Niagara Region Wind Farm
Renewable Energy Approval
Amendment
Modification Report

Prepared for:
FWRN LP
4672 Bartlett Road South
Beamsville ON L0R 1B1

Prepared by:
Stantec Consulting Ltd.
1-70 Southgate Drive
Guelph ON N1G 4P5
T: 519-836-6050
F: 519-836-2493

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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 #012-0614). 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).

This report and its attachments provide information regarding the proposed modifications. Based upon the classification system outlined in the Ministry of the Environment and Climate Change's *Technical Guide to Renewable* Energy *Approvals* (Published February, 2014), the proposed modifications include Project Design Changes and Technical Changes. 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 MODIFICATIONS

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 proposed modifications described below are properly classified as Technical or Project Design Changes because they meet the factors set out in Chapter 10 of the Technical Guide to Renewable Energy Approvals.

To address a recent administrative change to the Project, an application was submitted (under separate cover) to acknowledge the change in ownership of the Project from 'Niagara Region Wind Corporation' to 'FWRN LP', as FWRN LP has purchased the Project.

2.1 PROJECT DESIGN CHANGES

2.1.1 Modification A – Revised Footprint of Interconnect Station

This modification involves the expansion of the footprint for the Interconnect Station on Mountainview Road to accommodate additional equipment in response to Hydro One Networks Inc. (HONI) connection requirements determined during detailed design while also avoiding archaeological resources.

The location of the revised footprint is presented in the attached figures (Appendix A) and discussed in the following sections.

The construction and installation activities for the interconnection station will be completed in the same manner as described in the Construction Plan Report, submitted as part of the REA Application. Additional equipment beyond what was described in the Project Description Report will be installed at this location, including a small building, fence and riser structures, however no transformer is required.

2.1.2 Modification B – Alternate Access Road between T11, T12, T41

This modification involves adding a permanent alternative access road from T11 to T12 and from T11 to T41. The access roads would be located along the collector line route previously approved in the REA. The approved access roads to these turbines are not being modified. The modification would enable the Project to potentially avoid delivery of components from Gore A Road, which has been identified by Haldimand County as a potential concern.

This modification also involves rerouting the collector line and fibre optic line from T11 to T12 to remove angles at which the lines cross from one property to the other. This modification is proposed as a result of reviewing design features of the project layout.

The revised location for the access roads, collector line and fibre optic lines is presented in the attached figures (Appendix A) and discussed in the sections below.

The construction and installation activities for the access roads, collector line and fibre optic lines will be completed in the same manner as which is described in the Construction Plan Report, submitted as part of the REA Application.

2.2 TECHNICAL CHANGES

2.2.1 Modification C – Adjust Footprint of North Substation

This modification involves the adjustment of the footprint for the North Substation (north of the Welland River) to accommodate reorientation of the substation during detailed design to avoid archaeological resources that would require Stage 3 Archaeological Assessment. The footprint would be re-oriented into an area previously assessed as part of the construction laydown area. However, the location of the transformer remains consistent with the REA location as defined in the Noise Assessment Report (NAR) and REA Conditions of Approval.

The revised location for the North Substation is presented in the attached figures (Appendix A) and discussed in the sections below.

The construction and installation activities for the North Substation will be completed in the same manner as described in the Construction Plan Report, submitted as part of the REA Application.

2.2.2 Modification D – Relocation of Junction Boxes

This modification involves adding operational flexibility to install junction boxes within either the Municipal Right-of-Way, as proposed and approved in the REA, or on participating properties within previously assessed areas along the proposed collector line routes. Currently, the Project is approved to install junction boxes within the Right-of-Way. However, through continued consultation with area municipalities, a request to locate these junction boxes (where feasible) was received. This amendment would provide greater flexibility during the detailed design process to addresses Municipal comments while remaining within previously assessed areas.

The junction boxes will be constructed within the previously assessed constructible areas along the proposed collector and fibre optic lines. There is no increase to the Project Location as a result of this modification.

The construction and installation activities for the junction boxes will be completed in the same manner as described in the Construction Plan Report, submitted as part of the REA Application.

2.2.3 Modification E – Alternate Turbine Model

This modification involves changing 11 of the Project's 80 potential turbines to a customized ENERCON E101 (2.9MW) turbine on 124 m towers from a combination of different ENERCON models. Since the Project's inception and permitting, ENERCON has further reduced the sound characteristics of the E101 turbine through the following:

- limitation of power output to 2.9 MW;
- adjusted power curve for the entire range of operational wind speeds; and
- updates to the generator design.

As a result, the Project no longer wishes to install the 3 ENERCON E-82 turbines on 135 m towers and is proposing to reduce the tower height from 135 m to 124 m for 8 ENERCON E101 turbines, such that all proposed turbines will be at the same hub height (124 m) and the proposed layout will consist of only ENERCON E101 turbines, including 69 E101 3.0MW and 11 E101 2.9MW. This modification will also facilitate meeting the maximum rated capacity of 230 MW.

The number of turbines to be installed will remain the same at 77. However, the amended turbines would be physically lower than the REA approved turbines at these same locations, specifically with a hub height of 124 m (whereby 9 of the 11 turbines at these locations were previously approved at a hub height of 135 m). While this reduction in tower height addresses a potential concern raised by Environment Canada during the review of the REA, the Project remains committed to completing the supplemental bird mortality monitoring outlined in the REA Conditions.

At 3 locations, the rotor diameter for the previously approved ENERCON E82 turbines would increase from 82 m to 101 m; however, the rotor diameter for the amended E101 turbines would remain the same. The assessment of impacts and determination of setbacks for all turbines approved in the REA already assumed a rotor diameter of 101 m.

Specifications of the REA approved turbines and the new turbine model are summarized below in **Table 1**.

Table 1: Basic Wind Turbine Specifications

Parameter	REA Approved Turbine Models		New Turbine Model
Manufacturer	ENERCON	ENERCON	ENERCON
Model	E101	E82	E101
Name plate capacity (MW)	3.0 MW	2.3 MW	2.9 MW
Hub height above grade	124 m or 135 m	135 m	124 m
Blade length	48.6m	38.8 m	48.6 m
Rotor diameter	101 m	82 m	101 m

Table 1: Basic Wind Turbine Specifications

Parameter	REA Approved Turbine Models		New Turbine Model
Blade sweep area	8,012 m²	5,281 m²	8,012 m²
Rotational Speed	Variable, 4 – 14.5 rpm	Variable, 6 - 18 rpm	Variable, 4 – 14.1 rpm
Noise Level	104.8 dBA	103.3 dBA	102.9 dBA
Frequency spectrum	50 Hz or 60 Hz	50 Hz or 60 Hz	50 Hz or 60 Hz

As part of this amendment, one property will no longer be considered a participant in the Project. The short section of fibre optic cable that was approved to cross this property is no longer proposed.

