



Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

One Winter Street Boston, MA 02108 • 617-292-5500

DEVAL L. PATRICK
Governor

TIMOTHY P. MURRAY
Lieutenant Governor

RICHARD K. SULLIVAN JR.
Secretary

KENNETH L. KIMMELL
Commissioner

Massachusetts Wind Docket Email Submittals

MassDEP has contacted people who submitted comments to the Wind Turbine Docket requesting permission to post their emails on the agency's website. Based on the responses, MassDEP is posting submittals to which consent has been received as of December 2, 2011. Comments submitted that require redacting to protect personal and medical information, as required by state law and Executive Order Number 504, will be published shortly. Please note that in some cases, the wind turbine docket submittals contain attachments such as reports, journal articles or web links to additional information. In cases where copyright laws allow, we have either provided the material or a web link to that material. Copyright materials are included at the end of the emails and are listed as 'attachments.' Please note, that some of the links are already posted at (<http://www.mass.gov/dep/energy/wind/comments.htm#note>) and/or are available within the associated comment by right-clicking within and can be opened as a hyperlink. In some cases the URL may need to be cut and pasted into your web browser to complete the link. MassDEP is not responsible for links that are no longer available.

MASSACHUSETTS WIND DOCKET EMAIL SUBMITTALS:

From: george mcconochie [mailto:geo.mccon@gmail.com]
Sent: Tuesday, June 28, 2011 11:43 AM
To: MassDEP, WindTurbineDocket (DEP)
Subject: Wind Power Docket

As a citizen who supports the growth of clean, renewable energy in this country and the Commonwealth, I would like to express my support for appropriately sited wind turbine generators and my disapproval of the extreme setbacks suggested for the siting of wind turbines based upon random and unclear data - especially single on-site wind turbines. "There is no one-size-fits-all approach. Wind turbines should be sited appropriately according to the type of location and size of the wind turbine."

Properly sited single wind turbines will only positively impact the overall health of individuals and the environment of our planet. Distributed wind power is a safe source of energy for our environment. The more distributed wind projects that are built, the more we can alleviate the need for coal, natural gas, oil or nuclear power, all of which have been proven to be an inarguable detriment to the health of humans AND the environment. Please focus your valuable time and energy on the reduction of the real consequences of electric generation in this country.

Thank you for considering my comments.

George McConochie

From: Kerry O'Connor [mailto:kerry.oconnor@sed-net.com]
Sent: Friday, June 24, 2011 1:35 PM
To: MassDEP, WindTurbineDocket (DEP)
Subject:

As a citizen who supports the growth of clean, renewable energy in this country and the Commonwealth, I would like to express my support for appropriately sited wind turbine generators and my disapproval of the extreme setbacks suggested for the siting of wind turbines based upon random and unclear data - especially single on-site wind turbines. "There is no one-size-fits-all approach. Wind turbines should be sited appropriately according to the type of location and size of the wind turbine."

Properly sited single wind turbines will only positively impact the overall health of individuals and the environment of our planet. Distributed wind power is a safe source of energy for our environment. The more distributed wind projects that are built, the more we can alleviate the need for coal, natural gas, oil or nuclear power, all of which have been proven to be an inarguable detriment to the health of humans AND the environment. Please focus your valuable time and energy on the reduction of the real consequences of electric generation in this country.

Thank you for considering my comments.

Kerry O'Connor

--

Kerry O'Connor

Sustainable Energy Developments, Inc.
Corporate Office:
317 Route 104
Ontario, NY 14519-8958

Home Office:
7262 Collins Street
Whitney Point, NY 13862

Phone: 406.546.5799

From: Harry Dodson [mailto:hdodson@dodsonassociates.com]
Sent: Friday, July 08, 2011 1:21 PM
To: MassDEP, WindTurbineDocket (DEP)
Subject: Concerned About Health, Environmtal Impacts of Wind Turbines

Building hundreds of wind turbines in environmentally sensitive ridgelines, summits and shoreline areas of the state will have serious environmental and health impacts. I urge you to apply the same stringent environmental and health standards to wind turbines as you would to any other large project. Health impacts due to infrasound noise in areas within 1 mile of turbines can be devastating to residents. Light strobing from turbines can make homes unliveable over extended periods of time. And building industrial facilities: 450' towers, wide access roads and transmission lines in some of the Commonwealth's most sensitive and beautiful undeveloped landscapes is unacceptable. Please enforce our existing laws and standards - even for wind turbines.

Thanks

Harry L. Dodson FASLA
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(413) 628-3216 (fax)

From: Ann Christen [mailto:annchrispic@gmail.com]
Sent: Friday, July 08, 2011 6:17 PM
To: MassDEP, WindTurbineDocket (DEP)
Subject: Wind turbines make people sick

Mr. Kenneth Kimmell, Commissioner of MA Department of Environmental Protection

Mr. John Auerbach, Commissioner of MA Department of Public Health

Please protect the health of the citizens of the state of Massachusetts from adverse health impacts from wind turbines.

We urge you to please select an expert scientific panel on health impacts associated with exposure to wind turbines that is completely impartial where no member of the panel has been paid by the wind energy industry, pro-wind advocacy organization, wind developer, or any related industry.

Please hold meetings of the panel as public meetings and hold public hearings so the public is able to speak to the panel and to appropriately express concerns in a timely manner but without a three minute time limit.

Provide the panel with all the materials submitted and not a selected sub-set that has been sanitized so that the panel does not see the full scope of the adverse health impacts from around the globe.

Provide opportunities for the panel to talk with people who have been adversely impacted from a health standpoint.

Submit the evidence from people around the globe who are concerned about the adverse health impacts to people who are in close proximity to wind turbines because they live, work are in nursing homes or hospitals, attend school and are incarcerated within 6.3 miles of wind turbines.

Submit the ample scientific information from around the globe that concludes there are adverse health impacts for people living and working too close to wind turbines.

Urge the panel to err on the side of caution and to recommend invoking the precautionary principle and institute **at least** a one year moratorium on the construction of wind turbines in the state of Massachusetts until further research is completed in order to conclusively determine what is a safe setback of turbines from people and to protect the health and safety of the citizens of Massachusetts. State and town officials are rushing into wind energy development without knowing all the facts.

The World Health Organization states: “The precautionary principle. In all cases noise should be reduced to the lowest level achievable in a particular situation. When there is a reasonable possibility that the public health will be endangered, even though scientific proof may be lacking, action should be take to protect the public health, without awaiting the full scientific proof.”

World Health Organization, Guidelines for Community Noise,1999 http://www.euro.who.int/mediacentre/PR/2009/20091008_1

Thank you for your concern for the health of the citizens of Massachusetts.

Sincerely,

Ann & Gary Christen

Brewster, MA

From: Resident – Savoy, MA
Sent: Friday, July 22, 2011 3:26 PM
To: MassDEP, WindTurbineDocket (DEP)
Subject: personal comment on the topic of wind turbines

Legislators,

Too often legislation is passed without serious thought given to how to enforce it or all of the effects on citizens. I am certainly aware that legislators intent are genuine to protect citizens health, safety and welfare. This is also a part of my career and profession as an architect. Big business does not need any more help from government...the citizens need the help of their elected officials. Before passing additional measures to make it easier for wind projects in Massachusetts, PLEASE listen to those that are already living the ill effects of such development near their homes in our State. These devices should not be in locations were people live; not for miles. Trade homes for a week (even a day) and you will experience their concerns, they are real and genuine. More and more data is becoming available as to the negative effects on people. Please do not ignore this data. Please do not take away citizen rights and make construction easier for wind developers.

Wind power is NOT consistent nor reliable, obviously it is dependent upon strong wind. I believe wind power is a fallacy to promote a business/industry at an important time in our existence. The media and our government promote wind power as a need for conservation and energy independence. Wouldn't solar panels on all buildings and homes be a better alternative? Although wind turbines makes a very minor contribution, most people are unaware that the power providers still have to have the means of providing power when wind turbines are not producing power. Even with more and more wind projects being constructed, the power plants will still need to provide more power to compensate for when the devices are not operating. Are you aware of this? How about making our current power producing plants more efficient, promoting solar power collection AND continue to educate our citizens of conservation.

Please do not remove any additional citizen rights.

From: rrand [<mailto:rrand@randacoustics.com>]
> Sent: Tuesday, July 19, 2011 6:58 PM
> To: MassDEP, WindTurbineDocket (DEP)
> Cc: Round, Margaret (DPH); Chris Senie; Jo Solet; 'Rufus Brown'; Todd Drummey; S.E. Ambrose & Associates
> Subject: Testimony files, Citizen Petition Board hearing July 7, 2011
>
> Dear Expert Panel,
>
> I understand that you are accepting public comment through July 22, 2011 related to your charge to investigate and report on adverse health effects from wind turbines. I provide attached, four PDF files containing my testimony to the Citizen Petition hearing before the

Maine Board of Environmental Protection on July 7, 2011, for your use and documentation during your investigations of health effects from industrial wind turbines. I provided paper copies when I appeared before the Board and hope these PDF files will be useful to you.

>

> There are two letters. The first letter I read from during my sworn testimony in the morning. The second letter is a description of significant adverse health effects I suffered near an industrial wind turbine in April (in Massachusetts), for the Board's consideration, which I submitted as a private citizen (yet one with significant experience in environmental noise impact assessments and direct experience with adverse health impacts from wind turbines) during the afternoon session. You will note that the second letter cites actual noise levels present during the adverse effects, in dBA and dBG. It is worth noting that the more serious adverse health effects occurred while we were indoors with wind turbine operating nearby, with sound levels indoors at 18 to 20 dBA.

>

> There are two versions of the slides presented, the color version as presented, and a black and white version that works with photocopy.

> These slides present the case that adverse effects and escalating community responses are predictable as outdoor sound levels from wind turbines exceed and trend above 35 dBA.

>

> While levels over 35 dBA in rural areas can be linked easily to "nuisance" noise impacts and response in the community, I suggest that the use of dBA-limit might be able to function effectively as a surrogate regulatory restraint as concerns the adverse health effects, which we found uncorrelated to dBA and correlated best to infrasonic pulsations exceeding 60 dBG. That is, if the dBA is kept low, the dBG will be kept low as well, except in long valleys or mountainous terrain where the dBA could fall off and the dBG (long waves) be sustained by topography. As you can see, this becomes a complex issue fairly quickly.

>

> I suggest that community noise impact assessments can be performed readily using established methods and should be required for all wind turbine facilities to evaluate the potential for adverse health impacts and response. Further, I urge that in the regulatory process, facilities showing potential for adverse community impacts and response be required to revise or withdraw.

>

> I did not measure electromagnetic field strengths during the survey where we suffered adverse health effects in April. However, I feel that EMF field strengths, especially fluctuating, must be treated seriously and investigated at homes near operating facilities in Massachusetts.

> The descriptions I have read about fluctuating electromagnetic field issues near wind turbines relate to some of the adverse symptoms that I experienced.

>

> I know you will have many, many files to manage, and I hope these

provide some assistance to you. Please accept my sincere appreciation for the opportunity to convey to you real information, acquired independently of any wind facility or operator funding, about the potential for adverse noise impacts of wind turbines on people.

>

> Please contact me if you have any questions.

>

> Thank you kindly,

> Rob

>

> Re: <http://www.env.state.ma.us/mepa/mepadocs/2011/062211em/pn/12.pdf>

>

> --

> Robert W. Rand, Member INCE

> Rand Acoustics

> 65 Mere Point Road

> Brunswick, Maine 04011

> Tel: 207-632-1215

> Fax: 206-339-3441

> Web: <http://randacoustics.com>

Attachments:

To the Board of Environmental Protection,

Thank you for the opportunity to speak today as a Maine resident. My name is Robert Rand. I am a resident of Brunswick, and a member of the Institute of Noise Control Engineering (or INCE). I have over thirty years of experience in general and applied acoustics including ten years work on power plant noise control engineering in the Noise Control Group at Stone and Webster Engineering Corporation in Boston. I run a small business providing consulting, investigator and design services in acoustics.

I speak today in support of the Proposed Amendments to the DEP Noise Rule for wind turbine projects. With respect to environmental noise impacts, my professional guiding principle is coded in the INCE Canon of Ethics, which states, "Hold paramount the safety, health and welfare of the public". Welfare means well-being, or "the state of being happy, healthy, or prosperous." Because of the reports of adverse noise impacts on well-being near large wind turbines in Maine and elsewhere, well-being has become a focus of my work with towns and the public in discussions and evaluations of the effects of wind turbine noise on people.

The bottom line in environmental noise impacts is this. People respond to the change above the background sound level and to the noticeability or character of the intrusive noise. The World Health Organization stated in 1999, "In all cases noise should be reduced to the lowest level achievable in a particular situation. When there is a reasonable possibility that the public health will be endangered, even though scientific proof may be lacking, action should be taken to protect the public health, without

awaiting the full scientific proof."

Community noise impact assessments and "criteria noise limits" may be developed based on measured noise emissions and reasonable presumptions in order to prevent widespread complaints and promote public well-being. Criteria noise limits are not necessarily the same as the regulatory limits, which may lag the current understanding of adverse effects on people. Criteria are determined in consultation and agreement with the utility or developer, and may address for example, avoiding adverse community reaction, and being a good neighbor either from consideration of nearby residents or to preserve and enhance goodwill.

now present graphs that show probable community reaction, annoyance, and health effects for assessing the suitability of the existing Maine regulation and the proposed rulemaking. These graphs are based on the A-weighted sound level, the regulatory instrument of the existing Maine noise regulation. It is worth noting that wind turbines are predominately low-frequency noise sources, and increasingly so with larger size. The A-weighted sound level filters out low-frequency and infrasonic energy and additional regulatory instruments such as C-weighting limits are needed to control excessive lowfrequency noise.

In Summary

- Community noise impact assessment of community reaction, annoyance, and effects on health provide insight to the suitability of wind turbines sited in quiet rural areas of Maine.
- These assessments indicate that the existing Maine regulatory night noise limits can allow excessive levels of adverse community reaction, annoyance, and health effects for wind turbines sited in quiet rural areas of Maine. Lower-than-existing maximum sound levels are indicated to protect public well-being.
- The existing law's language on penalties for tonal and impulsive noise left open room for interpretation and could be simplified to be consistent with the law's original intent. I welcome and urge your support of the Proposed Amendments to the DEP Noise Rule for wind turbine projects.

