itself controversial. The MOE's Interpretation as a whole is quite controversial, as it specifically permits wind turbines to generate more noise than other industrial facilities. Plus, amazingly, the MOE has no way to confirm the noise levels. The COA is issued on the basis of a computer model that can be widely manipulated to suit the developer.

P2S7) Again, these fall well within Chatham-Kent setback limits.

We'll see when they get into operation just how well they fall within the limits. The record so far in Ontario is poor.

Paragraph Three

P3S1) Modern wind turbine construction has drastically decreased the noise complaints that resulted from the thumping sound created by a downwind rotor placement.^{42,43,44,45}

This entire point is not controversial, nor is it relevant. The important question is how today's turbines behave. So I'm skipping these references. Every one of them is, by the way, from an interested party.

#42 – AWEA (LO), same link as #35, still broken.

#43 – Jones (IP), http://amherstislandwindinfo.com/jones_consulting_background_report.pdf.

#44 – BWEA (LO), <http://www.bwea.com>, no specific link at all.

#45 – DTI, the Dept. of Trade and Industry, UK (IP/GV), <http://amherstislandwindinfo.com/dti-fact-sheet-4.pdf>.

P3S2) The Canadian Wind Association and the Ministry of the Environment indicate that current turbine technology requires a setback placement of at least 250 meters to meet separation distances for noise.^{47,48}

This is bizarre. I have no idea where their 250 meters figure came from. Even before the Green Energy Act the Ontario limit was generally 350 meters, and under local control. Now it is 550 meters.

#47 – CanWEA (LO), <http://www.canwea.ca>. No specific link, hardly disinterested. I can find nowhere on their site where 250 meters is mentioned.

#48 – MOE, interpretation (GV), use my link from #41. 250 meters is not mentioned, nor are any other setbacks mentioned. The Interpretation is based strictly on noise levels.

P3S3) While noise and sound can be annoying, the audible noise created by a wind turbine, constructed at the approved setback distance does not pose a health impact concern.

Note that there's no reference for this sweeping statement. What happened to the notion that we are entitled to the quiet enjoyment of our property? What happens if the noise is annoying enough to interfere with someone's sleep, which is a common complaint all around the world?

P3S4) A wind turbine setback at 750 meters emits noise comparable to a kitchen refrigerator. ^{49,50,51}

Wind industry marketing materials often use the refrigerator comparison, usually at 350 meters. I guess Colby wanted to play it safe and moved it back to 750 meters, which is not consistent with these references, so where he got the 750 figure is unknown. As it turns out, that is still not far enough for this statement to be consistently true.

#49 – AWPC (IP), Pubnico Environmental Assessment. The Colby report's link goes to the first half of the report, which doesn't discuss noise at all. To get to the second half, where noise is discussed, use:
<http://amherstislandwindinfo.com/PubnicoChapter4-7AppendixA-I.pdf>. [The original link was: <http://www.gov.ns.ca/nse/ea/pubnicowind/PubnicoChapter4-7AppendixA-I.pdf>.] By the way, in neither half the does the word "refrigerator" appear.

To the contrary - what this reference and the reality of what followed shows is that the assumptions and modeling used to predict noise and thus establish setbacks are seriously flawed. Section 5.1.11 on page 92 covers the topic of noise. After some introductory material and a discussion of construction noise, the noise created during operation is covered on page 94 and runs for roughly one page, including a chart. From that report:

"The noise levels at 200 metres (43.8 – 46.5 dBA) are equivalent to ambient rural noise levels, and are approximately what would be experienced in the interior of an average home (45 dBA). As the nearest occupied residence is approximately 300 metres distant from the northern row of turbines, the wind turbines should in most circumstances be inaudible at that distance."

Perhaps this is where the refrigerator reference was inferred. Regardless, the noise so bothered a Mr. D'Entremont and his family that eventually a Mr. Howe was dispatched to measure it. His report can be accessed at:
http://amherstislandwindinfo.com/pubnico_point_wind_farm_final.pdf. Mr. Howe found, as related on page 19:

“However, under certain wind and atmospheric conditions when background sound would be expected to be low, the measured sound levels were found to exceed the criteria and expected background sound by up to 13db.”

The criteria used throughout this report were Ontario’s, so the 13dB excess comes to 53dB, as mentioned on page 12. Recall that the original report estimated the sound to be 43.8 – 46.5 dB at 200 metres, and on this basis (and apparently this basis alone) the turbines were placed with no further regard to noise. At Mr. D’Entremont’s 330 metres the sound should be several dB lower, roughly 40dB, but instead was actually considerably higher, at 53dB. Amazingly, NRCan, who sponsored the Howe study, concluded that this wasn’t enough to justify compensating Mr. D’Entremont. CBC uncritically reported this result at: <http://www.cbc.ca/canada/nova-scotia/story/2006/11/06/pubnico-wind.html>. The D’Entremont home has been abandoned after he and his family suffered significant health issues, and he has been unsuccessfully trying to sell it for over a year now.

