

RE ORILLIA 3 SOLAR PROJECT

Water Body Site Investigations Report

August 3, 2011

RECURRENT
ENERGY





RE Orillia 3 ULC

Water Body
Site Investigations Report

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Project Report

August 3, 2011

**RE Orillia 3 ULC
RE Orillia 3 Solar Project**

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1. Introduction

1.1 Project Description

RE Orillia 3 ULC is proposing to develop and operate a 6.5-megawatt (MW) solar photovoltaic (Solar PV) facility, on approximately 15-hectare (ha) parcel of land, located about 7 km west-southwest of Orillia in the Township of Oro-Medonte in County of Simcoe; herein referred to as “RE Orillia 3” or the “Project”.

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. As 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 therefore, require an 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 Body Records Review) report prepared under Subsection 30 (2) are correct or require correction, and identifying any required corrections
- b) whether any additional waterbodies exist, other than those that were identified in the (Water Body 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
- 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 location. These requirements were not deemed applicable to the Project as no such lakes were found during the Water Body Records Review (Hatch Ltd., 2010a).

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

- 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.

Subsection 31(3) 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 (Water Body) 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 Investigations Report has been prepared to meet these requirements. It has also been prepared in accordance with the Ministry of Environment’s DRAFT Technical Bulletin – Guidance for Preparing the Water Assessment and Water Body Reports (dated January 28, 2011).

2. Summary of Results of Records Review

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

Table 2.1 Summary of Records Review Determinations

Determination to be Made	Yes/No	Description
Is the Project in a water body?	No	No part of the Project will be constructed within 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	Bass Lake is located approximately 700 m north of the Project location.

Determination to be Made	Yes/No	Description
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 on or within 300 m of the Project location.
Is the Project within 120 m of the average annual high water mark of a permanent or intermittent stream?	No	No water courses were identified during the Records Review on or within 120 m of the Project location.
Is the Project within 120 m of a seepage area?	No	No seepage areas were identified during the Records Review on or within 120 m of the Project location.

Based on the results of the Water Body Records Review, there are no waterbodies within 120 m of the Project location. This was to be confirmed during the site investigations.

3. Site Investigation Methodology

3.1 Date, Time, and Duration of Site Investigation

- Date: May 26, 2010
- Start Time: 09:30 a.m.
- Duration: 3 hours

3.2 Weather Conditions During Site Investigation

- Temperature: 22°C
- Beaufort Wind: 3 (24 km/h)
- Cloud Cover: 0%

3.3 Name and Qualifications of Person Conducting Site Investigation

The site investigation was completed by Martine Esraelian.

Martine Esraelian, B.Sc. is an Environmental Scientist specializing in species at risk and terrestrial ecosystems. She has a B.Sc. from Trent University where she specialized in Conservation Biology and Ecological Management and an Ecosystem Management Technician diploma from Sir Sandford Fleming College. During her time at Trent University, she completed a 1-yr internship with the MNR which involved developing a genetic-based protocol for the extraction of DNA from unknown turtle eggshells to assist with species identification. The project entailed extensive molecular genetics research and intensive lab work to develop a protocol able to supplement existing conservation management practices.

She offers expertise across the full breadth of the field from environmental assessments and technical analysis of environmental data to conservation management, corporate and government consulting, and community outreach. Martine has liaised with all levels of government, the community, and a portfolio of clients that includes consulting firms, planners, and high-profile developers. She has both technical and hands-on experience conducting site investigations (terrestrial and aquatic), evaluations of significance, environmental and agricultural impact studies, constraint analyses, water

quality and soil assessments, species at risk, wildlife management and fisheries studies to meet regulatory requirements.

Martine has a wide range of field experience related to terrestrial and aquatic ecosystems and species at risk. She has conducted reptile and amphibian surveys, small-mammal trapping, benthic invertebrate monitoring and fisheries inventories (seine netting and electrofishing). She has conducted detailed natural areas inventories which involve species identification of flora and fauna, vegetation community mapping, identifying rare vegetation communities and significant wildlife habitats.

Martine has project management and fieldwork experience for a number of species at risk monitoring projects. Some of the species she has been involved with include: fowler's toad, massasauga rattlesnake, gray ratsnake, Jefferson salamander, northern dusky and mountain alleghany dusky salamander, blanding's turtle, map turtle, spotted turtle, snapping turtle, queen snake, milksnake, ribbonsnake, flowering dogwood, swamp rose mallow and spoon-leaved moss.