Thank you,

Robert W. Rand, INCE To the Board of Environmental Protection

65 Mere Point Road July 7, 2011

Brunswick, Maine 04011

Tel: 207-632-1215

E-mail: rrand@randacoustics.com

http://api.ning.com/files/g2N-NwmYy7htxAlmiD4MIjt34lxFngxq974m8KSIK-T9Ohnf*DRhxxJ**Wb8X5PxiWVteXqOhjvtAi8f*LFqIMz02i14eeB/RandPresentationtoBEPJuly72011.pdf

To the Board of Environmental Protection,

Thank you for the opportunity to speak today as a Maine resident. My name is Robert Rand. I am a resident of Brunswick, and a member of the Institute of Noise Control Engineering (or INCE). I have over thirty years of experience in general and applied acoustics including ten years work on power plant noise control engineering in the Noise Control Group at Stone and Webster Engineering Corporation in Boston. The story I relate today really happened. I have conducted a number of independent wind turbine noise surveys in the last eighteen months in Maine and elsewhere without ill effects. However in April 2011 I was unpleasantly surprised while on a wind turbine noise survey with my long-time colleague Stephen Ambrose, also a Member of INCE, where indoors, variously we experienced nausea, loss of appetite, headache, vertigo, dizziness, inability to concentrate, an overwhelming desire to get outside, and anxiety, over a two-night period from Sunday April 17 to Tuesday April 19. It was an miserable and unnerving experience.

During the most adverse effects, the A-weighted sound level outdoors was at or above 42 dBA and indoors at 18 to 20 dBA due to the home's solid construction. The dBA levels indoors were found to be completely unrelated to the adverse effects. Adverse effects occurred indoors and outdoors when the infrasonic noise level was over 60 dBG, and the adverse health effects were absent when the wind turbine was idle and the infrasonic noise level was under 60 dBG. It is worth noting that Dr. Alec Salt identified 60 dBG as the inner ear infrasonic sensitivity threshold in 2010. Thus this experience in April ran consistent with Dr. Salt's findings that the inner ear responds to infrasonic noise above 60 dBG.

The distance was approximately 1700 feet from one 1.65MW industrial wind turbine. The owners who built this home for retirement are reluctantly preparing to abandon the home. We obtained some relief during the survey, repeatedly, by going several miles away. It took me a week or more to recover. I experienced recurring eye strain, nausea, sensitivity to lowfrequency

noises, and reduced ability to work on the computer for several weeks. The adverse health effects I experienced are similar to those reported by neighbors living near wind turbines in Maine and elsewhere. They are not addressed by the regulatory framework in place. I have not seen any consideration by wind facility applicants of potential adverse health effects or community reactions.

I now know personally and viscerally what people have been complaining about. Adverse health effects from wind turbines are real and can be debilitating. The field work points directly to wind turbine low-frequency noise pulsations especially indoors as a causative factor. I want all Mainers to be protected from these serious and debilitating health effects. I welcome and urge your support of the Proposed Amendments to the DEP Noise Rule for wind turbine projects.

Robert W. Rand, INCE To the Board of Environmental Protection
65 Mere Point Road July 7, 2011
Brunswick, Maine 04011

Tel: 207-632-1215

E-mail: rrand@randacoustics.com

Dear Expert Panel,

I understand that you are accepting public comment and information through July 22, 2011 related to adverse health effects from wind turbines.

<http://www.env.state.ma.us/mepa/mepadocs/2011/062211em/pn/12.pdf>

Important new information is coming forward. I understand you extended your period of public comment and hope you will extend again your deadline for receiving public comment on this important public health issue. I'm sure that many involved in public health or directly affected would like to communicate to you, and that you would have every interest in compiling the most comprehensive information for your work.

Yesterday I sent to you my adverse event report letter submitted to the Maine BEP July 7, 2011 which documented adverse health effects suffered while evaluating wind turbine noise at a wind turbine facility in Massachusetts. The data obtained during our field survey indicated that infrasonic sound levels from the wind turbine exceeded 60 dBG indoors and out when the adverse health effects were present. Dr. Alec Salt documented the ear's response to infrasonic noise above 60 dBG in 2010.

I attach Dr. Salt's 2010 paper for your use.

You may not be aware of Dr. Michael Nissenbaum's recent quantitative epidemiological studies of wind turbine health effects in Maine. I attach a copy of his testimony to the Maine BEP on July 7, 2011. His work is being published and will be available at a later date. I urge you to keep your period of public comment open to allow this epidemiological study to be entered in full when it becomes published.

I also attach for your use testimony by Dr. Carl Phillips of the Populi Health Institute which I found very interesting and useful to understand how the scientific method can be used effectively to protect public health and welfare as concerns wind turbine emissions.

The Maine BEP web site contains a voluminous record to which more documents are being added as they are processed by the Board staff.

http://www.maine.gov/dep/ftp/bep/ch375citizen_petition/

Would you be kind enough to let me know when and where the materials submitted to you will be posted to the Massachusetts web site?

Please contact me if you have any questions.

Thank you kindly,
Rob

Re: <http://www.env.state.ma.us/mepa/mepadocs/2011/062211em/pn/12.pdf>

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Robert W. Rand, Member INCE
Rand Acoustics
65 Mere Point Road
Brunswick, Maine 04011
Tel: 207-632-1215
Fax: 206-339-3441
Web: <http://randacoustics.com>

Dr. Salt's findings:

- 1) Hearing perception, mediated by the inner hair cells of the cochlea, is remarkably insensitive to infrasound.
- 2) Other sensory cells or structures in the inner ear, such as the outer hair cells, are more sensitive to infrasound than the inner hair cells and can be stimulated by low frequency sounds at levels below those that are heard. The concept that an infrasonic sound that cannot be heard can have no influence on inner ear physiology is incorrect.
- 3) Under some clinical conditions, such as Meniere's disease, superior canal dehiscence, or even asymptomatic cases of endolymphatic hydrops, individuals may be hypersensitive to infrasound.
- 4) A-weighting wind turbine sounds underestimates the likely influence of the sound on the ear. A greater effort should be made to document the infrasound component of wind turbine sounds under different conditions.
- 5) Based on our understanding of how low frequency sound is processed in the ear, and on reports indicating that wind turbine noise causes greater annoyance than other sounds of similar level and affects the quality of life in sensitive individuals, there is an urgent need for more research directly addressing the physiologic consequences of long-term, low level infrasound exposures on humans.

Attachments: Responses of the ear to low frequency sounds, infrasound and wind turbines, Salt, A. & Hullar, T. Hearing Research, 268 (2010) 12-21.

<http://www.windaction.org/documents/28175?theme=print>

From: Rogers [<mailto:jandprogers@comcast.net>]
Sent: Friday, July 22, 2011 11:48 AM
To: MassDEP, WindTurbineDocket (DEP)
Subject: Health Risks from Industrial Wind

Kenneth L. Kimmell
Commissioner Department of Environmental Protection
One Winter Street

Boston, MA 02108

John Auerbach
Commissioner Department of Public Health
One Ashburton Place
Boston, MA 02108

Commissioners:

In all your study and analysis of industrial wind turbines, please pay close attention to the documented health effects on humans from these machines.

You need look no further than Falmouth, Ma and the impact of Falmouth 1 upon many of my neighbors.

I would not like such a machine carelessly sited in my neighborhood, and I am sure you wouldn't either.

The health and well being of Massachusetts' citizens must come before any political or business wind turbine agenda.

Thank you for your concern.

James F. Rogers
197 Main Street
Sandwich, 02563

From: Todd Drummey
Sent: Friday, July 22, 2011 2:13 PM
To: MassDEP, WindTurbineDocket (DEP)
Subject: Wind Turbine recent articles

To the Expert panel,

Attached please find a list of abstracts for the August 2011 Special Issue of the Bulletin of Science, Technology and Society. There appear to be many "peer reviewed" articles related to wind turbine impacts. I hope you will include them in your review.

Thank you for your time,

Attachments: Bulletin of Science, Technology & Society, August 2011, 31(4).
<http://bst.sagepub.com/content/current>

Good Morning,

My name is Todd Drummey. I am a resident of Falmouth MA, and my family has been negatively impacted by the industrial wind turbines erected by the Town of Falmouth (Wind 1 & Wind 2) as well as a third turbine erected by NOTUS Clean Energy. While others have submitted lengthy documents to this panel, I have decided not to do so. I will keep my comments short and to the point.

1. These are very large industrial machines which do not belong this close to residential areas.
2. The noise from the turbines is one of the issues, but there may be others. Infrasound is one topic that has received a great deal of attention, but the effects of pressure changes behind the turbines should also be investigated.
3. The actual measurement of the noise generated by these machines is particularly difficult due to the modulating nature of the noise, and its dependence on wind speed and direction.

I have attached two recently published articles which summarize the majority of my comments on these matters. The first is "Wind Turbine Noise: why accurate prediction and measurement matter". The second is "Properly Interpreting the Epidemiologic Evidence about the Health Effects of Industrial Wind Turbines on Nearby Residents".

I hope the panel finds them useful.

Sincerely,

Attachments: Wind Turbine Noise: why accurate prediction and measurement matter, Thorne, R., & Shephard, D. Proceedings of ACOUSTICS, 2011. & Properly Interpreting the Epidemiologic Evidence about the Health Effects of Industrial Wind Turbines on Nearby Residents, Phillips, C.V., Bulletin of Science, Technology, and Society, V.31: 4, p.303-315. <http://www.windturbinesyndrome.com/news/wp-content/uploads/2011/07/Phillips-1.pdf>

From: Kara Duff [<mailto:kara@wecancenter.org>]

Sent: Friday, July 22, 2011 4:11 PM

To: MassDEP, WindTurbineDocket (DEP)

Subject: Wind Turbines and health concerns

Hello,

thank you for the opportunity to comment- as a hearing impaired individual I am very concerned about the subsonic and infra-sound that is given off by wind turbines. I notice that I tend to feel sound as a result of a sharpening of my senses since I became hearing impaired in 1992 after a severe sinus infection and life threatening fever at 19 years of age. For example, my cell phone can be on vibrate and in another room and I can feel it "ringing" where as my full hearing friends and family cannot. If my children- get up at night I don't hear them- I feel them. As a result I am very concerned that if a wind turbine is put up within 0-5 miles of my residence, I may have problems "feeling" the sound. I would really appreciate if someone who is impartial to the wind turbine industry could consider my situation and study this phenomena I would be very grateful. As of right now- the town of Brewster is trying to erect 2 wind turbines within a mile or so of my home and I am deeply concerned for my sleep and my health.

Thank you, again

Kara K. Duff

Brewster, MA Resident

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Kara K. Duff

Admin. & Program Assistant, WE CAN Corporation

537 Main St., Suite 2H

Harwich Port MA 02646

508.430.8111

www.wecancenter.org

From: Dick Mann [<mailto:manri02@yahoo.com>]

Sent: Thursday, July 21, 2011 1:58 PM

To: MassDEP, WindTurbineDocket (DEP)

Cc: John.Keenan@masenate.gov; Tackey.Chan@mahouse.gov; Mayor Koch; [mlaforest@Quincyma.gov](mailto:mలాforest@Quincyma.gov)

Subject: Re: Wind Turbine Human Health Problems

Commissioner Kimmell, Commissioner Auerbach, Senator Keenan,
Representative Chan, Mayor Koch, Councilor LaForest:

In the email I sent yesterday, I referred to a single article on health concerns by Carl Phillips in the August issue of "Bulletin of Science, Technology and Society". Actually it turns out that the ENTIRE ISSUE is devoted to health concerns about wind turbines. I have attached a report containing the abstracts of most of the articles in the August issue. Alternatively, you can reach the August issue itself [here](#) and the summary of abstracts [here](#).

Note that the "Bulletin of Science, Technology and Society" is a peer-reviewed journal which has been in existence since 1981.

As the title of one of the articles states, this is among other things a "social justice" issue, and the public expects and relies on the DEP, DPH, the Senate and the House of Representatives, along with the elected and appointed officials in the cities and towns to be advocates for the well-being of its citizens. It's not disputed that renewable energy is an important issue for the Commonwealth, but we simply must not allow that or any other technology to be implemented where they are harming the very citizens we should be protecting.

Please take these articles seriously and have someone on your staff objectively read entire articles and not just the abstracts.

Thank you.

Richard Mann

Quincy

From: Dick Mann [<mailto:manri02@yahoo.com>]

Sent: Wednesday, July 20, 2011 2:41 PM

To: MassDEP, WindTurbineDocket (DEP)

Cc: John.Keenan@masenate.gov; John.Keenan@masenate.gov; Tackey.Chan@mahouse.gov; Mayor Koch; mlaforest@Quincyma.gov

Subject: Wind Turbine Human Health Problems

Kenneth L. Kimmell

Commissioner Department of Environmental Protection

One Winter Street

Boston, MA 02108

John Auerbach

Commissioner Department of Public Health

One Ashburton Place

Boston, MA 02108

Dear Sirs:

I am writing this email to urge you to take very seriously the issue of significant health problems for humans caused by proximity to wind turbines. The attached article "Properly Interpreting the Epidemiologic Evidence About the Health Effect of Industrial Wind Turbines on Nearby Residents" is coming out in August in the "Bulletin of Science, Technology and Society," vol. 31, no. 4, pp.303-315. This article should serve as a final exclamation point to the mountains of evidence concerning health problems you have undoubtedly already received.

This evidence has now caused the unbiased scientific community to conclude in a peer-reviewed journal: **industrial wind turbines harm human beings who live nearby**. There are clearly economic and political ramifications to this conclusion, and even more importantly moral and ethical considerations. And there will increasingly now be legal consequences. However, that has been the case with other industries in the past: nuclear, coal, steel, chemical, etc. Why should the wind energy be exempt?

Be courageous and moral: do the right thing, regardless of the availability of green funds, or pressure from the wind industry. You MUST include human health hazard considerations in your wind turbine siting regulations.

