

***Adelaide Wind Energy Centre***  
**Water Body Environmental Impact Study**

**Prepared for:**  
NextEra Energy Canada  
5500 North Service Road, Suite 205  
Burlington, ON, L7L 6W6

Project No. 1230

Date: August 2012



**Adelaide Wind Energy Centre  
Water Body Environmental Impact Study**

**Project Team:**

<b>Staff</b>	<b>Role</b>
Andrew Ryckman	Project Manager/Biologist
Valerie Stevenson	Aquatic Biologist
Ashley Favaro	Aquatic Biologist
Mike Ewaschuk	Aquatic Biologist
Gerry Schaus	GIS Technician

Report submitted on August 17, 2012



---

Andrew G. Ryckman

## TABLE OF CONTENTS

<b>1.0</b>	<b>Project Description</b> .....	<b>1</b>
<b>2.0</b>	<b>REA Regulations</b> .....	<b>6</b>
<b>3.0</b>	<b>Summary of Records Review</b> .....	<b>7</b>
<b>4.0</b>	<b>Summary of Site Investigation</b> .....	<b>8</b>
<b>5.0</b>	<b>Description of Proposed Undertaking</b> .....	<b>10</b>
5.1	Design .....	10
5.2	Construction .....	11
5.3	Operation.....	12
5.4	Decommissioning .....	13
<b>6.0</b>	<b>Impact Assessment</b> .....	<b>15</b>
6.1	Approach to Impact Assessment .....	15
6.2	Generalized Project Phase Impacts.....	15
6.2.1	Design.....	16
6.2.2	Construction.....	19
6.2.3	Operation .....	25
6.2.4	Decommissioning.....	25
6.3	Site Specific Water Body Impacts .....	25
6.3.1	Intermittent/Permanent Watercourses .....	26
<b>7.0</b>	<b>Recommendations</b> .....	<b>31</b>
7.1	General Project Phase Mitigation.....	31
7.1.1	Design Related Mitigation .....	31
7.1.2	Construction Related Mitigation.....	32
7.1.3	Operational Related Mitigation .....	39
7.1.4	Decommissioning Related Mitigation .....	39
7.2	Site Specific Water Body Mitigation .....	40
7.3	Monitoring.....	45
<b>8.0</b>	<b>Impact Assessment Summary</b> .....	<b>47</b>
<b>9.0</b>	<b>Summary and Conclusions</b> .....	<b>51</b>
<b>10.0</b>	<b>References</b> .....	<b>52</b>

### List of Tables

Table 1.	Summary of Records Review of the Adelaide Wind Energy Centre .....	7
Table 2.	Summary of Water Body Site Investigations within the Adelaide Wind Energy Centre Project Area .....	8
Table 3.	Summary of Intermittent/Permanent Watercourse Crossing Locations, Site Specific Considerations & Potential Impacts.....	26
Table 4.	Summary of Potential Impacts and Site Specific Considerations for Intermittent/Permanent Watercourse Locations Within 120m of the Adelaide Project Location (but not crossing).....	29
Table 5.	Summary of Water Body Crossing Locations and Recommended Mitigation Measures.....	40
Table 6.	Summary of Water Body Locations within 120m of the Project Locations and Recommended Mitigation Measures.....	44

Table 7. Summary of General Monitoring Recommendations.....	45
Table 8. Summary of General Project Phase Potential Impacts, Recommended Mitigation Measures and Resulting Significance of Impact.....	48

**List of Figures**

Figure 1. Project Area .....	3
Figure 2. Project Area and Water Bodies (South).....	4
Figure 3. Project Area and Water Bodies (North) .....	5

## 1.0 Project Description

Natural Resource Solutions Inc. (NRSI) was retained in April 2011 by GL Garrad Hassan, on behalf of Kerwood Wind, Inc., a wholly-owned subsidiary of NextEra Energy Canada ULC, to conduct a water body resource assessment for the proposed Adelaide Wind Energy Centre, in accordance with the Renewable Energy Approval (REA) Regulation. This assessment includes a records review, site investigations, and environmental impact assessment (EIS) of water bodies located within the Adelaide Wind Energy Centre project area. The analysis of the water bodies within the project area is one issue being considered. Other factors, such as natural heritage, land ownership, social impacts, and cultural impacts are also being assessed under separate covers as outlined by the REA Regulation.