The construction and installation activities for the turbines will be completed in the same manner as described in the Construction Plan Report, submitted as part of the REA Application.

2.2.4 Modification F – Alternate Transformer

The transformer selected for the north substation will be rated 90 MVA as a base rating, and 69 MVA for south substation, both with two stages of cooling (via fan), as compared to the 100 MVA transformers modelled and approved in the REA. The location of the sound barrier required at both the north and south substation has been revised through detailed design of each substation. The sound power level of the amended transformer selected is less than that modelled in the NAR as approved in the REA. An updated Acoustic Assessment Report has been prepared to document the sound level for the Transformer including the revised location of the sound barrier considering a conservative assessment using the original 100 MVA transformer. There is no change to the Project Location size as a result of this modification.

2.2.5 Modification G – Revised Access Road Entrances

This modification involves adjustments to access road entrances, on private land owned by participating landowners, based on detailed design (engineering) and need for turning radius (driving surface) at 7 entrance locations:

- Entrance 4 to T79 and T80
- Entrance 22 to T76
- Entrance 27 to T09 and T51
- Entrance 36 to T10 and T37
- Entrance 46 to T84
- Entrance 49 to T99
- Entrance 50 to T20

The revised location for the access road entrances is presented in the attached figures (Appendix A) and discussed in the sections below.

The construction and installation activities for the access roads will be completed in the same manner as described in the Construction Plan Report, submitted as part of the REA Application.

3.0 RESULTS OF EFFECTS ASSESSMENT FOR THE PROJECT MODIFICATION

O. Reg. 359/09 requires that any adverse environmental effects that may result from construction, installation, operation and maintenance activities be described. The term "environment" in O. Reg. 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 proposed modifications to the Project was completed.

In summary, none of the proposed minor modifications described above will result in increased 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 modifications. A summary of the amendments to the sections and figures in each REA report and the applicable text change is provided in the table below.

3.1.1 Natural Heritage Assessment and Environmental Impact Study

The NHA/EIS (included in the REA Application) identified natural features within the Project Location and the associated 120 m Zone of Investigation around the limits of the Project Location.

A technical review was conducted to determine if the modifications result in: (a) a change to the identification of natural features within 120 m of the new Project Location; (b) a change to the assessment of impacts and mitigation measures; and/or (c) the overall assessment of changes to the NHA/EIS.

The Project Location associated with Modifications C, D, E, F, and G (all entrances except the one to T79/T80) was previously assessed as part of the NHA/EIS that was submitted as part of the original REA Application and was subsequently accepted by the Ministry of Natural Resources and Forestry (MNRF) in their Confirmation Letter dated April 2, 2013. As such, no additional NHA/EIS was required for Modifications C, D, E, F, and G (all entrances except the one to T79/T80) and all other commitments within the NHA/EIS and Environmental Effects Monitoring Plan (EEMP) for post-construction monitoring, mitigation and contingency measures remain unchanged for these modifications.

The Project Location requires a minor modification to account for:

- Modification A – Revised Footprint of Interconnection Station;
- Modification B – Alternate Access Road between T12, T11 and T41; and
- Modification G – Revised Access Road Entrance (to T79/T80 only).

Following the same methods found in the NRWC NHA/EIS, an additional records review was conducted for the new ZOI to confirm if new known natural features are present. According to the Natural Heritage Information Centre (NHIC, 2015) and Land Information Ontario (LIO, 2015) databases, there are no new areas designated as significant woodland, Area of Natural or Scientific Interest (ANSI), or significant wildlife habitat within the new ZOI. Near Modification B, one new area of Provincially-Significant Wetland (PSW) has been added: Marshville Station PSW Complex. The Project is located within 120 m of this natural feature. The Marshville Station PSW Complex is included in the NHA/EIS; however, this additional wetland community has been added by the MNRF to the Marshville Station PSW complex since the original records review.

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

The new ZOI for modifications A, B, and G (entrance to T79/T80) was surveyed on foot in the field as part of the original NHA/EIS. No new site investigations were required to assess the new ZOI; however, additional site investigations were conducted at Modification B.

No new vegetation communities have been added in the new ZOI. Near modification B, the boundary of woodland wo153 has been updated following removal of a portion of this woodland by the landowner for agricultural purposes (to provide access between two fields owned by the same landowner). This also resulted in the change of the boundary of the corresponding candidate significant wildlife habitats, including candidate amphibian woodland breeding habitat AH48 (no vernal pooling found in this section), deer winter congregation area dc93, and generalized woodland vole habitat. No vegetation removal is required in this woodland or candidate significant wildlife habitat features.

Near modification B, wetland we445 (now part of the Marshville Station PSW Complex) is a new wetland feature. No additional site investigation work was undertaken for this feature as it had been included in the original ZOI. This feature was not identified by Stantec as wetland in the NHA/EIS. The ELC communities in this feature were identified as FOD6-5 Fresh-Moist Sugar Maple-Hardwood Deciduous Forest, FOD9-1 Fresh-Moist Oak-Sugar Maple Deciduous Forest, FOD3-1 Dry to Fresh Poplar Deciduous Forest, FOD5-8 Dry-Fresh Sugar Maple-White Ash Deciduous forest, and FOD9-2 Fresh-Moist Oak-Maple Deciduous Forest (as described for woodland wo153 in the NHA/EIS). The FOD9-1 and FOD9-2 communities have since been identified as PSW by the MNRF, so a conservative approach has been used for this addendum and these ELC communities will be included as a wetland feature (we445) in this NHA addendum.

No new candidate significant wildlife habitats have been added as a result of the modifications. No changes to the original NHA/EIS for the candidate significant wildlife habitat assessments are required.

No new woodlands or candidate significant wildlife habitats were added in the new ZOI. The following updates to the evaluation of significance are required:

- New wetland we445 (part of the Marshville Station PSW Complex) is provincially-significant, as determined by the MNRF. No additional evaluation of significance of this feature is required;
- Wo153 has changed from 25.98 ha to 25.92 ha, and it is still considered a significant woodland;
- Dc93 has changed from 25.98 ha to 25.92 ha, and it is still considered a generalized significant deer winter congregation area; and,
- Generalized woodland vole habitat corresponding with the boundary of wo153 has changed from 25.98 ha to 25.92 ha, and it is still considered a generalized significant woodland vole habitat.

Snake hibernaculum feature SH3, located within 120 m of the new access road to T12 (modification B), was found to be not significant during pre-construction surveys (Stantec, 2014). Candidate amphibian woodland breeding habitat AH48 was found to be not significant in the original NHA (Stantec, 2013).

