

Appendix H: Archaeological Resource Assessment
(Test Pit results will be provided as an addendum)

**Archaeological Assessment of the Proposed Burchill Wind Farm near Saint
John, NB**
Permit #: 2019 NB 144

Prepared for

Natural Forces Developments LP

by

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ABSTRACT

On November 5th, 2019, an archaeological pedestrian survey took place at the location of a proposed wind farm near Lorneville, NB. The pedestrian survey was undertaken to identify any extant heritage/archaeological features of significance, any visible significant artifacts or if any potential exists for the presence of buried archaeological sites.



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INTRODUCTION

Natural Forces Development LP commissioned the work of an archaeologist to mitigate the potential negative effects of construction activity surrounding the development of a wind farm near Lorneville, New Brunswick (see Figures 1 + 2). In advance of their construction activities associated with the wind farm development, the locations of ten wind turbines and associated infrastructure, west of Saint John, were assessed for the presence of heritage resources and the potential for buried archaeological remains.



PREVIOUS RESEARCH

There are not any previously recorded archaeological sites registered at Archaeological Services New Brunswick within the vicinity of the proposed construction activities in the area surveyed.

The Borden system is a nation-wide, geographically based method for recording sites of archaeological value. In New Brunswick, each Borden block is 10 minutes of latitude by 10 minutes of longitude. Each of these blocks is referred to by a four-letter code, which describes the location of that particular block. Consequently, sites within each Borden block are numbered sequentially in the order in which they are reported. The Borden block that is of concern to this report is BhDm.



METHODS

The information presented in this report was gained through research of relevant documents from Archaeological Services in Fredericton and published materials, including topographic and surficial geology maps & reports, aerial photographs, LiDAR data, and the New Brunswick Register of Historic Places. The field component was conducted using intensive visual inspection through pedestrian surveying. Each turbine area was assessed, along with a select areas of the transmission line/roads (see Figure 17).



RESULTS

A review of early and modern aerial photographs (1935 5093/048 & 059) failed to indicate any extant cultural features of interest. The air photos and topographical mapping indicate that the assessed area of the proposed wind farm is sited across an area that has previously been forested with occasional wood lots and rests at an elevation of ~57-73 m asl. As can also be seen from the LiDAR data (see Figure 3), the project area is comprised of flat areas with several increases in elevation, which are usually bedrock outcrops. The flat areas are often at the lower local elevations and were sometimes wet and classified as a wetland. While bedrock can clearly be seen at the surface in places, there is also a good chance that much of the wet surface can be attributed to the near-surface presence of marine clay. The maximum elevation of the marine transgression is reported to be ~61 m asl (Lohse, 1977), which places much of the project area below or near this level.

The bedrock geology of the area, the outcrops on which some of the turbines are proposed, is comprised of four different formations – Taylor Island, Saint John Group, Ashburn and the Spruce Lake Tonalite (Barr and White, 2005). Of potential interest is the middle to late Neoproterzoic Ashburn Formation which is reported to contain white to grey fine-grained quartzite. This quartzite may have been used in the production of stone tools. Turbines 6 & 7 are sited in the area resting on the Ashburn Formation deposits.

The notable surficial geology of the project area consists of ice contact and marine shallow water deposits (see Figure 3). In the north of the project area, an elongated ice contact deposit was mapped with at least three recorded gravel pits. Below the topsoil, this deposit is described as fine to coarse-grained sand with fine to coarse gravel to several metres in depth. Turbine 10 is sited on the northern edge of this deposit. In the south of the map area, a couple of marine shallow water deposits were mapped, just south and immediately west of Turbine 2. These deposits are also described as fine to coarse-grained sand with fine to coarse gravel to several metres in depth.

With the maximum marine limit at ~61 m asl, it is assumed that early habitation sites may be found in close proximity to this migrating shoreline. Turbines 5-9 are at elevations at or below the 61 m asl level and consequently are considered as holding high potential for the presence of Indigenous archaeological remains (see Figures 8-12).



