Niagara Region Wind Farm
Renewable Energy Approval
Amendment
Modification Report #2

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1.0 INTRODUCTION

FWRN LP (the Proponent or FWRN) is developing the Niagara Region Wind Farm (the Project), a 230 MW wind energy project within the Townships of West Lincoln and Wainfleet and the Town of Lincoln within the Niagara Region and within Haldimand County in southern Ontario.

The Project's Renewable Energy Approval (REA) was issued under Ontario Regulation 359/09 of the *Environmental Protection Act*. The REA was issued on November 6, 2014 (EBR #012-0613). Since receipt of the REA and completion of the Environmental Review Tribunal, FWRN has identified the need to make minor amendments (modifications) to the Project as it was described in the REA application documents and subsequently approved by the Ministry of the Environment and Climate Change (MOECC). Modification Report #1 was submitted to the MOECC on October 5, 2015 in support of proposed project design and technical changes, and approved on April 8, 2016.

Since submission of Modification Report #1, FWRN has continued consultation with the Township of West Lincoln in regards to their concerns about the route of the proposed transmission line. Based on ongoing consultation, and at the request of the Township of West Lincoln, FWRN is pursuing a modified alternate transmission line route and associated access trail (the Modification) around the Town of Smithville that will avoid the area proposed for future urban expansion. The proposed Modification will provide project design flexibility to potentially re-route a portion of the approved transmission line to an alternate location if project timelines permit, in accordance with agreements made between the Proponent and the Township of West Lincoln.

This report and its attachments constitute Modification Report #2, and provide information on the proposed Modification. Based upon the classification system outlined in the MOECC's *Technical Guide to Renewable* Energy *Approvals* (MOE, 2013), the Modification is classified as a Project Design Change. As such, this document has been prepared to address the requirements of Chapter 10 "Making Changes to Renewable Energy Approval (REA) Projects" of the Technical Guide.

2.0 SUMMARY AND RATIONALE FOR MODIFICATION

The Project team is continually reviewing design features of the Project layout to consider efficiencies, address stakeholder comments, and further reduce potential environmental impacts. In our opinion, the Modification described below is properly classified as a Project Design Change because it meets the factors set out in Chapter 10 of the *Technical Guide to Renewable Energy Approvals* (MOE, 2013).

2.1 PROJECT DESIGN CHANGE

2.1.1 Modification – Smithville Transmission Line Relocation

The Modification involves adding a new alternate transmission line route around the Town of Smithville to avoid areas proposed for future urban expansion. This Modification is being considered as a potential alternative at the request of the Town of West Lincoln and is intended to provide project design flexibility to potentially re-route a portion of the transmission line to an alternate location if project timelines permit. In the event that the amendment is not feasible in the required Project timeframe, the transmission line will follow the original alignment approved through the REA.

The Modification would consist of an overhead transmission line constructed westward along Regional Road 20 from the intersection of South Grimsby Rd. 6 to an existing unopened road allowance, then northward along the unopened road allowance where the proposed route extends onto private agricultural lands just before Young Street. The proposed alternate route then follows Young Street eastward to its approved location at South Grimsby Rd. 5. The location of the revised footprint is presented in the attached figures (Appendix A) and is discussed in the following sections.

The alternative route will consist primarily of an overhead transmission line, with one section of underground line being installed beneath the existing Hydro One Networks Inc. (HYDRO ONE) transmission lines and a portion of provincially significant wetland (PSW) immediately north of the HYDRO ONE lines. An access trail following the transmission route will be constructed (including installation of appropriate culverts) along the unopened right of way and on the private lands south of Young Street, to provide access to the Modified Alternate Transmission Line. Some vegetation removal and pruning along the unopened right of way will and on private lands will be required to accommodate the proposed access trail and transmission line.

The construction, installation and decommissioning activities for the transmission line will be completed in the same manner as described in the Construction Plan Report and Decommissioning Plan Report, submitted as part of the REA application.

Based on the description above, we propose that the Modification would qualify as a Project Design Change because there is a minimal increase in negative environmental effects that may occur or are likely to occur as a result of the Modification.

The following rationale is provided:

- The Modification revises the boundary of the original Project Location by introducing a new alternate transmission line route;
- There is no increase in the overall impact at the receptors (i.e. no noise impacts);
- The Modification requires an additional Stage 2 Archaeological Assessment (AA) on lands not previously assessed, but does not require additional Stage 3 AA work;
- The Modification requires undertaking additional natural heritage work on lands not previously assessed (i.e. new project footprint and zone of investigation (ZOI));
- The Modification requires reconfirmation of written comments for archaeology and cultural heritage from the Ministry of Tourism, Culture and Sport (MTCS) and for natural heritage from the Ministry of Natural Resources and Forestry (MNRF); and
- There is no substantial increase in negative environmental effects that occur or are likely to occur as a result of the Modification.

As a result, the Modification described above is properly classified as a Project Design Change based on the factors set out in Chapter 10 of the *Technical Guide to Renewable Energy Approvals* (MOE, 2013).

3.0 RESULTS OF EFFECTS ASSESSMENT FOR THE PROJECT MODIFICATION

Ontario Regulation 359/09 requires that any adverse environmental effects that may result from construction, installation, operation and maintenance, and decommissioning activities be described. The term "environment" in Ontario Regulation 359/09 has the same meaning as in the *Environmental Protection Act*, and includes the natural, physical, cultural, and socio-economic environment.

A screening to identify any new environmental effects that would require additional mitigation or monitoring measures beyond those outlined in the REA documents as a result of the Modification was completed.

In summary, the proposed Modification will not result in increased net negative environmental effects that will or are likely to occur beyond those originally identified, documented and consulted on during the REA process for the original project.

3.1 IMPACTS ON STUDIES/ REA REPORTS

The REA reports require a material change to the content as a result of the Modification. The following sections identify the steps taken to identify any new environmental effects and the results of the screening. A summary of the amendments required to the sections and figures in each REA report and the applicable text change is provided in Table 1.

3.1.1 Natural Heritage Assessment and Environmental Impact Study

The Natural Heritage Assessment and Environmental Impact Study (NHA/EIS) included in the REA application identified natural features within the Project Location and the associated ZOI within 50 m of the Project Location. A technical review was conducted to determine if the Modification results in (a) a change to the identification of natural features within 50 m of the new Project Location or (b) a change to the assessment of impacts and mitigation measures.

The Project Location associated with the Modification was not previously assessed as part of the NHA/EIS accepted by the Ministry of Natural Resources and Forestry (MNRF) in their Confirmation Letter dated April 2, 2013, which was subsequently submitted as part of the REA application for the Project. As such, additional NHA/EIS work was required to support this Modification. A copy of the NHA/EIS addendum is provided in Appendix B.

Following the same methods used in the original NHA/EIS, a records review was conducted for the new portions of the ZOI to determine if known natural features are present in the area of the Modification. According to the Natural Heritage Information Centre (NHIC, 2015) and Land Information Ontario (LIO, 2015) databases, one area of Provincially Significant Wetland (PSW)

was identified within the new portions of the modified ZOI: Lower Twenty Mile Creek PSW Complex. This feature is also identified as a significant woodland and deer winter congregation area (NHIC, 2015). No rare species were identified as potentially occurring in the new ZOI. No additional changes are required to the Records Review of the NHA/EIS.

Site investigations along the alternate transmission line route were completed, as land access permitted, on foot to identify and confirm the presence of candidate significant natural features in and within 50 m of the proposed Modification. Where uncertainty existed a conservative approach was taken and a feature was treated as significant for the purposes of the NHA/EIS.

Wetland boundaries of the Lower Twenty Mile Creek Wetland Complex were delineated in the field by Anne Yagi (Guelph District MNRF) on October 20 and November 9, 2015. Wetland communities are shown on Figures in the NHA/EIS Addendum (Appendix B), including new wetland features we442 and we444. The modified ZOI includes woodland features that were not listed in the original NHA/EIS: wo225, wo226, wo227 and wo228. Woodlands wo225 and wo226 were evaluated as significant and carried forward to the EIS.

The following candidate SWH features were identified through the Site Investigation:

- One (1) new candidate significant amphibian breeding (woodland) habitat – ah93. The project does not occur in the boundary of this candidate wildlife habitat feature, but does occur within 50 m of the feature. In accordance with Appendix D of the NHAG (MNRF, 2012) it is treated as generalized SWH;
- One (1) new candidate significant amphibian breeding (woodland) – ah92. The project does not occur in the boundary of this candidate wildlife habitat feature, but does occur within 50 m of the feature. In accordance with Appendix D of the NHAG (MNRF, 2012) it is treated as generalized SWH;
- Two (2) new candidate significant woodland habitats for S1-S3 and special concern breeding bird species including Wood Thrush, White-eyed Vireo, Louisiana Waterthrush, Hooded Warbler, Canada Warbler, and Red-headed Woodpecker
    - SC01 - The project does not occur in the boundary of this candidate wildlife habitat feature, but does occur within 50 m of the feature. In accordance with Appendix D of the NHAG (MNRF, 2012) it is treated as generalized SWH;
    - SC02 – The Project occurs in this feature and it is carried forward to EOS;
- Two (2) new candidate significant bat maternity colonies, including for species of conservation concern Tricoloured Bat
    - bmc56 - The project does not occur in the boundary of this candidate wildlife habitat feature, but does occur within 50 m of the feature. In accordance with Appendix D of the NHAG (MNRF, 2012) it is treated as generalized SWH;
    - bmc57 – The Project occurs in this feature, and it is carried forward to EOS; and,

- One new candidate terrestrial crayfish habitat- tch1. The project does not occur in the boundary of this candidate wildlife habitat feature. In accordance with Appendix D of the NHAG (MNRF, 2012) it is treated as generalized SWH.

The following features have been carried forward directly to the EIS:

- the generalized candidate significant wildlife habitat is treated as significant in accordance with Appendix D (MNRF, 2015); and
- the deer winter congregation area habitat has been evaluated and ranked as significant by the MNRF, and does not require further evaluation. Forested ecosites are the habitat type considered to provide significant wildlife habitat for deer winter congregation areas (MNRF, 2015). The deer winter congregation area occurs in association with the boundaries of woodland feature wo225 as confirmed during the site investigation.

The following significant features were identified in, or within 50 m of, the modified transmission line project location and required an environmental impact study (Appendix B):

- Wetlands (we15, we442, we444)
- Woodlands (wo225, wo226)
- Wildlife Habitat
  - S1-S3 and special concern breeding bird species- SC02
  - Bat maternity colonies, including for species of conservation concern Tricoloured Bat – bmc57
  - Deer winter congregation areas , and,
  - Generalized wildlife habitat (AH92, AH93, bmc56, SC01 and tch1).

The following pre-construction EOS surveys are required: breeding bird surveys (targeting Wood Thrush, Eastern Wood-Pewee, White-eyed Vireo, Louisiana Waterthrush, Hooded Warbler, Canada Warbler, and Red-headed Woodpecker), and bat maternity roost surveys, including for Tricoloured Bat. The results of these surveys will be communicated to the MNRF in the form of a letter report, prior to construction.

Table 1 notes that required changes are reflected in the NHA/EIS Addendum (Appendix B). Application of existing mitigation measures from the NHA/EIS are required for the new sections of the transmission line. These required mitigation measures have been outlined within the NHA addendum (see Appendix B).

The line will be installed in accordance with the Construction Plan Report. Construction monitoring and contingency measures for the identified significant wetlands, significant wildlife habitats and significant woodlands will follow those in Sections 6.5 and 6.6 of the original NHA/EIS and those identified in the NHA/EIS Addendum (Appendix B).

The NHA/EIS Addendum concludes that the Modification can be implemented with no new net negative environmental effects. See NHA/EIS Addendum (Appendix B to this Modification document) for correspondence with the MNRF, and documentation of the additional assessment undertaken and associated recommendations provided.

3.1.2 Water Assessment and Water Body Report

The Water Assessment and Water Body Report (WAWBR) included in the REA application identified water bodies within the Project Location and the associated ZOI within 120 m of the Project Location. A technical review was conducted to determine if the Modification results in: (a) a change to the identification of water bodies within 120 m of the new Project Location; and (b) a change to the assessment of impacts and mitigation measures.

The revised Project Location and associated ZOI were not previously assessed as part of the WAWBR that was submitted as part of the original REA application. As such, additional assessment was required for the Modification. A records review was completed for the modified ZOI to identify potential water bodies within 120 m of modified Project Location. Based on available mapping and aerial photographs, two water bodies were identified within the ZOI. Additional site investigations, conducted to confirm the status of these water bodies, determined that the two mapped features meet the definition of a water body under Ontario Regulation 359/09. The two water bodies result in a total of three potential water body crossing locations for the Modification that were not previously assessed. Additionally, a new access trail is proposed which would require culverts to convey the flow of the water bodies at two of the three potential crossing locations. Final culvert locations will be determined during detailed design.

Changes are required to the assessment of potential impacts as presented in the WAWBR as a result of the Modification. Table 1 provides a summary of the changes required. Potential impacts identified in Table 4.2, and Sections 5.1, 5.3, and 5.4, as well as mitigation measures identified in Table 4.2, and Sections 6.1, 6.3, and 6.4 of the original WAWBR are applicable to the Modification. Construction methods and proposed mitigation measures associated with the Modification will be consistent with those approved for the construction and operation of the existing transmission line route. The access trail will be constructed in the same manner as those associated with turbine locations and will result in the same impacts and mitigation measures.

It was concluded that the Modification can be implemented with no new net negative effects to water bodies.

3.1.3 Heritage Impact Assessment

The Project Location associated with the Modification was not previously assessed as part of the Heritage Assessment Report that was submitted as part of the original REA Application and was accepted by the Ministry of Tourism, Culture and Sport (MTCS) in their Confirmation Letter dated April 12, 2013. As such, additional assessment was required for this Modification to determine if

heritage resources were present in vicinity to the proposed alternate transmission line route and if there are any anticipated impacts as a result. See Appendix C for a copy of the Heritage Assessment addendum.

The site visit resulted in the identification of four potential heritage resources along the proposed alternate transmission line route. Following evaluation, two of these properties were determined to represent heritage resources. An assessment of the potential impacts of the proposed alternate transmission line route was undertaken. It was determined in both cases that the proposed route had the potential to impact the heritage resources and therefore mitigation options were prepared. Based on the findings, the recommendations contained within the 2013 *Heritage Assessment, Niagara Region Wind Farm* report should be modified to reflect areas where additional cultural heritage resources and effects resulting from the Project were identified.

Overall, the Modification will result in potential effects not previously identified and mitigated in the heritage assessment and the recommendations should be modified to reflect areas where additional assessment was undertaken.

It was concluded that the Modification can be implemented with no new net negative effects based on appropriate mitigation. See Appendix C for correspondence with the MTCS, including the additional assessment undertaken and associated recommendations provided.

3.1.4 Protected Properties Assessment

The Project Location associated with the Modification, was previously assessed as part of the Protected Properties Assessment that was submitted as part of the original REA Application and was accepted by the Ministry of Tourism, Culture and Sport (MTCS) in their Confirmation Letter dated April 12, 2013. However, a Protected Properties Assessment was completed to confirm no new protected properties were designated within the area of this Modification.

The Township of West Lincoln was contacted to identify properties which may have been listed, designated, or otherwise protected under the *Ontario Heritage Act* since the issuance of the MTCS comment letter in April 2013. Rachelle Larocque, Planner with the Township of West Lincoln, reported that no listing, designation or other forms of protection have been placed on properties in the vicinity of the proposed alternate transmission line route.

Impact assessments contained within the Protected Properties Assessment were determined to remain valid for all properties and the recommendations in that report do not need to be modified.

It was concluded that the Modification will not result in potential effects not previously identified and mitigated in the Protected Properties Assessment.

3.1.5 Stage II Archaeological Assessment

The approved Project Location was previously assessed as part of the 2012 Stage 1 AA and the Stage 2 AA of the Project in the original REA Application. The Stage 1 report was accepted by the MTCS in a Confirmation Letter dated January 4, 2013 and the Stage 2 report was accepted in a Confirmation Letter dated April 5, 2013. Due to proposed changes to the Project Location as a result of the Modification, Stantec was retained to complete a Stage 2 AA of additional lands. The Stage 2 work took place between May 22, 2015 and January 7, 2016. See Appendix C for a copy of the Stage 2 Archaeological Assessment addendum submitted to MTCS. Additional Stage 2 AA work was undertaken on April 18, 2016 to assess the short section of transmission line located on private agricultural lands south of Young Street.

No archaeological sites or artifacts were identified during the initial Stage 2 assessment. The Additional Stage 2 archaeological assessment work in April identified two archaeological locations. No further archaeological assessment of the study area is required. See Appendix C for correspondence with the MTCS, including the additional assessments undertaken and associated recommendations provided for archaeology.

3.1.6 Noise Assessment

The transmission line is not considered a noise source and no additional noise receptors have been identified as result of this Modification. As such, no additional Noise Assessment was required for this Modification and the recommendations contained within the Noise Assessment Report do not need to be modified.

It was concluded that the Modification will not result in potential effects not previously identified and mitigated in the Noise Impact Assessment.

3.1.7 Summary of Impacts/Changes to REA Reports and Studies

The following table provides a list of the REA reports and studies that were reviewed by MOECC in their issuance of the REA, and notes whether changes to the reports are required due to the Modification proposed. As well, an outline of the specific changes or the justification for no change being required is provided. Any changes to the reports have been addressed by issuance of this Modification Report and its appendices.

Table 1: Summary of Impacts/Changes to REA Reports & Studies

REA Reports & Studies	Change (Yes/No)	Figure No.	Discussion of change / Justification for 'no' change
REA REPORTS			
Project Description Report (PDR)	Yes	1, 2.6, 2.7	Relevant figures from Appendix A of the PDR have been updated to display the modified alternate transmission line route and access trail. Section 3.2.5. (Transmission Line and Tap-in Location). Wording would be updated as follows: The transmission line will be installed overhead along municipal road rights of way, and either overhead or underground on private property and where it is proposed to cross the Welland River and associated wetland. The modified alternate transmission line will consist primarily of an overhead transmission line with one section of underground line to be installed beneath the existing HYDRO ONE transmission lines and beneath a portion of PSW immediately north of the HYDRO ONE lines. Section 3.3 (Access Roads). Wording would be updated as follows: In addition, an access trail will be required for construction and maintenance of the modified alternate transmission line. It will be located within the unopened right of way and on private property south of Young Street. Section 3.6 (Water Crossings). Wording would be updated as follows: Access roads, transmission line access trail, underground collector lines and fibre optic cables will require the crossing of permanent and intermittently flowing watercourses, as well as small surface drainage features (e.g., swales). To avoid flooding and to maintain pre-construction flow patterns, flow conveyance will be accommodated at these crossings through the installation of culverts beneath the proposed access roads and transmission line access trail, the size and location of which will be confirmed during detailed design. Appendix D (Summary of Potential Environmental Effects, Mitigation Strategies and Monitoring Plan). References to access roads would include the access trail and references to the transmission line would include the modification.
Construction Plan Report (CPR)	Yes	1, 2.6, 2.7	Relevant figures from Appendix A of the CPR have been updated to display the modified alternate transmission line route and access trail. Table 2.1 (Construction and Installation Activities): The above ground transmission line will be installed in the same manner as outlined in the CPR. The transmission line will be installed underground beneath the existing Hydro One Transmission Lines via trenching or directional drilling. The transmission line will be installed beneath the PSW using directional drilling.

Table 1: Summary of Impacts/Changes to REA Reports & Studies

REA Reports & Studies	Change (Yes/No)	Figure No.	Discussion of change / Justification for 'no' change
			Table 3.1 (Potential Environmental Effects and the Environmental Effects Monitoring Plan during Construction). References to access roads would include the access trail and references to the transmission line would include the Modification.
Design & Operations Report (DOR)	Yes	1, 2.6, 2.7	Relevant figures from Appendix A of the DOR have been updated to display the modified alternate transmission line route and access trail. Section 2.0 (Site Plan). Wording would be updated as follows: Permanent facility components, including: turbine locations, underground and overhead collector lines, fibre optic lines, junction boxes/pad-mounted disconnect switches, transmission lines, turbine access roads, transmission line access trail, two transformer substations, and tap-in location; Section 2.1 (Setback Distances). Wording would be updated as follows: With the exception of where the transmission line may be constructed over the Welland River PSW and under the Lower Twenty Mile Creek PSW Complex and where it runs along a private property boundary adjacent to a significant woodland….no Project Components are located in, on or over significant natural features. Table 3.1 (Key Facility Components). Wording would be updated for the Access Road row as follows: During construction, the access trail associated with the Modified Alternate Transmission Line will be approximately 10 m wide. The trail will remain during the operations phase to access the transmission line but will only be maintained when access to the line is required. Table 3.1 (Key Facility Components). Wording would be updated for the Water Crossings row as follows: Several water crossings varying in length will be installed where access roads and the transmission line access trail cross water bodies or swales so as to maintain existing drainage. Section 3.4 (Use of Unopened Road Allowances). The following unopened road allowance would be added to the list: South Grimbsy Road 6, Township of West Lincoln.Table 5.1 (Summary of the Potential Environmental Effects and the Environmental Effects Monitoring Plan during Operation). References to access roads would include the access trail and references to the transmission line would include the modification.

Table 1: Summary of Impacts/Changes to REA Reports & Studies

REA Reports & Studies	Change (Yes/No)	Figure No.	Discussion of change / Justification for 'no' change
Decommissioning Plan Report	No	n/a	There are no figures within the Decommissioning Plan Report to be updated. References in the Decommissioning Plan Report to transmission lines would include the Modification. In addition, the following wording would be included in Section 3.3.5. (Access Roads): At the time of decommissioning, the access trail used to support the construction and maintenance of the modified alternate transmission line would be decommissioned in consultation with the municipality to determine the degree to which culverts and the trail bed should be removed.
Consultation Report	Yes	n/a	Consultation with government representatives has been undertaken for the proposed Modification to the Project, including MOECC, MNRF and MTCS, and the mechanism to update the project documents and communicate this change to stakeholders is described in Section 3 of this Modification Document.
ADDITIONAL REPORTS			
Natural Heritage Assessment Report	Yes	1, 2.1, 2.2, 3.1, 3.2, 4.1, 4.2, 5.1, 5.2, 6.1, 6.2, 7.1, 7.2, 8	Relevant figures from the NHA/EIS have been updated to display the alternate transmission line route and access trail and new natural features. An addendum to the NHA/EIS has been prepared (see Appendix B) and identifies changes required to the wording of the NHA/EIS.
Water Assessment and Water Body Report	Yes	1, 2a, 3.6, 3.7	Relevant figures from the WAWBR have been updated to display the new alternate transmission line route and access trail and the two new water bodies. Table 4.2 of the WAWBR should be updated to include the proposed Modification and associated watershed reach.
Stage 1 Archaeological Assessment	Yes	Original figures as submitted to the MTCS will not be changed.	No edits are required to the text of the report.
Stage 2 Archaeological Assessment	Yes	Original figures as submitted to the MTCS will not be changed. Eight additional figures have been created to address the Modification.	Two addendum reports to the Stage 2 Archaeological Assessment Report has been prepared (see Appendix C). Figures 1, 2, 3.1, 3.2 and 3.3 of the addendum dated February 12, 2016 identify the Modification. Figures 1, 2 and 3 of the addendum dated April 20, 2016 show the assessment of the short section of transmission line located on private agricultural lands south of Young Street. Wording changes required to the Stage 2 AA report are also provided in the two addendum reports in Appendix C.

Table 1: Summary of Impacts/Changes to REA Reports & Studies

REA Reports & Studies	Change (Yes/No)	Figure No.	Discussion of change / Justification for 'no' change
Heritage Assessment Report	Yes	Original figures as submitted to the MTCS will not be changed. Two additional figures have been created to address the Modification.	An addendum to the Heritage Assessment Report has been prepared (see Appendix C). Figure 1 and Figure 2 of that addendum identify the Modification. Wording changes required to the Heritage Assessment Report are also provided in the addendum.
Protected Properties Assessment	Yes	Original figures as submitted to the MTCS will not be changed.	No edits are required to the text of the report.
Wind Turbine Specifications Report	No	n/a	n/a
Acoustic Assessment Report	Yes	B1	One figure from the Acoustic Assessment Report has been updated to display the new alternate transmission line route and access trail.
Property Line Setback Assessment	No	n/a	n/a

4.0 CONSULTATION

Consultation regarding the proposed Modification will be undertaken with the MOECC, MNRF, MTCS, municipalities, stakeholders and local Aboriginal communities. Details are provided in the subsequent sections.

4.1 GENERAL STAKEHOLDER CONSULTATION

FWRN LP will provide notification to stakeholders included on the Project distribution list regarding the proposed Modification and application to the MOECC for an amendment to the Project's REA. A Notice of Proposed Change to a Renewable Energy Project will be distributed, and will provide an overview of the proposed change, notification that a Modification Report to amend the Project's REA has been submitted to the MOECC for review, and information regarding availability of the Modification Report on the Project website.

The Notice and Modification Report will be posted on the Project website, to ensure the community is adequately informed of the proposed change. The Notice will be mailed to all stakeholders in the newly affected study area, as well as agencies, municipalities, and Aboriginal communities. Email notification will be provided to community members that are on the Project distribution list. The Notice will also be published on at least two separate days in newspapers with general circulation in the Project area.

4.2 AGENCY CONSULTATION

- Consultation regarding the Modification was undertaken with the MOECC via this Modification Document and as per letters submitted to the MOECC dated July 24, 2015 and January 22, 2016 (Appendix D).
- The Notice of Project Change will be provided to the MOECC.
- The MNRF was advised of the Modification through a letter addendum to the NHA/EIS (Appendix B). Written confirmation that the MNRF is satisfied that the NHA requirements of Ontario Regulation 359/09 have been met was received on April 29, 2016 (Appendix B).
- The MTCS was advised of the Modification through a report addendum to the Stage 2 Archaeological Assessments (Appendix C) and a letter addendum to the Heritage Assessment Report (Appendix C). On March 16, 2016, and on April 20, 2016 MTCS provided confirmation that MTCS is satisfied that the fieldwork and reporting for the archaeological assessment are consistent with the ministry's 2011 Standards and Guidelines for Consultant Archaeologists and the terms and conditions for archaeological licences. On April 11, 2016, MTCS provided written confirmation that they are satisfied that the heritage assessment process and reporting are consistent with the applicable heritage assessment requirements established in s. 23 of O. Reg. 359/09.

4.3 MUNICIPAL CONSULTATION

A hard and/or soft copy of this Modification Document will be provided to the following municipalities:

- Township of West Lincoln;
- Township of Wainfleet;
- Township of Pelham;
- Town of Grimsby;
- Town of Lincoln;
- Niagara Region; and
- Haldimand County.

4.4 ABORIGINAL COMMUNITY ENGAGEMENT

A hard and/or soft copy of this Modification Document will be provided to:

- Six Nations of the Grand River;
- Six Nations of the Grand River Haudenosaunee Confederacy Chiefs Council (via HDI);
- Mississaugas of the New Credit First Nation; and
- Métis Nation of Ontario/Niagara Region Métis Council.

5.0 REFERENCES

Land Information Ontario (LIO). 2015. Digital mapping. Available online: https://www.ontario.ca/page/make-natural-heritage-area-map. Accessed: November 2015.

Ministry of Natural Resources and Forestry (MNRF). 2015. Significant Wildlife Habitat Ecoregion 7E Criterion schedule. Available online: http://www.ebr.gov.on.ca/ERS-WEB-External/displaynoticecontent.do?noticeId=MTE1ODc5&statusId=MTczNDgy&language=en.

Natural Heritage Information Centre (NHIC). 2015. Natural Areas and Species records search. Biodiversity explorer, available online: http://www.ontario.ca/page/natural-heritage-information-centre. Ministry of Natural Resources and Forestry, Peterborough.

Ontario Ministry of Natural Resources (OMNR). 2012. Natural Heritage Assessment Guide for Renewable Energy Projects. 109 pp. November 2012.

Ontario Ministry of the Environment. 2013. *Technical Guide to Renewable Energy Approvals*. Queen's Printer for Ontario, 2013.

6.0 CLOSURE

The proposed Modification to the transmission line route has been adequately assessed in accordance with Ontario Regulation 359/09 and the MOECC's Technical Guide. It has been determined that the Modification would not result in new net negative environmental effects or associated mitigation measures beyond those identified as part of the original REA for the Project.

This report has been prepared by Stantec for the sole use of FWRN, and may not be used by any third party without the express written consent of FWRN. The data presented in this report are in accordance with Stantec's understanding of the Project as it was presented at the time of reporting.

Stantec Consulting Ltd.

Prepared by _____
(signature)

Katharine Myrans, Environmental Planner

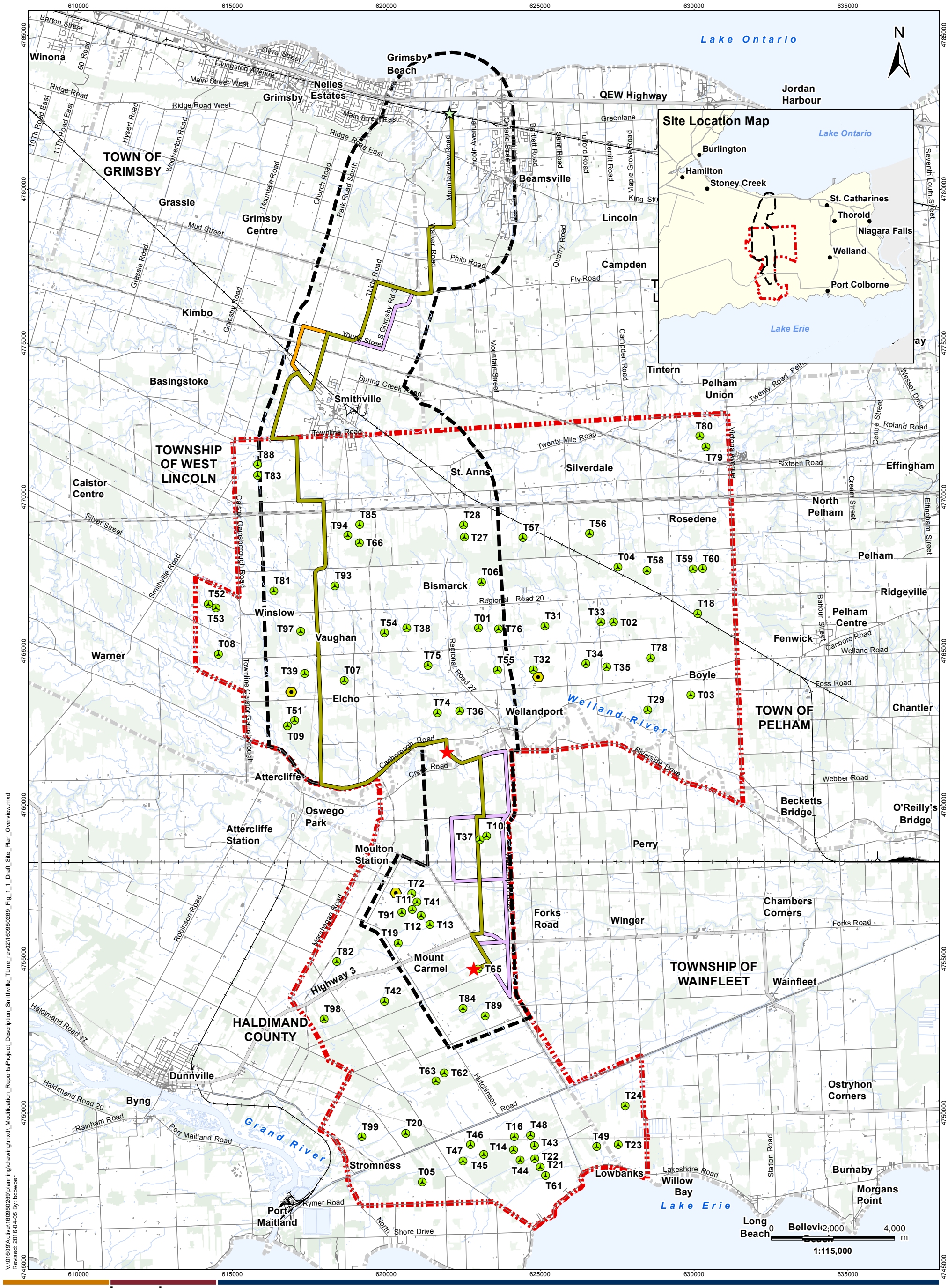
Reviewed by _____
(signature)

Bryan Tripp, Project Manager

APPENDIX A: FIGURES

UPDATED FIGURES FOR THE PROJECT DESCRIPTION REPORT, CONSTRUCTION PLAN REPORT AND DESIGN AND OPERATIONS REPORT

Stantec



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Revised: 2016-04-05 By: bcowper

Legend

- Project Study Area
- Interconnector Study Area
- Proposed Turbine Location
- Transformer Substation
- Tap-in Location
- Existing Met Tower
- Preferred Transmission Line Route (REA)
- Alternate Transmission Route (REA)
- Modified Alternate Transmission Route
- Road
- Expressway / Highway
- Active Railway
- Abandoned Railway
- Existing Structures
- Existing Transmission Line
- Watercourse
- Waterbody
- Wooded Area
- Municipality Lower Tier

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
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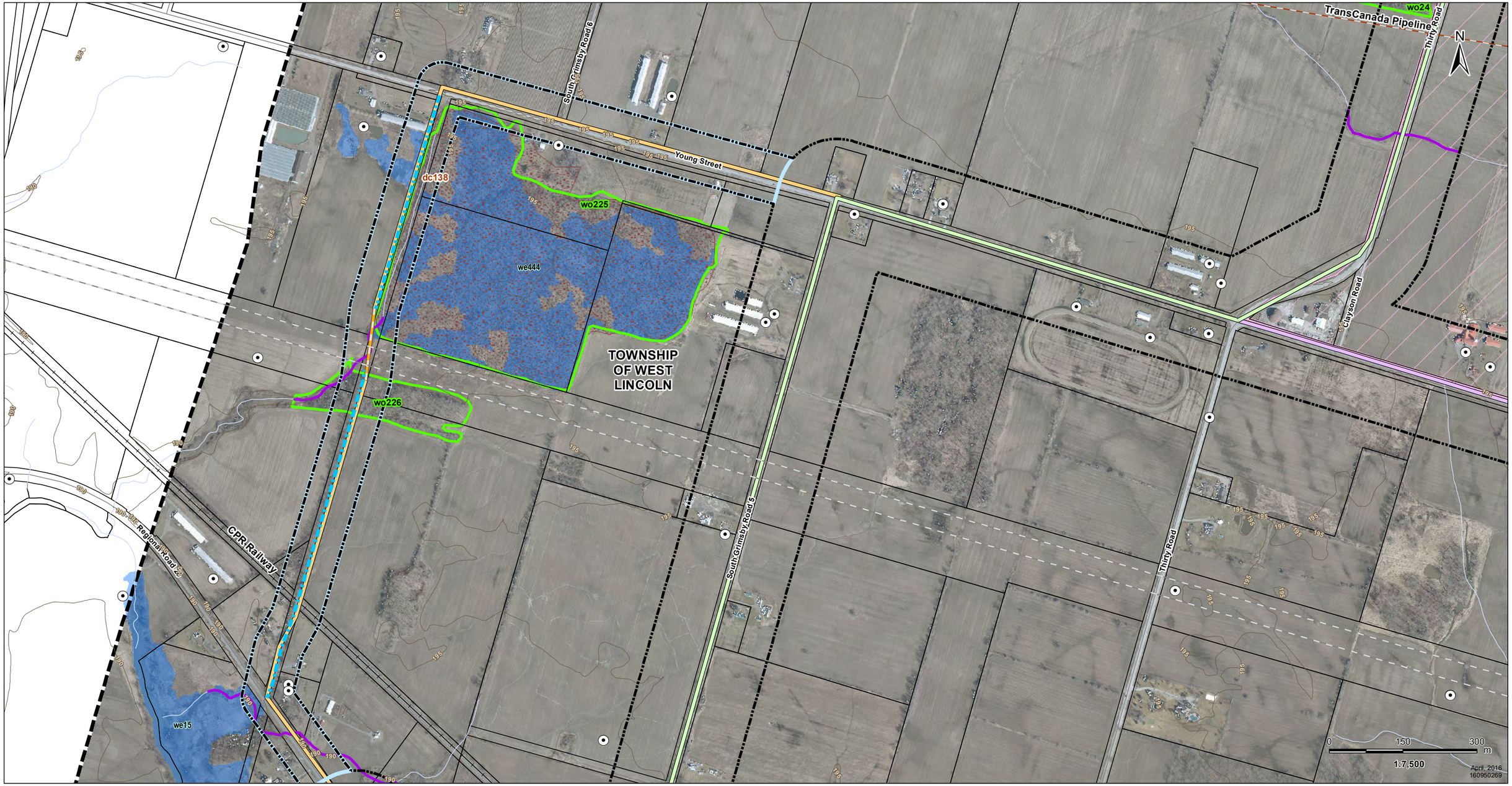
Niagara Region Wind Farm

April 2016
160950269

Figure No.
1

Title
Draft Site Plan Overview Revised

V:\01609\Active\160950269\planning\drawing\mxd_Modification_Reports\Project_Description_Smithville_TLine_rev02\160950269_Fig_02_Site_Plan_With_Socio_Eco_Natural_Features_Mapbook.mxd
Revised: 2016-04-27 By: bcowper



Legend

- Interconnector Study Area
- 120m Zone of Investigation

Zone of Investigation Adjustments
- Area Added
- Preferred Transmission Line Route (REA)
- Alternate Transmission Line Route (REA)

Modified Alternate Transmission Route
- Above Ground
- Underground
- Access Trail

Existing Features
- Road
- Active Railway
- Existing Transmission Line
- Pipeline
- Topographic Contour (mAMSL)
- Watercourse (MNR)
- Waterbody (Stantec)
- Property Boundary
- Greenbelt Plan Area (MMAH)
- Deer Congregation Areas (MNR) (Generalized)

Significant Natural Features
- Woodland Communities
- Wetland Communities
- Water Well (MOE) [5]

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N).
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2011.
3. Orthoimagery source: First Base Solutions, Date Spring 2010.
4. Petroleum Well source: © Ontario Oil, Gas and Salt Resource Library, 2010.
5. MOE Water well locations are approximate and have been positioned based on published UTM coordinates © Queen's Printer for Ontario, 2012.
6. Noise receptors are identified within 1500m of any wind turbine.

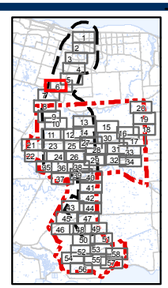


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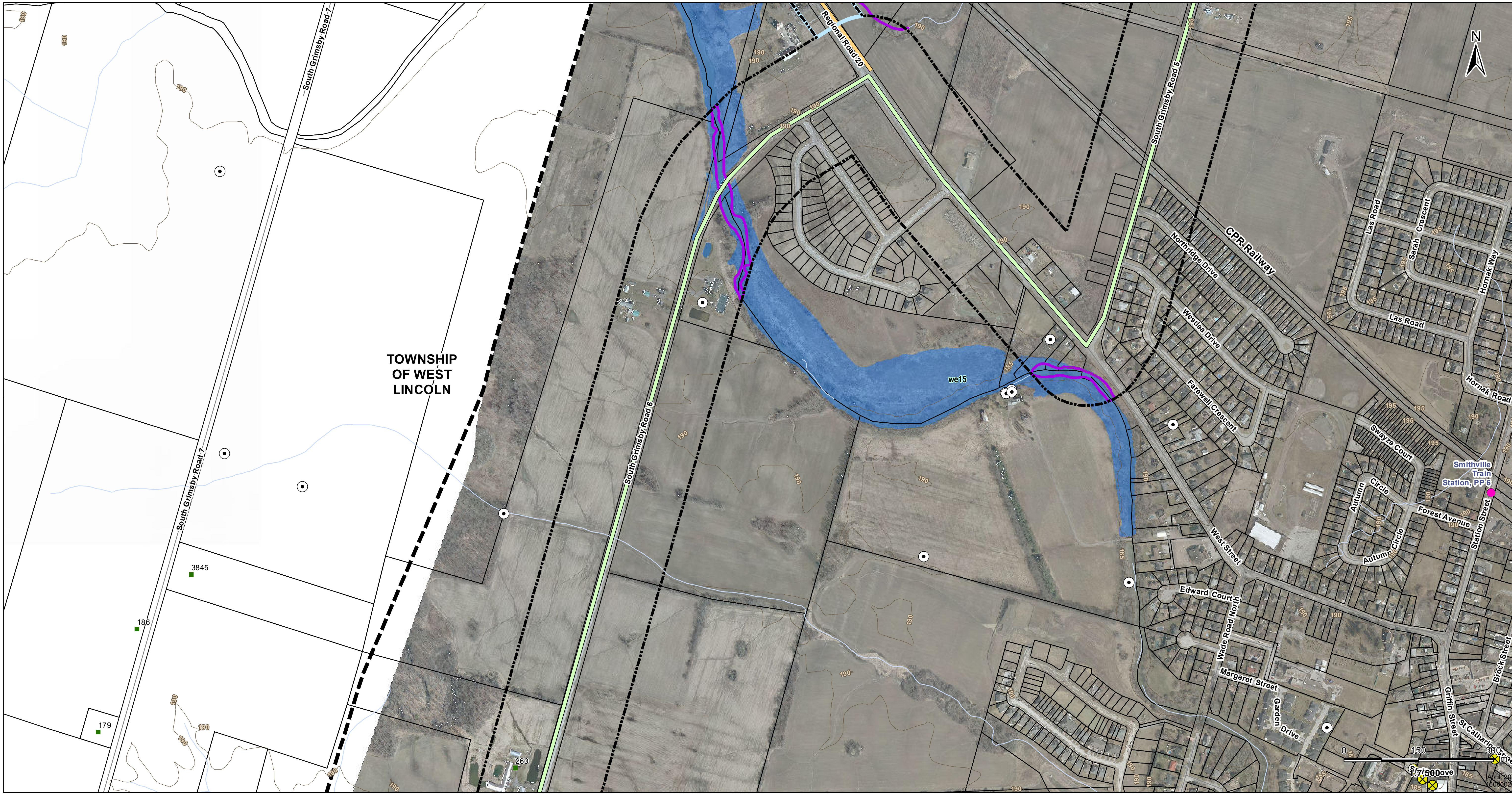
Figure No.
2.6

Title
Site Plan with Socio-Economic Features, Significant Natural Heritage Features and Water Bodies Figure 2.6 Revised



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Revised: 2016-04-27 By: bcowper

Legend

- Interconnector Study Area
- 120m Zone of Investigation

Zone of Investigation Adjustments

- Area Added
- Preferred Transmission Line Route (REA)

Modified Alternate Transmission Route

- Above Ground

Existing Features

- Road
- Active Railway
- Topographic Contour (mAMSL)
- Watercourse (MNR)
- Waterbody (Stantec)
- Property Boundary
- Wetland Communities

Cultural Heritiage Features

- Protected Property
- Petroleum Well (OGSR) [4]
- Water Well (MOE) [5]

Non-participating Receptors [5]

- Occupied

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N).
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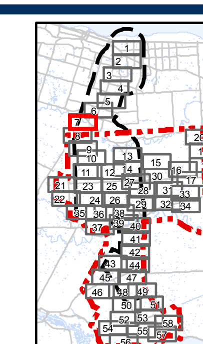
3. Orthoimagery source: First Base Solutions, Date Spring 2010.
4. Petroleum Well source: © Ontario Oil, Gas and Salt Resource Library, 2010.
5. MOE Water well locations are approximate and have been positioned based on published UTM coordinates © Queen's Printer for Ontario, 2012.
6. Noise receptors are identified within 1500m of any wind turbine.



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FWRN LP
Niagara Region Wind Farm

Figure No.

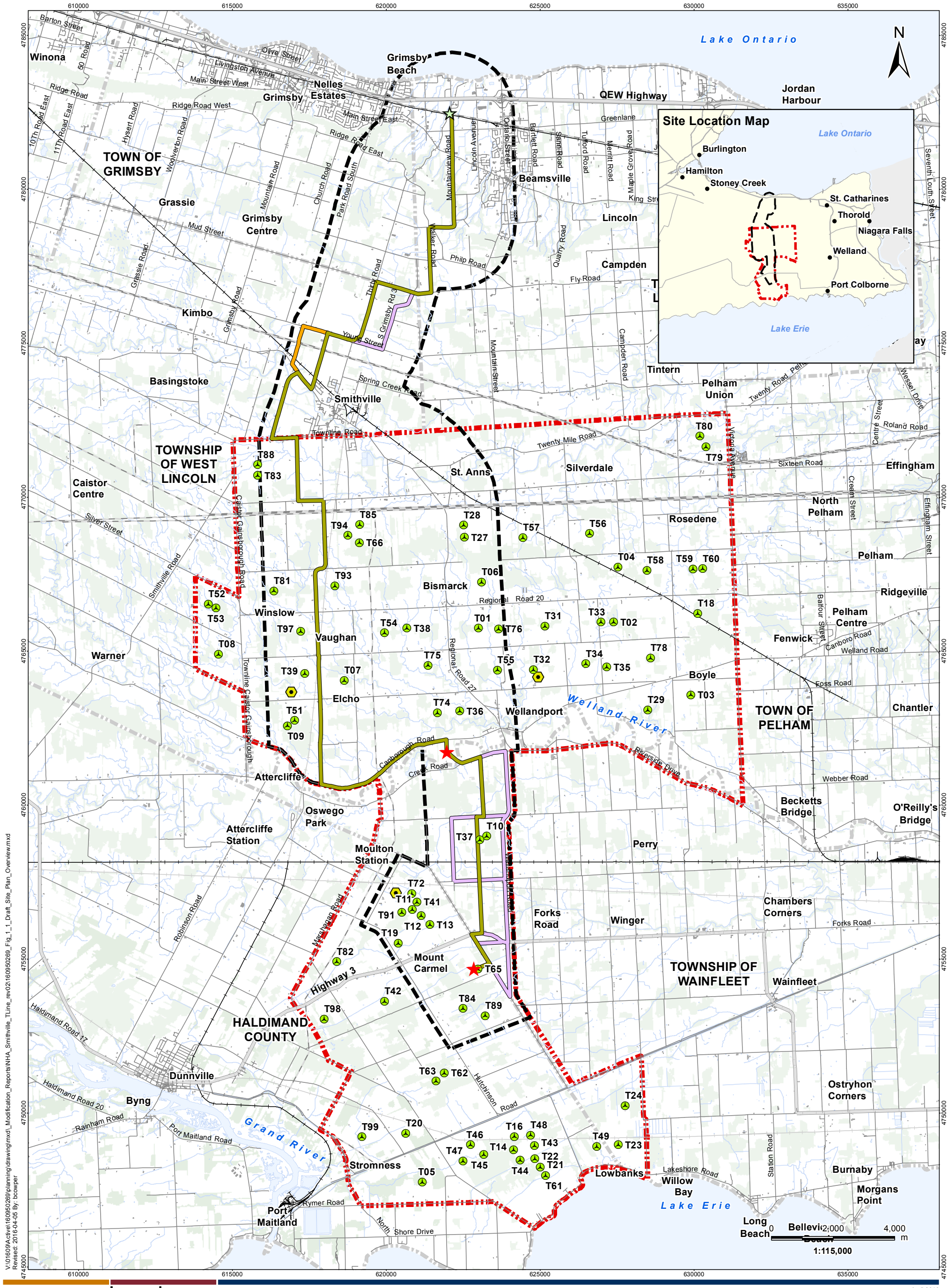
2.7

Title

Site Plan with Socio-Economic Features, Significant Natural Heritage Features and Water Bodies Figure 2.7 Revised

UPDATED FIGURES FOR THE NATURAL HERITAGE ASSESSMENT AND ENVIRONMENTAL IMPACT STUDY

Stantec



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Revised: 2016-04-05 By: bcowper

Legend

- Project Study Area
- Interconnector Study Area
- Proposed Turbine Location
- Transformer Substation
- Tap-in Location
- Existing Met Tower
- Preferred Transmission Line Route (REA)
- Alternate Transmission Route (REA)
- Modified Alternate Transmission Route
- Road
- Expressway / Highway
- Active Railway
- Abandoned Railway
- Existing Structures
- Existing Transmission Line
- Watercourse
- Waterbody
- Wooded Area
- Municipality Lower Tier

Notes

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Client/Project
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Niagara Region Wind Farm

April 2016
160950269

Figure No.
1

Title
Draft Site Plan Overview Revised

617000
617500
618000
4775500
4775000
N
Young Street
South Grimsby Road 6
South Grimsby Road 5
Lower Twenty Mile Creek Wetland Complex
Where underground Transmission Line crosses wetland, no ground or vegetation will be impacted by construction
0
80
160
m
1:4,000

V:\01609\Active\160950269\planning\drawing\mxd_Modification_Reports\NHA_Smithville_TLine_rev02\160950269_Figure_2_Records_Review_Mapbook.mxd
Revised: 2016-04-27 By: bcowper

April, 2016
160950269

Stantec

Legend

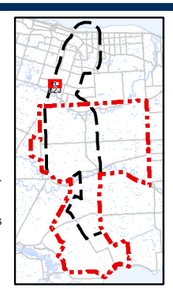
- 50 m Zone of Investigation
- Zone of Investigation assessed during NHA/EIS
- Area Added

Modified Alternate Transmission Route

- Above Ground
- Underground
- Preferred Transmission Route (REA)
- Access Trail
- Unevaluated Wetland (NPCA)
- Woodland (MNRF)
- Provincially Significant Wetland (MNRF)
- Provincially Significant Wetland (MNRF revised, 2015)
- Deer Winter Congregation Areas (MNRF)

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N).
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2011.
3. Orthoimagery source: First Base Solutions, Date Spring 2010.



Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
2.1

Title
Records Review - Natural Features Figure 2.1 Revised

617000 617500 618000

4774500

N

Regional Road 20

South Grimsby Rd 6

South Grimsby Road 5

Lower Twenty Mile Creek Wetland Complex

0 80 160 m

1:4,000

617000 617500 618000

4774500

April, 2016
160950269

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Revised: 2016-04-27 By: bcowper

Stantec

Legend

- 50 m Zone of Investigation
- Zone of Investigation assessed during NHA/EIS
- Area Added

Modified Alternate Transmission Route

- Above Ground
- Preferred Transmission Route (REA)
- Access Trail
- Unevaluated Wetland (NPCA)
- Woodland (MNRF)
- Provincially Significant Wetland (MNRF)
- Deer Winter Congregation Areas (MNRF)

Notes

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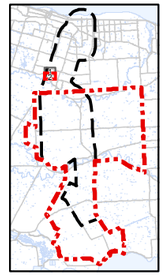
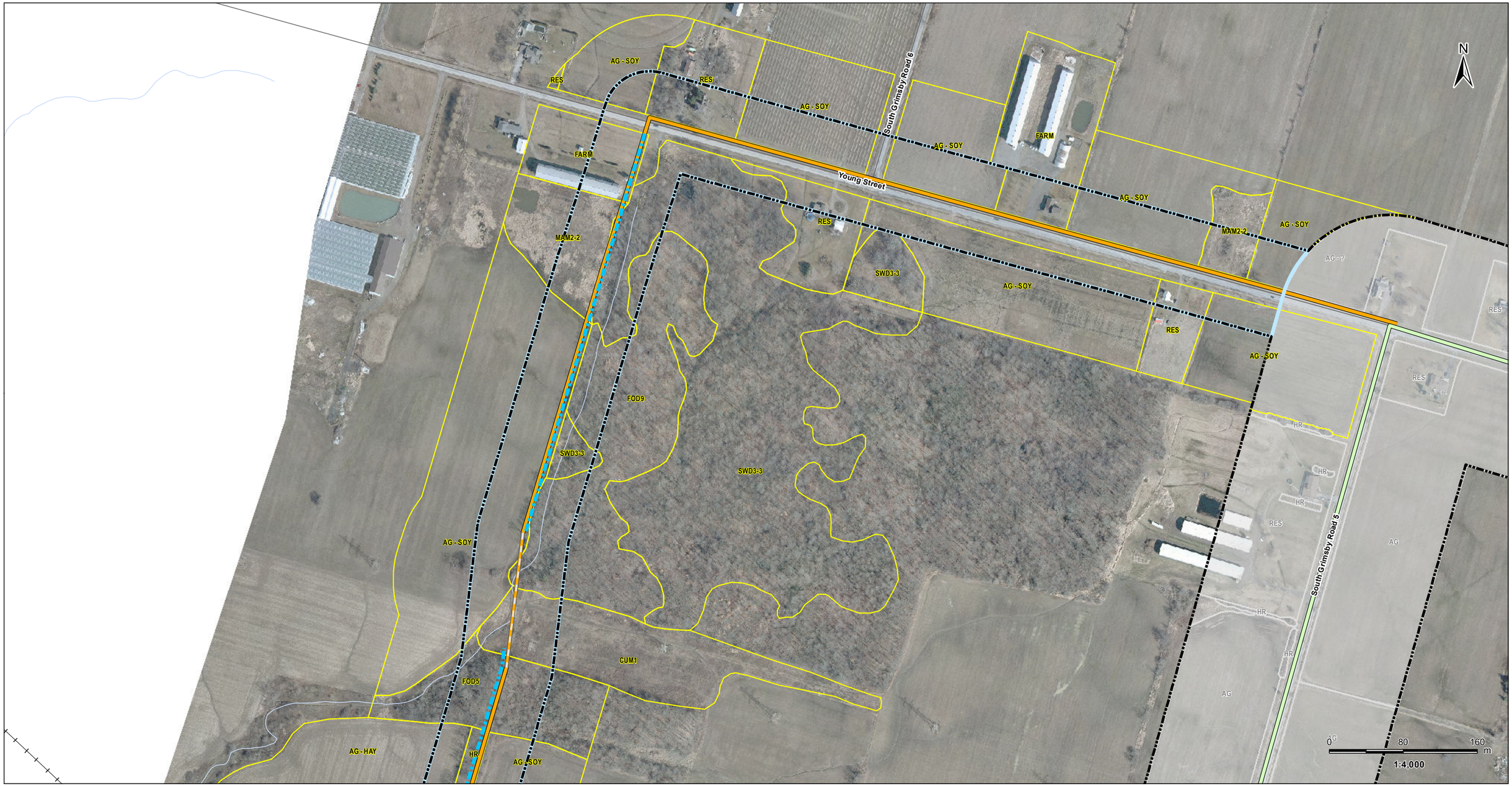
3. Orthoimagery source: First Base Solutions, Date Spring 2010.



Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
2.2

Title
Records Review - Natural Features Figure 2.2 Revised



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Revised: 2016-04-27 By: bcowper

April, 2016
160950269

Stantec

Legend

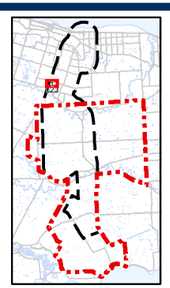
- 50 m Zone of Investigation
- Zone of Investigation assessed during NHA/EIS
- Area Added
- ELC Boundary

Modified Alternate Transmission Route

- Above Ground
- Underground
- Preferred Transmission Line Route (REA)
- Access Trail

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N).
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2011.
3. Orthoimagery source: First Base Solutions, Date Spring 2010.



Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
3.1

Title
ELC Vegetation Communities - Figure 3.1 Revised

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Revised: 2016-04-27 By: bcowper

April, 2016
160950269

Legend

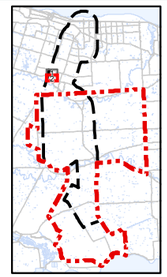
- 50 m Zone of Investigation
- Zone of Investigation assessed during NHA/EIS
- Area Added
- ELC Boundary

Modified Alternate Transmission Route

- Above Ground
- Preferred Transmission Line Route (REA)
- Access Trail

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N).
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2011.
3. Orthoimagery source: First Base Solutions, Date Spring 2010.