Minor changes to the EIS are required to address that the constructible area for the access road to T12 is now located within 120 m of wo153, we445, dc93, and woodland vole habitat. An EIS was conducted for each and confirmed mitigation measures specific to all significant woodlands are outlined in Table 6.1, Appendix B in the NHA/EIS, and no changes are required for wo153, we445, dc93, and woodland vole habitat.

It was concluded that overall, the modifications can be implemented with no new net negative environmental effects. See Appendix B for a copy of the NHA/EIS Addendum.

3.1.2 Water Assessment and Water Body Report (WAWBR)

The WAWBR (included in the REA application) identified water bodies within the Project Location and the associated 120 m Zone of Investigation (ZOI) around the limits of the Project Location.

A technical review was conducted to determine if the modifications result in: (a) a change to the identification of water bodies within 120 m of the new Project Location; (b) a change to the assessment of impacts and mitigation measures; and / or (c) the overall assessment of changes to the Water Assessment and Water Body Report (WAWBR).

The revised Project Location associated with Modification B, C, and G was previously assessed as part of the WAWBR that was submitted as part of the original REA application. Modification A is associated with a revised Project Location that extends the 120 m ZOI into an area that was not previously accessed; however no new additional assessment was required as no new water features were identified within the extended 120m ZOI. Lastly, Modification D, E and F will result in no change to the Project Location.

Additional site visits were not required to determine the status and boundary of water bodies. Water bodies that occur in or within 120 m of the revised Project Location are already identified on the maps provided within the WAWBR as approved in the REA. The evaluation of water bodies in the WAWBR does not change as a result of the Project modifications.

Since no new water body features were identified as a result of the new Project Location, the standard mitigation measures previously identified in the WAWBR as approved in the REA still apply. The modified Project Location will result in no changes to the tables in the WAWBR.

It was concluded that the modifications will not result in potential effects not previously identified and mitigated in the WAWBR.

3.1.3 Heritage Impact Assessment

The Project Location associated with Modifications A, B, C, D, E, F, G was previously assessed as part of the Heritage Impact Assessment that was submitted as part of the original REA Application and was subsequently accepted by the Ministry of Tourism, Culture and Sport (MTCS) in their Confirmation Letter dated April 12, 2013. As such, no additional Heritage Impact Assessment was required for these modifications.

Impact assessments contained within the Heritage Impact Assessment were determined to remain valid for all properties.

It was determined that the recommendations contained within the Heritage Impact Assessment do not need to be modified.

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

3.1.4 Protected Properties Assessment

The Project Location associated with Modifications A, B, C, D, E, F, G was previously assessed as part of the Protected Properties Assessment that was submitted as part of the original REA Application and was subsequently accepted by the Ministry of Tourism, Culture and Sport (MTCS) in their Confirmation Letter dated April 12, 2013. As such, no additional Protected Properties Assessment was required for these modifications.

Impact assessments contained within the Protected Properties Assessment were determined to remain valid for all properties.

It was determined that the recommendations contained within the Protected Properties Assessment do not need to be modified.

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

3.1.5 Stage II Archaeological Assessment

The Project Location associated with Modification A, D, E, F and G (for entrances 4, 22, 27, 46, 49, and 50) was previously assessed as part of the Stage II Archaeological Assessment that was submitted as part of the original REA Application and was subsequently accepted by the MTCS in their Confirmation Letter dated March 13, 2013. As such, no additional Stage II Archaeological Assessment was required for these modifications.

The Project Location associated with Modification B, C and G (for entrance 36 only) was not previously assessed as part of the Stage II Archaeological Assessment that was submitted as part of the original REA Application. As such, additional Stage II Archaeological Assessment was completed for Modification B, C and G (for entrance 36 only). See Appendix C for a copy of the Stage II Archaeological Assessment addendum.

It was concluded that the Stage II Archaeological Assessment resulted in the identification of no archaeological resources, and therefore it is recommended that no further archaeological assessment of the study area is required.

3.1.6 Noise Impact Assessment

The Noise Assessment Report was updated to consider the alternate turbine model and to amend the location of the proposed noise walls in Modification E and F. The predicted sound level at all receptors was remodeled in the updated Acoustic Assessment Report (updated AAR) with the following results:

- 1,275 of the noise receptors decreased by a value ranging from 0.1 to 1.9 dBA relative to the approved layout;
- 19 of the noise receptors increased by a value ranging from 0.1 to 0.7 dBA relative to the approved layout, all of which remain below the noise threshold of 40.0 dBA; and
- no changes were identified for the remaining noise receptors.

Overall, the proposed modification to the 11 turbines and revised location of the proposed noise walls at the north and south transformer are predicted to improve the acoustical conditions for the Project. As with the approved Project, the predicted noise emissions during the Project's

predictable worst case operation, based on the proposed changes, will continue to meet the MOE criteria at all Points of Reception with the inclusion of noise barriers at both the north and south transformer substations.

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, and notes whether changes to the reports are required due to the modifications 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 2: 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	Yes	1, 2.1, 2.20, 2.28, 2.31, 2.35, 2.39, 2.41, 2.43, 2.48, 2.54	Figures to be updated to display the revised Footprint of Interconnect Station, Alternate Access Road from T11 to T12 to T41, Footprint of North Substation, and revised Access Road Entrances, Appendix A (Modification A, B, C, D, and G). Section 1.1: (a) update text to a rated capacity ranging from 2.9MW to 3.0MW, 90 MVA base rating for north transformer and 69 MVA for the south transformer. Section 3.1: (a) amend text to remove the use of ENERCON E82, (b) update text to a rated capacity ranging from 2.9MW to 3.0MW, (c) Table 3.1 – amend text to remove turbine specifications for E82 and remove 135 m hub height, include new turbine model specifications for the customized ENERCON E101 (2.9MW), and (d) Table 3.2 – update turbine hub height and remove turbine model E82. Section 3.2.4: (a) update text to 90 MVA base rating for north transformer and 69 MVA for the south transformer, and (b) update locations of the north and south transformer sound barrier.
Construction Plan Report	Yes	1, 2.1, 2.20, 2.28, 2.31, 2.35, 2.39, 2.41, 2.43, 2.48, 2.54	Figures to be updated to display the revised Footprint of Interconnect Station, Alternate Access Road from T11 to T12 to T41, Footprint of North Substation, and revised Access Road Entrances, Appendix A (Modification A, B, C, D, and G). Section 1.1: (a) update text to a rated capacity ranging from 2.9MW to 3.0MW, 90 MVA base rating for north transformer and 69 MVA for the south transformer. Section 2.0: (a) amend text to remove reference to ENERCON E82, (b) Table 2.1 – update text to90 MVA base rating for north transformer and 69 MVA for the south transformer, (c) update the locations of the north and south transformer sound barrier and (d) update the potential location for junction boxes.
Design & Operations Report	Yes	1, 2.1, 2.20, 2.28, 2.31, 2.35, 2.39, 2.41, 2.43, 2.48, 2.54	Figures to be updated to display the revised Footprint of Interconnect Station, Alternate Access Road from T11 to T12 to T41, Footprint of North Substation, and revised Access Road Entrances, Appendix A (Modification A, B, C, D, and G). Section 1.1: (a) update text to a rated capacity ranging from 2.9MW to 3.0MW, 90 MVA base rating for north transformer and 69 MVA for the south transformer. Section 2.1: (a) update turbine hub height, and (b) amend text to remove reference to ENERCON E82. Section 3.1: (a) Table 3.1 update turbine specifications to include the customized

