

FILE

BEFORE THE OHIO POWER SITING BOARD

In the Matter of the Application)
of Buckeye Wind LLC for a Certificate)
to Install Numerous Electricity)
Generating Wind Turbines in)
Champaign County to be Collected at)
an Electric Substation in)
Union Township,)
Champaign County, Ohio)

Case No. 08-666-EL-BGN

PUCO

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DIRECT TESTIMONY OF MICHAEL A. NISSENBAUM, M.D ON
BEHALF OF INTERVENORS UNION NEIGHBORS UNITED, INC.,
ROBERT AND DIANE McCONNELL, AND JULIA F. JOHNSON

Q.1. Please state your name and business address.

A.1. Michael A. Nissenbaum.

Q.2. Please describe your educational background.

A.2. I am a graduate of University of Toronto Medical School with post graduate training at
McGill University and the University of California.

Q.3. Please describe your employment history.

A.3. I am a medical doctor with a specialty in diagnostic imaging. My training and work
involves developing and utilizing an understanding of the effects of energy deposition,
including sound, on human tissues. I am a former Associate Director of MRI at a major
Harvard teaching hospital, a former faculty member (junior) at Harvard University, and a
published author. In the past, I have worked on a part time basis in primary and
emergency medicine. I consult daily to internists, subspecialists, surgeons, and primary
care physicians.

Q.4. Are you familiar with the health effects of wind turbines?

A.4. Yes.

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Technician Bm Date Processed 11/3/09

Q.5. What caused you to become familiar with the health effects of wind turbines?

A.5. I developed an interest in the health effects of wind turbine projects after becoming aware of and investigating the widespread and serious health effects suffered by residents of Mars Hill, Maine who live in proximity to a 28 turbine wind project. This wind project received an authorization for construction and operation from the State of Maine.

Q.6. What did you do to investigate the health effects suffered by these residents?

A.6. I have studied the health effects that the wind turbines in the Mars Hill Wind Farm have had upon 15 persons residing between 1200 and 3400 feet of the turbines. These persons comprise about one-half of the adults living within 3400 feet of wind turbines of the Mars Hill Wind Farm. The approximate distances (in feet) between these persons and the nearest wind turbine are as follows: 3400, 3400, 3200, 3200, 3000, 3000, 2500, 2400, 2400, 2400, 2300, 2300, 2100, 1200, and 1200. The project at Mars Hill is laid out in such a way that there are no people living between 3400 feet and about 1.5 to 2 miles.

Q.7. How did you study the health effects that the wind turbines have had on these residents?

A.7. I interviewed these persons to obtain their medical histories. Such a medical interview is a standard procedure by which doctors evaluate medical problems.

Q.8. What were the findings of your study?

A.8. I found that since the turbines began operating, this group of individuals developed new health problems at a surprising and alarming rate. Fourteen of the fifteen interviewees reported new health problems and to a lesser extent exacerbations of prior health problems. These health problems include headaches (53% of the group), dizziness (20%), nausea (13%), unusual body sensations (chest pulsations or pulsatile ear pressure)

(20%), weight gain or loss (40%), and new or worsened hypertension (26%). These individuals also described numerous psychiatric symptoms, including stress (73%), anger (87%), anxiety (40%), irritability (27%), hopelessness (73%), and depression (53%). Serious sleep disturbances resulting in sleep deprivation occurred in fully 93% of the individuals. It is my opinion, held to a reasonable degree of scientific certainty, that any of the health problems and symptomatology described above have resulted from or been exacerbated by sleep deprivation caused by wind turbine noise. Shadow flicker was noted by some individuals to subjectively result in dizziness and nausea, and contributed to increased migraine frequency in one subject. Overall, 25 new prescriptions for medications were offered by the subjects' physicians for complaints that arose after the turbines went online. Fifteen prescriptions were accepted, and ten were declined. These findings reflect hard data, not self reported impression.

Q.9. Why didn't the noise from the wind turbines disturb the sleep of the fifteenth interviewee?

A.9. The one interviewee who did not experience sleep deprivation or other negative health effects noted that he had a hearing disability that allowed him to sleep undisturbed.

Q.10. Did you evaluate the health of any other persons as part of your study?

A.10. Medical personnel under my supervision and at my direction also recently interviewed people living at least 2.5 miles away from the Mars Hill Wind Project, with otherwise similar demographics, as a control group for this study. None of these persons reported sleep deprivation from wind turbine noise or any of the health effects described above as having developed since the wind turbines went online. This data has not yet been

presented publicly or submitted for publication. Most of the remaining people living in proximity to the wind farms will be interviewed shortly.

Q.11. Will your evaluation of the remaining individuals residing near the wind farm change the significance of your study?

A.11. No. Even if the non-interviewed adults living within the 3400 foot range of the Mars Hill Project reported no adverse effects whatsoever, the incidences of the symptoms described would simply fall by half, and would still be highly significant when compared to the control group. As there are approximately 30 adults living within 3400 feet of wind turbines at this project, the incidents of symptoms are highly significant and would remain so even if the remaining persons had no symptoms.