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FWRN LP
Natural Heritage Assessment Report

Figure No.
3.2

Title
ELC Vegetation Communities - Figure 3.2 Revised

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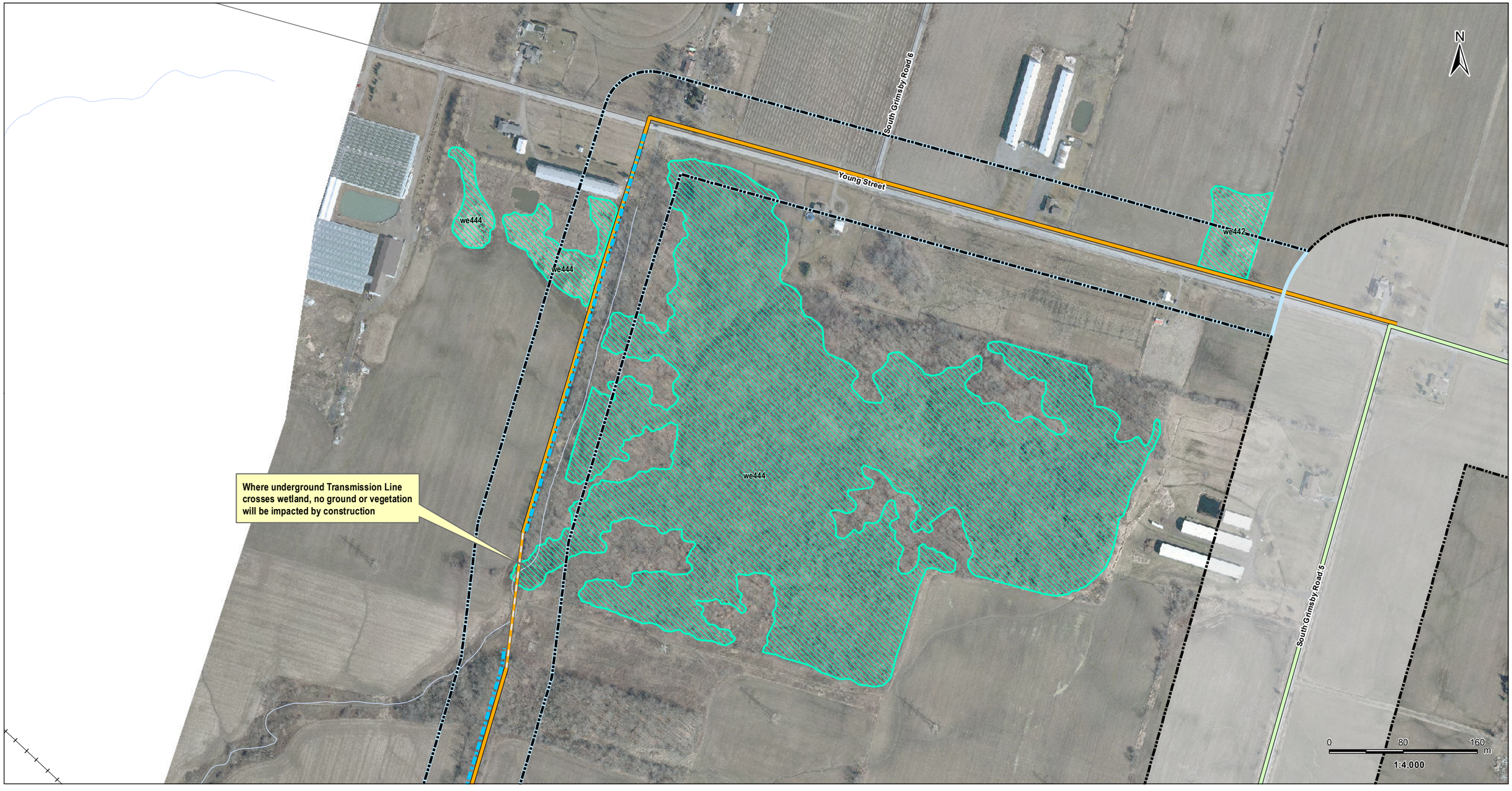
Revised: 2016-04-27 By: bcowper



April, 2016
160950269

Stantec

Legend

- 50 m Zone of Investigation
- Zone of Investigation assessed during NHA/EIS
- Area Added

Modified Alternate Transmission Route

- Above Ground
- Underground
- Preferred Transmission Line Route (REA)
- Access Trail
- Wetland Communities

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N).
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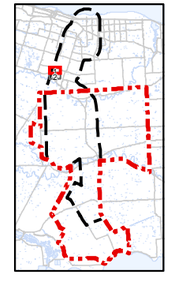
3. Orthoimagery source: First Base Solutions, Date Spring 2010.



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Natural Heritage Assessment Report

Figure No.
4.1

Title
Wetland Communities
Figure 4.1
Revised

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Revised: 2016-04-27 By: bcowper

April, 2016
160950269

Stantec

Legend

- 50 m Zone of Investigation
- Zone of Investigation assessed during NHA/EIS
- Area Added

Modified Alternate Transmission Route

- Above Ground
- Preferred Transmission Line Route (REA)
- Access Trail
- Wetland Communities

Notes

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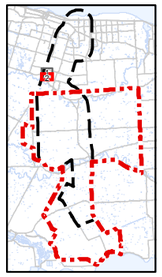
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2011.
3. Orthoimagery source: First Base Solutions, Date Spring 2010.



Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
4.2

Title
Wetland Communities
Figure 4.2
Revised

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Revised: 2016-04-27 By: bcowper

Legend

- 50 m Zone of Investigation
- Zone of Investigation assessed during NHA/EIS
- Area Added
- Woodland Communities

Modified Alternate Transmission Route

- Above Ground
- Underground
- Preferred Transmission Line Route (REA)
- Access Trail

Notes

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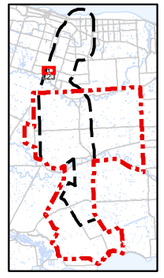
3. Orthoimagery source: First Base Solutions, Date Spring 2010.



Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
5.1

Title
Woodland Communities
Figure 5.1
Revised

April, 2016
160950269

617000
617500
618000
4774500
wo226
wo227
wo228
wo27
wo26
Regional Road 20
South Grimsby Rd 6
South Grimsby Road 5
N
0
80
160
m
1:4,000

V:\01609\Active\160950269\planning\drawing\mxd_Modification_Reports\NHA_Smithville_TLine_rev02\160950269_Figure_5_WoodlandCommunities_Mapbook.mxd
Revised: 2016-04-27 By: bcowper

April, 2016
160950269

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Legend

- 50 m Zone of Investigation
- Zone of Investigation assessed during NHA/EIS
- Area Added

Modified Alternate Transmission Route

- Above Ground
- Preferred Transmission Line Route (REA)
- Access Trail
- Woodland Communities

Notes

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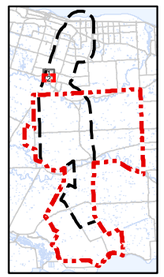
3. Orthoimagery source: First Base Solutions, Date Spring 2010.



Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
5.2

Title
Woodland Communities
Figure 5.2
Revised

V:\01609\Active\160950269\planning\drawing\mxd_Modification_Reports\NHA_Smithville_TLine_rev02\160950269_Figure_6_Candidate_Significant_Wildlife_Habitat_Mapbook.mxd
Revised: 2016-04-27 By: bcowper

April, 2016
160950269

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Legend

- 50 m Zone of Investigation
- Zone of Investigation assessed during NHA/EIS
- Area Added

Modified Alternate Transmission Route

- Above Ground
- Underground
- Preferred Transmission Line Route (REA)
- Access Trail
- Deer Winter Congregation Areas (MNRF)
- Amphibian Breeding Habitat
- Bat Maternity Colonies
- Special Concern Breeding Bird Species Habitat

Notes

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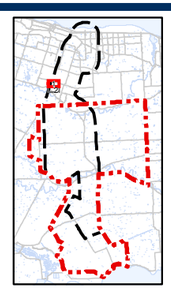
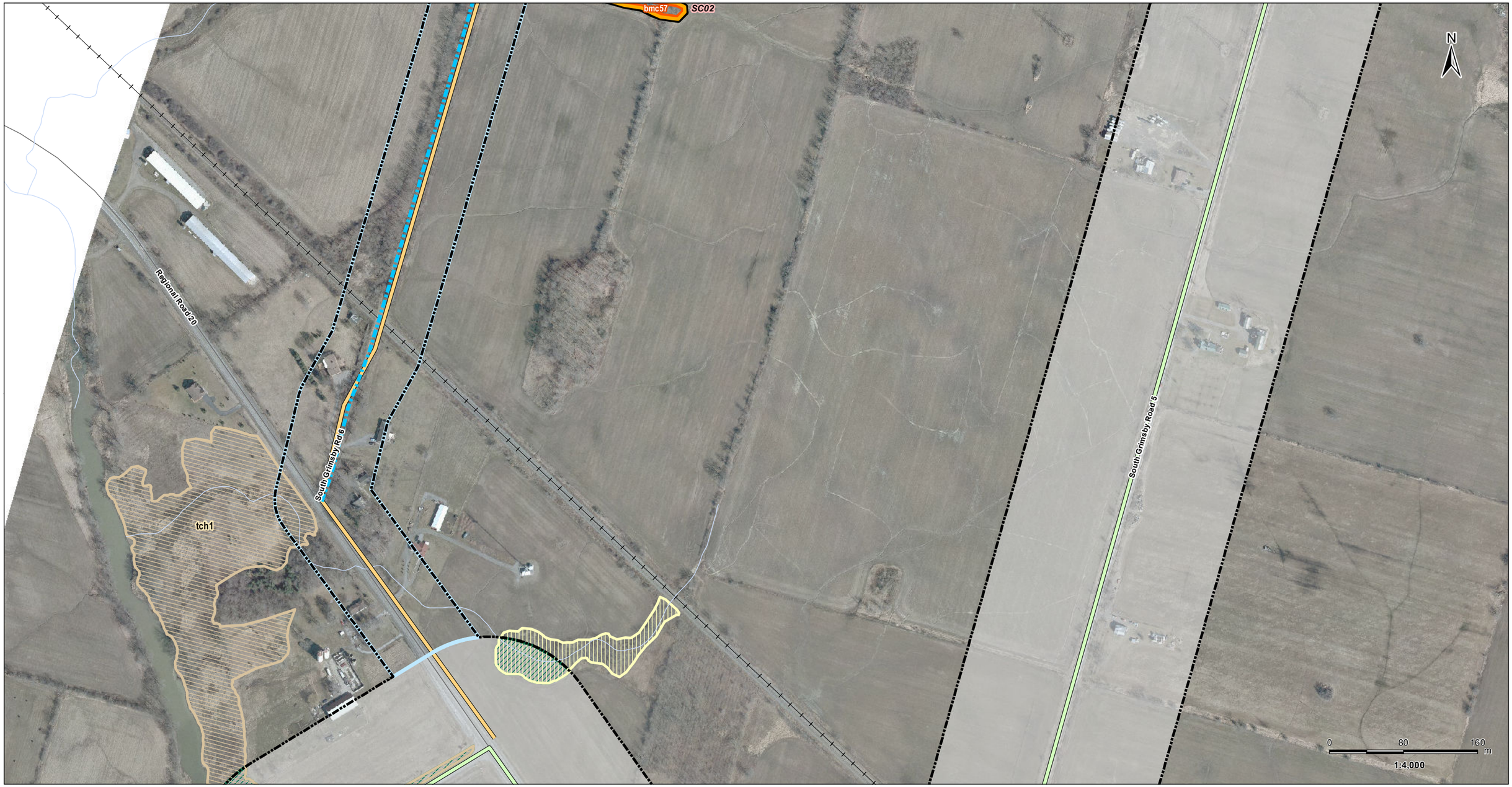
3. Orthoimagery © First Base Solutions, 2010.



Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
6.1

Title
Candidate Significant Wildlife Habitat Figure 6.1 Revised



April, 2016
160950269

Stantec

Legend

- 50 m Zone of Investigation
- Zone of Investigation assessed during NHA/EIS
- Area Added

Modified Alternate Transmission Route

- Above Ground
- Preferred Transmission Line Route (REA)
- Access Trail
- Woodland Vole Habitat
- Terrestrial Crayfish Habitat
- Bat Maternity Colonies
- Special Concern Breeding Bird Species Habitat

Notes

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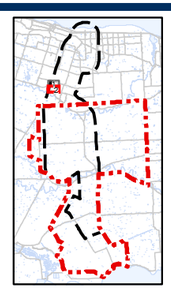
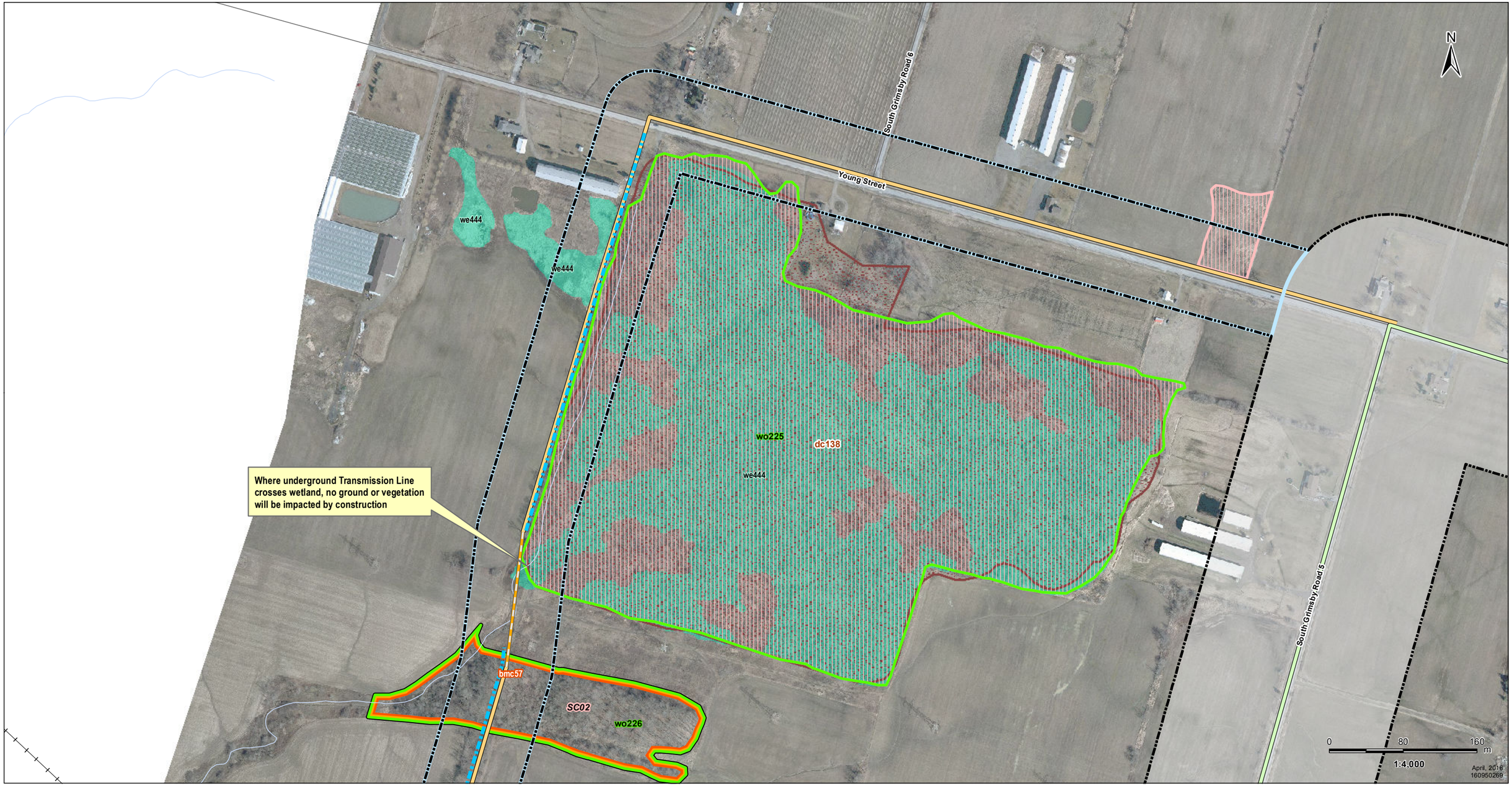
3. Orthoimagery © First Base Solutions, 2010.



Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
6.2

Title
Candidate Significant Wildlife Habitat Figure 6.2 Revised



Stantec

Legend

- 50 m Zone of Investigation
- Zone of Investigation assessed during NHA/EIS
- Area Added

Modified Alternate Transmission Route

- Above Ground
- Underground
- Preferred Transmission Line Route (REA)
- Access Trail
- Wetland Communities
- Woodland Communities
- Special Concern Breeding Bird Species Habitat
- Generalized Wildlife Habitat
- Deer Congregation Areas (MNR) (Generalized)
- Bat Maternity Colonies

Notes

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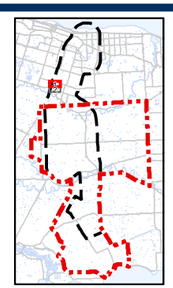
3. Orthoimagery © First Base Solutions, 2010.



Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
7.1

Title
Significant Natural Features Figure 7.1 Revised

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Revised: 2016-04-27 By: bcowper

Stantec

Legend

- 50 m Zone of Investigation
- Zone of Investigation assessed during NHA/EIS
- Area Added

Modified Alternate Transmission Route

- Above Ground
- Preferred Transmission Line Route (REA)
- Access Trail
- Wetland Communities
- Woodland Communities
- Special Concern Breeding Bird Species Habitat
- Generalized Wildlife Habitat
- Bat Maternity Colonies

Notes

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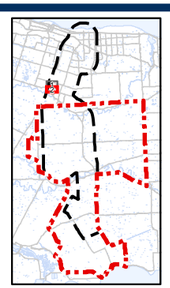
3. Orthoimagery © First Base Solutions, 2010.



Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
7.2

Title
Significant Natural Features Figure 7.2 Revised

617200 617400

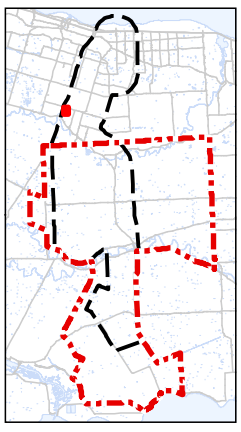
4775400 4775200 4775000

Young Street

N

19.3 m
11 m
3.4 m
2.8 m
23.4 m
5.3 m
4.2 m
26.2 m
8.1 m

we444
we444
we444
wo225
SC02
bmc57
wo226



Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2013.
3. Orthoimagery © First Base Solutions, 20xx.

- Property Boundary
- Proposed Transmission Line Pole Location
- Access Trail

Modified Alternate Transmission

- Overhead
- Underground
- Significant Woodland
- Wetland Communities
- Generalized Wildlife Habitat
- Special Concern Breeding Bird Species Habitat
- Bat Maternity Colonies

0 30 60 metres

1:2,000 (At Original document size of 11x17)

Stantec

Project Location
Niagara Region, ON

160950269 REVA
Prepared by BC on 2016-03-10
Technical Review by ## on 2016-###-##
Independent Review by ## on 2016-###-##

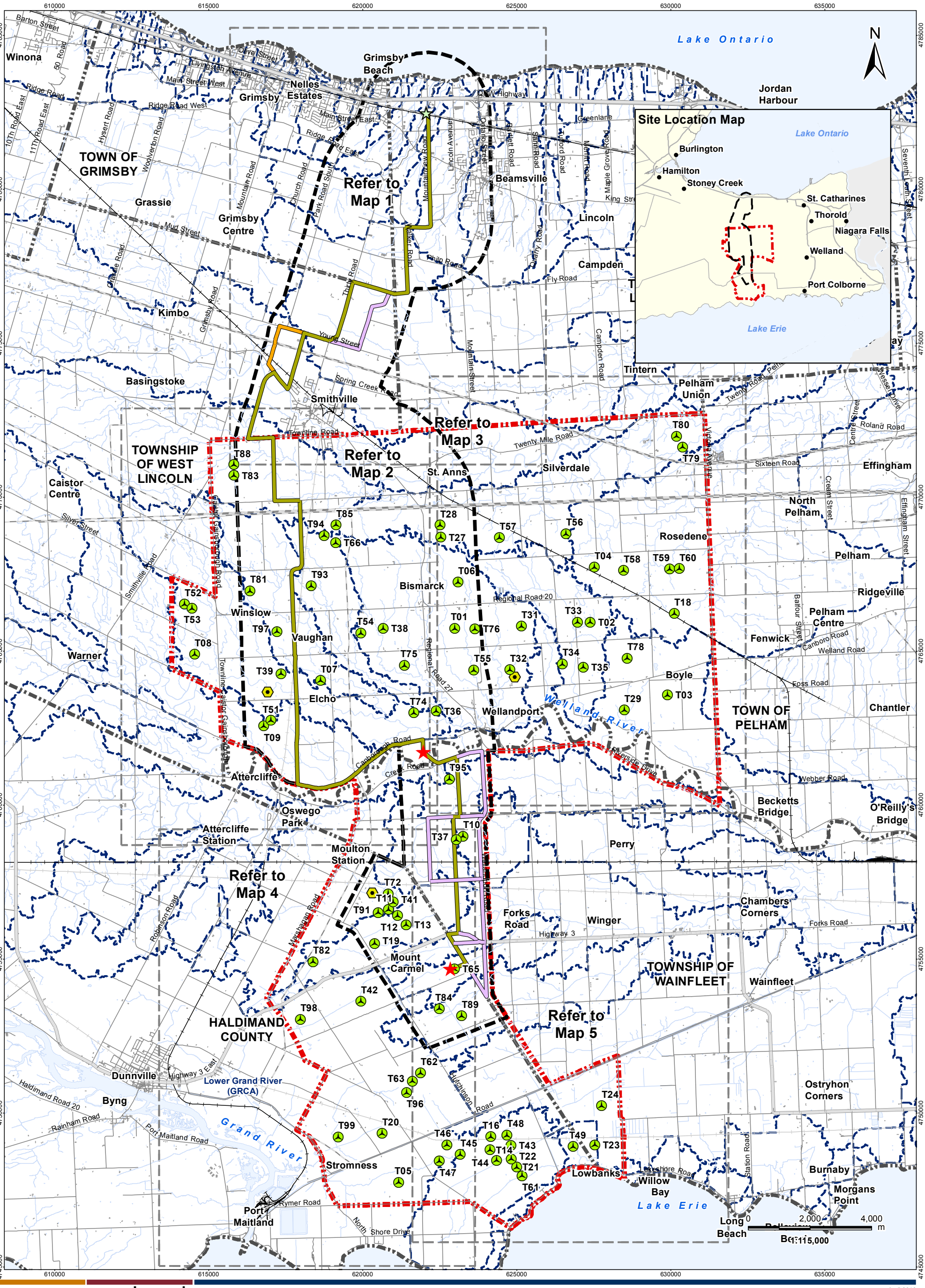
Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
8

Title
Natural Features and Alternate Transmission Line Location

UPDATED FIGURES FOR THE WATER ASSESSMENT AND WATER BODY REPORT

Stantec



V:\01609\Active\160950269\planning\drawing\mxd_Modification_Reports\Aquatics_Smithville_TLine\160950269_Figure_1_Location_of_Study_Area.mxd
Revised: 2016-04-05 By: bcowper

Stantec

Legend

- Project Study Area
- Interconnector Study Area
- Proposed Turbine Location
- Transformer Substation
- Tap-in Location
- Existing Met Tower
- Modified Alternate Transmission Route
- Preferred Transmission Route (REA)
- Alternate Tranmission Route (REA)
- Road
- Expressway / Highway
- Active Railway
- Abandoned Railway
- Existing Structures
- Existing Transmission Line
- Watercourse
- Waterbody
- Municipality Lower Tier
- Subwatershed (NPCA)

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2012.

Client/Project
Niagara Region Wind Corporation
Niagara Region Wind Farm
Water Assessment and Waterbody Report

April 2016
160950269

Figure No.
1

Title
Location of Study Area Revised

Lake Ontario

GR Lake Ontario 35
GR Lake Ontario 33
LAKE ONTARIO 27
LAKE ONTARIO 22
LAKE ONTARIO 21
LIN Lake Ontario 30
LIN Lake Ontario 32
LIN Lake Ontario 31
LIN Lake Ontario 29
LIN Lake Ontario 26
LIN Lake Ontario 25
LIN Lake Ontario 24
LIN Lake Ontario 23
LIN Lake Ontario 20
GR Forty Mile Creek
LIN Thirty Mile Creek
LIN Beamsville Creek
LIN Bartlett/Konkle Creek
TWEN Spring Creek
TWEN Twenty Mile Creek
TWEN North Creek
TWEN Gavora Ditch

Grimsby
Grimsby Beach
Nelles Estates
TOWN OF GRIMSBY
Beamsville
Grimsby Centre
TOWNSHIP OF WEST LINCOLN
TOWN OF LINCOLN
Smithville

Modified Alternate Transmission Route

T88

Refer to Map 2

Key Plan
Map 1
Map 2
Map 3
Map 4
Map 5

0 1,000 2,000 m
1:40,000

Legend

- Project Study Area
- Interconnector Study Area
- 120m Zone of Investigation
- Proposed Turbine Location
- Transformer Substation
- Potential Acesss Road
- Collector Lines – Underground or Overhead
- Preferred Transmission Route (REA)
- Alternate Tranmission Route (REA)
- Modified Alternate Transmission Route
- Junction Box
- Tap-in Location
- Existing Met Tower
- Potential Construction Laydown Area
- Road
- Expressway / Highway
- Active Railway
- Abandoned Railway
- Existing Transmission Line
- Existing Structures
- Watercourse
- Waterbody
- Wooded Area
- Subwatershed (NPCA)

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2012.

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Client/Project
Niagara Region Wind Corporation
Niagara Region Wind Farm
Water Assessment and Waterbody Report

April 2016
160950269

Figure No.
2a

Title
Subwatersheds
Map 1 of 5

V:\01609\active\160950269\planning\drawing\mxd_Modification_Reports\Aquatics_Smithville_TLine\160950269_Figure_2a_2e_Subwatersheds.mxd
Revised: 2016-04-05 By: bcowper

616500 617000 617500 618000 618500 619000

4775500 4775000 4774500

South Grimsby Road 6
Young Street
9-1
Clayson Road
South Grimsby Road 5
Thirty Road
Regional Road 20

N

0 150 300 m
1:7,500

V:\01609\Active\160950269\planning\drawing\mxd_Modification_Reports\Aquatics_Smithville_TLine\160950269_Figure_3_Waterbodies_Mapbook.mxd
Revised: 2016-04-27 By: bcowper

April, 2016
160950269

Stantec

Legend

- Interconnector Study Area
- Preferred Transmission Line Route (REA)
- **Modified Alternate Transmission Route**
  - Above Ground
  - Underground
  - Access Trail
  - 120m Zone of Investigation
  - Area Added
- Watercourse (MNR)
- Waterbody

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N).
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2011.
3. Orthoimagery source: First Base Solutions, Date Spring 2010.

Client/Project
Niagara Region Wind Corporation
Niagara Region Wind Farm
Water Assessment and Waterbody Report

Figure No.
3.6

Title
Water Bodies
Figure 3.6
Revised

615500 616000 616500 617000 617500 618000

4774000 4773500 4773000

11-2 12-1 11-2

Regional Road 20

South Grimsby Road 5

South Grimsby Road 6

South Grimsby Road 7

Northridge Drive

Westlea Drive

Farewell Crescent

Las Road

Sarah Crescent

Hornak Way

Hornak Road

Swayze Court

Autumn Circle

Forest Avenue

Station Street

Bartels Drive

Edward Court

Wade Road North

Wade Road South

Margaret Street

Garden Drive

Village Drive

Griffin Street

St Catharines Street

Brock Street

N

0 150 300 Meters

1:7,500 ove

V:\01609\Active\160950269\planning\drawing\mxd_Modification_Reports\Aquatics_Smithville_TLine\160950269_Figure_3_Waterbodies_Mapbook.mxd
Revised: 2016-04-27 By: bcowper

April, 2016
160950269

Stantec

Legend

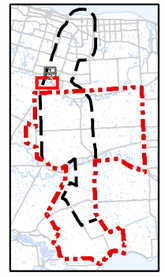
- Interconnector Study Area
- Preferred Transmission Line Route (REA)

Modified Alternate Transmission Route

- Above Ground
- 120m Zone of Investigation
- Area Added
- Watercourse (MNR)
- Waterbody
- Non-waterbody

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N).
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2011.
3. Orthoimagery source: First Base Solutions, Date Spring 2010.



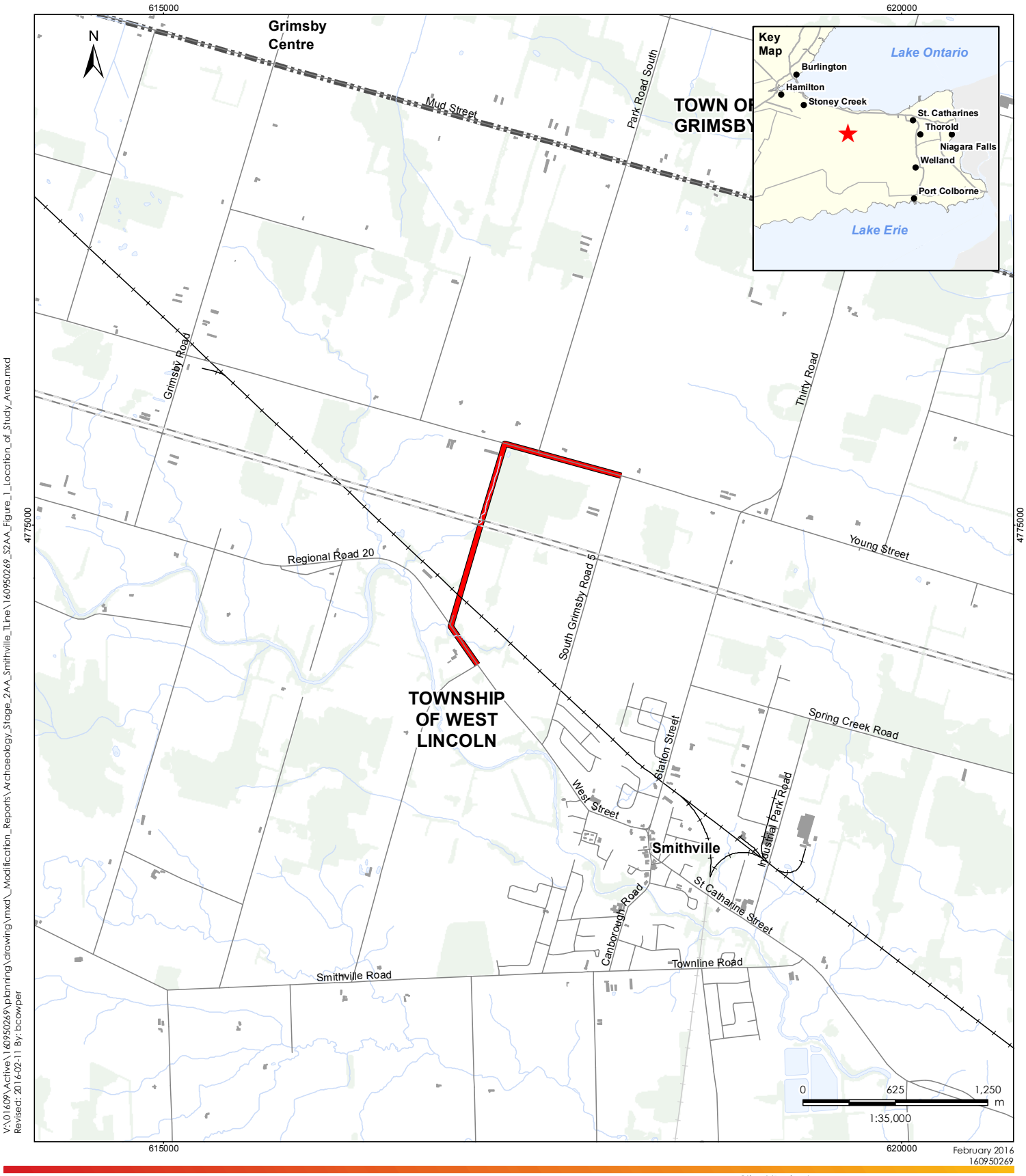
Client/Project
Niagara Region Wind Corporation
Niagara Region Wind Farm
Water Assessment and Waterbody Report

Figure No.
3.7

Title
Water Bodies
Figure 3.7
Revised

UPDATED FIGURES FOR THE STAGE 2 ARCHAEOLOGICAL ASSESSMENT

Stantec



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Revised: 2016-02-11 By: bcowper

Stantec

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2013.

Legend

- Study Area
- Road
- Expressway / Highway
- Active Railway
- Abandoned Railway
- Existing Structures
- Existing Transmission Line
- Watercourse
- Waterbody
- Wooded Area
- Municipality Lower Tier

Client/Project

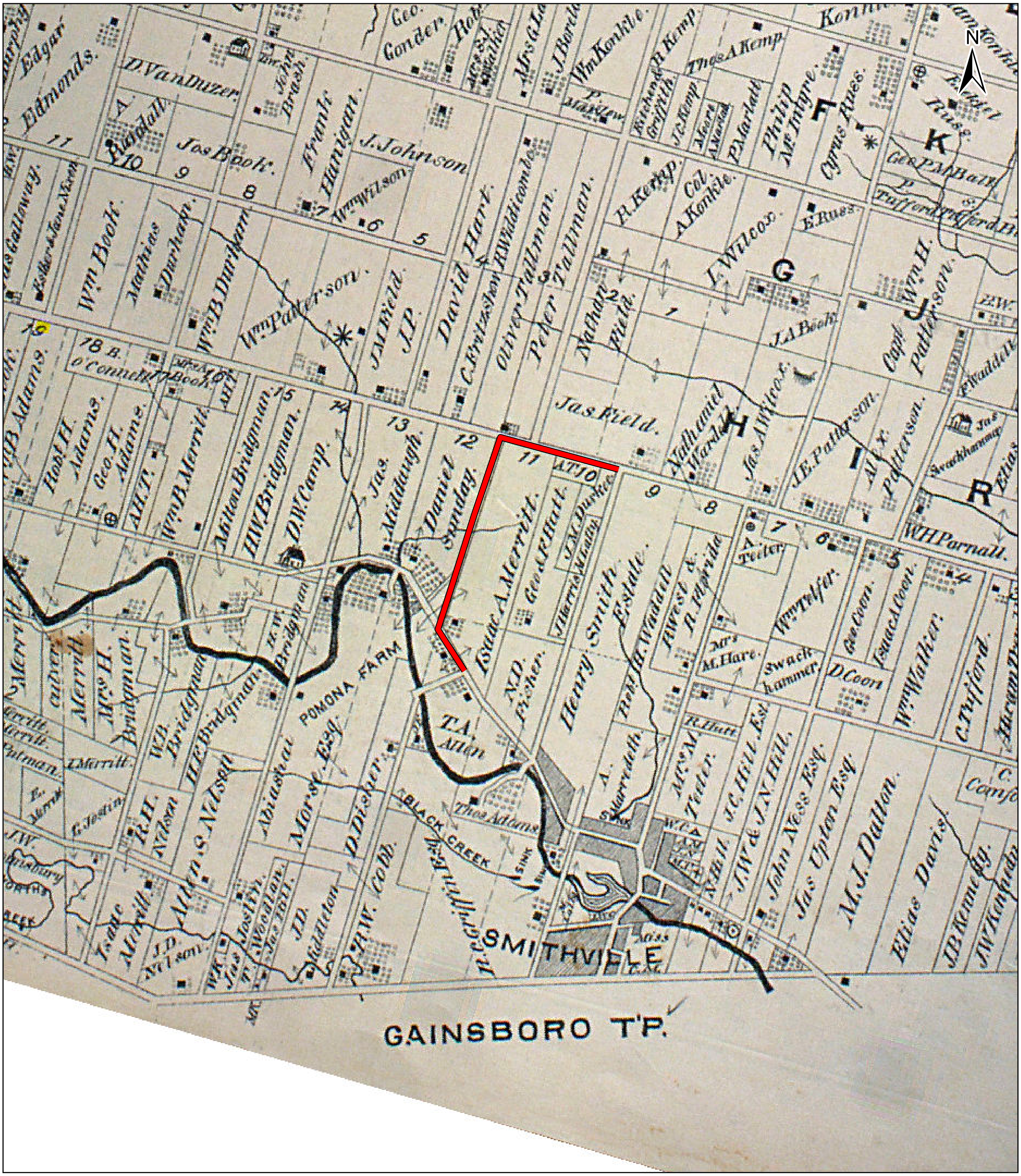
FWRN LP
Niagara Region Wind Farm
Stage 2 Archaeological Assessment

Figure No.

1

Title

Location of Study Area



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Revised: 2016-02-11 By: bcowper

February 2016
160950269

Stantec

Legend

Study Area

Client/Project

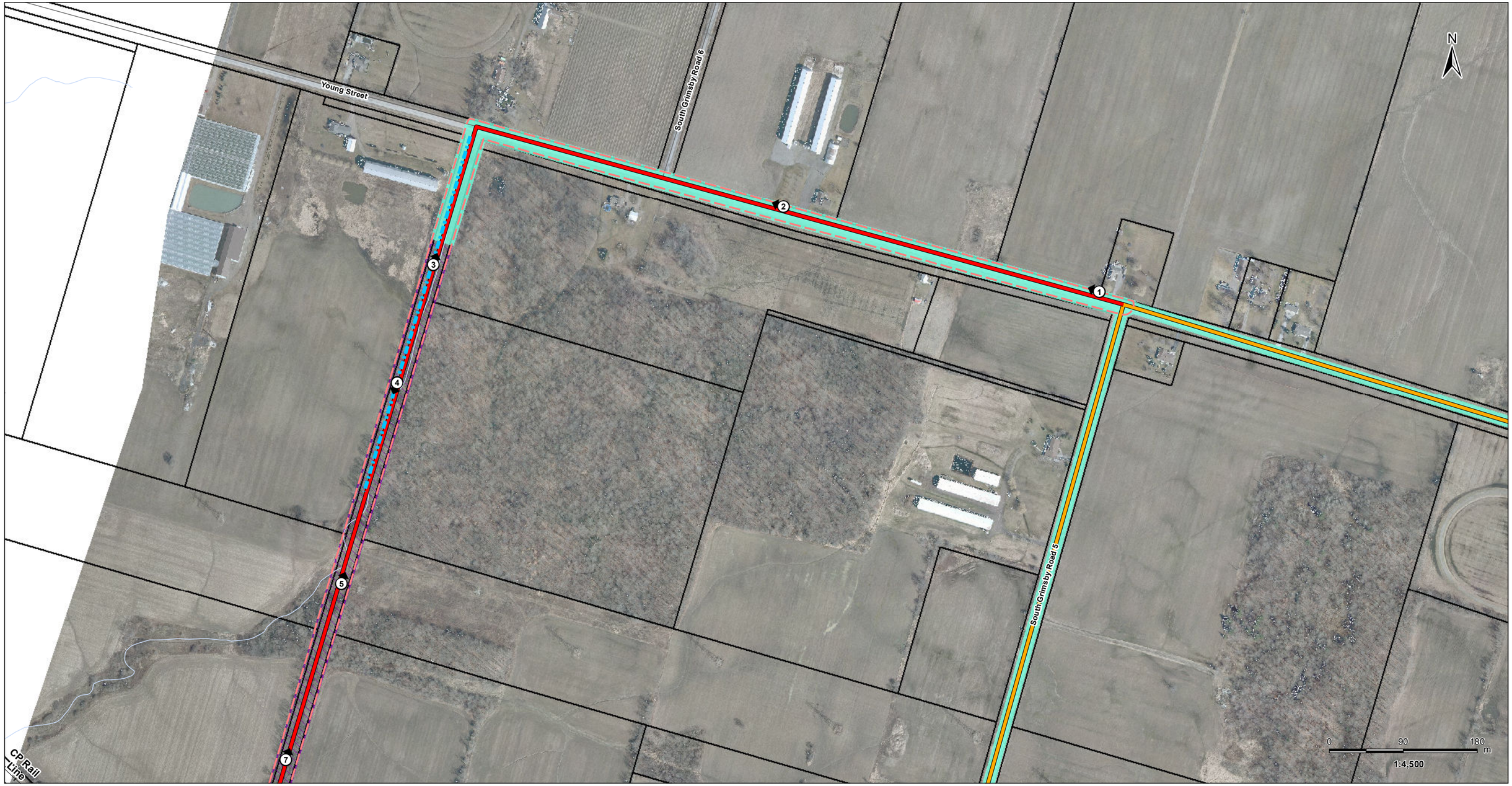
FWRN-LP (formerly Niagara Region Wind Corporation)
Niagara Region Wind Farm

Figure No.
2

Title
Portion of the 1876 Map of Grimsby Township

Notes

1. Historic Image: Illustrated historical atlas of the counties of Lincoln and Welland, Ont. Toronto : H.R. Page & Co., 1876.
2. Not to Scale



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Revised: 2016-02-11 By: bcowper

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160950269

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Notes

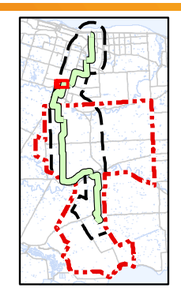
1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2010.
3. Orthoimagery © First Base Solutions, 2010.

Legend

- Modified Alternate Transmission Route
- Preferred Transmission Route
- Access Trail
- Study Area

Stage 2 Assessment

- Test Pitted, at 5m Intervals
- Disturbed, Not Surveyed
- Photograph Location



Client/Project
FWRN LP
Niagara Region Wind Farm
Stage 2 Archaeological Assessment

Figure No.
3.1

Title
Stage 2 Results

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Revised: 2016-02-11 By: bcowper

February 2016
160950269

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Notes

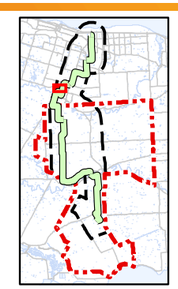
1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2010.
3. Orthoimagery © First Base Solutions, 2010.

Legend

- Modified Alternate Transmission Route
- Preferred Transmission Route
- Study Area

Stage 2 Assessment

- Test Pitted, at 5m Intervals
- Disturbed, Not Surveyed
- Photograph Location



Client/Project
FWRN LP
Niagara Region Wind Farm
Stage 2 Archaeological Assessment

Figure No.
3.2

Title
Stage 2 Results

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Revised: 2016-02-11 By: bcowpert

February 2016
160950269

Stantec

Legend

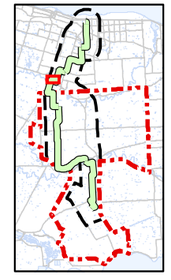
- Modified Alternate Transmission Route
- Preferred Transmission Route
- Study Area

Stage 2 Assessment

- Disturbed, Not Surveyed
- Photograph Location

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2010.
3. Orthoimagery © First Base Solutions, 2010.



Client/Project

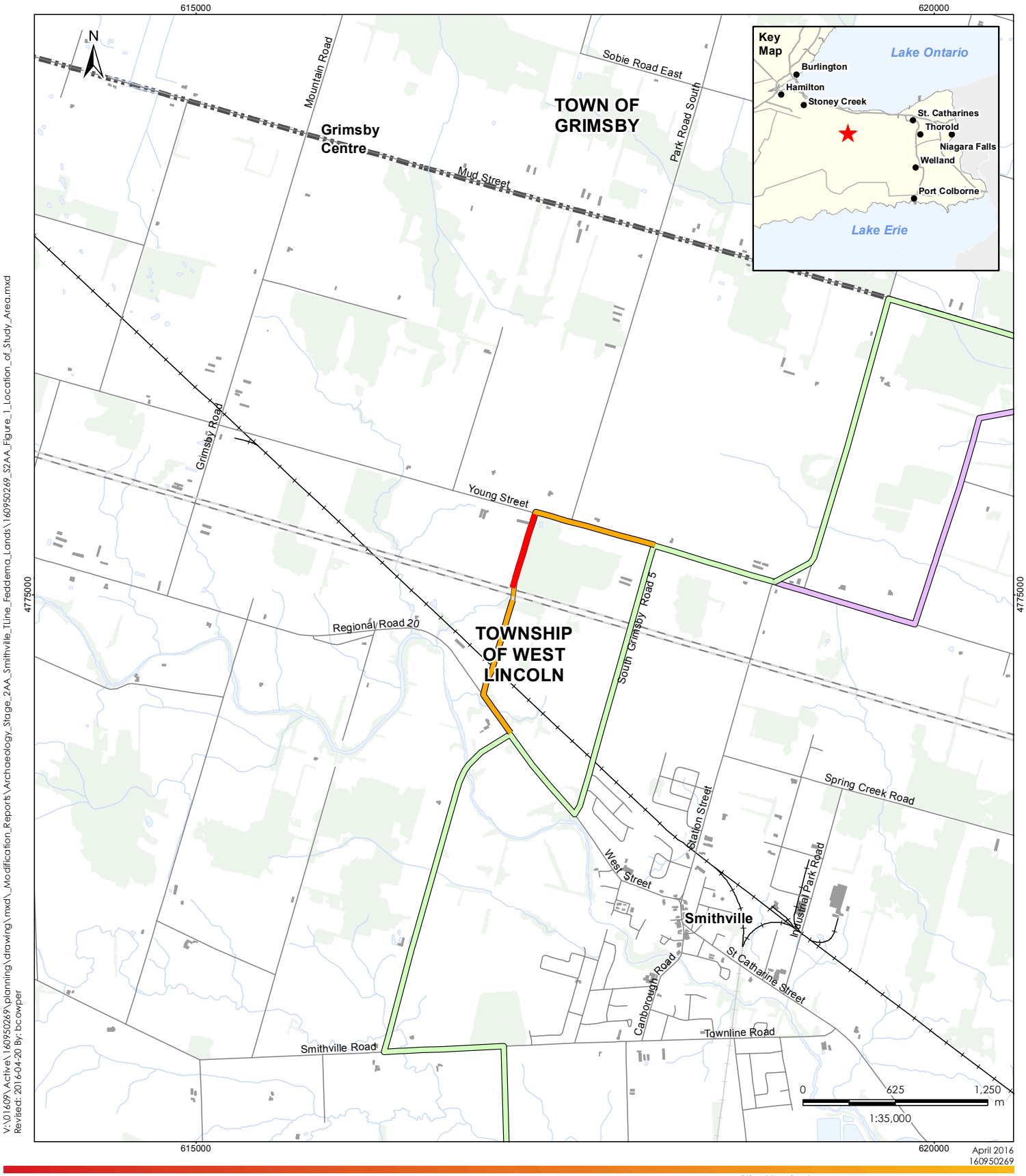
FWRN LP
Niagara Region Wind Farm
Stage 2 Archaeological Assessment

Figure No.

3.3

Title

Stage 2 Results



Stantec

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2013.

Legend

- Study Area
- Road
- Expressway / Highway
- Active Railway
- Abandoned Railway
- Existing Structures
- Existing Transmission Line
- Watercourse
- Waterbody
- Wooded Area
- Municipality Lower Tier

Modified Alternate Transmission Route

- Above Ground
- Underground
- Preferred Transmission Line Route (REA)
- Alternate Transmission Line Route (REA)

Client/Project

FWRN LP
Niagara Region Wind Farm
Stage 2 Archaeological Assessment

Figure No.

1

Title

Location of Study Area

V:\01609\Active\160950269\planning\drawing\mxd_Modification_Reports\Archaeology_Stage_2AA_Smithville_TLine_Feddema_Lands\160950269_S2AA_Figure_2_Historic_Map.mxd
Revised: 2016-04-18 By: bcowper

April 2016
160950269

Stantec

Legend

Study Area

Client/Project

FWRN-LP (formerly Niagara Region Wind Corporation)
Niagara Region Wind Farm

Figure No.

2

Title

Portion of the 1876 Map of Grimsby Township

Notes

1. Historic Image: Illustrated historical atlas of the counties of Lincoln and Welland, Ont. Toronto : H.R. Page & Co., 1876.
2. Not to Scale

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Revised: 2016-04-20 By: bcowper

April 2016
160950269

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Notes

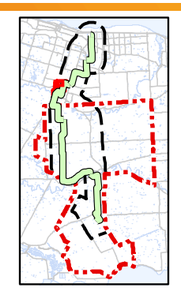
1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2010.
3. Orthoimagery © First Base Solutions, 2010.

Legend

- Study Area

Stage 2 Assessment

- Test Pitted, at 5m Intervals
- Disturbed, Not Surveyed
- Low and Wet Area, Not Surveyed
- Previously Assessed (Stantec 2016, PIF # P001-0885-2016)
- Photograph Location



Client/Project
FWRN LP
Niagara Region Wind Farm
Stage 2 Archaeological Assessment

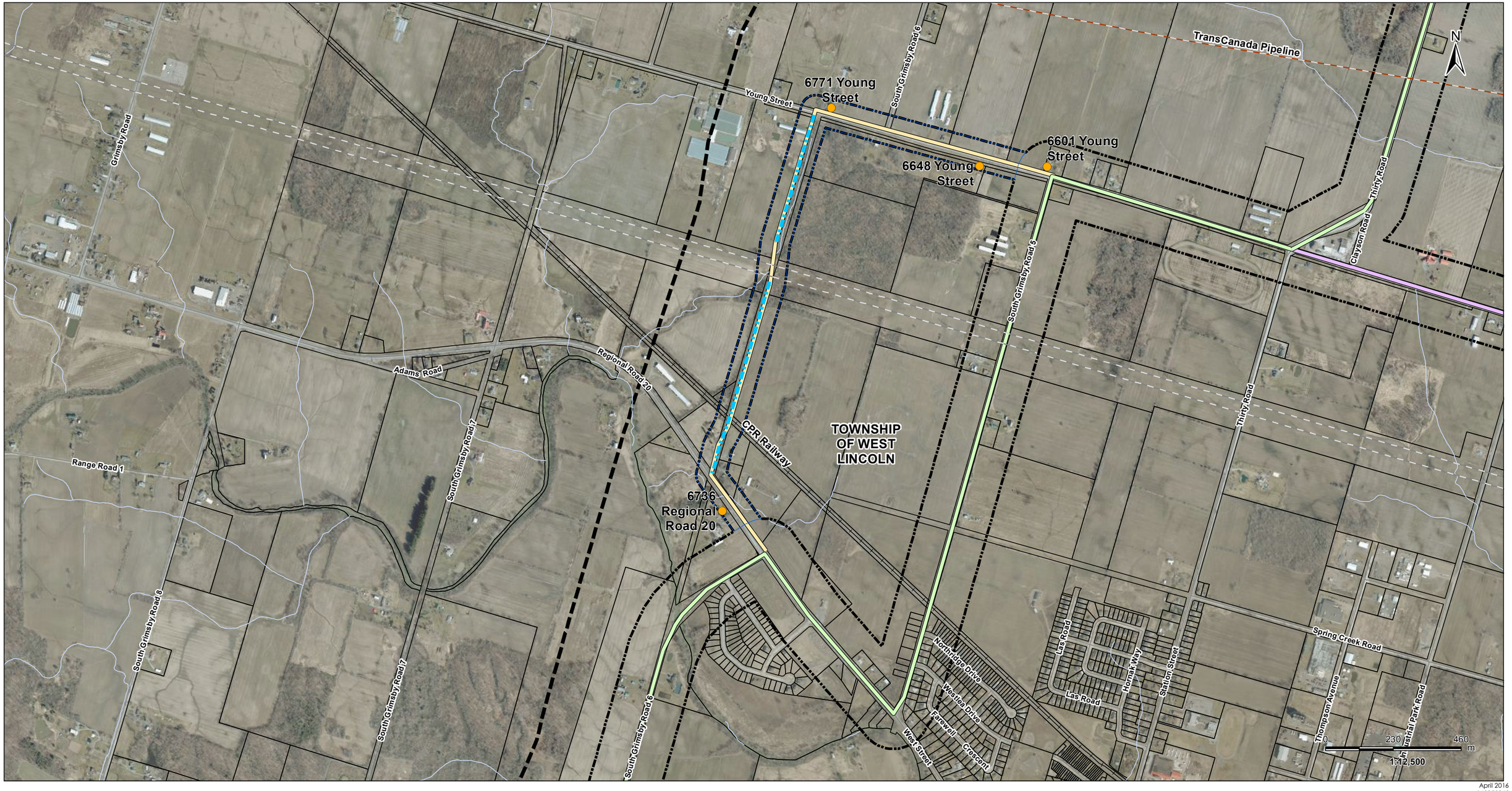
Figure No.
3

Title
Stage 2 Methods

UPDATED FIGURES FOR THE HERITAGE ASSESSMENT REPORT

Stantec

V:\01609\Active\160950269\planning\drawing\mxd_Modification_Reports\Cultural_Heritage_Smithville_TLine\160950269_Fig_01_Potential_Heritage_Resources.mxd
Revised: 2016-04-27 By: bcowper



April 2016
160950269

Stantec

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
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3. Orthoimagery © First Base Solutions, 2010.

Legend

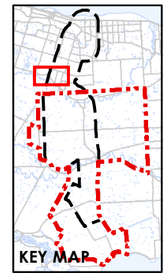
- Interconnector Study Area
- 120m Zone of Investigation

Zone of Investigation Adjustments

- Area Added
- Modified Alternate Transmission Route
- Preferred Transmission Line Route (REA)
- Alternate Transmission Line Route (REA)
- Access Trail

Existing Features

- Road
- Active Railway
- Existing Transmission Line
- Pipeline
- Watercourse (MNR)
- Property Boundary
- Potential Heritage Resource



Client/Project

FWRN LP
Niagara Region Wind Farm

Figure No.
1

DRAFT

Title

Potential Heritage Resources

V:\01609\Active\160950269\planning\drawing\mxd_Modification_Reports\Cultural_Heritage_Smithville_TLine\160950269_Fig_02_Identified_Heritage_Resources.mxd
Revised: 2016-04-27 By: bcowper

6771 Young Street
6648 Young Street
Young Street
Grimsby Road
South Grimsby Road 6
TransCanada Pipeline
Thirty Road
Clayson Road
South Grimsby Road 5
Regional Road 20
Adams Road
South Grimsby Road 7
Range Road 1
CPR Railway
TOWNSHIP OF WEST LINCOLN
South Grimsby Road 8
Northridge Drive
Westlea Drive
Farewell Crescent
West Street
Las Road
Hornak Way
Station Street
Spring Creek Road
Thompson Avenue
Industrial Park Road
N
0 230 460 m
1:12,500

April 2016
160950269

Stantec

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2010.
3. Orthoimagery © First Base Solutions, 2010.

Legend

- Interconnector Study Area
- 120m Zone of Investigation

Zone of Investigation Adjustments

- Area Added
- Modified Alternate Transmission Route
- Preferred Transmission Line Route (REA)
- Alternate Transmission Line Route (REA)
- Access Trail

Existing Features

- Road
- Active Railway
- Existing Transmission Line
- Pipeline
- Watercourse (MNR)
- Property Boundary
- Identified Heritage Resource

KEY MAP

Client/Project
FWRN LP
Niagara Region Wind Farm

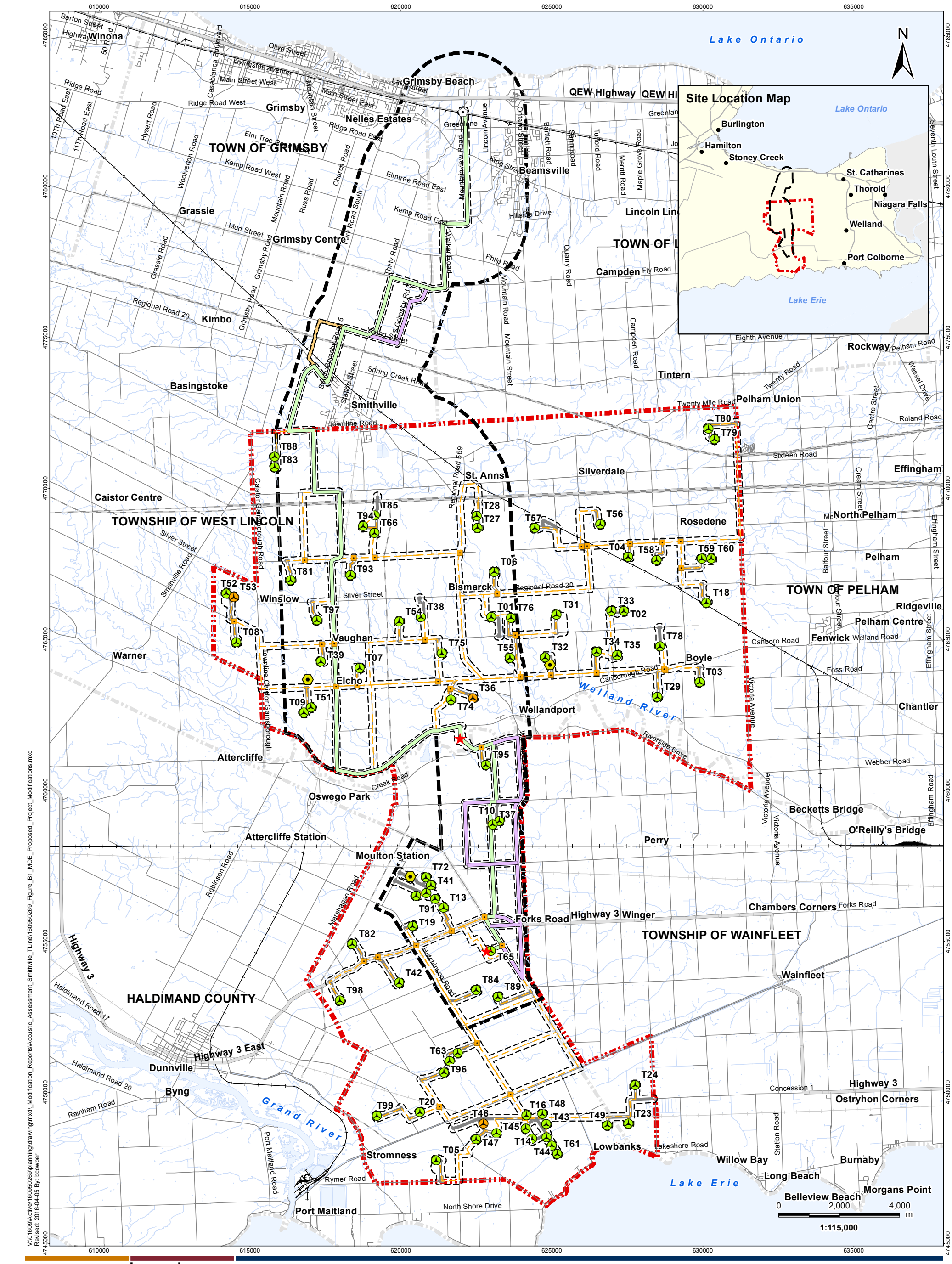
Figure No.
2

DRAFT

Title
Identified Heritage Resources

UPDATED FIGURE FOR THE ACOUSTIC ASSESSMENT REPORT

Stantec



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Revised: 2016-04-05 By: bcowper

Legend

- Project Study Area
- Interconnector Study Area
- Zone of Investigation
- Proposed Turbine Location (E101)
- Proposed Turbine Location (E82)
- Transformer Substation
- Tap-in Location
- Existing Met Tower
- Junction Box
- Preferred Transmission Line Route (REA)
- Alternate Transmission Route (REA)
- Modified Alternate Transmission Route
- Collector Lines - Underground or Overhead
- Potential Access Road
- Road
- Expressway / Highway
- Active Railway
- Abandoned Railway
- Existing Transmission Line
- Watercourse
- Waterbody
- Municipality Lower Tier

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2012.
3. Scenario 1 – T36, T46, T53 are E82 model at hub height 135 metre; T18, T45, T47, T55, T60 and T74 are E101 model at hub height 135 metre and the rest are E101 model at hub height 124 metre.
   Scenario 2 - T36, T46, T53 are E82 model at hub height 135 metre; and the rest are E101 model at hub height 135 metre

Stantec

April 2016
160950269

Client/Project
Niagara Region Wind Corporation
Niagara Region Wind Farm
Acoustic Assessment Report

Figure No.
B1

Title
Project Component Layout - Revised

APPENDIX B:
CORRESPONDENCE WITH MNRF

Ministry of Natural Resources and Forestry
Regional Resources Section
Southern Region
300 Water Street
4th Floor, South Tower
Peterborough, Ontario K9J 8M5

Ministère des Richesses naturelles et des Forêts

Ontario

April 29, 2016

Adam Rosso
Director of Development
Boralex
174 Mill Street
Milton, ON L9T 1S2

RE: NHA Addendum – Proposed Modified Alternate Transmission Route, Smithville Area Niagara Region Wind Farm

Dear Adam Rosso,

The Ministry of Natural Resources and Forestry (MNRF) has received the document dated April 29, 2016 which describes modifications the Smithville Area Niagara Region Wind Farm project made subsequent to MNRF's letter confirming the Natural Heritage Assessment in respect of the project.

