



**ENVIRONMENTAL ASSESSMENT
ADDENDUM REPORT
MARTOCK RIDGE COMMUNITY WIND PROJECT**

May 27, 2013



Taking Charge™



May 27, 2013

Mr. Dan Roscoe
Scotian WindFields Inc.
108F Trider Crescent
Dartmouth, NS B3B 1R6

Dear Mr. Roscoe,

Re: Environmental Assessment Addendum Report
Martock Ridge Community Wind Project

Attached is the Environmental Assessment Addendum Report prepared for the Martock Ridge Community Wind Project in the District of West Hants, Nova Scotia.

We trust this report to be satisfactory at this time. Once you have had an opportunity to review this correspondence, please contact us to address any questions you may have.

Thank you,

A handwritten signature in blue ink, appearing to read "Garry Gregory".

Garry Gregory, M.Sc.
Environmental Specialist
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A handwritten signature in blue ink, appearing to read "Shawn Duncan".

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EXECUTIVE SUMMARY

Scotian WindFields Inc., Scotian Wind Inc., and WEB Wind Energy North America Inc. have proposed the development of a 6.0 MW wind energy facility in the community of Three Mile Plains, near Windsor, Nova Scotia. Situated within the District of West Hants, the Project is centered at 4975562.97 N, 412080.95 E (20T; NAD 83) and is located approximately 7 km southeast of the Town of Windsor. The original Project site consisted of forested resource land owned by the Town of Windsor; however, a subsequent landowner agreement has been reached and Project lands now incorporate at least one adjacent parcel.

The Martock Ridge Community Wind Project Environmental Assessment document was registered on January 18, 2013. On March 7, 2013 the Minister of Environment determined that the information provided was insufficient to make a decision. Specifically, it was requested that information related to the proximity of the proposed Project to receptors be provided to the Environmental Assessment Branch as an addendum to the original Registration Document. To obtain approval, the Project must demonstrate that it can be developed while complying with the following guidelines:

- All turbines must be located at least 550 m from any receptor;
- Operational noise levels must not exceed 40 dBA at any receptor; and
- Shadow flicker must not exceed 30 minutes/day and/or 30 hours/year at any receptor.

In addition, detailed information was requested related to the steps taken to address concerns related to the protection of the Mill Lakes Watershed Protected Water Area. Consultation with the Municipality of the District of West Hants, the Town of Windsor and the Mill Lakes Watershed Advisory Committee was completed as part of this process.

Two alternative revisions to the turbine layout of the Martock Ridge Community Wind Project have been proposed to ensure that all guidelines outlined by the Minister in his decision have been met for all receptor locations, including identified seasonal woods camps. For both layout options, the closest receptor is located at least 555 m away from the closest turbine. A re-evaluation of potential sound and shadow flicker impacts of the Project was completed to account for these revisions to the proposed turbine layout and to include identified seasonal woods camps as receptors. Based on predictive modeling, sound and shadow flicker levels for either layout option are not expected to exceed NSE guidelines or accepted industry standards at any existing receptor.

The development of an Environmental Protection Plan has been an on-going process initiated shortly after Environmental Assessment registration on January 18th, 2013, and the Proponents have made every effort to engage and consult with key stakeholders related to the protection of the Mill Lakes Watershed Protected Water Area. Feedback has been received from the Municipality of the District of West Hants, and the Town of Windsor has indicated that they are open to further consultations once civil engineering design plans for the Project have been completed. A third key stakeholder, the Mill Lakes Watershed Advisory Committee, has yet to provide any feedback, although the Proponents have committed to continuing efforts to engage this and other stakeholder groups prior to finalizing the EPP document.

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1.0 INTRODUCTION

Scotian WindFields Inc., Scotian Wind Inc., and WEB Wind Energy North America Inc. have proposed the development of a 6.0 MW wind energy facility in the community of Three Mile Plains, near Windsor, Nova Scotia (the Project). Situated within the District of West Hants, the Project is centered at 4975562.97 N, 412080.95 E (20T; NAD 83) and is located approximately 7 km southeast of the Town of Windsor. The original Project site consisted of forested resource land owned by the Town of Windsor; however, a subsequent landowner agreement has been reached and Project lands now incorporate at least one adjacent parcel.

The Martock Ridge Community Wind Project Environmental Assessment (EA) document was registered on January 18, 2013. On March 7, 2013 the Minister of Environment determined that the information provided was insufficient to make a decision. Specifically, it was requested that information related to the proximity of the proposed Project to receptors be provided to the EA Branch as an addendum to the original Registration Document. To obtain approval, the Project must demonstrate that it can be developed while complying with the following guidelines:

- All turbines must be located at least 550 m from any receptor;
- Operational noise levels must not exceed 40 dBA at any receptor; and
- Shadow flicker must not exceed 30 minutes/day and/or 30 hours/year at any receptor.

In addition, detailed information was requested related to the steps taken to address concerns related to the protection of the Mill Lakes Watershed Protected Water Area during the construction and operation of the Project. Consultation with the Municipality of the District of West Hants, the Town of Windsor and the Mill Lakes Watershed Advisory Committee was completed as part of this process.

Camp 9, which is a mobile trailer on wheels, was previously identified in the EA as a seasonal camp receptor. However, its inclusion as a receptor is the subject of on-going discussion with regulatory agencies due to its poor state of repair, and the fact it is mobile in nature. Given that a final determination has yet to be made, the Proponents have developed two turbine layout options, hereafter referred to as Option 1 (in the event that Camp 9 is determined to be a receptor), and Option 2 (in the event that Camp 9 is determined not to be a receptor). The precise turbine locations for Options 1 and 2 are provided in Tables A1 and A2, Appendix A, respectively.

To address the items raised in the Minister's decision, the following tasks were completed for both turbine layout options:

- Compliance with the 550 m setback between non-participating receptors (including seasonal woods camps) and proposed turbine locations was confirmed;
- Sound modeling was completed using a revised layout for all receptors within 2 km of a turbine;
- Shadow flicker modeling was completed using a revised layout for all structures within 2 km of a turbine; and
- Consultation between the proponent and the District of West Hants, the Town of Windsor, and the Mill Lakes Watershed Advisory Committee regarding the protection of the Mill Lake Watershed Area was continued with all efforts specifically documented.

All modeling was based on the V100 turbine model, which has the following structural characteristics (Vestas 2011):

- Hub height – 95 m;
- Rotor diameter – 100 m;
- Maximum blade width – 3.9 m.

The sections that follow present the methodology and findings of the respective assessments for the Project.

2.0 SETBACK COMPLIANCE

In his EA decision, the Minister of Environment indicated that a minimum setback of 550 m from any non-participating receptor must be achieved. In the interim, an agreement has been reached with an adjacent landowner to permit one seasonal woods camp receptor (identified in the EA document as Camp 12) to be incorporated into the Project lands. As such, the setback requirement no longer applies to this Camp.

The layout provided in Option 1 has been revised from that presented in the original EA to accommodate the 550 m setback in the event that Camp 9 is determined to be a receptor (Drawing A1, Appendix A). Specifically, the following turbine relocations have been proposed:

- Turbine 1 – Moved 156.1 m to the southwest;
- Turbine 2 – Moved 219.9 m to the east; and
- Turbine 3 – Moved 276.6 m to the north/northeast.

With these revisions, the Option 1 layout exceeds the minimum 550 m setback; the closest receptor is Camp 9 which is located 555.3 m to the north/northwest of Turbine 1.

The layout provided in Option 2 has been revised from that presented in the original EA to accommodate the 550 m setback in the event that Camp 9 is determined not to be a receptor (Drawing A2, Appendix A). Specifically, the following turbine relocations have been proposed:

- Turbine 1 – Moved 101.5 m to the west;
- Turbine 2 – Moved 205.3 m to the east; and
- Turbine 3 – Moved 276.6 m to the north/northeast.

