DRAFT

Romney Wind Energy Centre
Water Body Report

Prepared for:
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NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

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Romney Wind Energy Centre
Water Body Report

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Report submitted on February 24, 2017

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Abbreviations

DFO – Fisheries and Oceans Canada

EASR – Environmental Activity and Sector Registry

EM – Environmental Monitor

ESC – Erosion and Sediment Control

FRP – Flood Response Plan

HONI – Hydro One Networks Inc.

LTVCA – Lower Thames Valley Conservation Authority

MNRF – Ministry of Natural Resources and Forestry

MOECC – Ministry of the Environment and Climate Change

MW – megawatts

NRSI – Natural Resource Solutions Inc.

O. Reg. – Ontario Regulation

O&M – Operations and Maintenance

PCC – Point of Common Coupling

POI – Point of Interconnect

REA – Renewable Energy Approval

REA Regulation – Ontario Regulation 359/09 – Renewable Energy Approvals under Part V.0.1 of the Act

SRP – Spill Response Plan

SWH – Significant Wildlife Habitat

The Project – Romney Wind Energy Centre

The Proponent – Romney Energy Centre Limited Partnership

WBA – Water Body Assessment

WBR – Water Body Report

ZOI – Zone of Influence

1.0 Project Description

Natural Resource Solutions Inc. (NRSI) was retained in April 2016 by DNV-GL, on behalf of Romney Energy Centre Limited Partnership ("the Proponent"), to conduct a Water Body Assessment (WBA) and Water Body Report (WBR) in accordance with the Renewable Energy Approval (REA) Regulation, Ontario Regulation (O. Reg.) 359/09. The WBA includes a records review and site investigation, provided under a separate cover, and the WBR includes a complete assessment of impacts to any water bodies occurring at the proposed wind energy generating facility.

The Proponent is proposing to develop the Romney Wind Energy Centre (the "Project"). This Project, with a total nameplate capacity of up to 60 megawatts (MW), is considered to be a Class 4 wind facility. A total of 18 wind turbines are being permitted.

The Romney Wind Energy Centre is located in southwestern Ontario, Town of Lakeshore and the Municipality of Chatham Kent, Ontario. More specifically, the Project is located south of Highway 401, and extends along Richardson Side Road and Wheatley Road near the community of Wheatley, ON.

Project components will be installed primarily on privately-owned agricultural lots within this area. It is anticipated that the electrical collector lines will be partially located within public road allowances. The Project is planned to connect to the existing Hydro One Networks Inc. (HONI) 230 kV transmission line located within the Town of Lakeshore, close to Richardson Side Road. A small section of transmission line (less than 1km) is proposed for the Project, to be built by HONI from the Point of Common Coupling (PCC) to the Point of Interconnect (POI).

According to O. Reg. 359/09, as amended, and as per the Technical Guide to Renewable Energy Approvals (MOE 2013), the Project Location is defined as "...*a part of land and all or part of any building or structure in, on or over which a person is engaging in or proposes to engage in the project and any air space in which a person is engaging in or proposes to engage in the project*". As described therein, the Project Location boundary is the outer limit of where site preparation and construction activities

will occur (i.e. disturbance areas described below) and where permanent infrastructure will be located, including the air space occupied by turbine blades.

For the purposes of this report, NRSI will refer to the areas within 120m of the Project Location as the 'Project Area'. This includes areas within 120m of proposed wind turbines, measured from blade tip, as well as within 120m of any areas that may be used as temporary lay-down areas, crane pads, access roads, PCC, Operations and Maintenance (O&M) building, a meteorological tower, substation and electrical collector lines. Junction boxes may also be installed below or above ground where more than one circuit must be connected together. See Map 1 for an illustration of the Project Area and natural features.

In accordance with Sections 39 and 40 of the REA Regulation, O. Reg. 359/09, NRSI conducted a thorough records review and site investigation to identify and characterize water bodies (lakes, seepage areas, permanent/intermittent watercourses) within 120m, or lake trout lakes within 300m, of the Project Location, the results of which are provided in the *Romney Wind Energy Centre: Water Body Assessment* (NRSI 2017). Based on a review of these results and the proposed Project layout and construction plans, an impact assessment was conducted to identify any potential impacts to water bodies located within the Project Area. The results of the impact assessment are provided in this report.

2.0 REA 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 requirements for the development of renewable energy projects in Ontario. In accordance with the REA Regulation, the Project is classified as a Class 4 wind facility and is required to obtain a REA.

Section 39, subsection (1) of the REA Regulation states, in relation to Class 4 wind facilities with no turbines or transformers within 30m of a water body, that "no person shall construct, install or expand a renewable energy generation facility as part of a renewable energy project at a project location that is in any of the following locations":

1. A lake or within 30 meters of the average annual high water mark of a lake.
2. A permanent or intermittent stream or within 30 meters of the average annual high water mark or a permanent or intermittent stream.
3. A seepage area or within 30 meters of a seepage area.

Section 40, subsection (1) of the REA Regulation states, in relation to any proposed facility, that "no person shall construct, install or expand a renewable energy generation facility as part of a renewable energy project at a project location that is in any of the following locations":

1. within 120 meters of the average annual high water mark of a lake, other than a lake trout lake that is at or above development capacity;
2. within 300 meters of the average annual high water mark of a lake trout lake that is at or above development capacity;
3. within 120 meters of the average annual high water mark of a permanent or intermittent stream; or
4. within 120 meters of a seepage area.

However, Sections 39(1) and 40(1) do not apply if the applicant submits a report that:

1. identifies and assesses any negative environmental effects of the project on a water body referred to in paragraphs 1 to 3 of Section 39 (1) and 1 to 4 of Section 40 (1) (above) and on land within 30 meters of the water body;
2. identifies mitigation measures in respect of any negative environmental effects mentioned in clause (i);
3. describes how the environmental effects monitoring plan addresses any negative environmental effects mentioned in clause (i); and describes how the construction plan report prepared in accordance with Table 1 of the REA Regulation addresses any negative environmental effects mentioned in clause (i).

In accordance with Section 39 and 40 of the REA Regulation, this report has been prepared to identify and assess any negative environmental effects on water bodies located within 30m of the Project Location (Section 6). Tables 4 to 6 of this report identify mitigation measures that are recommended to protect the identified water bodies from potential environmental impacts that might arise from the construction and operation of the Project.

Additional information relating to the development of this Project, including detailed descriptions of the construction activities, has been provided in the *Construction Plan Report* (DNV-GL 2017a). This document provides construction details and potential environmental impacts associated with the construction of the Project. Additional information relating to the operation and decommissioning of this Project has been provided in the *Design and Operations Report* (DNV-GL 2017b) and *Decommissioning Plan Report* (DNV-GL 2017c). A summary of the potential environmental effects, proposed mitigation measures, and monitoring programs that will be implemented during the construction and operational phases of the Project is also provided in Table 4-4 of the *Construction Plan Report* (DNV-GL 2017a) and Table 6-2 of the *Design and Operations Report* (DNV-GL 2017b) to satisfy the requirements as outlined in the REA Regulation. The content of this *Water Body Report* has also been used to develop the Environmental Effects Monitoring Plan included in the *Design and Operations Report* (DNV-GL 2017b), which has been completed by DNV-GL under separate cover.

As part of this Project, all aspects relating to provincially Threatened and Endangered species, Species of Conservation Concern, and other aquatic species and their habitats are addressed through a separate permitting process under the *Fisheries Act* (1985), *Endangered Species Act* (2007), and *Development, Interference of Wetlands and Alterations to Shorelines and Watercourses* (O.Reg. 152/06) under the *Conservation Authorities Act* (R.S.O. 1990). Therefore, they have not been discussed within the WBA or WBR. These species will be addressed in full detail, including a description and results of field assessments, potential impacts, and recommended mitigation measures, as part of a separate reporting process to be addressed with Fisheries and Oceans Canada (DFO), the Ministry of Natural Resources and Forestry (MNRF), and the Lower Thames Valley Conservation Authority (LTVCA), as required.

3.0 Summary of Records Review

In accordance with the REA Regulation, a thorough records review for the proposed Project was completed (NRSI 2017). This records review included correspondence with regional, provincial, and federal agency staff and a review of several available online and published resources. The results of this records review have been summarized in Table 1 below. For more detail, refer to the *Romney Wind Energy Centre: Water Body Assessment* (NRSI 2017).

Table 1. Summary of Records Review for the Project

Criteria	Associated Potential Water Bodies
i. In a water body	The records review has identified 33 potential water bodies as overlapping the Project Location, within the following drainage areas: • Big Creek (n=11) • East Two Creeks (n=13) • Yellow Creek (n=8) • Lake Erie (n=1) These potential overlaps represent proposed crossing locations for access roads, electrical collector lines, and/or construction disturbance areas. All of these potential water bodies may represent permanent or intermittent watercourses, drainage features or ponds. Within the LTVCA jurisdiction, these potential water bodies are designated as warmwater fisheries or intermittent drainage features based on the DFO drain classification system (LTVCA 2016).
ii. 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	None
iii. Within 300 m of the average annual high water mark of a lake trout lake that is at or above development capacity	None
iv. Within 120 m of the average annual high water mark of a permanent or intermittent stream	The records review has identified 24 potential water bodies within 120m of, but not overlapping, the Project Location, within the following drainage areas: • Big Creek (n=9) • East Two Creeks (n=8) • Yellow Creek (n=3) • Lake Erie (n=4) All of these water bodies represent potential permanent or intermittent watercourses, drainage features or ponds. Within the LTVCA jurisdiction, these water bodies are designated as warmwater fisheries or intermittent drainage features based on the DFO drain classification system (LTVCA 2016).
v. Within 120 m of a seepage area	None

4.0 Summary of Site Investigation

A comprehensive site investigation was conducted for the Project on several dates in 2016 (NRSI 2017). The site investigation included site-specific assessments of drainage features and other potential water bodies throughout the Project Area. The site investigation was focused on confirming the presence, absence and extent of potential water bodies within the Project Area identified during the records review. A total of 57 drainage features were assessed as part of the site investigation, 32 of which were confirmed as water bodies based on the O.Reg 359/09 definition of a water body. No lakes, lake trout lakes, or seepage areas were identified within the Project Area. A summary of the site investigation results is provided in Table 2 below. All water bodies are shown on Maps 3-1 to 3-5.