In accordance with Appendix D of the MNRF's Natural Heritage Assessment Guide, a commitment has been made to complete pre-construction assessments detailed in the April 3, 2013 confirmation letter. MNRF has reviewed and confirmed the assessment methods and the range of mitigation options. Pending completion of the pre-construction assessments and determination of significance, the appropriate mitigation is expected to be implemented, as committed in the environmental impact study for the following candidate significant wildlife habitats:

- Bat Maternity Colony Habitat (BMC57)
- ESA Special Concern Bird Habitat (SC02)

Upon review of these modifications, MNRF is satisfied that the Natural Heritage Assessment requirements of Ontario Regulation 359/09 have been met. Please add this letter as an addendum to the confirmation letter issued April 3, 2013, along with subsequent confirmation letters, for the Smithville Area Niagara Region Wind Farm project.

If you wish to discuss, please contact Jim Beal, Renewable Energy Coordinator, at jim.beal@ontario.ca or at 705-755-1362.

Sincerely,

Kazia Milian
Supervisor, Land Use Planning Unit
Southern Region Resources Section
Ministry of Natural Resources and Forestry

Cc Jim Beal, Renewable Energy Coordinator
Nicole Kopysh, Stantec Consulting LTD, nicole.koysh@stantec.com

Stantec Consulting Ltd.
1-70 Southgate Drive, Guelph ON N1G 4P5

April 29, 2016
File: 160961052

Attention: Jim Beal
Ontario Ministry of Natural Resources and Forestry
Peterborough District
1st Floor, South Tower
300 Water St
Peterborough ON K9J 8M5

Dear Jim Beal,

Reference: NHA Addendum – Proposed Modified Alternate Transmission Route, Smithville Area Niagara Region Wind Farm

This technical memorandum is addendum number two to the 'Natural Heritage Assessment and Environmental Impact Study for the Niagara Region Wind Farm', the NHA/EIS (Stantec, 2013). The Project's Renewable Energy Approval (REA) (EBR #012-0614) was issued on November 6, 2014 under Ontario Regulation 359/09 of the *Environmental Protection Act*. Since receipt of the REA and completion of the Environmental Review Tribunal, the Proponent has identified the need to make minor modifications to the Project.

The Township of West Lincoln has advised FWRN (the Proponent) in regards to Township concerns about the route of the proposed transmission line as approved by the Project's REA. Based on ongoing consultation with the Township of West Lincoln, FRWN is pursuing a modified alternate transmission line route and associated access trail (the Modification) around the Town of Smithville to avoid an area proposed for future urban expansion. The proposed Modification will provide project design flexibility to potentially re-route a portion of the approved transmission line to an alternate location if project timelines permit, in accordance with agreements made between the Proponent and the Township of West Lincoln.

The original Preferred and Alternate Transmission Routes are shown on **Figure 1 Attachment A**, along with the proposed modification in the Smithville area.

The Modification consists of an overhead transmission line that would deviate from the approved route at the intersection of South Grimsby Rd. 6 and proceed westward along Regional Road 20 to an existing unopened road allowance, then northward along the unopened road allowance, and onto private agricultural lands just before Young Street. The proposed alternate route would then follow Young Street eastward and rejoin the approved route at South Grimsby Rd. 5.

The alternative route would consist primarily of an overhead transmission line, with one section of underground line being installed beneath the existing Hydro One Networks Inc. (HYDRO ONE) transmission lines and a portion of provincially significant wetland (PSW) immediately north of the HYDRO ONE lines. An access trail following the transmission route would be constructed (including installation of appropriate culverts) to provide access to the Modified Alternate Transmission Line.

The access trail will provide access from the north and the south, but does not continue through in order to avoid Provincially Significant Wetland.

The access trail follows the transmission line from Young Street south, on private lands that are currently within agricultural land use. The access trail will be wide enough to allow for passage of maintenance vehicles during operation of the line (i.e. approximately 3-5 m wide) and, like the transmission line, will be installed in the agricultural field. Where the Lower Twenty Mile Creek Wetland Complex occurs on both sides of the Project Location (just south of Young Street), the access trail will be installed within the approximately 11m stretch of agricultural field that occurs between the two natural features (i.e. we444 and wo225).

An access trail will also follow the transmission line north from Regional Road 20, ending just north of the woodland (wo226). An access trail approximately 10-12 feet wide is present along the unopened municipal right-of-way and is currently used by the public for recreational vehicles and ATVs.

This addendum to the NHA is presented to the Ministry of Natural Resources and Forestry (MNRF) for their review and confirmation. Figure numbers follow the numbers used in the original NHA/EIS.

The proposed modification requires a modified zone of investigation (ZOI) (**Figures 2.1 and 2.2, Attachment A**).

SUMMARY OF CHANGES TO NHA/EIS

Records Review

Following the same methods used in the original NHA/EIS, a records review was conducted for the new portions of the modified ZOI to determine if known natural features are present in the area of the modification. According to the Natural Heritage Information Centre (NHIC, 2015) and Land Information Ontario (LIO, 2015) databases, there are no areas designated as an Area of Natural or Scientific Interest (ANSI), provincial parks or conservation reserves in the new portions of the modified ZOI. One area of Provincially-Significant Wetland (PSW) was found in new portions of the modified ZOI: Lower Twenty Mile Creek PSW Complex. This feature is also considered a significant woodland and deer winter congregation area (NHIC, 2015). This feature is shown on **Figures 2.1 and 2.2, Attachment A**.

No rare species were identified as potentially occurring in the new portions of the modified ZOI. No additional changes are required to the Records Review of the NHA/EIS.

Site Investigation

The new portions of the modified ZOI were surveyed on foot to identify and confirm natural features within 50 m of the proposed modification and provide a preliminary assessment of their ecological significance. The work included Ecological Land Classification (ELC) of vegetation communities and a floristic survey following the same methods as described in the NHA/EIS, which are provided below.

Reference: NHA Addendum – Proposed Modified Alternate Transmission Route, Smithville Area Niagara Region Wind Farm

Vegetation communities were delineated on aerial photographs and checked in the field. Vascular plant species lists were recorded separately for each community. Community characterizations were then based on the ELC system (Lee et al., 1998). English colloquial names and scientific binominals of plant species generally follow Newmaster et al. (1998). Wildlife habitat features were also searched for, including features such as hibernacula, bat roosts, stick nests, seeps, and vernal pools. Dates, times, surveyors, and weather conditions of the site investigation are provided in **Table 1**. Qualifications of the staff (James Leslie) who completed the Site Investigation are provided in **Attachment B1.** All data cards were completed in the field and are provided in **Attachment B2**. Wetland boundaries of the Lower Twenty Mile Creek Wetland Complex were delineated in the field by Anne Yagi (Guelph District MNRF) on October 20 and November 9, 2015.

Table 1. Survey Details and Summary

Survey Date and Time	Surveyor(s)	Type of Survey	Weather Conditions
July 30, 2014 11:45 – 14:00	James Leslie	Site Investigation, ELC, floristic survey	22°C, Wind 1 (Beaufort scale), cloud cover 70%, no precipitation

The vegetation communities in the new portions of the modified ZOI are shown on **Figures 3.6 and 3.7 Attachment A** and summarized in **Table 2.**

Table 2. Ecological Land Classification (ELC) Vegetation Types

ELC Type	Community Description
FOREST (FO)	
Deciduous Forest (FOD)	
FOD5 Dry – Fresh Sugar Maple Deciduous Forest	This mature community type contained an abundance of sugar maple in the canopy with occasional occurrences of green ash. Other less commonly observed associate species included shagbark hickory, white elm, black cherry, and red oak. The understory was often composed of gray dogwood and choke cherry. Ground cover included running strawberry-bush, jack-in-the-pulpit, violet species, enchanter's nightshade, and wild strawberry. This community contained a watercourse that runs along the western boundary of the woodland. A municipal road allowance (approximately 20m wide) runs through the woodland. The road allowance is currently unopened however a trail runs through it. The trail was approximately 10-12 feet wide.

Reference: NHA Addendum – Proposed Modified Alternate Transmission Route, Smithville Area Niagara Region Wind Farm

Table 2. Ecological Land Classification (ELC) Vegetation Types

ELC Type	Community Description
FOD9 Fresh – Moist Oak – Maple – Hickory Deciduous Forest	Generally, shagbark hickory was abundant in this mature canopy, with occasional associations of white elm, American basswood, and green ash. The understory often included grey dogwood, as well as canopy saplings (particularly white elm). Ground cover consisted of white avens, enchanter's nightshade, running strawberry-bush, graceful sedge, and wild strawberry. This community included a smaller, complex of sugar maple – beech forest community type (FOD5-2).
SWAMP (SW)	
Deciduous Swamp (SWD)	
SWD3-3 Swamp Maple Mineral Deciduous Swamp	Freeman's/swamp maple was abundant in this community, with occasional occurrences of shagbark hickory. The understory consisted of canopy saplings, inclusive of white elm, as well as common occurrences of gray dogwood. Ground cover species often included spotted touch-me-not, moneywort, panicled aster, and common heal-all. No surface water was observed in this community, although evidence of seasonal pooling was apparent.
MARSH (MA)	
Meadow Marsh (MAM)	
MAM2-2 Reed-canary Grass Mineral Meadow Marsh	These communities were typically dominated by reed-canary grass, occasionally complexed with small areas of upland cultural meadow habitat.
CULTURAL	
Cultural Meadow (CUM)	
CUM1 Mineral Cultural Meadow	This open meadow was dominated by herbaceous species with infrequent occurrences of young white elm and gray dogwood. Birds-foot trefoil and tall goldenrod were abundant in the ground cover, with common occurrences of white sweet clover, teasel, wild strawberry, common St. John's-wort, and timothy grass. In the north half of the Study Area, this CUM1 has a mapped watercourse running along the west edge, creating a small inclusion of marsh habitat. Species within this community consisted primarily of reed-canary grass, dark green bulrush, fox sedge, and moneywort. Surface water within the watercourse was limited to pooling within an otherwise dry, defined channel, where pool depth was generally less than 10 cm deep.
Cultural Woodland (CUW)	
CUW1 Mineral Cultural Woodland	This mid-age woodland had a canopy cover of approximately 40%, often composed of white elm and green ash, with fewer occurrences of Manitoba maple, American basswood and shagbark hickory. The understory had an abundance of gray dogwood, with fewer occurrences of Tartarian honeysuckle, multiflora rose, and wild red raspberry. Ground cover had an abundance of riverbank grape overtopping aster species, reed-canary grass, giant ragweed,

Table 2. Ecological Land Classification (ELC) Vegetation Types

ELC Type	Community Description
	and common heal-all, among others.

None of the vegetation communities located in the new portions of the modified ZOI are considered rare in the province. The complete list of vascular plants observed in the new portions of the modified ZOI is provided in **Attachment C**. Species of conservation concern, as identified in the original NHA/EIS, were searched for during botanical inventories. No species of conservation concern were found.

Wetland communities are shown on **Figures 4.1 and 4.2, Attachment A**, including new wetland feature we444. **Table 3**, in **Attachment D** includes the site investigation results for wetlands for the Modification.

The new portions of the modified ZOI include woodland features that were not listed in the original NHA/EIS: wo225, wo226, wo227 and wo228. Treed areas identified during vegetation surveys were compared to the definition of woodlands provided in O.Reg. 359/09 and the Natural Heritage Assessment Guide (NHAG) (MNR, 2012) to delineate the limits of "woodlands". A woodland is considered as a treed area, woodlot or forested area, other than a cultivated orchard or Christmas tree plantation. Boundaries were delineated using the outer edge of the dripline as the measuring point.

Table 4 in Attachment D includes a description of the attributes, composition and function for each of the woodlands identified as occurring in, or within 50 m of, the Project Location based on the site investigations. The new portions of the modified ZOI were subject to Site Investigations to identify candidate significant wildlife habitat (SWH). Criteria used to identify candidate significant wildlife habitat were derived from the Significant Wildlife Habitat Technical Guide (MNR, 2000) and the Significant Wildlife Habitat Ecoregion 7E Criterion Schedule (MNRF, 2015a). Specific emphasis was placed on determining whether the critical habitat features required to support significant wildlife habitat were present in natural features in the modified ZOI. The results of this assessment for the new portions of the modified ZOI are shown on **Figures 6.1 and 6.2, Attachment A** and summarized in **Table 5** (**Attachment D**). Natural features identified through the site investigations that were not identified through the Records Review included; candidate bat maternity roost habitat (in two features), amphibian breeding habitat (woodland; 2 features), terrestrial crayfish habitat (1 feature) and habitat for species of special concern (two features). The ELC Ecosite Codes and a description of the habitat as related to the Habitat Criteria for Candidate Significant Wildlife Habitat are provided in **Table 5**.

A lack of land access during the appropriate timing windows prevented Stantec from completing field studies necessary to determine candidate bat maternity roost colony SWH.

Reference: NHA Addendum – Proposed Modified Alternate Transmission Route, Smithville Area Niagara Region Wind Farm

It is proposed that the studies to identify candidate bat maternity roost colony habitat be combined with pre-construction surveys for Evaluation of Significance (EOS) for the candidate SWH listed below.

The following candidate significant wildlife habitat features were identified through the Site Investigation:

- One (1) new candidate significant amphibian breeding (woodland) habitat – ah93. The project does not occur in the boundary of this candidate wildlife habitat feature, but does occur within 50 m of the feature. In accordance with Appendix D of the NHAG (MNRF, 2012) it is treated as generalized SWH;
- One (1) new candidate significant amphibian breeding (woodland) – ah92. The project does not occur in the boundary of this candidate wildlife habitat feature but does occur within 50 m of the feature. In accordance with Appendix D of the NHAG (MNRF, 2012) it is treated as generalized SWH;
- Two (2) new candidate significant woodland habitats for S1-S3 and special concern breeding bird species including Wood Thrush, White-eyed Vireo, Louisiana Waterthrush, Hooded Warbler, Canada Warbler, and Red-headed Woodpecker
  - SC01- The project does not occur in the boundary of this candidate wildlife habitat feature but does occur within 50 m of the feature. In accordance with Appendix D of the NHAG (MNRF, 2012) it is treated as generalized SWH;
  - SC02- The Project occurs in this feature, and it is carried forward to EOS;
- Two (2) new candidate significant bat maternity colonies, including for species of conservation concern Tricoloured Bat –
  - bmc56- The project does not occur in the boundary of this candidate wildlife habitat feature but does occur within 50 m of the feature. In accordance with Appendix D of the NHAG (MNRF, 2012) it is treated as generalized SWH;
  - bmc57- The Project occurs in this feature, and it is carried forward to EOS; and
- One new candidate terrestrial crayfish habitat- tch1. The project does not occur in the boundary of this candidate wildlife habitat feature. In accordance with Appendix D of the NHAG (MNRF, 2012) it is treated as generalized SWH.

Reference: NHA Addendum – Proposed Modified Alternate Transmission Route, Smithville Area Niagara Region Wind Farm

The following features have been carried forward directly to the EIS:

- the generalized candidate significant wildlife habitat is treated as significant in accordance with Appendix D (MNRF, 2015); and
- the deer winter congregation area habitat has been evaluated and ranked as significant by the MNRF, and does not require further evaluation. Forested ecosites are the habitat type considered to provide significant wildlife habitat for deer winter congregation areas (MNRF, 2015). The deer winter congregation area occurs in association with the boundaries of woodland feature wo225 as confirmed during the site investigation.

The remaining candidate SWH features have been carried forward to the EOS.

Evaluation of Significance

Wetlands

Wetlands previously identified and confirmed by MNRF as provincially significant or locally significant meet the requirements for a determination of significance. Wetland we444 is identified by MNRF as part of the Lower 20 Mile Creek Wetland complex. The Lower 20 Mile Creek Wetland complex has been evaluated by MNRF as a provincially significant wetland. As a result, no evaluation of significance is required for we444 and the feature is carried forward to the Environmental Impact Study (EIS).

Wetland we15 was previously identified in the original NHA/EIS. It is part of a provincially significant wetland.

Wetland we442 has not been evaluated. It occurs within 50 m of the Project Location, however as no development is proposed within the wetland, it has been treated as significant and a Wetland Characteristics and Ecological Functions Assessment (WCEFA) has been completed in accordance with Appendix C of the Natural Heritage Assessment Guide for Renewable Energy Projects (MNR, 2012). The WCEFA is presented in **Table 6 (Attachment D)**, which summarizes the wetland attributes relevant to the completion of an Environmental Impact Statement for we442.

Woodlands

Guidance provided in Section 6.2.2.1 of the *Natural Heritage Assessment Guide for Renewable Energy Projects* (MNR, 2012) was used to evaluate woodlands. Four woodland features were identified in, or within 50 m of, the Project Location, and require an evaluation of significance. Evaluation of Significance is based on a woodland cover of 18.98% in the Niagara Region (NPCA, 2010). **Table 7 (Attachment D)** provides the evaluation of significance for woodlands wo225, wo226, wo227 and wo228.

Reference: NHA Addendum – Proposed Modified Alternate Transmission Route, Smithville Area Niagara Region Wind Farm

Wo225 met the criteria for significance based on size, proximity to other woodlands/habitats, linkages, water protection and diversity.

Wo226 met the criteria for significance based on water protection.

Woodlands wo225 and wo226 were evaluated as significant and will be carried forward to the EIS.

Candidate Wildlife Habitats

In accordance with Appendix D of the NHAG (MNRF 2012), the following candidate significant wildlife habitats are treated as significant for the purposes of this assessment, however a study of habitat use will be completed prior to development:

- S1-S3 and special concern breeding bird species- SC02
- bat maternity colonies, including for species of conservation concern Tricoloured Bat –bmc57

The following pre-construction EOS surveys are required: breeding bird surveys (targeting Wood Thrush, Eastern Wood-Pewee, White-eyed Vireo, Louisiana Waterthrush, Hooded Warbler, Canada Warbler, and Red-headed Woodpecker), and bat maternity roost surveys, including for Tricoloured Bat. The results of these surveys will be communicated to the MNRF in the form of a letter report, prior to construction. The qualifications of staff who completed the Evaluation of Significance are provided in **Appendix B1**.

The following methods will be used to evaluate these features prior to construction:

Breeding Bird Surveys (SC02)

Three rounds of surveys for breeding birds will be conducted in these features between late May and late June, targeting Wood Thrush, Eastern Wood-Pewee, White-eyed Vireo, Louisiana Waterthrush, Hooded Warbler, Canada Warbler, and Red-headed Woodpecker. Surveys will be comprised of 10-minute point counts, spread approximately 250 m apart, as needed to survey the entire feature. Given the relatively small size of the feature and the coverage of the point count circle (i.e. 100 m) one (1) point count will be completed. Surveys will begin at, or within, half an hour of sunrise and will be completed by 10:00 am. Surveys will be conducted in accordance with the recommended weather parameters (i.e., precipitation and visibility) outlined in the *Bird and Bird Habitats: Guidelines for Wind Power Projects* (MNRF, 2011a).

The following information will be recorded: date, names of observers, time, weather conditions (temperature, % cloud cover, Beaufort wind scale, visibility, and precipitation), location, species detected and number of individuals of significant species. Although these surveys target breeding birds, non-breeding bird observations will also be recorded.

Bat Maternity Roost Colony Surveys (bmc57)

Due to property access restrictions, access to the woodland is restricted to the unopened road allowance. Candidate bat maternity habitat will be evaluated by determining the density of snags/cavity trees in the woodland, by surveying the unopened road allowance and then calculating the number of snags/cavity trees per hectare. The survey will be conducted during leaf-off condition in early spring to document ≥25 cm dbh (centimetres diameter at breast height) wildlife trees and identify candidate habitat for maternity colony roosts in accordance with the 'Bats and Bat Habitats: Guidelines for Wind Power Projects' (OMNR, 2011b). If snag/ cavity tree density is ≥10 snags or cavity trees per hectare (ha) of trees ≥25 cm dbh, then the feature is a candidate for maternity colony roosts and bat exit surveys will be performed.

If required, the bat exit surveys will consist of surveying the best candidate trees (minimum of 10 trees) from Bmc57. in June (30 minutes before dusk until 60 minutes after dusk) to identify confirmed bat maternity roosting habitat. Evaluation methods will follow the 'Bats and Bat Habitats: Guidelines for Wind Power Projects' (OMNR, 2011b).

Additional information that will be recorded include: name(s) of the observer(s); date and time of day; weather conditions (temperature, Beaufort scale wind speed); % cloud cover; precipitation; and GPS coordinates of the point location.

Environmental Impact Study

The following significant features were identified in, or within 50 m of, the modified transmission line project location and require an environmental impact study:

- Wetlands (we15, we442, we444)
- Woodlands (wo225, wo226)
- Wildlife Habitat (treated as significant pending habitat use studies)
  - S1-S3 and special concern breeding bird species- SC02
  - Bat maternity colonies, including for species of conservation concern Tricoloured Bat – bmc57
  - Deer winter yarding habitat,
  - Generalized wildlife habitat (AH92, AH93, bmc56, SC01 and tch1)

The activities assessed within this report consist of the installation and operation of a transmission line and an associated access trail. The Project Location in relation to features we 444, wo 225 and the generalized wildlife habitat are shown on **Figure 8**, Attachment A.

The Modification consists of an overhead transmission line that would deviate from the approved route at the intersection of South Grimsby Rd. 6 and proceed in the municipal road allowance

westward along Regional Road 20 to an existing unopened road allowance. The line follows hedgerows along a soy field. It continues through the existing unopened road allowance through a woodland (wo226). From here the transmission line will be directionally drilled so that no construction or operation of the line occurs in the Lower 20 Mile Creek PSW and associated woodland (wo225). Other the other side of the directionally drilled portion, the line is contained within an active agricultural field and continues north through the field, to where it joins Young Street. The proposed alternate route will then proceed in the municipal road allowance along Young Street eastward and rejoin the approved route at South Grimsby Rd. 5.

Wetlands we15, we442, we444

No components of the Project Location are located in the significant wetland boundaries as identified and confirmed through site investigations. As the Project Location and all construction and operational activities are sited outside all significant wetland boundaries, there will be no direct loss of significant wetland habitat or function as a result of the Project.

Construction activities during the installation of the collector and transmission line are anticipated to be low impact and short term in duration.

There will be no clearing of trees in any of the wetland features that could result in wetland desiccation or drying. The risk of accidental intrusion and vegetation removal will be minimized through demarcation of work areas, as described below. The type of construction proposed involves works having little or minimal impact to pervious areas and precludes the potential for effects associated with changes in water balance (i.e. surface and ground water changes).

The wetland units are located adjacent to public roads, road allowances, and active agricultural operations. During operation there may be occasional maintenance to the collector line, but this will occur outside of all wetland boundaries. Maintenance activities are expected to be only required occasionally and will be short term in duration. Potential for impacts such as noise, dust, spills are considered low from maintenance activities.

The following mitigation measures are recommended:

Avoidance is the main strategy used to minimize impacts to wetland habitat within 50 m of the Project Location. All components of the Project are sited outside the wetland feature boundaries. Standard best management practices will be applied to all construction activities:

- No development will be permitted within the significant wetland boundaries.
- The boundaries of all wetlands within 30 m of the proposed construction area will be flagged / staked in the field by a qualified ecologist prior to construction to assist with the demarcation of the construction area, to ensure construction activities avoid these sensitive areas and to assist with the proper field installation of erosion and sediment controls;

Reference: NHA Addendum – Proposed Modified Alternate Transmission Route, Smithville Area Niagara Region Wind Farm

- Silt barriers (e.g., fencing) will be erected along the edge of all wetland boundaries where they are located within 30m of construction areas (including staging and laydown areas). These barriers will be monitored daily during constructionand after periods of high precipitation and bi-weekly following construction and properly maintained during and following construction until soils in the construction area are re-stabilized with vegetation. Additional mitigation measures for sediment and erosion control will be implemented as outlined in **Attachment E.**
- In the event of accidental damage to trees, or unexpected vegetation removal, these disturbed areas will be restored to pre-existing conditions through the seeding or planting of species native to Ecoregion 7E. Any trees damaged during construction will be inspected by a qualified arborist and appropriate measures implemented at their direction.
- Inspectors will ensure construction vehicles and personnel stay within the construction envelope, thereby limiting the disturbance of natural vegetation.
- All refueling activities will occur more than 30m from all wetlands. In the event of an accidental spill, the MOE Spills Action Centre will be contacted and emergency spill procedures implemented immediately.
- Any fuel storage and activities with the potential for contamination will occur in properly protected and sealed areas greater than 30m from a wetland.
- General mitigation measures for directional drill will be implemented as outlined in **Attachment E**

Significant Woodlands (wo225 and wo226)

Wo225

No project components for the Modification are located in wo225. As the Project Location (i.e. the transmission line and the associated access trail) and all construction and operational activities are sited outside of the wo225 boundary, there will be no direct loss of significant woodland habitat or function to this feature as a result of the Project. Some limited pruning of trees along the edge of the feature may be required.

Indirect effects resulting from construction activities, such as dust generation, sedimentation and erosion will be short term, temporary in duration and mitigated through the use of standard site control measures. During operation there is the potential for spills and contamination to the woodland. Storage of fuel and activities with the potential to cause contamination will occur in properly protected and sealed areas outside the woodland boundaries. Improper disposal of wastes (fluids, containers, cleaning materials) could also have a negative impact on the feature.

Reference: NHA Addendum – Proposed Modified Alternate Transmission Route, Smithville Area Niagara Region Wind Farm

Mitigation measures for wo225

The following mitigation measures will be implemented for wo225:

- No development will occur within the woodland boundary.
- The work area will be clearly delineated using erosion fencing to avoid accidental damage to trees.
- The erosion fencing will be placed as far away as possible from the significant woodland and no closer than the drip-line.
- Erosion and sediment control structures will be monitored regularly to ensure that they are fully functional especially before and after major rainfall events. Should erosion and sediment control measures not be functional, they should be immediately repaired.
- Workers will be instructed on the importance of avoiding entrance to the demarcated area.
- Inspectors will ensure construction vehicles and personnel stay within the construction envelope, thereby limiting the disturbance of natural vegetation.
- All refueling activities will occur well away from the woodland. In the event of an accidental spill, the MOE Spills Action Centre will be contacted and emergency spill procedures will be implemented immediately.
- All maintenance activities, vehicle refueling or washing, as well as the storage of chemical and construction equipment will be located more than 30m from significant woodlands.
- Accidental damage to trees, or unexpected vegetation removal, may require re-planting of similar, native species. If re-planting is required, MNR will be consulted on the appropriate action(s) to be taken.
- Construction activities within 30m of significant woodlands will occur during daylight hours to avoid excessive noise and/or light disturbances to wildlife.
- Mitigation measures for tree pruning as described in **Attachment E**.

wo226

Clearing of trees will be required to facilitate the installation of an 85 m stretch of overhead transmission line through wo226. Vegetation along this portion of the transmission line will be trimmed or removed to a distance of approximately 10 m (within the 20 m road allowance) to prevent conflicts between fallen branches and the lines. The transmission line has been sited in an unopened road allowance. While the road allowance is unopened, a 10-12 foot wide recreational trail exists through the woodland that is currently used by snowmobilers and ATVs. The transmission line has been sited to follow the existing trail, as closely as possible. This will minimize

Reference: NHA Addendum – Proposed Modified Alternate Transmission Route, Smithville Area Niagara Region Wind Farm

the amount of clearing that is required and will minimize impacts by avoiding creation of a new trail or opening. The trail will remain during the operations phase to access the transmission line but will only be maintained when access to the line is required.

Clearing activities during construction will result in the removal of vascular plants and portions of plant communities. All plant species observed within woodland wo226 were considered common in Ontario. The watercourse occurs more than 30m to the west of the transmission line location and all vegetation clearing activities will occur more than 30m from this feature.

Potential negative effects from removal of portions of significant woodlands include accidental damage to critical root zones and loss of trees or damage to limbs outside of those areas proposed for removal.

Indirect effects resulting from construction activities, such as dust generation, sedimentation and erosion will be short term, temporary in duration and mitigated through the use of standard site control measures. During operation there is the potential for spills and contamination to the woodland. Storage of fuel and activities with the potential to cause contamination will occur in properly protected and sealed areas outside the woodland boundaries. Improper disposal of wastes (fluids, containers, cleaning materials) could also have a negative impact on the feature.

Mitigation measures for wo226

The following mitigation measures will be used where removal of portions of significant woodland is required to permit the construction and operation of the transmission line:

- The vegetation removal area will be restricted to the narrowest corridor feasible (i.e. 10m) within the Municipal right-of-way for construction and safe operation of the line;
- Construction traffic in the woodland will be limited as much as possible including stringing cable from outside the area, where feasible;
- Mitigation measures for vegetation removal and sediment and erosion control will be implemented as described in **Attachment E**;
- The work area will be clearly delineated prior to any construction using a robust barrier such as a silt fence backed up with wire fencing to avoid accidental encroachment outside of the work areas;
- Silt barriers will be erected and maintained along the boundaries of all construction areas inside the significant woodlands;
- Workers will be advised not to trespass beyond the boundary of the marked area;

Reference: NHA Addendum – Proposed Modified Alternate Transmission Route, Smithville Area Niagara Region Wind Farm

- Any material (i.e. soil) stockpiles will be located more than 30 m from the woodland edge. Where this is not possible, stockpiles will be located outside of the feature and at a minimum, at the edge of the woodland as defined by the outer edge of the canopy (i.e. drip line). Stockpiles will be covered when not in use, especially during rain events or high wind events;
- All maintenance activities, vehicle refueling or washing and chemical storage will be located more than 30 m from significant woodlands,
- Any tree pruning that may be required to protect and maintain power lines will be done under the supervision of a Certified Arborist.

Significant Wildlife Habitat

Deer Winter Congregation Area Habitat and Generalized Wildlife Habitat

No Project components are located in the Deer winter congregation area habitat or the Generalized Wildlife Habitat. As the Project components and all construction and operational activities are sited outside of the boundaries of these features, there will be no direct loss of significant wildlife habitat or function to these features as a result of the Project.

Potential negative effects from construction activities could include habitat avoidance/disturbance caused by noise. However, given the rural and agricultural land uses currently occurring adjacent to the features, and their location adjacent to existing roads, they are not considered highly sensitive to temporary disturbances. Indirect impacts resulting from construction activities, such as dust generation, sedimentation and erosion are expected to be short term, temporary in duration and mitigated through the use of standard site control measures. Construction activities will occur outside of the winter season when deer would be using the congregation area and as a result construction activities are not anticipated to impact deer use of the habitat. Disturbance impacts from operation of an overhead transmission line on resident wildlife are considered negligible.

The following mitigation measures will be applied for Deer Yarding Habitat and Generalized Wildlife Habitat:

- Mitigation measures for the significant wetland and woodland that these features are contained within will be applied as outlined above.

Reference: NHA Addendum – Proposed Modified Alternate Transmission Route, Smithville Area Niagara Region Wind Farm

Bmc57 and SC02

Special Concern Species (Wood Thrush, Eastern Wood-Pewee, White-eyed Vireo, Louisiana Waterthrush, Hooded Warbler, Canada Warbler, and Red-headed Woodpecker) (SC02) and Bat Maternity Roosting Colony (bmc57)

Vegetation removal will be required in bmc57 and SC02 (as discussed under Significant Woodlands above) for the installation of the overhead line.

Given the limited nature of the removal and its siting along an existing recreational trail, the vegetation removal will not result in a loss of function for the significant wildlife habitat components associated with these features. It also will not result in a gap opening of more than 20 m. Openings of 20 m or less between crown edges (including public roads, railways etc.) are not considered to divide a woodland into two features (MNR, 2012). Indirect impacts resulting from construction activities, such as dust generation, sedimentation and erosion are expected to be short term, temporary in duration and mitigated through the use of standard site control measures.

Disturbance impacts from operation of an overhead transmission line on resident wildlife are considered negligible.

The following mitigation measures will be applied for Bmc57 and SC02:

- Mitigation measures for the significant woodland that these features are contained within will be applied as outlined above.

Evaluation of Significance surveys will be undertaken to confirm the significance of Bmc57 and SC02 as required by the NHAG (MNRF, 2012).

If bmc57 is confirmed as significant the following additional mitigation measures will be implemented:

- Tree removal will not occur from May 1st- August 31st
- To the extent possible, the best quality cavity trees/snags will be marked and retained.

If SC02 is confirmed as significant through habitat use studies the following additional mitigation measures will be implemented:

- Tree removal will not occur from May 1st- July 31st
- Mitigation measures for vegetation removal as described above under **Mitigation measures for wo226** will also be implemented.

Reference: NHA Addendum – Proposed Modified Alternate Transmission Route, Smithville Area Niagara Region Wind Farm

SUMMARY AND CONCLUSION

Given the results of this assessment, it is our opinion that the modification can be implemented with no new net negative environmental effects.

We would appreciate MNRF review of the material and confirmation as appropriate. If you have any questions or concerns, please do not hesitate to contact the undersigned at any time.

Regards,

STANTEC CONSULTING LTD.

Nicole Kopysh, BES
Senior Terrestrial Ecologist
Phone: (519) 780-8163
Fax: (519) 836-2493
nicole.kopysh@stantec.com

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Applied Ecologist, Senior Principal
Phone: (519) 780-8153
Fax: (519) 836-2493
david.charlton@stantec.com

Attachments:

A - Figures
- Figure 1 (Draft Site Plan Overview);
- Figures 2.6 & 2.7 (Records Review-Natural Features);
- Figures 3.6 & 3.7 (ELC Vegetation Communities);
- Figures 4.6 & 4.7 (Wetland Communities);
- Figures 5.6 & 5.7 (Woodland Communities);
- Figures 6.6 & 6.7 (Candidate Significant Wildlife Habitat);
- Figures 7.6 & 7.7 (Significant Natural Features)

B - Field Data Cards (B1) and Staff Qualifications (B2)

C - Vascular Plant Species List

D - Tables
- Table 3: Site Investigation Results Wetlands
- Table 4: Site Investigation Results Woodlands
- Table 5: Summary of Site Investigation Results for Candidate Significant Wildlife Habitat
- Table 6: Wetland Characteristics and Ecological Functions Assessment for Unevaluated Wetlands >0.5 ha found within 50 m of the Project Location
- Table 7: Evaluation of Significance – Woodlands

E - General Construction Mitigation Measures

c. Adam Rosso, Boralex
Chris Powell, Stantec
Bryan Tripp, Stantec

cm \\cd1220-f02\01609\active\60950269\reports\amendments 2015\nha addendum - smithville t-line\nha_addendum_t-line\submission 2 to mnrf_feedma property\let_61052_nha-adndm_smithville_20160408_fnl.docx

REFERENCES

Bird Studies Canada. 2003. The Marsh Monitoring Program – Training Kit and Instructions for Surveying Marsh Birds, Amphibians and Their Habitats. 2003 Edition. 40 pages. Published by Bird Studies Canada in cooperation with Environment Canada and the U.S. Environmental Protection Agency. March 2003.

Land Information Ontario (LIO). 2015. Digital mapping. Available online: https://www.ontario.ca/page/make-natural-heritage-area-map. Accessed: November 2015.

Ministry of Natural Resources and Forestry (MNRF). 2000. Significant Wildlife Habitat Technical Guide. 151p.

Ministry of Natural Resources and Forestry (MNRF). 2015a. Significant Wildlife Habitat Ecoregion 7E Criterion schedule. Available online: http://www.ebr.gov.on.ca/ERS-WEB-External/displaynoticecontent.do?noticeId=MTE1ODc5&statusId=MTczNDgy&language=en.

Natural Heritage Information Centre (NHIC). 2015. Natural Areas and Species records search. Biodiversity explorer, http:/nhic.MNRF.gov.on.ca. MNRF, Peterborough.

Ontario Ministry of Natural Resources (OMNR). 2011a. Natural Heritage Assessment Guide for Renewable Energy Projects. 109 pp. November 2012.

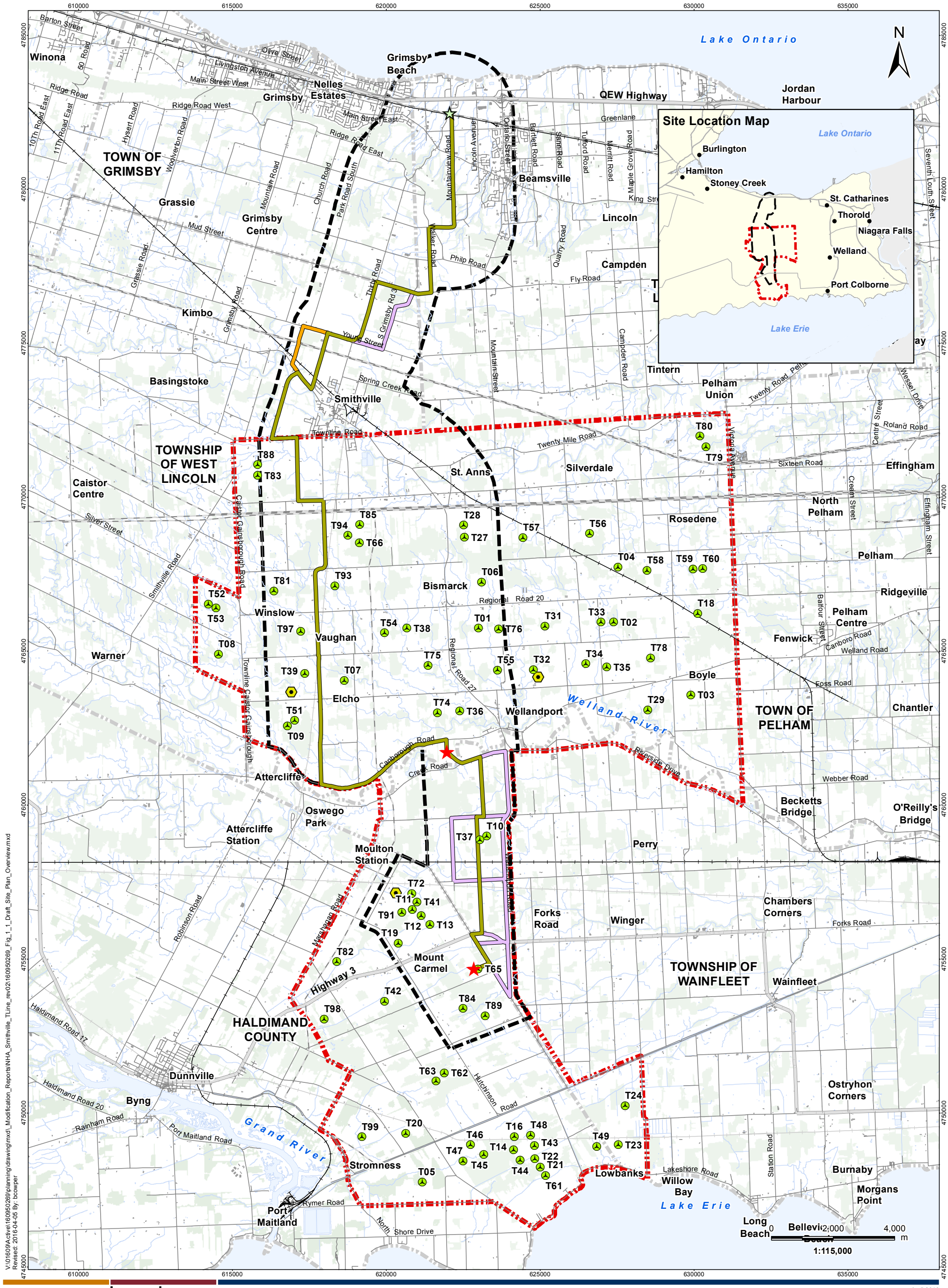
Ontario Ministry of Natural Resources (OMNR). 2011a. Birds and Bird Habitats. Guidelines for Wind Power Projects.24 pp. December, 2011.

Ontario Ministry of Natural Resources (OMNR). 2011b. Bats and Bat Habitats. Guidelines for Wind Power Projects.24 pp. July, 2011.

April 29, 2016

Reference: **NHA Addendum – Proposed Modified Alternate Transmission Route, Smithville Area Niagara Region Wind Farm**

ATTACHMENT A: FIGURES



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Revised: 2016-04-05 By: bcowper

Legend

- Project Study Area
- Interconnector Study Area
- Proposed Turbine Location
- Transformer Substation
- Tap-in Location
- Existing Met Tower
- Preferred Transmission Line Route (REA)
- Alternate Transmission Route (REA)
- Modified Alternate Transmission Route
- Road
- Expressway / Highway
- Active Railway
- Abandoned Railway
- Existing Structures
- Existing Transmission Line
- Watercourse
- Waterbody
- Wooded Area
- Municipality Lower Tier

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
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Stantec

Client/Project
FWRN LP
Niagara Region Wind Farm

April 2016
160950269

Figure No.
1

Title
Draft Site Plan Overview Revised

617000
617500
618000
4775500
4775000
N
Young Street
South Grimsby Road 6
South Grimsby Road 5
Lower Twenty Mile Creek Wetland Complex
Where underground Transmission Line crosses wetland, no ground or vegetation will be impacted by construction
0
80
160
m
1:4,000

V:\01609\Active\160950269\planning\drawing\mxd_Modification_Reports\NHA_Smithville_TLine_rev02\160950269_Figure_2_Records_Review_Mapbook.mxd
Revised: 2016-04-27 By: bcowper

April, 2016
160950269

Stantec

Legend

- 50 m Zone of Investigation
- Zone of Investigation assessed during NHA/EIS
- Area Added

Modified Alternate Transmission Route

- Above Ground
- Underground
- Preferred Transmission Route (REA)
- Access Trail
- Unevaluated Wetland (NPCA)
- Woodland (MNRF)
- Provincially Significant Wetland (MNRF)
- Provincially Significant Wetland (MNRF revised, 2015)
- Deer Winter Congregation Areas (MNRF)

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N).
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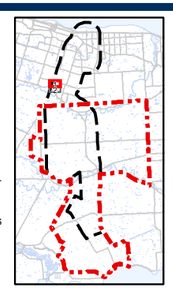
3. Orthoimagery source: First Base Solutions, Date Spring 2010.



Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
2.1

Title
Records Review - Natural Features Figure 2.1 Revised

617000 617500 618000

4774500

N

Regional Road 20

South Grimsby Rd 6

South Grimsby Road 5

Lower Twenty Mile Creek Wetland Complex

0 80 160 m

1:4,000

617000 617500 618000

4774500

April, 2016
160950269

V:\01609\Active\160950269\planning\drawing\mxd_Modification_Reports\NHA_Smithville_TLine_rev02\160950269_Figure_2_Records_Review_Mapbook.mxd
Revised: 2016-04-27 By: bcowper

Stantec

Legend

- 50 m Zone of Investigation
- Zone of Investigation assessed during NHA/EIS
- Area Added

Modified Alternate Transmission Route

- Above Ground
- Preferred Transmission Route (REA)
- Access Trail
- Unevaluated Wetland (NPCA)
- Woodland (MNRF)
- Provincially Significant Wetland (MNRF)
- Deer Winter Congregation Areas (MNRF)

Notes

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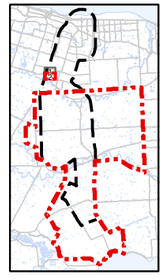
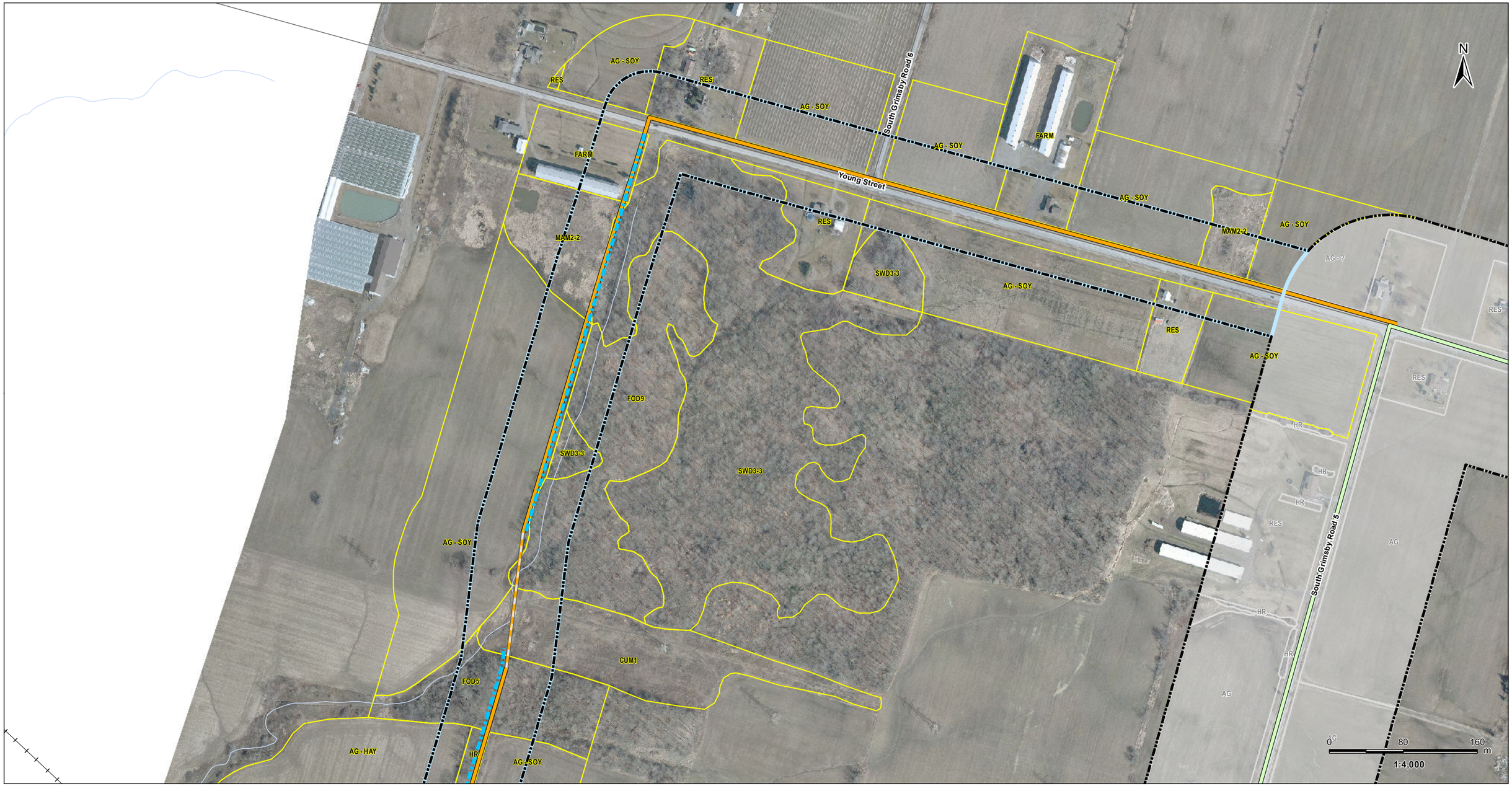


Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
2.2

Title
Records Review - Natural Features Figure 2.2 Revised



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Revised: 2016-04-27 By: bcowper

April, 2016
160950269

Stantec

Legend

- 50 m Zone of Investigation
- Zone of Investigation assessed during NHA/EIS
- Area Added
- ELC Boundary

Modified Alternate Transmission Route

- Above Ground
- Underground
- Preferred Transmission Line Route (REA)
- Access Trail

Notes

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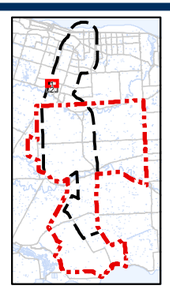

Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
3.1

Title
ELC Vegetation Communities - Figure 3.1 Revised

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Revised: 2016-04-27 By: bcowper

April, 2016
160950269

Legend

- 50 m Zone of Investigation
- Zone of Investigation assessed during NHA/EIS
- Area Added
- ELC Boundary

Modified Alternate Transmission Route

- Above Ground
- Preferred Transmission Line Route (REA)
- Access Trail

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N).
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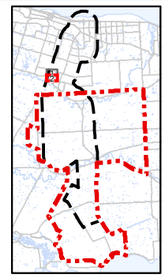

Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
3.2

Title
ELC Vegetation Communities - Figure 3.2 Revised

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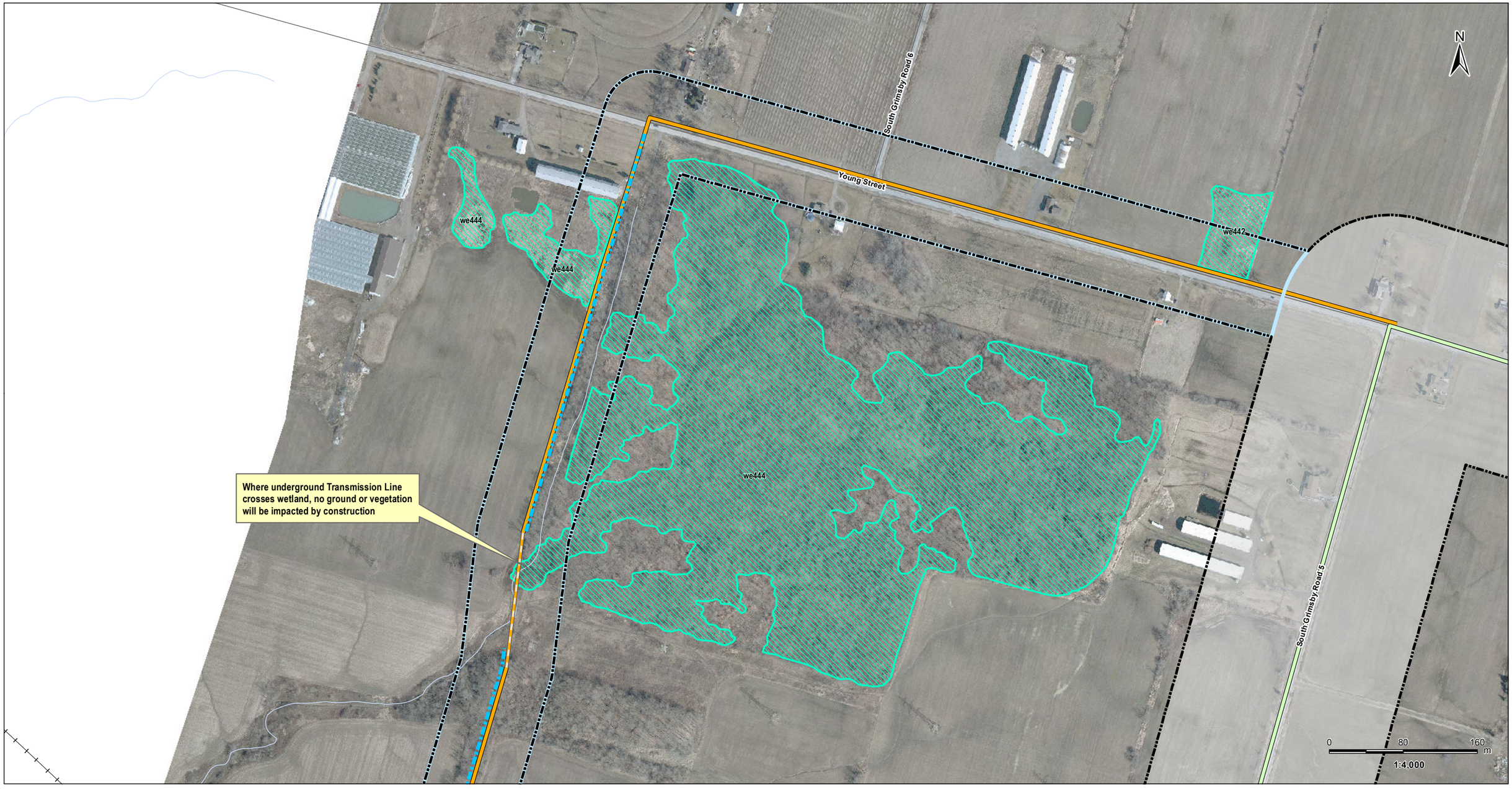
Revised: 2016-04-27 By: bcowper



April, 2016
160950269

Stantec

Legend

- 50 m Zone of Investigation
- Zone of Investigation assessed during NHA/EIS
- Area Added

Modified Alternate Transmission Route

- Above Ground
- Underground
- Preferred Transmission Line Route (REA)
- Access Trail
- Wetland Communities

Notes

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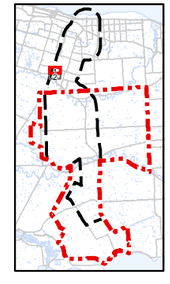
3. Orthoimagery source: First Base Solutions, Date Spring 2010.



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FWRN LP
Natural Heritage Assessment Report

Figure No.
4.1

Title
Wetland Communities
Figure 4.1
Revised

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Revised: 2016-04-27 By: bcowper

April, 2016
160950269

Stantec

Legend

- 50 m Zone of Investigation
- Zone of Investigation assessed during NHA/EIS
- Area Added

Modified Alternate Transmission Route

- Above Ground
- Preferred Transmission Line Route (REA)
- Access Trail
- Wetland Communities

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N).
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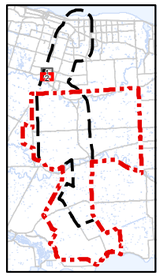
3. Orthoimagery source: First Base Solutions, Date Spring 2010.



Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
4.2

Title
Wetland Communities
Figure 4.2
Revised

V:\01609\Active\160950269\planning\drawing\mxd_Modification_Reports\NHA_Smithville_TLine_rev02\160950269_Figure_5_WoodIand_Communities_Mapbook.mxd
Revised: 2016-04-27 By: bcowper

Legend

- 50 m Zone of Investigation
- Zone of Investigation assessed during NHA/EIS
- Area Added
- Woodland Communities

Modified Alternate Transmission Route

- Above Ground
- Underground
- Preferred Transmission Line Route (REA)
- Access Trail

Notes

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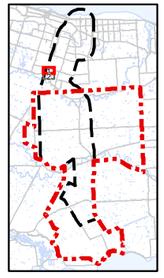

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FWRN LP
Natural Heritage Assessment Report

Figure No.
5.1

Title
Woodland Communities
Figure 5.1
Revised

April, 2016
160950269

617000
617500
618000
4774500
wo226
wo227
wo228
wo27
wo26
Regional Road 20
South Grimsby Rd 6
South Grimsby Road 5
N
0
80
160
m
1:4,000

V:\01609\Active\160950269\planning\drawing\mxd_Modification_Reports\NHA_Smithville_TLine_rev02\160950269_Figure_5_WoodlandCommunities_Mapbook.mxd
Revised: 2016-04-27 By: bcowper

April, 2016
160950269

Stantec

Legend

- 50 m Zone of Investigation
- Zone of Investigation assessed during NHA/EIS
- Area Added

Modified Alternate Transmission Route

- Above Ground
- Preferred Transmission Line Route (REA)
- Access Trail
- Woodland Communities

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N).
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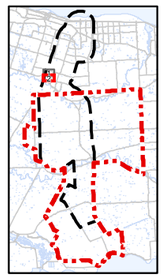

Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
5.2

Title
Woodland Communities
Figure 5.2
Revised

V:\01609\Active\160950269\planning\drawing\mxd_Modification_Reports\NHA_Smithville_TLine_rev02\160950269_Figure_6_Candidate_Significant_Wildlife_Habitat_Mapbook.mxd
Revised: 2016-04-27 By: bcowper

April, 2016
160950269

Stantec

Legend

- 50 m Zone of Investigation
- Zone of Investigation assessed during NHA/EIS
- Area Added

Modified Alternate Transmission Route

- Above Ground
- Underground
- Preferred Transmission Line Route (REA)
- Access Trail
- Deer Winter Congregation Areas (MNRF)
- Amphibian Breeding Habitat
- Bat Maternity Colonies
- Special Concern Breeding Bird Species Habitat

Notes

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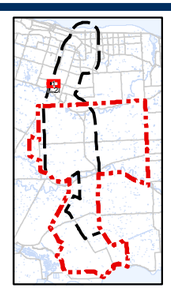
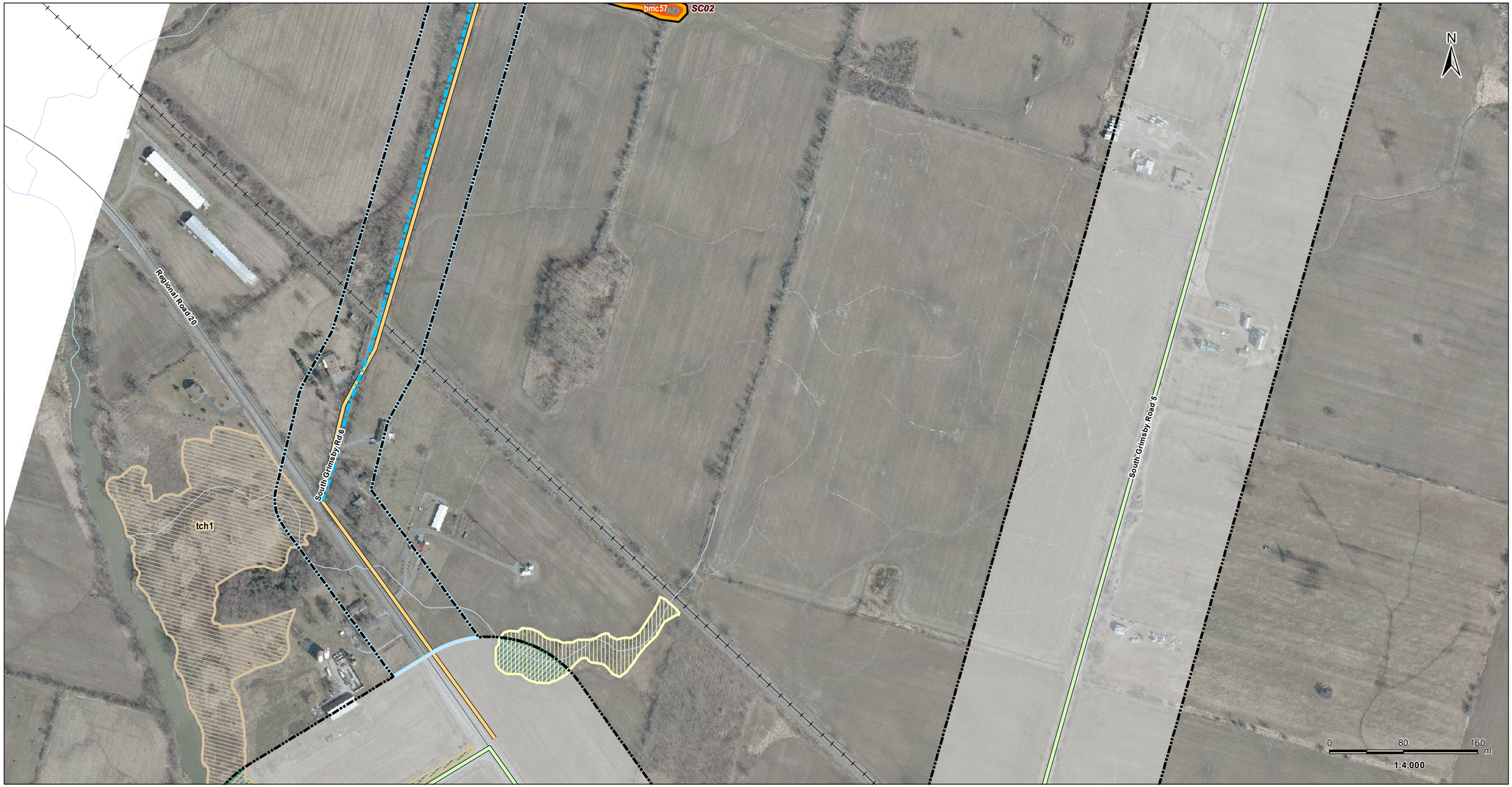


Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
6.1

Title
Candidate Significant Wildlife Habitat Figure 6.1 Revised



April, 2016
160950269

Stantec

Legend

- 50 m Zone of Investigation
- Zone of Investigation assessed during NHA/EIS
- Area Added

Modified Alternate Transmission Route

- Above Ground
- Preferred Transmission Line Route (REA)
- Access Trail
- Woodland Vole Habitat
- Terrestrial Crayfish Habitat
- Bat Maternity Colonies
- Special Concern Breeding Bird Species Habitat

Notes

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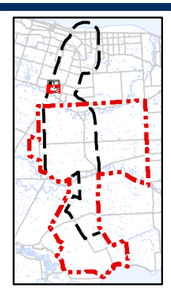
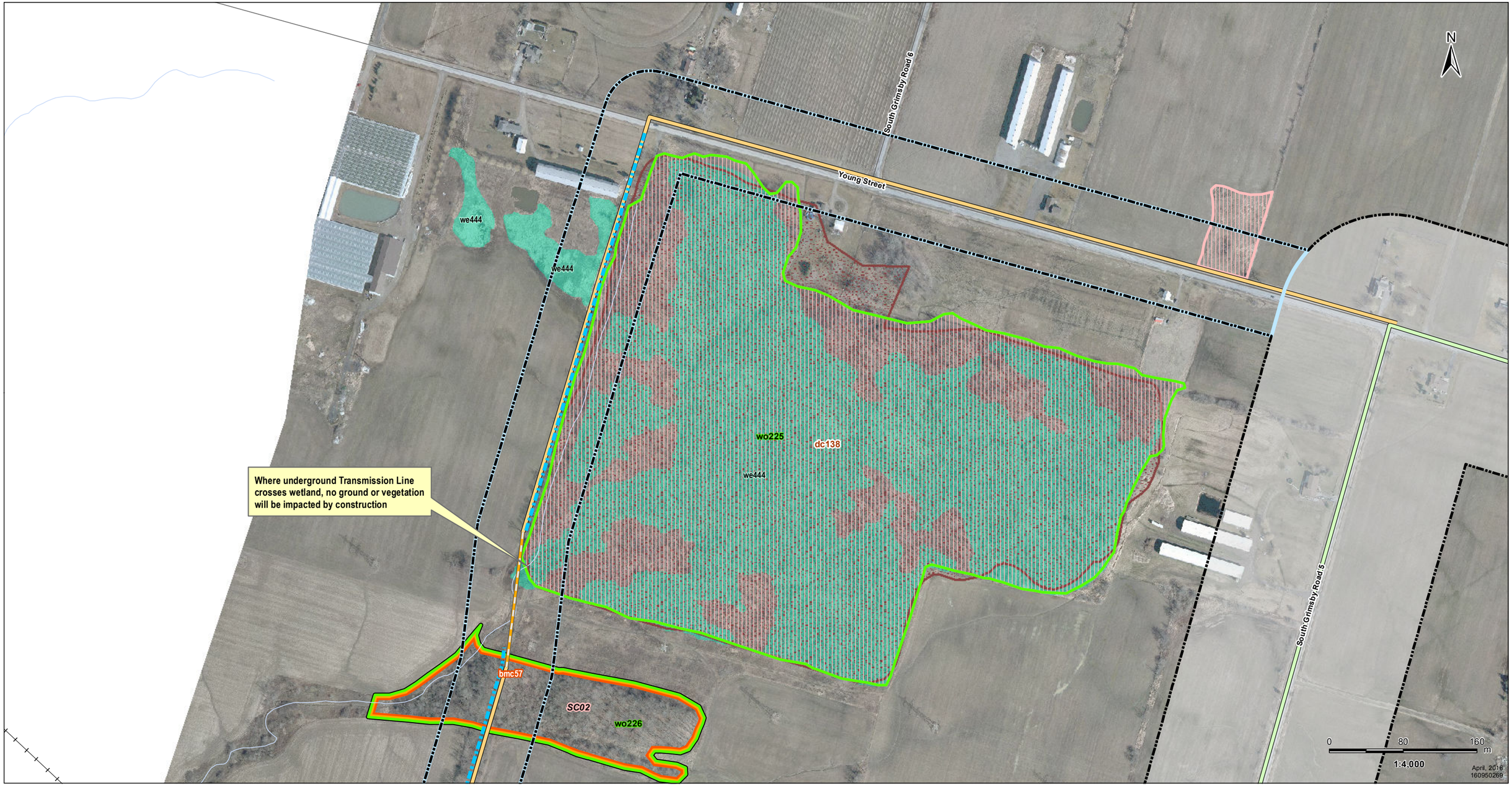


Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
6.2

Title
Candidate Significant Wildlife Habitat Figure 6.2 Revised



Stantec

Legend

- 50 m Zone of Investigation
- Zone of Investigation assessed during NHA/EIS
- Area Added

Modified Alternate Transmission Route

- Above Ground
- Underground
- Preferred Transmission Line Route (REA)
- Access Trail
- Wetland Communities
- Woodland Communities
- Special Concern Breeding Bird Species Habitat
- Generalized Wildlife Habitat
- Deer Congregation Areas (MNR) (Generalized)
- Bat Maternity Colonies

Notes

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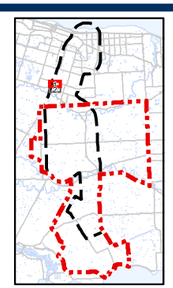

Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
7.1

Title
Significant Natural Features Figure 7.1 Revised

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Revised: 2016-04-27 By: bcowper

Stantec

Legend

- 50 m Zone of Investigation
- Zone of Investigation assessed during NHA/EIS
- Area Added

Modified Alternate Transmission Route

- Above Ground
- Preferred Transmission Line Route (REA)
- Access Trail
- Wetland Communities
- Woodland Communities
- Special Concern Breeding Bird Species Habitat
- Generalized Wildlife Habitat
- Bat Maternity Colonies

Notes

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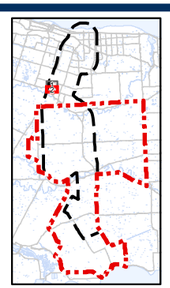


Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
7.2

Title
Significant Natural Features Figure 7.2 Revised

617200 617400

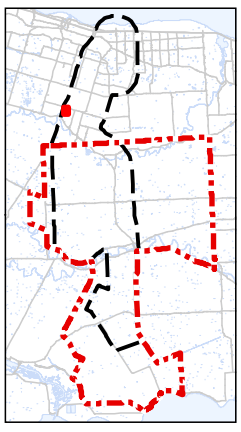
4775400 4775200 4775000

Young Street

N

19.3 m
11 m
3.4 m
2.8 m
23.4 m
5.3 m
4.2 m
26.2 m
8.1 m

we444
we444
we444
wo225
SC02
bmc57
wo226



Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2013.
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- Property Boundary
- Proposed Transmission Line Pole Location
- Access Trail

Modified Alternate Transmission

- Overhead
- Underground
- Significant Woodland
- Wetland Communities
- Generalized Wildlife Habitat
- Special Concern Breeding Bird Species Habitat
- Bat Maternity Colonies

0 30 60 metres

1:2,000 (At Original document size of 11x17)

Stantec

Project Location
Niagara Region, ON

160950269 REVA
Prepared by BC on 2016-03-10
Technical Review by ## on 2016-###-##
Independent Review by ## on 2016-###-##

Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
8

Title
Natural Features and Alternate Transmission Line Location

April 29, 2016

Reference: **NHA Addendum – Proposed Modified Alternate Transmission Route, Smithville Area Niagara Region Wind Farm**

ATTACHMENT B1: CVS

James Leslie B.E.S.

Terrestrial Ecologist

James Leslie has over six years of experience as a Terrestrial Ecologist with Stantec and is the Technical Lead for vegetation field studies. While James has acquired a diverse skill set, he has become a specialist in vegetation ecology with expertise in plant identification, Ecological Land Classification (ELC), wetland delineation, and vegetation monitoring. Additionally, he has gained extensive experience conducting and leading herpetofauna field surveys.

James completed his Bachelor of Environmental Studies at the University of Waterloo with a focus on applied ecology and environmental policy. He has obtained certification for Ecological Land Classification (ELC), Ontario Wetland Evaluation System (OWES), Ecological Monitoring and Assessment Network (EMAN), and is a Ministry of Natural Resources (MNR) designated Butternut Health Assessor for the endangered Butternut tree. He is RAQS-certified by the Ontario Ministry of Transportation (MTO), and can lead natural heritage assessments for MTO projects. James is familiar with legislation that applies to natural heritage assessment, including the Provincial Policy Statement (PPS), the *Endangered Species Act, 2007* and the federal *Species at Risk Act* (SARA).

James provides expertise in a variety of sectors including aggregate extraction, infrastructure, energy, and urban land development. He has gained extensive experience conducting and leading vegetation related surveys for renewable energy and highway infrastructure projects. He has authored a variety of reports, including natural heritage components of Environmental Impact Studies, Environmental Assessments, and Natural Environment Technical Reports.

EDUCATION

B.E.S., University of Waterloo / Environmental Studies / Geography, Waterloo, Ontario, 2006

Certificate, Humboldt Field Research Institute / Applied Field Identification of Grasses and Sedges, Steuben, Maine, 2010

Certificate, Butternut Health Assessment, Burlington, Ontario, 2009

Certificate, Ontario Wetland Evaluation System, North Bay, Ontario, 2009

Certificate, Ecological Monitoring and Assessment Network, Turkey Point, Ontario, 2008

Certificate, Ecological Land Classification for Southern Ontario, Kingston, Ontario, 2007

MEMBERSHIPS

Member, Botanical Society of America

Member, Field Botanists of Ontario

PROJECT EXPERIENCE

Aggregate Services

Proposed Duntroon Quarry Expansion, Duntroon, Ontario (Terrestrial Ecologist)

Designed and conducted a multi-year research program to assess the habitat characteristics of American hart's-tongue fern – a federal and provincial Special Concern species. Research examined various features of soil, ambient air, tree canopy cover, associate species, and snow depth. The purpose of this research was to compare and contrast known habitat with potential transplant locations. A preliminary transplant of over 500 ferns was conducted where post-transplant monitoring studies are ongoing. Unrelated surveys conducted onsite include butternut health assessments and forest plot assessments using protocols outlined in the Ecological Monitoring and Assessment Network (EMAN).

Proposed Flamborough Quarry, Hamilton, Ontario (Ecologist)

Aquatic surveys included stream flow discharge and uploading of data loggers. Terrestrial surveys included winter wildlife surveys and health assessments of over 100 butternut trees using 2009 OMNR guidelines.

James Leslie B.E.S.

Terrestrial Ecologist

Acton Quarry Environmental Review, Acton, Ontario (Terrestrial Ecologist)

Assist with extensive amphibian surveys to identify significant wildlife habitat, species composition, and presence or absence of pure Jefferson salamander specimens. Surveys included call-counts, egg mass surveys, pit and aquatic trapping, and tail clippings of potential Jefferson species (in conjunction with the OMNR). Assisted with surveys in 2007 and thereafter, which remain ongoing.

Environmental Mitigation and Monitoring

Various Urban Lands Projects, Waterloo and Oakville, Ontario (Terrestrial Ecologist)

Monitor vegetation communities using Ecological Monitoring and Assessment Network (EMAN) and local Conservation Authority guidelines. Field surveys consisted of identifying vascular plants growing within pre-determined plots and determining their respective cover; photographic records were compiled each year for temporal comparison. Data analysis included calculation of frequency, dominance, and importance value.

Georgia Pacific PCB Remediation, Thorold, Ontario (Terrestrial Ecologist)

ELC; mapping and evaluation of species at risk (Butternut); develop vegetation monitoring plots to determine density, frequency, dominance, and importance value; data synthesis, and technical memorandum.

Oil & Gas

Union Gas Lobo Compressor Station Expansion, Strathroy, Ontario (Terrestrial Ecologist)

Assist with Project Management of a proposed compressor station expansion, including proposal and budget; conduct/delegate appropriate field surveys; compile background data through review of Official Plan, Significant Wildlife Habitat Technical Guide, Ontario Provincial Policy Statement, etc.; agency consultation. Deliverables consisted of an Environmental Impact Study report.

Power Transmission & Distribution

Bruce to Milton Transmission Project, Milton, Ontario (Terrestrial Ecologist)

180 km linear study area of proposed hydro transmission lines from Bruce Nuclear to Milton, Ontario. Assisted with ELC, butternut health assessments, flora inventories, and winter wildlife surveys.

Renewable Energy

Terrestrial Surveys for Wind and Solar Projects, Various Municipalities, Ontario (Terrestrial Ecologist)

Conducted numerous site assessments based on the Renewable Energy Approvals (REA) process for proposed layouts near Belwood, Port Dover, Sydenham, Whittington, St. Columban, and Prince Edward County. Field work included ELC, wetland delineations and evaluations using the Ontario Wetland Evaluation System (OWES), floral and faunal species inventories, and identification of significant wildlife habitat. Study areas included proposed turbine locations, access roads, and transmission corridors. Data analysis and summaries were provided in the respective Natural Heritage Assessment Reports.

Island Falls Energy Project, Smooth Rock Falls, Ontario (Terrestrial Ecologist)

Field work component of a proposed hydroelectric dam in Northern Ontario. Assist with ELC, botanical inventory, and soil surveys in remote areas.

Avian Surveys for Wind and Solar Projects, Various Municipalities, Ontario (Terrestrial Ecologist)

Avian monitoring was conducted at Kingsbridge, Melancthon, Ostrander, Parkhill, and Plateau wind energy locations. Field work consisted of installation, troubleshooting, and data retrieval of Anabat SD1 monitoring devices. Received training for data interpretation and isolation of bat calls based on digital graph patterns. Post-construction surveys of avian mortality under active wind turbines were completed for the Kingsbridge and Melancthon locations.

Terrestrial Assessments

Master Service Plan, Cayuga and Jarvis, Ontario (Terrestrial Ecologist)

Develop ELC mapping for the towns of Jarvis and Cayuga. The purpose was to update natural heritage data for the respective Master Service Plan revisions. Data analysis included ecological constraints mapping and authoring a technical memorandum.

** denotes projects completed with other firms*

James Leslie B.E.S.

Terrestrial Ecologist

Transportation Planning

Highway 3 Rehabilitation, Detail Design, Renton to Jarvis, Ontario (Terrestrial Ecologist)

This work was conducted to identify natural features where road widening and culvert replacement was proposed. Performed ELC and compiled records of local flora and fauna. The study area included Endangered butternut trees and a variety of forested, wetland, and cultural communities. A Terrestrial Ecosystems Report was submitted to characterize existing conditions, and to address predicted impacts and required mitigation to on-site vegetation communities, terrestrial wildlife and their habitat. Fieldwork and reporting conducted in accordance with MTO regulations and guidelines.

Highway 69, Preliminary Design, Patrol Yard Selection, Parry Sound to Sudbury, Various Sites, Ontario (Terrestrial Ecologist)

This study was undertaken in order to assess a number of alternative locations for patrol yards within the study area, and to identify preferred alternatives at three locations. Performed ELC, compiled records of local flora and fauna, and identified significant wildlife habitat. Natural heritage features consisted of numerous wetland communities, large, contiguous forests, significant wildlife habitat and observations of a Threatened species. Fieldwork and reporting were conducted in accordance with MTO regulations and guidelines.

Highway 17, Preliminary Design, Sudbury Southwest Bypass, Sudbury, Ontario (Terrestrial Ecologist)

The purpose of this study was to identify a four-lane highway plan for a section of Highway 17 through the Sudbury area, with access restricted to interchange locations only. Performed ELC, compiled records of local flora and fauna, and identified significant wildlife habitat. The study area included a variety of upland and wetland habitats, including Areas of Natural and Scientific Interest. Fieldwork and reporting were conducted in accordance with MTO regulations and guidelines.

Highway 11, Preliminary Design Study, Access Review from Powassan to Callander, Ontario (Terrestrial Ecologist)

This project was part of a study to upgrade the highway to 'full freeway standard', which included eliminating at-grade intersections and entrances and providing access to highway only at interchanges. Performed ELC, compiled records of local flora and fauna, and identified significant wildlife habitat. The study area included a variety of upland and wetland habitats. Fieldwork and reporting were conducted in accordance with MTO regulations and guidelines.

Highway 401 and Highway 8 Improvements, Preliminary Design, Kitchener, Ontario (Terrestrial Ecologist)

This study was undertaken to assess proposed interchange improvements in the cities of Kitchener and Cambridge along Highway 401 and Highway 8. Performed ELC, compiled records of local flora and fauna, and identified significant wildlife habitat. The study area included rare flora, Provincially and Locally Significant Wetland, and an Area of Natural and Scientific Interest (ANSI). A Terrestrial Ecosystems Report was submitted to characterize existing conditions, and to address predicted impacts and required mitigation to on-site vegetation communities, terrestrial wildlife and their habitats. The preliminary impact assessment included constraint ratings of each ELC unit and the calculation of the areas potentially affected by the Preferred Plan. Fieldwork and reporting conducted in accordance with MTO regulations and guidelines.

Highway 11, Preliminary Design Study, Improvements North of Highway 144, Huntsville, Ontario (Terrestrial Ecologist)

The purpose of this study was to undertake the Planning, Preliminary Design and Environmental Assessment for improvements to Highway 11 from 1 km north of Highway 141, northerly for 5.5 km. Performed ELC, compiled records of local flora and fauna, and identified significant wildlife habitat. The study area included a rare vegetation community not previously documented and a variety of upland and wetland habitat. A Terrestrial Ecosystems Report was submitted to characterize existing conditions, and to address predicted impacts and required mitigation to on-site vegetation communities, terrestrial wildlife and their habitats. Fieldwork and reporting were conducted in accordance with MTO regulations and guidelines.

** denotes projects completed with other firms*

James Leslie B.E.S.

Terrestrial Ecologist

Highway 11, Preliminary Design Study, South Entrance to Powassan, Powassan, Ontario (Terrestrial Ecologist)

This study was carried out to update a Preliminary Design Report that recommended interchange locations for this stretch of Highway 11. Performed ELC, compiled records of local flora and fauna, and identified significant wildlife habitat. The study area included significant features, a variety of habitats, and cultural communities. Fieldwork and reporting were conducted in accordance with MTO regulations and guidelines.

Municipal Road Improvement Projects, Various Sites, Ontario (Terrestrial Ecologist)

Conducted ELC and wetland delineations using OMNR protocols. Identified wildlife habitat and determined potential impacts and mitigation options.
- City of London, Southdale Road Widening
- City of London, Hamilton Road Improvements

Victoria Road North Class EA, Guelph, Ontario (Terrestrial Ecologist)

Assist with Task Management for a proposed road widening, including background data review of applicable legislation and guidelines; conduct or delegate appropriate field surveys; agency consultation; prepare a draft Natural Environment Technical Report and constraints analysis for a proposed parking area.

** denotes projects completed with other firms*

Katherine St. James MSc, BSc

Terrestrial Ecologist

Katherine St. James is a Terrestrial Ecologist certified in Ecological Land Classification (ELC) with several years' experience in ecological field surveys, specializing in herpetofauna and bird surveys. She has been employed in both the public and private sectors. Her experience spans on a range of projects such as Species at Risk, wind development and monitoring, wetland restoration, wildlife hazard management, environmental impact studies, and various other development projects.

Katherine has successfully managed both small and large projects, including environmental impact statements (EIS), constraint analyses, and natural heritage assessments for wind, solar, and hydroelectric. She is familiar with various Acts and their application to projects, including the Migratory Birds Convention Act, Endangered Species Act, Species at Risk Act, and others.

EDUCATION

B.Sc. (Hons) of Environmental Science, Minor in Biology, University of Waterloo, Waterloo, Ontario, 2005

M.Sc. of Geography and Environmental Management, University of Waterloo, Waterloo, Ontario, 2009

Ontario Provincial Ecological Land Classification (ELC), Timmins, Ontario, 2012

PROJECT EXPERIENCE

Environmental Assessment

Brantford -Kirkwall Pipeline, Brantford, Ontario (Terrestrial Lead)
Terrestrial lead managing field investigations, including correspondence with client and agencies. Provided development of methods and field survey protocols.

Sprott Power Wind Proect Analysis, Ontario (Ecologist)
Analyzed status and viability of various wind farms available for purchase throughout Ontario

Algonquin Power's Amherst Island Wind Farm, Amherst Island, Ontario (Terrestrial Ecologist)
Produced NHA and EIS reports for a 37-turbine wind farm located on Amherst Island, Ontario.

Suncor's Cedar Point Wind Farm, Forest, Ontario (Terrestrial Ecologist)
Produced NHA and EIS reports for this 72-turbine wind farm located near Chatham, Ontario.

Cambridge Hydro EIS - Preston 27 kv Feeder, Cambridge, Ontario (Terrestrial Ecologist)
Managed field work, mapping and produced EIS report for this hydro-line upgrade in Cambridge, Ontario.

Renewable Energy Natural Heritage Assessments*, Ontario (Project Manager)
Conducted terrestrial evaluations including Ecological Land Classification, wildlife habitat assessments, and Species at Risk evaluations for various wind and solar projects including Oxley Wind Farm, Silvercreek Solar Park, 77 Netherby Solar Park, Armow Wind Farm, South Kent Wind Farm, and Skyway 124 Wind Farm.

Wetland Restoration*, Chatham, Ontario
Created wetland EIS and detailed restoration plan for Mud Creek Provinically-Significant Wetland after construction occurred within wetland.

** denotes projects completed with other firms*

Katherine St. James MSc, BSc

Terrestrial Ecologist

PUBLICATIONS

The Ecological Effects of Cleared Boundaries of BPNP. *Master's Thesis*, 2009.

"How We Mark Our Territory". *2009 A.D. Latornell Conference Symposium*, 2009.

"Assessing Stream Management Needs on Public Land in Pinedale, Wyoming". *Conference Presentation at 2007 CAG-ONT*, 2007.

Predicting Birdstrike Hazard from Gulls at Landfill Sites. *International Bird Strike Committee, Warsaw Poland*, 2003.

David L. Charlton M.Sc., P.Ag., LEED® AP

Senior Principal, Environmental Management

David Charlton is a LEED® Accredited Professional, who has been contributing to sustainable resource management practices since 1982. He has developed a practical approach to impact assessment and conflict resolution through his central role in a number of Environmental Assessments and watershed management plans dealing with the protection, restoration and management of a range of ecosystems.

David has written more than 300 impact assessments, and has been cited for his work by the Ontario Provincial Planning Institute and the Ontario Municipal Board, among others. He has provided planning and management services to a range of resource sectors including energy, transportation, aggregate, forestry and agriculture, among others. He has conducted pure and applied scientific research for all levels of Canadian government on a wide range of ecological topics including, as examples, species at risk, wetland management to agricultural land stewardship. He has worked closely with all interests, including development proponents, regulators, public interest groups and individual citizens, to solve challenging resource management issues. David has served on several advisory committees, such as the City of Guelph Environmental Advisory Committee, and has appeared as an expert witness more than 40 times before Boards and Tribunals including the Ontario Municipal Board, the Consolidated Hearings Board and the Ontario Court of Justice.

EDUCATION

M.Sc., Resources Development, University of Guelph, Guelph, Ontario, 1986

B.Sc., Agriculture, University of Guelph, Guelph, Ontario, 1982

CERTIFICATIONS & TRAINING

Fisheries Protection Program Fisheries Act Training, Fisheries and Oceans Canada, Burlington, Ontario, 2015

Certificate/Butternut Health Assessor, Forest Gene Conservation Association, Angus, Ontario, 2013

Qualified Electrofishing Operator (Class 2), Ontario Ministry of Natural Resources, Guelph, Ontario, 2013

Fisheries Assessment Specialist and Fisheries Contracts Specialist, MTO/DFO/OMNR Fisheries Protocol Course, Downsview, Ontario, 2010

Temperate Wetland Restoration Training Course, Ontario Ministry of Natural Resources, Peterborough, Ontario, 2004

Ontario Wetland Evaluation System, Southern Manual (3rd Edition) and Northern Manual (1st Edition), Ontario Ministry of Natural Resources, Lowville, Ontario, 1995

REGISTRATIONS

LEED Accredited Professional, Canada Green Building Council

MEMBERSHIPS

Professional Agrologist, Agricultural Institute of Canada

PROJECT EXPERIENCE

Renewable Energy

Settlers Landing Wind Park 10 MW Class 4 Wind Energy Generation Facility, City of Kawartha Lakes, Ontario (Senior Ecologist)

Provided input to the Renewable Energy Act application and approval under O.Reg. 398/05; Environmental Review Tribunal support and testimony for Natural Heritage, Species at Risk and ground and surface water issues

David L. Charlton M.Sc., P.Ag., LEED® AP

Senior Principal, Environmental Management

Snowy Ridge Wind Energy Project, Ontario (Senior Ecologist)
Provided input to the Renewable Energy Act application and approval under O.Reg. 398/05; Environmental Review Tribunal support and testimony for Natural Heritage, Species at Risk and ground and surface water issues

Bow Lake Wind Farm, Montreal River Harbour, Ontario (Senior Ecologist)
Designed, supervised and participated in a comprehensive field data collection program including detailed wetland, wildlife and vegetation inventories; led the production of the Natural Heritage Assessment and Environmental Impact Statement; coordinated environmental reviews of construction logistics, site access impacts and Species at Risk issues; agency and public consultation

K2 Wind Power Project, Huron County, Ontario (Senior Ecologist)
Assisted in responses to public natural heritage concerns regarding Species at Risk, wildlife and wetlands; reviewed pre- and post-construction monitoring reports

Gosfield Comber Wind Energy Project, Essex County, Ontario (Species at Risk Specialist)
Senior review of Species at Risk mitigation and monitoring plans to ensure that pre-construction activities and project components (i.e. crane paths, access roads, collector lines, etc.) adequately protected Eastern Foxsnake individuals and habitat as well as Bobolink habitat

White Pines Wind Project, Prince Edward County, Ontario (Senior Ecologist)
Performed senior review of the Natural Heritage Assessment / Environmental Impact Study document; assisted with description, categorization and management recommendations for rare vegetation communities, including alvars and wetlands; assessed significant wildlife habitat and potential impact on species of conservation concern

Ostrander Point Wind Energy Park, Prince Edward County, Ontario (Wetland Specialist)
Conducted a senior review of wetland boundary delineations, wetland functional assessments and wetland impacts

Cedar Point Wind Energy Project, Ontario (Senior Ecologist)
Conducted impact assessment and designed mitigation measures for inadvertent woodland removal

Niagara Region Wind Farm, Haldimand County, Ontario (Senior Ecologist)
Environmental Review Tribunal support and testimony for impacts and mitigation for wetland agricultural and woodland habitat issues

Port Ryerse Wind Project, Ontario (Senior Ecologist)
Performed senior review of the Natural Heritage Assessment / Environmental Impact Study document; assisted with description, categorization and management recommendations for significant wildlife habitat and potential impact on species of conservation concern Bald Eagle and Barn Owl

Amherst Island Wind Farm, Amherst Island, Ontario (Wetland Specialist)
Performed senior review of wetland assessments and wetland impacts

Linear Infrastructure

Highway 144 Route Planning Study, GWP 5023-09-00, Sudbury, Ontario (Natural Scientist)
Supervision of aquatic and terrestrial studies for route planning, preliminary design, and environmental assessment study for a future controlled access Highway 144 through the communities of Chelmsford and Dowling in the City of Greater Sudbury. Included aquatic habitat considerations, review of species at risk habitat and potential impacts and fish and wildlife passage requirements

Highway 401 Interchange Improvements / Structure Replacements, GWP 3070-09-00, London, Ontario (Project Principal)
Review and supervision of aquatic and terrestrial studies for preliminary design and environmental assessment for structure replacements and interchange improvements at:
- *Highway 401/ Westminster Drive (Site 19-366, west of London)*
- *Highway 401/Highway 19 (Site 23-210, Ingersoll)*
- *Highway 401/Norwich Avenue (Site 23-170, Woodstock)*

** denotes projects completed with other firms*

David L. Charlton M.Sc., P.Ag., LEED® AP

Senior Principal, Environmental Management

Highway 26 Improvements, GWP 57-00-00, Thornbury to Meaford, Ontario (Project Principal)
Supervision of aquatic and terrestrial studies for route planning, preliminary design, detail design and environmental assessment for improvements to Highway 26 between Thornbury and Meaford. The project included the development, assessment and recommendations for passing lane and intersection improvement alternatives; recommendations for drainage improvements; preliminary design of structural rehabilitation / extension for two culverts; and minor geometric improvements. Fish habitat impacts were assessed and mitigation designs recommended

Highway 26 Improvements, GWP 167-91-00, St. Vincent / Sydenham Boundary (Woodford) to Meaford, Ontario (Project Principal)
Detail design and environmental assessment project for improvements to Highway 26, including the realignment of intersections, culvert replacements, and new passing lanes. Fish habitat impacts were assessed and mitigation designs recommended

MTO Retainer Assignment #3006-E-0009 (Project Principal)
Supervision and senior review of ecological studies including fisheries assessments, fluvial geomorphology, post-construction monitoring, fisheries assessment, terrestrial assessment, impact assessment, site rehabilitation and DFO approvals related to 'No HADD'

Highway 6 (Hanlon Expressway) Interchange at Laird Road, GWP 3002-05-00, Guelph, Ontario (Project Principal)
Detail design and environmental assessment of a new interchange at Highway 6 (Hanlon Expressway) and Laird Road, in the City of Guelph, including widening Laird Road (east of the highway), realignment of Laird Road (west of the highway), a new underpass structure, reconstructing the Laird Road and Southgate Drive intersection, signalizing the N-E/W and S-E/W ramp terminals, and municipal illumination. The interchange will include a two-span bridge and seven ramps

Highway 6 (Hanlon Expressway) Improvements, Speed River to Maltby Road, GWP 3002-05-00, Guelph, Ontario (Project Principal)
Planning, preliminary design and environmental assessment to upgrade the existing Hanlon Expressway to full freeway standards with access restricted to interchange locations. Two interchange locations were selected, and a preliminary design was completed for each interchange

Highway 17 Route Planning Study and New Highway 69 Connection, GWP 5031-09-00, Sudbury to Markstay, Ontario (Natural Scientist)
Senior ecologist responsible for supervision of aquatic and terrestrial studies for route planning, preliminary design, and environmental assessment study to develop a route for a future four-lane controlled access Highway 17 between Sudbury and Markstay, including a new Highway 69 connection to the Sudbury Southeast Bypass

Highway 17, Sudbury Southwest By-Pass, GWP 5825-05-00, Sudbury, Ontario (Natural Scientist)
Supervision of aquatic and terrestrial studies for route planning, preliminary design and environmental assessment study for the four-laning of the Sudbury Southwest By-Pass (Highway 17) from Municipal Road 55 (middle junction) easterly to Highway 69 (13.3 km). Project included defining the alignment for four-laning, interchange improvements and/or additions, and service road connections to make this section of Highway 17 a fully-controlled access freeway. Included aquatic habitat considerations, review of species at risk habitat and potential impacts, and fish and wildlife passage requirements

Highway 17, Interchange at the West Junction of Sudbury Municipal Road 55, GWP 156-98-00, Sudbury, Ontario (Natural Scientist)
Supervision of aquatic and terrestrial studies for route planning and environmental assessment for the future four-lane alignment of Highway 17, and preliminary design of an interim two-lane Highway 17 including an interchange west of the west junction of Highway 17 and Sudbury Municipal Road 55. Included aquatic habitat considerations, review of species at risk habitat and potential impacts, and fish and wildlife passage requirements

** denotes projects completed with other firms*

David L. Charlton M.Sc., P.Ag., LEED® AP

Senior Principal, Environmental Management

Intersection Improvements, Highway 26 at Grey County Road 40 and Camperdown Road, GWP 3097-06-00, Grey County, Ontario (Project Principal)
Detail design and environmental assessment for intersection improvements

Aquatic and Terrestrial Biology Retainer Services, Southwestern Ontario (Project Principal)
Under the terms of two 2-year Retainer Agreements (2004-2006, 2007-2009) eleven individual assignments were completed, involving: characterizing existing ecological conditions, assessing site sensitivities and impacts related to proposed bridge/culvert repairs and highway improvements, recommending environmental mitigation measures, and conducting during/post-construction monitoring. Value added components included: fluvial geomorphological services, design and implementation of bio-engineered slope stabilization solutions, Permit to Take Water applications, and site rehabilitation and Planting Plans. Extensive agency liaison was required with staff from numerous Conservation Authority, MNR and DFO offices

Chinguacousy Road Widening, Brampton, Ontario (Project Principal)
Provided senior review of technical reports and regulatory approvals applications related to road widening works and natural channel design works resulting in a net benefit to Redside Dace, a federally and provincially Endangered species

DFO Approvals, Compensation and Mitigation Plans for the Construction of a New Road Network and Associated New Culverts in Muskoka Commercial Park, Huntsville, Ontario (Senior Ecologist)
Senior review of habitat assessments and fisheries inventories on Haynes Creek, the site of a proposed new commercial park. Review of agency correspondence and compensation designs

Train Derailment Wetland Restoration, Parry Sound, Ontario (Director of Ecological Restoration)
Supervision and review of work completed by Stantec's ecological restoration team of terrestrial and aquatic specialists. A freight train derailment resulted in the release of chemicals and grain into an approximately 2 hectare wetland area situated approximately 500 metres upstream of a lake in rural northern Ontario. The wetland restoration plan involved the use of regionally common plant species, where locally-sourced material was transplanted directly at the site from nearby sources, or propagated at the Royal Botanical Gardens' Burlington Wetland Nursery for transplantation following the winter. The selected wetland restoration technique successfully capitalized on natural succession processes, while avoiding the introduction of invasive species, and has resulted in the transformation of a damaged landscape into a naturalized one

Highway 10 Widening and Turning Lane Improvements, Orangeville, Ontario (Project Director)
Supervised ecological data collection and analysis; recommended mitigation measures to protect cold water stream and terrestrial habitat; provided sediment control and site restoration guidelines

Cement / Aggregates

Proposed Acton Quarry Extension, Dufferin Aggregates, Acton, Ontario (Project Director)
The extension of the existing Acton Quarry is proposed to meet the need for additional close-to-market aggregate resources of high quality Amabel Dolostone. The area of focus encompasses approximately 615 ha, across two Conservation Authority watersheds within the Regional Municipality of Halton Hills. David directed and participated in extensive ecological field work, including terrestrial and aquatic species surveys that included Jefferson's Salamander field surveys and MNR-permitted sampling, and habitat assessments, inventories for potential species at risk habitat, and aquatic rehabilitation planning. He co-authored technical reports produced in accordance with the Provincial Policy Statement and Aggregate Resources Act application requirements, as well as participated in interdisciplinary consultation with agencies and agency-appointed committees

** denotes projects completed with other firms*

David L. Charlton M.Sc., P.Ag., LEED® AP

Senior Principal, Environmental Management

Walker Aggregates Inc. Duntroon Quarry Expansion, Collingwood, Ontario (Project Director)
Senior author for Natural Environment Technical Reports and joint author of Adaptive Management Plan for extension of a Category 2 Aggregate License. Qualified as Expert Witness: Ecology for Ontario Municipal Board (OMB). Critical issues included Niagara Escarpment, ANSI, provincially significant wetlands, rare species and species at risk including Butternut and American Hart's-tongue Fern, brook trout habitat, water balance, agricultural impacts, quarry rehabilitation, and ecological restoration as compensation for forest removal

CBM Bromberg Pit (Senior Ecologist)
Natural heritage features assessment, including coldwater fish habitat, and senior report review

CBM Olszowka Pit (Senior Ecologist)
Directed project and contributed to design of mitigation and rehabilitation plan to protect coldwater stream

Capital Paving Proposed Montrose Pit, County of Wellington, Ontario (Senior Ecologist)
Senior project direction and report review for assessments of potential impacts on Grand River fish habitat and adjacent wetlands

Capital Paving Aikensville Pit (Senior Ecologist)
Directed project and senior input to wetland assessment and impact mitigation. Qualified as Expert Witness: Ecology for Ontario Municipal Board (OMB)

Walker Aggregates Inc. Orillia Quarry License, Orillia, Ontario (Project Manager)
Managed environmental reports in support of Official Plan Amendment and Aggregate License. Qualified as Expert Witness: Ecology for Ontario Municipal Board (OMB). Critical issues included rare species management plan, water balance to maintain streams and wetlands, heronry impacts and monitoring, and wetland policy application

Carden Quarry Aggregates License, Brechin, Ontario (Project Director)
Natural Environment Technical Reports and Feasibility Study for a Category 2 Aggregate License; alvar ecology, species at risk including Loggerhead Shrike and Five-lined Skink, significant wildlife habitat issues, water balance, quarry rehabilitation

Craig Pit Expansion, Mono Centre, Ontario (Project Director)
Natural Environment Technical Reports for gravel pit expansion, impacts on adjacent wetlands and fish habitat, cross watershed boundary issues, recreational impacts

Seeley and Arnill Aggregates Drysdale Pit Rehabilitation, Meaford Township, Ontario (Restoration Advisor)
Designed rehabilitation guidelines for gravel pit restoration to specialty crop production, microclimate and soils

Fonthill Pit, Fonthill, Ontario (Restoration Advisor)
Assisted in design and implementation of rehabilitation guidelines for gravel pit restoration to specialty crop production, microclimate and soils

Staff Seminars, Toronto, Ontario (Restoration Advisor)
Researched and presented staff seminars at the Ontario Ministry of Agriculture regarding rehabilitation guidelines for gravel pit restoration to specialty crop production, microclimate and soils

Environmental Assessments

Medway Valley Trunk Sewer Schedule C Class EA, London, Ontario (Project Director, Environmental Sciences)
Coordinated data collection, analysis and mapping for the terrestrial ecology and aquatic ecology components of the study; worked with other team members to integrate ecological issues with servicing and cost concerns; responsible for natural science input to the public participation process; led technical meetings with government agencies and public on environmental issues; developed mitigation and rehabilitation plans, supervised applications for DFO and CA permits, replanting of disturbed areas, and performance monitoring for stream crossings and ecological restoration

** denotes projects completed with other firms*

David L. Charlton M.Sc., P.Ag., LEED® AP

Senior Principal, Environmental Management

Kingston Master Drainage Plan and Class EAs for Stormwater Retrofit, Kingston, Ontario (Project Director, Environmental Sciences)
Part of a multidisciplinary team reviewing stormwater management policies and practices for the City of Kingston; reviewed background information; met with agencies, conducted field work and mapping; set priorities on a subwatershed basis; identified and evaluated alternative stormwater retrofit locations, recommended policy changes and management protocols, contributed to public participation process

Environmental Assessment Training Activities Canadian Forces Base Petawawa (Project Manager)
Managed ecological inventories, GIS, Valued Ecosystem Component identification, impacts and impact mitigation analysis, forest, fish and wildlife and recreational resource management

Environmental Assessment Training Activities Canadian Forces Base Val Cartier (Project Manager)
Managed ecological inventories, Valued Ecosystem Component identification, impacts and impact mitigation analysis, recommended a forest, fish and wildlife and recreational resource management program

Environmental Assessment Training Activities Canadian Forces Base Borden (Technical Advisor)
Advised on ecological inventories, application of Valued Ecosystem Components approaches, impacts and impact mitigation, ongoing forest resource management

Multi-Unit / Family Residential

The Neighbourhoods of Sunningdale, London, Ontario (Project Director)
Coordinated all environmental input for the design and approval of The Neighbourhoods of Sunningdale; project started with a Secondary Plan, progressing through alternative servicing analyses, plans of subdivision and detailed design exercises; was responsible for all environmental components of the project approval included extensive public input, negotiations with Conservation Authorities and an Ontario Municipal Board hearing. Located adjacent to the Medway Valley Environmentally Sensitive Area, The Neighbourhoods of Sunningdale was designed to take advantage of the natural beauty of the valley while protecting and enhancing the significant ecological resources in the ESA. The location and market thrust presented significant design and approval challenges that David helped overcome. His involvement continued into the marketing phase of the project as he contributed to the production of a Community Environmental Guide, which won the London Homebuilder's Association award for Best Brochure in 2002

Jackson's Landing, Sutton, Ontario (Project Director)
Environmental policies, approvals and design - Secondary Plan to Master Site Plan, site design and impact mitigation for high water table and sensitive vegetation, natural corridor functions and forest edges, qualified as an Expert Witness: Ecology for the Ontario Municipal Board (OMB)

Huron Road Subdivision, Kitchener, Ontario (Project Director)
Environmental approvals and design - Plan of subdivision, forest and wetland buffers, tree preservation, naturalized stormwater management, cold-water stream protection

Aberfoyle Creek Estates: Phases 2 and 3, Puslinch, Ontario (Project Director)
Environmental policies, approvals and design - wetland buffer, site plan control, naturalized stormwater management, protection of trout habitat, groundwater and fisheries interactions

** denotes projects completed with other firms*

David L. Charlton M.Sc., P.Ag., LEED® AP

Senior Principal, Environmental Management

Brentwood Subdivision, Aurora, Ontario (Project Director)
Environmental policies, approvals and design - Secondary Plan and plan of subdivision, recreational and aquatic corridor, forest and ravine buffers, naturalized stormwater management

Municipal

City of Hamilton Professional and Consultant Services Roster (C12-06-10), Hamilton, Ontario (Project Principal)
Under the terms of a 2-year Roster Agreement (2011-2012), four individual assignments were completed, including:
• Garner/Rymal Road and Garth Street Environmental Assessment
• Eastern Flowering Dogwood (Cornus florida) survey for a species at risk
• Scube Central, Scube East Parcel 'A', and Scube East Parcel 'B' breeding bird surveys for species at risk
• Fruitland-Winona Secondary Plan Area breeding bird survey for species at risk

Natural Sciences and Heritage Resources

Torrance Creek Subwatershed Study, City of Guelph, Ontario (Project Director, Environmental Sciences)
Directed ecological inventory, analysis and policy formation, guidelines for recreational trail location and design in provincially significant wetlands, resource management and land use policies and implementation guidelines, invasive species control and fisheries enhancement recommendations

The Effect of Lake Levels on Great Lakes Coastal Wetlands (Project Director)
Detailed historic air photo and GIS analysis of wetland community dynamics in response to lake level fluctuations, input to management responses

Terrestrial Effects of Acid Rain, Province of Ontario (Project Manager)
Managed crews evaluating the impact of acid raid on the tolerant hardwood forests of Ontario, involved visual assessment of trees, tissue sampling and soil sampling, data analysis

Technology Evaluation and Development Subprogram of Soil and Water Environmental Enhancement Program, Province of Ontario (Project Manager)
On behalf of Agriculture Canada, planned and managed $3.5 million of research into technologies for farm level control of soil erosion and sediment and chemical transport to waters in south western Ontario; coordinated a team responsible for identifying research needs, planning and implementing research program; multi-disciplinary workshops, statements of work, evaluating proposals, quality control and trouble shooting for research projects, control of a large budget and an ambitious communications program

Laurel Creek Subwatershed Study, City of Waterloo, Ontario (Project Manager, Environmental Sciences)
Directed ecological inventory, analysis and policy formation, resource management and land use policies and implementation guidelines, integrated modeling of water quality and quantity and fish habitat, GIS mapping and extensive public involvement and consultation

Fletcher's Creek Subwatershed Study, City of Brampton, Ontario (Project Manager, Environmental Sciences)
Directed ecological inventory, analysis and policy formation, resource management and land use policies and implementation guidelines, intermittent headwater tributary and swale management

Environmental Impact Studies Guidelines and Training, Province of Ontario (Trainer)
Assisted Ontario Ministry of Natural Resources in designing and delivering training programs on how to prepare environmental impact studies in compliance with Provincial Policies; established minimum standards, developed case studies; designed model mitigation measures; delivered nine, two-day training sessions to more than 400 people

** denotes projects completed with other firms*

David L. Charlton M.Sc., P.Ag., LEED® AP

Senior Principal, Environmental Management

Credit Valley Secondary Plan, City of Brampton, Ontario (Project Director, Environmental Sciences)
Planned, implemented and managed the multidisciplinary natural science inputs to a Subwatershed study done in support of this Secondary Plan, completed for the City of Brampton. Coordinated data collection, analysis and mapping for the terrestrial ecology and aquatic ecology components of the study; worked with other team members to integrate ecological issues with water quality and quantity analyses and policy formation; responsible for natural science input to the public participation process and participated in technical meetings with government agencies. The project and the ultimate policy recommendations were controversial, and the scientific basis for recommendations as well as the validity and interpretation of data were challenged by many interests. David's scientific credibility and his firm focus on objective interpretation of data were instrumental in helping arrive at an appropriate balance between competing interests, and provided the City with practical and effective ecological policies

Sports, Recreation & Leisure

York Major Golf Club, Vaughan, Ontario (Project Director)
Environmental design and Approvals - forest buffers, tree preservation, naturalized stormwater management, turf and water management, ESA and ANSI impacts, cold water stream protection, restoration of an aggregate operation.

Cardinal Golf Course, King Township, Ontario (Project Director)
Impacts of construction and expansion, wetland and forest preservation and buffers, turf and water management, Oak Ridges Moraine policies, restoration of an aggregate operation

Sandhills Golf and Residential Community, Uxbridge, Ontario (Project Director)
Environmental design and Approvals - Plan of subdivision, forest and wetland buffers, tree preservation, naturalized stormwater management, cold water stream protection, Oak Ridges Moraine policies, Ontario Municipal Board

Maskinonge Waterfront Development, Georgina, Ontario (Project Director)
Environmental feasibility studies for recreational development on Lake Simcoe, wetland, shoreline and fish habitat impact and mitigation studies

Lake Fanshawe Rowing Centre Course Upgrades - London, Ontario (Project Director)
Directed staff in evaluating fish habitat impacts of course improvements, designing mitigation measures and obtaining all necessary work permits

Emerald Hills Golf Course, Whitchurch-Stouffville, Ontario (Project Director)
Impacts of course changes, wetland and forest buffers, turf and water management, compliance with Oak Ridges Moraine policies

Dallaire Golf Course - Orillia, Ontario (Project Director)
Environmental design and Approvals - forest buffers, tree preservation, significant wildlife habitat, wild turkey management, naturalized stormwater management, turf and water management, cold water stream protection

Aikers Marina - Long Point, Ontario (Project Director)
Environmental impacts and mitigation for marina expansion: waterfowl staging, fish habitat, shoreline stability, World Biosphere Reserve, Ontario Municipal Board

Waste Management

Interim Waste Authority Metro-York and Durham EAs, Province of Ontario (Project Director)
Peer reviewed biological and agricultural components of the IWA process on behalf of Municipalities with identified sites (Vaughan and Pickering); evaluated the study process, data, analysis techniques and final decisions for appropriateness, comprehensiveness, consistency, accuracy, reliability and comprehensibility; worked with legal counsel to prepare interrogatories and witness statements; met with proponent representatives, recommended process improvements and modifications

** denotes projects completed with other firms*

David L. Charlton M.Sc., P.Ag., LEED® AP

Senior Principal, Environmental Management

Various Projects and Clients Across Southern Ontario, Counties of Grey, Wellington, Elgin and Lambton (Agrologist)

Evaluated the site selection criteria and process, evaluated agricultural impacts and mitigation measures, attended open houses and public meetings, made presentations to Municipal councils, and negotiated pre-hearing issues settlement and/or provided expert testimony in front of the Consolidated Hearings Board for landfills on behalf of public and private proponents as well as affected landowners. Focused on positive, proactive solutions to outstanding issues and represented all parties objectively and responsibly

** denotes projects completed with other firms*

April 29, 2016

Reference: **NHA Addendum – Proposed Modified Alternate Transmission Route, Smithville Area Niagara Region Wind Farm**

ATTACHMENT B2: FIELD DATA CARDS

Stantec

Memo

To:	Chris Powell Guelph	From:	James Leslie Guelph
File:	160950269	Date:	August 13, 2014

Reference: **ELC & Summer Botanical Inventory;**
NRWC Proposed Alternate Route for Transmission Line

This memo has been prepared to provide a summary of the field investigations conducted on July 30, 2014 near Smithville, Ontario. This survey was completed by James Leslie.

The purpose of this survey was to identify and confirm natural and anthropogenic features and provide a general assessment of their significance. The work included Ecological Land Classification (ELC) of vegetation communities and a floristic survey of the Study Area. A record of woodland and wildlife features was also documented, including hibernacula, bat roosts, stick nests, seeps, and vernal pools.

ELC mapping was prepared using the ELC field guide for Southern Ontario (Lee et al., 1998) and was completed to the finest level of resolution (Vegetation Type) where feasible. Vegetation communities were first identified on aerial imagery and then checked in the field. Provincial significance of vegetation communities was based on the rankings assigned by the Natural Heritage Information Centre (NHIC, 2010).

Flora nomenclature was based on the Ontario Plant List (Newmaster et al. 1998). However, many updates to genera, specific epithets and family names have been made to reflect recent taxonomic revisions. The primary source of these updates is Michigan Flora Online (2011). For Ontario species not present in the Michigan Flora, the NHIC (2010) was consulted to obtain an updated name if applicable.

The provincial status of all plant species is based on Newmaster et al. (1998), with updates from NHIC (2010). Identification of potentially sensitive native plant species is based on their assigned coefficient of conservatism (CC) value, as determined by Oldham et al. (1995). This CC value, ranging from 0 (low) to 10 (high), is based on a species' tolerance of disturbance and fidelity to a specific natural habitat. Species with a CC value of 9 or 10 generally exhibit a high degree of fidelity to a narrow range of habitat parameters.

VEGETATION COMMUNITIES

ELC mapping of the Study Area was completed at a scale of 1:4,500 and is shown on **Figures 1 to 3**.

The proposed above-ground transmission line corridor primarily followed an unused roadway allowance. Vegetation within this allowance consisted of herbaceous species with very little woody species present, having a corridor width of approximately 3 meters. Where present, adjacent tree canopy cover often extended overtop of this corridor, although some open areas were present. Tire ruts from all-terrain vehicles were present throughout much of this corridor, often having pooled

**Reference: ELC & Summer Botanical Inventory;
NRWC Proposed Alternate Route for Transmission Line**

surface water within them. This hydrological influence, in association with the clay substrates, allowed for a greater diversity of wetland and upland plant species within this corridor. This road allowance was not mapped on the ELC figure due to its narrow width and overall size. Overall species composition varied, but often included common heal-all, Rugel's plantain, common St. John's wort, daisy fleabane, white avens, black medic, fox sedge, path rush, Kentucky blue-grass, rice-cut grass, smooth brome, and reed-canary grass. Northern water-plantain was commonly observed where water had pooled within the tire ruts.

Overall, the north section of this Study Area was composed primarily of active agricultural land with a large woodland complex of swamp and forest habitat. The central section was predominantly active agricultural land, while the south section was primarily residential properties and open areas of upland meadow and marsh wetland.

All property was assessed from either the road allowance or from the shoulder of public roads. As a result, descriptions and mapping of these vegetation communities are generalized and would require further assessments prior to any construction activity.

The vegetation community types are briefly described in **Table 1** below.

