

**Open Submission: Industrial Wind Turbines
can Harm Humans**

Health and Social-economic impacts in Nova Scotia

Health Canada Wind Turbine Noise and Health Study

*Health Impacts and Exposure to Wind Turbine Noise:
Research Design and Noise Exposure Assessment*

Submitted by Carmen Krogh, BScPharm

February 2, 2013

Author's Note: This submission is being made on request and on behalf of a family in Nova Scotia, Canada. Documentation regarding this submission has been verified by the family.

This submission provides an update to the confidential submission of November 26, 2012 which has been redacted by the family and is now public. The redacted version is attached to this submission.

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Status Update February 2, 2013
Industrial Wind Turbines can Harm Humans
Health and Social-economic impacts in Nova Scotia
Submitted by Carmen Krogh, BScPharm
Original submitted November 26, 2012
Any errors or omissions are unintended

**Open Submission: Industrial Wind Turbines can Harm Humans
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Health Canada Wind Turbine Noise and Health Study

*Health Impacts and Exposure to Wind Turbine Noise: Research
Design and Noise Exposure Assessment*

Submitted by Carmen Krogh, BScPharm

February 2, 2013

To:

The Honourable Leona Aglukkaq
Minister of Health
Health Canada
minister_ministre@hc-sc.gc.ca

Copy:

The Right Honourable Stephen Harper
Prime Minister of Canada
pm@pm.gc.ca

David S. Michaud, PhD
Principal Investigator
david.michaud@hc-sc.gc.ca

February 2, 2013

Dear Minister Aglukkaq,

Re: Health Canada Wind Turbine Noise and Health Study

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Status Update February 2, 2013
Industrial Wind Turbines can Harm Humans
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Submitted by Carmen Krogh, BScPharm
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1 Background

This submission is being made on behalf of the La Rocque/Kapyrka family from Nova Scotia. This is the second submission provided to Health Canada. The original submission of November 26, 2012 requested confidentiality; however, the family wishes to provide the particulars of their situation in a public forum. This submission of February 2, 2013 provides Health Canada with a status update of the issues facing the family and the lack of remedy.

This submission relates to a project which is operational. The family members -- Cheryl La Rocque/Kapyrka, Peter Kapyrka and Pamela La Rocque, continue to report sleep disturbance, stress, frustrations, severe ear pain, temporary loss of hearing, anxiety and socio-economic issues. In spite of every effort to work with the developer and the Nova Scotia Environment, they report an inability to achieve remedy or resolution to the deteriorating health and quality of life of family members.

2 Purpose

The purpose of this submission is to inform Health Canada, the study team and others about the health and socio-economic issues which have caused reports of sleep disturbance, annoyance, mood disorders, such as stress, anxiety, depression, frustration, financial burdens, and social impacts within the community and other health related issues.

I have provided a copy of my comments to The Right Honourable Stephen Harper, Prime Minister of Canada, Dr. David Michaud, Principle Investigator, Health Canada.

This submission is intended to contribute to study design for the *Health Canada Wind Turbine Noise and Health Study* and to request an inquiry-investigation prior to finalizing the study design and to request that emergency funding be provided to relocate the family to restore their physical, mental and social well-being. Based on the elements of the Auditor General's Report, 2012, there may be an opportunity to obtain funding to take remedial action ¹ regarding affected sites.

3 Disclaimer

The contents of this submission should not be used to infer any bias for or against wind energy.

This submission is not to be associated with and/or used to characterize any individual and/or organization.

I have received no financial support for the research, authorship, and/or publication of this submission.

The information used to compile this submission has been verified and confirmed by the family.

4 Introduction

Health Canada is aware there continue to be reports regarding health and social-economic issues associated with wind energy facilities.

The submission of November 26, 2012 reported the family La Rocque/Kapyrka had undertaken significant effort to obtain resolution through various mechanisms including meetings with the developer and the Nova Scotia Environment. Months later, the lack of remedy has led to each family member reporting a further degradation of health, social-economic and altered quality of life.

It has been noted in other submissions that the harm reported is in conflict with the World Health Organisation's definition of health:

"Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" ²

Many jurisdictions, including the Canadian federal, provincial, and territorial governments and health officials have accepted WHO's definition of health (Health Canada, 2004, vol. 1, p. 1-1)." ³

5 Particulars as described in the November 26, 2012 submission [*some details which were confidential regarding the project and the family members are updated for the purposes of this submission.*]

The family, Cheryl La Rocque/Kapyrka, Peter Kapyrka and Pamela La Rocque reported:

Prior to the start-up of the facility, the family was supportive of wind energy development.

