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To:

The Honourable Leona Aglukkaq  
Minister of Health  
Health Canada  
[minister\\_ministre@hc-sc.gc.ca](mailto:minister_ministre@hc-sc.gc.ca)

Copy:

The Right Honourable Stephen Harper  
Prime Minister of Canada  
[pm@pm.gc.ca](mailto:pm@pm.gc.ca)

David S. Michaud, PhD  
Principal Investigator  
[david.michaud@hc-sc.gc.ca](mailto:david.michaud@hc-sc.gc.ca)

May 6, 2013

Dear Minister Aglukkaq,

Re: Health Canada Wind Turbine Noise and Health Study

Attached is a noise report relating to a family in close proximity to industrial wind turbines. The Weaver/Rooney family is one of those for which a pre- and post-turbine submission was forwarded to Health Canada "*Health Canada submission\_November 23 2012 FINAL*" and "*Pre\_Post\_Wind turbine submission\_Updated February 4 2013*" respectively.

The family is reporting serious health impairment which is associated with the start-up of the facility in December 2012.

A noise study was conducted and the results indicate "that the IWT generated noise does not comply with the MOE noise guidelines ~50% of the time and that SPL's are above the predicted "worst case" ~59% of the time."

The family started a journal December 26, 2012 and have maintained it to date. The attached noise study file contains extracts for a period of time that the noise measuring equipment was established at the family residence. The journal records the quality of life and health problems experienced by the family [see attached Appendix B of the report].

The journal documents many negative sleep events where one or both members of the family could not sleep. In some cases, sleep medication was required or members had to sleep away from their home.

The World Health Organization states [1]:

### **Sleep disturbance**

Sleep disturbance can be measured electro-physiologically or by self-reporting in epidemiological studies using survey questionnaires. In epidemiological studies, "self-reported sleep disturbance" is the most easily measurable outcome indicator, because electro-physiological measurements are costly and difficult to carry out on large samples and may themselves influence sleep.

Sleep disturbance is one of the most common complaints raised by noise-exposed populations, and it can have a major impact on health and quality of life. Studies have shown that noise affects sleep in terms of immediate effects (e.g. arousal responses, sleep stage changes, awakenings, body movements, total wake time, autonomic responses), after-effects (e.g. sleepiness, daytime performance, cognitive function deterioration) and long-term effects (e.g. self-reported chronic sleep disturbance).

The serious effect of sleep deprivation was recently forwarded to Health Canada. The message was entitled "*March 9 2013 Research Update - Wind Turbine Noise Study and sleep deprivation*" and it advised about the Möller-Levet et al (2013) study [2].

### **Abstract**

Insufficient sleep and circadian rhythm disruption are associated with negative health outcomes, including obesity, cardiovascular disease, and cognitive impairment, but the mechanisms involved remain largely unexplored. Twenty-six participants were exposed to 1 wk of insufficient sleep (sleep-restriction condition 5.70 h, SEM = 0.03 sleep per 24 h) and 1 wk of sufficient sleep (control condition 8.50 h sleep, SEM = 0.11). Immediately following each condition, 10 whole-blood RNA samples were collected from each participant, while controlling for the effects of light, activity, and food, during a period of total sleep deprivation. Transcriptome analysis revealed that 711 genes were up- or down-regulated by insufficient sleep. Insufficient sleep also reduced the number of genes with a circadian expression profile from 1,855 to 1,481, reduced the circadian amplitude of these genes, and led to an increase in the number of genes that responded to subsequent total sleep deprivation from 122 to 856. Genes affected by insufficient sleep were associated with circadian rhythms (PER1, PER2, PER3, CRY2, CLOCK, NR1D1, NR1D2, RORA, DEC1, CSNK1E), sleep homeostasis (IL6, STAT3, KCNV2, CAMK2D), oxidative stress (PRDX2, PRDX5), and metabolism (SLC2A3, SLC2A5, GHRL, ABCA1). Biological processes affected included chromatin modification, gene-expression regulation, macromolecular metabolism, and inflammatory, immune and stress responses. Thus, insufficient sleep affects the human blood transcriptome, disrupts its circadian regulation, and intensifies the effects of acute total sleep deprivation. The identified biological processes may be involved with the negative effects of sleep loss on health, and

highlight the interrelatedness of sleep homeostasis, circadian rhythmicity, and metabolism.

