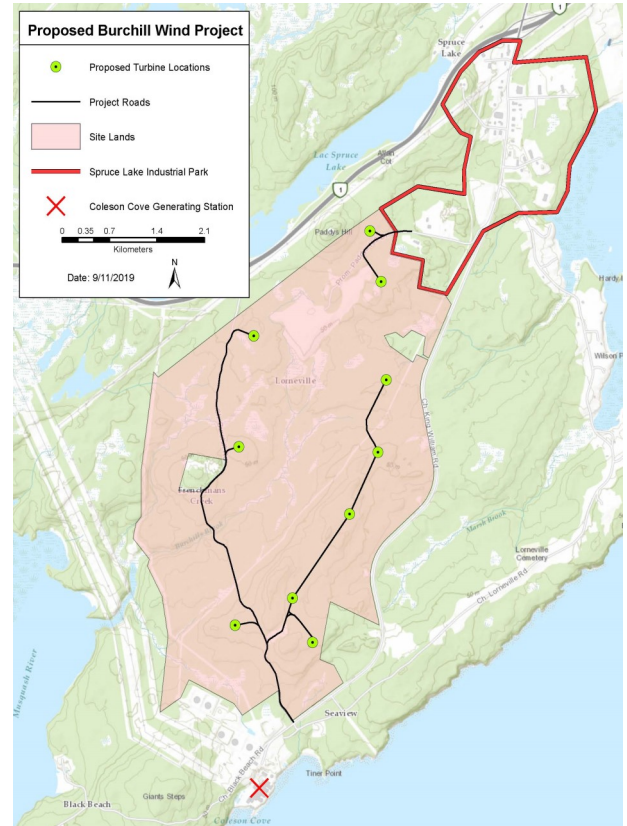


# Proposed Burchill Wind Project

The proposed **Burchill Wind Project** is a 5 to 10 wind turbine project being developed by Natural Forces to help Saint John Energy diversify their electricity mix by providing more local, renewable energy to their customers. The Project will generate approximately 20 to 42 megawatts of power to be distributed through the Saint John Energy electrical grid. The proposed turbines have an individual capacity of 4.2 MW, an approximate tower height of 135 meters and blade length of 70 meters. The Project will be located on Crown land approximately 15 kilometers southwest from the City of Saint John, between Lorneville, Spruce Lake Industrial Park and the Coleson Cove Generating Station. This location has been chosen due to its elevation, optimal windspeeds, and the industrial nature of the surrounding area.



**ABOUT US:** Natural Forces is a private independent power producer from Halifax NS, that delivers renewable energy projects in partnership with local communities across Canada.

natural forces

CONTACT US

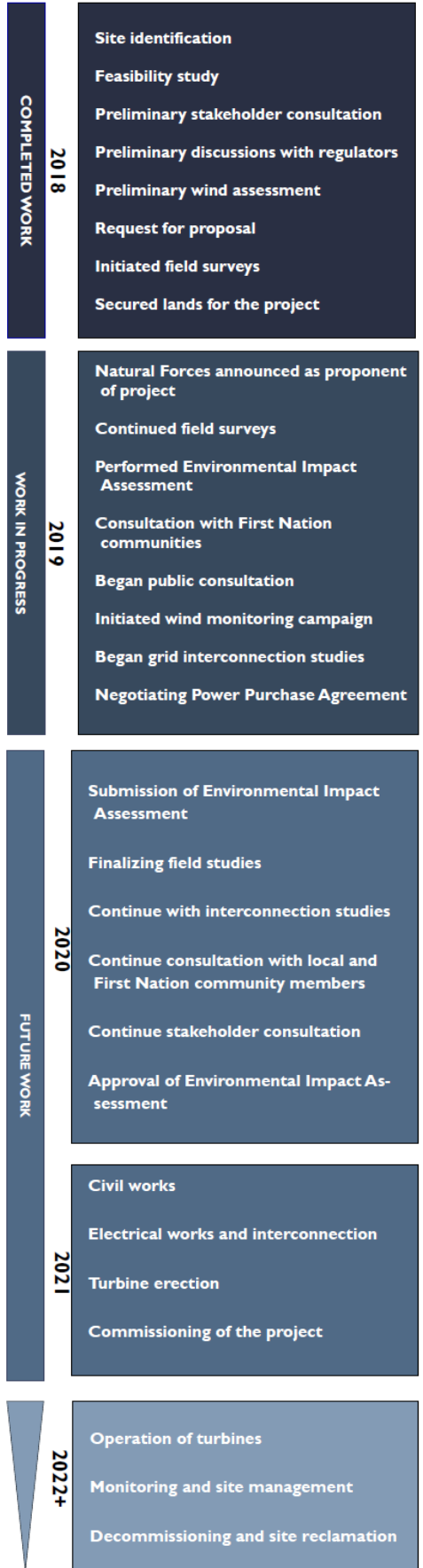
**Katherine Dorey**  
1 (902) 422 - 9663  
kdorey@naturalforces.ca

