



**NORTHLAND
POWER**

Rideau Lakes Solar Project Water Body Site Investigation Report

August 15, 2011



Northland Power Inc.
on behalf of
Northland Power Solar
Rideau Lakes L.P.
Toronto, Ontario

Water Body
Site Investigation Report

Rideau Lakes Solar Project

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Project Report

August 15, 2011

**Northland Power Inc.
Rideau Lakes Solar Project**

Water Body Site Investigation Report

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1. Introduction

1.1 Project Description

Northland Power Solar Rideau Lakes L.P. (hereinafter referred to as “Northland”) is proposing to develop a 10-megawatts (MW) solar photovoltaic project titled Rideau Lakes Solar Project (hereinafter referred to as the “Project”). The Project site will be located on approximately 50 hectares (ha) of land, located in the Township of Rideau Lakes, within the United Counties of Leeds and Grenville.

1.2 Legislative Requirements

Ontario Regulation (O. Reg.) 359/09 – *Renewable Energy Approvals Under Part V.0.1 of the Act*, (herein referred to as the REA Regulation) made under the *Environmental Protection Act* identifies the Renewable Energy Approval (REA) requirements for renewable energy projects in Ontario. Per Section 4 of the REA Regulation, ground mounted solar facilities with a name plate capacity greater than 10 kilowatts (kW) are classified as Class 3 solar facilities and require a REA.

Section 31 of the REA Regulation requires proponents of Class 3 solar projects to undertake a water site investigation for the purpose of determining

- a) whether the results of the analysis summarized in the (water records review) report prepared under subsection 30 (2) are correct or require correction, and identifying any required corrections
- b) whether any additional water bodies exist, other than those that were identified in the (water records review) report prepared under subsection 30 (2)
- c) the boundaries, located within 120 m of the project location, of any water body that was identified in the records review or the site investigation; and
- d) the distance from the project location to the boundaries determined under clause (c).

The REA Regulation has specific requirements if designated lake trout lakes are present within 300 m of the project area. These requirements were not deemed applicable to the Project as no such lakes were found during the Water Body Records Review (Hatch Ltd., 2010).

Waterbodies are defined in Section 1(1) of the REA Regulation to include a lake, a permanent stream, an intermittent stream or a seepage area, but does not include

- a) grassed waterways
- b) temporary channels for surface drainage, such as furrows, or shallow channels that can be tilled or driven through
- c) rock chutes and spillways
- d) roadside ditches that do not contain a permanent or intermittent stream
- e) temporarily ponded areas that are normally farmed
- f) dugout ponds, or

- g) artificial bodies of water intended for the storage, treatment or recirculation of runoff from farm animal yards, manure storage facilities and sites and outdoor confinement areas.

Further, intermittent streams are defined as “a natural or artificial channel, other than a dam, that carries water intermittently and does not have established vegetation within the bed of the channel, except vegetation dominated by plant communities that require or prefer the continuous presence of water or continuously saturated soils for their survival” (O.Reg. 359/09).

Seepage areas are defined as “a site of emergence of groundwater where the water table is present at the ground surface, including a spring” (O.Reg. 359/09).

Subsection 3 of Section 31 of the REA Regulation requires the proponent to prepare a report setting out the following:

1. A summary of any corrections to the Water Body Records Review report prepared under subsection 30 (2) and the determinations made as a result of conducting the site investigations under subsection (1)
2. Information relating to each water body identified in the records review and in the site investigations, including the type of water body, plant and animal composition and the ecosystem of the land and water investigated
3. A map showing
 - i. the boundaries mentioned in clause (1) (c)
 - ii. the location and type of each water body identified in relation to the project location, and
 - iii. the distance mentioned in clause (1) (d)
4. The dates and times of the beginning and completion of the site investigation
5. The duration of the site investigation
6. The weather conditions during the site investigation
7. A summary of methods used to make observations for the purposes of the site investigation
8. The name and qualifications of any person conducting the site investigation
9. Field notes kept by the person conducting the site investigation.

This Water Body Site Investigation Report has been prepared to meet these requirements.

2. Summary of Water Body Records Review Results

Table 2.1 summarizes the results of the Water Body Records Review (Hatch Ltd., 2010).