Table 2. Modifications to the Records Review Based on Site Investigation Results

Criteria	Result from Records Review	Corrections Based on Site Investigations
i. In a water body	The records review has identified 33 potential water bodies as overlapping the Project Location, within the following drainage areas: • Big Creek (n=11) • East Two Creeks (n=13) • Yellow Creek (n=8) • Lake Erie (n=1) These potential overlaps represent proposed crossing locations for access roads, electrical collector lines, and/or construction disturbance areas. All of these potential water bodies may represent permanent or intermittent watercourses, drainage features or ponds. Within the LTVCA jurisdiction, these potential water bodies are designated as warmwater fisheries or intermittent drainage features based on the DFO drain classification system (LTVCA 2016).	Site investigations identified 18 confirmed water bodies to be overlapping the Project Location, within each drainage areas as follows: • Big Creek (n=6) • East Two Creeks (n=8) • Yellow Creek (n=4) • Lake Erie (n=0) All of these water bodies represent permanent or intermittent drainage features. These locations where the water bodies overlap the Project Location represent proposed crossing locations for access roads, electrical collector lines, and/or construction disturbance areas.
ii. 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	None	No corrections.

Table 2. Modifications to the Records Review Based on Site Investigation Results

Criteria	Result from Records Review	Corrections Based on Site Investigations
iii. Within 300 m of the average annual high water mark of a lake trout lake that is at or above development capacity	None	No corrections.
iv. Within 120 m of the average annual high water mark of a permanent or intermittent stream	The records review has identified 24 potential water bodies within 120m of, but not overlapping, the Project Location, within the following drainage areas: • Big Creek (n=9) • East Two Creeks (n=8) • Yellow Creek (n=3) • Lake Erie (n=4) All of these water bodies represent potential permanent or intermittent watercourses, drainage features or ponds. Within the LTVCA jurisdiction, these water bodies are designated as warmwater fisheries or intermittent drainage features based on the DFO drain classification system (LTVCA 2016).	The site investigations identified 14 confirmed water bodies located within 120m of, but not overlapping, the Project Location, within each of the drainage areas, as follows: • Big Creek (n=7) • East Two Creeks (n=1) • Yellow Creek (n=3) • Lake Erie (n=3) All of these water bodies represent permanent or intermittent drainage features.
v. Within 120 m of a seepage area	None	No corrections.

The results of this site investigation will be used, in conjunction with the records review, to identify potential impacts associated with the proposed development activities of the Project.

5.0 Description of the Proposed Undertaking

The following sections provide information pertaining to the design, construction, operation, and decommissioning activities associated with the proposed undertaking for the Project. Although relevant information has been summarized in the following section, detailed information for each phase of the Project can be found in the following reports:

- *Romney Wind Energy Centre: Construction Plan Report* (DNV-GL 2017a)
- *Romney Wind Energy Centre: Design and Operations Report* (DNV-GL 2017b)
- *Romney Wind Energy Centre: Decommissioning Plan Report* (DNV-GL 2017c)

The construction phase of the Project will involve the installation of up to 18 of the permitted wind turbine locations, as well as all supporting infrastructure.

The Project will be made up of the following main components:

- Wind turbines;
- Permanent meteorological tower;
- Access roads and crane pads; and
- Electrical collector lines and substation;
- O&M building; and
- Laydown and storage areas (including temporary staging areas).

Junction boxes may also be installed below or above ground where more than one circuit must be connected together. The details of these construction activities and potential negative effects that may be associated with each activity are outlined in Table 3.

The REA Regulation sets clear guidelines as to where wind development is acceptable. In the case of Class 4 wind facilities, such as the proposed Project, the development of turbines and transformer stations is prohibited in, and within 30m of, all water bodies. The location of project components for the Project is in accordance with the established water body setbacks as set out in the REA Regulation.

The operational phase of the Project will include the operation of up to 18 wind turbines, as well as all associated regular maintenance activities. The potential negative effects of this facility during the operational phase of the Project are summarized in Table 3.

The decommissioning phase of the Project will include the disassembly and removal of the Project infrastructure associated with this Project. The details of this project phase, along with potential negative effects, are provided in Table 3.

6.0 Impact Assessment

6.1 Approach to Impact Assessment

For the purpose of this report, the analysis of potential impacts focuses on water bodies within 30m of the Project Location, as per the REA Regulation, and has been divided into 2 main categories, including water bodies that are overlapped by the Project Location and those that are located >0.1-30m from the Project Location. Although the REA Regulation does not require an identification or assessment of potential negative environmental effects for water bodies that are 30-120m from the Project Location, a conservative approach has been taken to also identify these features in the following sections. Potential impacts on water bodies related to each project phase including construction, operation, and decommissioning will be presented and discussed. These impacts are grouped by water body type, as identified by the REA Regulation, Section 30, and include lakes, lake trout lakes, permanent or intermittent watercourses, and springs and seeps.

All identified impacts are discussed in this section assuming no mitigation measures are applied, and are therefore treated very conservatively with respect to potential impacts on water bodies, in absence of any mitigation measures. Table 5 and Table 6 discuss the detailed mitigation measures to be applied during the construction, operation, and decommissioning phases of the Project. An overview of monitoring requirements is discussed in Section 6.3.

6.2 Project Phase Impacts

Project development, construction, operation, and decommissioning activities, if not mitigated appropriately, have the potential to affect water bodies. These impacts have the potential to affect surface water quality and quantity and general stream hydrology. These impacts range in degree from temporary disturbance to permanent loss or impairment. Impacts associated with each Project phase are outlined below in Table 3.

6.2.1 Construction

Potential impacts identified for the construction phase (Table 3) of the Project are based on the understanding of Project activities as outlined in Section 5.0, and the details provided in the *Construction Plan Report* (DNV-GL 2017a).

The Project layout dictates which water bodies will be directly impacted based on the orientation of project components (e.g. access roads that cross a water body), and the level of risk associated with the impact based on the proximity of the project component to the water body. It is inferred that the greater the distance a water body is from a Project component, the lower the risk of potential impacts to the feature from the proposed construction activities. Table 3 and Table 4 summarize the potential negative effects of the construction activities associated with the Project components that are located in, or within 30m of, water bodies. In addition to distance, other factors that determine the level of risk associated with potential impacts to a water body include local topography, the permeability of soils, and the density of vegetation and/or ground litter (i.e. dead grass, leaves, twigs and logs) surrounding the water body.

Potential negative effects of construction activities for water bodies located in or within 30m of Project components are summarized in Table 3. Individual water bodies that have the potential to be negatively affected by the construction phase are identified in Table 4, along with a summary of potential negative effects. Details of the mitigation measures, performance objectives, monitoring commitments, and contingency plans are provided in Table 5. A summary of the likelihood, significance, and duration of construction impacts following the application of recommended mitigation measures is also provided in Table 5.

6.2.2 Operation

Potential impacts identified for the operational phase of the Project are based on the understanding of Project activities as outlined in Section 5.0, and the details provided in the *Design and Operations Report* (DNV-GL 2017b).

During the operational phase of the project, it is anticipated that potential impacts to water bodies will be negligible, if any at all. Potential operational phase impacts are associated with ongoing maintenance activities, including the maintenance of vegetation near overhead electrical collector lines. The potential risks related to these activities include contaminant spills, and increases in erosion and sedimentation from maintenance activities (i.e. removal of vegetation). These potential impacts may result in the degradation of surface water quality within receiving water bodies.

Potential negative effects of operational activities for water bodies located in or within 30m of Project components are summarized in Table 3 below. Individual water bodies that have to potential to be negatively affected by the operational phase are identified in Table 4, along with a summary of potential negative effects. Details of the mitigation measures, performance objectives, monitoring commitments, and contingency plans are provided in Table 6. A summary of the likelihood, significance, and duration of operational impacts following the application of recommended mitigation measures is also provided in Table 6.

6.2.3 Decommissioning

Potential impacts identified for the decommissioning phase of the Project are based on the understanding of Project activities as outlined in Section 5.0, and the details provided in the *Decommissioning Plan Report* (DNV-GL 2017c).

The potential decommissioning phase impacts are essentially the same as the construction phase, and have been included below in Table 3. However, the decommissioning phase impacts have the potential to be of a lesser extent. This is due to water body crossing structures remaining in place if landowners request that access roads remain.