[www.naturalforces.ca/burchill-wind-project](http://www.naturalforces.ca/burchill-wind-project)

# Community Benefits

## Project Timeline

- **Generate clean electricity for up to 10,000 homes in the Saint John area, displacing energy produced from fossil fuels and contributing to Saint John’s growing renewable energy sector;**
- **Increase employment and revenue for local businesses due to activities associated with the development, construction and operation phases of the Project;**
- **Increase energy security by reducing Saint John Energy’s dependency on imported energy sources;**
- **Create a local energy source that will contribute to reducing greenhouse gas emissions;**
- **Stabilize energy costs for Saint John Energy customers;**
- **Increase in property tax revenues to the City of Saint John; and**
- **Provide an investment opportunity to New Brunswick residents via the New Brunswick CEDC program.**



# Environmental Studies

As the Burchill Wind Project will have an installed capacity greater than 3MW, a Provincial Environmental Impact Assessment (EIA) is required. Desktop and field studies are currently being completed as part of the EIA. These studies will help Natural Forces develop the project responsibly and mitigate environmental impact. Members of the local community will have an opportunity to review and comment on the EIA document.


## Studies in Progress

- Wetland and Watercourse
- Breeding Birds
- Migratory Birds
- Common Nighthawk / Raptor
- Bat Detection
- Archaeology
- Vegetation
- Wildlife & Habitat
- Species of Interest / Species at Risk
- Wind Resource
- Noise
- Shadow Flicker and Visual Aesthetics