Thank you.

Richard Mann, PhD (Princeton)

Quincy

From: Kially Ruiz [<mailto:kruiz@aquinergy.com>]
Sent: Thursday, July 21, 2011 4:47 PM
To: falmouthwind@gmail.com; MassDEP, WindTurbineDocket (DEP)
Cc: Liz Argo
Subject: Wind Turbine and Health

Dear Town of Falmouth,

Please see attached a court opinion in Canada that completely dismisses Dr. Nissenbaum's "expert" opinions on wind turbines and their alleged health effects.

An independent, unbiased judge reviewed Dr. Nissenbaum's claims and found them to be completely invalid.

This type of information should be posted on the Town's website. The presentations by the abutters, although passionate, represent only someone's opinion. They are relying on unproven theories and internet research lacking credibility.

Best regards,

Attachment: <http://www.world-spectator.com/news/newsid35.html>

From: Kially Ruiz [<mailto:kruiz@aquinergy.com>]
Sent: Thursday, June 23, 2011 1:18 PM
To: MassDEP, WindTurbineDocket (DEP)
Cc: Madeline Ruiz; Duncan Peterson; Bradford Cleaves
Subject: Health Concerns of Exposure to Wind Turbines

Dear MA DEP scientific panel,

As a wind energy expert and developer, I am writing to you to consider all aspects of health and environment related to wind turbines. While there has been some controversy regarding wind turbines and presumed impacts in terms of noise and shadow flicker, not much attention has been paid to the many health benefits associated with wind energy.

For instance, the following benefits can be directly linked to increasing wind energy production and reducing our dependence on fossil fuels or nuclear energy:

- Reduction in respiratory illnesses such as asthma and lung cancer
- Reduction in water contamination throughout the fossil fuel extraction, production, refining, and delivery chain.
- Lesser risks in terms of catastrophic events such as oil spills, gas pipeline explosions, and nuclear meltdowns.

I believe that a true cost-benefit analysis would show that wind turbines are a definite positive for the environment and health of Massachusetts residents.

The industry has worked diligently to make wind turbines quieter and more efficient with every new generation of our technology. We work closely with the local municipalities and our neighbors to produce clean energy and generate many local jobs and other economic benefits.

While wind turbines do generate sound from the rotation of the blades, this sound is largely confined to periods during which the wind is blowing. The sound emitted from wind turbines need not be disturbing or considered a nuisance. In many cases other ambient sound levels from vehicles, lawn mowers, and all sorts of other equipment is present in the vicinity.

It is our opinion that wind turbines are singled out for scrutiny largely because they are large machines and are very visible. Since not everyone likes wind turbines, those who are opposed tend to exaggerate the supposed ills that could come from wind turbines.

It is important for your panel to look into the psychological issues related to having a wind turbine nearby. It seems to me that when someone does not like a wind turbine in their neighborhood, they start listening for it intently even when it is just another noise in the background. It's like water dripping somewhere in the house. If you start listening for it, it can drive you "crazy". This is not a problem with wind turbines per se, but with the particular individual who does not like wind turbines and who becomes obsessive with how the wind turbine is making them "sick". If any illness does result, it's from the psychological stress of the person's obsession with not wanting "industrial turbines" in his or her backyard.

I also ask you to review very carefully how other countries and states have dealt with wind turbines. There is a long history of wind energy siting in Europe that should be considered.

Finally, I ask you not to look at wind in isolation from other industries. Many industries that provide economic benefits produce sound emissions. To impose a standard which is discriminatory to wind would be unfair. It would shortchange our future and our ability to generate our own energy.

Sincerely,

Kially Ruiz

President

Aquenergy LLC

3047 East Main Rd, Suite 2A

Portsmouth, RI 02871

Mobile: (401) 835-4033

Fax: (401) 847-5091

kruiz@aquenergy.com

<http://www.aquenergy.com/>

From: Bill Hallstein [mailto:billhallstein@gmail.com]

Sent: Tuesday, June 07, 2011 9:55 PM

To: falmouthwind@gmail.com; MassDEP, WindTurbineDocket (DEP)

Subject: Falmouth wind turbines

Remove the wind turbines quickly and sell them while they are still new the project is a disaster if the town delays putting the turbines up for sale then Falmouth commits to a huge financial loss OR is the town ready to underwrite relocating the affected residents. This is a "lose - lose" situation. Try to minimize damage.

I listened to the turbine noise. People cannot be expected to live near them.

William Hallstein, MD

36 South Road

Falmouth, MA 02540

From: Kially Ruiz [mailto:kruiz@aquenergy.com]

Sent: Thursday, June 23, 2011 1:18 PM

To: MassDEP, WindTurbineDocket (DEP)

Cc: Madeline Ruiz; Duncan Peterson; Bradford Cleaves

Subject: Health Concerns of Exposure to Wind Turbines

Dear MA DEP scientific panel,

As a wind energy expert and developer, I am writing to you to consider all aspects of health and environment related to wind turbines. While there has been some controversy regarding wind turbines and presumed impacts in terms of noise and shadow flicker, not much attention has been paid to the many health benefits associated with wind energy

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Sincerely,

Kially Ruiz

President

Aquenergy LLC

3047 East Main Rd, Suite 2A

Portsmouth, RI 02871

Mobile: (401) 835-4033

Fax: (401) 847-5091

kruiz@aquenergy.com

<http://www.aquenergy.com/>

From: Mike McCann [<mailto:mikesmccann@comcast.net>]

Sent: Wednesday, July 06, 2011 2:21 PM

To: MassDEP, WindTurbineDocket (DEP)

Subject: health effect inquiries

Kenneth Kimmell, Commissioner

MA Department of Environmental Protection

&

John Auerbach, Commissioner

MA Department of Public Health

MassDEP Wind Turbine Docket,

1 Winter Street 4th Floor Mailroom,

Boston, MA 02108.

Dear Commissioners Kimmell & Auerbach:

I am responding to your inquiry into health effects from industrial wind turbines. Since there is a noticeable correlation between reported health impacts and significant impacts on real estate values, as well as the real estate rights issue of peaceful use and enjoyment of one's home, I believe the documented diminution of property values caused by improper turbine siting is an objective measure of this secondary impact.

I do not write as a medical expert, however, in 6 years of reviewing industry funded and independent reports, inspecting project locations, researching empirical *prima facie* sale price evidence and interviewing residents, I have found that there is a tremendous market aversion of the "market" to buying homes within visible and audible (or sub-audible) proximity to industrial scale turbines.

My value studies have included submittals to Massachusetts Towns of Wareham and Brewster, and have been written to address zoning compliance evaluation of proposed projects in those locales. *(I am sure either Town's ZBA would be able to provide a copy of my submitted report or presentation, but if interested in reviewing these documents, feel free to contact me directly for a copy.)*

I would note for your consideration that wind project developers in Massachusetts typically seek to obtain setback permissions that have proven to be unhealthy and so disturbing to some existing residents near other wind energy projects worldwide, that dozens of people have abandoned their family homes rather than continue to try to cope with an untenable level of impact. Impacts from noise, shadow flicker and the unhealthy physical and/or physiological reactions to same.

Industry prefers to couch their applications for approval with their self defined limits of how many hours of shadow flicker are acceptable, or with "modeled" rather than measured noise studies. They also prefer to discuss setbacks in terms of feet and meters, when projects broadcast their impacts on a scale measured in miles and kilometers. I have personally seen more official scrutiny of public officials hearing zoning requests for fast-food drive through lanes or lighted parking lots than what is often rubber stamped approval of wind applications, with no serious consideration of the multitude of actual impacts from wind turbines.

It is my belief that peaceful use and enjoyment of a residential property is simply a measure of the other side of the same coin; namely, health impacts. If both ways of describing people's rights are to be adequately protected, then it is my recommendation that Massachusetts develop rules that require:

1. Setbacks be scaled to the size of turbines, i.e., 2+ miles for the 400-500 foot turbines typically proposed, reduced to perhaps ½ mile for turbines of 125 feet in height.
2. Mandatory shutdown of turbines during nighttime sleeping hours.
3. Mandatory shutdown of turbines that generate noise complaints, until such time that actual noise levels can be MEASURED and demonstrated that background levels are not exceeded by independently determined health/acoustic study levels, including low frequency and infrasound levels.
4. Mandatory homeowner option to sell to developers at market value, if and when inadequate (i.e., 1,000 feet – 1,500 feet) setbacks are approved by any unit of government.
5. A moratorium on any further turbine construction within 2 miles of any residence, until such time that there are reliable studies addressing low frequency and infrasound impacts from turbines on human health. Claims made by industry put the burden of proof on homeowners, and it is the appropriate role of government to end this trend and rely on credible evidence to protect the public health, safety and welfare,...and, indeed, their property values.

Any homeowners that lived at ground zero of the Big Dig project were certainly bought out for the greater public good. I suggest that enforcing that concept is an appropriate use of governmental authority with the claimed public good of wind energy projects as well. Until then, the completely lopsided scale of turbine developments will surely continue to create health impacts, and people will either be trapped within, or flee (abandon or sell at huge discounts) their family homes.

Thank you for your attention to my response to your inquiry. I remain available to discuss the related real estate issues that correlate with health effects.

Sincerely,

Michael S. McCann
McCann Appraisal, LLC
500 North Michigan Avenue, Suite # 300
Chicago, Illinois 60611

Real Estate Appraisal & Consulting

Cell: (312) 961-1601

mikesmccann@comcast.net

Frank Haggerty
126 Brandt Island Road
Mattapoisett, MA 02739

Concerned Citizens for Responsible Wind Power
Mattapoisett

June 7.2011

Re: Falmouth Wind Turbine Setbacks -Noise and Shadow Flicker

The major issue is the semi quasi state agency MTC, Massachusetts Technology Colaborative,as it has been in the past. The MTC actually were the owners of the 5.2 million dollars worth of Falmouth commercial wind turbines. The MTC had these turbines in a storage facility for almost five years at \$3300.00 per month. This is quite an embarrassment for the semi-quasi state agency

Prior to the installation of these two commercial wind turbines residents in Mattapoisett and Fairhaven had formed citizens groups and initiated legal action against the siting of these type of turbines to close to residential property. There is a URL below and in that document you will find that in the Brandt Island Road, Mattapoisett section the proposed placement of commercial wind turbines was less than 800 , eight hundred, feet from my house in Mattapoisett.

A review of the management employees at the MTC should be undertaken to see if the employees used the semi quasi state agency as a stepping stone in their resumes to work for private commercial wind turbine contractors after the installation of these two commercial wind turbines. A reveiw of the so called engineers and project management individuals in the Mattapoisett wind study would be a good start. How did the MTC hold out these two turbines as if they were a carrot on a stick or some kind of contest to see which town could race to get a "deal" from the MTC .

My belief is the MTC,Massachusetts Technology Colaborative, was stuck with these two commercial wind turbines and put the residents of Massachusetts residential property rights above the safety of the public to rid themselves of over 5 million dollars and the rental fees that could be a political embarrassment to the MTC and the people who work at the semi quasi state agency.

The MTC a semi quasi state agency acted as the purchasing agent for these two turbines,conducted a sale and public auction of the turbines ,provided financing for wind studies and appears to have acted as the general contractor for the Falmouth wind turbines rather than just promoting renewable energy .

PDF = 800 foot setback in MTC Mattapoisett wind siting :

http://www.masstech.org/Project%20Deliverables/Comm_Wind/Mattapoisett/Tri-Town_ORR_Preliminary_Site_Analysis.pdf

Concerned Citizens for Responsible Wind Power

http://www.mass.gov/Eoeea/docs/doer/renewables/wind/Public%20Comments_Wind%20On%20State%20Owned%20Lands_Listening%20Session%201_Frank%20Haggerty%20%20Joe%20DeLeo.pdf

Thanks Frank Haggerty

RE : Commercial Wind Turbine Noise

We used this argument about commercial wind turbines in Mattapoisett which worked as part of the argument against wind turbines.

Here is our view: The nacelle or what is called the motor on top of the wind turbine weighs well over 50 tons which equates to over 100,000 pounds. The nacelle is made up of gears turning and spinning. In some cases the motor has up to 1000 moving parts. Noise measurements are done to calculate the sound from the blades at different distances.

The point I'm trying to make here is that a modern day US Battle Tank weighs about the same as the nacelle on a modern day commercial wind turbine. The modern day tank is built for Stealth technology but the sound of a modern day tank gears and turning brings fears to ears of any type of ground troops as the sound of the gears turning. A soldier on the ground becomes quickly tuned to the sound of those gears as do the people who live around commercial wind turbines.

The comparison of the modern battle tank Vs the gearing noise of the commercial wind turbines is valid as so many citizens have been in the military service and are familiar with the gear noise from a battle tank - The gear noise and vibration has been overlooked in the siting of commercial wind turbines .

Thanks Frank Haggerty ,Brandt Island Road , Mattapoisett

Concerned Citizens for Responsible Wind Power

<http://www.azocleantech.com/news.aspx?newsID=8945>

The wind turbine from Vestas incorporates a microprocessor-based type of control that also includes remote monitoring option. The nacelle and rotor of the V82 wind turbine weigh 52 tons and 43 tons, respectively.

<http://www.fas.org/man/dod-101/sys/land/m1.htm>

The M1 Abrams Main Battle Tank (MBT) is the namesake of the late General Creighton W. Abrams, former Army Chief of Staff and commander of the 37th Armored Battalion. It is the backbone of the armored forces of the United States military, and several of US allies as well.

The modern day tanks weigh between 60 and 68.7 tons

The Massachusetts Constitution affirms the dignity and equality of all individuals. It forbids the creation of second-class citizens. The state through its semi quasi state agency and the cities and towns along with the agenda of the current governor are creating a second class group of citizens with the poor siting of commercial wind turbines.

The wind turbine fray is sparking class warfare. Time after time the blue collar section of town after town has been selected to lose their property rights for the good of all the others in town.