Sprott Power Corp's Amherst One Project in Nova Scotia consists of a transformer station and 15 – 2.1 MWatt turbines by Suzlon S97. The Suzlon S97 2.1 MW turbine height of the hub is 90m and the blade diameter is 97 m. Total height (with a blade in the vertical position) is $90 + 97/2 = 138.50$ m.). It initiated operation March 31, 2012. Testing of turbines began in the last week of March 2012; however, this testing was conducted only during daylight hours and turbines were not continually running. The date that the first wind turbine began continually running (i.e. in-service during day and night) was March 31, 2012. The substation (including transformer) was energized on March 21, 2012.

Since March 2012, the family has been communicating with representatives of Health Canada ^{4, 5}; Nova Scotia Ministry officials; the developer; consultants and other parties (examples include: examples are not exhaustive) ^{6, 7, 8, 9}

Within a few days of start up of the facility, the family reported sleep disturbance and a disturbance in the home living environment from noise including a deep low droning-humming pulsating sensation.

The family comprised of Cheryl La Rocque/Kapyrka, Peter Kapyrka and Pamela La Rocque has reported its symptoms which have required respites from the home environment in order to restore well being.

Recently, it is noted that restoration of health and well being takes longer than it did some months previously. As well, on return to the home environment, symptoms appear quicker than they did previously.

In addition to headaches, tinnitus, general malaise, and exhaustion, one family member reports serious impacts on hearing. Sudden loss of hearing, leaking and bleeding ears and extreme pain occurs intermittently which has resolved upon relocation away from the wind energy facility. The effects in general are extremely debilitating and normal day to day living and quality of life has been altered. The lack of sleep has affected emotional status.

Restlessness, twitching and thrashing activity by another family member has disrupted restorative sleep resulting in fatigue and degraded quality of life.

One family member, Cheryl La Rocque/Kapyrka reporting serious health issues is a caregiver to a disabled member of the family - Pamela La Rocque. Pamela La Rocque cries out during

sleep and is agitated and irritable when awake. Additional symptoms include intermittent but persistent diarrhea.

Another family member was scheduled to live with the affected family - La Rocque/Kapyrka, due to the need for care; however, due to the current circumstances, this is on hold. As a result, elderly parents, one of whom is gravely ill and who are challenged with the role of care giving are unable to be relieved of care giving responsibility.

The care giver of the family Cheryl La Rocque/Kapyrka has an array of serious symptoms that abate when relocated to another environment. Symptoms include persistent bowel issues, headaches, loss of cognitive functioning, intermittent total loss of hearing, ringing in the ears, stuffed and plugged sensations in the ears, ear pain, and feeling it is like being in a "fog". Chronic fatigue and emotional impacts persist when in the home environment.

When the home was purchased some years ago, the sound permeating the home was not present. It is proposed the home is resonating with low frequency noise and probably tonal noise, a persistent, pulsating and disturbing hum. Based on observations by the family members, the position of the turbines in relation to the direction of the wind affects the intensity of the LFN emissions.

The La Rocque/Kapyrka family describes the noise permeating their home as sounding like helicopters, thumping pulsating / vibratory sensations that which create pressure in the ears, persists, and disrupts the living environment.

A family member - Cheryl La Rocque/Kapyrka frequently relocates in order to recover from the harmful emissions and notes that recovery is taking longer than it did before and upon return to the family home, the effects of the emissions return more quickly than before.

The expected respite has been affected by chronic exposure to the facility.

The family moved to a quiet, peaceful location and the wind facility has affected the family's health, life style, home environment, and quality of life.

6 Family Case reports

These case reports are available in the attached November 26, 2012 submission (redacted February 2, 2013).

7 Update February 2, 2013

During a meeting held with Sprott Power October 22, 2012 the La Rocque/Kapyrka family reported deteriorating health and quality of life.

During the time between March, 2012 and January 17, 2013 communications by email and letter, telephone calls, and meetings resulted in a lack of remedy. During a time of ill health, there was a substantive level of effort required to maintain dialogue. There continues to be a persistent lack of sleep, exhaustion, digestive issues, vibratory sensations, humming, bowel issues, headaches, loss of cognitive function, intermittent total loss of hearing, ringing in the ears, stuffed and plugged sensations in the ears, ear pain, and feeling it is like being in a "fog". Chronic fatigue and emotional impacts persist when in the home environment.