A few streams were noted within the project area. A tributary to Mill Creek crosses the line between Turbines 6 & 9. Burchill Brook can be found between Turbines 8 & 9 and again south of Turbine 7, as is Frenchman's Creek. It should also be noted that many mapped wetlands occupy the project area, which are known to be great sources of food & resources as well as being ideal locations for human habitation for thousands of years after the last glaciation. Each of these modern and ancient geographical features should be considered as holding high potential for the presence of Indigenous archaeological remains (see Figures 3, 14 & 15).

No evidence of significant extant structures was visible during the desktop survey or in the field. However, several turbine locations, new roads and additional work space associated with this project meet the criteria for holding high potential for the presence of significant archaeological resources.

Throughout the course of the pedestrian survey, there were not any culturally significant extant or exposed features/artifacts identified. If any change to the proposed footprint of this project is anticipated, then consultation with a permitted archaeologist should occur to ensure a minimal amount of damage to any buried heritage that may be present.



CONCLUSIONS & RECOMMENDATIONS

On November 5th, 2019, an archaeological pedestrian survey took place at a proposed wind farm west of Lorneville, NB. The assessment of this area resulted in the failure to identify any evidence of significant past human use at the locations of the proposed 10 turbines or other associated locations. However, six turbine locations (Turbines 5-10) rest in areas that are considered to hold high potential for significant archaeological remains. Additionally, sections of new/upgraded roads or transmission lines exhibits the geographical characteristics that are traditionally regarded as draws for human habitation since the retreat of the glaciers.

Due to their proximity to the former marine shoreline, Turbines 5-9 should be considered as holding high potential for the presence of early postglacial archaeology. Following the *Guidelines* (2012), archaeological test pits should be excavated on a 5 m grid anywhere ground-disturbing activities (removing tree stumps, use of heavy equipment etc) will occur as follows: *(c) extends within 50 metres of the banks or shores of a current or former body of water (i.e., river, lake, bay, etc.) – for areas between 50-80 metres from current or former body of water see: Medium Potential (a 10 m grid).* Initially, it might be suitable to excavate test pits along a transect (in a N/S direction) at each of these locations, to better understand the surficial geology and the potential for early human habitation and to narrow focus. With Turbine 10 sited on a well-drained ice contact deposit in proximity to the ancient marine shoreline, it should also be considered as high potential and receive the same archaeological testing procedure mentioned above (see Figure 16).

New/upgraded roads or transmission lines are planned that cross mapped streams/wetlands. These areas may have been used for navigation or provided resources to people in the past and should therefore be considered as holding high potential for the presence of significant archaeological resources. Following the *Guidelines* (2012), archaeological test pits should be excavated on a 5 m grid anywhere ground-disturbing activities will occur as follows: *(c) extends within 50 metres of the banks or shores of a current or former body of water (i.e., river, lake, bay, etc.) – for areas between 50-80 metres from current or former body of water see: Medium Potential (a 10 m grid).*



REFERENCES

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Lohse, H.

- 1975** *Granular Aggregate Resources of Musquash 21G/1.* Province of New Brunswick, Mineral Resources Branch. Plate 76-16.
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NB Archaeological Services Unit

- 2012** *Guidelines and Procedures for Conducting Professional Archaeological Assessments in New Brunswick.* Archaeological Services Unit, Fredericton.