We feel bewildered and betrayed by our own government, which is maliciously trying to steal our land through the poor siting of commercial wind turbines. We have lost our democratic rights and have become second class citizens, facing the theft of our land through regulation. Massachusetts State law forbids the creation of second-class citizens

Thanks Frank Haggerty ,126 Brandt Island Road , Mattapoisett ,Ma 02739

From: M. Bernardi [<mailto:Marco.Bernardi@windwahn.de>]
Sent: Tuesday, July 05, 2011 7:20 PM
To: MassDEP, WindTurbineDocket (DEP)
Cc: J. Reichardt
Subject: concerns about wind turbines

Mr. Kenneth Kimmell, Commissioner of MA Department of Environmental Protection
Mr. John Auerbach, Commissioner of MA Department of Public Health

Dear Mr. Kimmell,
Dear Mr. Auerbach,

we are living in northern Germany near the Northsea. For the last 16 years, we have to endure wind turbines.
Short after building up the first turbines our health problems began.

The best way to express our concerns about wind turbines is this video about our life beside 122 wind turbines.

<http://www.youtube.com/watch?v=RiQ3EVhGriA>

The starting picture shows our home and the nearest 15 turbines.

Sincerely yours
Jutta Reichardt & Marco Bernardi
Hinter Neuendorf 11
D - 25554 Neuendorf-Sachsenbande

--

www.windwahn.de

CIVIL RIGHTS ARE OUR MOTIVATION - NATURE IS OUR ENERGY

remember: we are NIMBLY - not NIMBY

Member of

[EPAW](#)
[Save The Eagles International](#)

[Gegenwind Schleswig-Holstein](#)

siehe auch

www.na-paw.org

www.windvigilance.com

www.windturbinesyndrome.com

--

www.windwahn.de

As a citizen who supports the growth of clean, renewable energy in this country and the Commonwealth, I would like to express my support for appropriately sited wind turbine generators and my disapproval of the extreme setbacks suggested for the siting of wind turbines based upon random and unclear data - especially single on-site wind turbines.

A one-size-fits-all approach is completely inappropriate. Wind turbines should be sited appropriately according to the type of location and size of the wind turbine.

Properly sited single wind turbines will only positively impact the overall health of individuals and the environment of our planet. Distributed wind power is a safe source of energy for our environment. The more distributed wind projects that are built, the more we can alleviate the need for coal, natural gas, oil or nuclear power, all of which have been proven to be an inarguable detriment to the health of humans and the environment. Please focus your valuable time and energy on the reduction of the real consequences of electric generation in this country.

Thank you for considering my comments.

Alan Axworthy
Application Engineer
Northern Power Systems
29 Pitman Road
Barre, VT 05641
802-461-2907 Office
415-203-0219 Mobile
802-461-2996 Fax
www.northernpower.com

Connect with us online at:

www.northernpower.com/community-wind

www.northernpower.com/social-media

From: Lorrie [<mailto:lpcgillis@bmts.com>]

Sent: Sunday, July 03, 2011 7:44 AM

To: MassDEP, WindTurbineDocket (DEP)

Subject:

Attached please see Dr. McMurtry's April 22, 2009 deputation on industrial wind turbines to the provincial government.

Lorrie Gillis

R.R.4

Flesherton, Ontario, Canada

519-922-3072

Dr. Robert Y. McMurtry to receive the Order of Canada

Posted on [07/01/2011](#) by [MA](#)



Congratulations, Dr. McMurtry and **thank you** for all you have done to promote responsible health care in Canada.

[The Governor General of Canada](#)

OTTAWA—His Excellency the Right Honourable David Johnston, Governor General of Canada, announced today 50 new appointments to the Order of Canada.

From: Susan Klein [<mailto:sklein1@capecod.net>]
Sent: Monday, July 18, 2011 1:52 PM
To: MassDEP, WindTurbineDocket (DEP)
Cc: Paul Niedzwiecki; Ryan Christenberry
Subject: Potential Health Effects of Wind Turbines

Dear Colleagues

Paul Niedzwiecki, Executive Director of the Cape Cod Commission, has made me aware of the Massachusetts Department of Environmental Protection and the Massachusetts Department of Public Health's inquiry into the health effects of wind turbines. I want to express my deep appreciation to you all for launching this serious inquiry into the health effects of wind turbines.

I come at the issue of health effects of wind turbines wearing three hats. The first hat is as a public health professional for the past 45 years (Yale MPH '68), most of that time as a senior consultant with

John Snow, Inc. (JSI). My second is as a member of the Alternative Energy Committee of the Town of Dennis, promoting the use of renewable energy sources throughout the town. My third hat is as Executive Director of the Institute for Applied Neuroscience (IAN), a recently incorporated Massachusetts non-profit dedicated to research into technology-assisted treatment for brain-based disorders.

I have become increasingly dismayed over the polarization around the issue of wind turbines. I first became aware of health complaints associated with wind turbines last fall when, representing the Alternative Energy Committee, I attended the public hearings of the Cape Cod Commission on siting guidelines for wind turbines. I had come to the hearings as an unequivocal proponent of wind energy, but as one after another of the Falmouth residents catalogued their symptoms, I realized that something real was going on there. The epidemiologist in me wanted to understand why some people were affected while others were not and why these symptoms were associated with some configurations of wind turbines and not with others so that we can get on with promoting wind energy in a healthful manner—"safe siting," as it were.

Sleep disruptions, anxiety, depression, irritability, night terrors, cognitive disturbances, vertigo, dizziness, tinnitus--alarms began going off in my head. These symptoms are many of the brain-based conditions that practitioners and therapists treat via a variety of technology-assisted modalities that fall within the general rubric of applied neuroscience (often referred to generically as neurofeedback). Putting on my IAN hat, I began to think that if we can purposefully change brainwaves therapeutically, it stands to reason that there may well be something about certain configurations of wind turbines that could adversely affect brainwaves, resulting in the reported symptoms.

I'd like to throw out a number of hypotheses I believe are worth pursuing in order to get a better handle on the health effects of wind turbines.

Many people are theorizing that it is ILFN--the infrasound (< 20 Hz) and slightly above (low end of low frequency sound)--that is responsible for these symptoms. ILFN is exactly the frequency range at which the brain operates. In the brain, Delta (0-4 Hz) represents deep sleep and coma; Theta (5-7 Hz) represents deep relaxation on the edge of sleep and wakefulness; Alpha (8-12 Hz) represents relaxation; SMR or low Beta (13-15 Hz) represents basic cognition; Beta (16-22 Hz) represents focused cognition, high Beta (22-32 Hz) represents intense focus or stress and anxiety, and Gamma (38-42 Hz) is not well-understood but gamma synchrony seems to be required in order for the brain to organize itself for problem-solving and other cognitive challenges.

So what is the mechanism by which turbines might cause the symptoms? Different mechanisms may be at work for different clusters of symptoms. Symptoms of Wind Turbine Syndrome, as defined by Dr. Nina Pierpont and others, tend to cluster at various loci of the brain. Anxiety, depression, cognitive disturbances and migraines tend to be frontal lobe disorders. Nausea, dizziness, tinnitus and other symptoms related to the vestibular system tend to be associated with the lower portions of the occipital lobe. Sleep disturbances are generally associated with the Central Motor Strip. Irritability tends to be associated with the temporal and parietal lobes. Night terrors almost surely arise from the amygdala

deep within the brain but which might be accessed through the right prefrontal lobe or the sub-inion area below the occipital lobe. Other symptoms are physical rather than brain-based—tachycardia, elevated blood pressure, etc.

For frontal lobe symptoms, the mechanism at work may be some form of “entrainment,” a well-known phenomenon in physics wherein two waves oscillating at different frequencies fall into synchrony with one another. The waves involved could be sound, light, vibration, etc. Just like a tuning fork can be used to “entrain” or tune a piano string, some therapist use various methods to entrain brainwave to certain desired frequencies. Perhaps the ILFN waves emitted from certain wind turbine configurations are also causing the brainwave synchrony, but at frequencies that have deleterious rather than therapeutic effects. In addition to ILFN, some theorize that seismic waves-- be they produced by the infrasound or, independently, by the pulses of the turbine blades--traveling through the ground might be associated with some of the symptoms, particularly the physical symptoms. It is not unreasonable to consider that seismic waves could also produce an entrainment effect.

One of the most common forms of therapeutic brainwave entrainment is produced by means of “binaural beats,” a form of brainwave entrainment using sound waves. Two tones at different, but close, frequencies are presented to each ear, generating a “beat frequency” equal to the difference of the two frequencies, which is generally subsonic (i.e. ILFN). Depending on the beat frequency, binaural beats may have a calming effect (eg. 10 Hz—the mid-point of the alpha range) or may increase focus (eg. 20 Hz—the higher end of the beta range at which higher level cognition and focus take place). The phenomenon of binaural beats may well be what is at work in the Falmouth situation where you have two turbines about a mile apart, each emitting its own frequency waves. Those reporting the most intense symptoms live on Blacksmith Rd. which runs more or less parallel to an imaginary line drawn between the two turbines, enabling them to perceive the frequencies generated by each of the two turbines. If the resulting beat frequency were to be too low, depression could result; too high and anxiety could result. While symptoms seem to persist even when only one Falmouth turbine is operating, turbine configurations around the world associated with deleterious health effects tend to involve two or more turbines, suggesting that this still might also be a useful area of inquiry.

A relatively new departure from the traditional approach to neurofeedback, known as “gamma induction/beta attunement” or “beta reset” for short, may shed some light on those symptoms associated with the vestibular system. In addition to being used to treat chronic pain, “beta reset” has been used with good success to treat chronic vertigo, balance issues, and tinnitus. With traditional neurofeedback, a single optimum frequency is selected for the site in the brain associated with the particular disorder and the brain is “rewarded” when it makes waves at that frequency. With this new protocol, used at sites at the periphery of the occipital lobe, the reward frequency is in the high beta and gamma range and is ramped up in by 2 Hz increments in quick succession, followed by a precipitous drop to the original frequency. The brain’s inability to keep up with these changes causes the brain to “reset” itself to its normal frequency. The constantly changing frequencies of wind turbines in response to changing wind velocity may mimic this confounding onslaught to the brain, causing it to reset itself, but at abnormal frequencies.

Why might so many different areas of the brain be affected? Typically, the lower the frequency of waves, the longer their length, and the more able they are to penetrate physical barriers such as windows and walls of houses. It has been reported by acousticians that having penetrated these barriers, the low frequency and seismic waves will resonate within the house. If this is truly the case, then in resonating, they could well be bombarding the brain from different angles, and thus affecting a variety of different sites.

While all of the above is still within the realm of conjecture, I have bounced these ideas off of a number of applied neuroscientists and acousticians in the US and abroad, and all concur that these theories are consistent with what is known in their respective fields.

Solving the mysteries of the health effects of wind turbines is of great interest to me. It is important that experts in various disciplines enter into a dialogue, bringing their expertise in diverse areas together. If there is an opportunity for me to serve on your Expert Panel on the potential health effects of wind turbines, I would very much welcome the chance to do so.

Sincerely,

Susan F. Klein

Member, Dennis Alternative Energy Committee

Executive Director, Institute for Applied Neuroscience

Senior Consultant, John Snow, Inc.

From: Callie Reis [mailto:callier@noise-control.com]

Sent: Wednesday, June 22, 2011 2:03 PM

To: MassDEP, WindTurbineDocket (DEP)

Cc: Molly Ziergiebel; Mike Bahtiarian

Subject: NCE Wind Turbine Noise Measurement

To the MassDEP,

This e-mail is regarding the request for "Public Comments on Human Health Concerns Related to Exposure to Wind Turbines". As noise and vibration engineers in Massachusetts, we have been studying the phenomenon of wind turbine noise in several locations around New England. It has been our experience that the specific characteristics of wind turbine noise require more specialized noise criteria than what is currently expressed in the MassDEP noise criteria. In particular, it has come to our attention that the amplitude modulation (AM) of the wind turbine noise contributes significantly to wind turbine annoyance in humans. The existing MassDEP noise criteria of "10 dB above background noise levels" does not account for AM.

Wind turbine noise criteria in Europe and in other states and communities have begun to incorporate various metrics to account for the AM of wind turbine noise. We believe a specific wind turbine noise

metric should be developed for the state of Massachusetts. Our company, Noise Control Engineering, has prepared a white paper, attached here, which describes the issue of wind turbine noise from an acoustic engineering perspective, and proposes an "Acoustic Quality" metric to evaluate wind turbine noise. Our company is currently undergoing research efforts to study this issue in greater depth.

I hope that you and your colleagues find this document relevant to the current debate on wind turbine noise. We would be interested in discussing our findings with the members of your Expert Panel, if possible. Do not hesitate to contact us if you have questions about the proposed work. We simply ask that you notify us if you would like to send the white paper to a third party. This way we can maintain some control over where our work is released.

Best regards,

--

Callie Reis
Noise Control Engineering, Inc. (NCE)
Billerica, MA
[978-670-5339](tel:978-670-5339)
www.noise-control.com

Attachment: *Methods to develop an 'Acoustic Quality' Metric for wind turbine effects. Reis et.al., June 22, 2011.*

From: Dan Webb [<mailto:danwebb@notuscleanenergy.com>]
Sent: Sunday, June 26, 2011 10:50 PM
To: MassDEP, WindTurbineDocket (DEP)
Subject: PUBLIC COMMENT ON HUMAN HEALTH CONCERNS RELATED TO EXPOSURE TO WIND TURBINES

Dear Sirs,

Please see attached and confirm receipt.

Thank you,

Daniel Webb

.....

Notus Clean Energy, LLC

508-566-1882

Please note new postal address:

P.O. Box 547

West Falmouth, MA 02574-0547

www.notuscleanenergy.com

NOTUS Clean Energy, LLC

P.O. Box 547, West Falmouth MA 02574-0547 • 508-540-6063 • info@notuscleanenergy.com

1

June 27, 2011

MassDEP Wind Turbine Docket,

1 Winter Street

4th Floor Mailroom,

Boston, MA 02108

Re: Public comment on health concerns related to wind turbines

Dear Sirs,

Thank you for the opportunity to provide public comment. My input consists of several publications which are cited below with excerpts, and attached.