Table 2: Summary of Impacts/Changes to REA Reports & Studies

REA Reports & Studies	Change (Yes/No)	Figure No.	Discussion of change / Justification for 'no' change
			ENERCON E101 (2.9MW), and (b) amend text to remove reference to ENERCON E82.
Decommissioning Plan Report	No	n/a	There are no figures within the Decommissioning Plan Report to be updated. Section 1.1: (a) update text to a rated capacity ranging from 2.9MW to 3.0MW, 90 MVA base rating for north transformer and 69 MVA for the south transformer. Section 3.3: (a) amend text to remove reference to E82 and revise text to one proposed hub height.
Consultation Report	Yes	n/a	Consultation with government representative has been undertaken for the proposed modifications to the Project, including MOECC, MNRF and MTCS, and the mechanism to update the project documents and communicate these changes to stakeholders is described in Section 3 of this Modification Document. Section 1.1: (a) update text to a rated capacity ranging from 2.9MW to 3.0MW, 90 MVA base rating for north transformer and 69 MVA for the south transformer.
ADDITIONAL REPORTS			
Natural Heritage Assessment Report	Yes	1, 2.1, 2.20, 2.28, 2.31, 2.35, 2.39, 2.41, 2.43, 2.48, 2.54; 3.1, 3.20, 3.28, 3.35, 3.39, 3.41, 3.43, 3.48, 3.54; 4.1, 4.20, 4.28, 4.35, 4.39, 4.41, 4.43, 4.48, 4.54; 5.1, 5.20, 5.28, 5.35, 5.39, 5.41, 5.43, 5.48, 5.54; 6.1, 6.20, 6.28, 6.35, 6.39, 6.41, 6.43, 6.48, 6.54; 7.1, 7.20, 7.28, 7.35, 7.39, 7.41, 7.43, 7.48, 7.54	Figures to be updated to display the revised Footprint of Interconnect Station, Alternate Access Road from T11 to T12 to T41, Footprint of North Substation, and revised Access Road Entrances, Appendix A (Modification A, B, C, D, and G). Executive Summary: a) update text to a rated capacity ranging from 2.9MW to 3.0MW, 90 MVA base rating for north transformer and 69 MVA for the south transformer. Section 1.1: (a) update text to a rated capacity ranging from 2.9MW to 3.0MW, 90 MVA base rating for north transformer and 69 MVA for the south transformer. Approved NHA/EIS was completed assuming a rotor diameter of 101 m at all turbine locations, including those previously approved as E82 turbines. No change in turbine location required. See Appendix B for a copy of the Natural Heritage Assessment Addendum.
Water Assessment and Water Body Report	Yes	1, 3.1, 3.20, 3.28, 3.35, 3.39, 3.41, 3.43, 3.48, 3.54, 4.1, 4.20, 4.28, 4.35, 4.39, 4.41, 4.43,	Figures to be updated to display the revised Footprint of Interconnect Station, Alternate Access Road from T11 to T12 to T41, Footprint of North Substation, and revised Access Road Entrances, Appendix A (Modification A, B, C, D, and G). Section 1.1: (a) update text to a rated capacity ranging from 2.9MW to 3.0MW, 90 MVA base

Table 2: Summary of Impacts/Changes to REA Reports & Studies

REA Reports & Studies	Change (Yes/No)	Figure No.	Discussion of change / Justification for 'no' change
		4.48, 4.54	rating for north transformer and 69 MVA for the south transformer. Section 3.0: (a) Table 3.2 – update number of access roads for the Unnamed Tributary to UWR 3 (T072-1) to recognize new crossing to T41. Section 4.3: (a) Table 4.11 – update number of crossings for T072-1. Section 4.1.4: (a) Table 4.5 – updated proposed works for T072-1 to include access road from T11 to T12 to T41. Approved WAWBR was completed assuming a rotor diameter of 101 m at all turbine locations, including those previously approved as E82 turbines. No change in turbine location required.
Stage 1 Archaeological Assessment	Yes	1	Figures to be updated to display the revised Footprint of Interconnect Station, Alternate Access Road from T11 to T12 to T41, Footprint of North Substation, and revised Access Road Entrances, Appendix A (Modification A, B, C, D, and G). Section 2.1: (a) update text to a rated capacity ranging from 2.9MW to 3.0MW, 90 MVA base rating for north transformer and 69 MVA for the south transformer.
Stage 2 Archaeological Assessment	Yes	1, 3, 29, 30, 32, 39, 43, 48, 49, 56, 60, 61	Figures to be updated to display the revised Footprint of Interconnect Station, Alternate Access Road from T11 to T12 to T41, Footprint of North Substation, and revised Access Road Entrances (Modification A, B, C, D, and G). Section 2.1.1: (a) update text to a rated capacity ranging from 2.9MW to 3.0MW, 90 MVA base rating for north transformer and 69 MVA for the south transformer. See Appendix C for a copy of the Stage 2 Archaeological Assessment Addendum.
Heritage Assessment Report	Yes	3, 4, 5, 6, 7, 12, 13, 14, 15, 16	Figures to be updated to display the revised Footprint of Interconnect Station, Alternate Access Road from T11 to T12 to T41, Footprint of North Substation, and revised Access Road Entrances (Modification A, B, C, D, and G). Section 1.2: (a) update text to a rated capacity ranging from 2.9MW to 3.0MW, 90 MVA base rating for north transformer and 69 MVA for the south transformer. Section 1.3.2: (a) amend text to remove reference to 135m hub height and update blade length to 48.6 m, and (b) remove Visual Aid 3: Turbine Scale Schematic (135m hub height) and Visual Aid 4: Turbine Scale Schematic, with trees (135m hub height).
Protected Properties Assessment	Yes	2, 6, 7, 8, 9, 10	Figures to be updated to display the revised Footprint of Interconnect Station, Alternate Access Road from T11 to T12 to T41, Footprint of North Substation, and revised