Martine is a certified Butternut Health Assessor (BHA) and also holds a certificate in the Ecological Land Classification (ELC) system.

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 location 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

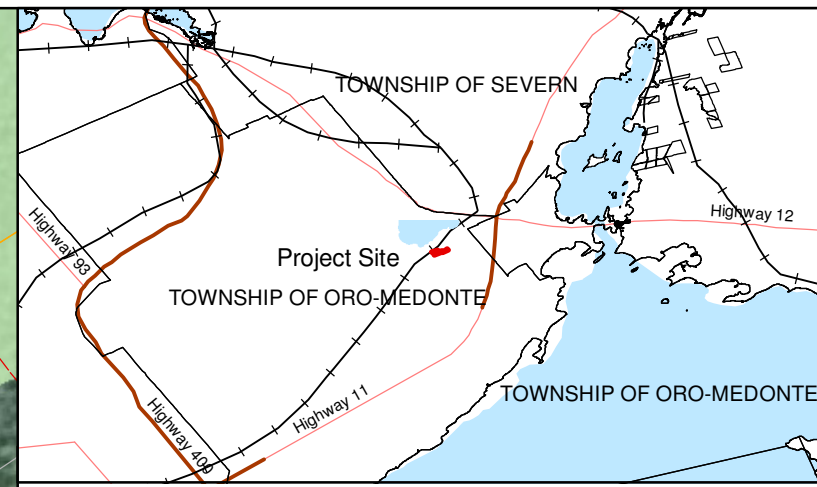
This section documents the results of the site investigation and discusses specific water features observed on and adjacent to the Project location. Features noted in the following sections, including the Project footprint boundary, are shown in Figure 4.1.

4.1 Permanent or Intermittent Streams

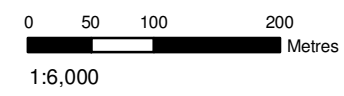
No permanent or intermittent streams were observed on or within 120 m of the Project location. As noted in the Water Body Records Review Report (Hatch Ltd., 2010a), the closest watercourse to the Project location is a stream associated with Langman Marsh Provincially Significant Wetland (PSW), approximately 210 m northeast of the Project boundary (as shown in Figure 4.1).

4.2 Seepage Areas

There were no seepage areas identified within the Project footprint boundary. However, some evidence of seepage, or a high groundwater table was observed in the northeast corner and along the eastern end of the Project location.



- Legend**
- Roads
 - - - Snowmobile Trail
 - Topographic Contour (5m interval)
 - Watercourse
 - Seepage Area
 - ▭ Parcels
 - ▭ Pit/Quarry
 - ▭ 30m Setback From Seepage Area
 - ▭ Significant Wetland
- Project Components**
- Connection Point With Existing Distribution Line
 - New Distribution Line From Project
 - ▭ Project Location
 - ▨ Temporary Construction Laydown Area
 - ▭ 120 m from Project Location



Notes:
 1. Base data downloaded from www.geographynetwork.ca, other environmental data from LIO.
 2. Spatial Referencing UTM NAD83
 3. Satellite imagery obtained from Google Earth Pro..

Figure 4.1
 Recurrent Energy
RE Orillia 3
 Water Body and
 Project Boundaries **HATCH™**

Back of Figure

As noted in the Water Body Records Review Report (Hatch Ltd., 2010a) and shown in Figure 4.1, the existing Langman Marsh PSW boundary is located approximately 250 m away from the Project boundary and an unclassified wetland adjoining to the Langman Marsh PSW is located within 120 m of the Project boundary.

The site investigation focussed on reassessing the boundary of the wetland in the woodlot north and east of the Project location. The wetland boundary was determined to be the location where wetland vegetation comprised 50% of the overall vegetation community, as per the Ontario Wetland Evaluation System requirements. More information on the determination of the wetland boundary is provided in the Natural Heritage Site Investigations Report (Hatch Ltd., 2010b).