With these revisions, the Option 2 layout exceeds the minimum 550 m setback; the closest receptor is Camp 6 which is located 558.6 m to the west/southwest of Turbine 3.

3.0 SOUND ASSESSMENT

3.1 Background - Wind Turbines and Noise

Wind turbines generate sound both through the movement of mechanical equipment inside the nacelle and through the interaction of the blades with the air as they rotate around the nacelle. In modern turbine designs, much of the mechanical noise is mitigated through the use of noise insulating materials. Aerodynamic sound resulting from blade rotation is an unavoidable by-product of wind energy generation, although advances in blade engineering have greatly reduced the sound power level emitted from operating turbines. The sound pressure level at a given point in the landscape surrounding the wind turbine is influenced by propagation distance, local topography, atmospheric conditions, and vegetative cover (Hau 2006).

Nova Scotia has no specific sound guidelines for wind farms; however, through the EA process, Nova Scotia Environment (NSE) requires that predicted noise levels at identified residential receptors (as well as seasonal residences, camps, daycares, hospitals and schools) not exceed 40 dBA. As this guideline is intended to be protective of human sleep disturbance, 40 dBA does not apply to commercial or vacant lot receptors. This guideline was used in the current sound assessment for the Project.

3.2 Assessment Methodology

An acoustic assessment was conducted for the Project to predict sound pressure levels at identified receptors within a 2 km radius of the proposed turbine locations for both layout options. The assessment was completed using the “Decibel” module of the WindPro v. 2.8 software package. For the purposes of this model, receptors included all structures identified in the provincial topographic mapping, as well several seasonal woods camps identified during an aerial reconnaissance survey. Structures located on Project lands were considered participating receptors, and as such are not subject to the same noise guidelines. Participating receptors included one seasonal woods camp (Camp 12) located on a parcel incorporated into Project lands subsequent to the submission of the original EA; as such, this camp was not included as a receptor in the updated sound model.

The sound assessment model followed ISO 9613-2 Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method and calculations, and was based on the following input information:

- UTM coordinates for the wind turbines;
- UTM coordinates for existing receptors (including seasonal woods camps) within a 2 km radius of the Project site;
- Camp 9 was excluded from the assessment for layout Option 2
- Octave band sound data for the V100, provided by the manufacturer via the proponent; and
- Topographic data for the surrounding area.

The highest overall sound power level corresponds to a 10 m wind speed of 8 m/s; therefore, this wind speed was used in the model.

3.3 Sound Modeling Results

Modeling results for layout Option 1 are provided in Table B1 (Appendix B) and indicate that predicted sound pressure levels will not exceed 40 dBA at any existing, non-participating receptor (range 26.7 – 38.8 dBA) (Drawing C1, Appendix C).

Modeling results for layout Option 2 are provided in Table B2 (Appendix B) and indicate that predicted sound pressure levels will not exceed 40 dBA at any existing, non-participating receptor (range 26.7 – 38.6 dBA) (Drawing C2, Appendix C).

4.0 SHADOW FLICKER ASSESSMENT

4.1 Background - Wind Turbines and Shadow Flicker

The rotating blades of a wind turbine can cast a moving shadow on locations within a certain distance of the turbine. This intermittent shadow, perceived as a change in light intensity to an observer, is referred to as shadow flicker. The potential impact area depends on the time of year and day and the wind turbine's physical characteristics (height, rotor diameter, blade width, and orientation of the rotor blades).

For shadow flicker to occur, the following criteria must be met:

- The sun must be shining and not be obscured by clouds/fog.
- The source turbine must be operating.
- The wind turbine must be situated between the sun and the shadow receptor.
- The wind turbine must be facing directly towards, or away from, the sun such that the rotational plane of the blades (rotor plane) is perpendicular to the azimuth of incident sun rays. For this to occur, the wind direction would have to be parallel to the azimuth of the incident sun rays throughout the day.
- The line of sight between the turbine and the shadow receptor must be clear. Light-impermeable obstacles, such as vegetation, tall structures, etc., will prevent shadow flicker from occurring at the receptor.
- The shadow receptor has to be close enough to the turbine to be in the shadow.

There are no municipal, provincial, or federal guidelines related to shadow flicker, but many jurisdictions (including NSE) have adopted the industry standard of no more than 30 hours of shadow flicker per year, or no more than 30 minutes of shadow flicker on the worst day of the year. These guidelines were developed in Germany to prevent excessive annoyance to neighbours of wind energy developments and now included under that country's *Federal Emission Control Act* (as cited in Haugen 2011). These guidelines were used in the current shadow flicker assessment for the Project.

4.2 Assessment Methodology

A shadow flicker assessment was completed for the Project to assess the potential impact of shadows at identified receptors within a 2 km radius of the proposed turbine locations for both layout options. Receptors were identified using the same methodology as described in the previous section for the sound assessment. The assessment was completed using the "Shadow" module of the WindPro v. 2.8 software package assuming ideal conditions for shadow generation, including:

- Constant sunshine during daylight hours;
- Turbines are always operational;
- Turbine blades are oriented perpendicular to the line between the sun and all receptors;
- No obstructions are present that may obscure shadows; and
- Receptor windows are oriented towards the turbine(s).

Vegetation effects were incorporated into the model using data from the Nova Scotia Forest Inventory (NSDNR 2012a). Specifically, forest stand height was included to determine if any part of the turbine will be visible from the receptor location. If vegetation obscures the visibility of turbines from a receptor, shadow flicker will not occur at that location. Turbine visibility was calculated at a 5 m grid resolution.

4.3 Shadow Flicker Modeling Results

Modeling results for layout Option 1 are provided in Table B3 (Appendix B) and indicate that shadow flicker guidelines are expected to be met at all existing receptors (Drawing C3, Appendix C).

Similarly, modeling results for layout Option 2 are provided in Table B4 (Appendix B) and indicate that shadow flicker guidelines are expected to be met at all existing receptors (Drawing C4, Appendix C).

5.0 PROTECTION OF THE MILL LAKES WATERSHED PROTECTED WATER AREA

5.1 Environmental Protection Plan (EPP)

The development and implementation of a Project specific EPP is the primary mechanism by which the Mill Lakes Watershed Protected Water Area is protected against potential adverse environmental effects related to the Project. The EPP outlines all of the potential adverse effects of the Project and describes in detail the protective measures which will be implemented to prevent/mitigate these effects. Such protective measures include, but are not limited to, erosion and sediment control plans, hazardous waste disposal plans, contaminant prevention plans, and surface water quality protection plans. As an added level of protection, the EPP outlines specific contingency measures which will be implemented in the unlikely event that adverse environmental effects are detected.

5.2 Stakeholder Consultation to Date

Throughout the development of the Project, a substantial amount of general consultation was conducted, as detailed in section 12.2 of the EA Registration Document. Furthermore, the following stakeholders have been consulted during the development of the EPP:

- The Municipality of the District of West Hants, through its Planning Advisory Committee;
- The Town of Windsor through its Department of Public Works; and
- The Mill Lakes Watershed Advisory Committee through its Town of Windsor representative, Don Beatty.

The first draft of the EPP, developed based upon the proposed table of contents submitted as Appendix A of the EA, was distributed to the above-noted groups in the week following EA registration on January 18th, 2013. However, this first draft was mistakenly classified as an internal “confidential

document” and was therefore withheld from several stakeholders. It is believed by the Proponents that this circumstance led to concerns raised during the EA public comment period related to a lack of information pertaining to watershed protection.