Table 2.1 Summary of Water Body Records Review Determinations

Determination to be Made	Yes/No	Description
Is the Project in a water body?	No	The Project will not be in a water body.
Is the Project within 120 m of the average annual high water mark of a lake, other than a lake trout lake that is at or above development capacity?	No	There are no lakes within 120 m of the Project area.
Is the Project within 300 m of the average annual high water mark of a lake trout lake that is at or above development capacity?	No	No lake trout lakes are present in the Project area.
Is the Project within 120 m of the average annual high water mark of a permanent or intermittent stream?	Yes	There is one watercourse located within 120 m of the Project site.
Is the Project within 120 m of a seepage area?	No	No seepage areas are present within the Project area.

Therefore, depending on the layout of the proposed solar facility, some components of the Project could potentially be located within 120 m of the average annual high water mark of on watercourse (an unnamed tributary of Sucker Creek).

3. Site Investigation Methodology

3.1 Date, Time, and Duration of Site Investigation

- Date: May 17, 2010
- Start Time: 1315 hours
- Duration: approximately 1.5 hours

3.2 Weather Conditions During Site Investigation

- Temperature: 19°C
- Beaufort Wind: 1
- Cloud Cover: 0%

3.3 Name and Qualifications of Person Conducting Site Investigation

The site investigation was completed by Sean K. Male.

Sean K. Male, M.Sc. is a Terrestrial Ecologist specializing in assessments of terrestrial habitat, flora and fauna. Sean received his Bachelors of Science (Honours) in Biology from Queen's University, where he completed his Honour's thesis under Dr. Raleigh J. Robertson, studying the impacts of nestbox density in Tree Swallows (*Tachycineta bicolor*) on nest-building behaviour. He then completed a Master's of Science degree in the Watershed Ecosystem Graduate Program at Trent University under Dr. Erica Nol. Sean's thesis focused on examining the impacts of a Canadian

diamond mine on a population of breeding passerines. For his thesis, Sean spent two summers in the Canadian arctic studying populations of Lapland Longspurs (*Calcarius lapponicus*) around the Ekati Diamond Mine, located 300 km northeast of Yellowknife. While at Trent, Sean participated in the Northern Saw-whet Owl (*Aegolius acadicus*) Migration Banding Project at the Oliver Centre. Following his time at Trent, Sean participated in the Landscape Monitoring Program and was involved in a study of the impacts of woodlot size on breeding birds.

Sean joined Hatch as a Terrestrial Ecologist in 2006. Since joining Hatch, Sean has participated in several environmental assessments for hydro and wind power developments. He has developed and implemented baseline monitoring and impact assessment programs for both terrestrial wildlife and plant communities, including detailed bird and bat studies for several wind power developments, including the proposed 100-MW Coldwell Wind Power Development near Marathon, Ontario, a proposed 20-MW facility near Port Dover, ON, and a proposed 110-MW wind facility in southwestern Ontario. Sean has also conducted terrestrial and wetland vegetation surveys for several proposed hydropower projects totalling over 40 MW in southern and northern Ontario and has participated in fisheries surveys for several of these projects.

3.4 Survey Methods

The entire site was searched by the observer on foot in order to document waterbodies. Photographs of the site were taken. Any observations of waterbodies, including the type of water body, instream habitat types, surrounding riparian areas, average annual high water mark and wildlife use were noted. Geographic coordinates at representative areas of the average annual high water mark for waterbodies on and within 120 m of the Project site were recorded using a sub-meter accuracy GPS for mapping purposes.