Table 2: Summary of Impacts/Changes to REA Reports & Studies

REA Reports & Studies	Change (Yes/No)	Figure No.	Discussion of change / Justification for 'no' change
			Access Road Entrances (Modification A, B, C, D, and G). Section 1.2: (a) update text to a rated capacity ranging from 2.9MW to 3.0MW, 90 MVA base rating for north transformer and 69 MVA for the south transformer. Section 1.3: (a) amend text to remove reference to 135m hub height, and (b) remove reference to E82 blade length to 38.8 m.
Wind Turbine Specifications Report	Yes	n/a	Section 1.1: (a) update text to a rated capacity ranging from 2.9MW to 3.0MW, 90 MVA base rating for north transformer and 69 MVA for the south transformer. Section 2.1: (a) amend text to remove the use of ENERCON E82, and (b) Table 2.1 – amend text to remove turbine specifications for ENERCON E82 and remove 135 m hub height, update to include new turbine model specifications for the customized ENERCON E101 (2.9MW). Section 2.2: (a) amend text to remove the use of ENERCON E82, and (b) update turbine hub height. Appendix A: update turbine specifications manual from manufacturer.
Acoustic Assessment Report	Yes	Yes	A revised Acoustic Assessment Report, including updated model and figures has been completed for alternate transformer, turbine model and noise wall coordinates at the north and south substation, Appendix D (Modification E and F). Executive Summary: amend text to describe proposed changes to the project assessed in the updated AAR. Section 2.2: (a) amend text to remove the use of ENERCON E82, and (b) amend text to a 90 MVA base rating for north transformer and 69 MVA for the south transformer. Section 2.3: (a) amend text to remove the use of ENERCON E82, and (b) Table 2.1 – update turbine specifications to include the customized ENERCON E101 (2.9MW). Section 2.4: (a) update turbine hub height to 124 m, (b) amend text to remove the use of ENERCON E82, and (c) update turbine specifications to include 11customized ENERCON E101 (2.9MW). Section 3.1: (a) amend text to remove the use of ENERCON E82, (b) amend noise sources to include 69 E101 3MW and 11 E101 2.9MW turbines, (c) amend text to describe transformer rating of 90 MVA for north transformer and 69 MVA for the south transformer, (d) Table 3.1, 3.2 and 3.4 – update with sound emission data for the customized E101 2.9MW and to remove the use of ENERCON E82, (e) Table 3.5 - update

Table 2: Summary of Impacts/Changes to REA Reports & Studies

REA Reports & Studies	Change (Yes/No)	Figure No.	Discussion of change / Justification for 'no' change
			to identify the following turbines as customized ENERCON E101 2.9 MW turbines on 124 m towers: T18, T33, T34, T36, T45, T46, T47, T53, T55, T60, T74, and (f) Table 3.6 – amend text to describe transformer rating of 90 MVA for north transformer and 69 MVA for the south transformer. Section 4.2: amend the number of participating and non-participating occupied receptors to reflect the removal of POR_2550 from the project. Section 6.2: (a) amend text to describe transformer rating of 90 MVA for north transformer and 69 MVA for the south transformer. Update Figure 6.1 and Figure B1 (Appendix B): (a) remove use of ENERCON E82, (b) revise layout to include 69 ENERCON E101 turbines and 11 customized ENERCON E101 turbines, and (c) update sound level contours (40 dBA). Update Appendix C predicted sound levels based on the updated noise model reflecting changes described above. Update Appendix D to include test data for the customized ENERCON E101 turbine and to remove the test data for the ENERCON E82 turbine. Update Appendix E sample calculations based on the changes described above. Update Appendix F: (a) include manufacturer's catalogue data for the customized ENERCON E101 turbine, (b) remove relevant ENERCON E82 turbine information and (c) amend text to describe transformer rating of 90 MVA for north transformer and 69 MVA for the south transformer. See Appendix D for a copy of the updated Acoustic Assessment Report.
Property Line Setback Assessment	Yes	1.1 -1.80a	Figures to be updated to display the revised, Alternate Access Road from T11 to T12 to T41, and revised Access Road Entrances (Modification B and G) and to remove 135m Buffer (Hub Height), Appendix A. Section 1.1: (a) update text to a rated capacity ranging from 2.9MW to 3.0MW, 90 MVA base rating for north transformer and 69 MVA for the south transformer. Section 2.0: (a) amend text to remove 135m hub height. No changes are being made to the turbine locations for this project as property line setbacks were based on ENERCON E101 turbines at all locations, including those previously approved as E82 turbines, for both 124 m and 135 m turbine hub heights.

4.0 CONSULTATION

Consultation regarding the proposed modification was 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, 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 Project stakeholders, including agencies, municipalities, Aboriginal communities, and community members that are on the Project distribution list. The Notice will also be published on at least two separate days within newspapers with general circulation in the Project area.

4.2 AGENCY CONSULTATION

- Consultation regarding the proposed modifications was undertaken with the MOECC via this Modification Document and as per a letter submitted to the MOECC dated July 24, 2015 (Appendix E).
- The Notice of Project Change will be provided to the MOECC.
- The MNRF was advised of the proposed modifications through a letter addendum to the NHA/EIS (Appendix B). Consultation with the MNRF regarding changes to the NHA/EIS included obtaining written confirmation (Appendix B) that the MNRF is satisfied that the NHA requirements of O. Reg. 359/09 have been met.
- The MTCS was advised of the proposed modifications through this Modification Report and letter addendums to the Stage 2 Archaeological Assessment (Appendix C). Consultation with the MTCS regarding changes to these assessments included obtaining written confirmation included obtaining written confirmation (Appendix C) that the MTCS is satisfied that the assessments met the requirements of O. Reg. 359/09.

A copy of this Modification Document has been provided to the MNRF and MTCS for their information.

A copy of this Modification Document will be placed on the Project website.

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:

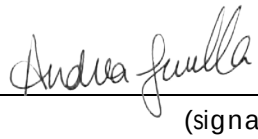
- Six Nations of the Grand River;
- Six Nations of the Grand River Haudenosaunee Confederacy Chiefs Council (via HDI);
- Mississaugas of the New Credit First Nation; and
- Metis Nation of Ontario/Niagara Region Metis Council.