A summary of all stakeholder consultations related to the protection of the Mill Lakes Watershed Protected Water Area is provided below.

5.2.1 The Municipality of the District of West Hants (through its Planning Advisory Committee)

- First draft was provided for review the week following January 18th, 2013;
- Second draft, reflecting a harmonization of incident response procedures with those already established in the Emergency Preparedness Plan for the Mill Lakes and Fall Brook Reservoir Water Supply System, was provided for review on March 13th, 2013;
- Presentation given by the Proponents to the Planning Advisory Committee on April 18th, 2013;
- Feedback was received from this stakeholder group on May 1st, 2013, with comments currently being addressed in the development of a revised EPP.

5.2.2 The Town of Windsor (through its Department of Public Works)

- First draft was provided for review the week following January 18th, 2013;
- Second draft, reflecting a harmonization of incident response procedures with those already established in the Emergency Preparedness Plan for the Mill Lakes and Fall Brook Reservoir Water Supply System, was provided for review on March 13th, 2013;
- Follow up meetings with Town of Windsor staff have indicated that in consideration of the revisions made to date, additional feedback will not be provided until after the detailed civil design work is complete.

5.2.3 The Mill Lakes Watershed Advisory Committee (through its Town of Windsor representative, Don Beatty)

- First draft was provided for review the week following January 18th, 2013;
- Second draft, reflecting a harmonization of incident response procedures with those already established in the Emergency Preparedness Plan for the Mill Lakes and Fall Brook Reservoir Water Supply System, was provided for review on March 13th, 2013;
- No feedback on either draft of the EPP has been received to date from this stakeholder group.

5.3 Plan for Continuing Stakeholder Consultation

The Proponents continue to engage the three primary stakeholders specifically on watershed protection issues. The goal is to address the majority of their concerns through revisions to the EPP draft, prior to registration of the plan with NSE. Further changes can be made via the “EPP Revision Request Form” to fine tune the document; however the proponents prefer that the stakeholders be comfortable with the content of the EPP in advance, to minimize the need for post-registration revisions.

The specific plan in the near-term includes additional consultation with the District of West Hants on a draft Best Management Practices document that has been in development for some time. The Proponents look forward to ensuring the intent and goals of that document are reflected in the EPP. Additionally, the Proponents intend to reengage the Town of Windsor once detailed road design and

facility layout has been completed (anticipated to occur in late May). Finally, further attempts will be made to ensure the Mill Lakes Watershed Advisory Committee is aware of the EPP development to ensure that their feedback is received.

In a more general scope, development of the Environmental Management Framework (EMF) to guide operation and maintenance of the proposed development will follow a similar model of stakeholder consultation. This system of documentation will be developed on a longer timeline than the EPP, which relates only to construction activities. However, it is the goal of the Proponents that the EMF be substantially underway prior to receiving municipal development approval. This is to ensure the public has confidence that watershed protection has been addressed thoroughly for all phases of the Project's 20 year lifespan prior to construction.

In addition to direct engagement of the three primary stakeholders by the Proponents, a Community Liaison Committee (CLC) is currently being established which will serve as another vehicle for consultation. The purpose of the CLC is to facilitate timely exchange of information and ensure healthy, two-way communication between the Proponents and a representative cross section of organizations and citizens from the area, including the Town of Windsor, Municipality of the District of West Hants, and the Mill Lakes Watershed Advisory Committee. Specifically, the CLC will:

- ask questions and offer advice about the Project;
- keep constituent organizations abreast of Project plans, progress and activities;
- draw the Proponents' attention to issues that concern constituent organizations;
- convey community views, concerns, and wishes to the Proponents;
- offer the Proponents suggestions on how to enhance the Project's benefits;
- provide feedback on Project issues, as requested by the Proponents; and
- have access to technical experts involved in the Project through, and with the agreement of the Proponents.

The CLC can examine any aspect of the Project, and will contain representatives from the larger community. Watershed protection will undoubtedly be addressed through this body, and the broader inclusion of the public will enhance the ongoing direct engagement between the Proponents and three key stakeholders. The CLC is expected to be operational by the end of May 2013.

6.0 ADDITIONAL CONSULTATION

In preparation of this Addendum, considerable consultation has been undertaken with seasonal woods camp owners within the vicinity of the Project site.

Building upon the early consultation carried out through a presentation to the Watershed Advisory Committee in March 2012, and two Public Open House events in August 2012 and February 2013, specific landowners and seasonal camp owners were contacted by phone and information regarding the proposed Project was provided. Numerous meetings were held throughout April 2013, often at the individual's principle residence, to discuss the Project in person with particular regard to achieving compliance with the guidelines described by the Minister in his March 7th, 2013 letter. The discussion

primarily revolved around addressing any questions or concerns the individuals may have had about the Project, and the potential for them to sign agreements by which they would become participants.

One camp owner (Camp 12) signed up to become a participating receptor to the Project. The Proponents believe the majority of those consulted do not have major issues with the Project, however at this stage, the Proponents are proceeding on the assumption that no additional landowners or seasonal camp owners will elect to become Project partners.

7.0 SUMMARY

The status of Camp 9, a seasonal woods camp previously identified in the EA as a seasonal camp receptor is pending a decision by NSE. Two alternative revisions to the turbine layout of the Martock Ridge Community Wind Project have been proposed to ensure that all guidelines outlined by the Minister in his EA decision have been met for all receptor locations, including identified seasonal woods camps, regardless of the ultimate decision by NSE. Layout Option 1 has been developed with Camp 9 considered a receptor, while Option 2 assumes that Camp 9 is not a receptor. For both layout options, the closest receptor is located at least 555 m away from the closest turbine. A re-evaluation of potential sound and shadow flicker impacts of the Project was completed to account for these revisions to the proposed turbine layout and to include identified seasonal woods camps as receptors. Based on predictive modeling, sound and shadow flicker levels for either layout option are not expected to exceed NSE guidelines or accepted industry standards at any existing receptor.

The development of an EPP document has been an on-going process initiated shortly after EA registration on January 18th, 2013, and the Proponents have made every effort to engage and consult with key stakeholders related to the protection of the Mill Lakes Watershed Protected Water Area. Feedback has been received from the Municipality of the District of West Hants, and the Town of Windsor has indicated that they are open to further consultations once civil engineering design plans for the Project have been completed. A third key stakeholder, the Mill Lakes Watershed Advisory Committee, has yet to provide any feedback, although the Proponents have committed to continuing efforts to engage this and other stakeholder groups prior to finalizing the EPP document.

Field surveys indicate that habitats within the areas encompassed by the revised turbine layouts are similar to those observed throughout the broader Project site. Additional field surveys will be completed during 2013 within the footprint of the Project. Therefore, no adverse environmental effects associated with the layout change are expected and conditions are consistent with those presented in the EA document.

8.0 CLOSURE

This report has been completed for the sole benefit of the Scotian WindFields Inc. Any other person or entity may not rely on this report without the express written consent of Strum Consulting and Scotian WindFields Inc.

The conclusions presented in this report represent the best judgement of the assessor based on the current environmental standards. The assessor is unable to certify against undiscovered environmental liabilities due to the nature of the assessment and the limited data available.

This report was prepared from data collected in May 2013. Should additional information become available, Strum requests that this information be brought to our attention so that we can re-assess the conclusions presented in this report. This report was prepared by Garry Gregory, M.Sc., Environmental Specialist and reviewed by Shawn Duncan, Vice President.

9.0 REFERENCES

Hau, E. 2006. *Wind Turbines, Fundamentals, Technologies, Application, Economics*, 2nd Ed. Berlin, Germany: Springer Verlag.