If a decision is made to discontinue the operation of the Project, removal of all turbines and associated infrastructure will occur. It is recommended that all water body crossing structures remain in place following decommissioning of the Project. Leaving structures in place will eliminate the need for additional in-water work and will reduce the potential for sedimentation, contaminant spills and therefore minimize the potential physical impacts to drainage feature morphology and habitat commonly associated with this type of work. Additionally, this will minimize the necessary remediation activities that are required to rehabilitate the site following the destruction and alteration of riparian vegetation and in-stream aquatic habitat.

If a decision is made to remove all crossing structures upon decommissioning of the Project, it is recommended that a comprehensive management plan be prepared prior to the commencement of any activities. This plan will include the required steps for removing structures and creating the lowest collective footprint of impact on the site.

Consultation with the appropriate agencies (e.g. LTVCA) should occur prior to decommissioning activities to address any required in-water work. All in-water work will follow the timing windows provided by the Aylmer District MNRF, or will otherwise be discussed with the MNRF.

Potential negative effects of decommissioning activities for water bodies located in, or within 30m of, Project components are summarized below in Table 3. Individual water bodies that have to potential to be negatively affected by the decommissioning phase are identified in Table 4, along with a summary of potential negative effects. Details of the mitigation measures, performance objectives, monitoring commitments, and contingency plans are provided in Table 5. A summary of the likelihood, significance, and duration of decommissioning impacts following the application of recommended mitigation measures is also provided in Table 5.

Table 3. Summary of Construction, Operation, and Decommissioning Activities and Potential Negative Environmental Effects Within the Project Area

Project Activity	Details of Proposed Activity	Overlapping Confirmed Water Bodies	Within 30m of Confirmed Water Bodies	Potential Negative Effects to Confirmed Water Bodies
Construction				
Ancillary Facility Construction	Three types of supporting facilities may be associated with the Project. These include a substation, meteorological tower, and an O&M building.	No	Yes	• Accidental vegetation removal • Increased erosion, sedimentation, and turbidity • Reduced water quality (i.e. increased turbidity) • Fugitive dust emission • Spills and leaks (oil, gas, frac-out, etc.), and contamination of nearby water bodies • Decreased infiltration • Changes in surface water drainage If dewatering of excavated substation, meteorological tower or O&M Building foundations is required: • Reduced groundwater discharge • Reduced stream baseflow and upwelling • Increased water temperatures • Reduced water quality (i.e. increased turbidity) • Increased water quantity to receiving area or water body
Turbine Foundation and Turbine Erection	A total of 18 proposed turbine locations will be permitted for the Project. The final number of operational turbines will depend on the nominal turbine power rating of each turbine. As part of the turbine erection, laydown areas and crane pads will be placed around the base of the turbine. The crane pads, measuring approximately 0.5ha, will require the removal of topsoil and subsoil, and crane pad locations will be filled with a varying mixture of granular base	No	Yes	• Accidental vegetation removal • Increased erosion, sedimentation, and turbidity • Reduced water quality (i.e. increased turbidity) • Fugitive dust emission • Spills and leaks (oil, gas, frac-out, etc.), and contamination of nearby water bodies • Decreased infiltration • Changes in surface water drainage If dewatering of excavated wind turbine foundations is required:

Table 3. Summary of Construction, Operation, and Decommissioning Activities and Potential Negative Environmental Effects Within the Project Area

Project Activity	Details of Proposed Activity	Overlapping Confirmed Water Bodies	Within 30m of Confirmed Water Bodies	Potential Negative Effects to Confirmed Water Bodies
	material and crushed gravel depending on site-specific conditions. Specialized crane matting solution could also be used. Following the erection of wind turbines, the portions of the crane pad areas not required during the operations phase will be restored to a state similar to pre-existing conditions. It is possible that during excavation for turbine foundations, groundwater or precipitation entering the excavation will require pumping. A measurable change in local groundwater flow levels within the zone of influence (ZOI) has the potential to extend a duration of 7 months, with 4 months of drawdown from dewatering and an additional 3 months where the groundwater table levels will be recovering to pre-dewatering levels. Relatively minor grading activities are expected to occur throughout the Project Area. Grading is important to ensure crane pads, staging areas, and other construction areas are level.			• Reduced groundwater discharge • Reduced stream baseflow and upwelling • Increased water temperatures • Reduced water quality (i.e. increased turbidity) • Increased water quantity to receiving area or water body
Access Road Construction	Access roads will be constructed to be up to 12m wide, including side clearance. Areas adjacent to the access road within the larger 20m construction disturbance area may be utilized during the construction phase in order to accommodate cranes, transportation equipment and other construction activities. After construction, these roads may be reduced in size to approximately 5-6m in width, to allow access to turbines and associated infrastructure for maintenance and repairs.	Yes	Yes	• Accidental vegetation removal • Increased erosion, sedimentation, and turbidity • Fugitive dust emission • Spills and leaks (oil, gas, frac-out, etc.), and contamination of nearby water bodies • Changes in surface water drainage • Decreased infiltration

Table 3. Summary of Construction, Operation, and Decommissioning Activities and Potential Negative Environmental Effects Within the Project Area

Project Activity	Details of Proposed Activity	Overlapping Confirmed Water Bodies	Within 30m of Confirmed Water Bodies	Potential Negative Effects to Confirmed Water Bodies
	Relatively minor grading activities are expected to occur throughout the Project Area. Grading is important to ensure crane pads, staging areas, and other construction areas are level.			
Electrical Collector Line Installation (Overhead or Underground)	Underground and overhead electrical collector lines are proposed for this Project. Most of the electrical collector lines within the Project Area will be underground and installed by way of open cut trenches or plowing. Horizontal directional drilling will also be required within the Project. Directional drilling will be used in some locations to extend electrical collector lines beneath natural features, wildlife habitats, or water bodies without direct impact. Although the exact locations of directional drilling are currently unknown, impacts associated with this construction activity have been considered as part of this impact study. Overhead electrical collector lines may also be required within the Project. Overhead electrical collector lines will be used in some locations to extend electrical collector lines above natural features, wildlife habitats, or water bodies without direct impact. Although the exact locations of overhead electrical collector lines are currently unknown, the potential impacts associated with both underground and overhead electrical collector lines have been considered throughout this impact study. Where possible, underground and overhead	Yes	Yes	• Accidental vegetation removal • Increased erosion, sedimentation, and turbidity • Fugitive dust emission • Decreased infiltration • Spills and leaks (oil, gas, frac-out, etc.), and contamination of nearby water bodies • Reduced water quality (i.e. increased turbidity) • Reduced groundwater discharge • Removal of vegetation within the existing municipal road right-of-way If dewatering of excavated trenches for underground electrical collector lines is required: • Reduced groundwater discharge • Reduced stream baseflow and upwelling • Increased water temperatures • Reduced water quality (i.e. increased turbidity) • Increased water quantity to receiving area or water body

Table 3. Summary of Construction, Operation, and Decommissioning Activities and Potential Negative Environmental Effects Within the Project Area

Project Activity	Details of Proposed Activity	Overlapping Confirmed Water Bodies	Within 30m of Confirmed Water Bodies	Potential Negative Effects to Confirmed Water Bodies
	electrical collector lines will be installed within the access road construction disturbance area and/or will follow municipal road allowances in order to minimize the area of disturbed land.			
Temporary Construction Staging Area	A temporary construction staging area will be located within the Project Area and will be approximately 8ha in size. Topsoil and subsoil will be stripped and stockpiled on site and the construction staging areas will be constructed of compacted surface material suitable for vehicular traffic and equipment/component storage. The depth of the graveled areas will vary and will be dependent on conditions encountered during the time of construction. Following construction, the temporary construction laydown area will be restored to pre-existing conditions to allow agricultural or prior activities to resume, at the discretion of landowners.	No	Yes	• Accidental vegetation removal • Increased erosion, sedimentation, and turbidity • Spills and leaks (oil, gas, frac-out, etc.), and contamination of nearby water bodies • Changes in surface water drainage • Decreased infiltration
Operation				
Water Taking (Ground Water)	During the operation of the Project, it is expected that approximately 6 full time employees will regularly use the O&M building. Potable water will be supplied by a well or through the municipal water system. Non-potable water taking during operation will be limited to regular personnel requirements, such as washroom facilities, sinks, etc.	No	No	• N/A
Turbine Operation	A total of 18 proposed turbine locations will be permitted for the Project. The final number of operational turbines will depend on the nominal turbine power rating of each turbine.	No	Yes	• N/A

Table 3. Summary of Construction, Operation, and Decommissioning Activities and Potential Negative Environmental Effects Within the Project Area