A second document by Bernert and Joiner on suicidal risks associated with sleep disturbances was also provided [3].

### **Abstract**

A growing body of research indicates that sleep disturbances are associated with suicidal ideation and behaviors. This article (1) provides a critical review of the extant literature on sleep and suicidality and (2) addresses shared underlying neurobiological factors, biological and social zeitgebers, treatment implications, and future directions for research. Findings indicate that suicidal ideation and behaviors are closely associated with sleep complaints, and in some cases, this association exists above and beyond depression. Several cross-sectional investigations indicate a unique association between nightmares and suicidal ideation, whereas the relationship between insomnia and suicidality requires further study. Underlying neurobiological factors may, in part, account for the relationship between sleep and suicide. Serotonergic neurotransmission appears to play a critical role in both sleep and suicide. Finally, it remains unclear whether or not sleep-oriented interventions may reduce risk for suicidal behaviors. Unlike other suicide risk factors, sleep complaints may be particularly amenable to treatment. As a warning sign, disturbances in sleep may thus be especially useful to research and may serve as an important clinical target for future suicide intervention efforts.

The family's living environment has been altered by the imposition of an industrial wind energy facility in proximity to their home. This was done without their consent. Within a short period of time, family members are reporting serious health effects and there is no remedy except to remove the source by leaving their home.

On May 5, 2013, ShanghaiDaily.com reports that:

“Canadian Prime Minister Stephen Harper announced Friday 82 million Canadian dollars in funding for 55 new clean-energy projects, ranging from electric vehicles to wind power.

Of the 55 projects that are part of the Canadian government's ecoENERGY Innovation Initiative and which are spread across seven provinces and two territories, 15 will be pre-commercialization demonstration projects to test the feasibility of various technologies.

According to Harper's office, the Canadian government has invested more than 10 billion dollars in green infrastructure, energy efficiency, clean-energy technologies, and the production of cleaner energy and fuels since his Conservative Party came to power in 2006.” [4]

The article reports that 10 Billion dollars has been invested in a green concept and more investment is pending.

Despite appeals from many rural families, some with babies and children, some elderly, some with pre-existing medical conditions, the Canadian government continues to ignore the people who have been harmed and will be harmed in the future.

There has been limited investment to resolve or remedy the issues with the exception of a \$1.8 million dollar investment in a Wind Turbine noise study that will be completed in 2014 and will not be definitive.

The family asks “Will an economic policy take precedence over health? What actions will Health Canada take to provide health protection for its citizens?”

Respectfully submitted for the Weaver/Rooney family,

Carmen Krogh, BScPharm  
Killaloe, ON, K0J 2A0  
[carmen.krogh@gmail.com](mailto:carmen.krogh@gmail.com)

### **References**

[1] World Health Organization (2011) Burden of Disease from Environmental Noise

[2] Carla S. Möller-Levet, Simon N. Archer, Giselda Bucca, Emma E. Laing, Ana Slak, Renata Kabiljo, June C. Y. Lo, Nayantara Santhi, Malcolm von Schantz, Colin P. Smith, and Derk-Jan Dijk Effects of insufficient sleep on circadian rhythmicity and expression amplitude of the human blood transcriptome Published online before print February 25, 2013, doi:10.1073/pnas.1217154110 PNAS (Proceedings of the National Academy of Sciences) February 25, 2013 201217154  
<http://www.pnas.org/content/early/2013/02/20/1217154110>

[3] Rebecca A Bernert and Thomas E Joiner Sleep disturbances and suicide risk: A review of the literature *Neuropsychiatr Dis Treat.* 2007 December; 3(6): 735–743. PMID: PMC2656315

[4] Canada announces major funding for clean energy projects, May 3 (Xinhua)  
[http://www.shanghaiidaily.com/article/article\\_xinhua.asp?id=140262](http://www.shanghaiidaily.com/article/article_xinhua.asp?id=140262)