5.0 CLOSURE

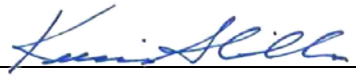
The proposed modifications have been adequately assessed in accordance with O. Reg. 359/09 and the MOECC's Technical Guide. It has been determined that the modifications would not result in new negative environmental effects or associated mitigation measures beyond those identified as part of the original 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)

Andrea Terella, Environmental Planner

Prepared by  (signature)

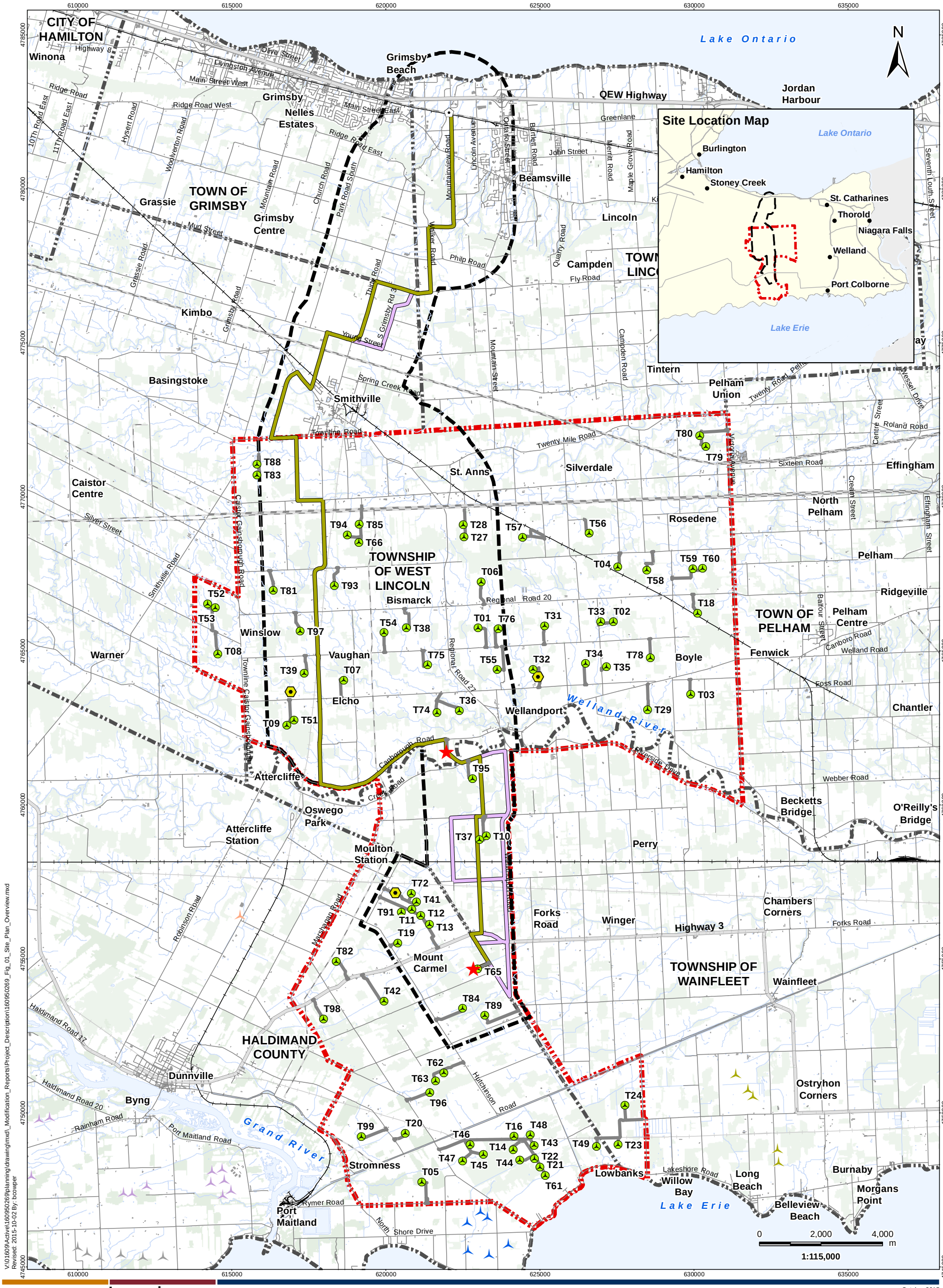
Kerrie Skillen, Environmental Planner

Reviewed by  (signature)

Chris Powell, Project Manager

Appendix A:

Figures



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Revised: 2015-10-02 By: bcowper

Legend

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

Other Wind Turbines

- Mohawk Wind Farm (Existing)
- Rosa Flora Turbine (Existing)
- Wainfleet Wind Energy Project (Proposed)
- HAF Wind Energy Project (Proposed)
- Grand Renewable Energy Project
- Other Wind Farm Projects

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.

Stantec

Client/Project
FWRN LP
Niagara Region Wind Farm

Figure No.
1

Title
Overview Site Plan

October 2015
160950269

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Revised: 2015-09-21 By: bcowper

Stantec

Legend

- Project Study Area
- Interconnector Study Area
- 120m Zone of Investigation

Zone of Investigation Adjustments
- Area Added
- Area Removed

Proposed Project Components
- Proposed Turbine Location
- Turbine Blade Length
- Tap-in Location
- Transformer Substation Location
- Junction Box
- Proposed Culvert
- Preferred Transmission Line Route
- Alternate Transmission Line Route
- Temporary Laydown Area
- Collector Lines – Underground or Overhead
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area
- Potential Construction Laydown Area
- Transformer Substation

Existing Features
- Road
- Expressway / Highway
- Unopened Road Allowance
- Active Railway
- Abandoned Railway
- Existing Transmission Line
- Pipeline
- Topographic Contour (mAMSL)
- Watercourse (MNR)
- Waterbody (Stantec)
- Property Boundary
- Municipality Lower Tier
- Niagara Escarpment Plan Area (NEC)
- Greenbelt Natural Heritage System
- Conservation Areas (NPCA)
- Greenbelt Plan Area (MMAH)

Significant Wildlife Habitat
- Snake Hibernacula
- Snake Hibernacula 30m Buffer
- Raptor Wintering Areas
- Deer Congregation Areas (MNR) (Generalized)
- Wetland Amphibian Breeding Habitat
- Woodland Amphibian Breeding Habitat
- Other Rare Vegetation Community
- Landbird Migratory Stopover
- Turtle Nesting Habitat/ Snapping Turtle Habitat
- Turtle Habitat 30m Buffer
- Turtle Wintering Area

Significant Natural Features
- Woodland Communities
- Wetland Communities
- ANSI, Earth Science, Provincially Significant (MNR)
- ANSI, Life Science, Provincially Significant (MNR)

Cultural Heritage Features
- Protected Property
- Cultural Heritage Resource

- Landfill - Active (MOE)
- Landfill - Closed (MOE)
- Petroleum Well (OGSR) [4]
- Water Well (MOE) [5]