Table 1: Ecological Land Classification (ELC) Vegetation Types

ELC TYPE	Community Description
Forest (FO)	
Deciduous Forest (FOD)	
FOD5 Dry – Fresh Sugar Maple Deciduous Forest	This mature community type contained an abundance of sugar maple in the canopy with occasional occurrences of green ash. Other less commonly observed associate species included shagbark hickory, white elm, black cherry, and red oak. The understory was often composed of gray dogwood and choke cherry. Ground cover included running strawberry-bush, jack-in-the-pulpit, violet species, enchanter's nightshade, and wild strawberry.
FOD9 Fresh – Moist Oak – Maple – Hickory Deciduous Forest	Generally, shagbark hickory was abundant in this mature canopy, with occasional associations of white elm, American basswood, and green ash. The understory often included grey dogwood, as well as canopy saplings (particularly white elm). Ground cover consisted of white avens, enchanter's nightshade, running strawberry-bush, graceful sedge, and wild strawberry. This community included a smaller, complex of sugar maple – beech forest community type (FOD5-2).
Cultural (CU)	
Cultural Meadow (CUM)	
CUM1 Mineral Cultural Meadow	This open meadow was dominated by herbaceous species with infrequent occurrences of young white elm and gray dogwood. Birds-foot trefoil and tall goldenrod were abundant in the ground cover, with common occurrences of white sweet clover, teasel, wild strawberry, common St. John's-wort, and timothy grass. In the north half of the Study Area, this CUM1 has a mapped watercourse running

**Reference: ELC & Summer Botanical Inventory;
NRWC Proposed Alternate Route for Transmission Line**

Table 1: Ecological Land Classification (ELC) Vegetation Types

ELC TYPE	Community Description
	along the west edge of it, creating a small inclusion of marsh habitat. Species within this community consisted primarily of reed-canary grass, dark green bulrush, fox sedge, and moneywort. Surface water within the watercourse was limited to pooling within an otherwise dry, defined channel, where pool depth was generally less than 10 cm deep.
Cultural Woodland (CUW)	
CUW1 Mineral Cultural Woodland	This mid-age woodland had a canopy cover of approximately 40%, often composed of white elm and green ash, with fewer occurrences of Manitoba maple, American basswood and shagbark hickory. The understory had an abundance of gray dogwood, with fewer occurrences of tatarian honeysuckle, multiflora rose, and wild red raspberry. Ground cover had an abundance of riverbank grape overtopping aster species, reed-canary grass, giant ragweed, and common heal-all, among others.
Swamp	
Deciduous Swamp (SWD)	
SWD3-3 Swamp Maple Mineral Deciduous Swamp	Freeman's/Swamp maple was abundant in this community, with occasional occurrences of shagbark hickory. The understory consisted of canopy saplings, inclusive of white elm, as well as common occurrences of gray dogwood. Ground cover species often included spotted touch-me-not, moneywort, panicled aster, and common heal-all. No surface water was observed in this community, although evidence of seasonal pooling was apparent.
Marsh (MA)	
Meadow Marsh (MAM)	
MAM2-2 Reed-canary Grass Mineral Meadow Marsh	These communities were typically dominated by reed-canary grass, occasionally complexed with small areas of upland cultural meadow habitat.

*ELC code not included in the First Approximation of ELC for Southern Ontario

None of the vegetation communities listed above are considered rare in the province.

VASCULAR PLANT SPECIES

A total of 119 species of vascular plants were recorded from the Study Area, of which 67% were native. 95% of these native plants have a rank of S5, indicating they are common and secure within Ontario, while four species (5%) have a rank of S4 (apparently secure).

Four locally rare species (Niagara Region) were observed:

**Reference: ELC & Summer Botanical Inventory;
NRWC Proposed Alternate Route for Transmission Line**

- Cardinal-flower (*Lobelia cardinalis*) – one specimen was growing in the mapped watercourse feature within the CUM1 community (north end of Study Area). This is an S5 species with a co-efficient of conservatism (CC) value of 7.
- Marsh Speedwell (*Veronica scutellata*) – flowering specimens were observed in a small moist pocket adjacent to the watercourse, all within the overall CUM1 community (north end of study area). This is an S5 species with a CC value of 7.
- Water Smartweed (*Persicaria amphibia*) – The terrestrial form of this species was observed growing in pooled surface water in a tire rut along the unused road allowance. It was only observed in the CUW1 community; it is an S5 species with a CC value of 5.
- Arrow-leaved Tearthumb (*Persicaria sagittata*) – a small group of these specimens were observed in the road allowance, overlapping with the SWD3-3 community. This is an S5 species with a CC value of 5.

None of the species observed throughout the accessible Study Area had a CC value of 9 or 10.

No nationally or provincially endangered, threatened, or special concern species were found.

HABITAT ASSESSMENT

Woodland and wildlife habitat were assessed from the roadside or from the edge of the road allowance.

Only one stick nest was observed in the FOD5 community, which appeared to be inactive. This nest was likely developed by and occupied by a crow, as the nest and stick size, as well as location within the canopy were indicative of this. No colonial nesting bird habitat was observed.

No seeps, springs, or vernal pools were observed during site investigations. It should be noted, however, that wooded areas in Niagara Region often have complex micro-topography with dense substrate, resulting in frequent pockets of seasonal surface water pooling. No turtle wintering or nesting habitat was observed, nor was any crayfish habitat observed.

No bat or snake hibernacula were observed. However, from the roadside, an unfinished foundation was observed at a farmhouse south of Regional Road 20, east of the proposed alternate transmission line. This foundation was generally intact and made from cinder blocks. This structure did not appear to provide snake hibernacula habitat, but closer examination would be required to confirm this. A photograph of this structure is saved in the project file (Photo # DSC04899).

STANTEC CONSULTING LTD.

Reference: ELC & Summer Botanical Inventory;
NRWC Proposed Alternate Route for Transmission Line

James Leslie, BES
Terrestrial Ecologist
james.leslie@stantec.com

Attachments: ELC Map and Field Notes

REFERENCES

Lee, H.T., W.D. Bakowsky, J. Riley, J. Bowles, M. Puddister, P. Uhlig and S. McMurray. 1998. Ecological land classification for Southwestern Ontario: first approximation and its application. Ontario Ministry of Natural Resources, South Central Region, Science Development and Transfer Branch. Technical Manual ELC-005.

Michigan Flora Online. A.A. Reznicek, E.G. Voss, and B.S. Walters. February 2011. University of Michigan. http://michiganflora.net/acknowledgments.aspx

Natural Heritage Information Centre (NHIC). 2010. Element summary for plants, wildlife and vegetation communities. Ontario Ministry of Natural Resources, Peterborough. Available at: http://www.biodiversityexplorer.mnr.gov.on.ca/nhicWEB/mainSubmit.do

Newmaster, S.G., A. Lehela, P.W.C Uhlig, S. McMurray and M.J. Oldham. 1998. Ontario plant list. Ontario Ministry of Natural Resources, Ontario Forest Research Institute, Sault Ste. Marie, ON, Forest Research Information Paper No. 123. 550 pp. + appendices.

Oldham, M.J., W.D. Bakowsky and D.A. Sutherland. 1995. Floristic quality assessment for southern Ontario. OMNR, Natural Heritage Information Centre, Peterborough. 68 pp.

617000 617500 618000 618500

4775500

South Grimsby Road 6

Young Street

AG - SOY
RES
FARM
SWD3-3
MAM2-2
AG - ?
AG
FOD9
CUT1-1
HR
TRACK
AG - HAY
CUM1
FOD5
South Grimsby Road 5
CP Rail Line

N

0 90 180 m

1:4,500

4775000

617000 617500 618000 618500

August 2014
160950269

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Revised: 2014-08-13 By: bcowper

Stantec

Notes

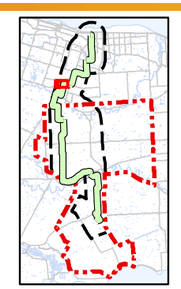
1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2010.
3. Orthoimagery © First Base Solutions, 2010.

Legend

- Preferred Transmission Route
- Alternate Transmission Route
- Interconnector Study Area
- 120m Zone of Investigation
- Approximate Smithville Urban Boundary Expansion
- ELC Boundary
- ELC Boundary - Alternative T-Line Route

ELC Description

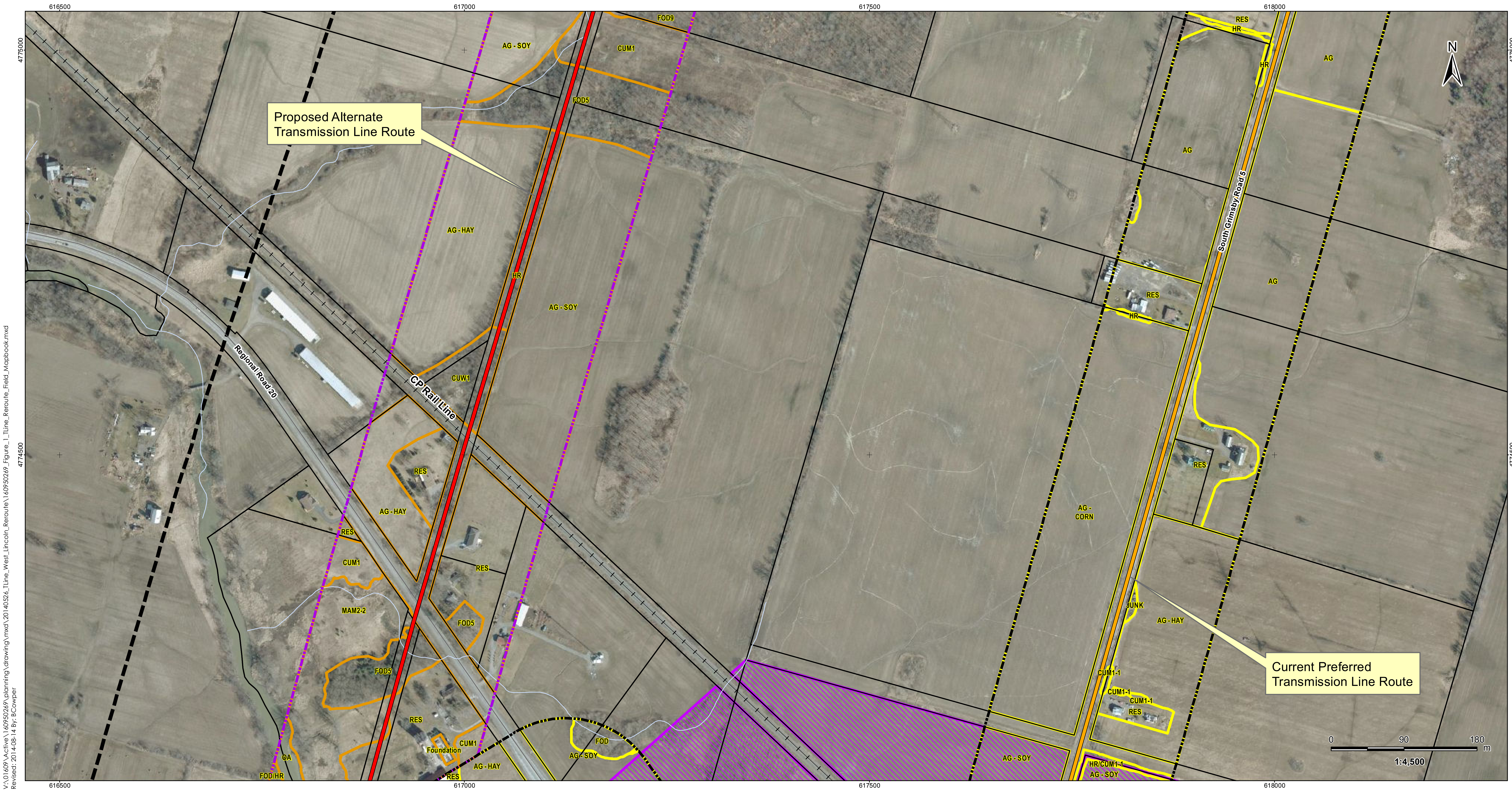
CUM1 - Mineral Cultural Meadow	AG - HAY - Agricultural - Hay
CUW1 - Mineral Cultural Woodland	AG - SOY - Agricultural - Soy
FOD5 - Dry-fresh Sugar Maple Deciduous Forest	HR - Hedgerow
FOD9 - Fresh-moist Oak-Maple-Hickory Deciduous Forest	OA - Open Aquatic
MAM2-2 - Reed-Canary Grass Mineral Meadow Marsh	FARM - Farm
SWD3-3 - Swamp Maple Mineral Deciduous Swamp	RES - Residential



Niagara Region Wind Corporation

1 **DRAFT**

Proposed Alternate Route For Transmission Line - Field Maps



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Revised: 2014-08-14 By: BCowper

August 2014
160950269

Stantec

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HR - Hedgerow
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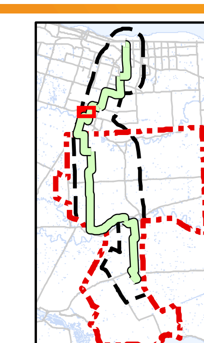
FARM - Farm
RES - Residential



Notes

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3. Orthoimagery © First Base Solutions, 2010.

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2 **DRAFT**

Proposed Alternate Route For Transmission Line - Field Maps

616500 617000 617500

4774000 4773500

Regional Road 20

CP Rail Line

Northridge Drive

Westlea Drive

Orland Street

Farewell Crescent

West Street

RES CUM1 AG - HAY FOD5 FOD5 MAM2-2 CUM1 Foundation RES RES OA AG - HAY MAM/CUM1-1 HR/CUM1-1 FOD/HR FOD FOD5-8 OA MAM2-2 MAM/CUM1-1 RES MAM/CUM1-1 HR/FOD RES FOD7-2 MAM2-2 AG - CUT GRAIN CUM1-1 FOD MAS2-1 OA RES ASH FOD RES/BARN HR/CUT1 HR/CUT1 AG - CUT GRAIN AG FOD AG - SOY HR MOWED GRASS CUM1-1 MAM2 RES RES AG - SOY CUM1-1 SWM POND/MOWED GRASS AG - SOY MAM2-2 RES CUT1-7 SWD2-2/CUW1-3 RES FOD5-2 RES SAF1-1 AG - CORN JUNK AG - HAY CUM1-1 CUM1-1 CUM1-1 RES HR/CUM1-1 AG - SOY MAS2-1 MAS2-1 RES

N

0 90 180 m

1:4,500

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Revised: 2014-08-13 By: bcowper

August 2014
160950269

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Notes

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Legend

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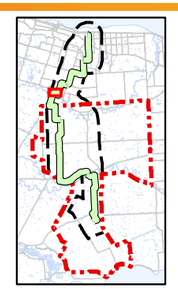

Niagara Region Wind Corporation

3 **DRAFT**

Proposed Alternate Route For Transmission Line - Field Maps

Stantec Consulting Ltd.
1 – 70 Southgate Drive
Guelph, ON
Canada N1G 4P5
Tel: (519) 836-6050
Fax: (519) 836-2493

Stantec

Roadside ELC, Woodland & Wildlife Habitat Assessment Form

Project Number: 609502609 Project Name: NRWC

Date: JULY 30 -14 Field Personnel: JN

Weather Conditions:	TEMP (°C):	WIND:	CLOUD:	PPT:	PPT (in last 24 hrs):
	22	1	70%	0	RAIN

POLYGON DESCRIPTION

ELC — COMMUNITY DESCRIPTION & CLASSIFICATION

POLYGON: 1

START TIME: 11:45AM

END TIME: 12:00PM

TOPOGRAPHIC FEATURE		HISTORY
☐ LACUSTRINE	☐ TALUS	☐ NATURAL
☐ RIVERINE	☐ CREVICE / CAVE	☑ CULTURAL
☐ BOTTOMLAND	☐ ALVAR	
☐ TERRACE	☐ ROCKLAND	
☐ VALLEY SLOPE	☐ BEACH / BAR	
☑ TABLELAND	☐ SAND DUNE	
☐ ROLL. UPLAND	☐ BLUFF	
☐ CLIFF		

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (>>MUCH GREATER THAN; >GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY	2-3	3	
2	SUB-CANOPY	—	—	
3	UNDERSTOREY	4	4	
4	GRD. LAYER	5-7	4	

HT CODES: 1=>25m 2=10<HT≤25m 3=2<HT≤10m 4=1<HT≤2m 5=0.5<HT≤1m 6=0.2<HT≤0.5m 7=HT<0.2m

CVR CODES: 0=NONE 1=0%<CVR≤10% 2=10<CVR≤25% 3=25<CVR≤60% 4=CVR>60% N/O=not observed

STANDING SNAGS:	☐ <10	☐ 10 – 24	☐ 25 – 50	☐ >50

ABUNDANCE CODES: N=NONE R=RARE O=OCCASIONAL A=ABUNDANT N/O=Not observed

STAND MATURITY:	PIONEER	YOUNG	☒ MID-AGE	MATURE	OLD GROWTH

VEGETATION TYPE: MINERAL CULTURAL WOODLAND CODE: CUWM1

COMPLEX CODE:

Evidence of Disturbance / Notes:

- CLAY SOILS
- SURFACE H2O CONFINED TO TIRE RUTS IN ROW

LAYERS: 1=CANOPY >10m 2=SUB-CANOPY 3=UNDERSTOREY 4=GROUND (GRD.) LAYER

ABUNDANCE CODES: N=NONE R=RARE O=OCCASIONAL A=ABUNDANT D=DOMINANT N/O=Not observed

SPECIES CODE	LAYER 1	2	3	4	DISTANCE FROM RD. ≤5 m	>5 m	COLL.
TREES: TILAMER	R						
CAR OVAT	R						
ULM AMER	O						
FRA PENN	O						
ACE NEGU	R		O				
POP TREM	R						
SHRUBS:							
COR FOEM			A				
CRATAEGUS			O				
LON TATA			O				
VIT RIPA				A			
ROS MULT			O				
RUB STRI			O				
GROUND:							
PHE PRAT				R			
SYM CF LAEVIS				O			
PRU VIRG				R			
W. NOD VARIE				O			
RIA RUG				R			
POA S. VIRA				O			
GIANT RAG				O			
PHARBUS.				O-A			
SYMPHY SPP.							

Signature: _____ (Field Personnel)

Quality Control: This form is complete ☐ & legible ☐.

Signature: _____ (Project Manager)

ELC Polygon: # 1 **Assessment Type:** ☒-Visual; no access / ☐-Walk through feature

Extent of Physical Investigation of Feature: ☐-Entire / ☒-Partial, walk through polygon *(indicate on map)*

Reptile / Bat Hibernacula Features:

Contains potential reptile hibernacula features?
☐-Y* / ☒-N / ☐-Unknown, no access *(*if yes, describe in table below)*
[i.e. features that would provide a route underground, including buried concrete or rock (e.g. foundations, bridge abutments or culverts with cracks/entry points, exposed rock crevices or inactive animal burrows)]

Contains potential bat hibernacula features?
☐-Y* / ☒-N / ☐-Unknown, no access *(*if yes, describe in table below)*
[i.e. karst topography, abandoned mines or caves]

POTENTIAL HIBERNACULA FEATURE(S) IDENTIFIED			
UTM	Feature Description	Photo No.	Spp. Observed Using Feature

Bat Roosting Features:

Contains potential bat roosting features?
☐-Y* / ☒-N / ☐-Unknown, no access *(*if yes, describe in table below)*
[i.e. tall trees with open surroundings, DBH >25cm, side-facing cavities ~10m high in tree]

POTENTIAL BAT ROOSTING FEATURE(S) IDENTIFIED							
UTM	Tree ID	Tree Spp.	DBH	Photo No.	Decay Class (1-5)	No. of Cavities	Height and Type of Cavities

Stick Nests:

Contains large stick nests?
☐-Y* / ☒-N / ☐-Unknown, no access *(*if yes, describe in table below)*

STICK NEST(S) IDENTIFIED					
UTM	Tree ID	Tree Spp.	Nest Size	Photo No.	Spp. Observed Using Feature

Seeps/Springs/Vernal Pools:

Contains seeps/springs/vernal pools?
☐-Y* / ☒-N / ☐-Unknown, no access *(*if yes, describe in table below)*

SEEP / SPRING / VERNAL POOL FEATURE(S) IDENTIFIED						
UTM	Feature No. & Type	Feature Size (Diameter)	Water Depth	Photo No.	Sub/Emergent Veg. Spp. Present?	Shrubs/ Logs at Edge Present?

SPECIES & HABITAT OBSERVATIONS (list species and type of observation & indicate on map)

GRCA - VO

RTHA - VO

CA=carcass; DP=distinctive parts; FE=feeding evidence; EY=eggs/nest; HO=house/den; OB=observed; SC=scat; SI=other sign; TK=track; VO=vocalization

Stantec Consulting Ltd.
1 – 70 Southgate Drive
Guelph, ON
Canada N1G 4P5
Tel: (519) 836-6050
Fax: (519) 836-2493

Stantec

Roadside ELC, Woodland & Wildlife Habitat Assessment Form

Project Number: 60950269 | Project Name: NRWC
Date: JULY 30-14 | Field Personnel: JTR

Weather Conditions:	TEMP (°C):	WIND:	CLOUD:	PPT:	PPT (in last 24 hrs):
	22	1	70%	ø	RAIN

ELC COMMUNITY DESCRIPTION & CLASSIFICATION

POLYGON: 12 - W/M
START TIME: 12:06pm
END TIME: 12:30

POLYGON DESCRIPTION

TOPOGRAPHIC FEATURE		HISTORY
☐ LACUSTRINE	☐ TALUS	☒ NATURAL
☐ RIVERINE	☐ CREVICE / CAVE	☐ CULTURAL
☐ BOTTOMLAND	☐ ALVAR	
☐ TERRACE	☐ ROCKLAND	
☐ VALLEY SLOPE	☐ BEACH / BAR	
☒ TABLELAND	☐ SAND DUNE	
☐ ROLL. UPLAND	☐ BLUFF	
☐ CLIFF		

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3	UNDERSTOREY	4	4	
4	GRD. LAYER	5-7	4	

HT CODES: 1=>25m 2=10<HT≤25m 3=2<HT≤10m 4=1<HT≤2m 5=0.5<HT≤1m 6=0.2<HT≤0.5m 7=HT<0.2m
CVR CODES: 0=NONE 1=0%<CVR≤10% 2=10<CVR≤25% 3=25<CVR≤60% 4=CVR>60% N/O=not observed

STANDING SNAGS:	R <10	R 10 – 24	R 25 – 50	N >50

ABUNDANCE CODES: N=NONE R=RARE O=OCCASIONAL A=ABUNDANT N/O=Not observed

STAND MATURITY:	☐ PIONEER	☐ YOUNG	☐ MID-AGE	☒ MATURE	☐ OLD GROWTH

VEGETATION TYPE:	CODE:
DRY-FRESH SUGAR MAPLE DECID. FOREST	FOD 5
☐ COMPLEX	CODE:

Evidence of Disturbance / Notes:

LAYERS: 1=CANOPY >10m 2=SUB-CANOPY 3=UNDERSTOREY 4=GROUND (GRD.) LAYER
ABUNDANCE CODES: N=NONE R=RARE O=OCCASIONAL A=ABUNDANT D=DOMINANT N/O=Not observed

SPECIES CODE	LAYER 1	2	3	4	DISTANCE FROM RD. ≤5 m	>5 m	COLL.
TREES:							
FRAPEN	O	O					
ACESASA	A	A					
CAR OVAT	R	R-O					
ULMAMER	R	R					
FAGGRAN	R	/					
PRUSERO	R	/					
QUE RUBR	R	/					
PRUNUS SP.	R	/					
SHRUBS:							
COR CAEM			O-A				
PRU VIRG			O				
TOX RHAD				R			
RIBES SP.			R				
GROUND:							
FRINGED LOOSE				R			
EUY OBON				O			
J. PULPIT				O			
VIOLA SP.				O-A			
CIR LUTE				O			
CAR GRAC				R			
FRA VIRG				O			

Signature: (Field Personnel)

Quality Control: This form is complete ☐ & legible ☐.
Signature: (Project Manager)

ELC Polygon: # 2 **Assessment Type:** ☒-Visual; no access / ☐-Walk through feature

Extent of Physical Investigation of Feature: ☐-Entire / ☒-Partial, walk through polygon *(indicate on map)*

Reptile / Bat Hibernacula Features:

Contains potential reptile hibernacula features?
☐-Y* / ☒-N / ☐-Unknown, no access *(*if yes, describe in table below)*
[i.e. features that would provide a route underground, including buried concrete or rock (e.g. foundations, bridge abutments or culverts with cracks/entry points, exposed rock crevices or inactive animal burrows)]

Contains potential bat hibernacula features?
☐-Y* / ☒-N / ☐-Unknown, no access *(*if yes, describe in table below)*
[i.e. karst topography, abandoned mines or caves]

POTENTIAL HIBERNACULA FEATURE(S) IDENTIFIED

UTM	Feature Description	Photo No.	Spp. Observed Using Feature

Bat Roosting Features:

Contains potential bat roosting features?
☐-Y* / ☒-N / ☐-Unknown, no access *(*if yes, describe in table below)*
[i.e. tall trees with open surroundings, DBH >25cm, side-facing cavities ~10m high in tree]

POTENTIAL BAT ROOSTING FEATURE(S) IDENTIFIED

UTM	Tree ID	Tree Spp.	DBH	Photo No.	Decay Class (1-5)	No. of Cavities	Height and Type of Cavities

Stick Nests:

Contains large stick nests?
☒-Y* / ☐-N / ☐-Unknown, no access *(*if yes, describe in table below)*

STICK NEST(S) IDENTIFIED

UTM	Tree ID	Tree Spp.	Nest Size	Photo No.	Spp. Observed Using Feature
—	—	GRAPENN	~20-25cm	—	NONE; APPROPRIATE FOR CROW

Seeps/Springs/Vernal Pools:

Contains seeps/springs/vernal pools?
☐-Y* / ☒-N / ☐-Unknown, no access *(*if yes, describe in table below)*

SEEP / SPRING / VERNAL POOL FEATURE(S) IDENTIFIED

UTM	Feature No. & Type	Feature Size (Diameter)	Water Depth	Photo No.	Sub/Emergent Veg. Spp. Present?	Shrubs/ Logs at Edge Present?

SPECIES & HABITAT OBSERVATIONS (list species and type of observation & indicate on map)

CA=carcass; DP=distinctive parts; FE=feeding evidence; FY=eggs/nest; HO=house/den; OB=observed; SC=scat; SI=other sign; TK=track; VO=vocalization

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Tel: (519) 836-6050
Fax: (519) 836-2493

Roadside ELC, Woodland & Wildlife Habitat Assessment Form

Project Number: 60950269
Date: JULY 30-14
Project Name: NRWC
Field Personnel: JR

Weather Conditions:	TEMP (°C):	WIND:	CLOUD:	PPT:	PPT (in last 24 hrs):
	22	1	70%	Ø	RAIN

POLYGON DESCRIPTION

ELC COMMUNITY DESCRIPTION & CLASSIFICATION

POLYGON: 3
START TIME: 12:38 PM
END TIME: 1.00 PM

TOPOGRAPHIC FEATURE		HISTORY
☐ LACUSTRINE	☐ TALUS	☐ NATURAL
☐ RIVERINE	☐ CREVICE / CAVE	☒ CULTURAL
☐ BOTTOMLAND	☐ ALVAR	
☐ TERRACE	☐ ROCKLAND	
☐ VALLEY SLOPE	☐ BEACH / BAR	
☒ TABLELAND	☐ SAND DUNE	
☐ ROLL. UPLAND	☐ BLUFF	
☐ CLIFF		

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (>>MUCH GREATER THAN; >GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY	4	1	
2	SUB-CANOPY	4		
3	UNDERSTOREY			
4	GRD. LAYER	5-7	4	

HT CODES: 1=>25m 2=10<HT≤25m 3=2<HT≤10m 4=1<HT≤2m 5=0.5<HT≤1m 6=0.2<HT≤0.5m 7=HT<0.2m
CVR CODES: 0=NONE 1=0%<CVR≤10% 2=10<CVR≤25% 3=25<CVR≤60% 4=CVR>60% N/O=not observed

STANDING SNAGS:	N	<10	N	10 – 24	N	25 – 50	N	>50

ABUNDANCE CODES: N=NONE R=RARE O=OCCASIONAL A=ABUNDANT N/O=Not observed

STAND MATURITY: ☐ PIONEER ☐ YOUNG ☐ MID-AGE ☐ MATURE ☐ OLD GROWTH

VEGETATION TYPE: MINERAL CULTURAL MEADOW — CODE: CUM1
☐ COMPLEX — CODE:

Evidence of Disturbance / Notes:

PIC 89 - SHOWS WETLAND POCKET
90-91 - DRAINAGE STREAM
- NO FLOW, ONLY SMALL POOLS OF H_2O OBS IN DRAIN (ie. 30x30 cm AND ~10cm DEEP)
- MAM INCL MIX OF PHAARUN, SCIATRO, CAR LUPU, CAR VULP, CAR BEBB, ELE. ERYTH., JUNEFFU, MONEYWORT
- NOT CONNECTED TO STREAM
- ~10% H_2O SURFACE, DEPTH = 7 10cm
- DIMENSIONS ...

LAYERS: 1=CANOPY >10m 2=SUB-CANOPY 3=UNDERSTOREY 4=GROUND (GRD.) LAYER
ABUNDANCE CODES: N=NONE R=RARE O=OCCASIONAL A=ABUNDANT D=DOMINANT N/O=Not observed

SPECIES CODE	LAYER 1	LAYER 2	LAYER 3	LAYER 4	DISTANCE FROM RD. ≤5 m	DISTANCE FROM RD. >5 m	COLL.
TREES:	R						
ULM AMER							
SHRUBS:							
COR FOEM	R						
GROUND:							
PHAARUN				R			
SYM PUNI				R			
EUT GRAM				R			
PLA RUGE				R-O			
SOL ALTI				A			
PHL PRAT				O			
CAR VULP				R			
LOT CORN				A			
SOL RUGO				R-O			
HYP PERF				O			
FRA VIRG				O			
TEASEL				O			
MEL ALBA				O			

Quality Control: This form is complete ☐ & legible ☐

Signature: (Field Personnel)
Signature: (Project Manager)

ELC Polygon: # 3 **Assessment Type:** ☒-Visual; no access / ☐-Walk through feature

Extent of Physical Investigation of Feature: ☐-Entire / ☒-Partial, walk through polygon *(indicate on map)*

Reptile / Bat Hibernacula Features:

Contains potential reptile hibernacula features?
☐-Y* / ☒-N / ☐-Unknown, no access *(*if yes, describe in table below)*
[i.e. features that would provide a route underground, including buried concrete or rock (e.g. foundations, bridge abutments or culverts with cracks/entry points, exposed rock crevices or inactive animal burrows)]

Contains potential bat hibernacula features?
☐-Y* / ☒-N / ☐-Unknown, no access *(*if yes, describe in table below)*
[i.e. karst topography, abandoned mines or caves]

POTENTIAL HIBERNACULA FEATURE(S) IDENTIFIED			
UTM	Feature Description	Photo No.	Spp. Observed Using Feature

Bat Roosting Features:

Contains potential bat roosting features?
☐-Y* / ☒-N / ☐-Unknown, no access *(*if yes, describe in table below)*
[i.e. tall trees with open surroundings, DBH >25cm, side-facing cavities ~10m high in tree]

POTENTIAL BAT ROOSTING FEATURE(S) IDENTIFIED							
UTM	Tree ID	Tree Spp.	DBH	Photo No.	Decay Class (1-5)	No. of Cavities	Height and Type of Cavities

Stick Nests:

Contains large stick nests?
☐-Y* / ☒-N / ☐-Unknown, no access *(*if yes, describe in table below)*

STICK NEST(S) IDENTIFIED					
UTM	Tree ID	Tree Spp.	Nest Size	Photo No.	Spp. Observed Using Feature

Seeps/Springs/Vernal Pools:

Contains seeps/springs/vernal pools?
☐-Y* / ☒-N / ☐-Unknown, no access *(*if yes, describe in table below)*

SEEP / SPRING / VERNAL POOL FEATURE(S) IDENTIFIED						
UTM	Feature No. & Type	Feature Size (Diameter)	Water Depth	Photo No.	Sub/Emergent Veg. Spp. Present?	Shrubs/ Logs at Edge Present?

SPECIES & HABITAT OBSERVATIONS (list species and type of observation & indicate on map)

CA=carcass; DP=distinctive parts; FE=feeding evidence; FY=eggs/nest; HO=house/den; OB=observed; SC=scat; SI=other sign; TK=track; VO=vocalization

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Fax: (519) 836-2493

Roadside ELC, Woodland & Wildlife Habitat Assessment Form

Stantec

Project Number: 60950609 Project Name: NRWC

Date: JULY 30-14 Field Personnel: JD

Weather Conditions:	TEMP (°C):	WIND:	CLOUD:	PPT:	PPT (in last 24 hrs):
	22	(	70%	~~X~~	RAIN

ELC
COMMUNITY DESCRIPTION & CLASSIFICATION

POLYGON: 4/5

START TIME: 1:04 PM

END TIME: 1:50 PM

POLYGON DESCRIPTION

TOPOGRAPHIC FEATURE		HISTORY
☐ LACUSTRINE	☐ TALUS	☒ NATURAL
☐ RIVERINE	☐ CREVICE / CAVE	☐ CULTURAL
☐ BOTTOMLAND	☐ ALVAR	
☐ TERRACE	☐ ROCKLAND	
☐ VALLEY SLOPE	☐ BEACH / BAR	
☒ TABLELAND	☐ SAND DUNE	
☐ ROLL. UPLAND	☐ BLUFF	
☐ CLIFF		

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (>>MUCH GREATER THAN; >GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY	2	4	
2	SUB-CANOPY	3	4	
3	UNDERSTOREY	4	3	
4	GRD. LAYER	5-7	4	

HT CODES: 1=>25m 2=10<HT≤25m 3=2<HT≤10m 4=1<HT≤2m 5=0.5<HT≤1m 6=0.2<HT≤0.5m 7=HT<0.2m

CVR CODES: 0=NONE 1=0%<CVR≤10% 2=10<CVR≤25% 3=25<CVR≤60% 4=CVR>60% N/O=not observed

STANDING SNAGS:	R <10	R 10 – 24	R 25 – 50	N >50

ABUNDANCE CODES: N=NONE R=RARE O=OCCASIONAL A=ABUNDANT N/O=Not observed

STAND MATURITY:	PIONEER	YOUNG	MID-AGE	X MATURE	OLD GROWTH

VEGETATION TYPE: SWAMP MAPLE MINERAL DECID. SWAMP CODE: SWD3-3

COMPLEX CODE:

Evidence of Disturbance / Notes:

- NO SURFACE H_2O OBS EXCEPT IN TIRE RUTS AND LOW AREAS OF ROAD ALLOWANCE. ACTUAL SWD APPEARED ABSENT OF H_2O

LAYERS: 1=CANOPY >10m 2=SUB-CANOPY 3=UNDERSTOREY 4=GROUND (GRD.) LAYER

ABUNDANCE CODES: N=NONE R=RARE O=OCCASIONAL A=ABUNDANT D=DOMINANT N/O=Not observed

SPECIES CODE	LAYER 1	2	3	4	DISTANCE FROM RD. ≤5 m	>5 m	COLL.
TREES:	A		O				
ACERRUB	A		O				
ULMAMER	R		O				
CAR OVAT	O		O				
SHRUBS:							
COR FOEM			O-A				
GROUND:							
IMPCAPE				A			
MONEYWORT				A			
BID CERNUA				R			
PHAARUN				R-O			
PERS. VIRG.				O			
SYMPLIO LAEVIC				A			
PRU VULG				O			

Quality Control: This form is complete ☐ & legible ☐.

Signature: (Field Personnel)

Signature: (Project Manager)

ELC Polygon: # 415 **Assessment Type:** ☒-Visual; no access / ☐-Walk through feature

Extent of Physical Investigation of Feature: ☐-Entire / ☒-Partial, walk through polygon *(indicate on map)*

Reptile / Bat Hibernacula Features:

Contains potential reptile hibernacula features?
☐-Y* / ☒-N / ☐-Unknown, no access *(*if yes, describe in table below)*
[i.e. features that would provide a route underground, including buried concrete or rock (e.g. foundations, bridge abutments or culverts with cracks/entry points, exposed rock crevices or inactive animal burrows)]

Contains potential bat hibernacula features?
☐-Y* / ☒-N / ☐-Unknown, no access *(*if yes, describe in table below)*
[i.e. karst topography, abandoned mines or caves]

POTENTIAL HIBERNACULA FEATURE(S) IDENTIFIED			
UTM	Feature Description	Photo No.	Spp. Observed Using Feature

Bat Roosting Features:

Contains potential bat roosting features?
☐-Y* / ☒-N / ☐-Unknown, no access *(*if yes, describe in table below)*
[i.e. tall trees with open surroundings, DBH >25cm, side-facing cavities ~10m high in tree]

POTENTIAL BAT ROOSTING FEATURE(S) IDENTIFIED							
UTM	Tree ID	Tree Spp.	DBH	Photo No.	Decay Class (1-5)	No. of Cavities	Height and Type of Cavities

Stick Nests:

Contains large stick nests?
☐-Y* / ☒-N / ☐-Unknown, no access *(*if yes, describe in table below)*

STICK NEST(S) IDENTIFIED					
UTM	Tree ID	Tree Spp.	Nest Size	Photo No.	Spp. Observed Using Feature

Seeps/Springs/Vernal Pools:

Contains seeps/springs/vernal pools?
☐-Y* / ☒-N / ☐-Unknown, no access *(*if yes, describe in table below)*

SEEP / SPRING / VERNAL POOL FEATURE(S) IDENTIFIED						
UTM	Feature No. & Type	Feature Size (Diameter)	Water Depth	Photo No.	Sub/Emergent Veg. Spp. Present?	Shrubs/ Logs at Edge Present?

SPECIES & HABITAT OBSERVATIONS (list species and type of observation & indicate on map)

CA=carcass; DP=distinctive parts; FE=feeding evidence; FY=eggs/nest; HO=house/den; OB=observed; SC=scat; SI=other sign; TK=track; VO=vocalization

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Tel: (519) 836-6050
Fax: (519) 836-2493

Roadside ELC, Woodland & Wildlife Habitat Assessment Form

Project Number: 60950669 Project Name: NRWC

Date: JULY 30-14 Field Personnel: JR

Weather Conditions:	TEMP (°C):	WIND:	CLOUD:	PPT:	PPT (in last 24 hrs):
	22	1	70%	Ø	RAIN

ELC COMMUNITY DESCRIPTION & CLASSIFICATION

POLYGON: 4/5

START TIME: 1:04 PM

END TIME: 1:48 PM

POLYGON DESCRIPTION

TOPOGRAPHIC FEATURE		HISTORY
☐ LACUSTRINE	☐ TALUS	☒ NATURAL
☐ RIVERINE	☐ CREVICE / CAVE	☐ CULTURAL
☐ BOTTOMLAND	☐ ALVAR	
☐ TERRACE	☐ ROCKLAND	
☐ VALLEY SLOPE	☐ BEACH / BAR	
☒ TABLELAND	☐ SAND DUNE	
☐ ROLL. UPLAND	☐ BLUFF	
☐ CLIFF		

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (>>MUCH GREATER THAN; >GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY	2	4	
2	SUB-CANOPY	3	4	
3	UNDERSTOREY	45	3	
4	GRD. LAYER	67	4	

HT CODES: 1=>25m 2=10<HT≤25m 3=2<HT≤10m 4=1<HT≤2m 5=0.5<HT≤1m 6=0.2<HT≤0.5m 7=HT<0.2m

CVR CODES: 0=NONE 1=0%<CVR≤10% 2=10<CVR≤25% 3=25<CVR≤60% 4=CVR>60% N/O=not observed

STANDING SNAGS:	R <10	R 10 – 24	R 25 – 50	N >50

ABUNDANCE CODES: N=NONE R=RARE O=OCCASIONAL A=ABUNDANT N/O=Not observed

STAND MATURITY:	PIONEER	YOUNG	MID-AGE	X MATURE	OLD GROWTH

VEGETATION TYPE: F-M OAK-MAPLE - HICKORY DECID. FOREST CODE: FOD9

COMPLEX CODE:

Evidence of Disturbance / Notes:

- GENERALLY HICKORY, BUT W/ INCLUSIONS OF FOD5-2

LAYERS: 1=CANOPY >10m 2=SUB-CANOPY 3=UNDERSTOREY 4=GROUND (GRD.) LAYER

ABUNDANCE CODES: N=NONE R=RARE O=OCCASIONAL A=ABUNDANT D=DOMINANT N/O=Not observed

SPECIES CODE	LAYER 1	2	3	4	DISTANCE FROM RD. ≤5 m	>5 m	COLL.
TREES:							
CAR OVAT	A	O	O				
U. AMER	O	O	OA				
ACE PLAT	/	/	R-O				
QUE RUBR	R-O	R	R				
OST VIRG	/	O	O				
TIL AMER	O	O	O				
FRA PENN	O	O	O				
ACE SACA	R-O	R	R-O				
FAG GRAN	R-O	R	R				
SHRUBS:							
COR FOEM			A				
VIB ACER			R				
LON TATA			R-O				
GROUND:							
GEU CANA				O			
CIR LUTE				O			
EUP OBTU				O			
EUR MACR				R			
MAYAPPLE				R			
FRAVIRG				O			
CAM GRAC				O			

Signature: (Field Personnel)

Quality Control: This form is complete ☐ & legible ☐.

Signature: (Project Manager)

ELC Polygon: # 415 **Assessment Type:** ☒-Visual; no access / ☐-Walk through feature

Extent of Physical Investigation of Feature: ☐-Entire / ☒-Partial, walk through polygon *(indicate on map)*

Reptile / Bat Hibernacula Features:

Contains potential reptile hibernacula features?
☐-Y* / ☒-N / ☐-Unknown, no access *(*if yes, describe in table below)*
[i.e. features that would provide a route underground, including buried concrete or rock (e.g. foundations, bridge abutments or culverts with cracks/entry points, exposed rock crevices or inactive animal burrows)]

Contains potential bat hibernacula features?
☐-Y* / ☒-N / ☐-Unknown, no access *(*if yes, describe in table below)*
[i.e. karst topography, abandoned mines or caves]

POTENTIAL HIBERNACULA FEATURE(S) IDENTIFIED			
UTM	Feature Description	Photo No.	Spp. Observed Using Feature

Bat Roosting Features:

Contains potential bat roosting features?
☐-Y* / ☒-N / ☐-Unknown, no access *(*if yes, describe in table below)*
[i.e. tall trees with open surroundings, DBH >25cm, side-facing cavities ~10m high in tree]

POTENTIAL BAT ROOSTING FEATURE(S) IDENTIFIED							
UTM	Tree ID	Tree Spp.	DBH	Photo No.	Decay Class (1-5)	No. of Cavities	Height and Type of Cavities

Stick Nests:

Contains large stick nests?
☐-Y* / ☒-N / ☐-Unknown, no access *(*if yes, describe in table below)*

STICK NEST(S) IDENTIFIED					
UTM	Tree ID	Tree Spp.	Nest Size	Photo No.	Spp. Observed Using Feature

Seeps/Springs/Vernal Pools:

Contains seeps/springs/vernal pools?
☐-Y* / ☒-N / ☐-Unknown, no access *(*if yes, describe in table below)*

SEEP / SPRING / VERNAL POOL FEATURE(S) IDENTIFIED						
UTM	Feature No. & Type	Feature Size (Diameter)	Water Depth	Photo No.	Sub/Emergent Veg. Spp. Present?	Shrubs/ Logs at Edge Present?

SPECIES & HABITAT OBSERVATIONS (list species and type of observation & indicate on map)

CA=carcass; DP=distinctive parts; FE=feeding evidence; FY=eggs/nest; HO=house/den; OB=observed; SC=scat; SI=other sign; TK=track; VO=vocalization

April 29, 2016

Reference: **NHA Addendum – Proposed Modified Alternate Transmission Route, Smithville Area Niagara Region Wind Farm**

ATTACHMENT C: VASCULAR PLANT SPECIES LIST

Overall	Summer													
x x x	x	LATIN NAME	COMMON NAME	COEFFICIENT OF CONSERVATISM	WETNESS INDEX	WETLAND PLANT SPECIES	WEEDINESS INDEX	PROVINCIAL STATUS	OMNR STATUS	COSEWIC STATUS	GLOBAL STATUS	LOCAL STATUS SOURCE LAST UPDATE/ INITIALS	LOCAL STATUS NIAG	AUTHOR
x		**DICOTYLEDONS**	**DICOTS**											
x														
x		**Adoxaceae**	**Moschatel Family**											
x	x	*Viburnum acerifolium*	Maple-leaved Viburnum	6	5			S5			G5		X	L.
x														
x		**Amaranthaceae**	**Amaranth Family**											
x	x	*Chenopodium album var. album*	Lamb's Quarters		1		-1	SE5			G5T5		I	L.
x														
x		**Anacardiaceae**	**Sumac or Cashew Family**											
x	x	*Toxicodendron radicans*	Climbing Poison-ivy	5	-1	T		S5			G5T		X	(Linnaeus) Kuntze
x	x	*Toxicodendron rydbergii*	Poison-ivy	0	0			S5			G5T		X	(Small ex Rydberg) Erskine
x														
x		**Apiaceae**	**Carrot or Parsley Family**											
x	x	*Cicuta maculata*	Spotted Water-hemlock	6	-5	I		S5			G5		X	L.
x	x	*Daucus carota*	Wild Carrot		5		-2	SE5			G?		I	L.
x														
x		**Apocynaceae**	**Dogbane Family**											
x	x	*Asclepias syriaca*	Common Milkweed	0	5			S5			G5		X	L.
x														
x		**Asteraceae**	**Composite or Aster Family**											
x	x	*Achillea millefolium*	Yarrow	0	3			S5			G5T5		X	L.
x	x	*Ambrosia artemisiifolia*	Common Ragweed	0	3			S5			G5		X	L.
x	x	*Ambrosia trifida*	Giant Ragweed	0	-1			S5			G5		X	L.
x	x	*Arctium minus*	Common Burdock		5		-2	SE5			G?T?		I	(Hill) Bernh.
x	x	*Bidens cf. frondosa*	Devil's Beggar-ticks	3	-3	I		S5			G5		X	L.
x	x	*Cichorium intybus*	Chicory		5		-1	SE5			G?		I	L.
x	x	*Cirsium arvense*	Canada Thistle		3		-1	SE5			G?		I	(L.) Scop.
x	x	*Cirsium vulgare*	Bull Thistle		4		-1	SE5			G5		I	(Savi) Ten.
x	x	*Erigeron strigosus*	Daisy Fleabane	0	1			S5			G5		X	Muhlenb. ex Willd.
x	x	*Eupatorium perfoliatum*	Boneset	2	-4	I		S5			G5		X	L.
x	x	*Eurybia macrophylla*	Large-leaved Aster	5	5			S5			G5		X	(L.) Cassini
x	x	*Euthamia graminifolia*	Grass-leaved Goldenrod	2	-2			S5			G5		X	(L.) Nutt.
x	x	*Solidago altissima*	Tall Goldenrod	1	3			S5					X	L.
x	x	*Solidago rugosa ssp. rugosa*	Rough Goldenrod	4	-1	T		S5			G5T?		X	Aiton
x	x	*Symphyotrichum cf. laeve var. laeve*	Smooth Aster	7	5			S5			G5		X	(L.) G.L. Nesom
x	x	*Symphyotrichum cf. lanceolatum ssp. lanceolatum*	Panicled Aster	3	-3	I		S5			G5T5			(Willdenow) G.L. Nesom
x	x	*Symphyotrichum puniceum*	Purple-stemmed Aster	6	-5	I		S5			G5		X	(L.) Á. Löve & D. Löve
x	x	*Taraxacum officinale*	Common Dandelion		3		-2	SE5			G5		I	G. Weber
x	x	*Tripleurospermum perforata*	Scentless Chamomile		5		-1	SE?			G?			(Merat) M. Lainz
x														
x		**Balsaminaceae**	**Touch-me-not Family**											
x	x	*Impatiens capensis*	Spotted Touch-me-not	4	-3	I		S5			G5		X	Meerb.
x														
x		**Berberidaceae**	**Barberry Family**											
x	x	*Podophyllum peltatum*	May-apple	5	3			S5			G5		X	L.
x														
x		**Betulaceae**	**Birch Family**											
x	x	*Ostrya virginiana*	Hop Hornbeam / Ironwood	4	4			S5			G5		X	(Miller) K. Koch
x														
x		**Brassicaceae**	**Mustard Family**											
x	x	*Alliaria petiolata*	Garlic Mustard		0		-3	SE5			G5		I	(M. Bieb.) Cavara & Grande
x	x	*Hesperis matronalis*	Dame's Rocket		5		-3	SE5			G4G5		I	L.
x														
x		**Campanulaceae**	**Bellflower Family**											
x	x	*Lobelia cardinalis*	Cardinal-flower	7	-5	I		S5			G5		R	L.

Overall	Summer	LATIN NAME	COMMON NAME	COEFFICIENT OF CONSERVATISM	WETNESS INDEX	WETLAND PLANT SPECIES	WEEDINESS INDEX	PROVINCIAL STATUS	OMNR STATUS	COSEWIC STATUS	GLOBAL STATUS	LOCAL STATUS SOURCE / LAST UPDATE/ INITIALS	LOCAL STATUS NIAG	AUTHOR
x														
x		**Caprifoliaceae**	**Honeysuckle Family**											
x	x	*Lonicera tatarica*	Tartarian Honeysuckle		3		-3	SE5			G?		I	L.
x														
x		**Caryophyllaceae**	**Pink Family**											
x	x	*Dianthus armeria*	Deptford Pink		5		-1	SE5			G?		I	L.
x														
x		**Celastraceae**	**Staff-tree Family**											
x	x	*Euonymus obovata*	Running Strawberry-bush	6	5			S5			G5		X	Nutt.
x														
x		**Cornaceae**	**Dogwood Family**											
x	x	*Cornus foemina ssp. racemosa*	Red Panicled Dogwood	2	-2	T		S5			G5?		X	Miller
x	x	*Cornus sericea*	Red-osier Dogwood	2	-3	I*		S5			G5		X	Michx.
x														
x		**Dipsacaceae**	**Teasel Family**											
x	x	*Dipsacus fullonum*	Wild Teasel		5		-1	SE5			G?T?		I	L.
x														
x		**Fabaceae**	**Pea Family**											
x	x	*Lotus corniculatus*	Bird's-foot Trefoil		1		-2	SE5			G?		I	L.
x	x	*Medicago lupulina*	Black Medick		1		-1	SE5			G?		I	L.
x	x	*Medicago sativa ssp. sativa*	Alfalfa		5		-1	SE5			G?T?		I	L.
x	x	*Melilotus alba*	White Sweet-clover		3		-3	SE5			G?		I	Medik.
x	x	*Trifolium hybridum ssp. elegans*	Alsike Clover		1		-1	SE5					I	L.
x	x	*Trifolium pratense*	Red Clover		2		-2	SE5			G?		I	L.
x														
x		**Fagaceae**	**Beech Family**											
x	x	*Fagus grandifolia*	American Beech	6	3			S5			G5		X	Ehrh.
x	x	*Quercus macrocarpa*	Bur Oak	5	1	T		S5			G5		X	Michx.
x	x	*Quercus rubra*	Red Oak	6	3			S5			G5		X	L.
x														
x		**Hypericaceae**	**St. John's-wort Family**											
x	x	*Hypericum perforatum*	Common St. John's-wort		5		-3	SE5			G?		I	L.
x														
x		**Juglandaceae**	**Walnut Family**											
x	x	*Carya ovata*	Shagbark Hickory	6	3	T		S5			G5		X	(Miller) K. Koch
x														
x		**Lamiaceae**	**Mint Family**											
x	x	*Prunella vulgaris ssp. lanceolata*	Self-heal / Heal-all	5	5	T		S5			G5T?		X	L.
x														
x		**Lythraceae**	**Loosestrife Family**											
x	x	*Lythrum salicaria*	Purple Loosestrife		-5	I	-3	SE5			G5		X	L.
x														
x		**Malvaceae**	**Mallow Family**											
x	x	*Tilia americana*	Basswood	4	3			S5			G5		X	L.
x														
x		**Moraceae**	**Mulberry Family**											
x	x	*Morus alba*	White Mulberry		0		-3	SE5			G?		I	L.
x														
x		**Myrsinaceae**	**Myrsine Family**											
x	x	*Lysimachia ciliata*	Fringed Loosestrife	4	-3	T		S5			G5		X	L.
x	x	*Lysimachia nummularia*	Moneywort		-4		-3	SE5			G?		I	L.
x														
x		**Oleaceae**	**Olive Family**											
x	x	*Fraxinus nigra*	Black Ash	7	-4	I		S5			G5		X	Marshall
x	x	*Fraxinus pennsylvanica*	Green / Red Ash	3	-3	T		S5			G5		X	Marshall

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x														
x		**Onagraceae**	**Evening-primrose Family**											
x	x	*Circaea canadensis*	Enchanter's Nightshade	3	3			S5			G5T5		X	L.
x	x	*Epilobium ciliatum ssp. ciliatum*	Hairy Willow-herb	3	3	I*		S5			G5T?		X	Raf.
x	x	*Ludwigia palustris*	Marsh Purslane	5	-5	I		S5			G5		X	(L.) Elliott
x														
x		**Oxalidaceae**	**Wood Sorrel Family**											
x	x	*Oxalis stricta*	Yellow Wood-sorrel	0	3			S5			G5			L.
x														
x		**Plantaginaceae**	**Plantain Family**											
x	x	*Plantago rugelii*	Rugel's Plantain	1	0			S5			G5		X	Decne.
x	x	*Veronica scutellata*	Marsh Speedwell	7	-5	I		S5			G5		R	L.
x														
x		**Polygonaceae**	**Smartweed Family**											
x	x	*Persicaria amphibia*	Water Smartweed	5	-5	I		S5			G5		R	(L.) Gray
x	x	*Persicaria maculosa*	Lady's-thumb		-3	T	-1	SE5			G?		I	Gray
x	x	*Persicaria sagittata*	Arrow-leaved Tearthumb	5	-5	I		S4			G5		R	(L.) H. Gross
x	x	*Persicaria virginiana*	Virginia Knotweed	6	0			S4			G5		X	(L.) Gaertner
x	x	*Rumex crispus*	Curly-leaf Dock		-1	T	-2	SE5			G?		I	L.
x														
x		**Ranunculaceae**	**Buttercup Family**											
x	x	*Anemone virginiana var. virginiana*	Thimbleweed	4	5			S5			G5T		X	L.
x	x	*Caltha palustris*	Marsh-marigold	5	-5	I		S5			G5		X	L.
x	x	*Ranunculus sceleratus var. sceleratus*	Cursed Crowfoot	2	-5	I		S5			G5T5		X	L.
x														
x		**Rhamnaceae**	**Buckthorn Family**											
x	x	*Rhamnus cathartica*	Common Buckthorn		3	T	-3	SE5			G?		I	L.
x														
x		**Rosaceae**	**Rose Family**											
x	x	*Agrimonia gryposepala*	Tall Hairy Agrimony	2	2			S5			G5		X	Wallr.
x	x	*Crataegus spp.*	Various Hawthorn Species											
x	x	*Fragaria virginiana*	Wild Strawberry	2	1			S5			G5T?		X	Miller
x	x	*Geum canadense*	White Avens	3	0	T		S5			G5		X	Jacq.
x	x	*Malus pumila*	Common Crabapple		5		-1	SE5			G5		I	Miller
x	x	*Potentilla recta*	Rough-fruited Cinquefoil		5		-2	SE5			G?		I	L.
x	x	*Prunus avium*	Sweet Cherry		5		-2	SE4			G?		I	(L.) L.
x	x	*Prunus serotina*	Black Cherry	3	3			S5			G5		X	Ehrh.
x	x	*Rosa multiflora*	Multiflora Rose		3		-3	SE4			G?		I	Thunb. ex Murray
x	x	*Rubus strigosus*	Wild Red Raspberry	0	-2			S5			G5T5		X	(Michaux) Focke
x														
x		**Salicaceae**	**Willow Family**											
x	x	*Populus tremuloides*	Trembling Aspen		0	T		S5			G5		X	Michx.
x														
x		**Sapindaceae**	**Maple Family**											
x	x	*Acer negundo*	Manitoba Maple	0	-2	T		S5			G5		X	L.
x	x	*Acer platanoides*	Norway Maple		5		-3	SE5			G?		I	L.
x	x	*Acer saccharum*	Sugar Maple	4	3			S5			G5T?		X	Marshall
x	x	*Acer X freemanii*	Freeman's / Swamp Maple			I		S4?					X	E. Murr.
x														
x		**Solanaceae**	**Nightshade Family**											
x	x	*Solanum dulcamara*	Bitter Nightshade		0	T	-2	SE5			G?		I	L.
x														
x		**Ulmaceae**	**Elm Family**											
x	x	*Ulmus americana*	White Elm	3	-2	T		S5			G5?		X	L.