1) In 2010 the Australian National Health and Medical Research Council (NHMRC) released a public statement¹ titled "Wind Turbines and Health". Excerpts:

"The Public Statement presents the evidence, current at 2009, relating potential health impacts of

wind turbines on people living in close proximity. The Statement concludes that there is currently no

published scientific evidence to positively link wind turbines with adverse health effects."

"The 2009 Evidence Review presents findings from a rapid review of the evidence from current literature on the issue of wind turbines and potential impacts on human health. The Review focuses

on concerns regarding the adverse health impacts of infrasound, noise, electromagnetic interference,

shadow flicker and blade glint produced by wind turbines."

2) An article by Dr. Simon Chapman², titled "Wind turbine sickness prevented by money drug" published by the Australian Broadcasting Corporation on 3/29/11. Excerpts:

"Wind turbines have so far killed no-one and seem likely instead to contribute to saving hundreds of

millions of lives over future decades through reducing greenhouse gases"

"Laurie claims that in addition to a long list of health problems, poor school performance, juvenile

mental health disturbance and acute suicidal tendencies are associated with exposure to wind farms.

Like Pierpont, she has not had her claims considered by independent peer review in any publications

in research journals.

Money is a highly effective antidote. Those most exposed to wind turbines include those who have them on their land. Yet miraculously, there are no known cases of such people making claims about being adversely affected by turbines. Strangely, it is always those who see the turbines on the land of their neighbours. Money, it seems, is an astonishingly effective preventive agent in warding off Wind Turbine Syndrome.”

¹ <http://www.nhmrc.gov.au/publications/synopses/new0048.htm>

² <http://www.abc.net.au/unleashed/45730.html>

NOTUS Clean Energy, LLC

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2

The author, Dr. Chapman, PhD FASSA, is Professor in Public Health at the University of Sydney. He has published over 365 articles in peer reviewed journals and 14 books and major reports. In 2008 he won the NSW Premier's Cancer Researcher of the Year medal; and the Public Health Association of Australia's Sidney Sax medal. He was deputy editor (1992-1997) then editor (1998-2008) of the British Medical Journal's, *Tobacco Control* and is now its commissioning editor for Low and Middle Income Countries.

3) An article by Jonathan Hiskes³, published by Grist magazine on 11/16/09, titled “One doctor’s quest to sound the alarm on wind turbine syndrome”. Excerpt:

“So here’s what’s wrong with wind-turbine syndrome. First, there’s Pierpont’s method. Her study consisted of 38 people from ten families—by most standards too small to yield conclusive results.

All of them self-identified as people who were already experiencing health effects; there was no control group.

Further, acousticians who study the issue say Pierpont fundamentally misunderstands the nature

of low-frequency sound. Geoff Leventhall, an English acoustician who retired from the University of London and chairs the European Institute of Noise Control Engineering, agrees that turbines create infrasound that cannot be heard. So do driving with an open window, swinging on a swing

set, and even jogging--the slight rise and fall of the head create the effect. Leventhall describes infrasound as a common phenomenon that isn’t dangerous except at extremely high levels, such

as those produced by spacecraft. Infrasound from wind turbines does not approach that level, said Leventhall, who recently flew to Wisconsin to testify at a hearing for the proposed Glacier Hills Wind Park.

His critique of “wind turbine syndrome” becomes more technical from there. Essentially, he picks

apart Pierpont’s claim that bodies absorb infrasound without actually hearing it. At the frequency of infrasound (generally less than 20 Hz), the human body makes plenty of its own noise—the heart pumps, the ribcage expands and contracts. These noises mask whatever turbines might add, Leventhall said. (A very small number of people experience extreme responses to all sorts of sounds, both low and high-frequency, though Leventhall and other experts say this is an unrelated issue.)

“Pierpont has clearly misunderstood much of the acoustic material which she refers to,” he

writes in an appraisal of her work he submitted to the Wisconsin project.”

³ <http://www.grist.org/article/2009-11-16-nina-pierpont-quest-to-sound-the-alarm-on-wind-turbine-syndrome>

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3

4) Any study of health impacts of wind turbines should include health benefits resulting from use of renewable energy sources, which displace emissions from generation plants using fossil fuels.

Data published by ISO New England⁴, the regional grid operator, quantifies emissions resulting from each unit of electricity produced in our region. The 2007 Marginal emissions rates (the most recent available) show that for every thousand kilowatt hours (i.e. each MWh) of generation, the marginal emissions are:

Carbon dioxide CO₂ 1004 lb/MWh

Sulfur dioxide SO₂ 0.57 lb/MWh

Nitrous oxide NO_x 0.28 lb/MWh

Every unit of electricity produced by a wind turbine, or another renewable energy source, prevents pollution per the above emissions rates.

5) Significant health impacts and costs resulting from emissions from fossil fuels used to generate electricity have been quantified. For example, Harvard Medical School’s Center for Health and the Global Environment recently published a report⁵ titled “Mining Coal, Mounting Costs: The Life Cycle Consequences of Coal”. Excerpt:

“Particulates and oxides of nitrogen and sulfur kill over 24,000 people annually, including 2,800 from lung cancer (2005). Heart disease: 38,200 non-fatal heart attacks annually”.

The report includes seven recommendations for local actions. One recommendation is:

“Manufacture and install solar, wind and small-scale hydro.”

The Brayton Point Station, located in Somerset, MA, burns over two million tons of coal annually⁶. It emits vast quantities of CO₂ as well as particulates including mercury and sulfur dioxide. I commend MA DEP for taking new interest in health impacts of electricity production, but surely the top priority should be consequences of pollution and climate change from fossil fuels, rather than clean renewable energy sources.

Sincerely,

Notus Clean Energy, LLC

Daniel H. Webb,

Manager

⁴ ISO New England “2007 New England Marginal Emission Rate Analysis”

http://www.iso-ne.com/genrntion_resrcs/reports/emission/2007_mea_report.pdf

⁵ <http://chge.med.harvard.edu/programs/ccf/documents/MiningCoalMountingCosts.pdf>

⁶ http://www.sourcewatch.org/index.php?title=Brayton_Point_Station#Emissions_Data

Attachments: <http://www.nhmrc.gov.au/guidelines/publications/new0048>

<http://www.grist.org/article/2009-11-16-nina-pierpont-quest-to-sound-the-al>

From: Rob Aliasso [<mailto:realiasso@stebbinseng.com>]

Sent: Tuesday, July 05, 2011 9:22 AM

To: MassDEP, WindTurbineDocket (DEP)

Subject: Public Comments on Human Health Concerns Related to Exposure of Wind Turbines

I wanted to express my strong objection of siting Industrial Wind Turbine Generators closely amongst human populations in Massachusetts (and for that matter anyplace). Dr. Nina Pierpont, and her peers have well documented the illness of Wind Turbine Syndrome which included effects of sound, vibrations and shadow flicker.

Also, it has been well documented that dBa, dBc sound shall be limited to extremely low values, that equate to some 3000 feet separation between wind turbine generators and humanity to avoid affliction to human beings, as well as domesticated animals (see attached Ontario study, which is now being restudied for further separation).

I have also attached an interview from a Dec 19 interview of residents living near the Fox Island wind facility in Vinalhaven, ME who are now experiencing problems with turbine noise.

The full interview, conducted by WERU radio is on 89.9 FM radio can be accessed here: <http://archives.weru.org/voices/weekend-voices-121909> . This project consists of 3 GE 1.5 MW turbines and was commissioned on November 17.

We ask the Commonwealth's DEP and DPH to strongly reconsider siting requirements of industrial Wind Turbine Generators to place a very strong setback requirement to avoid well documented afflictions, illness and discomfort to closely located human population.

Feel free to contact me with any questions or comments

Robert E. Aliasso, Jr.

+1 (315) 661-2694 (work)

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+1 (315) 938-7553 (home)

From: Lawrence Worthington

Sent: Thursday, June 30, 2011 11:56 AM

To: MassDEP, WindTurbineDocket (DEP)

Subject: industrial wind turbines

Dear To Whom It May Concern,

My wife, Jill and I live approx 3400 feet from Wind I and Webb/NOTUS Clean Energy Turbine in the town of Falmouth. We have experienced countless awakenings at all hours of the night and have heard them outside our home since April 2010. these industrial turbines were not meant to abutt residential areas. Proper siting is paramount. The health effects involving these turbines is not fully known. Why is the state not getting behind the people who are living with negative impacts, and before they put them up, why were we not informed by the Town of Falmouth? We have neighbors who live even closer, within 1400 feet? What about them?

Please consider what's really driving this initiative and not experiment with the general public's health and well-being. Sincerely, Lawrence V Worthington

From: LILLI Green [mailto:preservethewellfleetilove@gmail.com]

Sent: Friday, July 22, 2011 2:28 PM

To: MassDEP, WindTurbineDocket (DEP); Kimmell, Ken (DEP); Auerbach, John (DPH)

Subject: Submission of materials to be entered into evidence regarding the review of public health and safety standards near wind turbines

Dear Commissioners Kimmell and Auerbach:

Attached please find my submission as well as some supporting documentation.

I am formally submitting all four pdf files attached to this email into evidence regarding the review of public health and safety standards near wind turbines to be reviewed by the expert panel.

Respectfully submitted

Lilli-Ann Green

45 Tim Way Rd.

Wellfleet, MA 02663

7/19/2011

Kenneth L. Kimmell

Commissioner, Department of Environmental Protection

One Winter Street

Boston, MA 02108

John Auerbach

Commissioner, Department of Public Health

One Ashburton Place

Boston, MA 02108

RE: Submission of materials to be entered into evidence regarding the review of public health and safety standards near wind turbines

Dear Commissioners Kimmell and Auerbach:

I thank you for convening an expert scientific panel on health impacts associated with exposure to wind turbines that is completely impartial where no member of the panel has been paid by the wind energy industry, pro-wind advocacy organizations, wind developers, or any related industries. I

personally appreciate the interest in this serious topic that has the potential to adversely impact many thousands of Massachusetts residents and visitors.

Open and transparent government is of paramount importance to the citizens of Massachusetts.

Especially in light of recent articles in the Commonwealth Magazine and the Cape Cod Times to the

contrary, I am confident that you will show the citizens of our Commonwealth that open and

transparent government is important to you during the process in convening the expert panel, in

providing all materials submitted by the public as well as all submissions to the panel, in posting

online all submissions to DEP, in holding meetings of the panel and public hearings, and in writing

the drafts of the report and requesting the feedback of the public, and in finalizing the report.

I also urge you to err on the side of caution and to recommend invoking the precautionary principle,

and institute a moratorium on the construction of wind turbines in the state of Massachusetts until the

panel completes its work. I maintain that further research is needed in order to conclusively determine

what distance constitutes a safe setback of turbines from people to protect the health and safety of

the citizens of Massachusetts. We certainly know that at a distance of 2 km, or 1.24 miles from wind

turbines, people all around the globe are seriously physically ill as per the ample evidence that Wind

Wise~Massachusetts submitted on 7/19/11.

The World Health Organization states: "The precautionary principle. In all cases noise should be

reduced to the lowest level achievable in a particular situation. When there is a reasonable possibility

that the public health will be endangered, even though scientific proof may be lacking, action should

be take to protect the public health, without awaiting the full scientific proof."

World Health Organization, Guidelines for Community Noise, 1999

http://www.euro.who.int/mediacentre/PR/2009/20091008_1

2

I am formally asking if I may show a film to the expert panel that I have produced. I believe an hour of the film will provide the panel with new and valuable information not found elsewhere.

The film contains video footage that I shot in a recent visit to Australia and New Zealand. We

interviewed over 25 people living near wind turbines in three different locations. The people in the film simply tell their stories of what is like to live near wind turbines.

The surprise for me was that **many of the people we interviewed live over 2 miles from the nearest turbine and their adverse health impacts include serious cardiovascular symptoms**

that have been documented by medical professionals. One person we interviewed is a male in his

50s. Donald Thomas spoke about how he is finding himself waking up in the middle of the night with a

racing heart rate so intense that it feels like he has just run a marathon, but he was just sleeping. He

also experiences this symptom when he is relaxing during the day. He talked about having normal

and slightly lower than normal blood pressure readings his whole adult life in the range of 117/80. He

told us that his blood pressure has been dangerously elevated since the turbines became operational.

His condition was so alarming to his physician that he was given a 24 hour monitor that measured

heart rate and BP. The monitor measured his "maximum awake systolic blood pressure during the 24

hour period [at] 190, and his maximum "asleep" systolic blood pressure [at] 167" according to the

medical doctor who verified the personal account via email to me. He told us that this was a night that

the turbines were not especially loud or disturbing and did not wake him up as the turbines regularly

do. He was prescribed blood pressure medication. When we spoke with him in January of 2011, he

expressed his concerns being that when the turbines are not 'spinning' or when he goes away from

his home, his blood pressure drops dangerously low. Remember, he actually has normal blood

pressure. He told us that when he is driving and working, he feels dizzy and like he will pass out.

We spoke with several others who live over 2 miles from the nearest turbine and they spoke about

racing heart rates and dangerously high blood pressure readings first thing in the morning. They also

told us that their medical doctors have records showing many years of normal blood pressure

readings prior to the wind turbines becoming operational.

One person, Berni Janssen, spoke about feeling like her "heart was about to leap out of her body."

The first time she experienced this symptom she was asleep and awakened to think she was having a stroke and would die. She has experienced this symptom at least several times since. Other symptoms people in Australia and New Zealand described to us are what has been termed classic wind turbine syndrome symptoms. Many spoke of sleep disturbance and chronic sleep deprivation for days on end. Some reluctantly take medication in order to sleep so they can function during the day. Many also experience headaches that are so intense they need medication. Others talked about tinnitus, dizziness, vertigo, nausea, visual blurring, eye strain, tachycardia, irritability, problems with concentration and memory, distraction, fatigue, feeling vibration, muscle spasm, nausea, palpitations, pressure in the ears or head, stress, tension, and panic attack episodes associated with sensations of internal pulsation when awake or asleep as described above. We also interviewed over 15 experts. Video taped excerpts of experts are also included in the video. I welcome the opportunity to discuss showing the expert panel this evidence so that they are fully informed when making decisions that will impact many thousands of Massachusetts citizens for the next 20 years or longer. I am attaching several letters to this submission from people who live over 2 miles from the nearest turbine. They submitted the letters to the Australian Senate as evidence.