Recovery time while away from the home is taking longer that it did some months ago. Upon return to the home, the symptoms now return much quicker than they did previously.

Respite includes retreating to local office facilities and then going to a home that is no longer a refuge.

During the time of start up of the facility, the the La Rocque/Kapyrka family has provided the Nova Scotia Environment and Sprott Power with evidence, including peer reviewed and other associated with health and social-economic impacts. None of these efforts have achieved resolution / remedy.

8 Results and Consequences

The the La Rocque/Kapyrka family reports degradation of health status, quality of life and frustration due to lack of resolution.

Between March 2012 to January 17, 2013, correspondence by letter, e-mail, telephone, participation in the provincial process, meetings and communication with authorities including representatives of the local municipal and provincial authorities, the Public Health Unit, the wind developer, the Member of Parliament, the Provincial Member of Parliament, Health Canada and others advised about the health issues.

The family has been in contact with:

- § Representatives of Health Canada
- § Ministers of Environment, and Health
- § The developer and consultants
- * Chief Medical Officer (NS) and others

The La Rocque/Kapyrka family reports that responses from Health Canada, the provincial ministries and the developer have been inadequate and that there has been no resolution to date.

In addition, indications are the noise levels in Nova Scotia are supported by Health Canada.

A representative from Nova Scotia Environment stated:

"I have been enquiring about the availability of equipment for low frequency monitoring in Halifax. I have been advised by the Environmental Assessment Branch (EA) who issued the approval to SPROTT that monitoring is currently underway and Health Canada's 45 dba noise level would be conservative enough to account for low frequency noise. The results of this monitoring will be forwarded to Health Canada for analysis."¹⁰

A Record of Decision obtained through an ATIP regarding the Federal-Provincial-Territorial Guidelines draft guidelines for Wind Turbine Noise notes:¹¹



Record of Discussion (Draft)
FPT Committee on Health and the Environment
Working Group on Wind Turbine Noise
Teleconference/Meeting: Thursday, February 3, 1:00 p.m. - 3:00 p.m.

Participants:

Heather Johnstone (BC)
Karina Thomas (Alta)
Tim McCaulay (Sask)
Bryan Blunt (Man)
Gloria Rachamin (Ont)
Vic Schroeder (Ont)
Kim Edmonson (NB)
Gary O'Toole (NS)

Todd Fraser (PEI),
Tara Bower (Chair) (HC),
Stephen Keith (HC),
Mary Hill (HC),
Stephen Bly (HC),
Sarah Leslie (HC),
D'Arcy McGuire (HC)

E. Noise Assessment Reports/Table 2: Discussion of whether the limit should be 40 or 45 dBA . Health Canada has proposed 45 dBA based on maximum sound power level produced at any speed (Pederson). 45 dBA also accounts for “rattle. Current trend seems to be at a specific wind speed such as 40 dBA at 8 m/sec (agrees with WHO definition). Ontario uses 95% SPL.
Use of :40 dBA at 4 – 6 m/sec
42 dBA at 7 m/sec
45 dBA at 8 m/sec
Note this aligns with Ontario’s existing Guidelines

HC to propose new text for WG. HC to review ISO 9.6.13.2 for possible wording. HC to provide text articulating an explanation of SPL and its relationship to background noise etc.) HC to draft text defining offshore turbines/farms. Ont (Vic) to provide info on Ontario’s penalties (adjustments?) Also, Table 2 to be described as a “fast track “ guide only

Peer reviewed research ¹² and an Ontario Ministry of Environment field officer ¹³ propose 30 to 32 db.

Some have referenced that World Health Organization Noise Guidelines (2009) recommend a 40 dB noise level for industrial wind turbines; however, this is an incorrect interpretation of these guidelines. The WHO guidelines are based on road, rail and air craft noise, not on industrial wind turbine noise. Peer reviewed studies consistently acknowledge wind turbine noise is perceived to be more annoying than transportation noise or industrial noise at comparable sound pressure levels. ¹⁴ Therefore the premise of 40 dB applying to wind turbines is not supported.