Haugen K.M.B. 2011. International review of policies and recommendations for wind turbine setbacks from residences: setbacks, noise, shadow flicker, and other concerns. Minnesota Department of Commerce: Energy Facility Permitting. 43 pp.

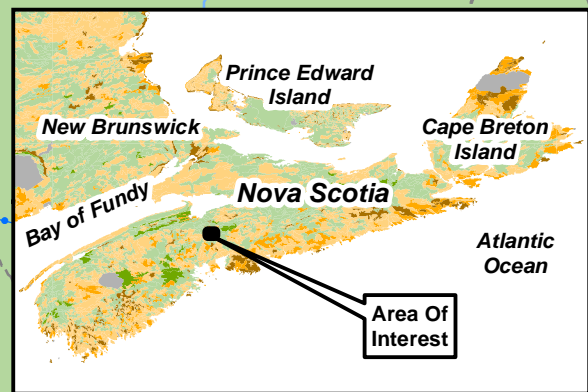
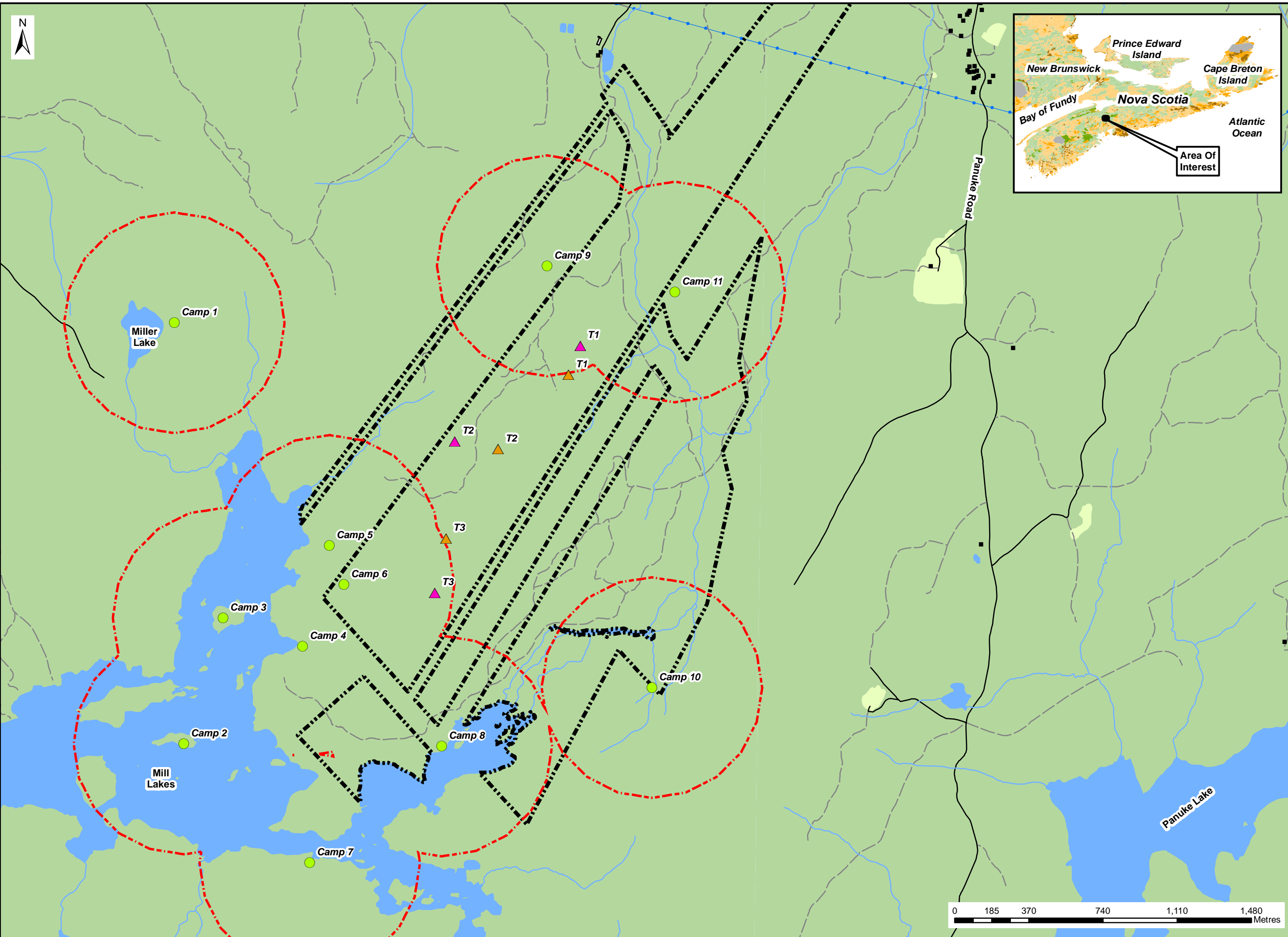
NSDNR (Nova Scotia Department of Natural Resources). 2012. Nova Scotia Forest Inventory. Accessed on May 15th, 2013 from <http://novascotia.ca/natr/forestry/gis/forest-inventory.asp>.

Vestas. 2011. General specification V100 – 2.0 MW 60 Hz. Document no. 022-1145 V02. 32 pp.

APPENDIX A
TURBINE COORDINATES AND PROPOSED LAYOUT

Turbine	Easting (m)	Northing (m)
WTG1	412235	4975903
WTG2	411884	4975532
WTG3	411624	4975087

Turbine	Easting (m)	Northing (m)
WTG1	412193	4976036
WTG2	411873	4975558
WTG3	411624	4975087



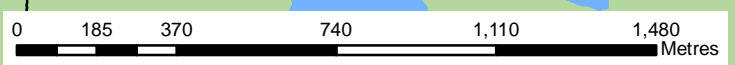
- Notes:**
- Reference: Digital Topographic Mapping By Nova Scotia Geomatics Centre. Project Layout Provided by Client.
 - Projection: NAD83(CSRS), UTM Zone 20 North.

