



# Interim Report for Huron County Wind Turbine Study about Noise, Vibration and Light

*Fall 2018*

## **Huron County Health Unit**

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Huron County Health Unit. (2018). Interim report for Huron County wind turbine study about noise, vibration and light: Fall. Clinton, Ontario.

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## Background

One of the contested issues regarding wind turbines is whether they cause adverse effects on human health at the setback currently mandated by the Government of Ontario. In Ontario, wind turbines must be at least 550 metres from a private dwelling.

In September 2015, the Huron County Health Unit Acting Medical Officer of Health received complaints from residents that their health was being affected by wind turbines located near their homes. The decision to proceed with studying the issue was based on review of the existing literature with emphasis on an assessment completed in April 2015 by the Council of Canadian Academics.

In May 2012, Health Canada issued a charge to the Council of Canadian Academics to assess the following question,

*Is there evidence to support a causal association between exposure to wind turbine noise and the development of adverse health effects? (Council of Canadian Academics, 2015, p. 3)*

The Council determined there was sufficient evidence that a causal relationship exists between wind turbine noise and annoyance, limited evidence of a causal relationship between wind turbine noise and sleep disturbance, and inadequate evidence to determine if wind turbines caused other adverse health effects (Council of Canadian Academics, 2015). The Council report also noted that long-term annoyance, in addition to sleep disruption and stress, may contribute to the development of other adverse health outcomes such as cardiovascular diseases. The Council concluded that further research into the potential human health risk posed by wind turbines would be beneficial.

The Council noted a number of knowledge gaps that need to be addressed to determine whether exposure to wind turbine noise is a health hazard and this study will address some of those gaps. The two gaps that this study will focus on are the lack of information on children and infants and the lack of a reporting system for the consistent **collection of residents' experiences living near wind turbines. This study will collect and analyze observations from Huron County residents of all ages living near a wind turbine over the course of one year.**

## Purpose

The purpose of this study is to better understand the impact of wind turbines on Huron County residents. We will determine what percentage of study participants report they have been bothered, disturbed or annoyed by noise, vibration, light and/or sensations from the wind turbines. We will also examine whether there are environmental conditions associated with more participants reporting being bothered, disturbed or annoyed by noise, vibration, light and/or sensations from the wind turbines.

## Research Questions

There are three questions being asked in this study:

- 1) What percentage of participating households have at least one person reporting being bothered, disturbed or annoyed by noise, vibration, light and/or sensations from the wind turbines?
  - a) Within 10km
  - b) Within 5km
  - c) Within 1km
- 2) What percentage of participants report being bothered, disturbed or annoyed by noise, vibration, light and/or sensations from the wind turbines?
  - a) At least once during the investigation
  - b) At least once a season
  - c) At least once a month
  - d) At least once a week
- 3) What environmental conditions increase the likelihood that participating households will report being bothered, disturbed or annoyed by noise, vibration, light and/or sensations from the wind turbines?

## Methods

All Huron County residents living within 10 km of a wind turbine are invited to participate in the study. Approximately 30,000 Huron County residents are eligible to participate in the study. The study involves participants completing a one-time Registration Survey then documenting observations of noise, vibrations, sensations and light from wind turbines for at least one week every month.

Table 1: Research questions and methods

Research question	Method
Determine percentage of participating households reporting being bothered, disturbed or annoyed by noise, vibration, light and/or sensations from the wind turbines By distance from a wind turbine By frequency of complaints	The denominator is all participating households. The numerator is participating households with at least one person reporting being bothered, disturbed or annoyed by noise, vibration, light and/or sensations from the wind turbines.
Determine percentage of participants reporting being bothered, disturbed or annoyed by noise, vibration, light and/or sensations from the wind turbines By distance from a wind turbine By frequency of complaints	The denominator is all participating individuals. The numerator is participating individuals reporting being bothered, disturbed or annoyed by noise, vibration, light and/or sensations from the wind turbines.
Determine whether there are environmental conditions that increase the likelihood that participating households will report being bothered, disturbed or annoyed by noise, vibration, light and/or sensations from the wind turbines	Hierarchical regression analysis. The outcome variable is the degree of annoyance from noise, vibrations, sensations and light from wind turbines. The possible predictor variables include meteorological conditions, wind turbine operation variables, and where the house is located relative to the wind turbines.

## Recruitment

In October 2017, the Huron County Wind Turbine Study about Noise, Vibration and Light launched. The Huron County Health Unit held an information meeting for the purpose of explaining the study process and answering questions from the public on Thursday, October 26, 2017 at the Huron County Health Unit in the Health and Library Complex, Clinton.

Media releases were sent to local media outlets announcing recruitment for the study October 26, 2017. Local radio stations, newspapers, and CTV News reported on this news release. Paid advertisements informing the public about the study also ran in all local weekly print newspapers as well as the Focus biweekly print newsmagazine, during the first week of November 2017.

Another media release, sent out June 20, 2018, targeted seasonal Huron County residents. This release was also reported on by local and regional radio stations and newspapers.

Huron County residents living within five km of a wind turbine were mailed an **information letter and consent form**. The mailing used Canada Post's neighbourhood mailing service to deliver information to households on Huron County mail routes that were within or mostly within five km of a wind turbine. The mail routes did not align perfectly with the area letters were to be mailed to. This meant some Huron County households that are within five km of a wind turbine did not receive a letter. If anyone who was missed by the neighbourhood mailing contacted the Huron County Health Unit, an information package was mailed to them. Anyone else who contacted the Huron County Health Unit asking for information on the study was mailed information unless they indicated they preferred to get it from a Huron County Library branch or front reception at the Huron County Health Unit Clinton office.

Residents living 10 km from a wind turbine were also invited to participate by reading the information letter on the Huron County Health Unit website, downloading and printing the consent form, and returning the completed consent form to the Huron County Health Unit by mail or in person. The Health Unit website maintained a prominent visual on its home page, linking to the study, for much of 2018.

Copies of the information letter, consent form, parent permission form, child assent form, Registration Survey and Observation Diary were also available at any branch of the Huron County Library as well as the Huron County Health Unit Clinton location. A copy of the map showing what areas of the county can participate in the study was available at all branches of the Huron County Library as well as in the front lobby of the Huron County Health Unit Clinton location.

## **Fall 2018 Interim Results**

When recruitment closed on October 31, 2018, 113 eligible Huron County residents (including five under 16 years) had signed consent forms to participate in the Huron County Wind Turbine Study about Noise, Vibration and Light. This is less than one percent of those who were eligible to participate.

Before this study began, we determined that a minimum of 1,000 participants would be needed to do the analysis for the third research question. The final sample size of 113 participants does not meet the minimum sample size set out for the third research question. The analysis in the final report will be limited to descriptive analysis for questions one and two.

## **Next Steps**

Descriptive analysis of the Observation Diaries and Registration Surveys will appear in the final report for the study. The final report is expected to be released late 2019.

## **References**

Council of Canadian Academies (2015). Understanding the Evidence: Wind Turbine Noise. Ottawa (ON): The Expert Panel on Wind Turbine Noise and Human Health, Council of Canadian Academies.