Regarding the use of Ontario guidelines, a December 2010 report commissioned by the Ontario Ministry of Environment, submitted as evidence during the Environmental Review Tribunal and released December 2011 by the Ministry notes:

“The audible sound from wind turbines, at the levels experienced at typical receptor distances in Ontario, is nonetheless expected to result in a non-trivial percentage of persons being highly annoyed. As with sounds from many sources, research has shown that annoyance associated with sound from wind turbines can be expected to contribute to stress related health impacts in some persons.” ¹⁵

The La Rocque/Kapyrka family reports that Health Canada was advised about the family’s situation through direct communication by the family and through the Nova Scotia Environment staff.

“I am sorry to hear that you and your family are suffering and it is unfortunate that this has come to this. We still have not heard anything back from Health Canada on the noise report, I am unsure how long these type of reports typically take for review and comment but I will look into it and see what the status is. Your formal complaint is still active as we await the report from Health Canada before we can determine our next step in the investigation. As for accessing equipment and obtaining the

expertise, that is beyond the powers of myself or even at *Branch Supervisor's*¹⁶ level. I will check on the status of the report and let you know."¹⁷

On January 10, 2013 the La Rocque/Kapyrka family received Sprott Power's response to their complaint [excerpt below]:

Sprott Power Corp.
Royal Bank Plaza, South Tower
200 Bay Street Suite 2700, P.O. Box 90
Toronto, Ontario M5J 2J2
Telephone: 416 943 8099
Facsimile: 416 943 4695



January 10, 2013

The Amherst wind project was constructed in compliance with all local and provincial regulations, including the requirement for noise levels from the project to be less than or equal to 45 dBA at all noise receptors. Pre-construction noise modeling determined that the project was compliant with the sound level requirement at the closest receptors to the project. These receptors are approximately 550m from the nearest turbine in the project. Your residence is almost 4 times further from the nearest turbine than these receptors. The sound from the wind turbines at your house is well below the requirement for this project's provincial environmental assessment. It is also well below the more stringent Ontario regulations.

Due to the distance between your residence and the Amherst wind project, the low levels of sound from the project and the high levels of sound from other sources, we believe that the Amherst wind project is not the cause of the symptoms that you are reporting. We encourage you to investigate other causes of your ailments and sincerely wish you a quick and full recovery.

Sincerely,

A handwritten signature in blue ink, appearing to read "Jeff Jenner", is written over the word "Sincerely,".

Jeff Jenner, CA, CBV
President and CEO

In correspondence on January 16, 2013, the La Rocque/Kapyrka family expressed:

“We did not have any issues or exhibited any of the symptoms we described PRIOR to Sprott Power Corp. Amherst One Project startup. Therefore, it is inaccurate to suggest there may be a relationship with home appliances, industries or bridges or the TCH with the symptoms we indicated to you on October 22, 2012.

We are concerned with Sprott Power Corp’s attitude and attempt to lay blame elsewhere and believe Sprott Power Corp’s statement to be completely and highly inaccurate and I feel sure you already know this.”

Subsequent to the above observation, on January 16, 2013, the La Rocque/Kapyrka family wondered:

“Now, I am wondering what the government will do with this information... I am hoping that NSE can act on our behalf and that Nova Scotia will take its head out the sand and fess up to their error in removing the power from NSE Special Inspectors and their Branch Managers whose role and mission is to protect the citizens and environment they serve from Industrial Wind Turbines – specifically here in Amherst from Sprott Power Corps Amherst One Project IWTs 2.1 MW.

I sincerely hope what I say in this email is heard loud and clear:

I am not prepared to suffer in silence any longer. I will be heard and I am taking a stand.

I DO expect my leaders to listen and I do expect my rights and my family’s rights and our home be protected.

I will not slink away quietly into the night nor will I be blown away from the effects of IWTs.

IWTs do NOT belong near where people LIVE, WORK, OR PLAY.”

Again on January 16, 2013:

"I asked Sprott to Turn off the turbines for one month on October 22, 2012 – so that I am my family could recuperate and symptoms abate and a solution worked on and so on... Sprott Power Corp has chosen to ignore our pleas of pain and suffering."

"Please know we are no longer in the shadows of the turbines discussing this problem or issue under confidential clause. We want everyone to know of our pain and suffering – it is like a peanut allergy but the nut is extremely large and very difficult to move."

A follow-up on January 22, 2013 to Nova Scotia Environment stated:

"Peter and I have reviewed NSE response and Sprott Power Corp's formal response.