The woodlot north and east of the Project location commences at the same topographic contour as the agricultural fields of the Project area. A short distance into the woodlot (< 10 m) the ground surface descends over a relatively short distance to a flatter lowlands area. The ground surface in this lowland part of the woodlot was moist with some wet areas during the May site investigation. Wetland vegetation became more predominant in this section of the woodland and the area appears to be a generally wet extension of the adjacent Langman Marsh PSW. As discussed in the Natural Heritage Site Investigations Report for this Project (Hatch Ltd., 2010b), the wetland boundary was revised on the basis of the presence of this wetland vegetation, as shown in Figure 4.1. A photograph of typical wet ground conditions within this woodlot is shown in Figure 4.2.



Figure 4.2 Photograph of Typical Wetland Ground Conditions with the Woodlot Adjacent to the Project Location

Given the general wetness of this area at the base of the slope from the tableland agricultural fields and the fact that it contains wetland vegetation and is situated in relatively close proximity to a known wetland, it is possible that this area is fed by groundwater seepage from below the adjacent tablelands, comprised of the Oro-Moraine and a generally high groundwater table in the lowland area. As noted in the Records Review (Hatch Ltd., 2010a), Langman Marsh and Bass Lake receive much of their hydrological input as groundwater discharge from the Oro-Moraine.

Therefore, the seepage area boundary, as shown in Figure 4.1, was assessed as being the base of the slope adjacent to the agricultural fields. This corresponds with the revised wetland boundary shown in Figure 4.1. The REA Regulation requires that a 30-m setback remain between the Project footprint and identified seepage areas. Therefore, this setback will encroach onto the Project location, forcing the solar panels to be set back farther from the woodlot edge than they would be if there was no groundwater seepage.

5. Conclusions

Based on the results of the site investigation discussed above, there is one correction to the results of the Water Body Records Review (Hatch Ltd., 2010a) required. This involves addition of a seepage area within the woodlot adjacent to the northeastern end of the Project location. In addition, the Project Footprint and associated study area has been refined in this Site Investigation Report compared to that shown in the Records Review Report, which shows the property leased for the proposed development but does not show the proposed footprint.

Based on the results of the site investigation and the proposed Project components and boundaries shown in Figure 4.1, some components of the Project will be located between 30 and 120 m of this seepage area. Therefore, an Environmental Impact Study (EIS) will be required to assess the potential effects of the Project and the required mitigation measures.

6. References

Hatch Ltd. 2010a. RE Orillia 3 Solar Project – Water Body Records Review Report. Prepared for RE Orillia 3 ULC.

Hatch Ltd. 2010b. RE Orillia 3 Solar Project – Natural Heritage Site Investigations Report. Prepared for RE Orillia 3 ULC.

Appendix A
Site Investigation
Field Notes

Project: Orillia 1, 2 + 3
Date: May 26, 2010
Location: 1599 Line 13 N, Hawkestone
Time: 0930-1230 (3hrs)
Temp: 22°C
%RH: 80%
Wind: SE 24km/h Beaufort 3

Orillia 1

SE Treeline

- AW (large)
 - Or (large)
 - MS (immature)
 - black cherry
- black bear scat?

Orchard (western boundary)

- old apple trees
- AW (D)
- Hawthorn
- Black cherry?
- Starbuck Gum (D)
- Sugar Maple
- maple, etc. (2)

Apple
maple (D)

North west boundary, Tree line

- Basswood (A)
 - Sugar maple (D)
 - white ash (D)
 - Hawthorn (A)
 - Elm (C)
 - Ironwood (R)
 - white Birch (R)
- maple
ashes (D)

Flora
Groundhog

Orellia Fish & Game
 Conservation Club (north of
 project site - trail through wetland)
 (705)-826-4263

White Birch Area / Woodlot
 mixed Woodland
 White Birch Hawthorn
 Large tooth Aspen (D) Sugar maple
 white cedar

Langman Marsh PSW

NE side of road (land of mine) L
 CW (White Cedar) aspen
 PW (White Pine)

Cherry Birch

NW side M (D) American Beech

Tall Buttercup AW Hawthorn

Field Strawberry Elm (O) (P) on
 wild geranium
 wild ginger

Bal (A)

PW (A) (P) (B)

near: red cedar mix saw my yellow birch (B)

Saw my oak - cedar saw my

dogwood saw red pine

Beech (A) Jack in pine

Bush (A) Pin

Cherry Birch (A)