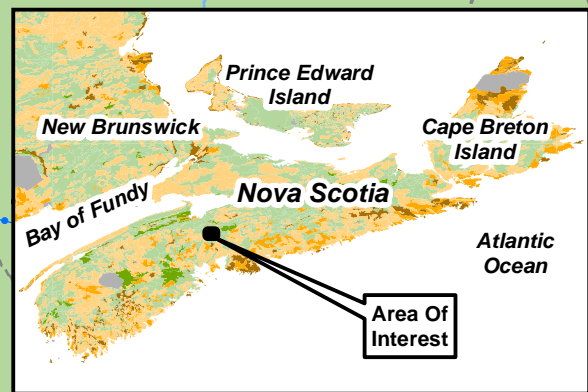
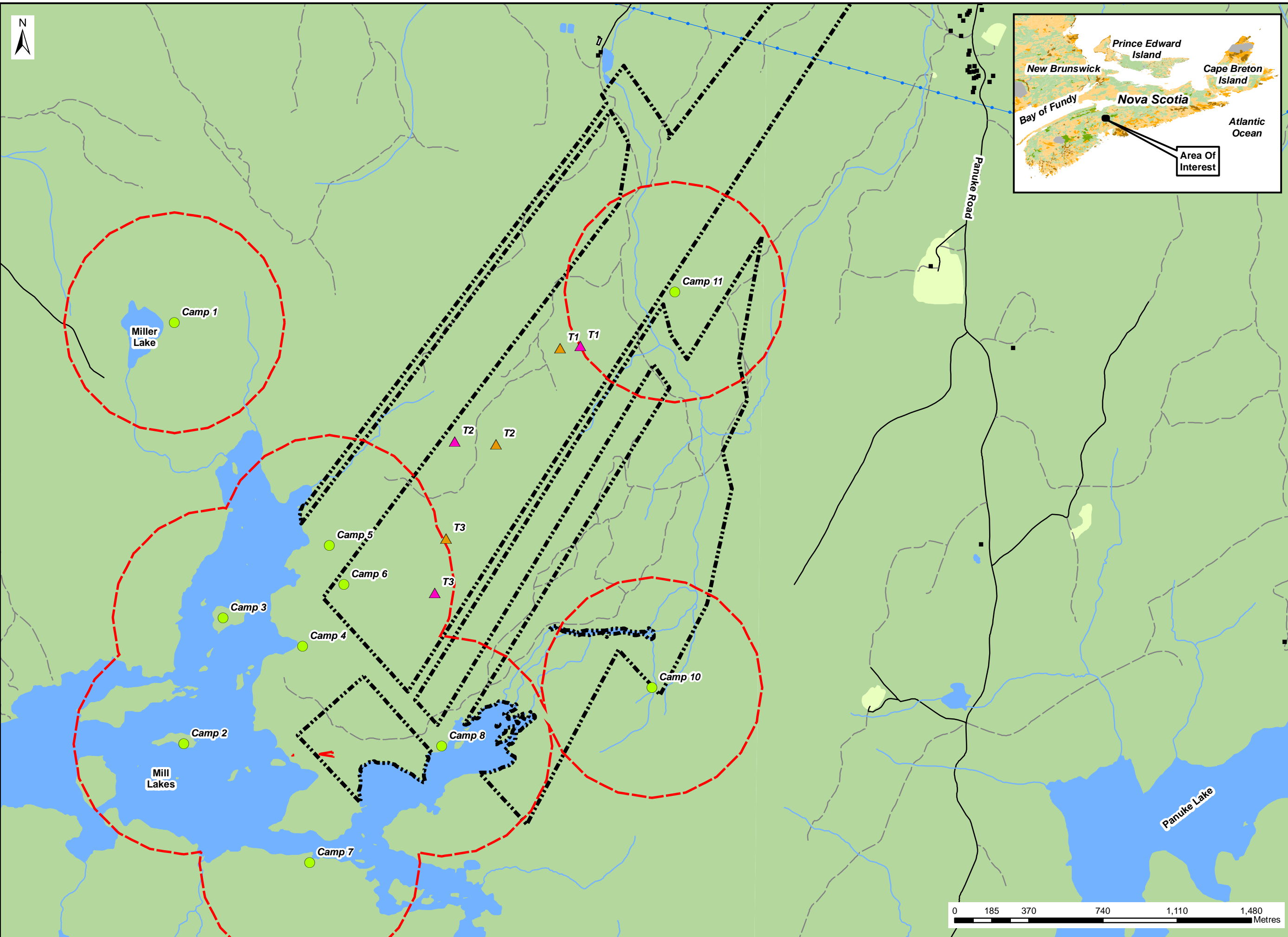
- Legend:**
- Town of Windsor Lands
 - Turbine Layout Option 1
 - EA Turbine Locations
 - Seasonal Woods Camps
 - 550 m Seasonal Camp Buffer
 - Water Body
 - Watercourse
 - Building
 - Major Roads and Highways
 - Roads
 - Access Roads / Trails
 - Existing Transmission Lines
 - Large Building
 - Cleared Area

Proposed Turbine Layout Option 1



Date:	May 2013	Project #:	12-4402	
Scale:	1:20,000	Drawing #:	A1	
Drawn By:	G. Gregory	Checked By:		M. Smith





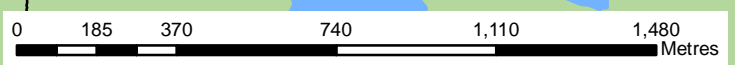
- Notes:**
1. Reference: Digital Topographic Mapping By Nova Scotia Geomatics Centre. Project Layout Provided by Client.
 2. Projection: NAD83(CSRS), UTM Zone 20 North.

- Legend:**
- Town of Windsor Lands
 - Turbine Layout Option 2
 - EA Turbine Locations
 - Seasonal Woods Camps
 - 550 m Seasonal Camp Buffer
 - Water Body
 - Watercourse
 - Building
 - Major Roads and Highways
 - Roads
 - Access Roads / Trails
 - Existing Transmission Lines
 - Large Building
 - Cleared Area

Proposed Turbine Layout Option 2



Date: May 2013	Project #: 12-4402
Scale: 1:20,000	Drawing #: A2
Drawn By: G. Gregory	Checked By: M. Smith



APPENDIX B
SOUND AND SHADOW FLICKER MODELING RESULTS

Receptor ID	Easting (m)	Northing (m)	Predicted Noise Level (dBA)
R1	412387	4977566	28
R2	412396	4977511	28.3
R3	412383	4977495	28.5
R4	414042	4976443	26.7
CAMP1	410268	4976163	29.3
CAMP2	410316	4974063	27.9
CAMP3	410511	4974690	31.6
CAMP4	410908	4974551	34.1
CAMP5	411042	4975053	38.4
CAMP6	411115	4974857	38.6
CAMP7	410944	4973470	27.3
CAMP8	411603	4974053	32.8
CAMP9	412128	4976447	38.8
CAMP10	412650	4974344	32.2
CAMP11	412765	4976317	36.7

Receptor ID	Easting (m)	Northing (m)	Predicted Noise Level (dBA)
R1	412387	4977566	28.6
R2	412396	4977511	28.9
R3	412383	4977495	29.1
R4	414042	4976443	26.7
CAMP1	410268	4976163	29.4
CAMP2	410316	4974063	27.9
CAMP3	410511	4974690	31.5
CAMP4	410908	4974551	34.1
CAMP5	411042	4975053	38.4
CAMP6	411115	4974857	38.6
CAMP7	410944	4973470	27.2
CAMP8	411603	4974053	32.7
CAMP10	412650	4974344	31.9
CAMP11	412765	4976317	37.2