Non-participating Receptors [5]
- Occupied
- Vacant

Participating Noise Receptors [5]
- Occupied
- Vacant

Notes

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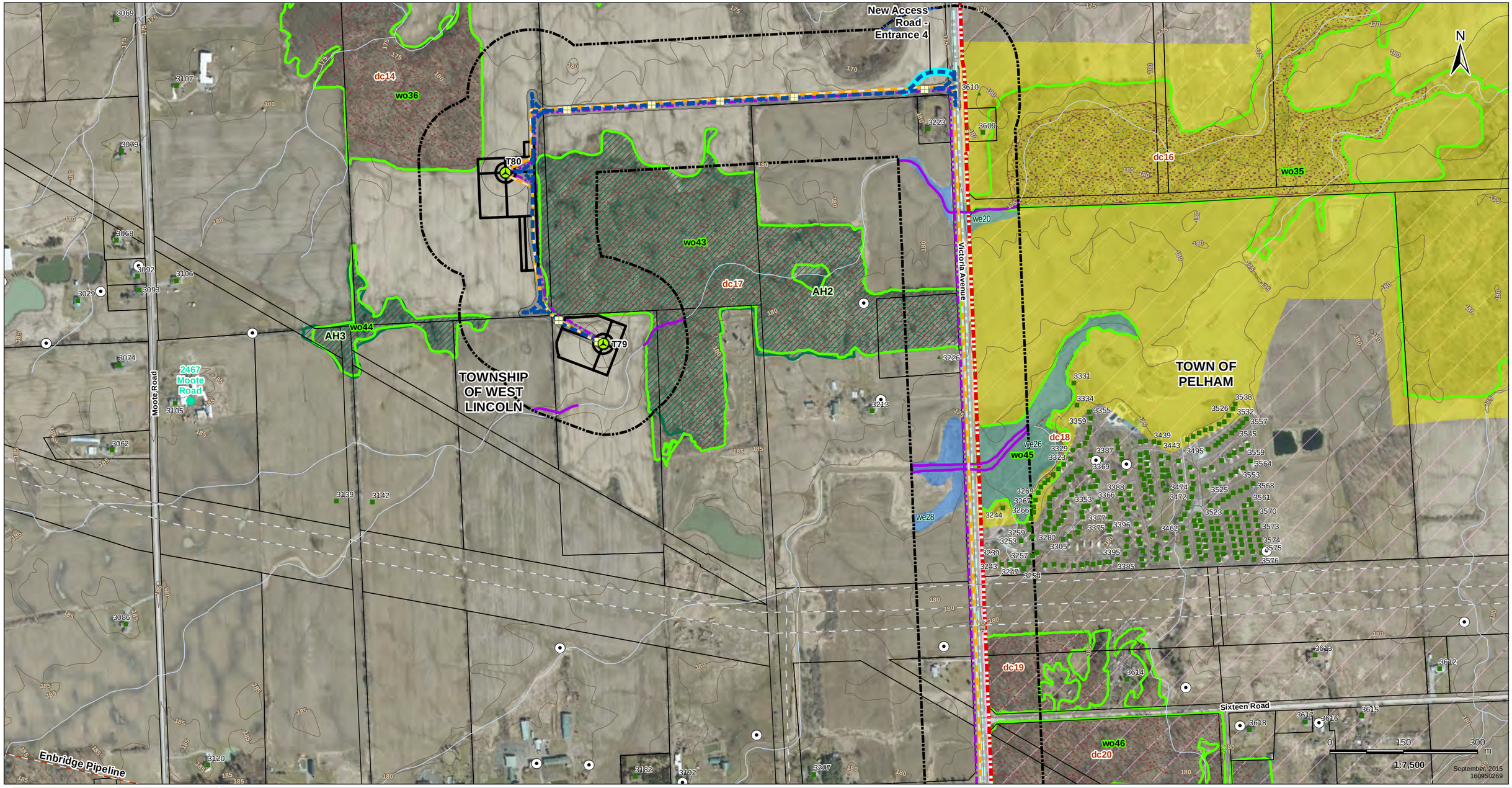
3. Orthoimagery source: First Base Solutions, Date Spring 2010.
4. Petroleum Well source: © Ontario Oil, Gas and Salt Resource Library, 2010.
5. MOE Water well locations are approximate and have been positioned based on published UTM coordinates © Queen's Printer for Ontario, 2012.
6. Noise receptors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

Client/Project
FWRN LP
Niagara Region Wind Farm

Figure No.
2.1

Title
Site Plan with Socio-Economic Features, Significant Natural Heritage Features and Water Bodies Figure 2.1



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Revised: 2015-09-21 By: bcowper

Stantec

Legend

- Project Study Area
- Interconnector Study Area
- 120m Zone of Investigation

Zone of Investigation Adjustments
- Area Added
- Area Removed

Proposed Project Components
- Proposed Turbine Location
- Turbine Blade Length
- Tap-in Location
- Transformer Substation Location
- Junction Box
- Proposed Culvert
- Preferred Transmission Line Route
- Alternate Transmission Line Route
- Temporary Laydown Area
- Collector Lines – Underground or Overhead
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area
- Potential Construction Laydown Area
- Transformer Substation

Existing Features
- Road
- Expressway / Highway
- Unopened Road Allowance
- Active Railway
- Abandoned Railway
- Existing Transmission Line
- Pipeline
- Topographic Contour (mAMSL)
- Watercourse (MNR)
- Waterbody (Stantec)
- Property Boundary
- Municipality Lower Tier
- Niagara Escarpment Plan Area (NEC)
- Greenbelt Natural Heritage System
- Conservation Areas (NPCA)
- Greenbelt Plan Area (MMAH)

Significant Wildlife Habitat
- Snake Hibernacula
- Snake Hibernacula 30m Buffer
- Raptor Wintering Areas
- Deer Congregation Areas (MNR) (Generalized)
- Wetland Amphibian Breeding Habitat
- Woodland Amphibian Breeding Habitat
- Other Rare Vegetation Community
- Landbird Migratory Stopover
- Turtle Nesting Habitat/ Snapping Turtle Habitat
- Turtle Habitat 30m Buffer
- Turtle Wintering Area

Significant Natural Features
- Woodland Communities
- Wetland Communities
- ANSI, Earth Science, Provincially Significant (MNR)
- ANSI, Life Science, Provincially Significant (MNR)

Cultural Heritage Features
- Protected Property
- Cultural Heritage Resource
- Landfill - Active (MOE)
- Landfill - Closed (MOE)
- Petroleum Well (OGSR) [4]
- Water Well (MOE) [5]

Non-participating Receptors [5]
- Occupied
- Vacant

Participating Noise Receptors [5]
- Occupied
- Vacant

Notes

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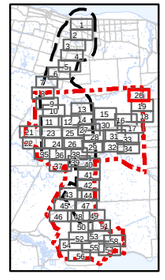
4. Petroleum Well source: © Ontario Oil, Gas and Salt Resource Library, 2010.
5. MOE Water well locations are approximate and have been positioned based on published UTM coordinates © Queen's Printer for Ontario, 2012.
6. Noise receptors are identified within 1500m of any wind turbine.