Project Activity	Details of Proposed Activity	Overlapping Confirmed Water Bodies	Within 30m of Confirmed Water Bodies	Potential Negative Effects to Confirmed Water Bodies
Turbine Maintenance	Regular maintenance activities will occur at all of the operational turbines at the Project. In addition to regularly scheduled maintenance, occasional unscheduled maintenance activities may be required.	No	Yes	• Spills and leaks (oil, gas, frac-out, etc.), and contamination of nearby water bodies
Vegetation Maintenance Along Overhead Electrical Collector Lines	Routine vegetation removal, including tree removal or pruning, may be required for clearance of the electrical collector lines during operations.	Yes	Yes	• Accidental vegetation removal • Increased erosion, sedimentation and turbidity • Reduced water quality (i.e. increased turbidity) • Spills and leaks (oil, gas, frac-out, etc.), and contamination of nearby water bodies
Decommissioning				
Pre-Dismantling Activities	At the end of the Project's life, the Project will first be de-energized and isolated from all external electrical lines.	N/A	N/A	• N/A
Removal of Ancillary Facilities	Three types of supporting facilities may be associated with the Project. These include a substation, meteorological tower, and an O&M building. The substation and O&M building, as well as all associated above-ground infrastructure, will be dismantled and removed from the Project Area. Any concrete foundations will be removed to at least 1m below original grade or to the depth originally installed if less than 1m below original grade. The area will be graded, contoured, and restored to land use similar to what was present prior to foundation installation, to allow for prior activities to resume. One meteorological tower will be permitted for construction and will be removed unless	No	Yes	• Accidental vegetation removal • Increased erosion, sedimentation, and turbidity • Reduced water quality (i.e. increased turbidity) • Fugitive dust emission • Spills and leaks (oil, gas, frac-out, etc.), and contamination of nearby water bodies • Changes in surface water drainage If dewatering of excavated substation, meteorological tower or O&M Building foundations is required: • Reduced groundwater discharge • Reduced stream baseflow and upwelling • Increased water temperatures • Reduced water quality (i.e. increased turbidity)

Table 3. Summary of Construction, Operation, and Decommissioning Activities and Potential Negative Environmental Effects Within the Project Area

Project Activity	Details of Proposed Activity	Overlapping Confirmed Water Bodies	Within 30m of Confirmed Water Bodies	Potential Negative Effects to Confirmed Water Bodies
	otherwise requested by the Municipality of Chatham-Kent or local aviation groups (and agreed to by the Proponent and the property owner) for it to remain in place. Any concrete foundations would be removed to at least 1m below original grade or to the depth originally installed if less than 1m below original grade. The area will be graded, contoured, and restored to land use similar to what was present prior to foundation installation, to allow for prior activities to resume.			• Increased water quantity to receiving area or water body
Removal of Turbine Infrastructure	Up to 18 wind turbines will be constructed for the Project. All constructed turbines will be removed as per the decommissioning plan. A crane pad and wind turbine laydown area will be constructed at each turbine location to accommodate the dismantling of the wind turbines. Following the removal of turbines, crane pads will be removed and the land will be restored to land use similar to what was present prior to turbine installation, to allow for agricultural activities or prior activities to resume. Removal of turbine components will also include the removal of 1m of the underground foundation below the original elevation (prior to construction). Excavated foundation areas will be backfilled with clean fill and stockpiled topsoil to match the original elevation, and the area will be graded, contoured, and restored to land use similar to what was present prior to foundation installation, to allow for prior activities to	No	Yes	• Accidental vegetation removal • Increased erosion, sedimentation, and turbidity • Reduced water quality (i.e. increased turbidity) • Fugitive dust emission • Spills and leaks (oil, gas, frac-out, etc.), and contamination of nearby water bodies • Changes in surface water drainage If dewatering of excavated wind turbine foundations is required: • Reduced groundwater discharge • Reduced stream baseflow and upwelling • Increased water temperatures • Reduced water quality (i.e. increased turbidity) • Increased water quantity to receiving area or water body

Table 3. Summary of Construction, Operation, and Decommissioning Activities and Potential Negative Environmental Effects Within the Project Area

Project Activity	Details of Proposed Activity	Overlapping Confirmed Water Bodies	Within 30m of Confirmed Water Bodies	Potential Negative Effects to Confirmed Water Bodies
	resume.			
Removal of Access Roads	Access road removal will be dependent on the requirements and agreements in place with the individual landowner. Impacted lands will be restored to land use prior to access road construction, at the discretion of landowners.	Yes	Yes	• Accidental vegetation removal • Increased erosion, sedimentation, and turbidity • Fugitive dust emission • Changes in surface water drainage • Spills and leaks (oil, gas, frac-out, etc.), and contamination of nearby water bodies
Removal of Electrical Collector Lines (Overhead or Underground)	Underground and overhead electrical collector lines are proposed for this Project. Underground electrical collector lines are expected to remain in place at the end of the Project life; however, at their connection points in the substation or in junction boxes, where the underground electrical collector lines come to the surface, the electrical collector lines will be cut to a depth of approximately 1m below original grade. Overhead electrical collector lines are expected to be removed at the end of the Project life; however, the poles on which the electrical collector lines will be installed that are not shared with HONI will be cut to a depth of approximately 1m below original grade or may be completely removed from the ground, where feasible. Any electrical collector lines located at directionally drilled watercourse crossings will also remain in place; however, the connection point will be severed at a point located outside of the Lower Thames Valley Conservation Authority (LTVCA) Regulation Area, where possible.	Yes	Yes	• Accidental vegetation removal • Increased erosion, sedimentation, and turbidity • Fugitive dust emission • Spills and leaks (oil, gas, frac-out, etc.), and contamination of nearby water bodies • Removal of vegetation within the existing municipal road right-of-way

Table 3. Summary of Construction, Operation, and Decommissioning Activities and Potential Negative Environmental Effects Within the Project Area

Project Activity	Details of Proposed Activity	Overlapping Confirmed Water Bodies	Within 30m of Confirmed Water Bodies	Potential Negative Effects to Confirmed Water Bodies
	The Proponent is responsible for decommissioning of the electrical line from the substation to the PCC, after which point the infrastructure is owned by HONI.			
Removal of Staging Area	Upon decommissioning of the Project, temporary staging and laydown areas will be constructed and appropriate decommissioning activities will be carried out within these designated areas. After completion of the decommissioning, temporary staging areas and any associated temporary decommissioning improvements (e.g., temporary construction trailer) used during the decommissioning phase will be removed. Any foundations associated with these facilities will be removed to a depth of at least 1m below original grade or to the depth originally installed if less than 1m below original grade. The area will be graded, contoured, and restored to land use similar to what was present prior to foundation installation, to allow for prior activities to resume.	No	Yes	• Increased erosion, sedimentation, and turbidity • Spills and leaks (oil, gas, frac-out, etc.), and contamination of nearby water bodies

Potential negative effects and proposed mitigation measures for each of the Project phases, including construction, operation, and decommissioning of project components can be found in Table 4 below.

Table 4. Potential Negative Effects and Mitigation Measures for Confirmed Water Bodies within the Project Area

Distance to Project Location	Water Body ID	Potential Negative Effects	Mitigation Measures
Wind Turbines (WT)			
Overlapping	N/A	• N/A	• N/A
0.1m - 30m	N/A		
>30m - 120m	WB-011 WB-013 WB-015 WB-033 WB-055	• Any potential negative effects have been mitigated by locating the project location more than 30m from the annual high water mark of these water bodies	• N/A
Access Road (AR)			
Overlapping	WB-003 WB-005 WB-018 WB-019 WB-026 WB-034 WB-037	• Accidental vegetation removal • Increased erosion, sedimentation, and turbidity • Fugitive dust emission • Spills and leaks (oil, gas, frac-out, etc.), and contamination of nearby water bodies • Changes in surface water drainage • Decreased infiltration	• Avoid Disturbance to Water Body Banks • Minimize Impacts to Infiltration • Minimize Erosion and Sedimentation • Minimize Fugitive Dust Emissions • Minimize Spills • Minimize Impacts to Surface Water Quality and Quantity
0.1m - 30m	WB-009 WB-011 WB-016 WB-035		
>30m - 120m	WB-007 WB-015	• Any potential negative effects have been mitigated by locating the project location more than 30m from the annual high water mark of this water body	• N/A
Electrical Collector Lines (CL)			
Overlapping	WB-001 WB-003 WB-004 WB-005 WB-006 WB-010 WB-017 WB-018 WB-019 WB-025 WB-026 WB-030 WB-031 WB-032 WB-034 WB-036 WB-037 WB-039 WB-041 WB-042	• Accidental vegetation removal • Increased erosion, sedimentation, and turbidity • Fugitive dust emission • Decreased infiltration • Spills and leaks (oil, gas, frac-out, etc.), and contamination of nearby water bodies • Reduced water quality (i.e. increased turbidity) • Reduced groundwater discharge • Removal of vegetation within the existing municipal road right-of-way If dewatering of excavated trenches for underground electrical collector lines is required: • Reduced groundwater discharge • Reduced stream baseflow and upwelling	• Avoid Disturbance to Water Body Banks • Minimize Erosion and Sedimentation • Minimize Fugitive Dust Emission • Minimize Spills • Minimize Impacts to Infiltration • Minimize Impacts to Surface Water Quality and Quantity • Minimize Impacts to Groundwater Discharge

Table 4. Potential Negative Effects and Mitigation Measures for Confirmed Water Bodies within the Project Area

Distance to Project Location	Water Body ID	Potential Negative Effects	Mitigation Measures
	WB-043 WB-046 WB-047 WB-053 WB-054 WB-059	• Increased water temperatures • Increased water quantity to receiving area or water body	
0.1m - 30m	WB-002 WB-008 WB-009 WB-016 WB-020 WB-021 WB-022 WB-023 WB-024 WB-027 WB-028 WB-038 WB-040 WB-044 WB-045 WB-049 WB-056 WB-057 WB-058 WB-060		
>30m - 120m	WB-007 WB-011 WB-012 WB-015 WB-035	• Any potential negative effects have been mitigated by locating the project location more than 30m from the annual high water mark of these water bodies	• N/A
Temporary Construction Staging Area			
Overlapping	WB-001 WB-003 WB-004 WB-005 WB-006 WB-010 WB-011 WB-017 WB-018 WB-019 WB-025 WB-026 WB-030 WB-031 WB-032 WB-034 WB-036 WB-037 WB-039 WB-041	• Accidental vegetation removal • Increased erosion, sedimentation, and turbidity • Spills and leaks (oil, gas, frac-out, etc.), and contamination of nearby water bodies • Changes in surface water drainage • Decreased Infiltration	• Avoid Disturbance to Water Body Banks • Minimize Erosion and Sedimentation • Minimize Fugitive Dust Emission • Minimize Spills • Minimize Impacts to Infiltration • Minimize Impacts to Surface Water Quality and Quantity