# Proposed Burchill Wind Project 10 Turbine Layout

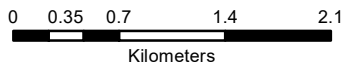
 Proposed Turbine Locations

 Project Roads

 Site Lands

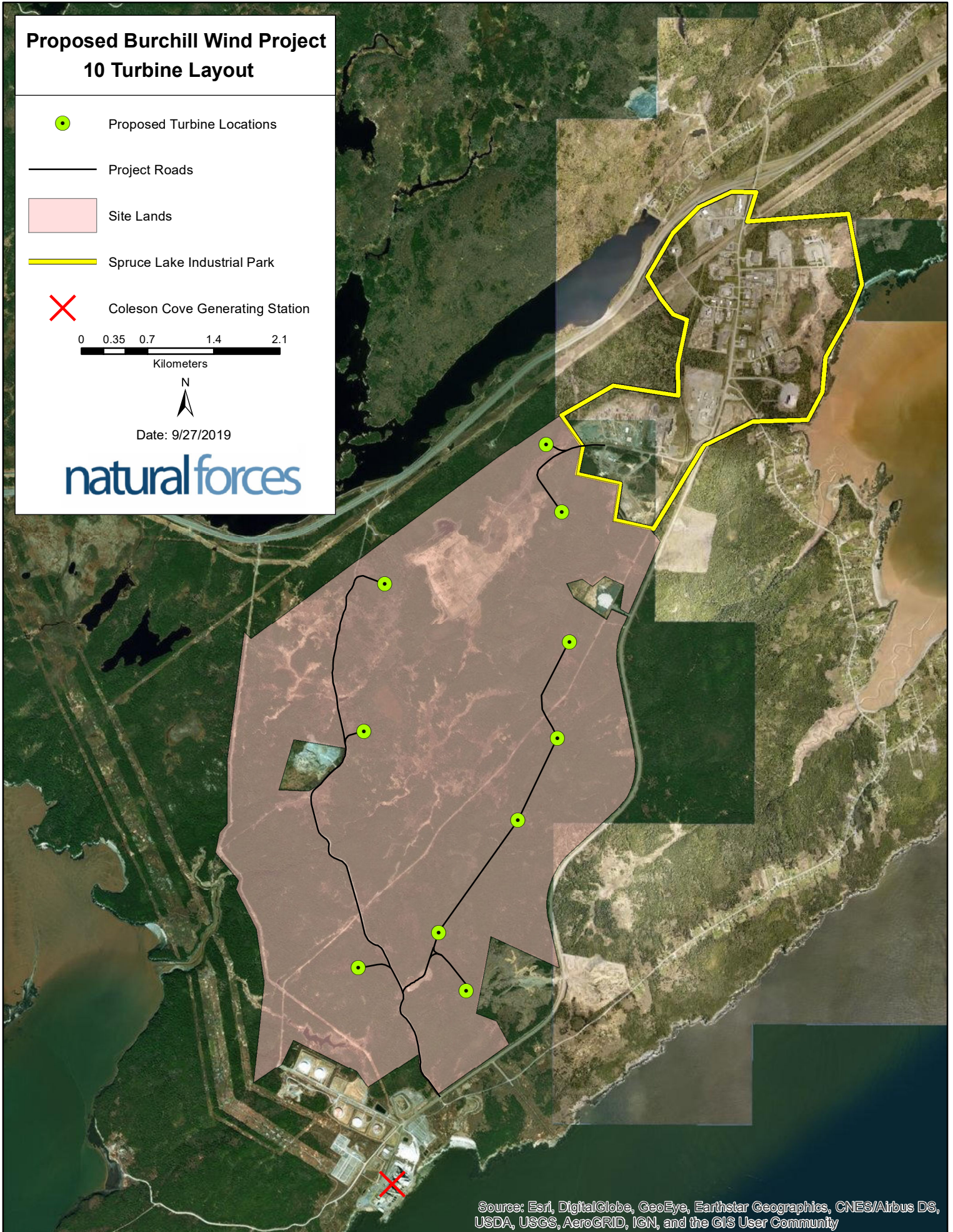
 Spruce Lake Industrial Park

 Coleson Cove Generating Station



Date: 9/27/2019

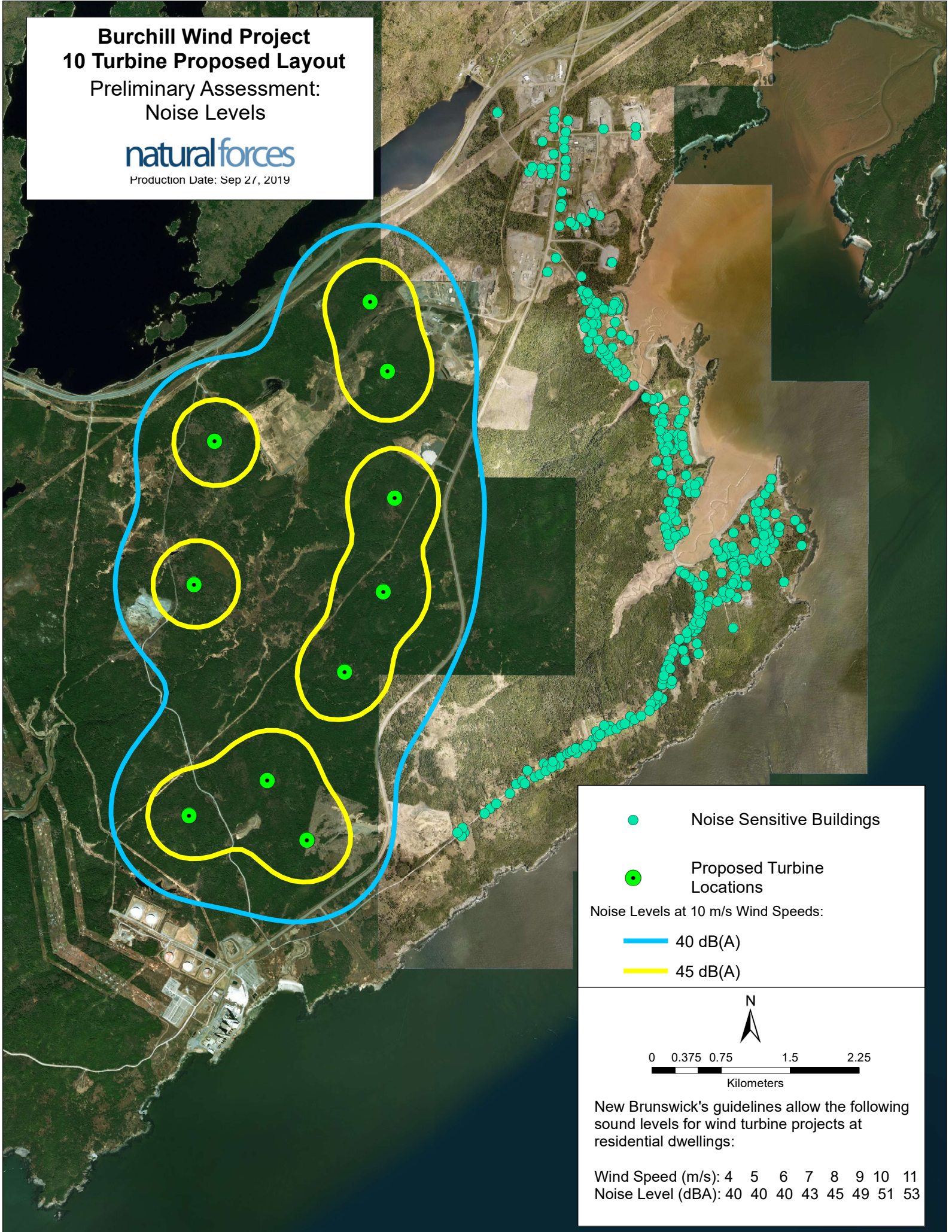
**natural forces**



**Burchill Wind Project**  
**10 Turbine Proposed Layout**  
 Preliminary Assessment:  
 Noise Levels

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Production Date: Sep 27, 2019



● Noise Sensitive Buildings

● Proposed Turbine Locations

Noise Levels at 10 m/s Wind Speeds:

— 40 dB(A)

— 45 dB(A)



0 0.375 0.75 1.5 2.25

Kilometers

New Brunswick's guidelines allow the following sound levels for wind turbine projects at residential dwellings:

Wind Speed (m/s):	4	5	6	7	8	9	10	11
Noise Level (dBA):	40	40	40	43	45	49	51	53



# Wind Energy and Your Health

Wind energy is one of the safest and most environmentally-friendly sources of electricity available today. It has also become one of the lowest-cost options for new electricity supply, while providing significant economic benefits to Canadian communities.

People have been living, working and enjoying productive lives near wind farms for decades. Wind energy is a growing source of electricity in more than 90 countries around the world. It is a safe and sustainable choice for the production of emissions-free electricity. Unlike many other sources of energy, wind energy does not produce toxic, hazardous or radioactive waste, requires significantly less water, creates no air pollution, and does not contribute to climate change.

It is important to have factual information when making decisions about Canada's energy future. One common concern is that sounds from wind turbines can cause health effects. This has been studied extensively and **the balance of scientific evidence and human experience to date clearly concludes that wind turbines are not harmful to human health.**

The global wind industry continues to engage with experts in science, medicine and occupational and environmental health to monitor ongoing, credible research in the area of wind turbines and human health.

## What do the experts say?

**Health Canada's 2014 *Wind Turbine Noise and Health Study*** found that wind turbine noise exposure was not

associated with self-reported medical illnesses and health conditions. This study was undertaken in Ontario and Prince Edward Island, studying residents of homes in the vicinity of 18 wind farms (consisting of 399 wind turbines). The study found that the following disorders were **not** associated with wind turbine noise:

- Self-reported sleep problems (such as general disturbance, use of sleep medication, diagnosed sleep disorders);
- Self-reported illnesses (such as dizziness, tinnitus, prevalence of frequent migraines and headaches) and chronic health conditions (such as heart disease, high blood pressure and diabetes); and
- Self-reported perceived stress and quality of life.

The study did find that higher levels of wind turbine noise based on proximity were statistically associated with annoyance. It also found that annoyance was significantly lower among the 110 participants who received a personal benefit from the wind farm, which could include lease payments, employment, etc.

A review of 60 research studies conducted worldwide on wind turbines and human health was published in **Frontiers in Public Health** and the authors concluded that the weight of evidence suggests that when sited properly, wind turbines are not related to adverse health effects in humans though they may be a source of annoyance for some people.



# Sound Levels from Wind Turbines

Wind energy has been used to generate electricity in Canada for more than three decades. It has many benefits – wind power does not pollute the air or emit greenhouse gases, it does not use water when producing electricity, and it has become the lowest-cost source for new electricity while benefiting local communities economically.

Some people living near existing or proposed wind turbines have expressed concerns about the sound levels coming from the turbines. Here are some facts about sound levels and how the wind energy industry strives to keep them at very low levels.

## What kinds of sounds do wind energy developments produce?

Construction represents the most active phase of a wind energy project, in terms of personnel, equipment and overall activity, so during this time sound emitted on a project site can be louder. When construction concludes, the related sounds end too. Once the wind turbines are operational and are producing electricity, they produce two types of sound, aerodynamic and mechanical.

**Aerodynamic** sound is created as the turbine blades pass through the air. This makes a “whoosh” or “swishing” sound.

**Mechanical** wind turbine sound comes from the working components and rotating gears of the turbine. The wind energy industry has reduced mechanical sounds through improved insulation and overall design.