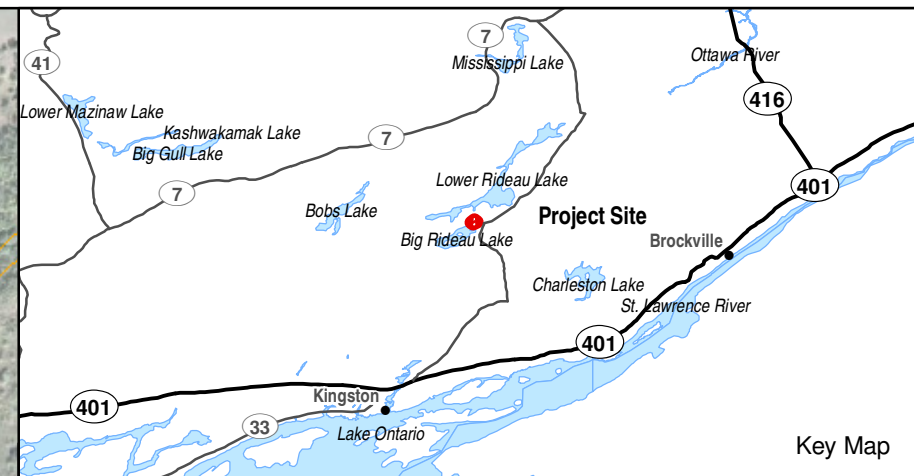
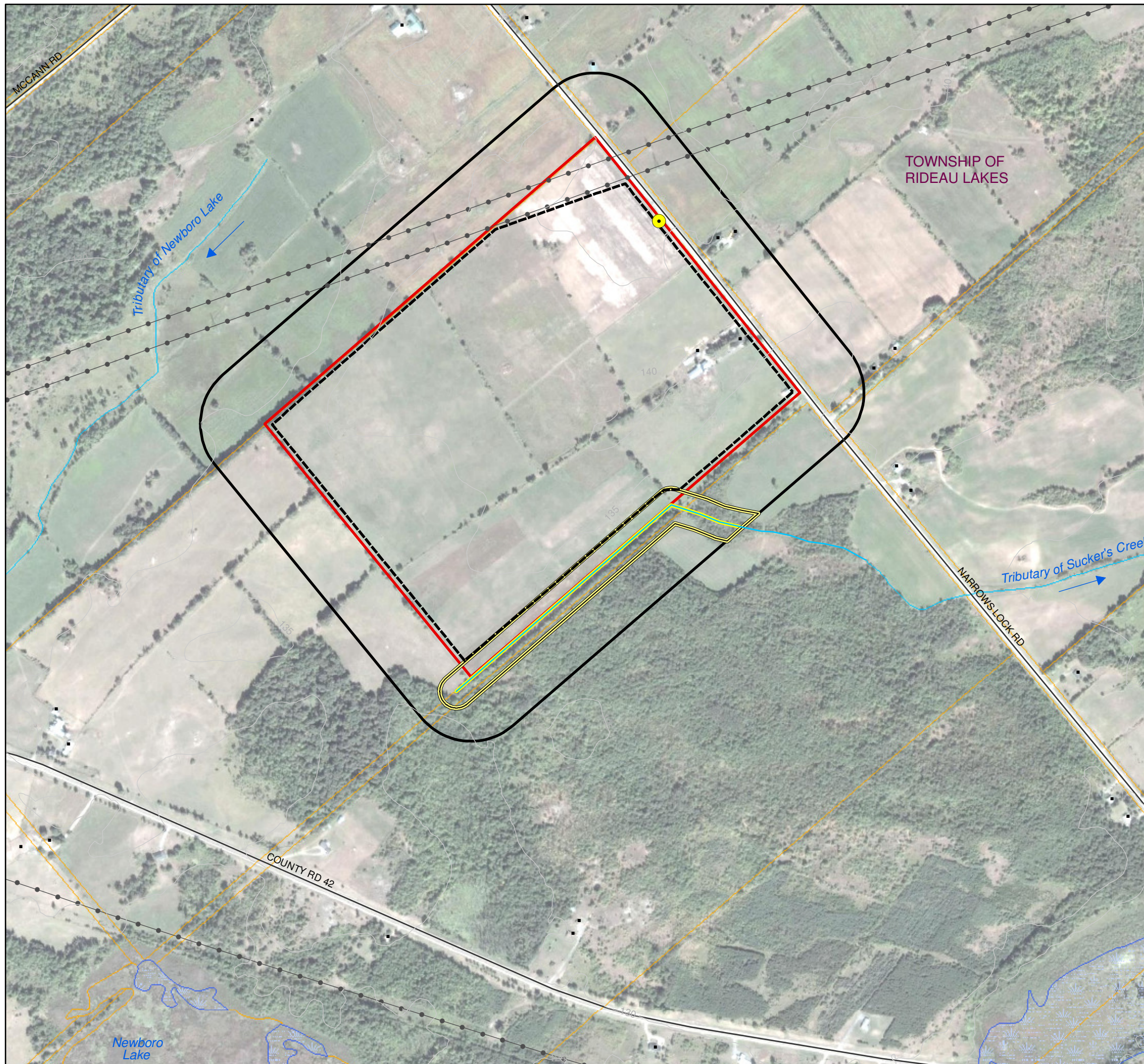
A copy of the field notes kept by the observer is provided in Appendix A.