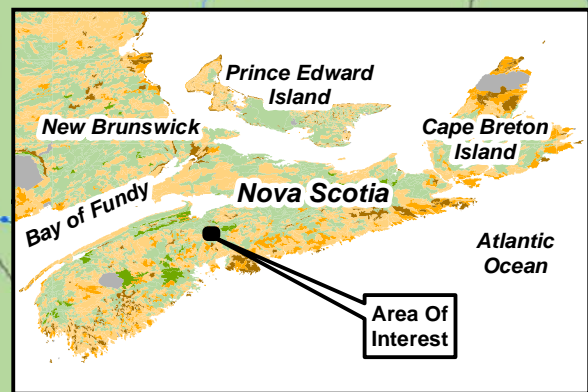
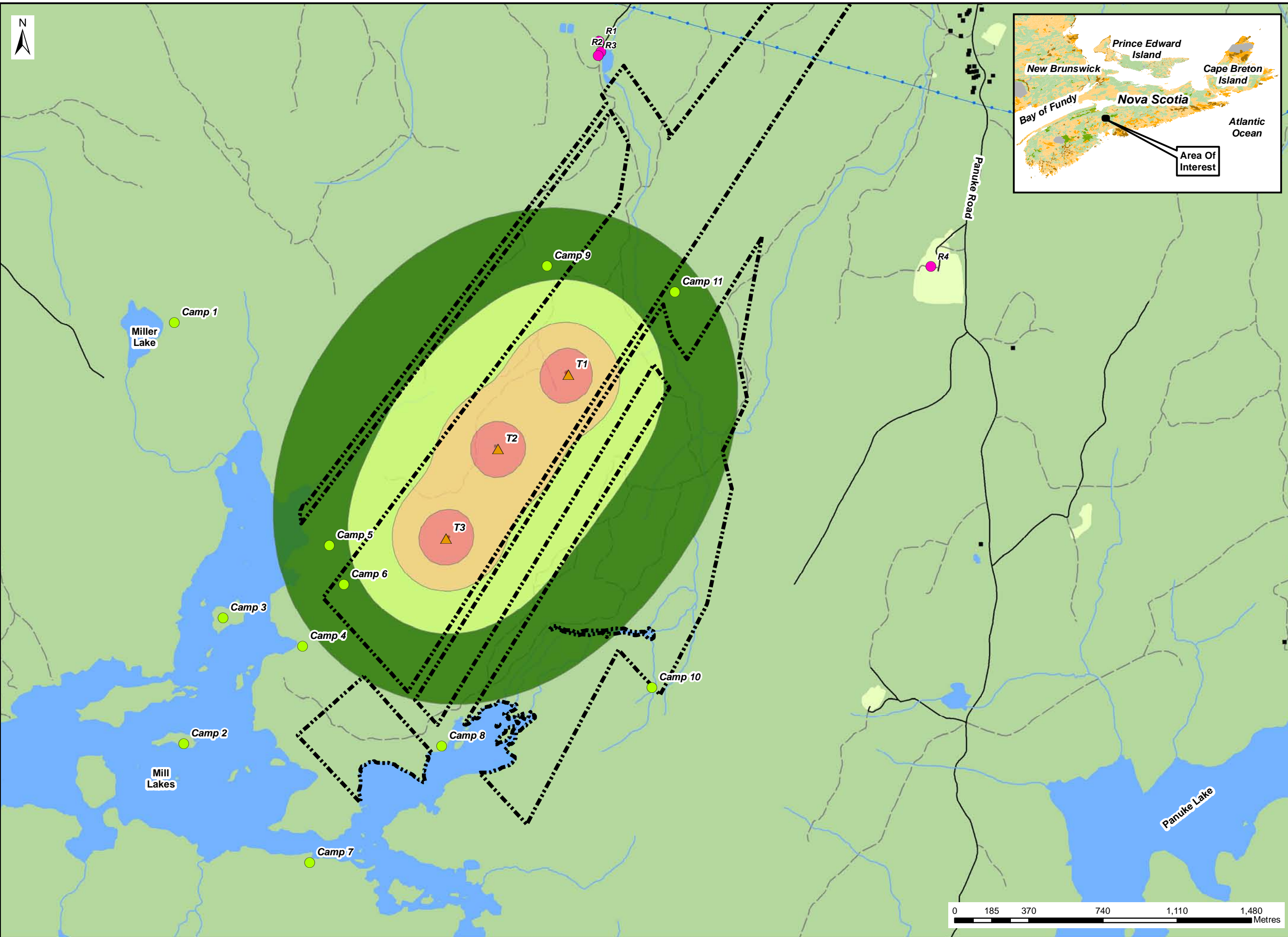
Table B3: Layout Option 1 Shadow Flicker Modeling Results, Martock Ridge Community Wind Project**Project # 12-4402**

Receptor ID	Easting (m)	Northing (m)	Shadow Hours/Year	Max Shadow Hours/Day
R1	412387	4977566	0:00	0:00
R2	412396	4977511	0:00	0:00
R3	412383	4977495	0:00	0:00
R4	414042	4976443	0:00	0:00
CAMP1	410268	4976163	0:00	0:00
CAMP2	410316	4974063	0:00	0:00
CAMP3	410511	4974690	0:00	0:00
CAMP4	410908	4974551	0:00	0:00
CAMP5	411042	4975053	0:00	0:00
CAMP6	411115	4974857	0:00	0:00
CAMP7	410944	4973470	0:00	0:00
CAMP8	411603	4974053	0:00	0:00
CAMP9	412128	4976447	0:00	0:00
CAMP10	412650	4974344	0:00	0:00
CAMP11	412765	4976317	0:00	0:00

Table B4: Layout Option 2 Shadow Flicker Modeling Results, Martock Ridge Community Wind Project**Project # 12-4402**

Receptor ID	Easting (m)	Northing (m)	Shadow Hours/Year	Max Shadow Hours/Day
R1	412387	4977566	0:00	0:00
R2	412396	4977511	0:00	0:00
R3	412383	4977495	0:00	0:00
R4	414042	4976443	0:00	0:00
CAMP1	410268	4976163	0:00	0:00
CAMP2	410316	4974063	0:00	0:00
CAMP3	410511	4974690	0:00	0:00
CAMP4	410908	4974551	0:00	0:00
CAMP5	411042	4975053	0:00	0:00
CAMP6	411115	4974857	0:00	0:00
CAMP7	410944	4973470	0:00	0:00
CAMP8	411603	4974053	0:00	0:00
CAMP10	412650	4974344	0:00	0:00
CAMP11	412765	4976317	0:00	0:00

APPENDIX C
SITE DRAWINGS - SOUND AND SHADOW FLICKER
MODELING RESULTS



Notes:

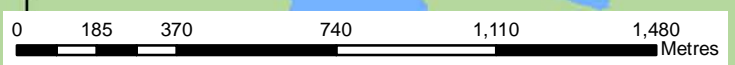
- Reference: Digital Topographic Mapping By Nova Scotia Geomatics Centre. Sound Modeling by WindPro v. 2.8.
- Projection: NAD83(CSRS), UTM Zone 20 North.