Some people claim that infrasound (which is sound at frequencies that cannot be heard by people) are a health concern. However, various studies show that infrasound near wind developments does not pose a concern for human health. For example, the Association of Australian Acoustical Consultants produced a position paper stating that “investigations conclude that infrasound levels adjacent to wind farms are below the threshold of perception and below currently-accepted limits set for infrasound.”

## Canadian sound regulations

Government requirements across Canada require that wind farms keep sound levels at required levels when measured at nearby dwellings.

Wind energy developers in Canada follow regulations for wind facilities that are administered by provincial governments. They also follow the best practices developed by the wind energy industry. This is in the interest of wind developers, who must meet the stringent requirements designed by regulators to protect communities from noise for their project to be approved.

For example, in Alberta a *Noise Impact Assessment* is required for all wind power project applications. The assessment considers other operational or proposed wind facilities nearby, as well as sound limits and distance constraints that create space between areas of concern (such as inhabited structures and property lines) and the wind project.

(continued on next page)

In Ontario, noise guidelines specific to wind power have been in place since 2004 and have been updated a number of times since. The regulatory requirements include detailed noise modelling, sound level limits for operating wind turbines, and post-construction sound measurement requirements.

### Studying potential sound levels

Wind energy developers first rely on wind turbine manufacturers to provide data about the sound levels the wind turbine will produce during operations. Next, the developer uses the noise calculations and measurements within the context of the development area to optimize turbine layouts and to minimize sound levels for residents.

Once the turbines are operational, sound audits are conducted to measure turbine sounds (ensuring they meet manufacturers' sound specifications), and to measure sound levels at nearby residences.

### Are wind turbine sounds more noticeable at night?

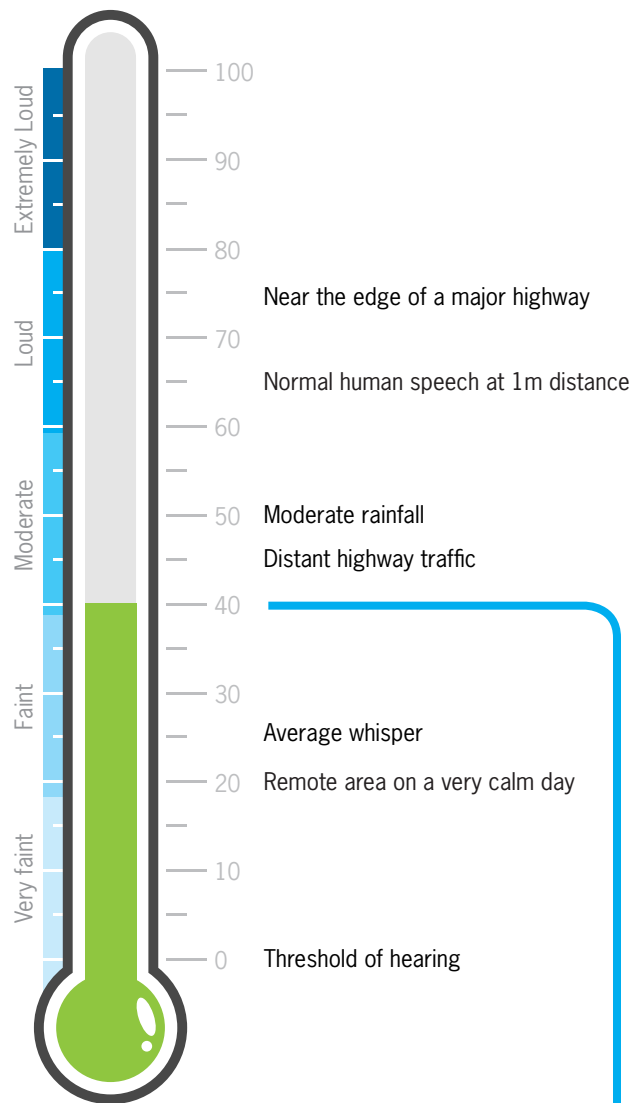
The background noises typically heard in rural areas during the day – such as from farming, or from nearby roads – often decrease at night. When that happens, wind turbine sounds can be more noticeable.

### How can residents around a wind project learn more about sound levels?

As part of the provincial environmental assessment process, local residents have an opportunity to attend open houses and discuss concerns about potential sound levels with the wind developer and provincial and local regulators.

## How loud is a wind turbine?

The diagram below shows how the sound levels from a wind turbine measure up.



At a distance of 550 metres, typically the sound from a wind turbine will have a sound pressure level of approximately 40 decibels at the outside of a residence.