That this report used this particular reference to build the case that wind turbine noise is not a health issue is quite astonishing. I guess Colby figured nobody would read it, or know the history behind it.

#50 – CanWEA (LO), <http://www.canwea.ca>. I didn’t find a statement equating a 120-metre tall turbine with a refrigerator on this industry lobby’s web site. AWEA perhaps. There’s a nice YouTube demonstration of how silly this is at <http://www.youtube.com/philbloomstein>.

#51 – SDC (IP), http://www.sdcommission.org.uk/publications/downloads/Wind_Energy-NovRev2005.pdf, also saved at <http://amherstislandwindinfo.com/sdc-wind-energy-nov05.pdf>. The word “refrigerator” is not found in this report either. The noise section starts on page 75. The closest statement regarding noise emissions is:

“Ten such wind turbines, all at a distance of 350m would create a noise level of 35-45 dB(A) under the same conditions.”

There was no source for this statement. This type of assertion is quite typical in wind proponent literature, and is shown by the Pubnico measurements above (and the Netherland’s measurements, below in #62) to be quite false.

P3S5) Greenpeace, in the September 2006 report Global Wind Energy Outlook, advise that wind turbine noise is comparatively lower than road traffic, trains, construction activities, and industrial noise.⁵²

#52 – Greenpeace and GWEO (IP). The 2006 report is no longer available, but the 2008 report is, at: http://amherstislandwindinfo.com/GWEO_A4_2008_lowres.pdf, and I assume it is similar to the 2006 version. [The original link was at: http://www.gwec.net/fileadmin/images/Logos/Corporate/GWEO_A4_2008_lowres.pdf.] The

noise section is on page 31 and includes the following, which by now should sound familiar.

“Compared to other types of industrial plants, wind farms are extremely quiet. Even though turbines are commonly located in rural areas, where background noise is lower, the roar of the wind often masks any sound their operation might make. Measured in a range of 35 to 45 decibels at a distance of 350 metres from the turbines, their sound is similar to the background noise found in a typical home.”

Note that there is no reference for this statement. Also note that the measurements as contained in Colby’s own references show this to be false.

Paragraph Four

P4S1) Howe Gastmeier Chapnik Limited (2007) recommends several best practice guidelines with respect to wind turbine sound by, identifying the potential receptors of turbine noise, acknowledging the noise generated (wind turbines are not silent), following established setbacks, acknowledging the impact of ambient sound, and dispelling the rumours regarding infrasound which have not been supported by research.⁵³

I’m not even sure how to respond to this, except to say it is among the most weasel-worded sentences I’ve seen in a long while. It keys off the same infrasound vs. low-frequency sound confusion that Leventhall says exists (back up in P1S3, #33), even if it generally does not.

#53 – Howe, via CanWEA (LO). The Colby report’s link is incorrect, it should be: http://www.canwea.ca/images/uploads/File/CanWEA_Infrasound_Study_Final.pdf and if that link has gone dead you can find it at http://amherstislandwindinfo.com/CanWEA_Infrasound_Study_Final.pdf Note that this paper was sponsored by CanWEA and is from their web site, hardly a sign of impartiality.

To provide some perspective, here’s a paragraph from the Introduction, page 1:

“Infrasound from wind turbines has been a contentious issue on occasion. The Toronto Star published an article in November 2006 indicting that a family left their house alleging a health concern from inaudible sounds produced at the Pubnico Point Wind Farm in Nova Scotia [the D’Entremont household, per #49]. On the other hand, an article in the June 2006 issue of the Journal of the Canadian Acoustical Association [as it happens, the Leventhall article in #33] presented a technical study suggesting that infrasound was not an issue.”

It is interesting how circular these references all become. More disgraceful is the equating of the actual experience of real people who lived close to a turbine with Leventhall's "suggestions".

Paragraph Five

P5S1) Inaudible noise, also known as infrasound is described as noise generated that humans cannot hear.^{54,55,56}

I'm not sure why this statement was included, except as filler. Regardless, whether we can hear infrasound or not (by definition, we cannot, otherwise it wouldn't be called infrasound) the issue is one of health, not audibility.

#54 – Leventhall (PR). See #33 above. Not controversial, not relevant.

#55 - Howe, via CanWEA (LO). The same reference as #53 above.

#56 – BWEA (LO). No specific link, hardly disinterested.