Overall	Summer													
x x x	x	LATIN NAME	COMMON NAME	COEFFICIENT OF CONSERVATISM	WETNESS INDEX	WETLAND PLANT SPECIES	WEEDINESS INDEX	PROVINCIAL STATUS	OMNR STATUS	COSEWIC STATUS	GLOBAL STATUS	LOCAL STATUS SOURCE LAST UPDATE/ INITIALS	LOCAL STATUS NIAG	AUTHOR
x														
x		**Verbenaceae**	**Vervain Family**											
x	x	*Verbena hastata*	Blue Vervain	4	-4	I		S5			G5		X	L.
x	x	*Verbena urticifolia*	White Vervain	4	-1	T		S5			G5		X	L.
x														
x		**Vitaceae**	**Grape Family**											
x	x	*Vitis riparia*	Riverbank Grape	0	-2			S5			G5		X	Michx.
x														
x		**MONOCOTYLEDONS**	**MONOCOTS**											
x														
x		**Alismataceae**	**Water-plantain Family**											
x	x	*Alisma triviale*	Northern Water-plantain	3	-5	I		S5			G5		X	L.
x														
x		**Araceae**	**Arum Family**											
x	x	*Arisaema triphyllum*	Jack-in-the-pulpit	5	-2	T		S5			G5T5		X	(L.) Schott
x	x	*Lemna minor*	Lesser Duckweed	2	-5	I		S5			G5		X	L.
x														
x		**Cyperaceae**	**Sedge Family**											
x	x	*Carex bebbii*	Bebb's Sedge	3	-5	I		S5			G5		X	(L.H. Bailey) Olney ex Fern.
x	x	*Carex gracillima*	Graceful Sedge	4	3	T		S5			G5		X	Schwein.
x	x	*Carex lupulina*	Hop Sedge	6	-5	I		S5			G5		X	Muhlenb. ex Willd.
x	x	*Carex stipata var. stipata*	Awl-fruited Sedge	3	-5	I		S5			G5		X	Muhlenb. ex Willd.
x	x	*Carex cf. tribuloides*	Blunt Broom Sedge	5	-4	I		S4S5			G5		X	Wahlenb.
x	x	*Carex vulpinoidea*	Fox Sedge	3	-5	I		S5			G5		X	Michx.
x	x	*Eleocharis erythropoda*	Red-footed Spike-rush	4	-5	I		S5			G5		X	Steud.
x	x	*Eleocharis obtusa*	Blunt Spike-rush	5	-5	I		S5			G5		X	(Willd.) Schult.
x	x	*Scirpus atrovirens*	Dark-green Bulrush	3	-5	T		S5			G5?		X	Willd.
x	x	*Scirpus cyperinus*	Wool-grass	4	-5	I		S5			G5		X	(L.) Kunth
x														
x		**Juncaceae**	**Rush Family**											
x	x	*Juncus effusus ssp. solutus*	Soft Rush	4	-5	I		S5			G5T?		X	L.
x	x	*Juncus tenuis*	Path Rush	0	0			S5			G5		X	Willd.
x														
x		**Poaceae**	**Grass Family**											
x	x	*Agrostis gigantea*	Red-top		0		-2	SE5			G4G5		I	Roth
x	x	*Bromus inermis*	Awnless Brome		5		-3	SE5			G4G5T?		I	Leyss.
x	x	*Dactylis glomerata*	Orchard Grass		3		-1	SE5			G?		I	L.
x	x	*Danthonia spicata*	Poverty Oat Grass	5	5			S5			G5		X	(L.) P. Beauv. ex Roem. & Schult.
x	x	*Echinochloa crus-galli*	Common Barnyard Grass		-3	T	-1	SE5			G?		I	(L.) P. Beauv.
x	x	*Glyceria striata*	Fowl Meadow Grass	3	-5	I		S5			G5T5		X	(Lam.) A. Hitchc.
x	x	*Leersia oryzoides*	Rice Cut Grass	3	-5	I		S5			G5		X	(L.) Sw.
x	x	*Phalaris arundinacea*	Reed Canary Grass	0	-4	T		S5			G5		X	L.
x	x	*Phleum pratense*	Timothy		3		-1	SE5			G?		I	L.
x	x	*Poa compressa*	Canada Blue Grass		2			SE			GNR		I	L.
x	x	*Poa palustris*	Fowl Meadow Grass	5	-4	I		S5			G5		X	L.
x	x	*Poa pratensis ssp. pratensis*	Kentucky Bluegrass	0	1			S5			G5T5		X	L.
x	x	*Schedonorus arundinaceus*	Tall Fescue		2		-1	SE5			G?		I	(Schreber) Dumortier

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x														
x			***FLORISTIC SUMMARY & ASSESSMENT***											
x														
x		***Species Diversity***												
x		*Total Species:*		**119**										
x		*Native Species:*		**80**	67%									
x		*Exotic Species*		**39**	33%									
x		*Regionally Significant Species*		4	5%									
x		*Locally Significant Species*												
x		*S1-S3 Species*	*rare in Ontario*	0	0%									
x		*S4 Species*	*uncommon in Ontario*	4	5%									
x		*S5 Species*	*common in Ontario*	76	95%									
x														
x		***Co-efficient of Conservatism (C) and Floristic Quality Index (FQI)***												
x		***mean C***		**3.4**										
x		*C 0 to 3*	*lowest sensitivity*	38	49%									
x		*C 4 to 6*	*moderate sensitivity*	36	46%									
x		*C 7 to 8*	*high sensitivity*	4	5%									
x		*C 9 to 10*	*highest sensitivity*	0	0%									
x		***FQI***		**30**										
x														
x		***Presence of Weedy & Invasive Species***												
x		*mean weediness*		**-1.9**										
x		*weediness = -1*	*low potential invasiveness*	16	42%									
x		*weediness = -2*	*moderate potential invasiveness*	10	26%									
x		*weediness = -3*	*high potential invasiveness*	12	32%									
x														
x		***Presence of Wetland (W) Species***												
x		*average wetness value*		**0.1**										
x		*upland*	*W of 5*	22	19%									
x		*facultative upland*	*W of 4, 3 or 2*	28	24%									
x		*facultative*	*W of 1, 0 or -1*	23	19%									
x		*facultative wetland*	*W of -2, -3 or -4*	22	19%									
x		*obligate wetland*	*W of -5*	23	19%									
x		*Total Wetland Tolerant (T) Plant Species as identified in OWES Manual*		22										
x		*Total Wetland Indicator (I) Plant Species as identified in OWES Manual*		33										

April 29, 2016

Reference: NHA Addendum – Proposed Modified Alternate Transmission Route, Smithville Area Niagara Region Wind Farm

ATTACHMENT D: TABLES

ATTACHMENT D: TABLES

Table 3: Site Investigation Results Wetlands

Feature No.	Total Feature Size (ha)	Project Component(s) located within 50 m (approximate closest point in parenthesis)	ELC Community	Description
we442	0.5	Transmission line – adjacent	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	This community was dominated by reed-canary grass, occasionally complexed with small areas of upland cultural meadow habitat.
we444 (Lower Twenty Mile Creek Provincially Significant Wetland)	17.8	Transmission line – adjacent and spanning over this feature	SWD3-3 Swamp Maple Mineral Deciduous Swamp	This community forms part of the Lower Twenty Mile Creek PSW Complex. Freeman's/swamp maple was abundant in this community, with occasional occurrences of shagbark hickory. The understory consisted of canopy saplings, inclusive of white elm, as well as common occurrences of gray dogwood. Ground cover species often included spotted touch-me-not, moneywort, panicled aster, and common heal-all. No surface water was observed in this community, although evidence of seasonal pooling was apparent.
			MAM2-2 Reed Canary Grass Mineral Meadow Marsh	This community was dominated by reed-canary grass, occasionally complexed with small areas of upland cultural meadow habitat.
we15 (Lower Twenty Mile Creek Provincially Significant Wetland)	16.8	Transmission line – adjacent and spanning over this feature	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	This community was dominated by reed-canary grass, occasionally complexed with small areas of upland cultural meadow habitat.

Table 4: Site Investigation Results Woodlands

Feature No.	Feature Size (ha)	Project Component(s) located within 50 m (approximate closest point in parenthesis)	ELC Community Type(s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo225	24.1	Transmission line – 4.2 m	SWD3-3 Swamp Maple Mineral Deciduous Swamp FOD9 Fresh – Moist Oak – Maple – Hickory Deciduous Forest	Freeman's/Swamp maple was abundant in this community, with occasional occurrences of shagbark hickory. The understory consisted of canopy saplings, inclusive of white elm, as well as common occurrences of gray dogwood. Frequent cover species included spotted touch-me-not, moneywort, panicled aster, and common heal-all. No surface water was observed in this community, although evidence of seasonal pooling was apparent. Generally, shagbark hickory was abundant in this mature canopy, with occasional associations of white elm, American basswood, and green ash. The understory often included grey dogwood, as well as canopy saplings (particularly white elm). Ground cover consisted of white avens, enchanter's nightshade, running strawberry-bush, graceful sedge, and wild strawberry. This community included a smaller, complex of sugar maple – beech forest community type (FOD5-2).	This woodland feature is located south of Young Street adjacent to an unopened road allowance. It is surrounded by agricultural land use.	This feature contains candidate amphibian breeding habitat and candidate special concern species habitat for birds and bats, as well as significant deer yarding habitat.	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge).
wo226	2.7	Transmission line – in feature	FOD5 Dry – Fresh Sugar Maple Deciduous Forest	This mature community type contained an abundance of sugar maple in the canopy with occasional occurrences of green ash. Other less commonly observed associate species included shagbark hickory, white elm, black cherry, and red oak. The understory was often composed of gray dogwood and choke cherry. Ground cover included running strawberry-bush, jack-in-the-pulpit, violet species, enchanter's nightshade, and wild strawberry.	This small woodland feature is located adjacent to an unopened road allowance. It is surrounded by agricultural land use. A watercourse occurs in the woodland, along the western edge of the feature.	This feature contains candidate special concern species habitat for birds and bats.	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). A small, isolated, and disturbed woodland.
wo227	0.2	Transmission line – 36.5 m	FOD5 Dry – Fresh Sugar Maple Deciduous Forest	This mature community type contained an abundance of sugar maple in the canopy with occasional occurrences of green ash. Other less commonly observed associate species included shagbark hickory, white elm, black cherry, and red oak. The understory was often composed of gray dogwood and choke cherry. Ground cover included running strawberry-bush, jack-in-the-pulpit, violet species, enchanter's nightshade, and wild strawberry.	This woodland feature is located along Regional Road 20. It is surrounded by agricultural land use.	No candidate significant wildlife habitat was identified in this feature.	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). A small, isolated, and disturbed woodland.
wo228	0.7	Transmission line – in feature	FOD5 Dry – Fresh Sugar Maple Deciduous Forest	This mature community type contained an abundance of sugar maple in the canopy with occasional occurrences of green ash. Other less commonly observed associate species included shagbark hickory, white elm, black cherry, and red oak. The understory was often composed of gray dogwood and choke cherry. Ground cover included running strawberry-bush, jack-in-the-pulpit, violet species, enchanter's nightshade, and wild strawberry.	This woodland feature is located along Regional Road 20. It is surrounded by agricultural land use.	No candidate significant wildlife habitat was identified in this feature.	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). A small, isolated, and disturbed woodland.

ATTACHMENT D: TABLES

Table 5: Summary of Site Investigation Results for Candidate Significant Wildlife Habitat

Candidate Significant Wildlife Habitat	Present in or within 50 m of Project Location	Rationale	Carried Forward to Summary and EOS (Y/N)
Waterfowl Stopover and Staging Area (Terrestrial)	No	Spring air photos were reviewed of the new ZOI and no areas of spring flooding were identified in the new ZOI. Habitat to support the requirements of waterfowl during stopover and staging was not identified through the Site Investigation survey in the project location or ZOI. The project is sited primarily in the municipal road allowances and through agricultural fields. Agricultural fields within this area do not qualify as candidate significant wildlife habitat.	No
Waterfowl Stopover and Staging Area (Aquatic)	No	No large wetlands or marshes, ponds, or bays with a diversity of vegetation communities were identified in the ZOI.	No
Shorebird Migratory Stopover Area	No	No known shorebird migratory stopover areas were identified within the new ZOI. No large wetland features with shorelines were identified in the new ZOI.	No
Raptor Wintering Area	No	Grasslands are predominantly small, fragmented and under active agriculture – there were no CUM, CUS, or CUT communities >15 ha identified in the new ZOI.	No
Bat Maternity Roosting Colony Habitat	Yes	Two candidate woodland features were identified in the new ZOI: bmc 56 and bmc 57. Bmc56 is comprised of both FOD and SWD ecosites, which are ELC Ecosites considered for candidate habitat for bat maternity roosts (MNRF, 2015a). The project does not occur in the boundary of this feature. In accordance with Appendix D of the NHAG (MNRF, 2012) it is treated as generalized SWH Bmc 57 is a Sugar Maple deciduous forest (FOd5). FOD ecosites (MNRF, 2015a). Further assessment will be conducted to determine whether this feature supports >10ha large diameter (>25 dbh) wildlife trees.	Yes (bmc57) and Generalized (bmc56)
Bat Hibernacula	No	There were no caves, abandoned mine shafts, underground foundations, or karsts or crevice/cave communities identified within the Project Location or ZOI.	No
Turtle Wintering Areas	No	No large bodies of water or wetlands with permanent water were identified in the ZOI. Wetlands along the Smithville transmission line relocation do not contain permanent water or suitable habitat for turtle overwintering.	No
Reptile Hibernacula	No	No candidate snake hibernacula features, such as rock piles, slopes or rock fences were identified in the new ZOI during site investigations.	No
Colonial-Nesting Bird Breeding Habitat (bank/cliff)	No	No eroding banks, sandy hills, borrow pits, steep slopes or sand piles present were identified in the ZOI.	No

Table 5: Summary of Site Investigation Results for Candidate Significant Wildlife Habitat

Candidate Significant Wildlife Habitat	Present in or within 50 m of Project Location	Rationale	Carried Forward to Summary and EOS (Y/N)
Colonial-Nesting Bird Breeding Habitat (tree/shrub)	No	Deciduous swamp communities were observed in the new ZOI; however, no stick nest colonies were observed.	No
Colonial-Nesting Bird Breeding Habitat (ground)	No	No lakes or large rivers providing shoreline habitat or containing rocky island or peninsula features were identified in the new ZOI.	No
Migratory Butterfly Stopover Areas	No	No habitat a minimum of 10 ha in size with a combination of field and forest habitat was found in and within the new ZOI within 5 km of Lake Erie.	No
Landbird Migratory Stopover Areas	No	There are no new woodland features >5 ha in size within 5 km of Lake Erie located in the new ZOI.	No
Deer Winter Congregation Area	Yes	One deer winter yarding area was identified during the Records Review in the new ZOI. This feature type is identified by the MNRF and is considered significant.	Yes
Cliffs and Talus Slopes	No	Rare vegetation communities (cliffs and talus slopes) were not observed during ELC and vegetation surveys in the new ZOI.	No
Sand Barrens	No	Rare vegetation communities (sand barrens) were not observed during ELC and vegetation surveys in the new ZOI.	No
Alvars	No	Rare vegetation communities (alvars) were not observed during ELC and vegetation surveys in the new ZOI.	No
Old-growth Forest	No	Old-growth forests are rare in Ecoregion 7E (MNRF, 2015). Old growth forest communities were not observed during vegetation surveys and woodland assessment of all woodlands in the new ZOI.	No
Savannahs	No	Rare vegetation communities (savannahs) were not observed during ELC and vegetation surveys in the new ZOI.	No
Tall-grass Prairies	No	Rare vegetation communities (tall-grass prairie) were not observed during ELC and vegetation surveys in the new ZOI.	No
Other Rare Vegetation Communities	No	Rare vegetation communities (i.e. those ranked S1, S2, S3 according to the NHIC database) were not observed during ELC and vegetation surveys in the new ZOI.	No

Table 5: Summary of Site Investigation Results for Candidate Significant Wildlife Habitat

Candidate Significant Wildlife Habitat	Present in or within 50 m of Project Location	Rationale	Carried Forward to Summary and EOS (Y/N)
Waterfowl Nesting Area	No	Site investigations were used identify upland areas of open habitat >120 m wide that occurred adjacent to a large marsh, pond, swamp or swamp thicket communities or clusters of these vegetation communities within the new ZOI. Habitats adjacent to wetlands without standing water were not considered candidate SWH. No candidate waterfowl nesting areas identified in the new ZOI.	No
Bald Eagle and Osprey Nesting, Foraging, and Perching Habitat	No	No FOD, FOM, FOC, SWD, SWM, or SWC communities adjacent to riparian areas were identified in the new ZOI.	No
Woodland Raptor Nesting Habitat	No	No woodlands >30 ha with >4 ha of interior habitat were identified in the new ZOI.	No
Turtle Nesting Areas	No	No exposed mineral soil (sand or gravel) were identified in the new ZOI.	No
Seeps and Springs	No	No seeps and springs were observed during site investigations in the new ZOI.	No
Amphibian Breeding Habitat (Woodland)	Yes	Two new candidate amphibian breeding habitat (woodland) features were identified in the new ZOI. AH92 is a complex of FOD and SWD communities. Although no standing water was observed during the July 2014 visit, evidence of pooling was apparent. The project does not occur in the boundary of this candidate wildlife habitat feature. In accordance with Appendix D of the NHAG (MNRF, 2012) it is treated as generalized SWH AH93 is a MAM2-2, a reed canary grass meadow marsh is located within 50 m of Project components. The project does not occur in the boundary of this candidate wildlife habitat feature. In accordance with Appendix D of the NHAG (MNRF, 2012) it is treated as generalized SWH	Generalized (AH92 and AH93)
Amphibian Breeding Habitat (Wetland)	No	No vernal pooling outside of 120 m from wooded features was observed during site investigations in the new ZOI.	No
Woodland Area-sensitive Bird Breeding Habitat	No	No woodlands >30 ha with interior habitat were identified in the new ZOI.	No
Marsh Bird Breeding Habitat	No	Although there are MAM ecosites within the new ZOI, they did not have shallow standing water or emergent aquatic vegetation, and therefore do not provide potential nesting habitat for marsh breeding birds. No additional candidate marsh breeding bird habitats were identified.	No

Table 5: Summary of Site Investigation Results for Candidate Significant Wildlife Habitat

Candidate Significant Wildlife Habitat	Present in or within 50 m of Project Location	Rationale	Carried Forward to Summary and EOS (Y/N)
Open Country Breeding Bird Habitat	No	No grasslands >30 ha were identified in the new ZOI.	No
Shrub/Early Successional Bird Breeding Habitat	No	No large natural field areas succeeding to shrub and thicket habitats > 10 ha in size were identified in the ZOI.	No
Terrestrial Crayfish	Yes	No terrestrial crayfish chimneys were observed in the new ZOI. A CUM adjacent to an MAM community occurs within 50 m of the Project Location. In accordance with Appendix D of the NHAG (MNR, 2012) it is treated as generalized wildlife habitat.	Generalized (tch1)
S1-S3, Special Concern Species and Communities	Yes	Two new habitat features were identified for S1-S3, Special Concern species and communities in the new ZOI: candidate significant habitat for Wood Thrush, Eastern Wood Pewee, White-eyed Vireo, Louisiana Waterthrush, Hooded Warbler, Canada Warbler, Red-headed Woodpecker, and Tricoloured Bat. SC01 is a 24 ha woodland comprised of forest and swamp ecosites. The project does not occur in the boundary of this candidate wildlife habitat feature. In accordance with Appendix D of the NHAG (MNRF, 2012) it is treated as generalized SWH. SC02 is a 2.7 ha feature comprised of a sugar maple deciduous forest. The Project occurs in SC02. Both features contain ELC ecosite codes that have the potential to provide wildlife habitat for the woodland birds identified above. This feature is not found within the known locations of Woodland Vole and no meadow vole habitat was identified within the Project Location or 50 m ZOI(MNRF, 2015b).	Yes (SC02) and Generalized (SC01)
Amphibian Movement Corridors	No	No amphibian breeding habitat for wetlands was observed in the new ZOI; therefore, no candidate amphibian movement corridors were identified.	No

Table 6 6: Wetland Characteristics and Ecological Functions Assessment for Unevaluated Wetlands >0.5 ha found within 50 m of the Project Location

Wetland #	Size (ha)	Wetland Type	Site Type	Vegetation Communities	Proximity to other (nearest) wetlands	Interspersion	Open Water Types	Flood Attenuation	Water Quality Improvement (short term)	Water Quality Improvement (long term nutrient trap)	Water Quality Improvement (groundwater discharge)	Shoreline Erosion	Groundwater Recharge	Rare Species	Significant Features	Fish Habitat
OWES Manual Section		**1.1.2**	**1.1.3**	**1.2.2**	**1.2.4**	**1.2.5**	**1.2.6**	**3.1**	**3.2**	**3.2**	**3.2**	**3.4**	**3.5**	**4.1.2**	**4.2**	**4.2.6**
we442	0.5	Marsh	Palustrine	MAM2-2	155m	Low	No open water	42 ha	No surface water present	Marsh with <50% coverage of organic soil	No evidence of discharge (seeps) observed	Not applicable	Palustrine feature predominantly Clay Loam Soil	None known to be present	None confirmed	None present

Table 7: Evaluation of Significance – Woodlands

Feature #	Size (ha)[1]	Interior Habitat[2]	Proximity to other significant woodlands/habitats[3]	Linkages [4]	Water Protection[5]	Diversity[6]	Uncommon Characteristics[7]	Significant (Y/N)
wo225	Y	N	Y	Y	Y	Y	N	Y
wo226	N	N	N	N	Y	N	N	Y
wo227	N	N	N	N	N	N	N	N
wo228	N	N	N	N	N	N	N	N

[1] Considered significant if ≥20 ha based on the woodland size criteria standards within the natural Heritage Assessment Guide for Renewable Energy Projects
[2] Considered significant if any interior habitat is present (i.e., woodland has ≥2 ha interior forest measured 100 m from the edge)
[3] Considered significant if located within 30 m from another natural feature or fish habitat, and ≥4 ha
[4] Considered significant if located within 120 m of two other significant features, and ≥4 ha
[5] Considered significant if located within 50 m of groundwater discharge, recharge, headwater area, watercourse or fish habitat, and ≥2 ha
[6] Considered significant if contains native, naturally occurring vegetation types, and ≥4 ha
[7] Considered significant if contains a rare (S1-S3) vegetation community, rare plant habitat, and ≥0.5

April 29, 2016

Reference: **NHA Addendum – Proposed Modified Alternate Transmission Route, Smithville Area Niagara Region Wind Farm**

ATTACHMENT E: GENERAL CONSTRUCTION MITIGATION MEASURES

General Construction Mitigation Measures

The following section provides best management practices and other mitigation measures intended to minimize or mitigate potential adverse impacts on adjacent significant natural features. These measures will be implemented, where required and reasonable, during the construction and decommissioning of the modified transmission line.

Vegetation Removal

Natural features where habitat will be removed include woodland wo226. Where vegetation removal is proposed, the following mitigation measures will be applied:

- As appropriate, and prior to construction, the limits of vegetation clearing will be staked in the field. The Construction Contractor will ensure that no construction disturbance occurs beyond the staked limits and that edges of sensitive areas adjacent to the work areas are not disturbed. Regular monitoring of the limits of clearing will be implemented to ensure the objective of minimal disturbance. Should monitoring reveal that clearing occurred beyond defined limits, mitigation action will be taken that could include rehabilitation of the disturbed area to pre-disturbance conditions at the direction of a qualified ecologist (with enhancement of any disturbed areas).
- To the extent practical, tree and/or brush clearing and grassland removal will be completed prior to, or after, the core nesting season for migratory birds (May 1 to July 31). Should clearing be required during the breeding bird season, prior to construction, surveys will be undertaken by a qualified biologist to identify the presence/absence of nesting birds or breeding habitat. If a nest is located, a designated buffer will be marked off within which no construction activity will be allowed while the nest is active. The radius of the buffer will range from 5 - 60 m, depending on the species. Buffer widths are based on the species' sensitivity and on buffer width recommendations that have been reviewed and approved by Environment Canada.
- Prior to the start of construction activity, the topsoil/seedbank will be stripped and preserved; material will be reapplied in suitable rehabilitation areas post construction.
- All disturbed areas of the construction site will be re-vegetated to pre-disturbance conditions as soon as conditions allow.
- All seeding and /or replanting of disturbed areas will use species native to Ecoregion 7E (or returned to agricultural operations) following construction.
- Tree pruning will be minimized to the greatest extent possible and any tree limbs or roots that are accidentally damaged by construction activities will be pruned using proper arboricultural techniques.
- Accidental damage to trees, or unexpected vegetation removal, may require re-planting of similar, native species. If re-planting is required, MNR will be consulted on the appropriate action(s) to be taken.
- To the extent practical, pruning will be avoided during leaf fall, typically between September to November;

- Construction activities within 30m of significant woodlands should occur during daylight hours to avoid excessive noise and/or light disturbances to wildlife.
- As appropriate and prior to construction the limits of tree pruning will be marked in the field. The Construction Contractor would ensure that no construction disturbance occurs beyond the marked limits;
- To the extent practical, tree pruning will be completed prior to or after the breeding season for migratory birds (May 1 to July 31). Should pruning be required during the breeding bird season, prior to construction, surveys will be undertaken to identify the presence/absence of nesting birds by a qualified biologist. If a nest is located, a designated buffer will be marked off within which no construction activity will be allowed while the nest is active. The radius of the buffer width ranges from 5 - 60 m depending on the species. Buffer widths are based on the species sensitivity and on buffer width recommendations that have been reviewed and approved by Environment Canada;
- One year post-pruning a certified arborist would undertake an evaluation of the health of the pruned trees.

Sediment and Erosion Control Measures

In order to minimize erosion and the introduction of sediment into significant natural features during grading and construction activities, erosion and sediment (E&S) control measures will be implemented prior to the initiation of any construction.

Erosion susceptibility in this area is relatively low. Due to the flat topography of the area, there are no steep or elongated slopes that would accelerate runoff during a storm event. As such, the risk of erosion and resulting sedimentation within downstream natural features is limited, although not absent. As such, standard erosion and sediment controls will be installed during construction to minimize potential impacts.

The proximity of adjacent significant natural features increases the risk of sedimentation within a construction area. As such, all significant natural features identified within 30 m of any proposed construction area are at higher risk of sediment transfer and erosion from grading and topsoil removal.

E&S control measures will be in installed to minimize erosion impacts adjacent to significant natural features, as appropriate. The following measures/guidelines will be implemented, as required, during the construction of the Niagara Region Wind Project components:

- Sediment control measures, which may include perimeter silt fencing, mud mats (access roads), check dams (rock or straw bales), and sediment bags (dewatering);
- Silt barriers (e.g., fencing) will be erected along wetland and woodland community edges located within 30 m of construction areas (including staging areas and laydown areas) to minimize potential sediment transport to the significant natural features. These barriers will be regularly monitored and properly maintained during and following construction until soils in the construction area are re-stabilized with vegetation; and

Specific E&S control measures will be selected, located and sized by an engineer during the detailed design stage to ensure proper functioning of these measures. All E&S controls will be installed prior to construction and will be inspected daily or immediately following a rain event during construction and weekly following construction until the site is stabilized to ensure their effectiveness at protecting the adjacent significant natural features.

Directional Drilling

Where the modified transmission line is proposed to be installed beneath the Lower 20 Mile PSW, the method in construction will be via direction drilling or boring. No open cut installation of these buried project components will occur in a natural feature.

Erosion control devices will be installed at the drill location and drill cuttings will be collected and removed from the site for disposal in an approved and appropriate manner. An entrance and exit pit will be excavated outside of the wetland and woodland boundary ensuring that no encroachment into the significant feature. The following mitigation measures will be implemented:

- no clearing of vegetation will occur for drilling;
- drilling equipment will be set up and all drilling will be conducted a minimum of 30 m from the edge of the feature and 30 m away from the wetland boundary, where feasible;
- all drilling will occur at a depth of 3 m, or as close to this depth as construction and site conditions allow;
- prior to drilling, sediment control fencing will be installed at feature edges that occur within 30 m of drilling activities;
- topsoil stripped from the drill exit site must be stockpiled in a location designated by the Inspector;
- the topsoil stockpile must be located greater than 30m from the feature;
- any required dewatering associated with this process will follow the mitigation measures outlined in below;
- all fuel storage and refueling activities will occur greater than 30m from the feature;
- in the event of an accidental spill, spill response kits will be available on site. The MOE Spills Action Centre will be contacted as appropriate and emergency spill procedures will be implemented immediately; and
- construction machinery should be checked for presence of wildlife (i.e., reptiles) daily prior to operating machinery.

In the event of an inadvertent return of drilling lubricant (i.e. a frac-out) during drilling beneath a woodland or wetland feature, preventive and responsive measures as outlined in a Frac-out Response Plan will be implemented immediately and will include the following;

- Isolate the area with hay bales, sand bags or silt fencing will be used to surround and contain the drilling mud.

- The Ministry of the Environment will be consulted regarding the next appropriate action, which may include using a mobile vacuum truck to pump the drilling mud from the contained area and recycled to the return pit or leaving the drilling mud in place to avoid potential damage from vehicles entering the area.
- Once excess drilling mud is removed, the area will be seeded and/or replanted using native species similar to those in the adjacent area, or allowed to re-grow from existing vegetation.
- Re-vegetated areas will be monitored twice per year for two years subsequent to frac-out to confirm re-vegetation is successful. If re-vegetation is unsuccessful, additional measures will be taken to restore the vegetation, including removal and replacement (using local soils) of existing substrate in the affected area.

Dewatering

Site specific geotechnical investigations to be completed prior to construction activities will provide further details related to geologic conditions. Dewatering requirements will be re-assessed as part of the geotechnical investigations.

If groundwater is encountered during excavations, good construction practices will be used, such as minimizing the length of time that the excavation is open and monitoring seepage into the excavation. Should pumping be required to dewater excavated areas, water will be directed into the nearest drain or spread across the buildable area greater than 30m from any natural feature and appropriate energy dissipation techniques will be used to reduce the potential for erosion and scouring. Discharge piping will be free of leaks and will be properly anchored to prevent bouncing and snaking during surging. The rate of discharge will be monitored to ensure no erosion or flooding occurs. If energy dissipation measures are found to be inadequate, the rate of dewatering will be reduced or ceased until satisfactory mitigation measures are in place.

In order to mitigate any impacts to significant natural features during dewatering activities, the following measures will be implemented, as required and necessary:

- The area to be used for dewatering will be clearly marked with flagging and/or snow-fencing prior to work commencing;
- During site preparation, silt fencing will be included to retain sediments on site so they do not enter any significant natural feature. All dewatering sediment control structures will be inspected immediately prior to and following the commencement of pumping activities with on-going inspection to be undertaken by the contractor while pumping occurs. Any repairs or maintenance will be completed as necessary to ensure the continuous functions of these protection measures;
- All water pumped during dewatering activities will be directed greater than 30m from significant natural features and not directly into wetlands;
- The use of sediments bags (or filter rings) will be used as appropriate to filter out suspended sediment prior to discharge. Any sediment bags or filter rings will be

monitored during pumping to ensure their efficacy, with any clogging or failures to be rectified immediately; and

- After the staging area and dewatering work area is no longer required, any remaining disturbed soils will be returned to pre-disturbance conditions and/or reseeded.

Further dewatering recommendations will be reviewed upon the completion of the detailed engineering design.

APPENDIX C:
CORRESPONDENCE WITH MTCS

Ministry of Tourism, Culture and Sport

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Ontario

Mar 16, 2016

Jim Wilson (P001)
Stantec Consulting
400 - 1331 Clyde Ottawa ON K2C 3G4

RE: Review and Entry into the Ontario Public Register of Archaeological Reports: Archaeological Assessment Report Entitled, "Stage 2 Archaeological Assessment: Modified Alternate Transmission Route, Niagara Region Wind Project. Part of Lots 1 to 3, Gore A Between 7th and 8th Concessions and the Road Allowance Between Lots 11 and 12, Concessions 8 and 9, Geographic Township of Grimsby, former Lincoln County, Township of West Lincoln, now Regional Municipality of Niagara, Ontario", Dated Feb 12, 2016, Filed with MTCS Toronto Office on Feb 29, 2016, MTCS Project Information Form Number P001-0885-2016, MTCS File Number 26EA078

Dear Mr. Wilson:

This office has reviewed the above-mentioned report, which has been submitted to this ministry as a condition of licensing in accordance with Part VI of the Ontario Heritage Act, R.S.O. 1990, c 0.18.[1] This review has been carried out in order to determine whether the licensed professional consultant archaeologist has met the terms and conditions of their licence, that the licensee assessed the property and documented archaeological resources using a process that accords with the 2011 Standards and Guidelines for Consultant Archaeologists set by the ministry, and that the archaeological fieldwork and report recommendations are consistent with the conservation, protection and preservation of the cultural heritage of Ontario.

The report documents the assessment/mitigation of the study area as depicted in Figure 1 and Figures3.1 to 3.3 of the above titled report and recommends the following:

The Stage 2 assessment of the proposed modified alternate transmission route resulted in the identification of no archaeological resources. Therefore, it is recommended that no further archaeological assessment of the property is required.
The Ministry of Tourism, Culture and Sport is asked to accept this report into the Ontario Public Register of Archaeological Reports.

Based on the information contained in the report, the ministry is satisfied that the fieldwork and reporting for the archaeological assessment are consistent with the ministry's 2011 Standards and Guidelines for Consultant Archaeologists and the terms and conditions for archaeological licences. This report has been entered into the Ontario Public Register of Archaeological Reports. Please note that the ministry makes no

representation or warranty as to the completeness, accuracy or quality of reports in the register.

Should you require any further information regarding this matter, please feel free to contact me.

Sincerely,

Meagan Brooks
Archaeology Review Officer

cc. Archaeology Licensing Officer
Adam Rosso,FWRN LP
Mohsen Keyvani,MOECC, Environmental Approvals Branch

[1]In no way will the ministry be liable for any harm, damages, costs, expenses, losses, claims or actions that may result: (a) if the Report(s) or its recommendations are discovered to be inaccurate, incomplete, misleading or fraudulent; or (b) from the issuance of this letter. Further measures may need to be taken in the event that additional artifacts or archaeological sites are identified or the Report(s) is otherwise found to be inaccurate, incomplete, misleading or fraudulent.

Tripp, Bryan

Subject: FW: Your report package is being screened for completeness - P001-0885-2016 / *

From: Wilson, Jim (Ottawa)
Sent: Friday, February 12, 2016 4:20 PM
To: Muir, Jeff
Subject: FW: Your report package is being screened for completeness - P001-0885-2016 / *

From: pastport
Sent: Friday, February 12, 2016 2:19:45 PM (UTC-07:00) Mountain Time (US & Canada)
To: Wilson, Jim (Ottawa)
Cc: PastPort@ontario.ca
Subject: Your report package is being screened for completeness - P001-0885-2016 / *

Dear Jim Wilson,

The ministry has received your project report package associated with PIF number P001-0885-2016 submitted on Feb 12, 2016.

We are now screening this report package to make sure it is complete and accurate. This process may take up to 10 business days.

Please note that your report filing due date will only be met once the report package passes the screening.

If the report package does not pass the screening before the due date, the report will become overdue and you will not be eligible to begin new fieldwork projects (submit new PIFs).

When the report passes the screening, the report will be considered 'filed'. Once this happens, you will receive an email to let you know. We will then either add the report to our queue to be reviewed or enter it into the *Ontario Public Register of Archaeological Reports* without technical review.

Please do not reply to this e-mail. The message will be undeliverable and we are unable to respond from this address.

If you have any questions about this report email us at:Archaeology@ontario.ca

Stage 2 Archaeological Assessment: Modified Alternate Transmission Route, Niagara Region Wind Project

Part of Lots 1 to 3, Gore A Between 7th and 8th Concessions and the Road Allowance Between Lots 11 and 12, Concessions 8 and 9, Geographic Township of Grimsby, former Lincoln County, Township of West Lincoln, now Regional Municipality of Niagara, Ontario

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Licensee: Jim Wilson, MA
License Number: P001
PIF Number: P001-0885-2016
Project Number: 160961052
FIT Number: : F-001580-WIN-130-601

ORIGINAL REPORT

February 12, 2016

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Project Personnel

Licensed Archaeologist:	Jim Wilson, MA (P001)
Project Manager:	Chris Powell, MA
Licensed Field Director:	Gemma Calgie, B.Sc. (R472), Lisa Sonnenburg, Ph.D. (R262), Helen Ohlke, MA (R427)
Field Technicians:	Danielle Brown, Monika Kwiatkowski, Alex Renner, Lisa Sonnenburg, Kirsty Walker, Sophie Goldberg, Natalie Brewster, Danielle Roscoe, John Johnson, Brandon Dafoe, Taylor Dilliott
First Nations Observers:	Haudenosaunee Development Institute: Blake Sault
GIS Specialist:	Brian Cowper
Report Writer:	Amanda Laprise, BA (R470)
Quality Review:	Jeffrey Muir, BA (R304)
Independent Review:	Tracie Carmichael, BA, B.Ed. (R140)

Acknowledgements

Proponent Contact:	Adam Rosso, FWRN LP
Ministry of Tourism, Culture and Sport	Robert von Bitter

Executive Summary

A Stage 2 archaeological assessment of the proposed modified alternate transmission route was conducted by Stantec Consulting Ltd. (Stantec) on behalf of FWRN LP (FWRN) for the proposed Niagara Region Wind Project. The Stage 2 archaeological assessment conducted by Stantec was undertaken as part of an amendment to FWRN's Renewable Energy Approval under the Renewable Energy Approval regulation (Government of Ontario 2011a), as related to Ontario Regulation 359/09 sections 21 and 22 under Part V.0.1 of the *Environmental Protection Act* (Government of Ontario 1990a) and informed by the *Green Energy Act* (Government of Ontario 2009).

The Project, as approved under Approval Number 4353-9HMP2R, is currently under construction. FWRN is concurrently seeking approval for project changes that would be constructed, once approved. Due to proposed changes to the Project Location, Stantec was retained to conduct a Stage 2 archaeological assessment of additional lands affected by the proposed Project amendments. This amendment consists of a modified alternate transmission route. The Stage 2 archaeological assessment of the modified alternate transmission route was conducted between May 22, 2015 and November 23, 2015 under PIF P001-0885-2016 issued to Jim Wilson, MA, by the MTCS. The study area encompasses an approximate five hectares. Stantec's Stage 2 survey of the area of the modified alternate transmission route resulted in the identification of no archaeological resources. Therefore **it is recommended that no further archaeological assessment of the study area is required.**

The Ministry of Tourism, Culture and Sport is asked to accept this report into the Ontario Public Register of Archaeological Reports.

The Executive Summary highlights key points from the report only; for complete information and findings the reader should examine the complete report.

1.0 PROJECT CONTEXT

1.1 DEVELOPMENT CONTEXT

FWRN LP (FWRN) is proposing to develop the Niagara Region Wind Project (the Project) with a maximum name plate capacity of 230 megawatts (MW). The Project Location is located within the Townships of West Lincoln and Wainfleet and the Towns of Grimsby and Lincoln in Niagara Region, as well as the Geographic Townships of Moulton and Sherbrooke in Haldimand County (Figure 1).

The Project consists of 77 wind turbine generators, each with a rated capacity ranging from approximately 2.3 MW to 3.0 MW for a maximum installed name plate capacity of 230 MW. An overhead and/or underground collection system connects each turbine to one of two transformer substations along a series of 34.5 kilovolt (kV) lines. Turbines are grouped into nine collector circuits that bring power (and data via fibre optic lines) to one of the transformer substations. Voltage is stepped up from 34.5kV to 115kV at each transformer substation by means of a 100 megavolt ampere (MVA) base rated transformer with two stages of cooling (via fans). A 115kV transmission line transports power from each of the two transfer substations north to the tap-in location where the Project is connected to the Hydro One Networks Inc. (HONI) owned transmission line, south of the Queen Elizabeth Way (QEW) in the Town of Lincoln. Power generated from this Project will be conveyed along the existing HONI transmission line to the Beach Transformer Station in Hamilton.

Other Project components include access roads, junction boxes (or pad-mounted disconnect switches), and associated culverts at swales and waterbody crossings. Temporary components during construction may include temporary laydown areas (for storage and staging areas at each turbine location); crane pads or mats; staging areas along access roads; delivery truck turnaround areas; central construction laydown areas; and crane paths.

The Project, as approved under Approval Number 4353-9HMP2R, is currently under construction. FWRN is concurrently seeking approval for project changes that would be constructed, once approved. Due to proposed changes to the Project Location, Stantec was retained by FWRN to conduct a Stage 2 archaeological assessment of additional lands affected by the proposed Project amendments. This amendment consists of a modified alternate transmission route. The Stage 2 archaeological assessment conducted by Stantec was undertaken as part of an amendment to FWRN's Renewable Energy Approval under the Renewable Energy Approval regulation (Government of Ontario 2011a), as related to Ontario Regulation 359/09 sections 21 and 22 under Part V.0.1 of the *Environmental Protection Act* (Government of Ontario 1990a) and informed by the *Green Energy Act* (Government of Ontario 2009). This archaeological assessment is also subject to the *Ontario Heritage Act* (Government of Ontario 1990b) and the 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011b).

Project Context
February 12, 2016

Permission to access the study area to conduct the archaeological assessment was provided by Adam Rosso of FWRN.

1.1.1 Objectives

The Stage 2 assessment has been conducted to meet the requirements of the Ministry of Tourism, Culture and Sport's (MTCS) *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011b).

The objective of the Stage 2 assessment was to provide an overview of archaeological resources within the study area and to determine whether any of the resources might be archaeological sites with cultural heritage value or interest and to provide specific direction for the protection, management and/or recovery of these resources. In compliance with the provincial standards and guidelines set out in the MTCS' 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011b), the objectives of the Stage 2 Archaeological Assessment are as follows:

- To document archaeological resources within the study area;
- To determine whether the study area contains archaeological resources requiring further assessment; and,
- To recommend appropriate Stage 3 assessment strategies for archaeological sites identified.

1.2 HISTORICAL CONTEXT

1.2.1 Post-contact Aboriginal Resources

The post-contact Aboriginal occupation of Southern Ontario was heavily influenced by the dispersal of various Iroquoian-speaking communities by the New York State Iroquois and the subsequent arrival of Algonkian speaking groups from northern Ontario at the end of the 17th century and the beginning of the 18th century (Konrad 1981; Schmalz 1991). This is the period in which the Mississaugas are known to have moved into southern Ontario and the lower Great Lakes watersheds (Konrad 1981). Mississauga oral traditions, as told by Chief Robert Paudash and recorded in 1904, indicate that after the Mississauga defeat of the Mohawk Nation, who retreated to their homeland south of Lake Ontario, a peace treaty was negotiated between those groups. Upon the Mississaugas' return they decided to settle permanently in Southern Ontario, including within the Niagara Peninsula. These events occurred around 1695 (Praxis Research Associates n.d.).

The proposed modifications fall within the lands surrendered by Treaty Number 3. Treaty Number 3

> *...was made with the Mississa[ug]a Indians 7th December, 1792, though purchased as early as 1784. This purchase in 1784 was to procure for that part of the Six Nation Indians coming into Canada a permanent abode.*
>
> *The area included in this Treaty is, Lincoln County excepting Niagara Township; Saltfleet, Binbrook, Barton, Glanford and Ancaster Townships, in Wentworth County; Brantford, Onondaga, Tusc[a]r[o]ra, Oakland and Burford Townships in Brant County; East and West Oxford, North and South Norwich, and Dereham Townships in Oxford County; North Dorchester Township in Middlesex County; South Dorchester, Malahide and Bayham Township in Elgin County; all Norfolk and Haldimand Counties; Pelham, Wainfleet, Thorold, Cumberland and Humberstone Townships in Welland County ... .*
>
> (Morris 1943:17-18)

1.2.2 Euro-Canadian Archaeological Resources

A historical background for the entire Niagara Region Wind Project is provided in Stantec's Stage 1 archaeological assessment report (Stantec 2012) and Stage 2 archaeological assessment report (Stantec 2013). The proposed modified alternate transmission route is located on part of Lots 1 to 3, Gore A Between 7th and 8th Concessions and the road allowance between Lots 11 and 12, Concessions 8 and 9, Geographic Township of Grimsby, former Lincoln County, Township of West Lincoln, now Regional Municipality of Niagara, Ontario.

Table 1 summarizes the available landowner information and structures within the study area as depicted in the 1876 *Illustrated Historic Atlas of the Counties of Lincoln and Welland* (Page & Co. 1876) (Figure 3). The lots have been occupied and some in agricultural use for over 100 years.

Table 1: Landowner Information from the 1876 *Illustrated Historic Atlas of the Counties of Lincoln and Welland*

Lot	Concession	Owner	Comment
1	Gore A between 7th and 8th Concession	James Field	One structure and one orchard to the east of the study area
2	Gore A between 7th and 8th Concession	James Field (south half)	No structures
3	Gore A between 7th and 8th Concession	Peter Tallman (east half)	One structure and one orchard
11	8	Isaac A. Merritt (north of the road)	One structure and one orchard
12	8	Daniel Sunday (north of the road)	One structure and two orchards
11	9	Isaac A. Merritt	One structure and one orchard
11	9	T.A. Allen	One structure and one orchard
11	9	J.E.	One structure and one orchard

Lot	Concession	Owner	Comment
12	9	D. Disher	One structure and one orchard

The study area is located approximately one kilometre to the northwest of Smithville. Smithville was established in the 1780s. From 1784 to 1790, several United Empire Loyalists arrived in the area from Nine Partners, New York State, including Richard Griffin in 1787 who settled on the Jordan (Twenty Mile Creek) in what is now Smithville. These Loyalists settled on Lots 8, 9, and 10, Concession 9. Solomon Hill, who married Bethia, daughter of Richard Griffin, settled on Lot 6; Charles Meredith on Lot 7; Thomas Harris on Lot 11; and Thomas North on Lot 12. These lots became the settlement first known as Griffintown, but was renamed Smithville after Mrs. Griffin, whose maiden name was Mary Smith (Powell and Coffman 1956).

1.2.3 Recent Reports

Two archaeological assessment reports document work within 50 metres of the study area: the Stage 1 and Stage 2 archaeological assessment reports for the Niagara Region Wind Project (Table 2).

Table 2: Stage 1 and 2 Archaeological Assessment Reports for Studies in the Area

Year	Title	Author	PIF Number
2012	*Stage 1 Archaeological Assessment, Niagara Region Wind Project, Various Lots, Concession 1-6 Gainsborough Township, Concessions 7-10, Clinton Township, Regional Municipality of Niagara and Various Lots, Moulton Township, Haldimand County, Ontario*	Stantec	P002-263-2011
2013	*Stage 2 Archaeological Assessment, Niagara Region Wind Project, Various Lots, Concession 1-6 Gainsborough Township, Concessions 7-10, Clinton Township, Regional Municipality of Niagara and Various Lots, Moulton Township, Haldimand County, Ontario*	Stantec	P002-289-2012

1.3 ARCHAEOLOGICAL CONTEXT

1.3.1 Natural Environment

The proposed modified alternate transmission route is located in the Haldimand Clay Plain physiographic region, a large region that occupies the majority of the Niagara Peninsula south of the Niagara Escarpment down to Lake Erie. It is a region of approximately 3,500 square kilometres characterized by recessional moraines in the northern part, deep river valley in the middle, and flat and low lying ground in the south (Chapman and Putnam 1984).

The vast majority of the surficial geology of the proposed modifications consists of heavy silty clay loam, till, and alluvial deposits in flood plains spanning the length of the region's waterways.

The dominant soil series is Haldimand clay loam with small pockets of Lincoln clay till, predominantly along waterways (Wicklund and Mathews 1963).

Potable water is the single most important resource for any extended human occupation or settlement and since water sources in southwestern Ontario have remained relatively stable over time proximity to drinkable water is regarded as a useful index for the evaluation of archaeological site potential. In fact, distance to water is one of the most commonly used variables for predictive modeling of archaeological site location in Ontario. The closest source of potable water to the proposed modified alternate transmission route is Twenty Mile Creek, which runs through the southern end of the study area.

1.3.2 Pre-Contact Aboriginal Resources

This portion of southern Ontario has been occupied by First Nations peoples since the retreat of the Wisconsin glacier approximately 11,000 years ago. Local environmental conditions were significantly different from what they are today. Ontario's first peoples would have crossed the landscape in small groups in search of food, particularly migratory game species. In this area, caribou may have been a Paleo-Indian diet staple, supplemented by wild plants, small game, birds, and fish. Given the low density of populations on the landscape at this time and their mobile nature, Paleo-Indian sites are small and ephemeral. They are sometimes identified by the presence of fluted points. Sites are frequently located adjacent to the shorelines of large glacial lakes (Ellis and Ferris 1990).

Archaeological records indicate subsistence changes around 8,000 B.C. at the start of the Archaic Period in southern Ontario. Since the large mammal species that formed the basis of the Paleo-Indian diet became extinct or moved north with the warming of the climate, Archaic populations had a more varied diet, exploiting a range of plants and bird, mammal, and fish species. Reliance on specific food resources like fish, deer, and several nut species became more noticeable through the Archaic Period and the presence of warmer, more hospitable environs led to expansion of group and family sizes. In the archaeological record, this is evident in the presence of larger sites. The coniferous forests of earlier times were replaced by stands of mixed coniferous and deciduous trees by about 4,000 B.C. The transition to more productive environmental circumstances led to a rise in population density. As a result, Archaic sites become more abundant over time. Artifacts typical of these occupations include a variety of stemmed and notched projectile points; chipped stone scrapers; ground stone tools (e.g., celts, adzes) and ornaments (e.g., bannerstones, gorgets); bifaces or tool blanks; animal bone; and chert waste flakes, a byproduct of the tool making process (Ellis and Ferris 1990).

Significant changes in cultural and environmental patterns occurred in the Early and Middle Woodland periods (*circa* 950 B.C. to 800 A.D.). Occupations became increasingly more permanent in this period, culminating in major semi-permanent villages by roughly 1,000 years ago. Archaeologically, the most significant changes by Woodland peoples were the appearance of artifacts manufactured from modeled clay and the emergence of more

sedentary villages. The earliest pottery was crudely made by the coiling method and early house structures were simple oval enclosures. The Early and Middle Woodland periods are also characterized by extensive trade in raw materials, objects and finished tools, with sites in Ontario containing trade items with origins in the Mississippi and Ohio River valleys (Ellis and Ferris 1990).

The Late Woodland period is marked by the emergence of the Neutral Iroquoians, one of several discrete groups that emerge from this period. Neutral settlements include large villages of several longhouses and a number of associated smaller satellite villages (hamlets), seasonally occupied sites with only one or two small "cabins" (usually associated with working horticultural fields), and camps for specialized extractive activities such as hunting and fishing (Ellis and Ferris 1990).

Discrete clusters of politically allied Neutral villages have been identified from the late pre-contact and early post-contact periods. The study area is situated in close proximity to the Lower Grand River cluster, located on both sides of the Grand River above and below the town of Cayuga, the Upper Twenty Mile Creek cluster to the west, and the Grimsby cluster to the north (Ellis and Ferris 1990).

Table 3 provides a general outline of the cultural chronology of the Niagara Region, based on Ellis and Ferris (1990).

Table 3: Cultural Chronology for Niagara Region

Period	Characteristics	Time	Comments
Early Paleo-Indian	Fluted Projectiles	9000 - 8400 B.C.	spruce parkland/caribou hunters
Late Paleo-Indian	Hi-Lo Projectiles	8400 - 8000B.C.	smaller but more numerous sites
Early Archaic	Kirk and Bifurcate Base Points	8000 - 6000 B.C.	slow population growth
Middle Archaic	Brewerton-like points	6000 - 2500 B.C.	environment similar to present
Late Archaic	Lamoka (narrow points)	2000 - 1800 B.C.	increasing site size
	Broad Points	1800 - 1500 B.C.	large chipped lithic tools
	Small Points	1500 - 1100B.C.	introduction of bow hunting
Terminal Archaic	Hind Points	1100 - 950 B.C.	emergence of true cemeteries
Early Woodland	Meadowood Points	950 - 400 B.C.	introduction of pottery
Middle Woodland	Dentate/Pseudo-Scallop Pottery	400 B.C. - A.D.500	increased sedentism
	Princess Point	A.D. 550 - 900	introduction of corn
Late Woodland	Early Ontario Iroquoian	A.D. 900 - 1300	emergence of agricultural villages
	Middle Ontario Iroquoian	A.D. 1300 - 1400	long longhouses (100m +)
	Late Ontario Iroquoian	A.D. 1400 - 1650	tribal warfare and displacement

Period	Characteristics	Time	Comments
Contact Aboriginal	Various Algonkian Groups	A.D. 1700 - 1875	early written records and treaties
Late Historic	Euro-Canadian	A.D. 1796 - present	European settlement

1.3.3 Previously Identified Archaeological Sites and Surveys

In order to compile an inventory of archaeological resources, the registered archaeological site records kept by the MTCS were consulted. In Ontario, information concerning archaeological sites stored in the ASDB is maintained by the MTCS. This database contains archaeological sites registered according to the Borden system. Under the Borden system, Canada is divided into grid blocks based on latitude and longitude. A Borden Block is approximately 13 kilometres east to west and approximately 18.5 kilometres north to south. Each Borden Block is referenced by a four-letter designator and sites within a block are numbered sequentially as they are found. The study area under review is within Borden Block AgGv.

Information concerning specific site locations is protected by provincial policy, and is not fully subject to the *Freedom of Information and Protection of Privacy Act*. The release of such information in the past has led to looting or various forms of illegally conducted site destruction. Confidentiality extends to all media capable of conveying location, including maps, drawings, or textual descriptions of a site location. The MTCS will provide information concerning site location to the party or an agent of the party holding title to a property, or to a licensed archaeologist with relevant cultural resource management interests.

An examination of the ASDB has shown that there is one archaeological site registered within a one-kilometre radius of the study area (Robert von Bitter, personal communication, February 11, 2016; Government Ontario n.d.). The site, AgGv-85, was an isolated pre-contact Aboriginal findspot consisting of a Kramer projectile point dating to 500-1 B.C.

1.3.4 Determination of Archaeological Potential

Archaeological potential is established by determining the likelihood that archaeological resources may be present on a subject property. Stantec used criteria established by the MTCS (Government of Ontario 2011b) to determine areas of archaeological potential.

Distance to modern or ancient water sources is generally accepted as the most important determinant of past human settlement patterns and, considered alone, may result in a determination of archaeological potential. However, any combination of two or more other criteria, such as well-drained soils or topographic variability, may also indicate archaeological potential. Finally, extensive land disturbance can eradicate archaeological potential (Wilson and Horne 1995).

The Stage 1 assessment indicated that the study contains potential for both pre-contact Aboriginal and Euro-Canadian archaeological resources (Stantec 2012). Pre-contact and post-contact Aboriginal potential is moderate to high for the study area given the proximity to nearby water sources. Finally, Euro-Canadian potential is moderate to high for the study area given its close proximity to the 19th century road grid and the community of Smithville.

1.3.5 Existing Conditions

The Stage 2 assessment of the modified alternate transmission route was conducted between May 22, 2015 and November 23, 2015 under PIF P001-0885-2016 issued to Jim Wilson, MA, by the MTCS. The current study area occupies part of Lots 1 to 3, Gore A Between 7th and 8th Concessions and the Lincoln road allowance between Lots 11 and 12, Concession 8 and 9, Geographic Township of Grimsby, former Lincoln County, Township of West Lincoln, now Regional Municipality of Niagara, Ontario. It comprises approximately five hectares of disturbed road right-of-way, unopened road allowance used as an ATV trail, and manicured lawn.

2.0 FIELD METHODS

The Stage 2 assessment involved a survey of all of the land to be impacted by the proposed modified alternate transmission route. The study area consists of an unopened road allowance used as an ATV trail and manicured lawn which were test pit surveyed and Twenty Mile Creek and areas of previous disturbance including road right-of-ways, culverts, and gravel roads which were not surveyed.

A Topcon FC-25 handheld GPS unit, running Magnet GIS software using the North American Datum (NAD) 83 with a minimal accuracy of two metres and loaded with shapefiles provided by FWRN, was used to help identify the boundaries of the study area in the field.

The Stage 2 was undertaken between May 22, 2015 and January 7, 2016 as summarized in Table 4. During the Stage 2 assessment, the weather varied from partly cloudy and warm to sunny and cold. Overall, field visibility and lighting conditions were good and at no time were the field or weather conditions detrimental to the recovery of archaeological material. Photos 1 to 11 (Section 8.1) confirm that conditions met the requirements for Stage 2 archaeological assessment as per the MTCS' 2011 *Standards and Guidelines for Consultant Archaeologists* (Section 7.8.6 Standard 1a; Government of Ontario 2011b).