Q.12. What are the effects of sleep deprivation on human health?

A.12. The fact that sleep deprivation can result in a cascade of negative physiological effects resulting in diagnosable disorders that impair health and quality of life is a basic medical fact learned by the time a medical student reaches the second year of medical school. A diagram outlining the cascade of negative physiological effects, and medical references, are included in Appendix 1, attached.

Q.13. Are you familiar with the wind turbines being considered for the Buckeye Wind project?

A.13. Yes, I have read the information on them provided by Buckeye Wind's application.

Q.14. How do the wind turbines considered for the Buckeye Wind project compare to the wind turbines used in the Mars Hill Wind Farm?

A.14. The wind turbines in the Mars Hill Wind Farm have 1.5 MW generators and are 389 feet tall. My understanding is that the turbines being considered for the Buckeye Project

are 492 feet tall, with 2.5 MW generators. These produce more noise than 1.5 MW generators according to the manufacturer's specification, and may additionally produce additional primarily low frequency noise that is not well captured or quantified by the standard dBA calibration used by the industry. This is in contrast to the more appropriate dBC calibration recommended by the WHO for sources of low frequency noise, which discounts lower frequency sound to a lesser degree than dBA.

Q.15. Do you have an opinion, held to a reasonable degree of scientific certainty, as to whether the location proposed for Buckeye Wind's turbines poses a health risk to residents in the vicinity of the project?

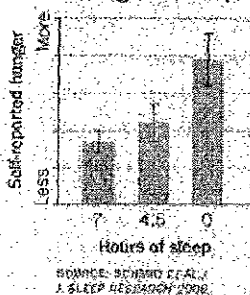
A.15. Yes. Upon review of proximity maps submitted by Everpower regarding the Buckeye Project, it becomes clear that residences will be well within 3400 feet of turbine installations, and in many cases much less. In addition, the Buckeye turbines will be producing more noise compared to the 1.5 MW generators operating at Mars Hill. This constellation of factors is of grave concern, in my professional opinion.

Effects of sleep deprivation

Losing sleep, even for one night, can trigger a flood of changes throughout the body. Scientists don't fully understand how the sleep-starved body goes awry, but many studies find clear relationships between sleep and the health and function of body systems.

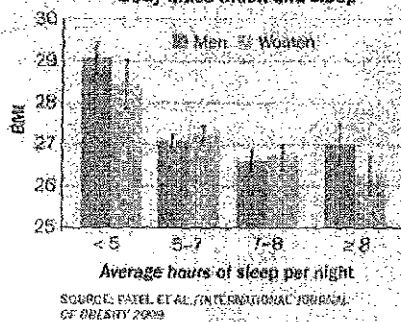
Thymus
Immune system impairment

Stomach
Increased hunger
Hunger and sleep



Pancreas
Insulin resistance and higher risk of type 2 diabetes

Fat layer
Increased risk of obesity
Body mass index and sleep

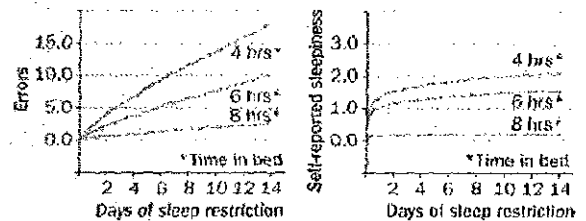


Muscle
Decreased reaction time and accuracy

Brain

Cognitive impairment, declines in memory and judgment, and brain chemical changes that can lead to depression

Attention and sleep

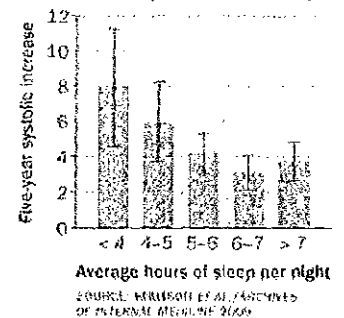


People's performance on an attention test declines with sleep loss (left), even though they don't feel much sleepier (right). SOURCE: VAN Dongen et al. / SLEEP 2003

Heart

Higher disease risk, irregular heart beat

Blood pressure and sleep

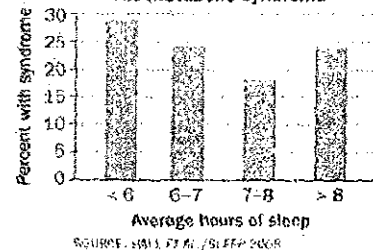


Joints

Increased inflammation, which can lead to atherosclerosis (artery hardening) and rheumatoid arthritis

Metabolism Higher risk of "the metabolic syndrome," which includes high blood pressure and cholesterol and reduced insulin sensitivity, sometimes leading to diabetes and heart disease

The metabolic syndrome



CERTIFICATE OF SERVICE

I hereby certify that, on November 2, 2009, a copy of the foregoing Direct Testimony was served by regular mail on Gene Park, Piqua Shawnee Tribe, 1803 Longview Drive, Springfield, Ohio 45504, and by electronic mail upon the following counsel of record:

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