*P5S2) Early wind turbines, those installed in the 1980s, were downwind models meaning the wind had to pass by the tower before reaching the blades, subsequently creating a low frequency repetitive or constant thumping that created concerns and complaints from individuals located in close proximity to early wind farms.*⁵⁷

#57 – Howe, via CanWEA, again, same as #53 (LO). What does this history lesson have to do with human health? Beats me. As evidenced by more recent reports, the problems are still there – perhaps worse than ever, given the larger sizes of the turbines.

*P5S3) In 2006, Howe Gastmeier Chapnik engineering completed an independent study on infrasound associated with Canadian wind farms.*⁵⁸

#58 – Howe, via CanWEA, yet again, same as #53 (LO). The study was commissioned by CanWEA, so to call it "independent" is a stretch.

P5S4) This study determined that wind farms do generate infrasound however, it is not at a level perceptible to the human ear.

Of course it is not perceptible, that's why it is called infrasound. But so what? The issue remains one of health, not audibility.

P5S5) Studies around the world have also indicated that infrasound generated by wind turbines is not known to be harmful to human health.^{59,60,61,62,63}

Notice the weak disclaimer "not known to be harmful". That same wording has been used by all sorts of industries to deny the harmful effects of their products.

Also note just “studies”, not “health studies”. Still, this is quite a sweeping statement, so let’s see who Colby’s references are.

#59 – Enteraguk (IP). Hoo boy. I finally figured out who this was – Enertrag! I admit, I’ve screwed up links, but not as badly as this. The link should be <http://www.enertraguk.com/technical/noise-and-vibration.html>. The relevant parts of that page are saved at <http://amherstislandwindinfo.com/enertrag-noise-page.jpg>. Enertrag is a wind project developer. This page has the typical wind industry promotional verbiage, and uses the typical industry references. They mention the Hayes McKenzie’s study, the one that made news late in 2009 when a FOIA request in Britain found that the government had deleted some of Hayes’ recommendations regarding noise levels in the final published report. Unfortunately, this report can no longer be found on the government’s web site. They also reference the Salford Report, which didn’t even go into the field to find out if there were problems there or not, and is discussed further at <http://amherstislandwindinfo.com/wg-salford-exam.pdf>.

#60 – Pederson & Waye (PR). This article can be found at <http://amherstislandwindinfo.com/pederson.pdf>. This study was about annoyance from wind turbine noise, and made no statements regarding health issues. The word “infrasound” does not appear in the article. The study does report, however, that:

“The results suggest that the proportions of respondents annoyed by wind turbine noise are higher than for other community noise sources at the same A-weighted SPL and that the proportion annoyed increases more rapidly.”

Note the direct contrast of this statement with Colby’s words in P3S5 above. Apparently Dr. Colby didn’t read this far, or is content to cherry-pick his quotes.

#61 – Viollon, etc (PR), no link provided. This paper is copyrighted and after reading the abstract it didn’t seem interesting or relevant enough to pay for it. Here’s the entire abstract:

“We assessed how listener’s judgments of a set of urban sound environments were affected by co-occurring visual settings. In artificial audiovisual environments, subjects rated eight urban sound environments (recordings) when they were associated with five visual settings (four color slides varying in degree of urbanization and a control condition with no slide), along two sound scales (Unpleasant–Pleasant and Stressful–Relaxing). In general, the more urban the visual setting, the more negative the sound ratings. However, this influence depended on the type of sound. It was marked for recordings which did not include human sounds (particularly strong for bird song and weaker for traffic noise), but was absent for all recordings which included human sounds (footsteps and voices). Results are discussed in terms of the degree of matching between visual and sound information, and the degree of implication of the perceiver with these sound environments.”

This has nothing to do with wind turbines, infrasound and human health.

#62 – Jakobsen (PR). This paper can be obtained at:

<http://amherstislandwindinfo.com/jakobsen-low-freq-noise.pdf>. [The original link was: <http://www.hayswind.com/info/low%20frequency%20noise%20-%20jakobsen.pdf>.] This is just the second one of all these references (along with Leventhall, #33 above) - that actually makes a statement about wind turbines and human health, but only marginally. The paper is primarily about measuring infrasound from turbines and is only incidentally interested in health affects. Jakobsen is an acoustician, not a medical doctor. The two sentences below, from the conclusion, are the only even remotely relevant comments on human health in this paper.

“Even quite close to these turbines the infrasound level is far below relevant assessment criteria, including the limit of perception. Such low infrasound levels are unimportant for the evaluation of the environmental effects of wind turbines.”

These two sentences plus the phrases from Leventhall (#33) represent the summed totality of Dr. Colby’s peer-reviewed evidence-based “research” into the relationship between wind turbine noise and human health in his entire report. That’s it. No kidding. No medical personnel, no field studies, no surveys, no nothing. And Colby’s a leading expert on turbines and health? And this represents an authoritative report?