APPENDIX



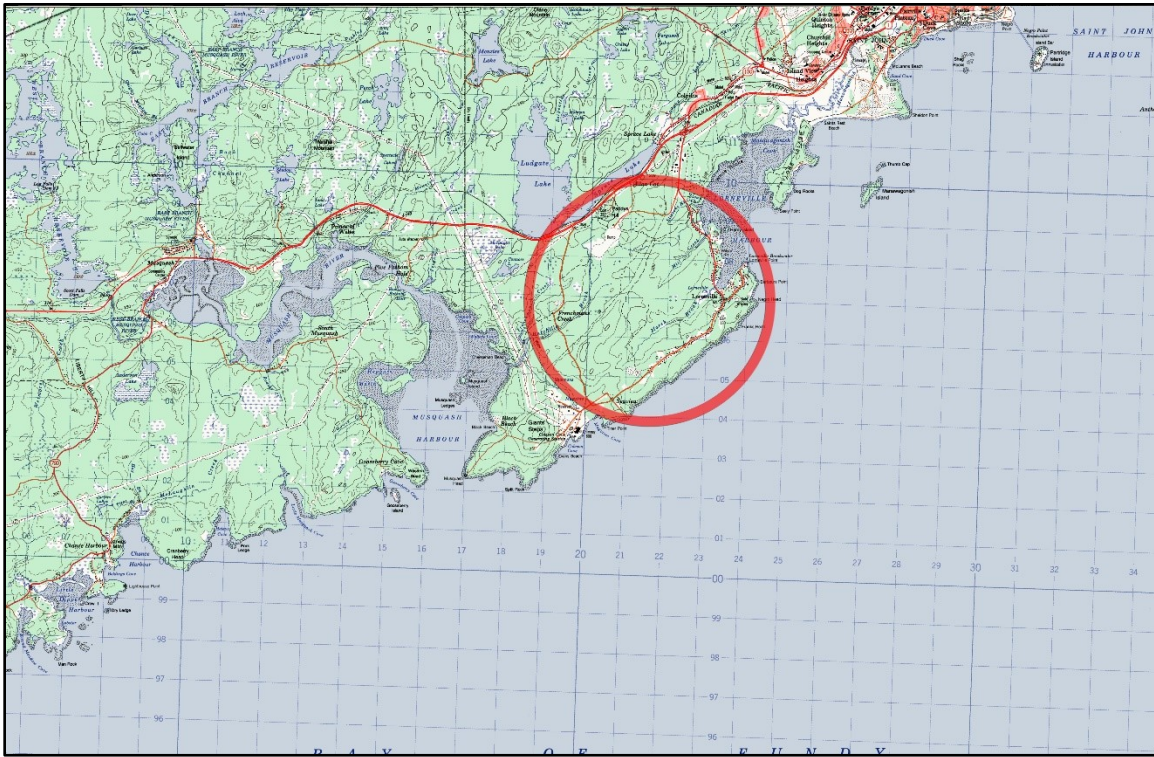


Figure 1: Approximate location of the proposed wind farm. (21 G/01)



Figure 2: Project area with locations of turbines and infrastructure.