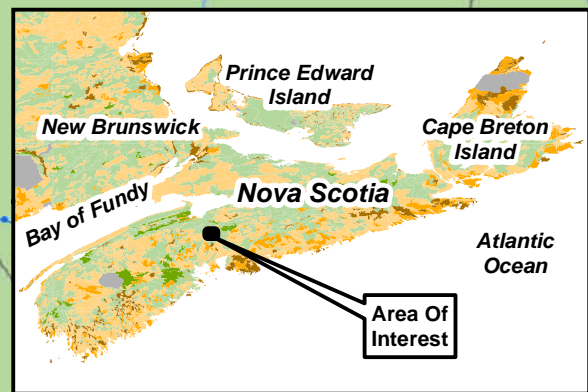
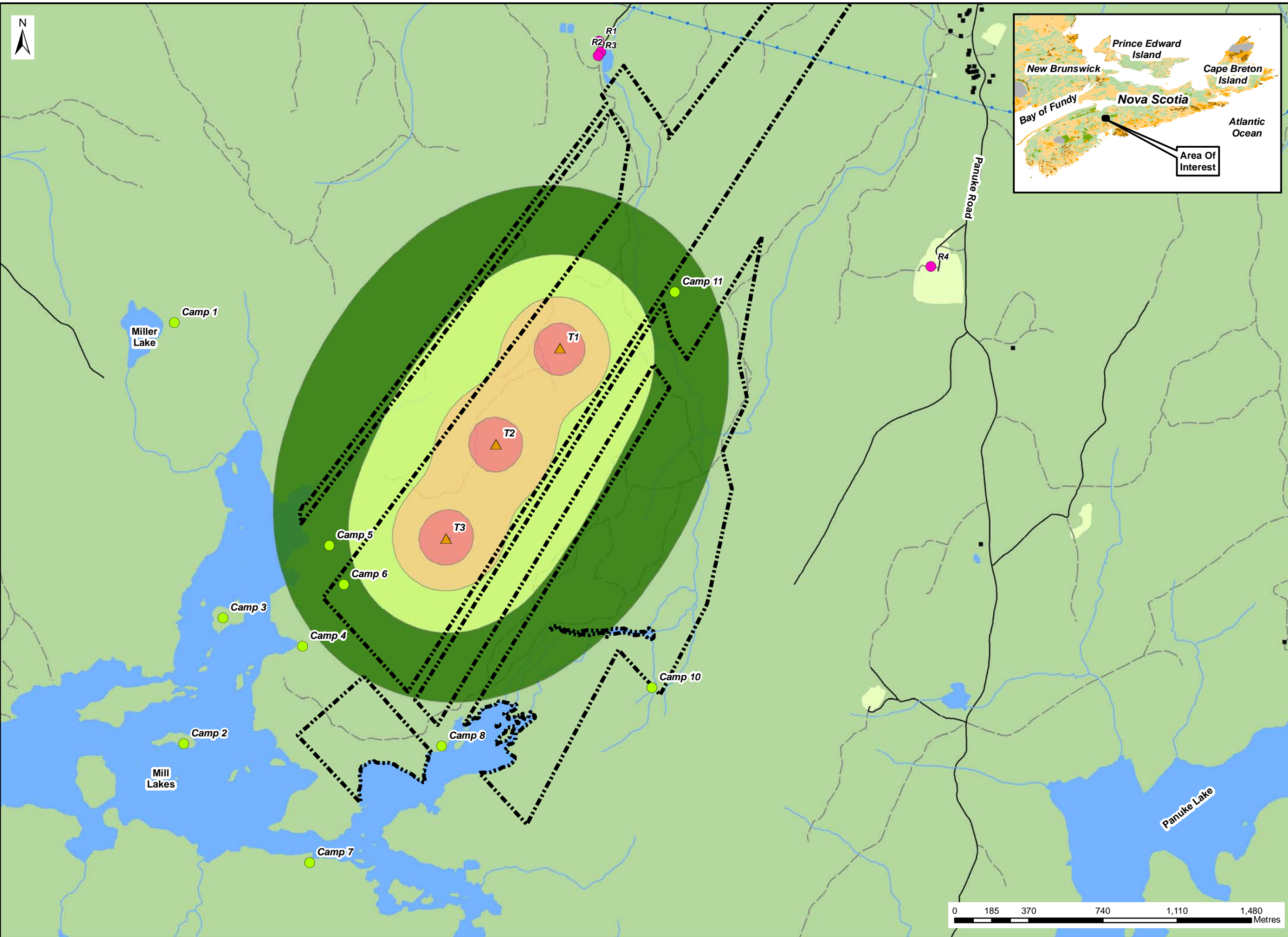
- Legend:**
- Town of Windsor Lands
 - Turbine Layout Option 1
 - Camps
 - Existing Receptors
- Predicted Noise Levels (dBA)**
- 35
 - 40
 - 45
 - 50
 - 55
- Water Body
 - Watercourse
 - Building
 - Major Roads and Highways
 - Roads
 - Access Roads / Trails
 - Existing Transmission Lines
 - Large Building
 - Mapped Stream
 - Indefinite Stream
 - Cleared Area

Sound Modeling Results Turbine Layout Option 1



Date:	May 2013	Project #:	12-4402
Scale:	1:20,000	Drawing #:	C1
Drawn By:	G. Gregory		
Checked By:	M. Smith		





Notes:

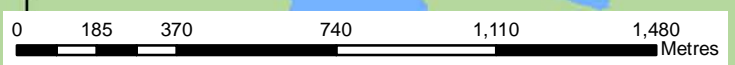
- Reference: Digital Topographic Mapping By Nova Scotia Geomatics Centre. Sound Modeling by WindPro v. 2.8.
- Projection: NAD83(CSRS), UTM Zone 20 North.

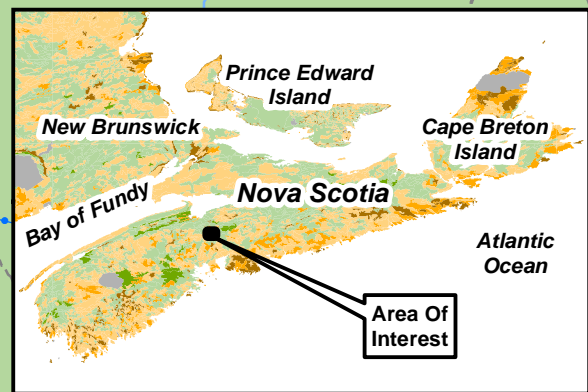
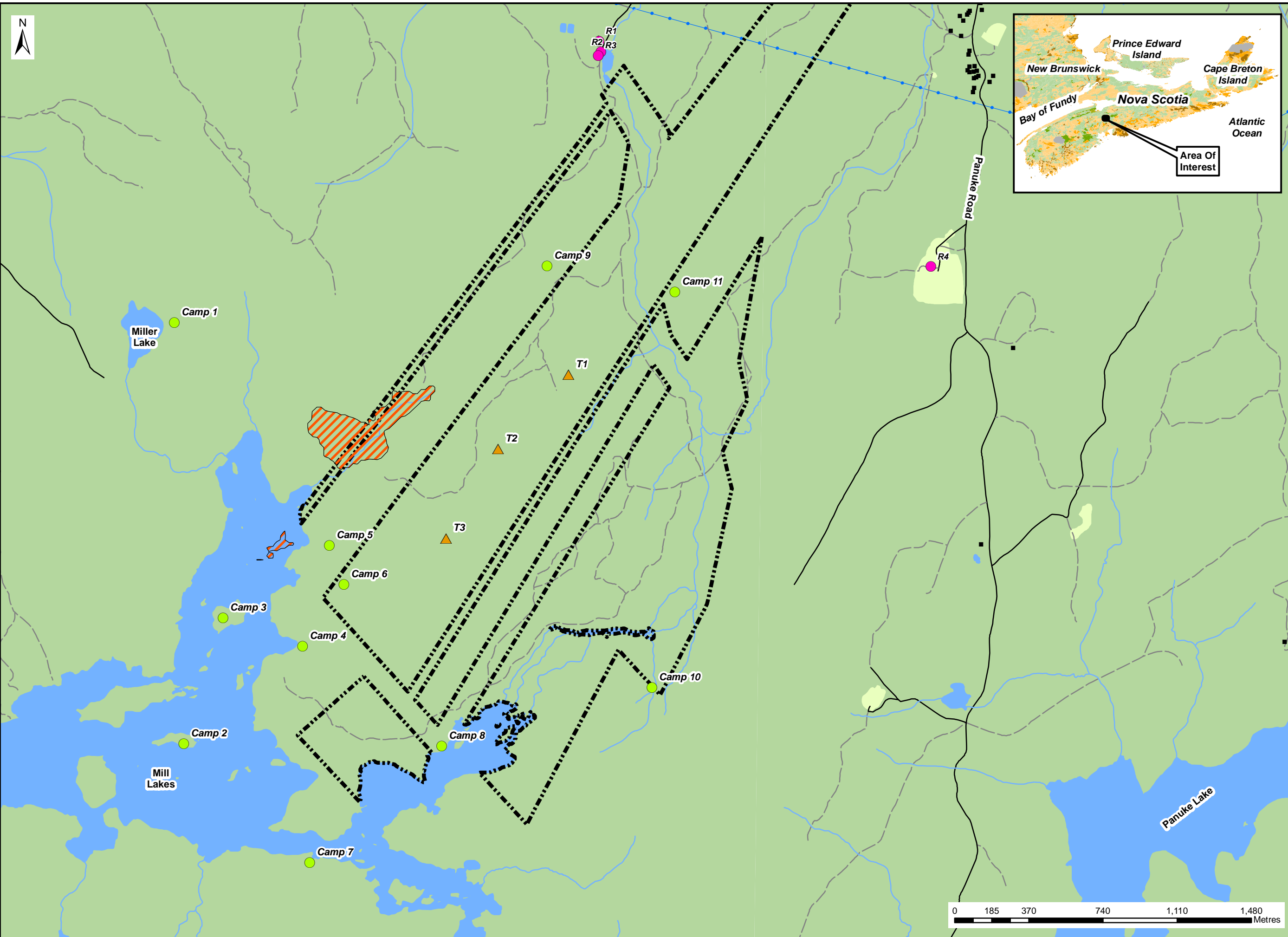
- Legend:**
- Town of Windsor Lands
 - Turbine Layout Option 2
 - Seasonal Woods Camps
 - Existing Receptors
- Predicted Noise Levels (dBA)**
- 35
 - 40
 - 45
 - 50
 - 55
- Other Symbols:**
- Water Body
 - Watercourse
 - Building
 - Major Roads and Highways
 - Roads
 - Access Roads / Trails
 - Existing Transmission Lines
 - Large Building
 - Mapped Stream
 - Indefinite Stream
 - Cleared Area