Here is the crux of the issue – We have become ill since the start up of a new industry – the only industry that we can think of that is new and coincides with our symptoms/illnesses has to do with the Amherst One IWT Project – Sprott Power Corp.

There are no other new businesses and/or environmental issues that coincide with the symptoms/illnesses we are experiencing... these same symptoms diminish and/or go away when we leave our home. (We leave Amherst).

These same symptoms/illnesses return when we return to our home in Amherst.

These same symptoms/illnesses increase and decrease while in our home and it appears to coincide with the direction of the IWTs and the speed the blades are turning.

The wind has never made me or Peter or Pam ill before... we lived in BC and NFL both have turbulent and powerful winds.

To point to the train tracks as being part of the components that may be making us sick is UNTRUE. We enjoy the passage of the trains. The trains are not making us ill because the trains have been passing us since we have been living in this home and we did not experience any illness or symptoms that coincide with the passage of the trains.

FYI – Pam and I grew up with trains. Peter grew up with similar transportation sounds.

To say another industry is making us ill or exhibit symptoms is a form of deflection and child like behavior so as to remove themselves/their business from the equation and remove themselves as the primary culprit that is causing harm. We consider Sprott Power Corp's deflection in pointing to other possible culprits that may be making us ill as a slap in the face and/or they consider us simpletons with little intelligence!

Sprott's letter of denial is a great example of the art of spin and denial.

Peter and I have more than enough combined experience and intelligence to see through this nonsense. Even Pam can see this.

That said, what is most infuriating is the lack of power in the hands of NSE Amherst Branch Inspectors, BUT it is NOT your fault.

However, we HOLD the GOVERNMENT OF NOVA SCOTIA FULLY accountable and Expect NSE to resolve this issue. We URGE that you read the Shirley wind project information we sent to you via email. And it is IMPERATIVE NSE Amherst consider, acknowledge and ACT on the information gained from the Shirley Wind Project.

The main point is -- that because the wind industry does NOT measure the wind turbine's infrasound emissions they – the wind industry, thinks that they can deny it exists.

The following steps MUST be TAKEN:

NSE SHOULD DO a test with independent acousticians who have the proper infrasound data recording equipment.

Then it is IMPORTANT to make sure to do a test when WE -- Peter and I and Pam are feeling the symptoms and the operation state of the wind turbines (hub level wind speed and direction, power output, hub rpm, blade angles, and nacelle orientation) is being tracked and that information made available to the people doing the study.

Is this too much to ask our government to do?

Is it too much to ask the government to assist us? To protect us?

With respect and kindest,

Cheryl La Rocque/Kapyrka Peter Kapyrka
Pam La Rocque"

9 Role of New Experts

The role of New Experts has been described in previous Health Canada submissions. This and other submissions provided to Health Canada on behalf of Canadian families are examples of the important role of the New Experts.

"The concept of Soundscaping, has gained recognition.^{18, 19, 20, 21, 22} It is considered to be different from noise control engineering.²³ Soundscaping considers the people living in the environment as local experts,²⁴ an essential component of the evaluation,²⁵ and that perception of the soundscape " can provide comfort, tranquility, and needed information to the person concerned or may be a source of annoyance." ²⁶

With respect to very low frequency noise which may not be audible, humans are being considered as "objective measuring instruments (New Experts), whose reports and descriptions must be taken seriously and quantified by technical measurements." ²⁷

10 Closing statements ²⁸

Research indicates New Experts i.e. humans, “are objective measuring instruments...”.

This submission on behalf of the La Rocque/Kapyrka family is an example of the urgent requirement to consult with the New Experts prior to finalizing the Health Canada study design.

This submission and those made on behalf of other families that were provided in confidence to Health Canada are examples of an urgent requirement to convene an inquiry-investigation and to assist resolving the issues reported to Health Canada.

Other jurisdictions have conducted a public inquiry-investigation to better understand the health and socio-economic impact of wind energy development. ^{29, 30, 31, 32, 33}

In addition to the advantages of a public inquiry-investigation described in the Krogh and Harrington submissions of September 5, 2012 and October 31, 2012, “New Expert” testimony would provide expert advice regarding health, social well-being and social-economic impacts and would assist with moving forward and achieving remedy.

Action by Health Canada should support its “Mission and Vision”:

“Health Canada is the federal department responsible for helping the people of Canada maintain and improve their health.