Table 4: Weather and Field Conditions during Stage 2 Assessment

Date	Activity	Weather	Field Conditions
May 22, 2015	Test pit survey	Partly cloudy, warm	Soil is dry and friable, screens easily
May 26, 2015	Photo documentation	Sunny, warm	Visibility is suitable
November 23, 2015	Test pit survey	Sunny, cold	Soil is dry and friable, screens easily
January 7, 2016	Photo documentation	Overcast, cold	Visibility is suitable

Approximately 50% of the study area consisted of an unopened road allowance used as an ATV trail and manicured lawn, which were subject to test pit survey at a five metre interval (Photos 4, 5, 7) in accordance with Section 2.1.2 of the MTCS' 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011b). Each test pit was excavated by hand and was approximately 30 centimetres in diameter and excavated five centimetres into sterile subsoil. All soil was screened through six millimetre mesh hardware cloth to facilitate the recovery of small artifacts. Prior to backfilling, all test pits were examined for stratigraphy, cultural features, and evidence of fill. No artifacts were recovered during the test pit survey and so no further field methods were employed.

Approximately 50% of the study area comprised of areas of previous disturbance, such as the road right-of-ways, culverts, and gravel roads (Photos 1 to 3, 6, 8, and 9). These areas were not subject to further Stage 2 survey since they are documented as disturbed or permanently wet as

per Section 2.1 Standard 2a and 2b of the MTCS' 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011b). Instead, these areas were photo documented as per Section 7.8.6 Standard 1b of the MTCS' 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011b).

First Nations monitors from interested communities participated in the Stage 2 archaeological assessment alongside the Stantec archaeological field technicians. Additional information on the Aboriginal Engagement practices conducted during the Stage 2 assessment is provided in the Supplementary Documentation.

3.0 RECORD OF FINDS

The Stage 2 archaeological assessment was conducted employing the methods described in Section 2.0. An inventory of the documentary record generated by fieldwork is provided in Table 5 below.

Table 5: Inventory of Documentary Record

Document Type	Current Location of Document Type	Additional Comments
11 Pages of Field Notes	Stantec office in Hamilton	In original field book and photocopied in project file
3 Maps Provided by Client	Stantec office in Hamilton	Hard and digital copies in project file
218 Digital Photographs	Stantec office in Hamilton	Stored digitally in project file

No artifacts or archaeological sites were identified or collected during the Stage 2 assessment of the modified alternate transmission route and so no collection arrangements were needed.

4.0 ANALYSIS AND CONCLUSIONS

The Stage 2 assessment of the proposed modified alternate transmission route resulted in the identification of no archaeological sites.

5.0 RECOMMENDATIONS

The Stage 2 assessment of the proposed modified alternate transmission route resulted in the identification of no archaeological resources. **Therefore, it is recommended that no further archaeological assessment of the property is required.**

The Ministry of Tourism, Culture and Sport is asked to accept this report into the Ontario Public Register of Archaeological Reports.

6.0 ADVICE ON COMPLIANCE WITH LEGISLATION

This report is submitted to the Minister of Tourism, Culture and Sport as a condition of licensing in accordance with Part VI of the *Ontario Heritage Act*, R.S.O. 1990, c 0.18. The report is reviewed to ensure that it complies with the standards and guidelines that are issued by the Minister, and that the archaeological fieldwork and report recommendations ensure the conservation, protection and preservation of the cultural heritage of Ontario. When all matters relating to archaeological sites within the project area of a development proposal have been addressed to the satisfaction of the Ministry of Tourism, Culture and Sport, a letter will be issued by the ministry stating that there are no further concerns with regard to alterations to archaeological sites by the proposed development.

It is an offence under Sections 48 and 69 of the *Ontario Heritage Act* for any party other than a licensed archaeologist to make any alteration to a known archaeological site or to remove any artifact or other physical evidence of past human use or activity from the site, until such time as a licensed archaeologist has completed fieldwork on the site, submitted a report to the Minister stating that the site has no further cultural heritage value or interest, and the report has been filed in the Ontario Public Register of Archaeological Reports referred to in Section 65.1 of the *Ontario Heritage Act*.

Should previously undocumented archaeological resources be discovered, they may be a new archaeological site and therefore subject to Section 48(1) of the *Ontario Heritage Act*. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out archaeological fieldwork, in compliance with Section 48(1) of the *Ontario Heritage Act*.

The *Cemeteries Act*, R.S.O. 1990 c. C.4 and the *Funeral, Burial and Cremation Services Act*, 2002, S.O. 2002, c.33 (when proclaimed in force) require that any person discovering human remains must notify the police or coroner and the Registrar of Cemeteries at the Ministry of Government and Consumer Services.

7.0 BIBLIOGRAPHY AND SOURCES

Chapman, L.J. and D.F. Putnam. 1984. *The Physiography of Southern Ontario*. Third Edition. Ontario Geological Survey. Special Volume 2. Toronto: Ontario Ministry of Natural Resources.

Ellis, Chris J. and Neal Ferris (editors). 1990. *The Archaeology of Southern Ontario to A.D. 1650*. Occasional Publication of the London Chapter, Ontario Archaeological Society, Number

Government of Ontario. 1990a. *Environmental Protection Act*, R.S.O. 1990, CHAPTER O.18. Last amendment: 2009, c. 33, Sched. 11, s. 6. Electronic document: http://www.ontario.ca/laws/statute/90e19. Last accessed January 6, 2016.

Government of Ontario. 1990b. *Ontario Heritage Act*, R.S.O. 1990, CHAPTER O.18. Last amendment: 2009, c. 33, Sched. 11, s. 6. Electronic document: http://www.ontario.ca/laws/statute/90o18. Last accessed January 6, 2016.

Government of Ontario. 2011a. *Ontario Regulation 359/09: Renewable Energy Approval Under Part V.0.1 of the Act*. Electronic document: http://www.ontario.ca/laws/regulation/090359. Last accessed January 11, 2016.

Government of Ontario. 2011b. *Standards and Guidelines for Consultant Archaeologists*. Toronto: Ministry of Tourism, Culture and Sport.

Government of Ontario. n.d. *Archaeological Sites Database Files*. Toronto: Archaeology Programs Unit, Ministry of Tourism, Culture and Sport.

Konrad, Victor. 1981. An Iroquois Frontier: The North Shore of Lake Ontario during the Late Seventeenth Century. *Journal of Historical Geography* 7(2):129-144.

Morris, J.L. 1943. *Indians of Ontario*. 1964 reprint. Toronto: Department of Lands and Forests, Government of Ontario.

Page, H.R. and Co. 1876. *Illustrated Historical Atlas of the Counties of Lincoln and Welland, Ont.* Toronto: H.R. Page and Co.

Powell, R. Janet, and Barbara F. Coffman. 1956. *Lincoln County, 1856-1956*. St. Catharines: Lincoln County Council.

Praxis Research Associates. n.d. *The History of the Mississaugas of the New Credit First Nation.* Hagersville: Lands, Research and Membership, Mississaugas of the New Credit First Nation.

Schmalz, Peter S. 1991. *The Ojibwa of Southern Ontario*. Toronto: University of Toronto Press.

Stantec Consulting Ltd. 2012. *Niagara Region Wind Farm Stage 1 Archaeological Assessment, Various Lots, Concession 1-6 Gainsborough Township, Concession 7-10 Clinton Township, Regional Municipality of Niagara and Various Lots, Moulton Township, Haldimand County.* Report on file with the Ministry of Tourism, Culture and Sport, Toronto.

Stantec Consulting Ltd. 2013. *Niagara Region Wind Project Final Stage 2 Archaeological Assessment, Various Lots, Concession 1-6 Gainsborough Township, Concession 7-10 Clinton Township, Regional Municipality of Niagara and Various Lots, Moulton Township, Haldimand County.* Report on file with the Ministry of Tourism, Culture and Sport, Toronto.

Wicklund, R.E. and B.C. Matthews. 1963. *The Soil Survey of Lincoln County.* Report No. 34 of the Ontario Soils Survey. Guelph: Department of Agriculture and the Ontario Agricultural College.

Wilson, J.A. and M. Horne 1995*. City of London Archaeological Master Plan*. London: City of London, Department of Planning and Development.

8.0 IMAGES

8.1 PHOTOGRAPHS

Photo 1: Disturbed Right-of-Way, Not Surveyed, facing northwest

Photo 2: Disturbed Right-of-Way, Not Surveyed, facing northwest

Photo 3: Previously Disturbed Gravel Road, Not Surveyed, facing northeast

Photo 4: Test Pit Survey at Five-Metre Intervals, facing southwest

Photo 5: Test Pit Survey at Five-Metre Intervals, facing northeast

Photo 6: Previously Disturbed Culvert, Not Surveyed, facing northwest

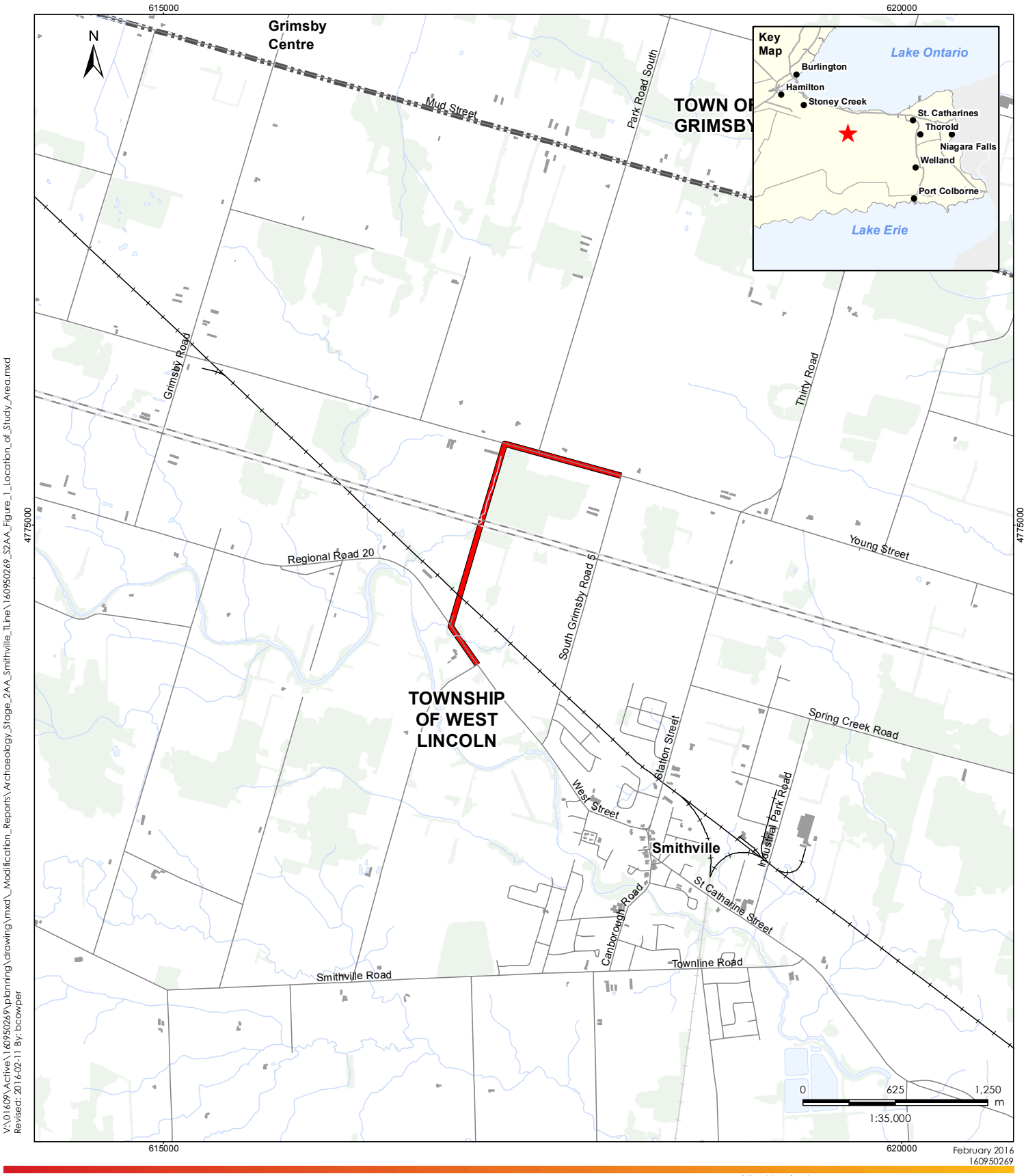
Photo 7: Test Pit Survey at Five-Metre Intervals, facing northeast

Photo 8: Previously Disturbed Gravel Road, Not Surveyed, facing northeast

Photo 9: Disturbed Right-of-Way, Not Surveyed, facing northwest

9.0 MAPS

All maps will follow on succeeding pages.



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Revised: 2016-02-11 By: bcowper

Stantec

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2013.

Legend

- Study Area
- Road
- Expressway / Highway
- Active Railway
- Abandoned Railway
- Existing Structures
- Existing Transmission Line
- Watercourse
- Waterbody
- Wooded Area
- Municipality Lower Tier

Client/Project

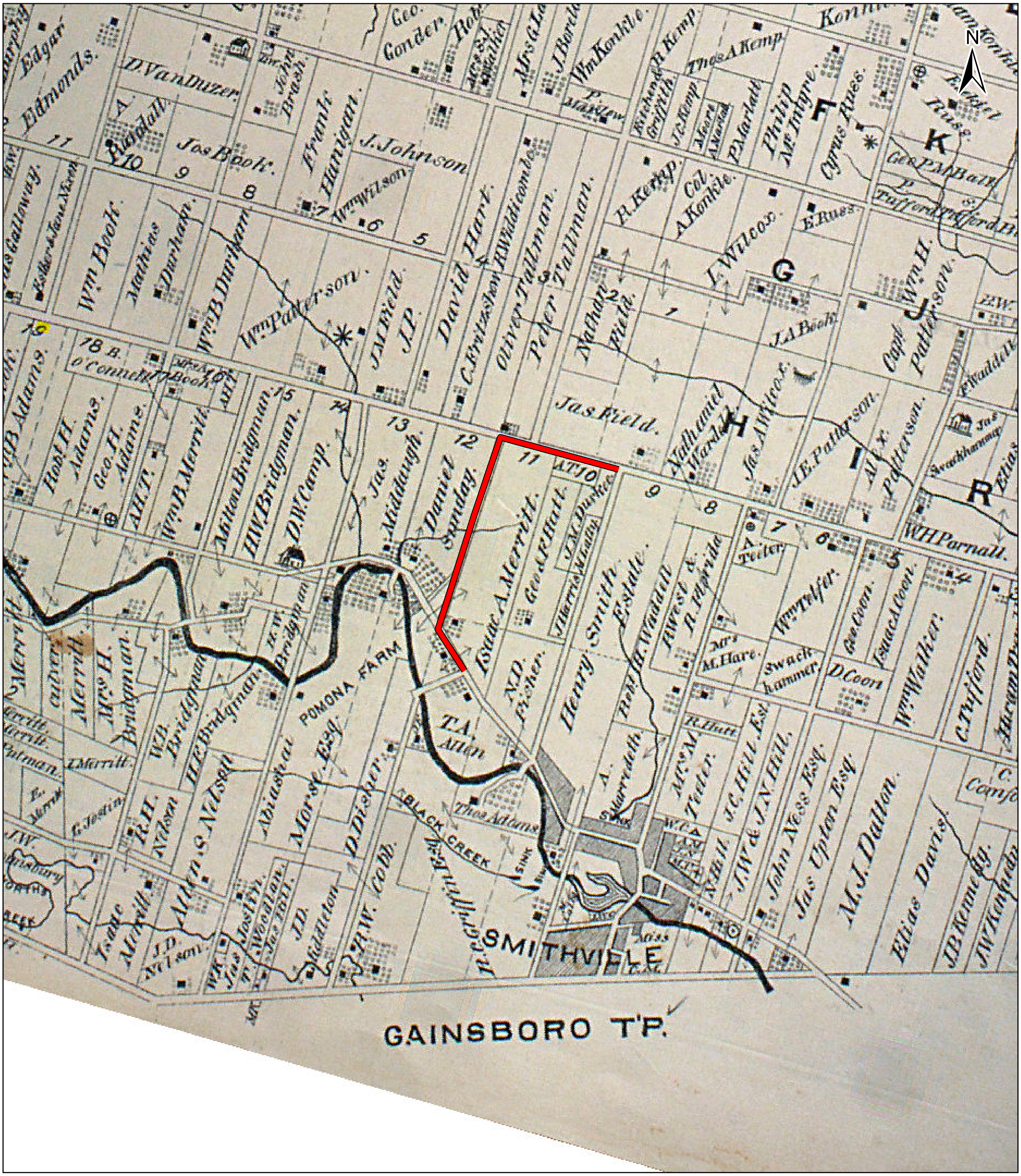
FWRN LP
Niagara Region Wind Farm
Stage 2 Archaeological Assessment

Figure No.

1

Title

Location of Study Area



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Revised: 2016-02-11 By: bcowper

February 2016
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Stantec

Legend

Study Area

Client/Project

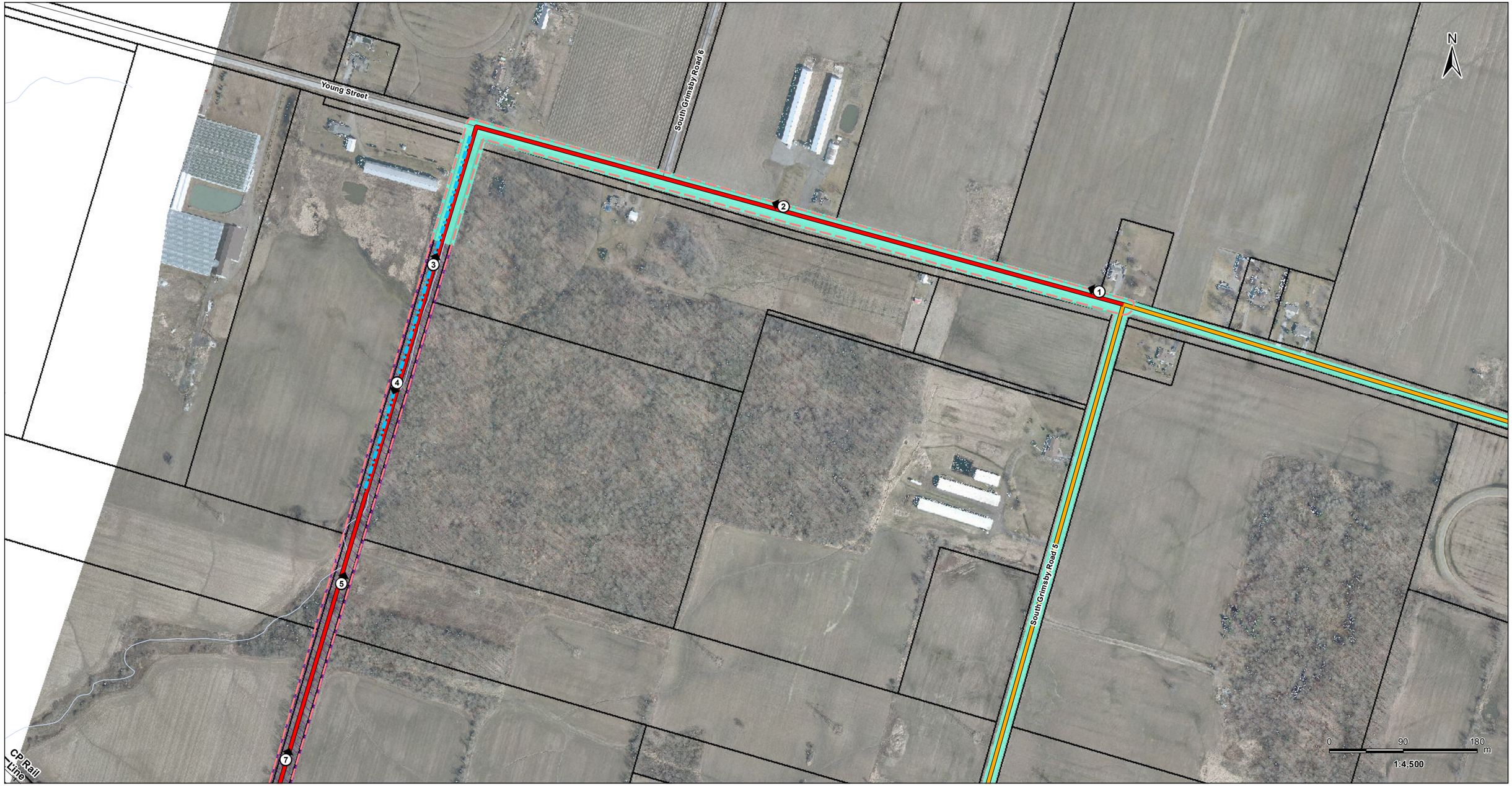
FWRN-LP (formerly Niagara Region Wind Corporation)
Niagara Region Wind Farm

Figure No.
2

Title
Portion of the 1876 Map of Grimsby Township

Notes

1. Historic Image: Illustrated historical atlas of the counties of Lincoln and Welland, Ont. Toronto : H.R. Page & Co., 1876.
2. Not to Scale



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Revised: 2016-02-11 By: bcowper

February 2016
160950269

Stantec

Notes

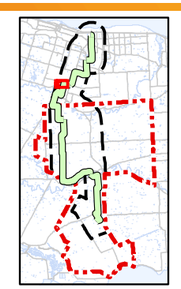
1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2010.
3. Orthoimagery © First Base Solutions, 2010.

Legend

- Modified Alternate Transmission Route
- Preferred Transmission Route
- Access Trail
- Study Area

Stage 2 Assessment

- Test Pitted, at 5m Intervals
- Disturbed, Not Surveyed
- Photograph Location



Client/Project
FWRN LP
Niagara Region Wind Farm
Stage 2 Archaeological Assessment

Figure No.
3.1

Title
Stage 2 Results

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Revised: 2016-02-11 By: bcowper

February 2016
160950269

Stantec

Notes

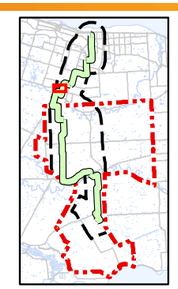
1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2010.
3. Orthoimagery © First Base Solutions, 2010.

Legend

- Modified Alternate Transmission Route
- Preferred Transmission Route
- Study Area

Stage 2 Assessment

- Test Pitted, at 5m Intervals
- Disturbed, Not Surveyed
- Photograph Location



Client/Project
FWRN LP
Niagara Region Wind Farm
Stage 2 Archaeological Assessment

Figure No.
3.2

Title
Stage 2 Results

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Revised: 2016-02-11 By: bcowpert

February 2016
160950269

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Legend

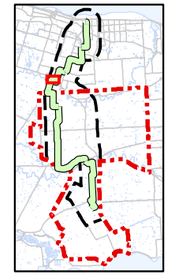
- Modified Alternate Transmission Route
- Preferred Transmission Route
- Study Area

Stage 2 Assessment

- Disturbed, Not Surveyed
- Photograph Location

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2010.
3. Orthoimagery © First Base Solutions, 2010.



Client/Project

FWRN LP
Niagara Region Wind Farm
Stage 2 Archaeological Assessment

Figure No.

3.3

Title

Stage 2 Results

10.0 CLOSURE

This report documents work that was performed in accordance with generally accepted professional standards at the time and location in which the services were provided. No other representations, warranties or guarantees are made concerning the accuracy or completeness of the data or conclusions contained within this report, including no assurance that this work has uncovered all potential archaeological resources associated with the identified property.

All information received from the client or third parties in the preparation of this report has been assumed by Stantec to be correct. Stantec assumes no responsibility for any deficiency or inaccuracy in information received from others.

Conclusions made within this report consist of Stantec's professional opinion as of the time of the writing of this report, and are based solely on the scope of work described in the report, the limited data available and the results of the work. The conclusions are based on the conditions encountered by Stantec at the time the work was performed. Due to the nature of archaeological assessment, which consists of systematic sampling, Stantec does not warrant against undiscovered environmental liabilities nor that the sampling results are indicative of the condition of the entire property.

This report has been prepared for the exclusive use of the client identified herein and any use by any third party is prohibited. Stantec assumes no responsibility for losses, damages, liabilities or claims, howsoever arising, from third party use of this report. We trust this report meets your current requirements. Please do not hesitate to contact us should you require further information or have additional questions about any facet of this report.

Quality review by  (signature)

Jeffrey Muir, BA

Independent review by  (signature)

Tracie Carmichael, BA, B.Ed.

Attachments: ENTERED INTO REGISTER Archaeological Report for P415-0077-2016.pdf

From: Brooks, Meagan (MTCS) [mailto:Meagan.Brooks@ontario.ca]
Sent: Wednesday, April 20, 2016 5:08 PM
To: Raetsen, Sarah (MOECC)
Cc: Muir, Jeff; Wilson, Jim (Ottawa); Hoskins, Patrick; Adam Rosso; Tripp, Bryan
Subject: FW: ENTERED INTO REGISTER: Archaeological Report for P415-0077-2016 / *

Hi Sarah,

If you recall, we chatted on the phone at the beginning of the month about the Niagara Region Wind project, alternate transmission route in West Lincoln and the archaeological assessment that was required on the route.

As we discussed, I am sending you the attached acceptance letter for the archaeological assessment directly: "*Stage 2 Archaeological Assessment: Modified Alternate Transmission Route, Feddema Lands, Niagara Region Wind Project. Part of Lot 12, Concession 8, Geographic Township of Grimsby, former Lincoln County, Township of West Lincoln, now Regional Municipality of Niagara"* MTCS Project Information Form number P415-0077-2016, FIT Number: F-001580-WIN-130-601

Thanks very much, if you have any questions let me know,
Meagan

Meagan Brooks
archaeology@ontario.ca
(416) 314-7123

From: pastport [mailto:pastport@ontario.ca]
Sent: April 20, 2016 4:52 PM
To: patrick.hoskins@stantec.com
Cc: Keyvani, Mohsen (MOECC); adam.rosso@boralex.com; PastPort (MTCS)
Subject: ENTERED INTO REGISTER: Archaeological Report for P415-0077-2016 / *

Dear Patrick Hoskins,

The ministry has reviewed the Original report for PIF P415-0077-2016 submitted by you as a condition of your licence.

This report has been deemed compliant with ministry requirements for archaeological fieldwork and reporting. It has been entered into the *Ontario Public Register of Archaeological Reports.* Please refer to the attached letter to see the result of this review.

Note: the ministry makes no representation or warrant as to the completeness, accuracy or quality of reports in the register.

Development proponents and approval authorities: the Ontario Ministry of Tourism, Culture and Sport has copied you on this email as you have been identified by the consultant archaeologist as either the proponent or approval authority for this project.

Please **do not** reply to this e-mail. The message will be undeliverable and we are unable to respond from this address.

If you have any questions about this report email us at: Archaeology@ontario.ca

Thank you,

Meagan Brooks

meagan.brooks@ontario.ca

Ministry of Tourism, Culture and Sport

Archaeology Programs Unit
Programs and Services Branch
Culture Division
401 Bay Street, Suite 1700
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Tel.: (416) 314-7123
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Ministère du Tourisme, de la Culture et du Sport

Unité des programmes d'archéologie
Direction des programmes et des services
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401, rue Bay, bureau 1700
Toronto ON M7A 0A7
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Email: meagan.brooks@ontario.ca

Ontario

Apr 20, 2016

Patrick Hoskins (P415)
Stantec Consulting
400 - 1331 Clyde Ottawa ON K2C3G4

RE: Review and Entry into the Ontario Public Register of Archaeological Reports: Archaeological Assessment Report Entitled, "Stage 2 Archaeological Assessment: Modified Alternate Transmission Route, Feddema Lands, Niagara Region Wind Project. Part of Lot 12, Concession 8, Geographic Township of Grimsby, former Lincoln County, Township of West Lincoln, now Regional Municipality of Niagara, Ontario.", Dated Apr 20, 2016, Filed with MTCS Toronto Office on Apr 20, 2016, MTCS Project Information Form Number P415-0077-2016, MTCS File Number 26EA078

Dear Mr. Hoskins:

This office has reviewed the above-mentioned report, which has been submitted to this ministry as a condition of licensing in accordance with Part VI of the Ontario Heritage Act, R.S.O. 1990, c 0.18.[1] This review has been carried out in order to determine whether the licensed professional consultant archaeologist has met the terms and conditions of their licence, that the licensee assessed the property and documented archaeological resources using a process that accords with the 2011 Standards and Guidelines for Consultant Archaeologists set by the ministry, and that the archaeological fieldwork and report recommendations are consistent with the conservation, protection and preservation of the cultural heritage of Ontario.

The report documents the assessment/mitigation of the study area as depicted in Figure 1, 3 and Tile 1 of the above titled report and recommends the following:

The Stage 2 assessment of the proposed modified alternate transmission route on the Feddema Lands resulted in the identification of two archaeological locations: CL-44 and CL-45 (AgGv-138).
CL-44 does not fulfill the criteria for a Stage 3 archaeological investigation as per Section 2.2 of the MTCS' 2011 Standards and Guidelines for Consultant Archaeologists (Government of Ontario 2011b). The cultural heritage value or interest of CL-44 has been sufficiently documented. Therefore, no further archaeological assessment is recommended for CL-44.

CL-45 (AgGv-138) does not fulfill the criteria for a Stage 3 archaeological investigation as per Section 2.2 of the MTCS' 2011 Standards and Guidelines for Consultant Archaeologists (Government of Ontario 2011b). The cultural heritage value or interest of CL-45 (AgGv-138) has been sufficiently documented. Therefore, no further archaeological assessment is recommended for CL-45 (AgGv-138).

The Stage 2 archaeological assessment for the other portions of the study area did not identify any additional archaeological resources (neither artifacts nor sites). Thus, in accordance with Section 2.2 and Section 7.8.3 of the MTCS' 2011 Standards and Guidelines for Consultant Archaeologists (Government of Ontario 2011b), no further archaeological assessment of the study area is required.

However, the remainder of the Feddema Lands to the west has not been subject to Stage 2 archaeological assessment and if the remainder of the property is to be subject to development in the future, then a Stage 2 archaeological assessment is recommended outside of the current study area. Therefore it is recommended that 30 metres of protective fencing be erected on the west and east sides of both CL-44 and CL-45 (AgGv-138) in order to prevent any development impacts. It is also recommended that a licensed archaeological be present during fence installation to monitor the installation process prior to construction.

Based on the information contained in the report, the ministry is satisfied that the fieldwork and reporting for the archaeological assessment are consistent with the ministry's 2011 Standards and Guidelines for Consultant Archaeologists and the terms and conditions for archaeological licences. This report has been entered into the Ontario Public Register of Archaeological Reports. Please note that the ministry makes no representation or warranty as to the completeness, accuracy or quality of reports in the register.

Should you require any further information regarding this matter, please feel free to contact me.

Sincerely,

Meagan Brooks
Archaeology Review Officer

cc. Archaeology Licensing Officer
Adam Rosso,FWRN LP
Mohsen Keyvani,Ministry of the Environment and Climate Change

[1]In no way will the ministry be liable for any harm, damages, costs, expenses, losses, claims or actions that may result: (a) if the Report(s) or its recommendations are discovered to be inaccurate, incomplete, misleading or fraudulent; or (b) from the issuance of this letter. Further measures may need to be taken in the event that additional artifacts or archaeological sites are identified or the Report(s) is otherwise found to be inaccurate, incomplete, misleading or fraudulent.

Stage 2 Archaeological Assessment: Modified Alternate Transmission Route, Feddema Lands, Niagara Region Wind Project

Part of Lot 12, Concession 8, Geographic Township of Grimsby, former Lincoln County, Township of West Lincoln, now Regional Municipality of Niagara, Ontario

Prepared for:
FWRN LP
4672 Bartlett Road South
Beamsville, ON L0R 1B1

Prepared by:
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200-835 Paramount Drive
Stoney Creek, ON L8J 0B4

Licensee: Patrick Hoskins, MA
License Number: P415
PIF Number: P415-0077-2016
Project Number: 160961052
FIT Number: : F-001580-WIN-130-601

ORIGINAL REPORT

April 20, 2016

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Project Personnel

Licensed Archaeologist:	Patrick Hoskins, MA (P415)
Project Manager:	Bryan Tripp, P.Eng., M.A.Sc.
Licensed Field Director:	Caitlin Simmons, MA (R1060)
Field Technicians:	Lucas Hillcoat, John Johnson, Christian Meier
GIS Specialist:	Brian Cowper
Report Writer:	Lisa Sonnenburg, Ph.D. (R262)
Quality Review:	Jeffrey Muir, BA (R304)
Independent Review:	Jim Wilson, MA (P001)

Acknowledgements

Proponent Contact:	Adam Rosso, FWRN LP
Ministry of Tourism, Culture and Sport	Robert von Bitter

Executive Summary

A Stage 2 archaeological assessment of the proposed modified alternate transmission route on part of Lot 12, Concession 8, Geographic Township of Grimsby, former Lincoln County, Township of West Lincoln, now Regional Municipality of Niagara, Ontario , presently owned by the Feddema family (Feddema Lands), was conducted by Stantec Consulting Ltd. (Stantec) on behalf of FWRN LP (FWRN) for the proposed Niagara Region Wind Project. The Stage 2 archaeological assessment conducted by Stantec was undertaken as part of an amendment to FWRN's Renewable Energy Approval under the Renewable Energy Approval regulation (Government of Ontario 2011a), as related to Ontario Regulation 359/09 sections 21 and 22 under Part V.0.1 of the *Environmental Protection Act* (Government of Ontario 1990a) and informed by the *Green Energy Act* (Government of Ontario 2009).

The Project, as approved under Approval Number 4353-9HMP2R, is currently under construction. FWRN is concurrently seeking approval for project changes that would be constructed, once approved. Due to proposed changes to the Project Location, Stantec was retained to conduct a Stage 2 archaeological assessment of additional lands affected by the proposed Project amendments. This amendment consists of a modified alternate transmission route on part of Lot 12, Concession 8, in the Township of West Lincoln. The Stage 2 archaeological assessment of the modified alternate transmission route on the Feddema Lands was conducted on April 18, 2016 under PIF number P415-0077-2016 issued to Patrick Hoskins, MA, by the Ministry of Tourism, Culture and Sport (MTCS). The study area consists of manicured lawn, areas of previous disturbance including a driveway and barn, agricultural fields, and low and permanently wet areas, and encompasses approximately 0.75 hectares.

The Stage 2 assessment of the proposed modified alternate transmission route on the Feddema Lands resulted in the identification of two archaeological locations: CL-44 and CL-45 (AgGv-138).

Neither CL-44 nor CL-45 (AgGv-138) fulfills the criteria for a Stage 3 archaeological investigation as per Section 2.2 of the MTCS' 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011). The cultural heritage value or interest of CL-44 and CL-45 (AgGv-138) has been sufficiently documented. **Therefore, no further archaeological assessment is recommended for CL-44 or for CL-45 (AgGv-138).**

The Stage 2 archaeological assessment for the other portions of the study area did not identify any additional archaeological resources (neither artifacts nor sites). Thus, in accordance with Section 2.2 and Section 7.8.3 of the MTCS' *2011 Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011), **no further archaeological assessment of the study area is required**.

However, the remainder of the Feddema Lands to the west has not been subject to Stage 2 archaeological assessment and if the remainder of the property is to be subject to development in the future, then a Stage 2 archaeological assessment is recommended outside of the current study area. **Therefore it is recommended that 30 metres of protective fencing be erected on the west and east sides of both CL-44 and CL-45 (AgGv-138) in order to prevent any development impacts. It is also recommended that a licensed archaeological be present during fence installation to monitor the installation process prior to construction.**

The Ministry of Tourism, Culture and Sport is asked to accept this report into the Ontario Public Register of Archaeological Reports.

The Executive Summary highlights key points from the report only; for complete information and findings the reader should examine the complete report.

1.0 PROJECT CONTEXT

1.1 DEVELOPMENT CONTEXT

FWRN LP (FWRN) is proposing to develop the Niagara Region Wind Project (the Project) with a maximum name plate capacity of 230 megawatts (MW). The Project Location is located within the Townships of West Lincoln and Wainfleet and the Towns of Grimsby and Lincoln in Niagara Region, as well as the Geographic Townships of Moulton and Sherbrooke in Haldimand County (Figure 1).

The Project consists of 77 wind turbine generators, each with a rated capacity ranging from approximately 2.3 MW to 3.0 MW for a maximum installed name plate capacity of 230 MW. An overhead and/or underground collection system connects each turbine to one of two transformer substations along a series of 34.5 kilovolt (kV) lines. Turbines are grouped into nine collector circuits that bring power (and data via fibre optic lines) to one of the transformer substations. Voltage is stepped up from 34.5kV to 115kV at each transformer substation by means of a 100 megavolt ampere (MVA) base rated transformer with two stages of cooling (via fans). A 115kV transmission line transports power from each of the two transfer substations north to the tap-in location where the Project is connected to the Hydro One Networks Inc. (HONI) owned transmission line, south of the Queen Elizabeth Way (QEW) in the Town of Lincoln. Power generated from this Project will be conveyed along the existing HONI transmission line to the Beach Transformer Station in Hamilton.

Other Project components include access roads, junction boxes (or pad-mounted disconnect switches), and associated culverts at swales and waterbody crossings. Temporary components during construction may include temporary laydown areas (for storage and staging areas at each turbine location); crane pads or mats; staging areas along access roads; delivery truck turnaround areas; central construction laydown areas; and crane paths.

The Project, as approved under Approval Number 4353-9HMP2R, is currently under construction. FWRN is concurrently seeking approval for project changes that would be constructed, once approved. Due to proposed changes to the Project Location, Stantec was retained by FWRN to conduct a Stage 2 archaeological assessment of additional lands affected by the proposed Project amendments. This amendment consists of a modified alternate transmission route on part of Lot 12, Concession 8, Geographic Township of Grimsby, former Lincoln County, Township of West Lincoln, now Regional Municipality of Niagara, Ontario, a property owned by the Feddema family (Feddema Lands). The Stage 2 archaeological assessment conducted by Stantec was undertaken as part of an amendment to FWRN's Renewable Energy Approval under the Renewable Energy Approval regulation (Government of Ontario 2011a), as related to Ontario Regulation 359/09 sections 21 and 22 under Part V.0.1 of the *Environmental Protection Act* (Government of Ontario 1990a) and informed by the *Green Energy Act* (Government of Ontario 2009). This archaeological assessment is also subject to the *Ontario Heritage Act* (Government of

Ontario 1990b) and the Ministry of Tourism, Culture, and Sport's (MTCS) 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011b).

Permission to access the study area to conduct the archaeological assessment was provided by Adam Rosso of FWRN.

1.1.1 Objectives

The Stage 2 assessment has been conducted to meet the requirements of the MTCS 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011b).

The objective of the Stage 2 assessment was to provide an overview of archaeological resources within the study area and to determine whether any of the resources might be archaeological sites with cultural heritage value or interest and to provide specific direction for the protection, management and/or recovery of these resources. In compliance with the provincial standards and guidelines set out in the MTCS' 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011b), the objectives of the Stage 2 Archaeological Assessment are as follows:

- To document archaeological resources within the study area;
- To determine whether the study area contains archaeological resources requiring further assessment; and,
- To recommend appropriate Stage 3 assessment strategies for archaeological sites identified.

1.2 HISTORICAL CONTEXT

1.2.1 Post-contact Aboriginal Resources

The nature of Aboriginal settlement size, population distribution, and material culture shifted as European settlers encroached upon their territory. However, despite this shift, "written accounts of material life and livelihood, the correlation of historically recorded villages to their archaeological manifestations, and the similarities of those sites to more ancient sites have revealed an antiquity to documented cultural expressions that confirms a deep historical continuity to Iroquoian systems of ideology and thought" (Ferris 2009:114). As a result, First Nations peoples of Southern Ontario have left behind archaeologically significant resources throughout Southern Ontario which show continuity with past peoples, even if they have not been recorded in historical Euro-Canadian documentation.

The post-contact Aboriginal occupation of Southern Ontario was heavily influenced by the dispersal of various Iroquoian-speaking communities by the New York State Iroquois and the subsequent arrival of Algonkian-speaking groups from northern Ontario at the end of the 17th century and beginning of the 18th century (Konrad 1981; Schmalz 1991). This is the period in

which the Mississaugas are known to have moved into southern Ontario and the lower Great Lakes watersheds (Konrad 1981).

The proposed modifications fall within the lands surrendered by Treaty Number 3. Treaty Number 3

> *...was made with the Mississa[ug]a Indians 7th December, 1792, though purchased as early as 1784. This purchase in 1784 was to procure for that part of the Six Nation Indians coming into Canada a permanent abode.*
>
> *The area included in this Treaty is, Lincoln County excepting Niagara Township; Saltfleet, Binbrook, Barton, Glanford and Ancaster Townships, in Wentworth County; Brantford, Onondaga, Tusc[a]r[o]ra, Oakland and Burford Townships in Brant County; East and West Oxford, North and South Norwich, and Dereham Townships in Oxford County; North Dorchester Township in Middlesex County; South Dorchester, Malahide and Bayham Township in Elgin County; all Norfolk and Haldimand Counties; Pelham, Wainfleet, Thorold, Cumberland and Humberstone Townships in Welland County ... .*
>
> (Morris 1943:17-18)

1.2.2 Euro-Canadian Resources

A historical background for the entire Niagara Region Wind Project is provided in Stantec's Stage 1 archaeological assessment report (Stantec 2012) and Stage 2 archaeological assessment report (Stantec 2013). The proposed modified alternate transmission route is located on part of part of Lot 12, Concession 8, Geographic Township of Grimsby, former Lincoln County, Township of West Lincoln, now Regional Municipality of Niagara, Ontario.

The 1876 *Illustrated Historic Atlas of the Counties of Lincoln and Welland* (Page & Co. 1876) lists the owner of of Lot 12, Concession 8 as Daniel Sunday. A structure and an orchard are depicted in the southern portion of the lot, bordering what is now Regional Road 20 and outside of the study area (Figure 2). The study area fronts onto Young Street to the north and is depicted on the 1876 map. The lot has been occupied and in agricultural use for over 100 years. The property is currently owned by the Feddema family.

It should be noted that not all structures were not necessarily depicted or placed accurately (Gentilcore and Head 1984), although the structures noted on the map correspond in part to the standing structures still visible today. By 1876 the current road system was constructed and is still recognizable today.

The study area is located approximately one kilometre to the northwest of Smithville. Smithville was established in the 1780s. From 1784 to 1790, several United Empire Loyalists arrived in the area from Nine Partners, New York State, including Richard Griffin in 1787 who settled on the Jordan (Twenty Mile Creek) in what is now Smithville. These Loyalists settled on Lots 8, 9, and 10,

Concession 9. Solomon Hill, who married Bethia, daughter of Richard Griffin, settled on Lot 6; Charles Meredith on Lot 7; Thomas Harris on Lot 11; and Thomas North on Lot 12. These lots became the settlement first known as Griffintown, but were renamed Smithville after Mrs. Griffin, whose maiden name was Mary Smith (Powell and Coffman 1956).

1.2.3 Recent Reports

Three archaeological assessment reports document work within 50 metres of the study area: the Stage 1 and Stage 2 archaeological assessment reports for the Niagara Region Wind Project (Stantec 2012, 2013), and the Stage 2 report for the modified alternate transmission route (Stantec 2016) (Government of Ontario 2016a) (Table 1).

Table 1: Stage 1 and 2 Archaeological Assessment Reports for Studies in the Area

Year	Title	Author	PIF Number
2012	*Stage 1 Archaeological Assessment, Niagara Region Wind Project, Various Lots, Concession 1-6 Gainsborough Township, Concessions 7-10, Clinton Township, Regional Municipality of Niagara and Various Lots, Moulton Township, Haldimand County, Ontario*	Stantec	P002-263-2011
2013	*Stage 2 Archaeological Assessment, Niagara Region Wind Project, Various Lots, Concession 1-6 Gainsborough Township, Concessions 7-10, Clinton Township, Regional Municipality of Niagara and Various Lots, Moulton Township, Haldimand County, Ontario*	Stantec	P002-289-2012
2016	*Stage 2 Archaeological Assessment: Modified Alternate Transmission Route, Part of Lots 1 to 3, Gore A Between 7th and 8th Concessions and the Road Allowance Between Lots 11 and 12, Concessions 8 and 9, Geographic Township of Grimsby, former Lincoln County, Township of West Lincoln, now Regional Municipality of Niagara, Ontario*	Stantec	P001-0886-2016

1.3 ARCHAEOLOGICAL CONTEXT

1.3.1 Natural Environment

The proposed modified alternate transmission route is located in the Haldimand Clay Plain physiographic region, a large region that occupies the majority of the Niagara Peninsula south of the Niagara Escarpment down to Lake Erie. It is a region of approximately 3,500 square kilometres characterized by recessional moraines in the northern part, deep river valley in the middle, and flat and low lying ground in the south (Chapman and Putnam 1984).

The surficial geology of the proposed modifications consists of heavy silty clay loam, till, and alluvial deposits in flood plains spanning the length of the region's waterways. The soil series is Haldimand clay loam (Wicklund and Mathews 1963).

Potable water is the single most important resource for any extended human occupation or settlement and since water sources in southwestern Ontario have remained relatively stable

over time proximity to drinkable water is regarded as a useful index for the evaluation of archaeological site potential. In fact, distance to water is one of the most commonly used variables for predictive modeling of archaeological site location in Ontario. The closest source of potable water to the study area is an unnamed tributary of Twenty Mile Creek, which flows along the eastern edge of the property. The main branch of Twenty Mile Creek is 650 metres south of the study area.

1.3.2 Pre-contact Aboriginal Resources

This portion of southern Ontario has been occupied by First Nations peoples since the retreat of the Wisconsin glacier approximately 11,000 years ago. Local environmental conditions were significantly different from what they are today. Ontario's first peoples would have crossed the landscape in small groups in search of food, particularly migratory game species. In this area, caribou may have been a Paleo-Indian diet staple, supplemented by wild plants, small game, birds, and fish. Given the low density of populations on the landscape at this time and their mobile nature, Paleo-Indian sites are small and ephemeral. They are sometimes identified by the presence of fluted points. Sites are frequently located adjacent to the shorelines of large glacial lakes (Ellis and Ferris 1990).

Archaeological records indicate subsistence changes around 8,000 B.C. at the start of the Archaic Period in southern Ontario. Since the large mammal species that formed the basis of the Paleo-Indian diet became extinct or moved north with the warming of the climate, Archaic populations had a more varied diet, exploiting a range of plants and bird, mammal, and fish species. Reliance on specific food resources like fish, deer, and several nut species became more noticeable through the Archaic Period and the presence of warmer, more hospitable environs led to expansion of group and family sizes. In the archaeological record, this is evident in the presence of larger sites. The coniferous forests of earlier times were replaced by stands of mixed coniferous and deciduous trees by about 4,000 B.C. The transition to more productive environmental circumstances led to a rise in population density. As a result, Archaic sites become more abundant over time. Artifacts typical of these occupations include a variety of stemmed and notched projectile points; chipped stone scrapers; ground stone tools (e.g., celts, adzes) and ornaments (e.g., bannerstones, gorgets); bifaces or tool blanks; animal bone; and chert waste flakes, a byproduct of the tool making process (Ellis and Ferris 1990).

Significant changes in cultural and environmental patterns occurred in the Early and Middle Woodland periods (*circa* 950 B.C. to 800 A.D.). Occupations became increasingly more permanent in this period, culminating in major semi-permanent villages by roughly 1,000 years ago. Archaeologically, the most significant changes by Woodland peoples were the appearance of artifacts manufactured from modeled clay and the emergence of more sedentary villages. The earliest pottery was crudely made by the coiling method and early house structures were simple oval enclosures. The Early and Middle Woodland periods are also characterized by extensive trade in raw materials, objects and finished tools, with sites in Ontario containing trade items with origins in the Mississippi and Ohio River valleys (Ellis and Ferris 1990).

The Late Woodland period is marked by the emergence of the Neutral Iroquoians, one of several discrete groups that emerge from this period. Neutral settlements include large villages of several longhouses and a number of associated smaller satellite villages (hamlets), seasonally occupied sites with only one or two small "cabins" (usually associated with working horticultural fields), and camps for specialized extractive activities such as hunting and fishing (Ellis and Ferris 1990).

Discrete clusters of politically allied Neutral villages have been identified from the late pre-contact and early post-contact periods. The study area is situated in close proximity to the Lower Grand River cluster, located on both sides of the Grand River above and below the town of Cayuga, the Upper Twenty Mile Creek cluster to the west, and the Grimsby cluster to the north (Ellis and Ferris 1990).

Table 2 provides a general outline of the cultural chronology of the Niagara Region, based on Ellis and Ferris (1990).

Table 2: Cultural Chronology for Niagara Region

Period	Characteristics	Time	Comments
Early Paleo-Indian	Fluted Projectiles	9000 - 8400 B.C.	spruce parkland/caribou hunters
Late Paleo-Indian	Hi-Lo Projectiles	8400 - 8000B.C.	smaller but more numerous sites
Early Archaic	Kirk and Bifurcate Base Points	8000 - 6000 B.C.	slow population growth
Middle Archaic	Brewerton-like points	6000 - 2500 B.C.	environment similar to present
Late Archaic	Lamoka (narrow points)	2000 - 1800 B.C.	increasing site size
	Broad Points	1800 - 1500 B.C.	large chipped lithic tools
	Small Points	1500 - 1100B.C.	introduction of bow hunting
Terminal Archaic	Hind Points	1100 - 950 B.C.	emergence of true cemeteries
Early Woodland	Meadowood Points	950 - 400 B.C.	introduction of pottery
Middle Woodland	Dentate/Pseudo-Scallop Pottery	400 B.C. - A.D.500	increased sedentism
	Princess Point	A.D. 550 - 900	introduction of corn
Late Woodland	Early Ontario Iroquoian	A.D. 900 - 1300	emergence of agricultural villages
	Middle Ontario Iroquoian	A.D. 1300 - 1400	long longhouses (100m +)
	Late Ontario Iroquoian	A.D. 1400 - 1650	tribal warfare and displacement
Contact Aboriginal	Various Algonkian Groups	A.D. 1700 - 1875	early written records and treaties
Late Historic	Euro-Canadian	A.D. 1796 - present	European settlement

1.3.3 Previously Identified Archaeological Sites and Surveys

In order to compile an inventory of archaeological resources, the registered archaeological site records kept by the MTCS were consulted. In Ontario, information concerning archaeological sites stored in the ASDB is maintained by the MTCS. This database contains archaeological sites registered according to the Borden system. Under the Borden system, Canada is divided into grid blocks based on latitude and longitude. A Borden Block is approximately 13 kilometres east to west and approximately 18.5 kilometres north to south. Each Borden Block is referenced by a four-letter designator and sites within a block are numbered sequentially as they are found. The study area under review is within Borden Block AgGv.

Information concerning specific site locations is protected by provincial policy, and is not fully subject to the *Freedom of Information and Protection of Privacy Act*. The release of such information in the past has led to looting or various forms of illegally conducted site destruction. Confidentiality extends to all media capable of conveying location, including maps, drawings, or textual descriptions of a site location. The MTCS will provide information concerning site location to the party or an agent of the party holding title to a property, or to a licensed archaeologist with relevant cultural resource management interests.

An examination of the ASDB has shown that there are no archaeological sites within a one-kilometre radius of the study area (Government Ontario 2016b).

1.3.4 Determination of Archaeological Potential

Archaeological potential is established by determining the likelihood that archaeological resources may be present on a subject property. Stantec used criteria established by the MTCS (Government of Ontario 2011b) to determine areas of archaeological potential.

Distance to modern or ancient water sources is generally accepted as the most important determinant of past human settlement patterns and, considered alone, may result in a determination of archaeological potential. However, any combination of two or more other criteria, such as well-drained soils or topographic variability, may also indicate archaeological potential. Finally, extensive land disturbance can eradicate archaeological potential (Wilson and Horne 1995).

The Stage 1 assessment indicated that the study contains potential for both pre-contact Aboriginal and Euro-Canadian archaeological resources (Stantec 2012). Pre-contact and post-contact Aboriginal potential is moderate to high for the study area given the proximity to nearby water sources. Finally, Euro-Canadian potential is moderate to high for the study area given its close proximity to the 19th century road grid and the community of Smithville.

1.3.5 Existing Conditions

The Stage 2 assessment of the modified alternate transmission route on the Feddema Lands was conducted on April 18, 2016 under PIF P415-0077-2016 issued to Patrick Hoskins, MA, by the MTCS. The study area occupies part of Lot 12, Concession 8, Geographic Township of Grimsby, former Lincoln County, Township of West Lincoln, now Regional Municipality of Niagara, Ontario. It comprises approximately 0.75 hectares of manicured lawn, areas of previous disturbance including a driveway and barn, agricultural fields, and low and permanently wet areas.

2.0 FIELD METHODS

The Stage 2 assessment involved a survey of the land to be impacted by the proposed modified alternate transmission route on the Feddema Lands. A Topcon FC-25 handheld GPS unit, running Magnet GIS software using the North American Datum (NAD) 83 with a minimal accuracy of four metres and loaded with shapefiles provided by FWRN, was used to help identify the boundaries of the study area in the field.

The Stage 2 assessment was conducted on April 18, 2016. The weather was sunny and warm, and the soil was moist but friable, and screened well. Overall, field visibility and lighting conditions were suitable and at no time were the field or weather conditions detrimental to the recovery of archaeological material. Photos 1 to 5 (Section 8.1) confirm that conditions met the requirements for Stage 2 archaeological assessment as per the MTCS' 2011 *Standards and Guidelines for Consultant Archaeologists* (Section 7.8.6 Standard 1a; Government of Ontario 2011b).

Approximately 71% of the study area consists of manicured lawn and agricultural fields. As such, it was determined that the study area would be assessed by test pit survey at five-metre intervals (Photos 1 and 4). Although the agricultural field was viable for ploughing, the assessed area was less than 10 metres wide and can be test pitted in accordance with Section 2.1.2 Standard 1f of the MTCS's 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011b). The test pit survey survey was conducted in accordance with Section 2.1.2 of the MTCS's 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011b). Each test pit was excavated by hand and was approximately 30 centimetres in diameter and excavated five centimetres into sterile subsoil. All soil was screened through six millimetre mesh hardware cloth to facilitate the recovery of small artifacts. Prior to backfilling, all test pits were examined for stratigraphy, cultural features, and evidence of fill.

In accordance with Section 2.1.3 Standard 1 of the MTCS' 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011b), when archaeological resources were encountered during the Stage 2 test pit survey, the test pit excavation continued on the survey grid to determine the extent of further positive test pits. UTM coordinates were recorded for all positive test pits using a Topcon FC-25 handheld GPS unit with a minimal accuracy of four metres and with Magnet Field software. All UTM coordinates are located in zone 17T and are based upon the North American Datum 1983 (NAD83). All artifacts were collected and recorded according to their associated positive test pit. Moreover, for CL-44, as no further positive test pits were identified at the five metre interval, eight additional test pits were excavated at 2.5 metre intervals around the single positive test pit. For CL-45 (AgGv-138), two positive test pits were identified approximately 10 metres apart, and additional test pits were excavated at 2.5 metre intervals around the positive test pits as long as those additional test pits fell within the 10 metre wide corridor comprising the study area. As none of these additional test pits were positive, a

one-metre by one-metre test unit was placed directly over the positive test pit at CL-44 and one of the positive test pits at CL-45 (AgGv-138) (Photo 5).

The test units were excavated in systematic levels. The one-metre units each contained a single stratigraphic layer (topsoil) and were excavated into the first five centimetres of subsoil. All soil from the unit was screened through six millimetre hardware cloth. The subsoil surface of the unit was shovel shined, troweled and examined for any evidence of subsurface cultural features prior to backfilling, none of which were identified. The test units were 25 centimetres in depth; taking into account that the test unit had been excavated into subsoil, topsoil was 20 centimetres in depth.

Although the 10 metre wide corridor was subject to test pit survey, there was still some surface visibility in the area. When one artifact was found incidentally on the surface, its UTM coordinates were recorded using a Topcon FC-25 handheld GPS unit with a minimal accuracy of four metres and with Magnet Field software. All UTM coordinates are located in zone 17T and are based upon the North American Datum 1983 (NAD83). Even though surface visibility of the unploughed agricultural field was less than 80%, a survey transect at a one-metre interval was applied and spanned a minimum 20 metre radius around the identified artifact, but as long as the transects stayed within the 10 metre corridor of the study area. This approach was used to determine if the artifact was an isolated find or part of a larger surface scatter, as an adaptation of Section 2.1.1 Standard 7 of the MTCS' 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011b).

The remaining 29% of the study area was not surveyed due to areas of previous disturbance, including a driveway and barn (Photo 2), and low and permanently wet areas (Photo 3). While these areas were not surveyed, they were photo documented to confirm physical features that affected the ability to survey portions of the study area (Section 7.8.6 Standard 1b; Government of Ontario 2011b).