The Adelaide Wind Energy Centre ('Adelaide'), proposed by NextEra Energy Canada, is located in the geographic Township of Adelaide Metcalfe, approximately 13km northwest of the Town of Strathroy. The general project area is roughly bordered by Centre Road, Townsend Line, Sexton Road, and Napperton Drive. In addition, a transmission line is proposed to run north along Kerwood Road from Cuddy Drive north to Nairn Road. This transmission line is then proposed to continue eastward along Nairn Road to an existing 500kV line and substation located west of Petty Street. The Adelaide wind energy generating facility is proposed to consist of up to thirty-eight GE 1.6-100 (1.62 MW) turbines for a total installed capacity of up to 61.56 MW. The proposed GE 1.6-100 turbine is a 3-bladed, upwind, horizontal-axis turbine. The total rotor diameter of the turbine is 100 m, resulting in a swept area of 7,854 m<sup>2</sup>, and is designed to operate at between 9.75 and 16.18 revolutions per minute (rpm). The turbine rotor and nacelle are mounted on top of an 80m tubular tower which is manufactured in sections from steel plate. Each turbine is mounted on a steel reinforced concrete foundation and equipped with a transformer, located outside the base of the tower.

As defined by REA Regulation, the proposed layout of these features is collectively referred to as the 'project location'. This includes turbines and associated infrastructure as described above, as well as any areas that may be used temporarily during construction (i.e. staging areas, crane pads, crane walks etc.) For the purposes of this

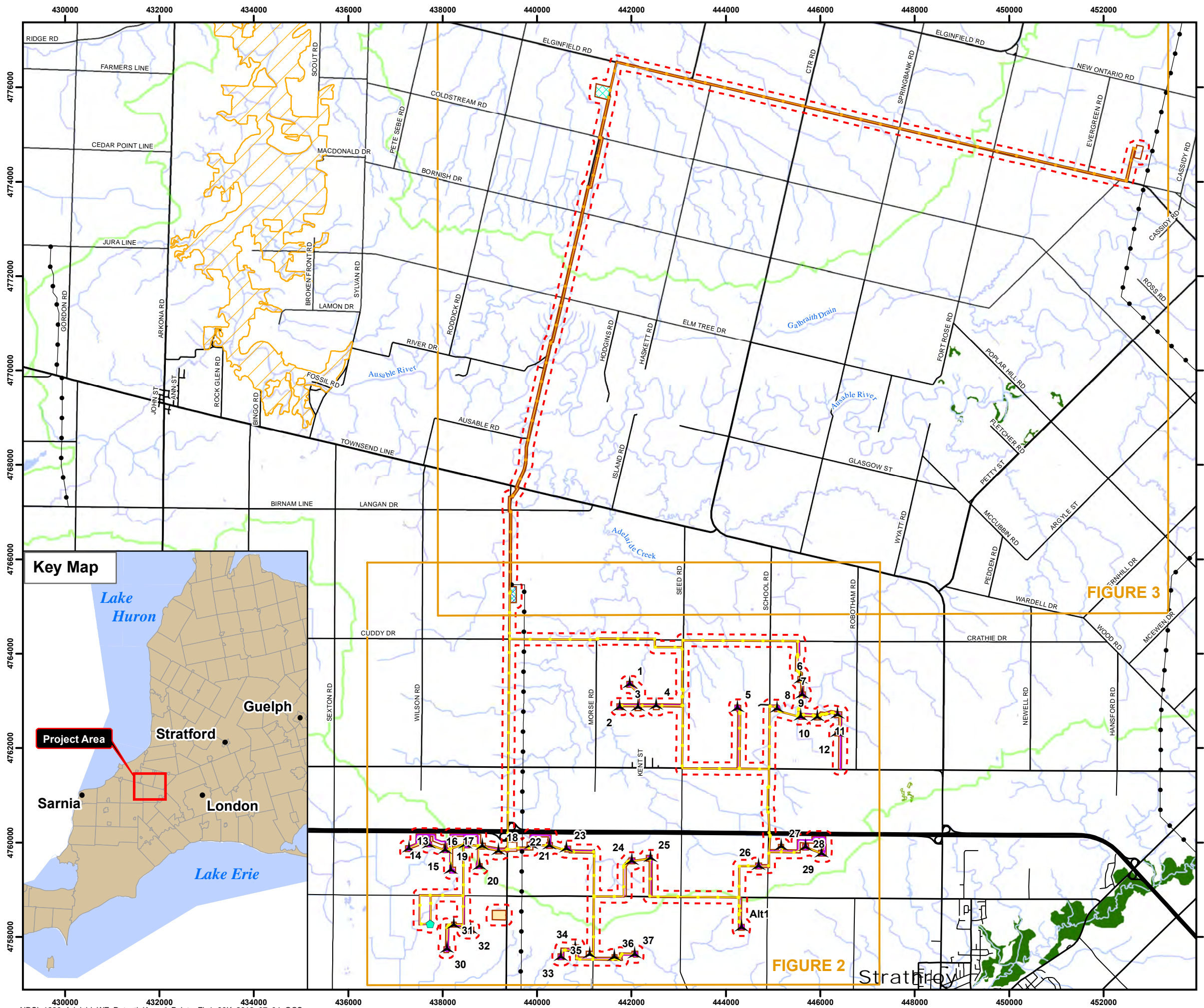
report, NRSI will refer to the areas within 120m of the project location as the 'project area'.