Health Canada is committed to improving the lives of all of Canada 's people and to making this country's population among the healthiest in the world as measured by longevity, lifestyle and effective use of the public health care system.” ³⁴

Action should support Health Canada’s “Objectives”:

“By working with others in a manner that fosters the trust of Canadians, Health Canada strives to:

- Prevent and reduce risks to individual health and the overall environment;
- Promote healthier lifestyles;

- Ensure high quality health services that are efficient and accessible;
- Integrate renewal of the health care system with longer term plans in the areas of prevention, health promotion and protection;
- Reduce health inequalities in Canadian society; and
- Provide health information to help Canadians make informed decisions.”³⁵

Based on the elements of the Auditor General’s Report, 2012, there may be an opportunity to obtain funding to take remedial action³⁶ regarding affected sites.

Under normal circumstances, if someone claims to be affected by an exposure to agents such as peanuts, smoke, sulfites, scents, certain food, sea food, noise etc, the individual can avoid or remove the source.

If it is serious or life threatening regulators and/or society rise to the occasion and take steps such as banning peanuts in schools; no scents in offices; noise control for autistic or children with ADD or noise sensitive individuals; no sulfites at salad bars; seafood; and labeling non-medicinal ingredients in consumer and prescription products and food, including fast food. This is so that individuals at risk can avoid the exposure.

In the case of wind turbine facilities, they are imposed on the population, there is no remedy and those exposed can't avoid or remove the source.

The rapid pace of development has ignored the critical element i.e. human responses and there are health and social-economic issues being reported.

Until reports of the human responses to industrial wind turbine and transformer station exposure are acknowledged, resources will continue to be used trying to discount/deny the issues.

I would appreciate any assistance that Health Canada could offer to many of those reporting health effects associated with the start up of operations of industrial wind energy facilities.

Until guidelines are established that protect human health and social-economic viability, no further development of wind energy facilities should occur and existing sites reporting health issues should be resolved to the satisfaction of the New Experts.

In the meantime, due to my concern for the health and well being of this family exposed to wind turbine facilities, I am requesting that emergency funding be provided to relocate the La Rocque/Kapyrka family and other families that agree to come forward, to an area in order to restore their physical, mental and social well-being.

Respectfully submitted on behalf of 3 family members from Nova Scotia, Peter Kapyrka; Cheryl La Rocque/Kapyrka; and Pamela La Rocque,

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¹ 2012 Spring Report of the Commissioner of the Environment and Sustainable Development
http://www.oagbvg.gc.ca/internet/English/parl_cesd_201205_03_e_36775.html#ex5

² World Health Organization. (1948). Preamble to the constitution of the World Health Organization as adopted by the International Health Conference, New York, 19-22 June, 1946; signed on 22 July 1946 by the representatives of 61 States (Official records of the World Health Organization, no. 2, p. 100) and entered into force on 7 April 1948. Cited Krogh, CME, (2011), Industrial Wind Turbine Development and Loss of Social Justice? Bulletin of Science Technology & Society 2011 31: 321, DOI: 10.1177/0270467611412550, <http://bst.sagepub.com/content/31/4/321>

³ World Health Organization. (1948). Preamble to the constitution of the World Health Organization as adopted by the International Health Conference, New York, 19-22 June, 1946; signed on 22 July 1946 by the representatives of 61 States (Official records of the World Health Organization, no. 2, p. 100) and entered into force on 7 April 1948. Cited Krogh, CME, (2011), Industrial Wind Turbine Development and Loss of Social Justice? Bulletin of Science Technology & Society 2011 31: 321, DOI: 10.1177/0270467611412550, <http://bst.sagepub.com/content/31/4/321>

⁴ July 7, 2012 communications

⁵ Health Canada study, submissions to Dr. Michaud, post July 7, 2012

⁶ Correspondence Nova Scotia Environment, March 29, 2012

⁷ Correspondence developer, October 29, 2012

⁸ Correspondence developer, November 09, 2012

⁹ Correspondence developer, November 02, 2012

¹⁰ Email correspondence Nova Scotia Environment representative, May 14, 2012

¹¹ Access to Information and Privacy (ATIP) Record of Discussion (Draft) FPT Committee on Health and the Environment, Working Group on Wind Turbine Noise, February 3, 2010

¹² Thorne, B, (2011), The Problems With "Noise Numbers" for Wind Farm Noise Assessment, Bulletin of Science Technology & Society 2011 31: 262, DOI: 10.1177/0270467611412557, <http://bst.sagepub.com/content/31/4/262>