3.0 RECORD OF FINDS

The Stage 2 archaeological assessment was conducted employing the methods described in Section 2.0. An inventory of the documentary record generated by fieldwork is provided in Table 3 below.

Table 3: Inventory of Documentary Record

Document Type	Current Location of Document Type	Additional Comments
14 Pages of Field Notes	Stantec office in Stoney Creek	In original field book and photocopied in project file
1 Map Provided by Client	Stantec office in Stoney Creek	Hard and digital copies in project file
64 Digital Photographs	Stantec office in Stoney Creek	Stored digitally in project file

All of the material culture collected during the Stage 2 assessment of the study area is contained in one Bankers box. It will be temporarily housed at the Stantec Stoney Creek office until formal arrangements can be made for a transfer to an MTCS collections facility.

All of the recovered lithic artifacts are manufactured from Onondaga chert. Chert and material type identification was accomplished visually using reference materials located in the Stantec London office.

Onondaga formation chert is from the Middle Devonian age, with outcrops occurring along the north shore of Lake Erie between Long Point and the Niagara River (Eley and von Bitter 1989). Primary outcrops have also been reported along the banks of the Grand River (Ellis *et a*l. 1990). It is a high quality raw material frequently utilized by pre-contact people and often found at archaeological sites in southern Ontario. Onondaga chert occurs in nodules or irregular thin beds. It is a dense non-porous rock that may be light to dark grey, bluish grey, brown or black and can be mottled with a dull to vitreous or waxy lustre (Eley and von Bitter 1989).

All pieces of chipping detritus were subject to morphological analysis following the classification scheme described by Lennox *et al.* (1986) and expanded upon by Fisher (1997).

Primary flakes feature dorsal surfaces that are either entirely covered with cortex or have substantial visible cortex present. Secondary flakes can also have a trace of cortex on the dorsal surface. Both varieties, along with shatter, are associated with early stages of lithic reduction as chert cores or flint nodules are converted into blanks or preforms. Tertiary flakes and micro flakes are produced during the further reduction of blanks and preforms into formal tool shapes. They are the result of precise flake removal through pressure flaking, where the maker applies direct pressure onto a specific part of the tool in order to facilitate flake removal. Pressure flaking generally produces smaller, thinner flakes than does percussion flaking. Broadly, primary,

secondary, and shatter flakes indicate early stages of lithic reduction; while, tertiary and micro flakes indicate later stages of the reduction sequence.

3.1 CL-44

CL-44 is located on the edge of an agricultural field and consists of two pieces of pre-contact Aboriginal chipping detritus manufactured from Onondaga chert. One piece of chipping detritus was recovered from the positive test pit and is tertiary flake. The second piece of chipping detritus is a broken flake and was recovered from the test unit excavated over the positive test pit. A sample of the recovered artifacts can be viewed in Plate 1. Table 4 provides a catalogue of the Stage 2 artifact assemblage recovered from CL-44. A sample of artifacts is depicted in Section 8.2.

Table 4: CL-44 Artifact Catalogue

Catalogue #	Context	Artifact	Frequency	Chert	Morphology
1	Test Pit 101	Chipping detritus	1	Onondaga	Tertiary flake
2	Test Unit 102	Chipping detritus	1	Onondaga	Broken flake

3.2 CL-45 (AgGv-138)

CL-45 (AgGv-138) is located on the edge of an agricultural field, approximately 120 metres south of CL-44. CL-45 (AgGv-138) consists of four pieces of chipping detritus manufactured from Onondaga chert. Two pieces of chipping detritus were recovered from two positive test pits and one was recovered from the test unit. The fourth piece of chipping detritus was a surface find recovered in between the positive test pits. Two of the flakes were secondary flakes, one flake was a tertiary flake, and the final flake was missing its striking platform and therefore classified as a broken flake. Table 5 provides a catalogue of the Stage 2 artifact assemblage recovered from CL-44. A sample of artifacts is depicted in Section 8.2.

Table 5: CL-45 (AgGv-138) Artifact Catalogue

Catalogue #	Context	Artifact	Frequency	Chert	Morphology
1	Test Pit 201	Chipping detritus	1	Onondaga	Tertiary flake
2	Test Pit 202	Chipping detritus	1	Onondaga	Secondary flake
3	Test Unit 203	Chipping detritus	1	Onondaga	Broken
4	Surface Find 204	Chipping detritus	1	Onondaga	Secondary flake

4.0 ANALYSIS AND CONCLUSIONS

The Stage 2 archaeological assessment of the study area resulted in the documentation of two pre-contact Aboriginal locations, CL-44 and CL-45 (AgGv-138). CL-44 is comprised of two pieces of chipping detritus and CL-45 (AgGv-138) is comprised of four pieces of chipping detritus. All of the recovered chipping detritus from both locations is manufactured from Onondaga chert.

Chipping detritus is the waste product from the production of lithic tools and is the most often recovered artifact on pre-contact Aboriginal archaeological sites in Southern Ontario. A piece of chipping detritus is generally considered a non-diagnostic artifact and cannot help place the archaeological site within a specific time period or cultural group.

Lithic surface finds were common throughout the larger FWRN-LP Project Location. Of the 50 sites documented during the Stage 2 assessment, 45 of them were lithic scatters, while all of the 100 isolated findspots and 41 artifact clusters comprised pre-contact Aboriginal lithic material (Stantec 2013). The majority of the lithics recovered at these locations were comprised of chipping detritus that cannot be assigned to a specific time period or cultural group.

Although both artifact clusters could be part of a larger site that falls outside of the study area, the Stantec archaeological team interprets these artifacts as being at the most part of the edge of a site outside of the study and still not with an artifact concentration high enough to fulfill Standard 1a.ii of the MTCS 2011' *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011b). As a result, the cultural heritage value or interest of these artifacts has been sufficiently documented and if either artifact cluster is the edge of an archaeological site, any such archaeological sites will be documented during Stage 2 archaeological assessment of the remainder of the property through which the current study area runs if future development is to occur. Given the paucity of artifacts recovered from both CL-44 and CL-45 (AgGv-138), the cultural heritage value or interest of CL-44 and CL-45 (AgGv-138) is judged to be sufficiently documented. CL-44 and CL-45 (AgGv-138) do not fulfill the criteria for a Stage 3 archaeological investigation as per Section 2.2 of the MTCS' 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011b).

5.0 RECOMMENDATIONS

The Stage 2 assessment of the proposed modified alternate transmission route on the Feddema Lands resulted in the identification of two archaeological locations: CL-44 and CL-45 (AgGv-138).

CL-44 does not fulfill the criteria for a Stage 3 archaeological investigation as per Section 2.2 of the MTCS' 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011b). The cultural heritage value or interest of CL-44 has been sufficiently documented. **Therefore, no further archaeological assessment is recommended for CL-44.**

CL-45 (AgGv-138) does not fulfill the criteria for a Stage 3 archaeological investigation as per Section 2.2 of the MTCS' 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011b). The cultural heritage value or interest of CL-45 (AgGv-138) has been sufficiently documented. **Therefore, no further archaeological assessment is recommended for CL-45 (AgGv-138).**

The Stage 2 archaeological assessment for the other portions of the study area did not identify any additional archaeological resources (neither artifacts nor sites). Thus, in accordance with Section 2.2 and Section 7.8.3 of the MTCS' *2011 Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011b), **no further archaeological assessment of the study area is required**.

However, the remainder of the Feddema Lands to the west has not been subject to Stage 2 archaeological assessment and if the remainder of the property is to be subject to development in the future, then a Stage 2 archaeological assessment is recommended outside of the current study area. **Therefore it is recommended that 30 metres of protective fencing be erected on the west and east sides of both CL-44 and CL-45 (AgGv-138) in order to prevent any development impacts. It is also recommended that a licensed archaeological be present during fence installation to monitor the installation process prior to construction.**

The Ministry of Tourism, Culture and Sport is asked to accept this report into the Ontario Public Register of Archaeological Reports.

6.0 ADVICE ON COMPLIANCE WITH LEGISLATION

This report is submitted to the Minister of Tourism, Culture and Sport as a condition of licensing in accordance with Part VI of the *Ontario Heritage Act*, R.S.O. 1990, c 0.18. The report is reviewed to ensure that it complies with the standards and guidelines that are issued by the Minister, and that the archaeological fieldwork and report recommendations ensure the conservation, protection and preservation of the cultural heritage of Ontario. When all matters relating to archaeological sites within the project area of a development proposal have been addressed to the satisfaction of the Ministry of Tourism, Culture and Sport, a letter will be issued by the ministry stating that there are no further concerns with regard to alterations to archaeological sites by the proposed development.

It is an offence under Sections 48 and 69 of the *Ontario Heritage Act* for any party other than a licensed archaeologist to make any alteration to a known archaeological site or to remove any artifact or other physical evidence of past human use or activity from the site, until such time as a licensed archaeologist has completed fieldwork on the site, submitted a report to the Minister stating that the site has no further cultural heritage value or interest, and the report has been filed in the Ontario Public Register of Archaeological Reports referred to in Section 65.1 of the *Ontario Heritage Act*.

Should previously undocumented archaeological resources be discovered, they may be a new archaeological site and therefore subject to Section 48(1) of the *Ontario Heritage Act*. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out archaeological fieldwork, in compliance with Section 48(1) of the *Ontario Heritage Act*.

The *Funeral, Burial and Cremation Services Act*, 2002, S.O. 2002, c.33 requires that any person discovering human remains must notify the police or coroner and the Registrar of Cemeteries at the Ministry of Government and Consumer Services.

7.0 BIBLIOGRAPHY AND SOURCES

Chapman, L.J. and D.F. Putnam. 1984. *The Physiography of Southern Ontario*. Third Edition. Ontario Geological Survey. Special Volume 2. Toronto: Ontario Ministry of Natural Resources.

Ellis, Chris J. and Neal Ferris (editors). 1990. *The Archaeology of Southern Ontario to A.D. 1650*. Occasional Publication of the London Chapter, Ontario Archaeological Society, Number 5.

Ellis, Chris J., Ian T. Kenyon, and Michael W. Spence. 1990. The Archaic. In Ellis and Ferris 1990, pp. 65-124.

Eley, Betty, and Peter H. von Bitter. 1989. *Cherts of Southern Ontario*. Toronto: Royal Ontario Museum

Ferris, Neal. 2009. *The Archaeology of Native-Lived Colonialism: Challenging History in the Great Lakes*. The Archaeology of Colonialism in Native North America Series, vol. 1. Tucson: University of Arizona Press.

Fisher, J. A. 1997. *The Adder Orchard Site: Lithic Technology and Spatial Organization in the Broadpoint Late Archaic*. Occasional Publications of the London Chapter, OAS, Number 3.

Gentilcore, Louis R. and C. Grant Head. 1984. *Ontario's History in Maps*. Toronto: University of Toronto Press, Scholarly Publishing Division.

Government of Ontario. 1990a. *Environmental Protection Act*, R.S.O. 1990, CHAPTER O.18. Last amendment: 2009, c. 33, Sched. 11, s. 6. Electronic document: http://www.ontario.ca/laws/statute/90e19. Last accessed April 19, 2016.

Government of Ontario. 1990b. *Ontario Heritage Act*, R.S.O. 1990, CHAPTER O.18. Last amendment: 2009, c. 33, Sched. 11, s. 6. Electronic document: http://www.ontario.ca/laws/statute/90o18. Last accessed April 19, 2016.

Government of Ontario. 2009. *Green Energy Act, 2009,* S.O. 2009, CHAPTER 12, Sched. A. Last amendment: 2011, c.9, Sched. 27, s. 27. Electronic document: https://www.ontario.ca/laws/statute/09g12. Last accessed April 19, 2016.

Government of Ontario. 2011a. *Ontario Regulation 359/09: Renewable Energy Approval Under Part V.0.1 of the Act*. Electronic document: http://www.ontario.ca/laws/regulation/090359. Last accessed April 19, 2016.

Government of Ontario. 2011b. *Standards and Guidelines for Consultant Archaeologists*. Toronto: Ministry of Tourism, Culture and Sport.

Government of Ontario. 2016a. *PastPortal Report Database Files*. Electronic document: https://www.pastport.mtc.gov.on.ca/APSWeb/report/reportSearch.xhtml. Last accessed April 19, 2016.

Government of Ontario. 2016b. *Archaeological Sites Database Files*. Electronic document: https://www.pastport.mtc.gov.on.ca/APSWeb/pif/projectSiteDataSearch.xhtml. Last accessed April 19, 2016.

Konrad, Victor. 1981. An Iroquois Frontier: The North Shore of Lake Ontario during the Late Seventeenth Century. *Journal of Historical Geography* 7(2):129-144.

Lennox, P., C. Dodd, and C. Murphy. 1986. *The Wiacek Site: A Late Middleport Component, Simcoe County*. London: Ontario Ministry of Transportation and Communications.

Morris, J.L. 1943. *Indians of Ontario*. 1964 reprint. Toronto: Department of Lands and Forests, Government of Ontario.

Page, H.R. and Co. 1876. *Illustrated Historical Atlas of the Counties of Lincoln and Welland, Ont.* Toronto: H.R. Page and Co.

Powell, R. Janet, and Barbara F. Coffman. 1956. *Lincoln County, 1856-1956*. St. Catharines: Lincoln County Council.

Schmalz, Peter S. 1991. *The Ojibwa of Southern Ontario*. Toronto: University of Toronto Press.

Stantec Consulting Ltd. 2012. *Niagara Region Wind Farm Stage 1 Archaeological Assessment, Various Lots, Concession 1-6 Gainsborough Township, Concession 7-10 Clinton Township, Regional Municipality of Niagara and Various Lots, Moulton Township, Haldimand County.* Report on file with the Ministry of Tourism, Culture and Sport, Toronto.

Stantec Consulting Ltd. 2013. *Niagara Region Wind Project Final Stage 2 Archaeological Assessment, Various Lots, Concession 1-6 Gainsborough Township, Concession 7-10 Clinton Township, Regional Municipality of Niagara and Various Lots, Moulton Township, Haldimand County.* Report on file with the Ministry of Tourism, Culture and Sport, Toronto.

Stantec Consulting Ltd. 2016. *Stage 2 Archaeological Assessment: Modified Alternate Transmission Route, Part of Lots 1 to 3, Gore A Between 7th and 8th Concessions and the Road Allowance Between Lots 11 and 12, Concessions 8 and 9, Geographic Township of Grimsby, former Lincoln County, Township of West Lincoln, now Regional Municipality of Niagara, Ontario.* Report on file with the Ministry of Tourism, Culture and Sport, Toronto.

Wicklund, R.E. and B.C. Matthews. 1963. *The Soil Survey of Lincoln County.* Report No. 34 of the Ontario Soils Survey. Guelph: Department of Agriculture and the Ontario Agricultural College.

Wilson, J.A. and M. Horne. 1995*. City of London Archaeological Master Plan*. London: City of London, Department of Planning and Development.

8.0 IMAGES

8.1 PHOTOGRAPHS

Photo 1: Test Pit Survey at Five-Metre Intervals, facing northwest

Photo 2: Previously Disturbed Driveway and Barn, Not Surveyed, facing southwest

Photo 3: Low and Permanently Wet Area, Not Surveyed, facing northeast

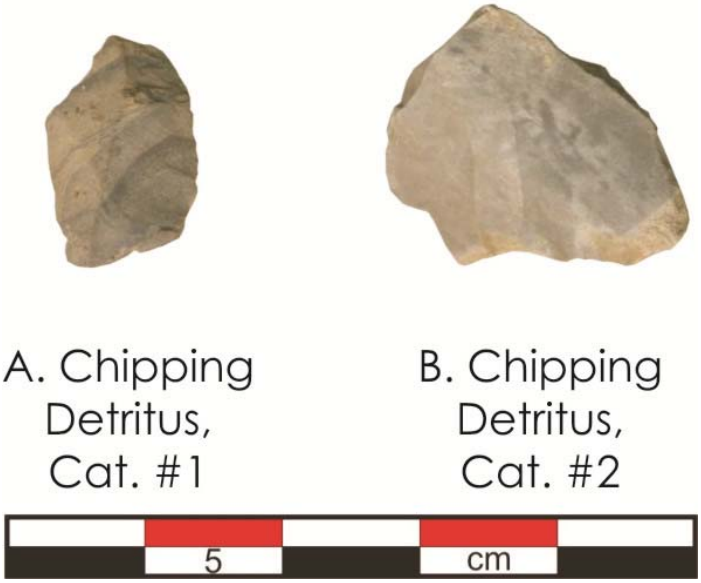
Photo 4: Test Pit Survey at Five-Metre Intervals, facing southwest

Photo 5: Excavated Test Unit, facing northeast (grid north)

8.2 ARTIFACTS

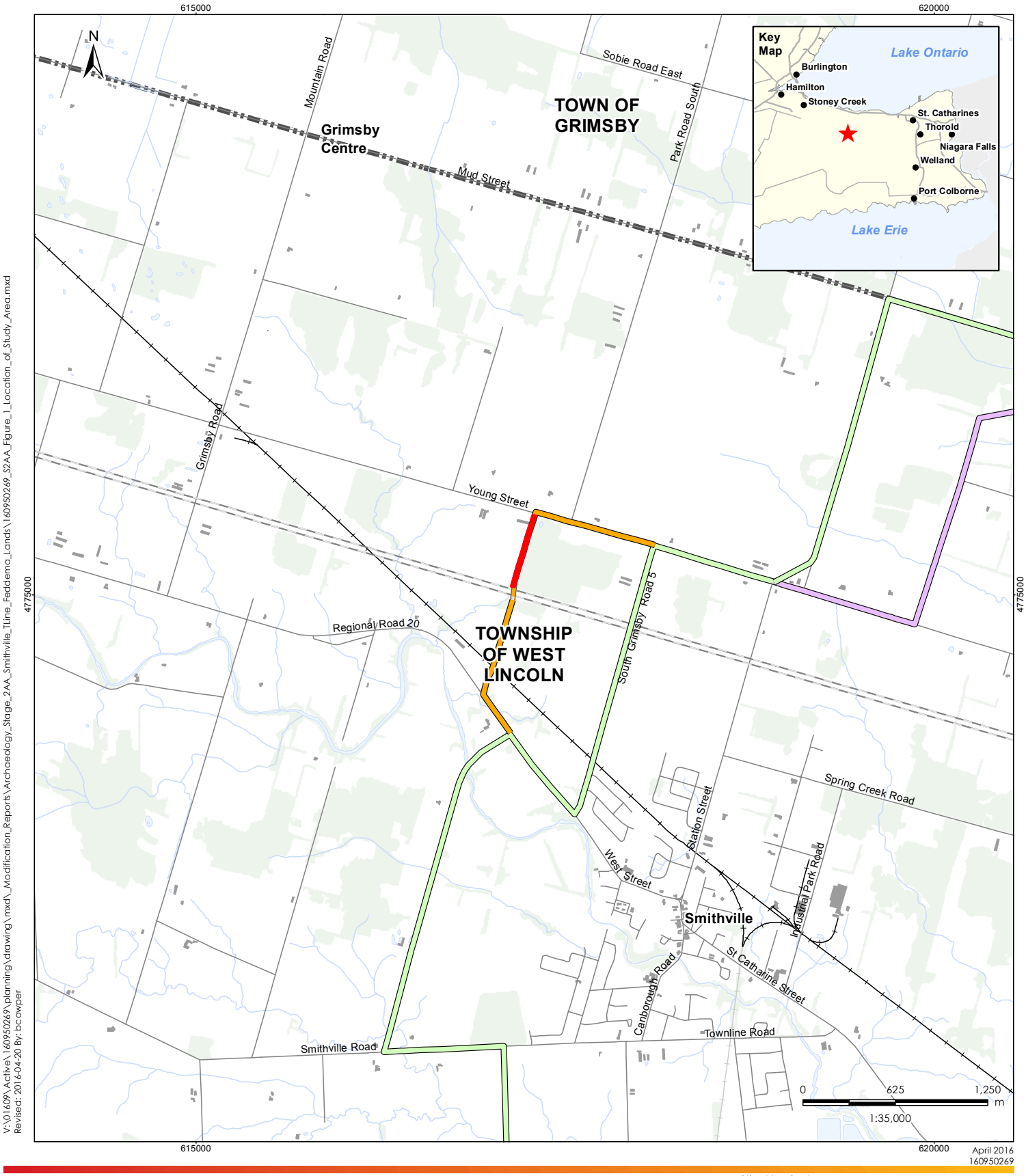
Plate 1: Pre-contact Aboriginal Artifact from CL-44

Plate 2: Pre-contact Aboriginal Artifacts from CL-45



9.0 MAPS

All maps will follow on succeeding pages. Maps identifying exact site locations do not form part of this public report; they may be found in the supplementary documentation.



Stantec

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2013.

Legend

- Study Area
- Road
- Expressway / Highway
- Active Railway
- Abandoned Railway
- Existing Structures
- Existing Transmission Line
- Watercourse
- Waterbody
- Wooded Area
- Municipality Lower Tier

Modified Alternate Transmission Route

- Above Ground
- Underground
- Preferred Transmission Line Route (REA)
- Alternate Transmission Line Route (REA)

Client/Project

FWRN LP
Niagara Region Wind Farm
Stage 2 Archaeological Assessment

Figure No.

1

Title

Location of Study Area

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Revised: 2016-04-18 By: bcowper

April 2016
160950269

Stantec

Legend

Study Area

Client/Project

FWRN-LP (formerly Niagara Region Wind Corporation)
Niagara Region Wind Farm

Figure No.
2

Title
Portion of the 1876 Map of Grimsby Township

Notes

1. Historic Image: Illustrated historical atlas of the counties of Lincoln and Welland, Ont. Toronto : H.R. Page & Co., 1876.
2. Not to Scale

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Revised: 2016-04-20 By: bcowper

April 2016
160950269

Stantec

Notes

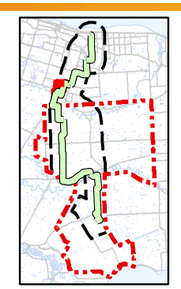
1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2010.
3. Orthoimagery © First Base Solutions, 2010.

Legend

- Study Area

Stage 2 Assessment

- Test Pitted, at 5m Intervals
- Disturbed, Not Surveyed
- Low and Wet Area, Not Surveyed
- Previously Assessed (Stantec 2016, PIF # P001-0885-2016)
- Photograph Location



Client/Project
FWRN LP
Niagara Region Wind Farm
Stage 2 Archaeological Assessment

Figure No.
3

Title
Stage 2 Methods

10.0 CLOSURE

This report documents work that was performed in accordance with generally accepted professional standards at the time and location in which the services were provided. No other representations, warranties or guarantees are made concerning the accuracy or completeness of the data or conclusions contained within this report, including no assurance that this work has uncovered all potential archaeological resources associated with the identified property.

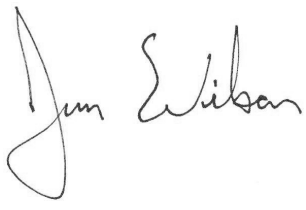
All information received from the client or third parties in the preparation of this report has been assumed by Stantec to be correct. Stantec assumes no responsibility for any deficiency or inaccuracy in information received from others.

Conclusions made within this report consist of Stantec's professional opinion as of the time of the writing of this report, and are based solely on the scope of work described in the report, the limited data available and the results of the work. The conclusions are based on the conditions encountered by Stantec at the time the work was performed. Due to the nature of archaeological assessment, which consists of systematic sampling, Stantec does not warrant against undiscovered environmental liabilities nor that the sampling results are indicative of the condition of the entire property.

This report has been prepared for the exclusive use of the client identified herein and any use by any third party is prohibited. Stantec assumes no responsibility for losses, damages, liabilities or claims, howsoever arising, from third party use of this report. We trust this report meets your current requirements. Please do not hesitate to contact us should you require further information or have additional questions about any facet of this report.

Quality review by  (signature)

Jeffrey Muir, BA

Independent review by  (signature)

Jim Wilson, MA

Attachments: NRWF addendum#2 2016-04-11 HPU MTCS Letter.pdf

From: Muller, Joseph (MTCS) [mailto:Joseph.Muller@ontario.ca]
Sent: Monday, April 11, 2016 10:58 AM
To: Rivard, Meaghan
Cc: shiloh.berriman@enercon.de; Hedley, Kathleen (MOECC); Paul, Sarah (MOECC); Hamilton, James (MTCS)
Subject: Proposed Smithville Transmission Line Route By-Pass (amendment)

Hello Meaghan Rivard:

Please find attached our letter from the Heritage Program Unit at the Ministry of Tourism, Culture and Sport on the above project, and contact me if you have any questions or would like to further discuss the file. Thank-you for your assistance,

Joe

Joseph Muller, RPP, MCIP

Heritage Planner
Ministry of Tourism, Culture and Sport
Culture Division | Programs and Services Branch | Heritage Program Unit

401 Bay Street, Suite 1700
Toronto, Ontario M7A 0A7

Tel. 416.314.7145 | Fax. 416.212.1802

Ministry of Tourism, Culture and Sport

Heritage Program Unit
Programs and Services Branch
Culture Division
401 Bay Street, Suite 1700
Toronto ON M7A 0A7
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Ministère du Tourisme, de la Culture et du Sport

Unité des programmes patrimoine
Direction des programmes et des services
Division de culture
401, rue Bay, bureau 1700
Toronto ON M7A 0A7
Tél: 416 314-7145
Téléc: 416 212-1802

April 11, 2016

Meaghan Rivard
Stantec Consulting Limited
49 Frederick Street
Kitchener, ON N2H 6M7
E: Meaghan.Rivard@stantec.com

Project:	**Niagara Region Wind Farm**
Feed-in Tariff Number:	**FIT-FLKZ509**
Report Title:	**Proposed Alternate Transmission Line Route to by-pass Smithville, Ontario** **Niagara Region Wind, Heritage Assessment Review (amendment)**
Applicant:	**Niagara Region Wind Corporation**
Location:	**Townships of West Lincoln and Wainfleet and Town of Lincoln in the Regional Municipality of Niagara, and portions of Haldimand Country.**
MTCS File No.:	**00EA080**

Dear Meaghan Rivard:

This office has reviewed the above-mentioned report (the "Report"), which has been submitted to this ministry as required under O. Reg. 359/09, as amended (Renewable Energy Approvals under the *Environmental Protection Act*) (the "REA regulation"). This letter constitutes the Ministry of Tourism, Culture and Sport (the "Ministry") comments for the purposes of section 23(3)(a) of the REA regulation regarding the heritage assessment undertaken for the above project.

The Report recommends the following:

Recommendations

Potential negative impacts identified for the cultural heritage resources situated at 6648 and 6671 Young Street are generally of three types:

• Indirect impacts resulting from construction vibrations of the potential installation of new infrastructure (i.e., access roads, collector lines) in close proximity to structures;
• Direct impacts related to the damage or removal of heritage attributes (i.e., built components such as fencing, or cultivated plants or trees) resulting from the construction of new Project infrastructure; and
• Visual impacts with respect to views from public spaces.

In order to lessen or avoid potential indirect negative impacts from construction vibrations, the following recommendations have been made:

- In the event that new Project infrastructure is constructed in the vicinity of identified CHRs, it is recommended that construction be avoided within 50 m of any structures associated with these cultural heritage resources.
- If construction within a 50 m bufferzone cannot be avoided, maximum acceptable vibration levels, or peak particle velocity (PPV) levels, should be determined by a qualified engineer with previous experience with built heritage in similar circumstances.
  Construction within the 50 m bufferzone should be monitored to ensure that PPV levels are not exceeded. All construction activities should cease, should levels be exceeded.

Based on the information contained in the Report, the Ministry is satisfied that the heritage assessment process and reporting are consistent with the applicable heritage assessment requirements established in s. 23 of O. Reg. 359/09. Please note that the Ministry makes no representation or warranty as to the completeness, accuracy or quality of the heritage assessment report (please see Note 1).

This letter does not waive any requirements under the *Ontario Heritage Act*.

This letter does not constitute approval of the renewable energy project. Approvals or licences for the project may be required under other statutes and regulations. Please ensure that you obtain all required approvals and/or licences.

Please ensure that the proponent is aware that, if new information or substantive project changes arise after issuance of this letter, the applicant should discuss them with you to determine if any additional assessment or reporting is required. If additional reporting or revisions are required, they should be submitted to the Ministry for review. Upon completion of that review, the Ministry will determine if any revisions to the content of this letter are required.

Should you have any questions or require further information, please do not hesitate to contact me.

Sincerely,

Joseph Muller, RPP/MCIP
Heritage Planner
Joseph.Muller@Ontario.ca

cc. Shiloh Berriman, Project Coordinator
Enercon

Kathleen Hedley, Director
Environmental Approvals Branch, Ministry of the Environment and Climate Change (MoECC)

Sarah Paul, Director
Environmental Approvals Access and Service Integration Branch, MoECC

James Hamilton, Manager
Culture Services Unit, Ministry of Tourism, Culture and Sport

---

Note 1: In no way will the Ministry be liable for any harm, damages, costs, expenses, losses, claims or actions that may result: (a) if the Report or its recommendations are discovered to be inaccurate, incomplete, misleading or fraudulent; or (b) from the issuance of this letter. Further measures may need to be taken in the event that additional heritage resources are identified or the Report is otherwise found to be inaccurate, incomplete, misleading or fraudulent.

Stantec Consulting Ltd.
49 Frederick Street, Kitchener ON N2H 6M7

April 8, 2016
File: 160950269

Attention: Laura Hatcher, Team Lead: Heritage Land Use Planning
Culture Services Unit
Programs and Services Branch
Ministry of Tourism, Culture and Sport
401 Bay Street, Suite 1700
Toronto ON M7A 0A7

Dear Ms. Hatcher,

Reference: Niagara Region Wind Farm, Heritage Assessment Addendum – Proposed Alternate Transmission Line Route to by-pass Smithville, Ontario

INTRODUCTION

Stantec Consulting Ltd. (Stantec) was retained by FRWN LP (FRWN, "the Proponent") to prepare a Renewable Energy Approval (REA) Application for the Niagara Region Wind Farm ("the Project"). The Project's REA (EBR #012-0614) was issued on November 6, 2014 under Ontario Regulation 359/09 of the *Environmental Protection Act*. Since receipt of the REA and completion of the Environmental Review Tribunal, the Proponent has identified the need to make minor modifications to the Project that differ from the information described in the REA Application documents and subsequently approved by the Ministry of the Environment and Climate Change (MOECC). Based on ongoing consultation, and at the request of the Township of West Lincoln, FRWN is pursuing a modified alternate transmission line route and associated access trail (the Modification) around the Town of Smithville that will avoid the area proposed for future urban expansion. The proposed Modification will provide project design flexibility to potentially re-route a portion of the approved transmission line to an alternate location if project timelines permit, in accordance with agreements made between the Proponent and the Township of West Lincoln.. Stantec was retained by the Proponent to review this modification as it pertains to heritage resources. The purpose of this memo is to review the modification in relation to the findings of the original heritage assessment and to identify heritage resources, if any, that were not previously assessed. Heritage resources were identified as a result of the project modification, and this memo assesses the resources based on Ontario Regulation 9/06 and determines the potential impacts of the project on the heritage resources, where applicable.

PROJECT DESCRIPTION

The Project includes development, construction, operation and decommissioning of the 230 Megawatt (MW) Niagara Region Wind Farm within the Townships of West Lincoln and Wainfleet and the Town of Lincoln within the Niagara Region and within Haldimand County in Southern Ontario, in response to the Government of Ontario's initiative to promote the development of renewable electricity in the province. The Project Study Area covers approximately 33,747.5 ha

and is generally bounded by Castor Gainsborough Road to the West; the Queen Elizabeth Way to the North; the north shore of Lake Erie to the South; and Balfour Street to the East. The Project Location includes all land and buildings/structures associated with the Project and any air space which the Project will occupy. This includes structures such as turbines, access roads and power lines as well as any temporary work areas (the 'constructible area' for the Project) which are required to be utilized during the construction of the Project.

The basic components of the Project include 77 wind turbine generators (80 potential locations identified) each with a rated capacity of approximately 3.0 MW for a maximum installed nameplate capacity of 230 MW. An overhead and/or underground collection system connects each turbine to one of two transformer substations along a series of 34.5 kilovolt (kV) lines. Turbines are grouped into eight collector circuits that bring power (and data via fiber optic lines) to one of the transformer substations. Voltage is stepped up from 34.5kV to 115kV at each transformer substation by means of a 100 MVA base rated transformer with two stages of cooling (via fans). A 115kV transmission line transports power from each of the two transformer substations north to the tap-in location where the Project is connected to the Hydro One Networks Inc. (HONI) owned transmission line, south of the Queen Elizabeth Way in Lincoln. Power generated from this Project will be conveyed along the existing HONI transmission line to the Beach Transformer Station in Hamilton. Additional information regarding the Project can be found in the Project Description report available on the project website.

HERITAGE CONTEXT

As part of the REA, a Heritage Assessment Report entitled *Heritage Assessment, Niagara Region Wind Farm* (the Report), was conducted by Stantec for the Project (Stantec, 2013). The Report was submitted to, and approved by, the Ministry of Tourism Culture and Sport (MTCS) on April 12, 2013. No changes to the original document have been made since the original submission to MTCS.

PROPOSED MODIFICATION DESCRIPTION

The modification involves a new alternate transmission line route to avoid the Town of Smithville and areas proposed for future urban expansion, at the request of the Town of West Lincoln. The proposed modification is to provide project design flexibility to potentially re-route a portion of the transmission line to an alternate location if project timelines permit. The proposed alternate transmission line route would continue from the preferred transmission line along Young Street heading west past South Grimsby Road 5 and turning south to travel along an unopened road allowance until Regional Road 20, then turning east onto Regional Road 20 until it meets South Grimsby Road 6 and continues along the preferred transmission line route (Figure 1).

Reference: Niagara Region Wind Farm, Heritage Assessment Addendum – Proposed Alternate Transmission Line Route to by-pass Smithville, Ontario

REPORT REVIEW

In order to determine the need for further heritage assessment, Stantec reviewed the Report. There were 111 cultural heritage resources identified as part of the study. Recommendations were prepared to mitigate any potential impacts identified based on an understanding of the Project at that time. These recommendations were as follows:

> *Potential negative impacts identified for the 52 cultural heritage resources (listed in Table 19) are generally of three types:*
>
> - *Indirect impacts resulting from construction vibrations of the potential installation of new infrastructure (i.e., access roads, collector lines) in close proximity to structures;*
> - *Direct impacts related to the damage or removal of heritage attributes (i.e., built components such as fencing, or cultivated plants or trees) resulting from the construction of new Project infrastructure; and*
> - *Visual impacts with respect to views from public spaces.*
>
> *In order to lessen or avoid potential indirect negative impacts from construction vibrations, the following recommendations have been made:*
>
> - *In the event that new Project infrastructure is constructed in the vicinity of identified CHRs, it is recommended that construction be avoided within 50 m of any structures associated with these cultural heritage resources.*
> - *If construction within a 50 m bufferzone cannot be avoided, maximum acceptable vibration levels, or peak particle velocity (PPV) levels, should be determined by a qualified engineer with previous experience with built heritage in similar circumstances. Construction within the 50 m bufferzone should be monitored to ensure that PPV levels are not exceeded. All construction activities should cease, should levels be exceeded.*
> - *It is further recommended that the final Project Description Report document which option was chosen to mitigate the potential impact of construction vibrations, a description of how the recommendation will be implemented, and a discussion of the Project factors that determined that decision.*

Reference: Niagara Region Wind Farm, Heritage Assessment Addendum – Proposed Alternate Transmission Line Route to by-pass Smithville, Ontario

> *As a general recommendation, roads travelling through cultural heritage landscapes in the communities of Smithville, St. Ann's, Bismark, Elcho, Wellandport, and Stromness should be avoided to the greatest extent practicable when transporting heavy machinery and turbine components to the Project Location in order to minimize the potential for accidental or indirect damage to the high concentration of narrowly setback cultural heritage resources and landscapes within those communities.*
>
> *In order to lessen or avoid potential direct negative impacts resulting from the removal or alteration of the heritage attributes of identified cultural heritage landscapes, the following recommendations have been made:*
>
> - *Removal of or damage to identified heritage attributes (i.e., root systems and above ground vegetation of cultivated plant, canal infrastructure, landscape features and built components of rail landscapes) should be avoided to the greatest extent practicable.*
> - *Where damage or removal is unavoidable, plantings and built features should be restored to their pre-construction state immediately following the completion of Project activities.*
>
> *In order to minimize the potential visual impact of the Project on views from the Elcho United Church Cemetery (CHR-49), it is recommended that the proponent work with the Elcho Cemetery Board to design and install an appropriate visual barrier around the cemetery to protect views from within the cemetery (e.g., fencing, shrubbery or trees).*
>
> *In order to avoid direct impacts on views of the West Lincoln McCaffrey Cemetery (CHR-14), it is recommended that any overhead transmission infrastructure installed along Port Davidson Road in the vicinity of the cemetery be installed along the eastern side of the road.*

Following a review of the Report, it was determined that the impact assessment contained within the Report is valid but requires updating to reflect the proposed alternate transmission line. Therefore, additional assessment was required to determine if heritage resources are present in vicinity of the proposed alternate transmission line and if there are any anticipated impacts as a result.

Reference: Niagara Region Wind Farm, Heritage Assessment Addendum – Proposed Alternate Transmission Line Route to by-pass Smithville, Ontario

FIELD ASSESSMENT AND PROPERTY DESCRIPTIONS

A site visit to identify potential heritage resources along the proposed alternate transmission line route was conducted on November 16, 2015 by James Sebele, Cultural Heritage Specialist with Stantec. The weather conditions were clear, sunny and dry. The site visit resulted in the identification of four potential heritage resources. The potential heritage resources are identified in Figure 1. A property description of each potential heritage resource follows.

6601 YOUNG STREET

The property contains a residential structure and an outbuilding (Plate 1). The residence is a one storey, L-shaped building with a hipped roof. It is clad with modern siding and sits on a rusticated concrete block foundation. A red brick chimney stack is visible on the west façade of the building. The front porch of the residence, on the south façade, has a wooden platform and an overhang supported by four modern pillars. Based on 19th century mapping, the residence was built sometime after 1876 (Page, 1876).

Plate 1: 6601 Young Street, looking north

Reference: Niagara Region Wind Farm, Heritage Assessment Addendum – Proposed Alternate Transmission Line Route to by-pass Smithville, Ontario

6648 YOUNG STREET

The property contains a residence and an outbuilding. The structure is a one-and-one-half storey, front gabled residence (Plate 2). The residence is clad in modern siding and sits on a concrete block foundation. A modern addition is situated on the east façade. It contains an entrance and three windows. A brick chimney stack is at the rear of the residence. Based on 19th century mapping, the residence was built sometime after 1876 (Page, 1876).

Plate 2: 6648 Young Street, looking south

6771 YOUNG STREET

The property contains a farmstead including a residence, barn and outbuilding (Plates 3, 4). There are two distinct portions of the residence. At the front, facing the road, is a two storey symmetrical red brick residence with a medium pitched hipped roof and three bays. At the rear is a side gable, one-and-one-half storey red brick building with pointed dormer window on each side. The rear, side gable portion of the residence has a covered porch with decorative trim and bargeboard on the west façade. The two storey portion of the residence has a front covered porch with decorative trim and bargeboard on the south (front) façade. A bay window is situated on the west side. All windows are rounded and have simple decorative brick voussoirs. The residence sits on a stone foundation and has wide eaves, dentils and decorative brackets.

Situated at the rear of the residence is an L-shape timber frame barn with metal roof, timber siding, and undetermined foundation. Based on 19th century mapping, the residence was built prior to 1876 (Page, 1876).

Reference: Niagara Region Wind Farm, Heritage Assessment Addendum – Proposed Alternate Transmission Line Route to by-pass Smithville, Ontario

Plate 3: 6771 Young Street, residence, looking north

Plate 4: 6771 Young Street, barn, looking north

6736 REGIONAL ROAD 20

The property contains a farmstead including a residence, a barn foundation, an outbuilding and three silos (Plates 5, 6). The residence is a one storey structure clad in vinyl siding that sits on a concrete foundation. The front portion of the residence, closest to the road, has a low pitched

hipped roof, while the rear portion of the residence is side gabled with an entrance door on the east façade.

Situated at the rear of the residence is a concrete foundation where a barn was likely present. Also situated at the rear of the residence is a sheet metal outbuilding and three concrete silos. Based on 19th century mapping, the residence was built sometime before1876 (Page, 1876).

Plate 5: 6736 Regional Road 20, looking south

Plate 6: 6736 Regional Road 20, looking west

Reference: Niagara Region Wind Farm, Heritage Assessment Addendum – Proposed Alternate Transmission Line Route to by-pass Smithville, Ontario

EVALUATION OF CULTURAL HERITAGE VALUE OR INTEREST

Determination of cultural heritage value or interest (CHVI) was undertaken for each potential heritage resource along the proposed alternate transmission line route. Where CHVI was identified, the property was determined to contain a cultural heritage resource and is indicated in Figure 2. Table 1 includes the findings for each property.

Table 1 Evaluation of Cultural Heritage Value or Interest

Municipal Address	Evaluation of CHVI According to *Ontario Regulation 9/06*	CHVI	Heritage Attributes	Plate Reference
6601 Young Street	Design/Physical: None identified. Historical/Associative: None identified. Contextual: None identified.	No	Determined to have no CHVI; therefore heritage attributes were not identified.	Plate 1
6648 Young Street	Design/Physical: Representative in scale and massing of a vernacular one-and-one-half storey residence with a medium pitched roof built in the mid-19th century. Historical/Associative: None identified. Contextual: None identified.	Yes	Residence: one-and-one-half storey, medium roof pitch.	Plate 2
6771 Young Street	Design/Physical: Red brick residence and timber frame barn representative of a 19th century farmstead. The rear portion of the residence is representative of Victorian architecture popular in the mid-19th century (and later) as seen in the pointed dormer windows. The front portion of the residence is representative of a vernacular interpretation of the Italianate design, also popular from the mid-19th century onwards. The timber frame barn is representative of a relatively early, if common, type of construction method dating back to the 19th century. Historical/Associative: None identified. Contextual: The residence and barn is consistent with the character of the surrounding landscape.	Yes	Residence: two distinct wings of the house, rear and front. Attributes of the rear portion include one and one half stories in height, red brick, stone foundation, inset porch with decorative trim and bargeboard, steep pitched roof and dormer with pointed window on both sides of residence. Attributes of the front portion include symmetrical design, red brick, stone foundation, front covered porch with decorative trim and bargeboard, bay window, rounded window with decorative brick voussoirs, wide eaves, and decorative brackets Barn: timber frame construction.	Plates 3, 4
6736 Regional Road 20	Design/Physical Value: None identified. Historical/Associative Value: None identified. Contextual: None identified.	No	Determined to have no CHVI; therefore heritage attributes were not identified.	Plate 5,6

Reference: Niagara Region Wind Farm, Heritage Assessment Addendum – Proposed Alternate Transmission Line Route to by-pass Smithville, Ontario

IMPACT ASSESSMENT

Where CHVI was identified, the anticipated direct and indirect impacts of the proposed modification were assessed. These impacts were identified according to InfoSheet #5 in *Heritage Resources in the Land Use Planning Process, Cultural Heritage and Archaeology Policies of the Ontario Provincial Policy Statement, 2005* (Government of Ontario, 2006). Additional information regarding assessment criteria and methodologies can be found within the Report.

The findings of the impact assessment are summarized in Table 2. It was determined that, given the vicinity of the heritage resources to the municipal right-of-way, there are no direct Project-related negative impacts anticipated. However, in two cases, indirect impacts resulting from construction vibrations were identified as a potential effect of Project construction if the proposed alternate transmission line is built. Therefore, as new potential impacts resulting from the proposed modification were identified, mitigation measures are required.

Table 2: Evaluation of Potential Impacts

Address	Direct Impact		Indirect Impact					Discussion
	Destruction	Alteration	Shadows	Isolation	Obstruction of views	Change in Land Use	Land Disturbances	
6648 Young Street	I	NA	NA	NA	NA	NA	NA	It is anticipated that the proposed undertaking will be contained within the municipal right-of-way. The residence was determined to be situated within 50 m of the municipal right-of-way and therefore susceptible to potential construction vibrations. **Therefore, mitigation measures are required.**
6771 Young Street	I	NA	NA	NA	NA	NA	NA	It is anticipated that the proposed undertaking will be contained within the municipal right-of-way. The residence was determined to be situated within 50 m of the municipal right-of-way and therefore susceptible to potential construction vibrations. **Therefore, mitigation measures are required.**

*I = Potential Impact Anticipated, NA = Not Anticipated

Reference: Niagara Region Wind Farm, Heritage Assessment Addendum – Proposed Alternate Transmission Line Route to by-pass Smithville, Ontario

MITIGATION

The potential for indirect impacts resulting from construction vibrations was identified for the residential buildings situated at 6648 Young Street and 6771 Young Street. Both residences are situated within 50 m of the proposed alternative transmission line route. Given the similarity in distance between the heritage resource and the proposed alternate line, it was determined that mitigation recommendations contained within the Report would be appropriate. Therefore, it is recommended that construction within a 50 m area surrounding the residences situated at 6648 and 6771 Young Street be avoided. In the event that construction cannot be avoided within 50 m of the residences it is recommended that maximum acceptable vibration, or peak particle velocity (PPV), levels be determined by a qualified engineer prior to Project construction and that construction activities be monitored to ensure that maximum PPV levels are not exceeded. In the event that these levels are exceeded, Project activities within the 50 m buffer zone should cease until an appropriate solution can be determined by a qualified engineer.

RECOMMENDATIONS

Based on these findings, it was determined that the recommendations contained within the 2013 *Heritage Assessment, Niagara Region Wind Farm* should be modified to reflect areas where additional cultural heritage resources and effects resulting from the Project were identified. We ask that MTCS review the attached figures illustrating the proposed alternate transmission line route as well as the impact assessment contained within this letter. Following review, if appropriate, we request that MTCS issue a confirmation letter regarding the following findings:

> *Potential negative impacts identified for the cultural heritage resources situated at 6648 and 6671 Young Street are generally of three types:*
>
> - *Indirect impacts resulting from construction vibrations of the potential installation of new infrastructure (i.e., access roads, collector lines) in close proximity to structures;*
> - *Direct impacts related to the damage or removal of heritage attributes (i.e., built components such as fencing, or cultivated plants or trees) resulting from the construction of new Project infrastructure; and*
> - *Visual impacts with respect to views from public spaces.*
>
> *In order to lessen or avoid potential indirect negative impacts from construction vibrations, the following recommendations have been made:*

Reference: Niagara Region Wind Farm, Heritage Assessment Addendum – Proposed Alternate Transmission Line Route to by-pass Smithville, Ontario

- *In the event that new Project infrastructure is constructed in the vicinity of identified CHRs, it is recommended that construction be avoided within 50 m of any structures associated with these cultural heritage resources.*
- *If construction within a 50 m bufferzone cannot be avoided, maximum acceptable vibration levels, or peak particle velocity (PPV) levels, should be determined by a qualified engineer with previous experience with built heritage in similar circumstances. Construction within the 50 m bufferzone should be monitored to ensure that PPV levels are not exceeded. All construction activities should cease, should levels be exceeded.*

Regards,

STANTEC CONSULTING LTD.

Meaghan Rivard, MA
Cultural Heritage Specialist
Phone: (519) 579-6733
Fax: (226) 268-9025
Meaghan.Rivard@stantec.com

Attachments: Figure1: Potential Heritage Resources
Figure 2: Identified Heritage Resources

c. Colin Varley, Stantec Consulting Ltd.
Bryan Tripp, Stantec Consulting Ltd.
Adam Rosso, FRWN LP

ks i:\01609\active\60950269\reports\amendments 2015\built heritage addendum_2015\modification doc #2 (smithville t-line)\let_160950269_addendum_20160408_fin.docx

References

Government of Ontario. 2006. InfoSheet #5 in *Heritage Resources in the Land Use Planning Process, Cultural Heritage and Archaeology Policies of the Ontario Provincial Policy Statement, 2005*. Ministry of Tourism, Culture, and Sport (formerly Ministry of Tourism and Culture).

Page, H.R., 1876. *Illustrated Atlas of the Counties of Lincoln and Welland*. Toronto: H.R. Pageand Co.

Stantec Consulting Ltd. 2013. *Heritage Assessment, Niagara Region Wind Farm*.

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Revised: 2016-04-05 By: bcowper

April 2016
160950269

Stantec

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2010.
3. Orthoimagery © First Base Solutions, 2010.

Legend

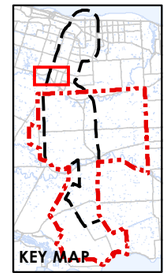
- Interconnector Study Area
- 120m Zone of Investigation

Zone of Investigation Adjustments

- Area Added
- Modified Alternate Transmission Route
- Preferred Transmission Line Route (REA)
- Alternate Transmission Line Route (REA)
- Access Trail

Existing Features

- Road
- Active Railway
- Existing Transmission Line
- Pipeline
- Watercourse (MNR)
- Property Boundary
- Potential Heritage Resource



Client/Project

FWRN LP
Niagara Region Wind Farm

Figure No.

1

DRAFT

Title

Potential Heritage Resources

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Revised: 2016-04-05 By: bcowper

April 2016
160950269

Stantec

Notes

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3. Orthoimagery © First Base Solutions, 2010.

Legend

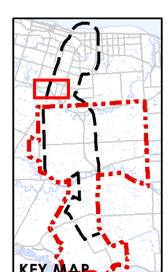
- Interconnector Study Area
- 120m Zone of Investigation

Zone of Investigation Adjustments

- Area Added
- Modified Alternate Transmission Route
- Preferred Transmission Line Route (REA)
- Alternate Transmission Line Route (REA)
- Access Trail

Existing Features

- Road
- Active Railway
- Existing Transmission Line
- Pipeline
- Watercourse (MNR)
- Property Boundary
- Identified Heritage Resource



Client/Project
FWRN LP
Niagara Region Wind Farm

Figure No.
2

DRAFT

Title
Identified Heritage Resources

APPENDIX D:
CORRESPONDENCE WITH MOECC

Myrans, Katharine

From: Tripp, Bryan
Sent: Friday, January 22, 2016 4:30 PM
To: Raetsen, Sarah (MOECC); adam.rosso@boralex.com
Cc: Keyvani, Mohsen (MOECC); Brian Treble; Powell, Chris
Subject: RE: Niagara Region Wind Farm
Attachments: 61052 Letter to MOECC smithville bypass classification final.pdf

Dear Sarah,

Further to your email request, Stantec has prepared the attached letter on behalf of FRWN LP outlining further details on the proposed transmission line location and assessment of the category of the proposed change.

Please contact myself or Adam Rosso if you have any questions,

Sincerely,

Bryan Tripp, P.Eng., M.A.Sc.
Senior Project Manager, Environmental Services
Stantec
1-70 Southgate Drive Guelph ON N1G 4P5
Phone: (519) 780-8148
Mobile: (519) 546-9952
Fax: (519) 836-2493
Bryan.Tripp@stantec.com

From: Raetsen, Sarah (MOECC) [mailto:Sarah.Raetsen@ontario.ca]
Sent: Monday, December 21, 2015 4:15 PM
To: adam.rosso@boralex.com
Cc: Tripp, Bryan; Keyvani, Mohsen (MOECC)
Subject: Niagara Region Wind Farm

Hi Adam,

In order for the ministry to better understand the proposed change to the transmission line, could you please provide more details on the change? In addition, it would be helpful if you provided details on your assessment of the category of change, including the rationale.

Thanks,
Sarah

Sarah Raetsen | Senior Project Evaluator | Approval Services Unit - Team 5 | Environmental Approvals Branch | **Ministry of the Environment and Climate Change**
135 St. Clair Ave. W., 1st Floor, Toronto ON M4V 1P5 | Phone: (416) 326-6089 | Fax: (416) 314-8452 | Email: sarah.raetsen@ontario.ca

Stantec Consulting Ltd.
70 Southgate Drive, Suite 1
Guelph, ON, N1G4P5
Tel: ((519) 780 - 8148

January 22, 2016
File: 160961052

Attention:
Sarah Raetsen, Senior Project Evaluator
Environmental Approvals Branch
Ministry of the Environment and Climate Change
135 St. Clair Ave. W., 1st Floor, Toronto ON M4V 1P5

Via email: sarah.raetsen@ontario.ca

RE: Niagara Region Wind Farm – Proposed Transmission Line Location Change, Near Smithville

Dear Ms. Raetsen

The purpose of this letter is to provide additional details on the proposed change to the transmission line in Smithville and further details / rationale on our assessment of the category of change.

This proposed change will also be required to go through an amendment to the Ontario Energy Board (OEB) and proceed through the Leave to Construct (LTC) process. In addition the Road Use Agreement (RUA) with the Town of West Lincoln will need to be amended to incorporate the new section of transmission line running along Regional Road 20.

Proposed Amendment

Further to correspondence from FWRN LP dated July 31, 2015, the proposed modification involves rerouting a portion of the approved transmission line to avoid areas within the Town of Smithville proposed for future urban expansion. This modification is being considered as a potential alternative at the request of the Township of West Lincoln. In the event that the amendment is not feasible in the required Project timeframe, the transmission line will follow the originally alignment approved through the REA.

The alternative route would consist of an overhead transmission line constructed westward along Regional Road 20 from the intersection of South Grimsby Rd. 6 to an existing unopened road allowance, then northward along the unopened road allowance to Young Street, and then eastward to its approved location at South Grimsby Rd. 5. The attached figure illustrates the approved and proposed alternative route. The route is located within the previously identified Interconnection Study Area used to gather and review existing background but is located outside of the Zone of Investigation.

The alternative route will consist primarily of an overhead transmission line, with one section of underground line being installed beneath the existing HONI transmission lines and possibly a portion of provincially significant wetland within the unopened right of way immediately north of the HONI lines. To accommodate construction and maintenance along the transmission line, an access road will also be constructed (including appropriate culverts) along the unopened right of way, with a portion possibly installed on private property located immediately west of the right of

way to avoid construction within the wetland. Some vegetation removal and pruning along the unopened right of way will be required to accommodate the proposed access road and transmission line.

The construction and installation activities for the transmission line will be completed in a similar manner as described in the Construction Plan Report, submitted and approved as part of the REA.

Category of Change

Based on the description of the proposed modification, and as noted in correspondence from FWRN LP dated July 30, 2015, we propose that this modification would qualify as a Project Design Change as there is a minimal increase in negative environmental effects that may occur or are likely to occur as a result of the proposed modification.

The following rationale is provided:

- The proposed modification revises the boundary of the original Project Location by introducing a new alternative transmission line route;
- No increase in the overall impact at the receptors;
- Requires undertaking additional Stage 2 Archaeological Assessment (AA) on lands not previously assessed, although no additional Stage 3 AA work is required;
- Requires undertaking additional natural heritage work on lands not previously assessed;
- Requires reconfirmation of written comments from MTCS (archaeology, cultural heritage) and MNRF (natural heritage); and
- There is no substantial increase in negative environmental effects that occur or are likely to occur as a result of the proposed modification.

As a result, the proposed modification described above is properly classified as a Project Design Change based on the factors set out in Chapter 10 of the Technical Guide to Renewable Energy Approvals (MOE, 2014).

Through submission of this letter, we request confirmation from the MOECC that, if submitted as described above, the proposed modifications would be classified as indicated above.

Proposed Consultation

The above described modification will be communicated as follows:

- filing a Notice of Proposed Change in the local newspapers;
- sending the Notice to stakeholders in the newly affected study area;
- posting the Notice to the Project website;
- filing a Modification Report to the MOECC, local Municipalities, and Aboriginal Communities; and
- posting the Modification Report to the Project website.

Further communication through the LTC process at the OEB will occur in conjunction with the corresponding LTC amendment.

While the proposed REA modification is located outside of the approved Project Location, it is located within the area where REA notifications were originally circulated. Project notices, including newspaper advertisements and notices mailed to the project stakeholders list were sent to residents in this area.

We trust this additional information is of assistance in addressing your email. Further information, including the results of the NHA/EIS addendum and additional Stage 2AA reporting, would be provided as part of the modifications report should this amendment proceed.

If you have any questions or require any further information please do not hesitate to contact the undersigned.

Regards,

STANTEC CONSULTING LTD.

Bryan Tripp
Senior Project Manager

Chris Powell
Project Manager, Environmental Planner

Encl.

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Revised: 2016-01-12 By: bcowper

January, 2016
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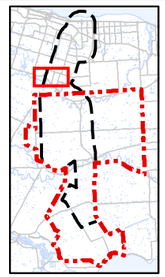
Stantec

Legend

- Approved Transmission Line Route (REA)
- Proposed Alternate Transmission Route

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N).
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2011.
3. Orthoimagery source: First Base Solutions, Date Spring 2010.



Client/Project
FWRN LP
Niagara Region Wind Farm

Figure No.
1

Title
Proposed Alternate Transmission Route