Sound Modeling Results Turbine Layout Option 2



Date:	May 2013	Project #:	12-4402
Scale:	1:20,000	Drawing #:	C2
Drawn By:	G. Gregory		
Checked By:	M. Smith		





Notes:

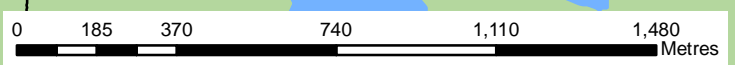
- Reference: Digital Topographic Mapping By Nova Scotia Geomatics Centre. Shadow Modeling by WindPro v. 2.8.
- Projection: NAD83(CSRS), UTM Zone 20 North.

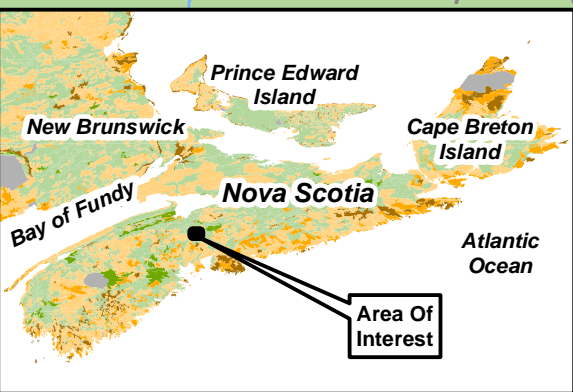
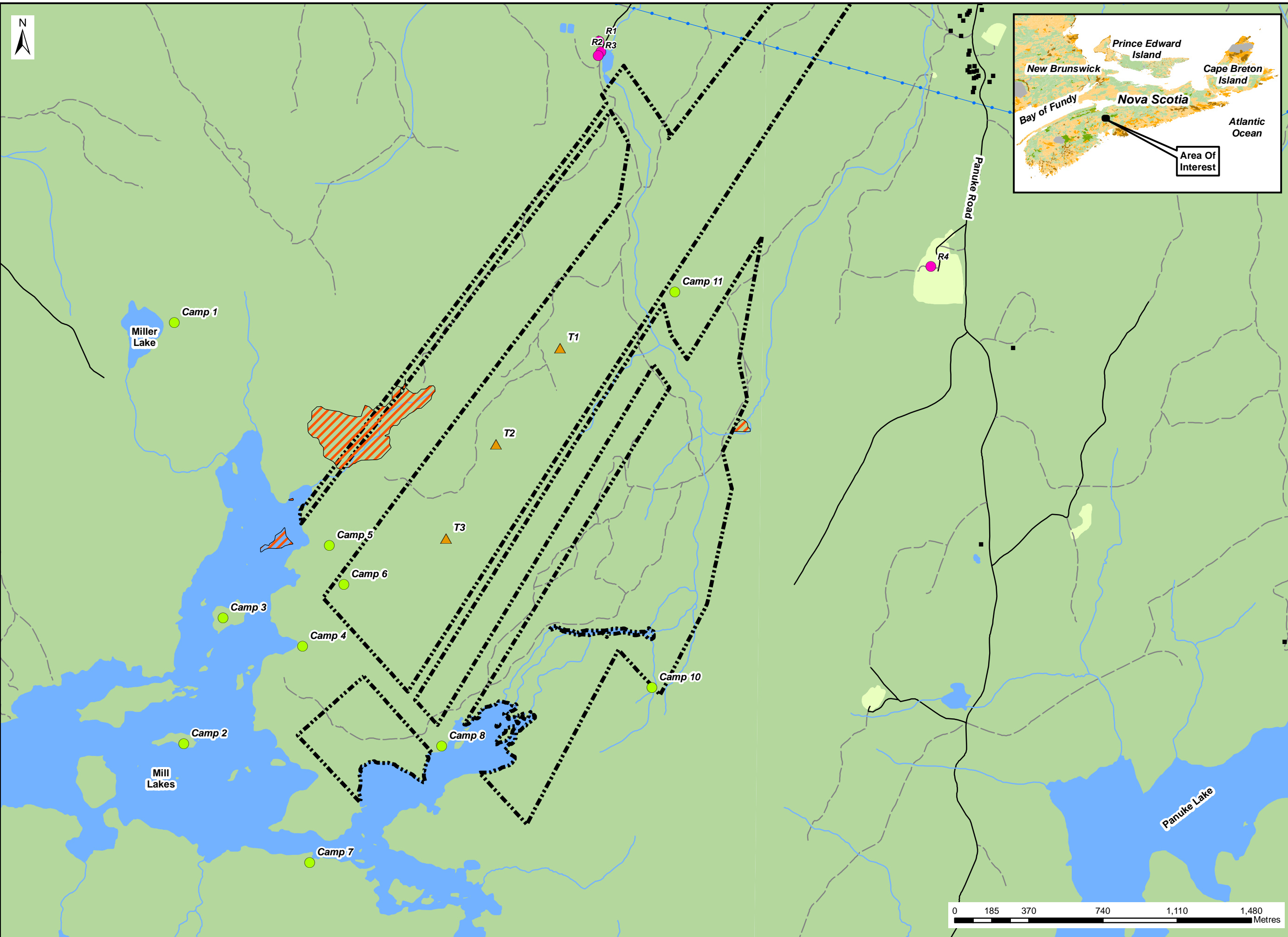
- Legend:**
- Town of Windsor Lands
 - Turbine Layout Option 1
 - Seasonal Woods Camps
 - Existing Receptors
 - 30+ Shadow Flicker Hours Per Year
 - Water Body
 - Watercourse
 - Building
 - Major Roads and Highways
 - Roads
 - Access Roads / Trails
 - Existing Transmission Lines
 - Large Building
 - Cleared Area

**Shadow Flicker
Modeling Results
Turbine Layout
Option 1**



Date: May 2013	Project #: 12-4402
Scale: 1:20,000	Drawing #: C3
Drawn By: G. Gregory	C3
Checked By: M. Smith	





Notes:

1. Reference: Digital Topographic Mapping By Nova Scotia Geomatics Centre. Shadow Modeling by WindPro v. 2.8.
2. Projection: NAD83(CSRS), UTM Zone 20 North.

- Legend:**
- Town of Windsor Lands
 - Turbine Layout Option 2
 - Seasonal Woods Camps
 - Existing Receptors
 - 30+ Shadow Flicker Hours Per Year
 - Water Body
 - Watercourse
 - Building
 - Major Roads and Highways
 - Roads
 - Access Roads / Trails
 - Existing Transmission Lines
 - Large Building
 - Cleared Area

**Shadow Flicker
Modeling Results
Turbine Layout
Option 2**



Date: May 2013	Project #: 12-4402
Scale: 1:20,000	Drawing #: C4
Drawn By: G. Gregory	
Checked By: M. Smith	