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My experience abroad leads me to believe that the reported 50 people in Falmouth, those in Woods Hole, in Newburyport, at Mass Maritime, in Hull and Hingham, near Jimney Peak and now in Hancock who are experiencing adverse health impacts are just the tip of the iceberg for what awaits Massachusetts if wind turbines are placed too close to people. Doctor Sarah Laurie in Australia has learned of several people who had normal blood pressure readings prior to the wind turbines being constructed and who have now developed high blood pressure, or have had heart attacks and strokes since the turbines commenced operating. One person lives 6.3 miles from the nearest turbine. The question I have is how close is too close to the nearest neighbor's property line where

people live, attend school, work, are incarcerated or recreate so that there will be no adverse health

impacts from wind turbines?

I further have serious questions about the top priorities of Massachusetts and MA DPH and the larger

issue of health care costs. I sincerely applaud the efforts of Mr. Auerbach and the MA DPH to

promote wellness and reduce chronic disease in our state. I support and appreciate the efforts to do

so. As CEO of a Massachusetts company that focuses on health care education and quality

improvement, I know that these efforts are much needed in our state and nation. A concern I have

about wind turbines, is regarding chronic sleep deprivation and other reported cardiovascular

symptoms and the top priorities of our state. In my humble opinion, the two are at odds with each

other. People can not habituate to wind turbines. Wind turbine construction will increase chronic

disease in our state and therefore is the antithesis of the stated goals of the Governor and MA DPH.

One only needs to look at the potential cost to society from an industry that has received numerous

complaints from people all over the globe stating that they are experiencing adverse health impacts.

Can we really afford to close our eyes to the people who are suffering? Can we really afford to allow

this industry to place the health care costs of Massachusetts citizens who become physically ill on the

already over burdened health care system? I think not.

I also have concerns that are specific to people living on Cape Cod. We have a unique situation

because our water system is based on a sole source aquifer. Our water supply is fragile and this is

not taken lightly by anyone I know. Wind turbines contain extremely toxic oil. A simple Google search

revealed a website with wind turbine data. This particular turbine contains 500 kg (or 1,102.311 lb) of

lubricating oil. It recommends that it is replaced every two years. Other turbines certainly may contain

less oil but the fact remains, that is a lot of oil and a lot of room for accidents in a fragile unforgiving

piece of Massachusetts. During our stay in New Zealand we saw wind turbines leaking oil. Our host

told us he sees this "all the time". In fact he said that there are gear boxes being brought up to what

they call the industrial wind power plants “all the time.” He told us that he assumes that they have problems with the gear boxes and they need replacement because he sees the used ones traveling down the road near his home. He also said that when they confronted the wind developer with oil leaking from the turbines, they were told “accidents happen.” Wind turbines also fall over, just collapse. What happens to the oil when they collapse? What happens to wind turbines during hurricanes? Will they collapse? What guarantees do the citizens of Cape Cod have that the public health and safety of our fresh water supply will not be harmed? I think NONE. If there are wind turbines on Cape Cod we are not 100 % safe from oil leaks and other hazardous materials that are associated with wind turbines in the cleaning, repair and maintenance adversely impacting our water supply. How can you sanction putting our water supply in jeopardy? This is simply a health hazard and unacceptable.

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Furthermore, my town website says that Wellfleet is “Located some seventy-five miles out into the Atlantic Ocean on the outer end of Cape Cod”. I love that about where I live. But I won’t love that if there are wind turbines and they catch on fire. What does the wind energy industry and wind developers say about fire? They say, let them burn. When they burn, sparks fly. You will see a document attached to this email concerning a fire in Australia. What can be done when one is 75 miles out to sea? Forest fires were a huge problem for the Cape Cod National Seashore in the early days of the park. Are we really willing to put one of our National Parks in jeopardy? Think about the environmental devastation. Then think about the health risks to the people living here. Then imagine if it happened during the summer months or during a hurricane or snow storm. I am very concerned about wind turbines impacting the health of the citizens of our great Commonwealth from many standpoints. I am also very concerned about the human impact on our environment. I believe it is important for us to find responsible solutions that benefit our state and do

not adversely impact our citizens and visitors from a health standpoint. I believe we can find many responsible solutions if we work together.

Respectfully submitted,
Lilli-Ann Green
45 Tim Way Rd.
Wellfleet, MA 02663
508-801-6211

preservethewellfleetilove@gmail.com

Attachments: <http://www.victorharbortimes.com.au/news/local/news/general/cant-fight-the-fire/1987235.aspx> ,
<https://senate.aph.gov.au/submissions/committees/viewdocument.aspx?id=003cd2fa-b08f-482c-a6f6-2a70a3a26cf7> , <https://senate.aph.gov.au/submissions/committees/viewdocument.aspx?id=77d6ff14-af83-4f25-b9de-5564cd9d1270>

From: Rene Wood
Sent: Thursday, June 30, 2011 11:26 PM
To: MassDEP, WindTurbineDocket (DEP)
Subject: Comments on DEP/DPH Human Health Concerns

June 30, 2011

Mr. John Auerbach, Commissioner
MassDPH

Mr. [Kenneth L. Kimmell](#), Commissioner
MassDEP

250 Washington Street

One Winter Street, 2nd Floor

Boston, MA 02108

Boston, MA 02108

Re: Proposed Expert Panel on Potential Health Impacts Associated with Wind Turbines

Dear Commissioner Auerbach and Commissioner Kimmell:

I am encouraged to see the joint collaboration between your two departments on the subject of potential health impacts associated with exposure to wind turbines.

While I have no personal experience in this matter and therefore no personal opinion, I do have concerns that what appear to be sincere reports from persons, including some living in Massachusetts, citing what they believe to be first hand negative health impacts resulting from exposure to wind turbines are being off-handedly dismissed or disparagingly characterized.

Medical history is filled with situations where symptoms did not fit the current diagnostic parameters so the patients were said to be imagining symptoms, overreacting or given other negative descriptors, such as troubled, mentally ill or hysterical. Lyme disease and Fibromyalgia are but two recent examples of this occurrence.

My comments:

- The announcement of your joint effort provided few details of how this expert panel would be formed, selection criteria for members, scope, time frames, public involvement etc. I believe details are important so I would encourage you to have on the expert panel persons from outside of the United States, as many areas of the world are ahead of us in the installations of wind turbines. Potential health concerns would likely manifest there first. Cultural difference may require further consideration.
- I would hope the panel's scope of work would be as large as possible to make sure that the panel does truly meaningful work and that it does not dismiss work/reports/experiences that may not have bubbled their way up to scientific peer review literature, as much of what is being reported may be too new to have reached such journals. A comprehensive scope of data will also help ensure greater acceptance of the panel's work.
- I urge the panel to pay particular attention to experiences, data, studies, and articles etc., in areas, which most closely resemble the Governor's and DEP's wind turbine siting strategy. The panel needs to know if Massachusetts is unique in its siting strategy and thus there may be no potential health concerns comparables, or whether Massachusetts' siting strategy has been implemented elsewhere. Comparing Massachusetts' siting strategy with that of T. Boone Pickens in the unpopulated Great Plains or the siting of turbines in the Altamont Pass in the San Joaquin Valley, CA and extrapolating their associated health concern data may have limited applicability.
- An independent panel, one without ties – monetary or otherwise – to the wind industry or its financial backers is essential.
- While it is not stated as to how, when or where this panel will meet, I do hope its meetings are public and include public hearings so testimony may be given. Such public testimony may need more than the usual three-minute testimony limit, as this topic may be deeply personal to many wishing to testify.
- I am concerned that the standard definition of “noise”, one of the listed specific attributes of concern, will miss what seems to be a different type of noise, not currently covered under our Massachusetts' noise law. It seems a new type of sound may be associated with wind turbines and it may have characteristics not currently well known but under study. From what I have read, it is not as audible or captured by standard noise measurement tools; it has been described as having a different impact on the inner ear. While we all are aware of this discussion relative to wind

turbines, it has yet to given an accepted descriptive term for easy reference. I do hope the panel will study this carefully.

- I am also interested in the potential impact of wind turbines on communications due to electromagnetic interference, especially flight and local emergency communications, as well as cell phone and broadband. If not already included in your listed specific attributes of concern, please consider adding them, as these are human health impact categories.

Thank you for this opportunity to provide comments.

Sincerely,

Rene C. Wood

From: akweyman@verizon.net [<mailto:akweyman@verizon.net>]

Sent: Thursday, July 21, 2011 10:47 PM

To: MassDEP, WindTurbineDocket (DEP)

Subject: Wind Turbine Health Effects

Dear DEP/DPH:

As a physician, I am concerned about health problems which have been related to large land-based wind trubines. Reports which I have found interesting and well researched are from Mars Hill, Maine, by Dr. Michael Nissenbaum (1), New York State and elsewhere by Dr. Nina Pierpont (2), and Australia by Dr. Sarah Laurie (3). In her book, Dr. Pierpont has described the problems as "Wind Turbine Syndrome" and others have preferred to attribute this collection of symptoms to sleep deprivation related to night-time noise as previously described by the WHO (4) which included fatigue, memory difficulties, concentration problems, mood disorders, cardiovascular, respiratory, renal, gastrointestinal, musculoskeletal disorders, immune system dysfunction, and an increased risk of mortality.

It appears that some people are more sensitive than others to the low frequency Aerodynamically Amplitude Modulated (AAM) sound produced by wind turbines and that infrasound which is produced may also play a role. An overview of the pathophysiology is found in "Audiology Today" (5), and more in depth research is described by Salt (6).

Acoustic engineers will provide important information for our understanding of AAM. A recent experience by Robert Rand and Stephen Ambrose as reported in testimony by Rand (7) before the Maine Board of Environmental Protection begins to document the importance of infrasound. More extensive study of wind turbine noise is important for our understanding of how the sound is created and transmitted in relation to atmospheric, topographic, and geographic conditions.

The recent publication by Phillips (8) "Epidemiologic Evidence for Health Effects from Wind Turbines" brings to an end the 'denial' approach to health problems taken by the wind industry. The completion of many wind projects in recent years provides the opportunity for open and objective evaluation of both good and bad wind turbine projects. The wind industry will probably not provide funding, so participation of the DEP and DPH will be important.

Investigations could begin at sites where property has been abandoned through "buy-outs with gag clauses" by the industry.

At this point, in view of our incomplete knowledge, and with the many variables involved, the only reasonable public health alternative is the ASSURANCE OF ADEQUATE RESIDENTIAL SETBACKS from the turbines. Empirically suggested setbacks range from two kilometers as recommended by Nissenbaum and Pierpont to as much as several kilometers by Phillips and ten kilometers by Laurie.

REFERENCES:

(Printed copies will be provided on request if there are problems with the internet)

1. Michael Nissenbaum, MD, www.windvigilance.com/mars_hill.aspx

2. Nina Pierpont, MD, PhD, "Wind Turbine Syndrome", K-Selected Books, Santa Fe, NM.

or at www.windturbinesyndromw.com

3. Sarah Laurie, MD, sarah@waubrafoundation.com.au

or <http://www.windturbinesyndrome.com/news/2011/explicit-cautionary-notice-to-those-responsible-for-wind-turbine-siting-decisions-waubra-foundation/>

4. Night Noise Guidelines for Europe, World Health Organization(2009)

www.euro.who.int/document/e92845.pdf

5. Wind-Turbine Noise; Punch, Jerry; James, Richard; Pabst, Dan; Audiology Today, Jul/Aug 2010 p.20-31

6. Responses of the Ear to Low Frequency Sounds, Infrasound, and Wind Turbines; Salt, Alec N.; Hullar, Timothy E.

Hearing Research 268 (2010) p.12-21

7. Robert W. Rand, testimony 07-07-2011, Maine Board of Environmental Protection,

http://www.maine.gov/dep/bep/hearing_375.htm

8. Epidemiologic Evidence for Health Effects from Wind Turbines; Phillips, Carl V., PhD; Bulliten of Science, Technology, and Society,

Vol.31:no.4 (August 2011)pp303-315

Thank you for the opportunity to provide this information. Good Luck with the review.

Albert K. Weyman, MD

41 Consodine Road

Brewster, MA 02631-1807

(508) 896-4206

akweyman@verizon.net

From: Mike Bahtiarian [mailto:mikeb@noise-control.com]

Sent: Monday, June 13, 2011 11:23 AM

To: MassDEP, WindTurbineDocket (DEP)

Subject: Wind Turbine Expert Noise Panel

Dear MADEP,

At the June 6th meeting in Falmouth I was able to have a quick conversation with Regional Director Dave Johnston regarding the expert panel on wind turbine sound. During the conversation Mr. Johnston told me the panel would only include medical doctors. Having been involved in a couple of sound studies for wind turbines, I think staffing the panel with only MD's will be difficult to address all the issues that need to be examined. I hope the MADEP will strongly consider including a couple of noise experts on such a panel.

If such is decided, I would be interested in serving on the expert panel regarding wind turbine sound issues. I believe my credentials as a Board Certified Acoustical Engineer make me more than qualified to serve on such a panel. I have also attached by CV for further information and review.

Thanks for taking the time to consider this important matter.

Regards,

Michael Bahtiarian, INCE Bd Cert*

Vice President

Noise Control Engineering

799 Middlesex Turnpike

Billerica, MA 01821

[978-670-5339](tel:978-670-5339), [extension 21](tel:978-670-5339) (voice)

[978-667-7047](tel:978-667-7047) (fax)

www.noise-control.com

*Board Certified Acoustical Engineer by the Institute of Noise Control Engineering (www.inceusa.org).

From: Jennifer Carlino
Sent: Thursday, June 16, 2011 4:26 PM
To: MassDEP, WindTurbineDocket (DEP)
Subject: Wind turbine letter

Hi,

Please accept this letter regarding wind turbine concerns. Thank you.