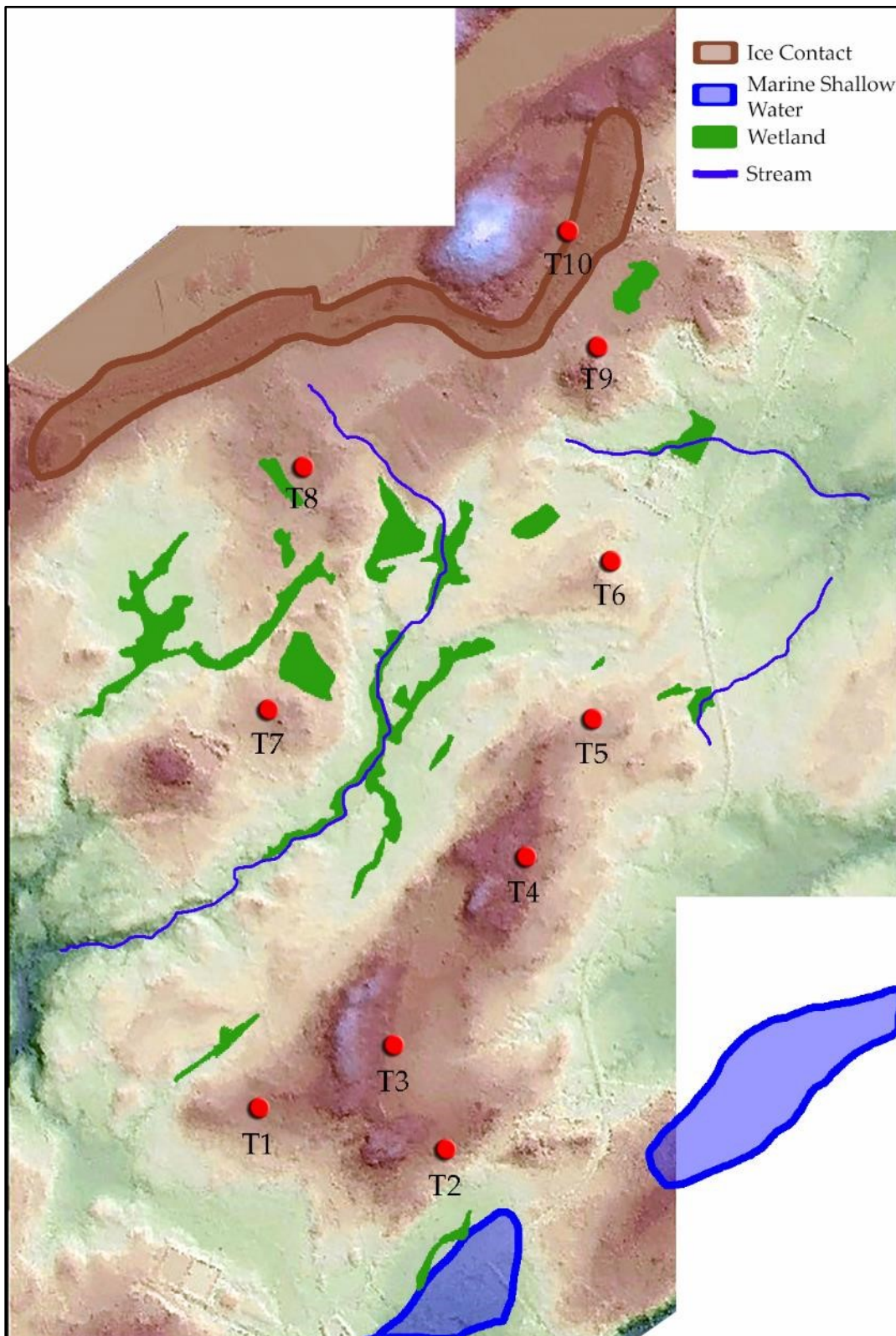


Figure 3: Project area on LiDAR data with turbine locations, wetlands, streams & geology.



Figure 4: Proposed placement for Turbine 1.



Figure 5: Proposed placement for Turbine 2.





Figure 6: Proposed placement for Turbine 3.



Figure 7: Proposed placement for Turbine 4.





Figure 8: Proposed placement for Turbine 5.



Figure 9: Proposed placement for Turbine 6.





Figure 10: Proposed placement for Turbine 7.



Figure 11: Proposed placement for Turbine 8.





Figure 12: Proposed placement for Turbine 9.



Figure 13: Proposed placement for Turbine 10.



Figure 14: Stream between Turbines 5 & 6.



Figure 15: Stream between Turbines 6 & 9.