4. Results of Site Investigation

This section documents the results of the site investigation and discusses specific water features observed on and adjacent to the subject property. Features noted in the following sections, including the proposed Project footprint boundary and the average annual high water mark of watercourses on and within 120 m of the Project site, are shown in Figure 4.1. There were no lakes, other waterbodies or seepage areas identified during the site investigation.

4.1 Permanent or Intermittent Streams

The Water Body Records Review (Hatch Ltd., 2010) identified one permanent or intermittent stream (an unnamed tributary of Sucker Creek), located within 120 m of the Project area. This is described in the following section.



Legend

- Roads
- Transmission Line
- Topographic Contour (5m interval)
- Watercourse
- Average Annual High Water Mark
- 30m Setback From High Water Mark
- Project Site
- Study Area
- Parcels

Project Components

- Connection Point with Existing Distribution Line
- Project Footprint Boundary



Notes:
 1. OBM and NRVIS data downloaded from LIO, with permission.
 2. Spatial referencing UTM NAD 83.
 3. Satellite imagery from Google Earth Pro.

Figure 4.1
 Northland Power Inc.
Rideau Lakes Solar Energy Project
Water Body and
Project Boundaries



Back of figure

4.1.1 Unnamed Tributary of Sucker Creek

The mapping obtained during the Water Body Records Review (Hatch Ltd., 2010) indicated that the unnamed tributary of Sucker Creek arose in the wooded area south of the Project area. However, during the site investigation, the tributary was found running along nearly the entire south eastern boundary of the Project site and the woodlot to the south, before turning south to run into the reach of the tributary identified on the Records Review mapping.

Where the watercourse runs adjacent to the Project site, it consists of an approximately 1 to 1.5 m wide, linear, excavated channel, flowing through a wooded area. Banks are relatively low and dominated by ground cover grasses and forbs, shrubs and young trees. The vegetation on the banks is not indicative of a community that experiences periodic inundation due to overbank flooding. The channel bed consists primarily of muck and mineral soils with organic debris (leaves and branches). Water depth during the site investigation was typically <0.20 m. The watercourse is a slow-moving run, with little variation in flow velocity or channel features. It was flowing during the site investigation, but may be intermittent. No fish were observed during the site investigation.

The channel likely provides habitat for benthic invertebrates and may provide seasonal habitat for fish from permanent downstream reaches. The watercourse would also serve to regulate downstream water quality in more permanent fisheries habitats such as Sucker Creek.

As shown in Figure 4.1, the proposed Project may be constructed between 30 m and 120 m away from the average annual high water mark of the tributary of Sucker Creek adjacent to the Project site. Therefore, an Environmental Impact Study (EIS) is required to assess the potential for adverse effects of the Project and mitigation measures necessary to prevent or minimize these effects.

5. Conclusions

Based on the results of the site investigation discussed above, the Water Body Records Review would be changed to indicate that the tributary of Sucker Creek runs through the woodlot south of the Project site in an area where it was not noted on mapping (Hatch Ltd., 2010).

In addition, the Project Footprint and study area have been refined in this report compared to that shown in the Records Review, which only depicted the leased portion of the property.

Based on the results of the site investigation and the proposed Project components and boundaries shown in Figure 4.1, an EIS will be required.

6. References

Hatch Ltd. 2010. Rideau Lakes Solar Project – Water Body Records Review Report. Prepared for Northland Power Solar Rideau Lake L.P.

Appendix A
Site Investigation
Field Notes

No Northland - Rideau Lakes
Date 1 May 1970 Page ①

No
Date Page ②

C.C. 0

B 1

Temp ~19°C

Start 13:15 - 14:45

ROBO RTHA

RIM YAVA

ENST DMR

SVSP WMA - singing

SOSP GACH

OSPR TUVU

→ fields are ~~partly~~ (grass/decid)

Hedgehog
Black Cherry (dec.)
Basswood (dec.)
Maple - common
Cedar Apple

GACH

Wooded - 15 Deciduous

Open

Apple Maple Juniper

Willow along road

→ ~~some~~ Mobile ~~and~~ Honey ~~See~~
bees