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- ¹³ MOE memorandum, Ontario Senior Environmental Officer, April 9, 2010
- ¹⁴ Pedersen, E., Bakker, R., Bouma, J., & van den Berg, F. (2009), Response to noise from modern wind farms in the Netherlands, *Journal of the Acoustical Society of America*, 126, 634-643
- ¹⁵ HGC (2010) Low frequency Noise and Infrasound Associated with Wind Turbine Generation Systems, A Literature Review, Ontario Ministry of Environment RFP December 2010
- ¹⁶ “*Branch Supervisor’s*” term inserted to protect privacy
- ¹⁷ Correspondence, Nova Scotia Environment, October 30, 2012
- ¹⁸ Call for Papers on Soundscape in *Journal of the Acoustical Society of America (JASA) | The World Listening Project*. Cited 29/10/2012
<http://www.worldlisteningproject.org/cal-lfor-papers-on-soundscape-in-journal-of-the-acoustical-society-of-america-jasa/>
- ¹⁹ Hot topics in soundscapes, COST action TD0804: “Soundscape of European Cities and Landscapes” workshop, Edinburgh UK, Novotel, 80 Lauriston Place, Thursday 29th – Friday 30th 2009,
<http://www.cost.est.org>
- ²⁰ Bert De Coensel, Annelies Bockstael, Luc Dekoninck, Dick Botteldooren, Brigitte Schulte-Fortkamp, Jian Kang, Mats E. Nilsson, The Soundscape Approach for Early Stage Urban Planning: A Case Study, InterNoise 2012, Lisbon, Portugal (Invited Paper)
- ²¹ Soundscape. An environment of sound (or sonic environment) with emphasis on the way it is perceived and understood by the individual, or by a society. Truax, B. (1999). *Handbook for Acoustic Ecology* (2ndEd.). Cambridge Street Publishing
- ²² Axelsson, Östen, Introducing soundscape, AESOP, 2012, 26th Annual Congress, July 11-15, Ankara, Turkey
- ²³ Brigitte Schulte-Fortkamp, Jian Kang, Soundscape research in networking across countries: COST Action, *The Journal of the Acoustical Society of America*. 03/2010; 127(3):1801.
- ²⁴ B. Schulte-Fortkamp, “The tuning of noise pollution with respect of the expertise of people’s mind”, proceedings InterNoise, (2010) Lisbon Portugal, 13-13 June 2010
- ²⁵ Brigitte Schulte-Fortkamp, Bennett Brooks, Interventions through the soundscape approach. *The Journal of the Acoustical Society of America*. 10/2010; 128(4):2370.
- ²⁶ Brigitte Schulte-Fortkamp, Bennett Brooks, Better soundscapes for all workshops on continuing development of soundscape techniques standardization: Workshop introduction. *The Journal of the Acoustical Society of America*. 11/2008; 124(4):2552.
- ²⁷ Bray Wade, Acoustical Society of America 164th Meeting, Kansas City, MO 22 – 26 October, 2012, 2aNS6, Relevance and applicability of the Soundscape concept to physiological or behavioural effects caused by noise at very low frequencies which may not be audible. www.acoustics.org/press/164th/Bray_2aNS6.html
- ²⁸ Closing statements by Krogh
- ²⁹ New South Wales. Parliament. Legislative Council. General Purpose Standing Committee No. 5, Rural Wind Farms, 2009
- ³⁰ The social and economic impact of rural wind farms: Public hearing before the Senate Community Affairs References Committee, Commonwealth of Australia (2011, May 17). Retrieved from http://www.aph.gov.au/senate/committee/clac_ctte/impact_rural_wind_farms/index.htm
- ³¹ Falmouth Board of Health, Correspondence June 11, 2012, Falmouth, Massachusetts USA, Massachusetts Department of Public Health (MASS DPH)
- ³² Renewable Energy (Electricity) Amendment (Excessive Noise from Wind Farms) Bill (2012), Australia, <https://senate.aph.gov.au/submissions/pages/index.aspx>
- ³³ Falmouth Board of Health, Correspondence June 11, 2012, Falmouth, Massachusetts USA, Massachusetts Department of Public Health (MASS DPH)
- ³⁴ Health Canada, About Health Canada, About Mission, Values, Activities, Retrieved from <http://www.hc-sc.gc.ca/ahc-asc/activit/about-apropos/index-eng.php>, Cited August 24, 2012

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