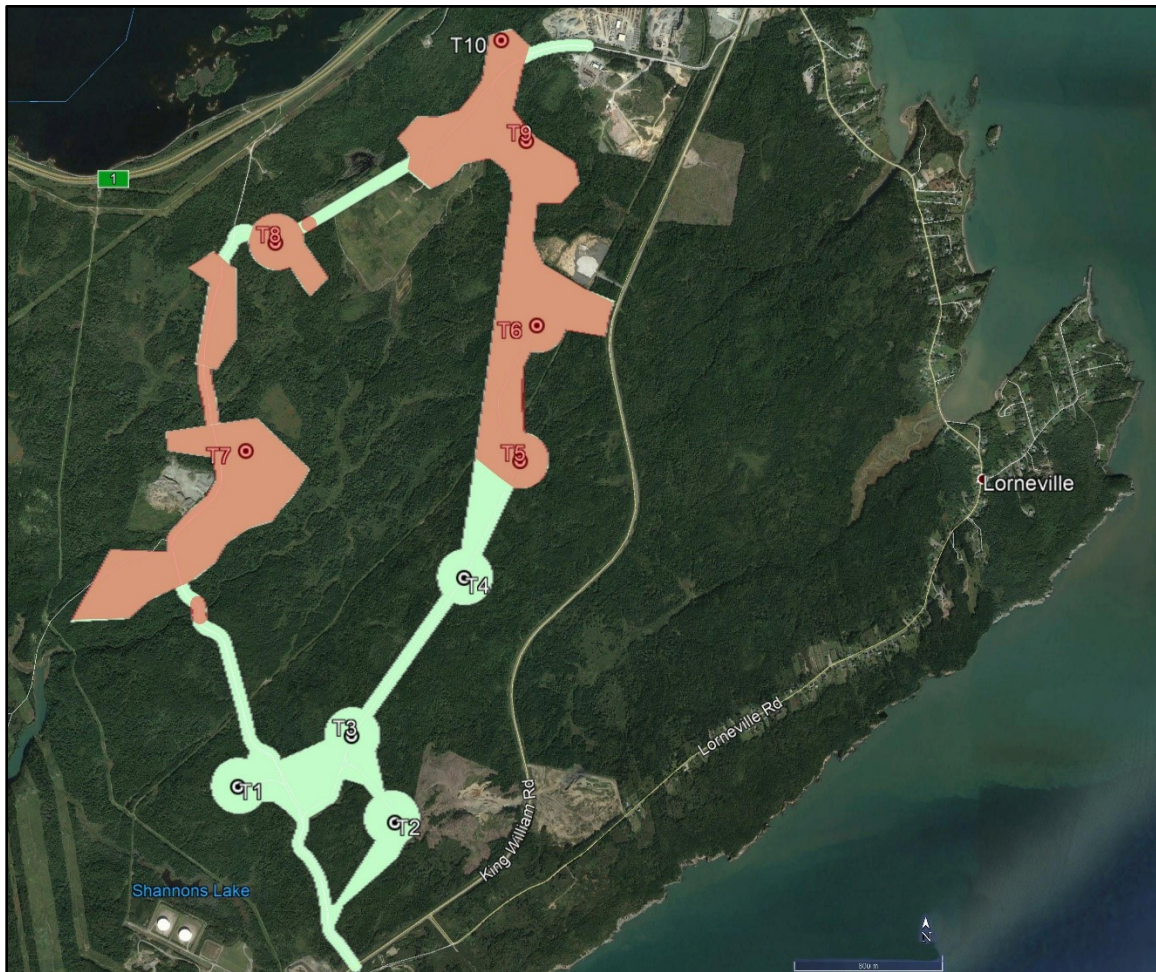


Figure 16: Turbines and impact areas on a satellite image. Red shaded areas represent locations assessed as holding high potential for archaeological resources.