Table 4. Potential Negative Effects and Mitigation Measures for Confirmed Water Bodies within the Project Area

Distance to Project Location	Water Body ID	Potential Negative Effects	Mitigation Measures
	WB-042 WB-043 WB-046 WB-047 WB-053 WB-054 WB-059		
0.1m - 30m	WB-002 WB-008 WB-009 WB-015 WB-016 WB-020 WB-021 WB-022 WB-023 WB-024 WB-027 WB-028 WB-035 WB-038 WB-040 WB-044 WB-045 WB-049 WB-055 WB-056 WB-057 WB-058 WB-060 WB-061 WB-062		
>30m - 120m	WB-007 WB-012 WB-013 WB-014 WB-063	• Any potential negative effects have been mitigated by locating the project location more than 30m from the annual high water mark of these water bodies	• N/A
Ancillary Facilities			
Overlapping	N/A	• Accidental vegetation removal • Increased erosion, sedimentation, and turbidity • Reduced water quality (i.e. increased turbidity) • Fugitive dust emission • Spills and leaks (oil, gas, frac-out, etc.), and contamination of nearby water bodies • Decreased infiltration • Changes in surface water drainage If dewatering of excavated substation, meteorological tower or O&M Building foundations is required:	• Avoid Disturbance to Water Body Banks • Minimize Erosion and Sedimentation • Minimize Fugitive Dust Emission • Minimize Spills • Minimize Impacts to Infiltration • Minimize Impacts to Surface Water Quality and Quantity • Minimize Impacts to Groundwater Discharge
0.1m - 30m	WB-016		

Table 4. Potential Negative Effects and Mitigation Measures for Confirmed Water Bodies within the Project Area

Distance to Project Location	Water Body ID	Potential Negative Effects	Mitigation Measures
		• Reduced groundwater discharge • Reduced stream baseflow and upwelling • Increased water temperatures • Reduced water quality (i.e. increased turbidity) • Increased water quantity to receiving area or water body	
>30m - 120m	N/A	• N/A	• N/A

Detailed information relating to mitigation measures, performance objectives, monitoring commitments and contingency plans for the construction and decommissioning phases can be found in Table 5 below. Table 5 also includes a summary of the likelihood, duration and significance of construction and decommissioning related impacts following the application of recommended mitigation measures. The majority of impacts are highly unlikely and represent very rare events.

Table 5. Detailed Mitigation Measures, Performance Objectives, Monitoring Commitments, and Contingency Plans Recommended During the Construction and Decommissioning Phases of the Project

Mitigation Measure	Details of Proposed Mitigation Measure	Performance Objective(s)	Monitoring Commitment(s)	Contingency Plan(s)	Duration and Significance of Impacts
Minimize Disturbance to Water Body Banks	• Clearly delineate work area using erosion fencing or other suitable barrier to avoid accidental damage or removal of retained species. • Erect erosion fencing, or other barrier, to correspond to the disturbance area limits. • Place the erosion fencing, or other barrier, as far away as practical from the water body, and where possible from the average annual high water mark of the water body (e.g. bankfull level or top of bank). • The on-site environmental monitor may also consider substituting other demarcating types for fencing, such as staking and flagging, where it is determined that there is no apparent risk to water bodies. • Locate directional drilling entry/exit shafts beyond the top of bank, at a distance that allows the minimum depth, as established by geotechnical studies, to be reached while below the water body. This distance should be agreed upon with regulatory agencies. • Operate construction equipment (i.e., cranes, back hoes etc.) in a manner that minimizes disturbance to the water body banks and stays outside of the water body and bank area. • Implement riparian planting after construction, as soon as weather permits, to stabilize water body banks and encourage rapid re-vegetation of disturbed soils. This will aid in preventing bank collapse and erosion, which, in turn, will minimize sedimentation and protect sensitive ecological functions that occur in water bodies. • If insufficient time is available in the growing season to establish vegetative cover, overwintering treatments could be applied, such as erosion control blankets, fiber matting, rock (i.e. large, clean angular rocks) reinforcement/armoring or equivalent to contain the site over the winter period. Plant vegetative cover as soon as is feasible in the next growing season, followed by maintenance and inspection.	To avoid accidental damage to water body banks or removal of riparian vegetation adjacent to water bodies.	• Undertake regular monitoring of the work delineation fencing at a minimum frequency of once per month to ensure damage has not occurred to the fencing, and boundaries are clearly delineated and respected when construction is occurring within 30m of a water body.	• Accidental damage to riparian vegetation may require re-planting of similar, native species, depending on the extent of damage incurred.	• Unlikely • Highly localized • Temporary • Not significant*
Minimize Spills	• Clearly delineate the work area and place the fencing/barriers, as far away as practical from the average annual high water mark of the water body (e.g. bankfull level or top of bank). • Locate drilling entry/exit shafts beyond the top of bank, at a distance that allows the minimum depth, as established by geotechnical studies, to be reached while below the water body. This distance should be agreed upon with regulatory agencies. • Develop a Spill Response Plan (SRP) prior to commencement of construction and train staff on appropriate procedures. • Keep emergency spill kits on site at all times. • Keep contact information for the MOECC Spills Action Centre in a designated area on-site. • Dispose of waste material by authorized and approved off-site vendors. • Store fuel, hazardous materials, and other construction related materials securely away from any drainage features. • Locate construction staging areas a minimum of 30m away from any water body. • Locate all vehicle refueling or washing stations a minimum of 30m from any water body. • Develop and implement an emergency 'frac-out' response plan including steps to contain, monitor and clean-up in response to the event. • Horizontal directional drilling should be executed at a minimum depth established by geotechnical studies to limit the potential impacts associated with the possibility of a 'frac-out'.	To prevent contamination of water bodies, minimize spills	• Regular environmental monitoring will occur at least once every 2 weeks during the construction and decommissioning phase to ensure vehicle refueling and storage of chemicals is occurring more than 30m from any water body. • An on-site environmental monitor will be present when active directional drilling is occurring within 30m of a water body to identify frac-out, if it occurs.	• In the event of a spill, notify the MOECC Spills Action Centre, immediately stop work, and ensure all efforts are made to completely remediate affected areas, especially prior to rain events. • If a spill occurs within a water body, the on-site environmental monitor will be notified and a follow-up site inspection will be conducted to document extent of degradation of the features, if any. • If degradation of a water body occurs as a result of the spill, appropriate contingency measures will be implemented, which may include re-establishing mitigation measures, habitat remediation, and/or seeding of banks and/or riparian areas in permanently damaged areas depending on the extent of degradation incurred. • If 'frac-out' occurs, immediately implement 'frac-out' contingency plan.	• Highly unlikely • Highly localized • Temporary • Not significant*
Minimize Impacts to Infiltration	• Minimize the use of impervious surfaces, where practical, such as utilizing and contouring permeable surface material (i.e. gravel) to increase infiltration, and reduce surface water runoff. • Minimize vehicle traffic on exposed soils during site clearing, grubbing,	To minimize impacts to infiltration and changes in surface drainage patterns and run-off	• Undertake regular monitoring of the work delineation fencing at a minimum frequency of once per month to ensure damage has not occurred to the fencing,	• No contingency plan required.	• Likely minimal • Localized • Temporary • Not significant*

Table 5. Detailed Mitigation Measures, Performance Objectives, Monitoring Commitments, and Contingency Plans Recommended During the Construction and Decommissioning Phases of the Project