Jennifer

To Whom It May Concern:

Thank you for the opportunity to provide concerns about wind turbines in MA. Sustainable energy projects are an important and beneficial endeavor for research and development and have important implications for our changing climate. I have Menieres Syndrome and have a concern about any impacts wind turbines may have on my condition.

I would like to know if the wind turbines can have localized impacts on air pressure. I have noticed an increase in severity of tinnitus, pressure in the ear, dizziness and vertigo symptoms with changes in air pressure. If there is a change in air pressure locally, what could be the aerial extent? For instance, if the air pressure is significantly different and detectible by someone with Meniere's, is the air pressure different 100 feet away from the turbines? 200 feet? Etc. Then perhaps these problems can be averted by certain best management practices that offer guidelines about the locations for siting the turbines and requirements for a buffer distance around the turbines.

I also have noticed an increase in severity in symptoms while driving from sunlight passing through trees, something that may be similar to flicker from turbines. I wouldn't want to suffer a debilitating vertigo attack just by driving by a wind turbine. The location of the turbine and buffers to them from houses and roads may prevent this from happening.

From: Helen Parker

Subject: Submission to MA DPH/DEP Expert Panel on Health IParker Helen [windscoop.mvy@gmail.com]Impacts of Industrial Scale Wind Turbines

FACT#1 INDUSTRIAL SCALE TURBINES PRODUCE INFRASOUND.

FACT #2 - INFRASOUND MAKES PEOPLE SICK

END OF STORY

Can you put yourself in the backyards of folks living in Brewster, listening to the platitudes passing for policy while the threat of the turbines looms larger by the day? Consider that it is indisputable (but roundly ignored) that turbines produce infrasound. **Seismologists in Italy have recently measured airborne infrasound emanating from nearby turbines as well as ground-borne vibration up to 6.8 miles away.** I'm not implying that the health impacts extend 6.8 miles from the turbines. How far they need to be placed from human activity to obviate their impact is a critical question and is known to vary with many factors.

Around the world, however, minimum 1.25 mile setbacks from residences are being codified after the health impacts have been all-too-amply made clear.

Consider that **infrasound has been used as high-tech crowd control by the Israeli army for some years now:** *The Toronto Star* (Canada), "The Cutting Edge: Military Use of Sound," 6 June 2005: **"Military weaponry exists that relies on low-frequency sound to disperse crowds or control crowd behavior. The effect of low-frequency noise at high intensities creates discrepancies in the brain, producing disorientation in the body: 'The knees buckle, the brain aches, the stomach turns. And suddenly, nobody feels like protesting anymore. The latest weapon in the Israeli army's high-tech tool kit.' 'The intention is to disperse crowds with sound pulses that create nausea and dizziness. It has no adverse effects, unless someone is exposed to the sound for hours and hours.'"**

Where does that leave people in those little cottages facing Craigsville Beach on Cape Cod when Cape Wind goes online?

.....INDUSTRIAL SCALE WIND TURBINES MAKE PEOPLE SICK!

Nearby turbine noise = sleep deprivation [unhealthy in itself] which leads to other significant health problems. Beyond that:

Measurable sub-audible sound waves sent out as the blades spin past the shaft set up vibration and resonance in our homes as well as our body cavities - ears, ocular orbs, skull, our lungs and bellies. Of course they do. They are the ultimate, inescapable boombox moved in next door.

High doses of infrasound can only be exacerbated by the quality of the audible noise – rhythmic, repetitive, throbbing, thumping, percussive - or roaring and grinding... unnatural. People say that the noise gets into their head and that they can't get it out. Thousands of industrial wind turbine neighbors worldwide have reported the same symptoms, including headaches, fluctuating pressure and ringing in the ears, increased blood pressure, anxiety, nausea, difficulty with memory and concentration, depression, and panic attacks arising when awake or asleep.

*And as for those who decry these personal reports as ‘purely anecdotal,’ these knowbetters are simply exhibiting their ignorance of statistical design. Pierpont’s “case crossover design” is as strong as you can get. Same people, different circumstances: near the turbines, they get sick. People distance themselves from the turbines and their symptoms abate or disappear (until they’ve become ingrained over time, unfortunately). Back to the turbine area and the symptoms return. Turbines are the only changing variable. Results allow for easy interpretation without the participation of thousands.

This is the Wind Turbine Syndrome.

Turbine infrasound has a direct physical impact on ~10% of those living within 1.25 miles or more. More often the young, the old, those who are especially sensitive to stimuli [the autistic, those with a prior PTSD, those of us who for whatever reasons have retreated to rural areas].

Again, around the world, minimum 1.25 mile setbacks from residences are being codified after the health impacts have been all-too-amply made clear.

Let’s look at this from one more direction: Consider the announcement which showed up in the Watertown (NY) Daily Times: Sunday, May 16, 2010:

“Hospital shows off balance center” HEALTH AWARENESS DAY:

Lewis County General introduces new \$100,000 facility

LOWVILLE — Kicking off Community Health Awareness Day on Saturday, Lewis County General Hospital introduced the first balance center north of Syracuse.

The \$100,000 center has equipment to diagnose issues stemming from vertigo, imbalance and traumatic brain injury. The new equipment can perform comprehensive patient evaluations by checking inner ear functions to test balance. It also can test patients’ abilities to walk on stairs or step off a curb correctly....

“We expect to be busy fairly quickly,” said Eric R. Burch, chief executive officer of the hospital.

Mr. Burch said the idea of a balance center came about when various ear, nose and throat specialists in the Syracuse and Utica areas mentioned they were getting a lot of patients from the north country. He said specialists in Utica plan to refer up to seven patients a week to the new center.....

Randy L. Lehman, director of rehabilitation services, said he expects the equipment to improve the quality of life for those in the north country who may suffer from balance problems.”

Why open a clinical center to diagnose vertigo, dizziness, and related inner ear (vestibular) disorders in Lowville, pop. 3500, some 90 miles NE of Syracuse? Maybe because Lowville is some five miles from the outskirts of the [Maple Ridge Wind Farm](#) whose 140 - 1.65MW turbines make up the largest wind farm east of the Mississippi. Maybe there’s another altogether different explanation for the vestibular (balance) problems - aka Wind Turbine Syndrome. Maybe it’s just a coincidence.

Please address the very serious questions surrounding the health impacts of industrial scale wind turbines objectively and fairly.

Thank you.

Helen Schwiesow Parker, Ph.D.

Licensed Clinical Psychologist

Chilmark, MA 02535

508-645-3803

From: wfbarnes@comcast.net [mailto:wfbarnes@comcast.net]

Sent: Friday, July 22, 2011 7:55 AM

To: MassDEP, WindTurbineDocket (DEP)

Subject: Impact of Noise of Industrial Wind Turbines on Human Health - for Study by MASS DEP and MASS DPH

To: Massachusetts DEP and Massachusetts DPH

Communities in Europe, Australia, Canada, and the United States have learned through experience that siting industrial wind energy facilities too close to residents in quiet, rural areas has resulted in negative health, safety, and quality of life impacts. Those communities which have learned their lessons the hard way have established minimum performance standards to protect the public, the basis of which are satisfactory setback distances that at least partially ameliorate noise. Noise has an impact over the greatest distance, so any setback distance which eliminates noise is more than adequate for the other impacts. However, we must measure all noise, particularly infrasound, and A/scale measurements do not accomplish this. Communities should not expect neighbors who live too close to wind energy facilities to bear the brunt of the impacts for a twenty year period.

Please see my attached research report regarding noise from industrial wind energy facilities.

Please confirm receipt of this e-mail.

Walter F. Barnes, M.D.

Westport, MA 02790

wfbarnes@comcast.net

To:

The Commonwealth of Massachusetts Departments of Environmental Protection and Public Health

From:

Mark Cool

Falmouth, MA

Date:

June 16, 2011

Honorable Members,

I focus attention to individual differences in sensitivity to "sub-threshold" air pressure fluctuations and low frequency impact. Society appreciates individual differences from

the effects of allergies to peanut butter or medications. Massachusetts has legal remedies for people who have particular sensitivity to cigarette smoke or perfumes.

My Experience

I live at 250 Fire Tower Road, Falmouth MA. I am 52 years old. My house is 1629 feet south of Falmouth's Wind 1 industrial sized wind turbine. Wind 1 stands 398 ft tall (tip height) with a rotor diameter of 269 feet.

Following is collective portrayal of journal experiences beginning mid April 2010, shortly after Falmouth's Wind 1 went operational.

HEALTH EFFECTS

Frequent and long durational headaches never before experienced. Disturbed sleep, changed sleep in the number of awakenings during the night and quality of that sleep. The after effects during the day(s) following disturbed sleep cause lack of energy, moodiness and effect memory aptitude.

EXCESSIVE NOISE AND VIBRATION

I am an air traffic controller (31 years). I experience second guessing myself in lifecritical

decisions when I work. Before the turbine, I didn't allow second guessing to distract me from the job; I was confident and a good controller. Since the turbine, and when being effected by it's harms, I'm indecisive and anxious about the job I perform. The frequency of summer 2010 journal entries dropped significantly, due entirely to seasonal wind velocities and direction.

The NTSB (National Transportation Safety Board) mandates pilots and controllers an allowance of 8 hours minimum, "stress free", non-operational time between flight - control operations. The turbine forces me from being compliant because of sleep deprivation and the added stress of wondering if I'll sleep on a particular night knowing wind forecasts are N-NE, above 8 knots. If sleep is disturbed, I become anxious about the toll it will take on the subsequent day's performance.

I voluntarily have set up a make shift bedroom in the basement. It is there I am less impacted, less stressed when wind forecasts and job requirements make it necessary. On these nights, it is only in my basement I get a good night's sleep and thereby am able to be adequately prepared to perform as an air traffic controller. My concern is, as a property owner and taxpayer, should I be forced to redesign sleeping accommodations in *my own* home? My other concern is should the flying public's safety be compromised by a sleep deprived controller?

My solace from air traffic control stress was my 2 acres of gardens. Since Wind 1, I suffer pressure headaches when in the yard and while wind directions are from the North Northeast. Wind velocities do have an effect. Stronger winds, produce the onset of headache more rapidly and, from my journal, have indicated no ill effect when wind velocities are less than 8 knots.

The best description of my headache is akin to the pressure experienced just before ears pop while an aircraft climbs or descends through equilibrium altitude. The "pop," in the case of being a passenger, offers relief. In my case, relief is gained by wind velocity decay below 8 knots, wind direction changes from those cited, by going to the basement or leave the property entirely. It's awfully difficult to garden, shovel snow, rake leaves or do spring clean up from my basement.

Vibrations seemingly have started causing a structural effect on my house (built in

1988). The topography of the land is of a glacial moraine. Vibrations have caused the crown molding and molding adorning the dining room chandelier to fall or become detached. Also, in that room, the drywall nail heads have started to become exposed. The latex paint pliability, so far, prevents the nail heads puncturing the paint coats. It is unique in that this is the only room presenting these symptoms. The dining room is at the center of the house, neither closest to, or furthest away from, the turbine. Numbers of dead bats have been found on my property. Before Wind I went operational I had never been witness to a bat carcass on my property. I have recorded 26 carcasses showing no external injury. Studies have proven that as the wind moves through a wind turbine's blades, pressure drops behind them. The effect on a bat flying into the undetectable low pressure bubble is that its lungs and blood vessels rapidly expand and burst.

Air Flow Behind Wind Turbines

When the wind (velocity volume) meets turbine propellers, the kinetic energy of that volume is translated into electricity. By the **law of conservation of energy**, this volume of kinetic energy must be balanced by a decrease in the pressure-volume product that flows outward behind the turbine. Wind turbines take momentum out of the air, so there's less momentum after the wind passes through the turbine rotor. This body of air,

after passing the turbine rotor, is the turbine wake.

"The wake effect has been modeled in wind tunnel studies and numerical models, but the atmosphere is different, it's more variable and complicated."

"Turbine Wake and Inflow Characterization Study, a Memorandum of Understanding on "Weather-dependent and Oceanic Renewable Energy Resources"" signed by NOAA and

the DOE in **January 2011**)

"NOAA (National Oceanic and Atmospheric Administration) researchers are launching a study to make visible the invisible "wakes" produced behind wind turbines. Wind-farm designs have long known that wind turbine rotors generate ripples, waves, and other atmospheric disturbances downstream of turbines."

(Study to detailed airflow through wind farm, Windpower Engineering **April 30, 2011** by Paul Dvorak)

"Vortical wakes are not currently well enough understood or represented to account for the effects of one turbine on those downwind. Many of these challenges arise from gaps that remain in our fundamental knowledge of the [atmosphere] boundary layers. The knowledge gaps reflected in failures of parameterizations are caused in part by inadequate measurements of the boundary layer. Observations, particularly of turbulence, remain quite localized and relatively rare above the surface layer."

"There is an outstanding need for integrated data-sets that offer information for developing and validating models in their respective domains."

"The measurements need to be of a long enough duration to characterize a site at least through the seasonal cycle, and longer still to understand climate change effects on wind resources."

(Research Needs for Wind Resource Characterization by W. Shaw—Pacific Northwest National Laboratory, Richland, Washington; J. Lundquist—Lawrence Livermore National Laboratory, Livermore, California; S. Schreck—National Renewable Energy

Laboratory, Golden, Colorado. American Meteorological Society 10/2008)

Industry Turbines Wake Separation

The immense energy recently exhibited by a vortex in western and mid Massachusetts were tornadoes. The same principles and characteristic are present in the body of air after passing a wind turbine. The wind industry focus is to better understand the wake effect on wind turbine performance.

“The blade-tip vortices component mixes with the downwind air-flow component, and research shows that the near-field wake turbulence, behind a horizontal axis turbine, can extend downwind to 3 to 7 rotor diameters.”

(Ralph Holland, B Sc., Dip Ed., Dip Com. Sc. Wind Turbines Wake Turbulence and Separation: Arising Technology Sys. Pty Limited. D. Medici. Wind Turbine Wakes – Control and Vortex Shedding. Technical Reports from KTH Mechanics Royal Institute 2004)

“Industry accepted turbine separation is 6 to 7 rotor diameters” (Falmouth’s Wind I and II equates to 1614 - 1883 feet) “in the direction of the prevailing wind directions and 3 rotor diameters perpendicular to the prevailing conditions.”