In accordance with the Renewable Energy Approval (REA) Regulation, NRSI has conducted a records review and site investigations to identify and characterize water bodies (lakes, seepages, intermittent/permanent watercourses) within 120m of the project location, or Lake Trout (*Salvelinus namaycush*) lakes within 300m, of the 'project location'. Site investigations were conducted within the project area to confirm the presence/absence of water bodies identified within the records review, as well as to document new water bodies not previously identified. Field investigations also focused on the characterization of these features. Findings of these assessments are provided in the Adelaide Wind Energy Centre Records Review Report (NRSI 2012a) and the Site Investigations Report (NRSI 2012b). Based on review of these findings and the proposed Adelaide Wind Energy Centre layout and design plans, NRSI has conducted an impact assessment to identify any potential impacts to water bodies located within the project area. Findings of this assessment are provided within this report.

As part of this project, NRSI has considered all aspects relating to provincially Threatened and Endangered species. However, since these species are addressed as part of the *Endangered Species Act* (2007), they have not been discussed within any of these Water Body reports. These species will be addressed in full detail, including a habitat description and results of field assessments, potential impacts, and recommended mitigation measures, as part of a separate *Approval and Permitting Requirements Document (APRD)* to be submitted to the Ontario Ministry of Natural Resources (OMNR) under separate cover, where necessary.

Figure 1

# Adelaide Wind Energy Centre Project Area and Water Bodies



**Legend**

- Project Area (120m)
- Figure Extents
- Turbine
- MET
- Access Road
- Collector System (Underground Cabling)
- Transmission Line (Aboveground Cabling)
- Project Location
- Staging Area
- Substation
- Operations & Maintenance Buildings
- Railroad
- Existing Transmission Line
- Highway
- Primary Road
- Secondary Road
- Watercourse
- Waterbody
- Watershed Boundaries
- Provincially Significant Wetland (PSW)
- Other Wetland
- ANSI, Life Science
- ANSI, Earth Science



**NATURAL RESOURCE SOLUTIONS INC.**  
Aquatic, Terrestrial and Wetland Biologists

Map Produced by Natural Resource Solutions Inc. This map is proprietary and confidential and must not be duplicated or distributed by any means without express written permission of NRSI. Source: Data provided by MNR. Copyright: Queen's Printer Ontario

Project: 1230 Date: July 4, 2012	NAD83 - UTM Zone 17 Scale: 1:80,000 (11x17")
-------------------------------------	---

0 1,000 2,000 3,000 4,000 5,000 Meters