Mitigation Measure	Details of Proposed Mitigation Measure	Performance Objective(s)	Monitoring Commitment(s)	Contingency Plan(s)	Duration and Significance of Impacts
	grading and topsoil removal. • Confine construction equipment to designated, controlled vehicle access routes to minimize the potential for soil compaction. • Clearly delineate work area using erosion fencing or other suitable barrier to avoid accidental damage to water body banks or removal of riparian vegetation. • Place the erosion fencing, or other barrier, as far away as practical from the water body from the average annual high water mark of the water body (e.g. bankfull level or top of bank). • Avoid construction during high volume rain events and substantial snow melt/thaw events, where possible, to avoid risk of soil compaction. •		and boundaries are clearly delineated and respected when construction is occurring within 30m of a water body. • Regular environmental monitoring will occur during the construction and decommissioning phase.		
Minimize Erosion and Sedimentation	• Develop and implement an erosion and sediment control (ESC) plan. • Install, monitor, and maintain ESC measures (i.e. erosion fencing) around the Project Location for the duration of the construction or decommissioning activities, as identified within the ESC plan. • Clearly delineate work area using erosion fencing or other suitable barrier to avoid accidental damage or removal of retained species. • Erect erosion fencing, or other barrier, to correspond to the construction disturbance area limits and as far away as practical from the average annual high water mark of the water body (e.g. bankfull level or top of bank). • Depending on site-specific conditions, such as steep topography and the presence of direct, or regular, surface water flow, the on-site environmental monitor may consider substituting other styles of fencing, when appropriate. • Utilize erosion blankets, silt fencing, straw bales, etc. for construction. • Store any stockpiled material more than 30m from the average annual high water mark of water bodies (e.g. bankfull level for intermittent/permanent watercourses). • Schedule grading to avoid times of high runoff volumes, wherever possible. • Where possible, time clearing, grubbing, and grading activities to avoid seasonally wet periods (i.e., spring and fall). • Collect directional drill cuttings as they are generated and placed in a soil bin or bag for off-site disposal. • Re-vegetate areas adjacent to water bodies, and directional drill entry/exit pits, to pre-construction conditions as soon as practical after construction activities are complete. • Schedule construction activities within 30m of a water body to occur within the low flow period of the late summer months, where possible, to avoid or minimize impacts. • Remove construction debris from the site and stabilize stockpiles, where practical, to prevent debris from entering the nearby water bodies. • Develop a Flood Response Plan (FRP) to deal with on-site flooding in order to mitigate any possible effects to the aquatic environment.	To avoid sedimentation or erosion of water bodies.	• Undertake regular monitoring and routine inspections to ensure proper installation of erosion control measures are in place. • Monitor sediment and erosion control measures, such as erosion fencing, and check dams daily in areas where work is taking place, and prior to, during, and after any storm events or significant snowmelt events. • During extended rain or snowmelt periods, monitoring erosion control measures daily. • Monitor sediment and erosion control measures monthly in areas where active construction is not occurring until the construction phase is complete. • Undertake regular monitoring of the work delineation fencing at a minimum frequency of once per month to ensure damage has not occurred to the fencing, and boundaries are clearly delineated and respected when construction is occurring within 30m of a water body.	• If deficiencies in sediment and erosion control measures are noted, the on-site environmental monitor will notify the general contractor and the Proponent and recommend remedial actions. • Silt fencing, or other applicable sediment and erosion control measures, that is not working properly will be corrected. • If sedimentation and erosion control measures fail and/or degradation of a water body occurs, appropriate contingency measures will be implemented, which may include re-establishing mitigation measures, water body clean out and/or bank stabilization, depending on the extent of degradation incurred. • Repair or replace any damaged fencing immediately upon discovering an issue.	• Highly unlikely • Localized • Temporary • Not significant*
Minimize Impacts to Groundwater Discharge	• Monitor rate of water pumping and timing to meet requirement of less than 50,000L per foundation site per day. If a volume of 50,000 L/day per foundation site is surpassed but is less than 400,000 L/day per foundation site, then registration on the MOECC's Environmental Activity and Sector registry (EASR) for Water taking may be required. If the Project encounters extraordinary conditions (i.e. an infrequent storm event) that necessitate additional water takings (i.e. construction dewatering) beyond 400,000 L/day per foundation site, the local MOECC District Office will be contacted and consulted on direction on how to address the situation to allow the Project to proceed in a timely	To minimize direct impacts to water quantity/quality in water bodies.	• Monitor water levels of adjacent water body during groundwater dewatering activities to determine if activities are resulting in alteration of water levels within the water body. • Adhere to MOECC water quality Policy 1 and 2 Standards for discharging to water bodies. • Monitor end point of dewatering discharge for water quality and erosion (if	• If impacts to groundwater discharge occur as a result of construction activities, the MNRF will be notified of appropriate contingency measures that will be implemented.	• Highly unlikely • Temporary • Not significant*

Table 5. Detailed Mitigation Measures, Performance Objectives, Monitoring Commitments, and Contingency Plans Recommended During the Construction and Decommissioning Phases of the Project

Mitigation Measure	Details of Proposed Mitigation Measure	Performance Objective(s)	Monitoring Commitment(s)	Contingency Plan(s)	Duration and Significance of Impacts
	manner while maintaining environmental protection. • Restrict taking of groundwater and surface water during extreme low flow time periods. • Control quantity and quality of stormwater discharge using best management practices, and avoid direct discharge into wetlands, SWHs, and Generalized SWHs. • When discharging to a water body follow the ESC Plan and implement best management practices to avoid degradation of the water body. • If discharging to a municipal storm sewer system, ensure that water quality meets the objectives of the municipal storm sewer by-law prior to discharge. • Obtain water quality and turbidity samples prior to discharge to ensure the quality is suitable for discharge and will not result in an impact to the receiving water body. If the water quality is not suitable for discharge, identify alternate disposal locations or undertake all practical measures to upgrade water quality prior to discharge.		dewatering). • Conduct daily erosion checks during discharge of water. • Monitor water quality (turbidity) prior to discharge, once a week thereafter or as described by agencies.		
Minimize impacts to surface water quality and quantity	• Clearly delineate work area using erosion fencing, or other barrier, to minimize potential impacts to water quality which may result from loss of riparian vegetation. • Erect erosion fencing, or other barrier, to correspond to the disturbance area limits. • Place the erosion fencing, or other barrier, as far away as practical from the average annual high water mark of the water body (e.g. bankfull level or top of bank). • Locate drilling entry/exit shafts beyond the top of bank, at a distance that allows the minimum depth, as established by geotechnical studies, to be reached while below the water body. This distance should be agreed upon with regulatory agencies. • On site speed limits will be clearly posted, applied, and followed by construction staff to reduce fugitive dust. • Apply dust suppressants to unpaved areas when necessary to suppress dust, as determined by the on-site environmental monitor and general contractor. Application frequency will vary, but will be determined by site specific weather conditions, including recent precipitation, temperatures, and wind speeds. Install wind fences, where determined to be necessary by the on-site environmental monitor. Installation of these fences will depend on site-specific conditions, including wind speeds, topography, land cover, and the extent of surrounding natural wind breaks. • Restrict taking of groundwater and surface water during extreme low flow time periods. • If in-water work is required (e.g. for culvert installation and or electrical collector line installation), adhere to required timing windows confirmed through consultation with regulatory agencies, including the MNRF. • If required, perform in-water work in dry conditions, where possible. • Where work in dry-conditions is not possible, short-term, isolated surface water dewatering is required. • Prior to dewatering, isolate the work area with the installation of a temporary water containment structure. The structure should form an impermeable enclosure that will prevent debris and sediment from escaping into the surrounding water body. • Construct a by-pass channel to maintain flow through the water body and prevent back flooding, which could ultimately overtop the water containment structure. • Obtain applicable permits, where required, for surface water dewatering. • Prior to surface water dewatering, obtain a Fish Salvage Plan, prepared	To prevent degradation of surface water quality and changes in water quantity related to construction activities.	• Follow the ESC Plan monitoring commitments. • When discharging to a different drainage feature, monitor general water quality parameters as required to meet MOECC Policy 1 and 2 standards for discharging to a water body. In addition measure turbidity levels of water to be discharged. If the water quality is not suitable for discharge, identify alternate disposal locations or undertake all practical measures to upgrade water quality prior to discharge. • Monitor water levels immediately before and during dewatering activities, to determine if dewatering activities are resulting in alteration of water levels within the water body. • Monitor the discharge location for dewatering activities to ensure erosion and sedimentation of the receiving water body is not occurring. • Monitor erosion and sediment control systems frequently for effectiveness at a minimum of once daily during discharge activities. Repair deficient controls in a timely manner and using an adaptive management approach when deemed appropriate. • Monitor by-pass channel (if applicable) daily to ensure it is functioning appropriately and water is flowing through as designed. • Undertake regular monitoring of the work delineation fencing at a minimum frequency of once per month to ensure damage has not occurred to the fencing, and boundaries are clearly delineated and respected when construction is occurring within 30m of a water body.	• If reduced water quality (i.e. increased turbidity) as a result of construction activities is observed, the MNRF will be notified of appropriate contingency measures that will be implemented. • Repair or replace any damaged fencing immediately upon discovering an issue.	• Unlikely • Localized • Temporary • Not significant*

Table 5. Detailed Mitigation Measures, Performance Objectives, Monitoring Commitments, and Contingency Plans Recommended During the Construction and Decommissioning Phases of the Project

Mitigation Measure	Details of Proposed Mitigation Measure	Performance Objective(s)	Monitoring Commitment(s)	Contingency Plan(s)	Duration and Significance of Impacts
	by a qualified fisheries biologist and relocate fish to a suitable location, preferably downstream and away from the construction area, as detailed in the plan. • Install an in-stream sediment filter (e.g. Siltsoxx or Filtersoxx) downstream of water containment structure. Dewatering discharge should be dissipated (i.e. splash pads, sand bags, hay bales etc.) and may require splitting discharge to more than one location. • Dewatering discharge rates should be evaluated as to not result in erosion and sedimentation to receiving water body. • If discharging to a municipal storm sewer system, ensure that water quality meets the objectives of the municipal storm sewer by-law prior to discharge. • Re-vegetate disturbed area adjacent to water bodies as soon as practical after construction activities are complete.				
Minimize Fugitive Dust Emission	• On-site speed limits will be clearly posted, applied, and followed by construction staff. • Apply dust suppressants to unpaved areas when necessary to suppress dust, as determined by the on-site environmental monitor and the general contractor. Application frequency will vary, but will be determined by site specific weather conditions, including recent precipitation, temperatures, and wind speeds. • Re-vegetate cleared areas as soon as reasonably practical after construction activities are complete. Install wind fences, where determined to be necessary by the on-site environmental monitor. Installation of these fences will depend on site-specific conditions, including wind speeds, topography, land cover, and the extent of surrounding natural wind breaks. • Install wind fences, where determined to be necessary by the on-site environmental monitor. Installation of these fences will depend on site-specific conditions, including wind speeds, topography, land cover, and the extent of surrounding natural wind breaks.	To minimize fugitive dust deposits within water bodies.	• Undertake regular monitoring and routine inspections to ensure proper fugitive dust control measures are in place. • Monitor dust control measures at a minimum weekly frequency in areas where work is taking place. • Monitor dust control measures at a minimum monthly frequency in areas where active construction is not occurring until the construction phase is complete.	• If fugitive dust is noted, the on-site environmental monitor will notify the general contractor and the Proponent and recommend remedial actions, if necessary. • If fugitive dust control measures fail and degradation of water bodies occurs, appropriate contingency measures will be implemented, which may include re-establishing mitigation measures, and/or seeding of permanently damaged areas depending on the extent of degradation incurred.	• Likely minimal • Area of impact depends on direction and speed of winds • Temporary • Not significant*