(Ralph Holland, B Sc., Dip Ed., Dip Com. Sc. Wind Turbines Wake Turbulence and Separation: Arising Technology Sys. Pty Limited. D. Medici. Wind Turbine Wakes – Control and Vortex Shedding. Technical Reports from KTH Mechanics Royal Institute 2004)

At higher wind speeds (free-flow air velocity rate in-front of turbine) the wake field expands and more mixing occurs and the wake field is less contained and spreads out.

“At this higher wind speeds, the effect of a wind turbine wake, now may take as many as 16 rotor diameters for the airstream to recover back to the initial free-airflow.”

(Ralph Holland, B Sc., Dip Ed., Dip Com. Sc. Wind Turbines Wake Turbulence and Separation: Arising Technology Sys. Pty Limited. D. Medici. Wind Turbine Wakes – Control and Vortex Shedding. Technical Reports from KTH Mechanics Royal Institute 2004)

As an example, this would represent 4304 feet between Falmouth’s two municipal turbines. They presently are separated by approximately 1200 feet - 4.5 rotor diameters.

The near-field turbulence component caused by the turbine rotation, coupled with the downwind wind velocity reduction component caused by **the law of conservation of energy** is represented by wind shear turbulence and a mechanically induced low atmospheric pressure bubble. A miniature tornado if you will.

Wind Turbine Induced Climate Change

“Numerical experiments show that wind farms generate statistically significant impacts on near-surface air temperature and humidity as well as surface sensible and latent heat fluxes. These impacts depend on the atmospheric lapse rates of equivalent potential temperature and total water mixing ratio. Sensitivity studies show that these impacts are not confined to the wind farms but extend a significant distance downwind. The typical length-scale of the wind farm wakes is approximately 20 km that is independent of the size of the wind farms as well as background meteorology.”

(Baidya Roy, S., Simulating impacts of wind farms on local hydrometeorology. J. Wind

Eng. Ind. Aerodyn. (2011), doi:10.1016/j.jweia.2010.12.013)

“Vortex shedding and wake disturbances cause fluctuating pressures on the turbine surfaces and propeller trailing edge, and since the propellers are flexible, this can cause oscillations that emit frequencies.”

“Turbine effects of extremely low frequency and low frequency, mechanically induced changes in air pressure have clear correlations and adverse experiences, headaches, nausea, and dizziness. The mechanisms involve both resonances with the whole human body, because of its intrinsic oscillations between 6 Hz and 20 Hz, with amplitudes in the order of five micrometers.”

(Michael A. Persinger, PhD Behavioural Neuroscience and Biomolecular Sciences

Programs, Laurentian University, Ontario, Canada)

“A feature of the [air velocity] flow was that spectra from the time signals showed the appearance of a low-frequency fluctuation both in the wake and in the flow outside the wake. This fluctuation was found both with and without freestream turbulence and also with a yawed turbine. The frequency expressed as a Strouhal number was shown to be independent of the freestream velocity or turbulence level, but the low frequency was only observed when the tip speed ratio (or equivalently the drag coefficient) was high.”

(Measurements on a wind turbine wake: 3D effects and bluff body vortex shedding
Authors: Medici, D.; Alfredsson, P.H. Publication: Wind Energy, vol. 9, Issue 3,
pp. 219-236 Date: 05/2006)

“Slight atmospheric pressure oscillations (APO) in the extra-low-frequency range below 0.1 Hz, which frequently occur naturally, can influence human mental activity. This phenomenon has been observed in experiments with a group of 12 healthy volunteers exposed to experimentally created APO with amplitudes 30–50 Pa in the frequency band 0.011–0.17 Hz. Exposure of the subjects to APO for 15–30 min caused significant changes in attention and short-term memory functions, performance rate, and mental processing flexibility. These observations suggest that APO could be partly responsible for meteorosensitivity in humans.”

(The effects of extra-low-frequency atmospheric pressure oscillations on human mental activity International Journal of Biometeorology, 31-37, DOI: 10.1007 s004840050113
By A.A. Delyukoy and L. Didyk)

“The definition of ARS is: “changes of the physical, mental, emotional or social wellbeing

and increases of the incidence or exacerbations of diseases, if they are related to changes of weather dependent atmospheric factors.”

“Two atmospheric factors are in the focus of the new studies, i.e. atmospheric impulse radiation (sferics) and low frequency air pressure oscillations (APO). Both already fulfill most of the presuppositions to be causal agents for ARS. They have distinct weather associated patterns, they intrude into houses and there are first results of controlled exposure studies (with artificially generated sferics resp. APO) showing effects in humans (Delyukov and Didyk, 1999). In the case of APO there also already exists a hypothesis for the receptor, which could be the baroreceptor in the carotid sinus.”

(Prevalence of Weather Sensitivity in Germany: P. Höppe*. S. von Mackensen+. D.

Nowak*. E. Piel# *Institute und Outpatient Clinic for Occupational and Environmental

Medicine. Ludwig-Maximilians-University. Munich. Germany +
Institute for Medical

Psychology. Ludwig-Maximilians-University. Munich. Germany # Institut für
Demoskopie. Allensbach. Germany)

“A concept often referred to in this context but hardly investigated is weather sensitivity. It is defined as the enhanced reactivity toward variations in atmospheric parameters such as humidity, pressure, temperature, etc. (Pschyrembel, 1990). Common symptoms are fatigue, negative mood, decreased work motivation and headaches. The high prevalence of weather sensitivity, which has been estimated at 30 per cent in mid-European countries (Faust, 1973), underlines the importance of studying the still unknown origin of this syndrome.”

(Biological Effects of Very Low Frequency (VLF) Atmospheric in Humans: A Review, SCHIENLE, R. STARK, AND D. VAITL Journal of Scientific Exploration, Vol. 12, No.3, pp. 455±468, 1998 0892-3310/98)

Conclusion

The wind industry is committed to better understand wake effect to improve turbine performance. Those state agencies and this panel, sworn to protect the public, must commitment to better understand turbine wake effect on human performance (i.e. well being). There is an outstanding need to integrate industry turbine separation criteria, with the growing evidentiary trend of physical effect on population clusters.

It is already known that increased distance is beneficial in reducing audible noise levels. It is known wind can enhance noise propagation in certain directions and impede it in others. A unique feature of wind turbine audible noise is that it can result from continuous periods of daytime and night time operation. This is in contrast to the more common road traffic or neighborhood noises levels that vary as a function of time of day.

What about the noises not heard? They too are components that similarly result from continuous periods of turbine operation. The infrasound and low frequency oscillation characteristics have been proven to cause changes in attention, short-term memory functions, performance rate, and mental processing flexibility. As with audible noise, could increased distance be an equally viable mitigation method until scientific certainties are established?

What of the harmful components being carried by the mini-tornado cell, the turbine wake vortices? It is already known that this climate changing zone kills bats and poses potential climatic risks to agriculture. What is it doing to the human physical condition in close proximity? If the industry has determined that this low atmospheric pressure bubble can extend downwind outwards to 16 rotor diameters, I and my family are in the impact zone. Though not bombarded by the extreme forces of a tornado, it stands to reason that smaller doses of mimicked characteristics over a constant and longer duration of time could be as harmful. Could this be what is causing my headaches, my sleepless nights?

Necessary to support the claim of harmful health effect from poorly sited turbines will be peer reviewed research. The wind industry seemingly has exclusivity in researching a better understanding of wind turbine dynamics and performance. If anything enlightening is to spawn from this literature review, it should be heavily weighed that peer examined research on the dynamics of human impact from wind turbines is well

behind the wind industry's focus on performance and productivity. It is in its infancy as a result of a limited data-base before the explosion of the wind energy industry in the US.

We are in the midst of the wind energy explosion and these scientific matters, in large part, come down to whose authority people trust. Frankly, especially when I've heard so many ridiculous arguments and lies coming from wind people telling me that I'm not actually experiencing headaches caused by Wind I, I'm highly skeptical of their credibility.

I trusted the sales pitch provided the town of Falmouth by the wind experts and consultants. The concept, I believe, is well conceived. The *implementation* of the concept however, after becoming an expert through experience, has left me greatly distrustful.

The panel's literature review should sound an alarm. Before any further wind energy development, more research and peer review, specific to the human health effect is essential. This sentiment is clearly pitched by the science community in the noted references of this letter. The sanctity of public, all public welfare must be held above all else. I entrust this panel to draw this same conclusion.

Respectfully,

Mark J. Cool

Reference List

Turbine Wake and Inflow Characterization Study, a Memorandum of Understanding on "Weather-dependent and Oceanic Renewable Energy Resources" signed by NOAA and the DOE in January 2011

Study to detailed airflow through wind farm by Paul Dvorak. Windpower Engineering April 30, 2011

Research Needs for Wind Resource Characterization by W. Shaw—Pacific Northwest National Laboratory, Richland, Washington; J. Lundquist—Lawrence Livermore National Laboratory, Livermore, California; S. Schreck—National Renewable Energy Laboratory, Golden, Colorado. American Meteorological Society 10/2008

Simulating impacts of wind farms on local hydrometeorology by Baidya Roy, S. J. Wind Eng. Ind. Aerodyn. (2011), doi:10.1016/j.jweia.2010.12.013

Wind Turbines Wake Turbulence and Separation by R. Holland, B Sc., Dip Ed., Dip Com. Sc.: Arising Technology Sys. Pty Limited.

Biological Effects of Very Low Frequency (VLF) Atmospherics in Humans: A Review by S. Stark, and D. Vaitl: Journal of Scientific Exploration, Vol. 12, No. 3, pp. 455±468, 1998 0892-3310/98

The effects of extra-low-frequency atmospheric pressure oscillations on human mental activity by A.A. Delyukoy and L. Didyk. International Journal of Biometeorology, 31-37, DOI: 10.1007 s004840050113

Prevalence of Weather Sensitivity in Germany by P. Höpfe, S. von Mackensen, D. Nowak, E. Piel. Institute und Outpatient Clinic for Occupational and Environmental Medicine.

Measurements on a wind turbine wake: 3D effects and bluff body vortex shedding by Medici, D.; Alfredsson. P.H. Publication: Wind Energy, vol. 9, Issue 3, pp. 219-236

Date: 05/2006

Wind Turbine Wakes – Control and Vortex Shedding by D. Medici. Technical Reports from KTH Mechanics Royal Institute 2004
Michael A. Persinger, PhD Behavioural Neuroscience and Biomolecular Sciences

Programs, Laurentian University, Ontario, Canada

To:

The Commonwealth of Massachusetts Departments of Environmental Protection and Public Health

From:

Mark Cool

Falmouth, MA

Date:

June 30, 2011

Honorable Members,

The work your panel undertakes is admirable. Literature reviews are confined to the examination of existing literature, rather than conducting new research that directly targets the issues.

I offer the “**Falmouth Experiment**” as new information directly targeting the lowfrequency,

infrasound issues. I will explain the experiment in a moment.

Many sources presented in the committee review that are cited as being scholarly, are wind industry documents (i.e. the American and Canadian Wind Energy Association and the Australian Wind Energy Association).

These are not independent sources. These are industry documents! Instead of scientific examination, these documents serve merely to prop-up the marketability of wind energy with the veil of scientific research. An obvious conflict of interest in what these documents state and what people in Falmouth, not to mention the world, are saying, are feeling, exist.

A peer reviewed, independent study partly funded by the Danish government and published in the Acoustical Society of America Journal June 2011 confirms: beyond any doubt that the **low-frequency part of the spectrum plays an important role in the noise at neighbors** and that the **low-frequency sound must be treated seriously in the assessment of noise from large turbines.**

(H.Moller and C. S. Pedersen. Low-Frequency Noise from Large Wind Turbines Journal Acoustical Society of America. June 2011)

“The **effects of low frequency infrasound** (less than 20Hz) on humans are **not well understood**”

(National Research Council of the National Academies. Environmental Impacts of Wind-Energy Projects. NRC, 2007).

This continues to be the accepted scientific and medical research fields assertion.

Yet regulators conduct literature reviews, making evidence based decisions regarding health impact of wind turbines, and continue to conclude that adverse health consequences are not justified by the evidence.

Doesn't it strike you odd that the evidence regulators use to base their decisions

concerning low frequencies effects are classified as “not well understood” in the National Research Council’s presentation to Congress, but regulators remain willing to risk the health of residents?

February 28, 2011 Falmouth Selectmen adopted an operational control for the municipal

turbine, Wind I. The “**Falmouth Experiment**” began March 2 when those controls were imposed on the machine.

It must be noted “ at the one-third-octave band spectra at lower frequencies, **the highest levels (low-frequencies)** are shown to be **associated with the highest wind speeds** and the **highest power outputs.**”

(NASA technical papers; H. H. Hubbard and K. P. Shepard. Aeroacoustics of Large Wind Turbines. 1991)

The Board of Selectmen, by their 23 mph wind restriction on Wind I, **unknowingly** reduced the highest levels of low frequency imposed on neighbors. The resulting town complaint log entries after March 2 will, I’m sure, demonstrate this. I have, since the restriction, solicited numerous neighbor complainants.

The result of my unscientific experiment revealed a reduction of the number of adverse disruptions. Further, at the very least, a protective action by Falmouth Selectmen succeeded, and indicates a correlation between NASA’s determination of higher levels of low frequency component existing at higher wind velocity - turbine power output and residents irritation instances.

Currently, regulators rely on the state’s generalized community noise standards in examining wind turbines. There are no standards addressing noise pollutants you can’t hear, yet can feel.

State noise regulations are not providing the same protections from wind turbine noise as they do from other noise sources.

Low frequency and Infrasound **Risk Management Analysis** is necessary. Where public health is at stake, public health risk must hold precedence over Renewable Energy Agenda strategies.

The panel’s review should sound an alarm. Before any further wind energy development, more research specific to low-frequency and the human health effect is essential. This sentiment is clearly pitched by the science community in the noted references of this letter. I entrust this panel to draw this same conclusion and find that low-frequency regulatory guidelines for wind turbines need immediate attention.

Respectfully,

Mark J. Cool