If Dr. Colby would have looked a little further, he would have found this, excerpted from Table III on page 153:

Turbine Size, MW	Distance, M	Measured Noise, dBA
2.0	1000	47
4.2	250	61
3.0	2100	37
3.0	750	51

These measured noise levels are far higher than all the proponent assertions that were presented in Dr. Colby’s references.

#63 – AWEA Siting Handbook (LO), <http://www.awea.org/sitinghandbook/> and is also saved at http://amherstislandwindinfo.com/AWEA_Siting_Handbook_Feb2008.pdf Hardly disinterested. Regardless, the word “infrasound” does not appear once in the 183 pages of this book. Section 5-5 is the noise section, and health is not discussed at all. Section 5-8 is the health section, and neither noise nor infrasound is discussed there. How this came to be cited as support for this conclusion escapes me.

Paragraph Six

P6S1) Huron County Health Unit completed an assessment of human health impacts from wind turbines in 2006.

P6S2) Noise was the only issue identified as requiring complete assessment and modeling prior to wind farm development.⁶⁴

#64 – Savage (GV). No link was provided, and the report could not be found online on the Huron County web site, <http://www.huroncounty.ca/health/>. This was the second reference that could not be found. Its relevance to the overall conclusion of this section is unclear, as noise was stated as something needing assessment. How this is used to build a case for no human health effects escapes me.

P6S3) The Kingston, Frontenac, Lennox & Addington Health Unit provided a summary of the information presented to the local Board of Health, municipal government, and community stakeholders, concluding that current evidence failed to demonstrate a health concern associated with wind turbines and would be taking no further action at this time.⁶⁵

#65 – Moccio (GV). No link was provided, and the report could not be found online, even on the KFL&A Public Health web site, at <http://www.kflapublichealth.ca/>. This was the third reference that could not be found. The title is general enough that it could potentially include references to studies of turbine noise and health, but no opinion on its value can be given. If the report becomes available, this paper will be updated to include it.

P6S4) Even noise that falls within known safety limits is subjective to the recipient and will be received and subsequently perceived positively or negatively.

P6S5) However, noise is one of the few health issues surrounding wind turbines that can be measured and has guidelines that must be adhered to.

Conclusions

This examination paid close attention to the 32 references that were part of a self-described disinterested study of current wind turbine health-related research, where “Wherever possible, peer reviewed journals were utilized as the first information source in efforts to reduce potential bias.”

Unfortunately, at least for the *Noise and Sound Concern* section, the 32 references cited fall far short of this standard. First, consider their sources. Of the 32:

1) 13 were directly from an industry lobbyist’s web site. Information from a lobbyist isn’t necessarily wrong; it just has no place in a report that purports to “reduce potential bias”. Recall that a lobbyist’s mission is not the dissemination of truth.

2) 8 were from organizations who have a direct financial interest in the wind energy industry, or whose stated purpose is to promote the wind energy industry. Again, they

may be truthful, but they do not belong in a report that claims to be unbiased, at least not without counterviews.

3) 6 were from peer-reviewed sources, of which 1 was mentioned twice. Only two of these five (#33/#54 and #62) even mentioned human health, and those mentions were so tenuous they are nonsensical. Neither was written by someone in the medical profession, and neither did any studies of humans at all.

4) 5 were from governmental publications, two of which could not be found online.

Next, consider their relevance and contribution to the overall point being made, that noise from wind turbines is not a human health concern. All 28 of the known references were some combination of interested, non-illuminating, erroneous or irrelevant. None of them was written by a medical doctor. None of them studied humans. None of them even said that noise was not a health concern.

The quality of the references was so poor that some combination of the following must be true:

1) The authors figured nobody important would ever actually read the report carefully. Sadly, they may be right.

2) The authors had an agenda that did not include performing an honest assessment of the evidence.

3) Neither Dr. Colby nor his department had the time or interest to do the report themselves, and turned it over to someone else. And who would know more about the topic than someone from the industry?

Personally, I'm voting for #3. I've studied wind industry "myths" and "facts" and "evidence-based research" for a long time, and the techniques used in their reports is the same as that used in Dr. Colby's report.

Finally, a real medical doctor, Robert McMurtry, had this to say about the Colby report, as noted at <http://windconcernsontario.wordpress.com/2009/02/03/commentary-on-%E2%80%9Cthe-health-impact-of-wind-turbines-a-review-of-the-current-white-grey-and-published-literature%E2%80%9D-chatham-kent-public-health-unit-june-2008/>.

"In short this is a paper that would not be accepted in a responsible peer review journal. The transgressions of confirmation bias and the failure to quote relevant literature are fundamental errors. This paper is not an authoritative contribution to the literature regarding wind turbines. Finally as a public health document it is seriously deficient."