**Assuming all mitigation recommendations, monitoring commitments and contingency plans are applied.*

Detailed information relating to mitigation measures, performance objectives, monitoring commitments and contingency plans for the operational phase can be found in Table 6 below. Table 6 also includes a summary of the likelihood, duration and significance of operation related impacts following the application of recommended mitigation measures. The majority of impacts are highly unlikely and represent very rare events.

Table 6. Detailed Mitigation Measures, Performance Objectives, Monitoring Commitments, and Contingency Plans Recommended During the Operational Phase of the Project

Mitigation Measure	Details of Proposed Mitigation Measure	Performance Objective(s)	Monitoring Commitment(s)	Contingency Plan(s)	Duration and Significance of Impacts
Minimize Erosion and Sedimentation	• Schedule grading to avoid times of high runoff volumes, wherever possible. • Where possible, time vegetation clearing or maintenance activities to avoid seasonally wet periods (i.e., spring and fall) and to avoid times of high runoff volumes, wherever practical.	To minimize potential impacts associated with erosion and sedimentation of water bodies.	• No monitoring plan required.	• Accidental damage to riparian vegetation may require re-planting of similar, native species, depending on the extent of damage incurred.	• Highly unlikely • Localized • Temporary • Not significant*
Minimize Spills	• Develop a Spill Response Plan (SPRP) prior to commencement of construction and train staff on appropriate procedures. • Keep emergency spill kits on site at all times. • Keep contact information for the MOECC Spills Action Centre in a designated area on-site. • Dispose of waste material by authorized and approved off-site vendors. • Store hazardous materials in designated areas. • Locate all maintenance activities, vehicle refueling or washing, as well as the storage of chemicals and heavy equipment a minimum of 30m away from water bodies.	Prevent contamination of water bodies. Minimize spills near water bodies.	• No monitoring plan required.	• In the event of a spill, notify the MOECC Spills Action Centre, immediately stop work, and ensure all efforts are made to completely remediate affected areas, especially prior to rain events. • If degradation of a water body occurs as a result of the spill, appropriate contingency measures will be implemented, which may include re-establishing mitigation measures, habitat remediation, and/or seeding of banks and/or riparian areas in permanently damaged areas depending on the extent of degradation incurred.	• Highly unlikely • Highly localized • Temporary • Not significant*

**Assuming all mitigation recommendations, monitoring commitments and contingency plans are applied.*

6.3 Summary of Monitoring Activities

An adaptive management approach to the protection of water bodies requires regular site inspections and monitoring by a designated on-site Environmental Monitor(s) (EM). Understanding the condition of the natural ecosystem throughout all phases of the Project will form the basis upon which to consider altering construction methods, environmental protection measures, and monitoring programs. Ultimately, any determination related to the application of mitigation and contingency measures will be informed by ongoing analyses of monitoring data, and rely on the experience and judgment of the on-site EM in consultation with the LTVCA, MNRF, Ministry of the Environment and Climate Change (MOECC) and Fisheries and Oceans Canada (DFO) as regulatory agencies.

Active construction monitoring will be required at all locations where drainage features and water bodies are located within 120m of the Project Location. General recommended monitoring activities are summarized above in Table 5 for construction-related impacts and Table 6 for operation-related impacts.

7.0 Summary and Conclusions

A detailed assessment of the water bodies within and adjacent to the proposed Project occurred through a detailed records review and site investigation conducted by NRSI biologists (NRSI 2017).

Through the completion of site-specific assessments, NRSI confirmed the presence of 32 water bodies within the Project Area, all of which were identified as permanent or intermittent drainage features. Of these 32 water bodies, 18 were identified as crossing the Project Location. Each of the crossing locations involves at least one type of project component, but may involve multiple project components (i.e. access road and underground or overhead electrical collector lines). Of the remaining water bodies, 8 are found within 30m and 6 are found between 31-120m of the Project Location at their closest point, without specifically overlapping the Project Location.

No lakes, lake trout lakes or seepage areas were identified within the Project Area.

If recommended mitigation measures are employed as described in this report, no significant impacts are anticipated on the identified water bodies as a result of the development of the Project.

8.0 References

DNV-GL. 2017a. Romney Wind Energy Centre: Construction Plan Report. February 2017.

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Map 1
Project Area and Natural Features

Map 1

Romney WEC

Project Area and Natural Features

Legend

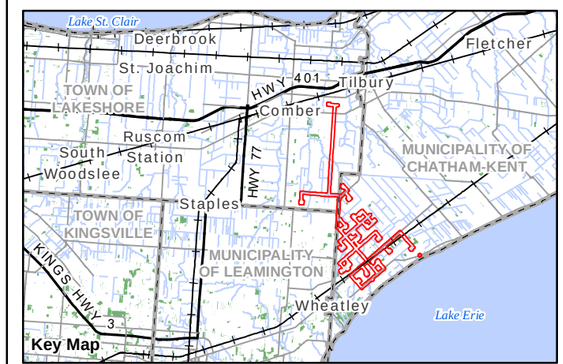
- Utility Line
- Railway
- Highway
- Primary Road
- Secondary Road

Project Components

- Project Area
- Project Location
- Proposed Turbine
- Proposed Meteorological Tower
- Proposed Collection Line
- Proposed Access Road
- Proposed O&M Building

Natural Features

- Permanent Watercourse
- Intermittent Watercourse
- Open Water
- Wooded Area



NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project:1736C
Date: February 14, 2017

NAD83 - UTM Zone 17
Size: 11x17"
1:68,000

0 1 2 3 4 Kilometers

N

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Map 2
Water Body Assessment Key Map

Map 2

Romney WEC

Key Map

Legend

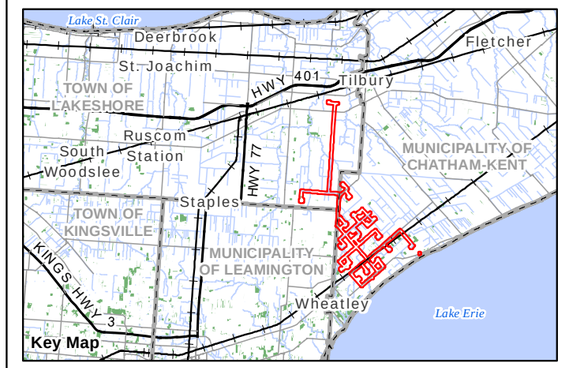
- Map Extent
- Utility Line
- Railway
- Highway
- Primary Road
- Secondary Road

Project Components

- Project Area
- Project Location
- Proposed Turbine
- Proposed Meteorological Tower
- Proposed Collection Line
- Proposed Access Road
- Proposed O&M Building

Natural Features

- Permanent Watercourse
- Intermittent Watercourse
- Open Water



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Project:1736C Date: February 24, 2017	NAD83 - UTM Zone 17 Size: 11x17" **1:68,000**