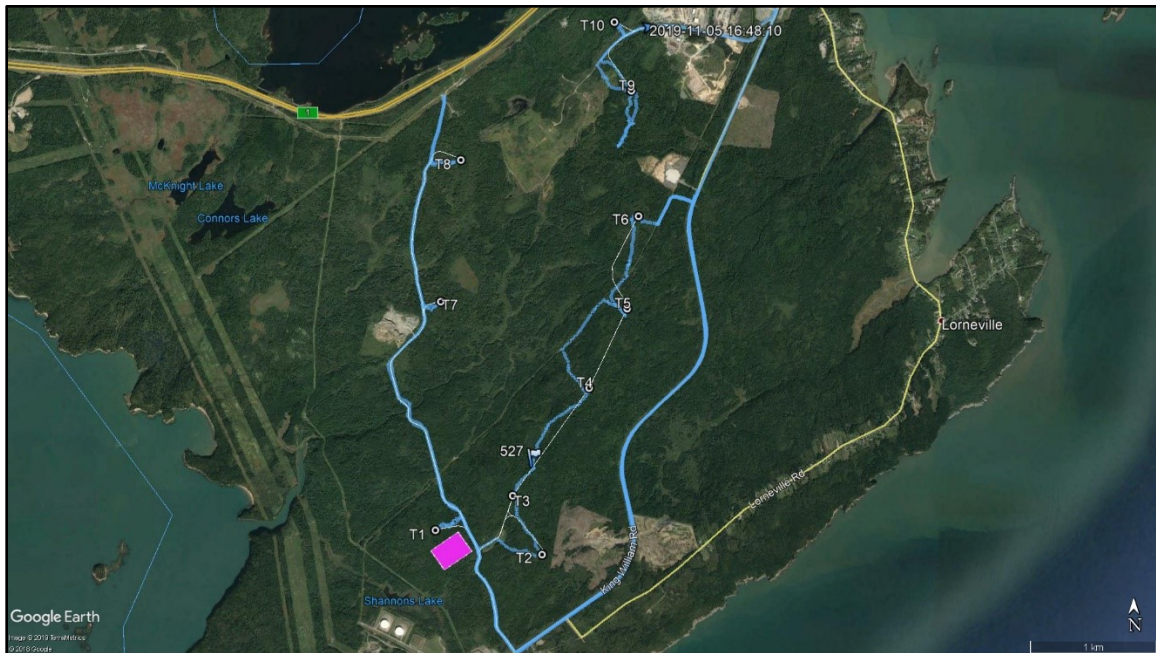


Figure 17: Turbines and tracklog on a satellite image.

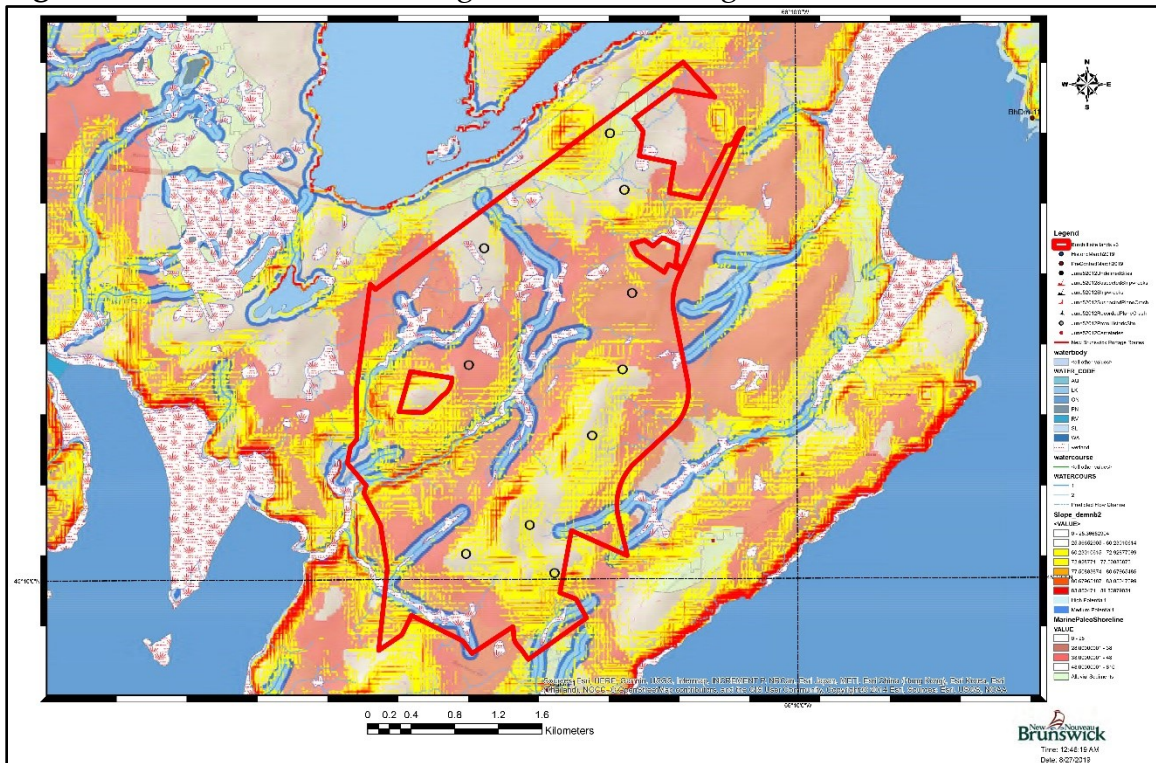


Figure 18: The required predictive model purchased from the Province, with turbine placement superimposed.