0 1 2 3 4 Kilometers

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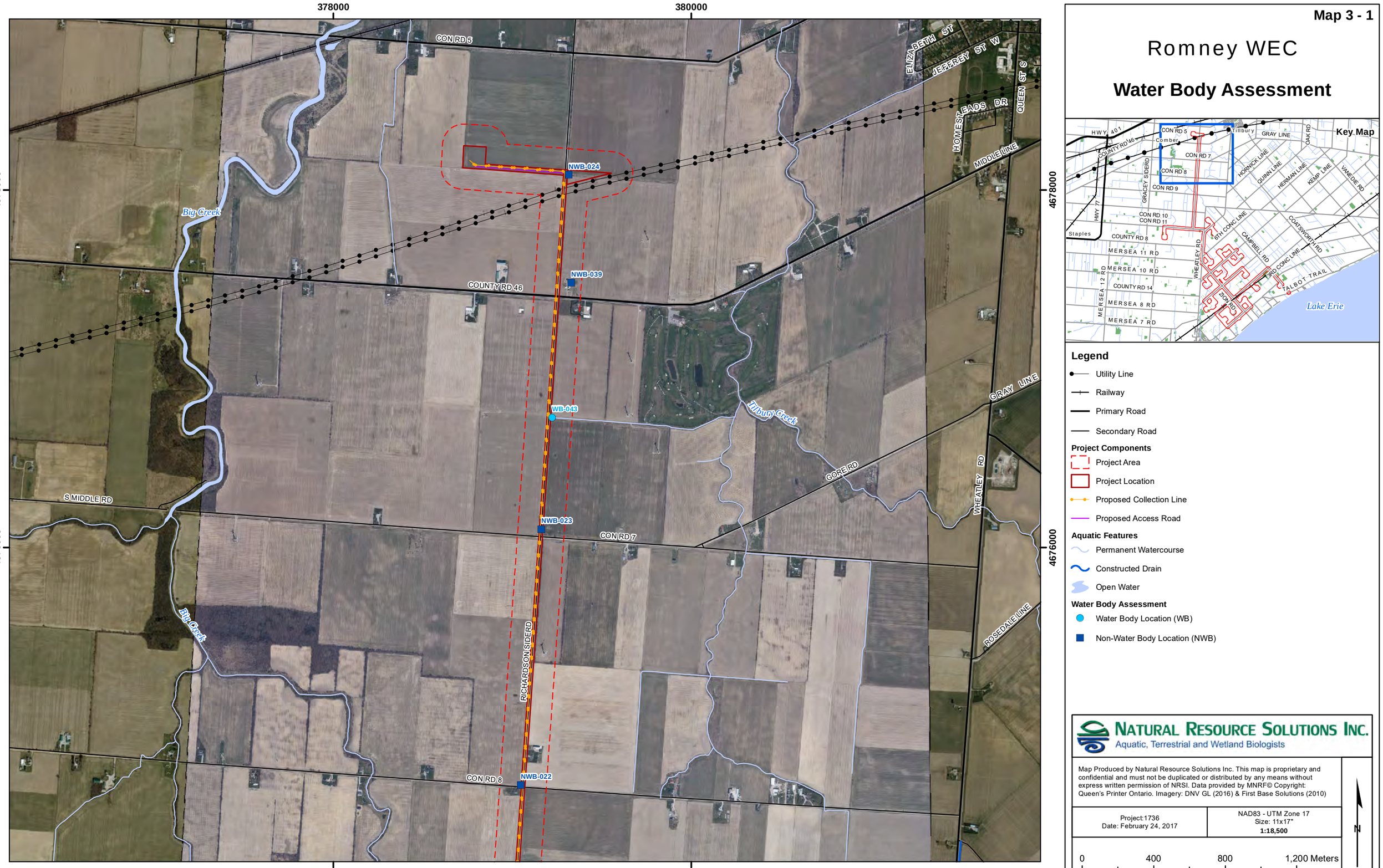
Maps 3-1 to 3-5
Water Body Assessment Maps

Map 3 - 1

Romney WEC

Water Body Assessment



Legend

- Utility Line
- Railway
- Primary Road
- Secondary Road

Project Components

- Project Area
- Project Location
- Proposed Collection Line
- Proposed Access Road

Aquatic Features

- Permanent Watercourse
- Constructed Drain
- Open Water

Water Body Assessment

- Water Body Location (WB)
- Non-Water Body Location (NWB)

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Project:1736
Date: February 24, 2017

NAD83 - UTM Zone 17
Size: 11x17"
1:18,500

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0 400 800 1,200 Meters

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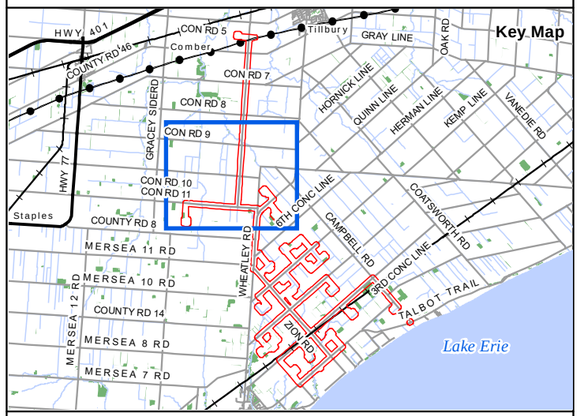
Map 3 - 2

Romney WEC

Water Body Assessment



Legend

- Primary Road
- Secondary Road

Project Components

- Project Area
- Project Location
- Proposed Turbine
- Proposed Collection Line
- Proposed Access Road

Aquatic Features

- Permanent Watercourse
- Municipal Drain
- Constructed Drain
- Open Water

Water Body Assessment

- Water Body Location (WB)
- Non-Water Body Location (NWB)

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Project:1736
Date: February 24, 2017

NAD83 - UTM Zone 17
Size: 11x17"
1:18,500

0 400 800 1,200 Meters

N

376000 378000 380000

4674000 4672000 4670000

CON RD 9 CON RD 10 CON RD 11

RICHARDSON SIDERD GOODREAU LINE CAMPBELL RD TILBURY W & ROMNEY RD WHEATLEY RD 6TH CONC LINE

Big Creek

WB-059 WB-058 WB-057 WB-056 WB-055 WB-054 WB-053 WB-047 WB-046 WB-045 WB-044 WB-049 WB-033 WB-019 WB-020

NWB-028 NWB-027 NWB-040 NWB-026 NWB-025 NWB-032 NWB-031 NWB-030 NWB-043 NWB-021 NWB-012 NWB-011 NWB-010 NWB-014

A1 T1 T17

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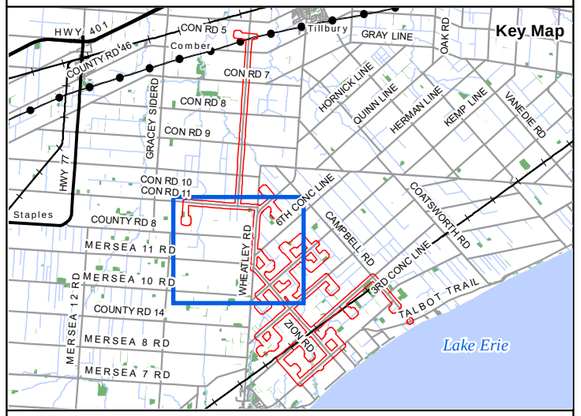
Map 3 - 3

Romney WEC

Water Body Assessment



Legend

- Primary Road
- Secondary Road

Project Components

- Project Area
- Project Location
- Proposed Turbine
- Proposed Collection Line
- Proposed Access Road

Aquatic Features

- Permanent Watercourse
- Municipal Drain
- Constructed Drain
- Open Water

Water Body Assessment

- Water Body Location (WB)
- Non-Water Body Location (NWB)

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Project:1736
Date: February 24, 2017

NAD83 - UTM Zone 17
Size: 11x17"
1:18,500

0 400 800 1,200 Meters

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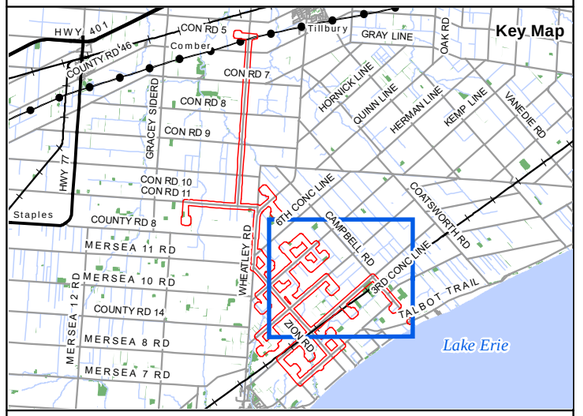
Map 3 - 4

Romney WEC

Water Body Assessment



Legend

- Railway
- Primary Road
- Secondary Road

Project Components

- Project Area
- Project Location
- Proposed Turbine
- Proposed Collection Line
- Proposed Access Road

Aquatic Features

- Permanent Watercourse
- Municipal Drain
- Constructed Drain
- Open Water

Water Body Assessment

- Water Body Location (WB)
- Non-Water Body Location (NWB)

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Project:1736
Date: February 24, 2017

NAD83 - UTM Zone 17
Size: 11x17"
1:20,500

0 400 800 1,200 Meters

N

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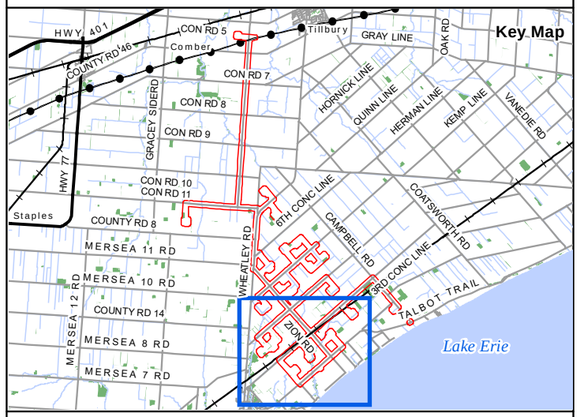
Map 3 - 5

Romney WEC

Water Body Assessment



Legend

- Railway
- Primary Road
- Secondary Road

Project Components

- Project Area
- Project Location
- Proposed Turbine
- Proposed Meteorological Tower
- Proposed Collection Line
- Proposed Access Road
- Proposed O&M Building

Aquatic Features

- Permanent Watercourse
- Municipal Drain
- Constructed Drain
- Open Water

Water Body Assessment

- Water Body Location (WB)
- Non-Water Body Location (NWB)

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Project:1736
Date: February 24, 2017

NAD83 - UTM Zone 17
Size: 11x17"
1:18,500

0 400 800 1,200 Meters

N

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