Client/Project
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Niagara Region Wind Farm

Figure No.
2.20

Title
Site Plan with Socio-Economic Features, Significant Natural Heritage Features and Water Bodies Figure 2.20

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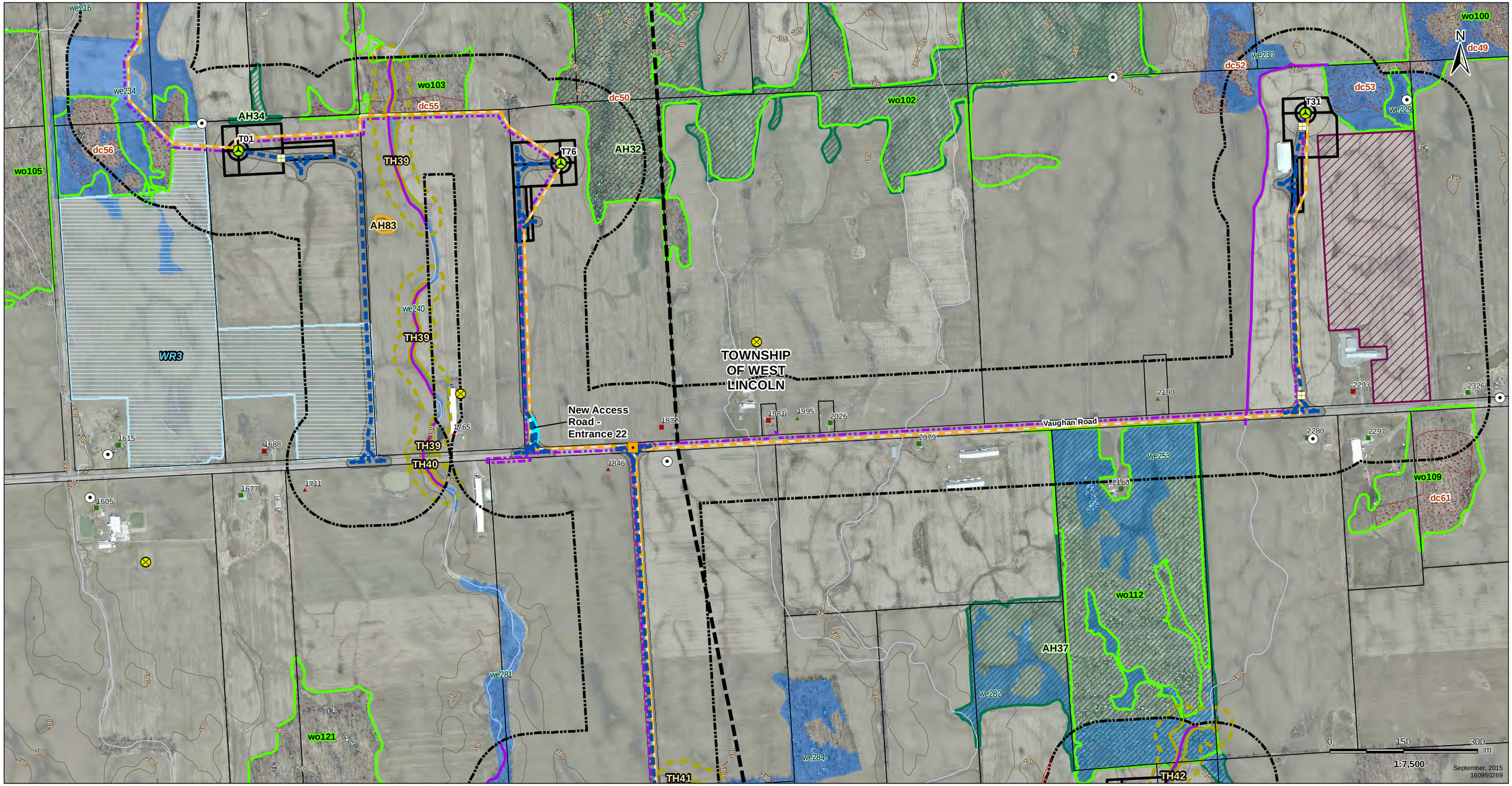

Legend

- Project Study Area
- Interconnector Study Area
- 120m Zone of Investigation

Zone of Investigation Adjustments
- Area Added
- Area Removed

Proposed Project Components
- Proposed Turbine Location
- Turbine Blade Length
- Tap-in Location
- Transformer Substation Location
- Junction Box
- Proposed Culvert
- Preferred Transmission Line Route
- Alternate Transmission Line Route
- Temporary Laydown Area
- Collector Lines – Underground or Overhead
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area
- Potential Construction Laydown Area
- Transformer Substation

Existing Features
- Road
- Expressway / Highway
- Unopened Road Allowance
- Active Railway
- Abandoned Railway
- Existing Transmission Line
- Pipeline
- Topographic Contour (mAMSL)
- Watercourse (MNR)
- Waterbody (Stantec)
- Property Boundary
- Municipality Lower Tier
- Niagara Escarpment Plan Area (NEC)
- Greenbelt Natural Heritage System
- Conservation Areas (NPCA)
- Greenbelt Plan Area (MMAH)

Significant Wildlife Habitat
- Snake Hibernacula
- Snake Hibernacula 30m Buffer
- Raptor Wintering Areas
- Deer Congregation Areas (MNR) (Generalized)
- Wetland Amphibian Breeding Habitat
- Woodland Amphibian Breeding Habitat
- Other Rare Vegetation Community
- Landbird Migratory Stopover
- Turtle Nesting Habitat/ Snapping Turtle Habitat
- Turtle Habitat 30m Buffer
- Turtle Wintering Area

Significant Natural Features
- Woodland Communities
- Wetland Communities
- ANSI, Earth Science, Provincially Significant (MNR)
- ANSI, Life Science, Provincially Significant (MNR)

Cultural Heritage Features
- Protected Property
- Cultural Heritage Resource

- Landfill - Active (MOE)
- Landfill - Closed (MOE)
- Petroleum Well (OGSR) [4]
- Water Well (MOE) [5]

Non-participating Receptors [5]
- Occupied
- Vacant

Participating Noise Receptors [5]
- Occupied
- Vacant

Notes

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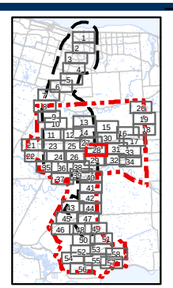
3. Orthoimagery source: First Base Solutions, Date Spring 2010.
4. Petroleum Well source: © Ontario Oil, Gas and Salt Resource Library, 2010.
5. MOE Water well locations are approximate and have been positioned based on published UTM coordinates © Queen's Printer for Ontario, 2012.
6. Noise receptors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



Client/Project
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Niagara Region Wind Farm

Figure No.
2.28

Title
Site Plan with Socio-Economic Features, Significant Natural Heritage Features and Water Bodies Figure 2.28

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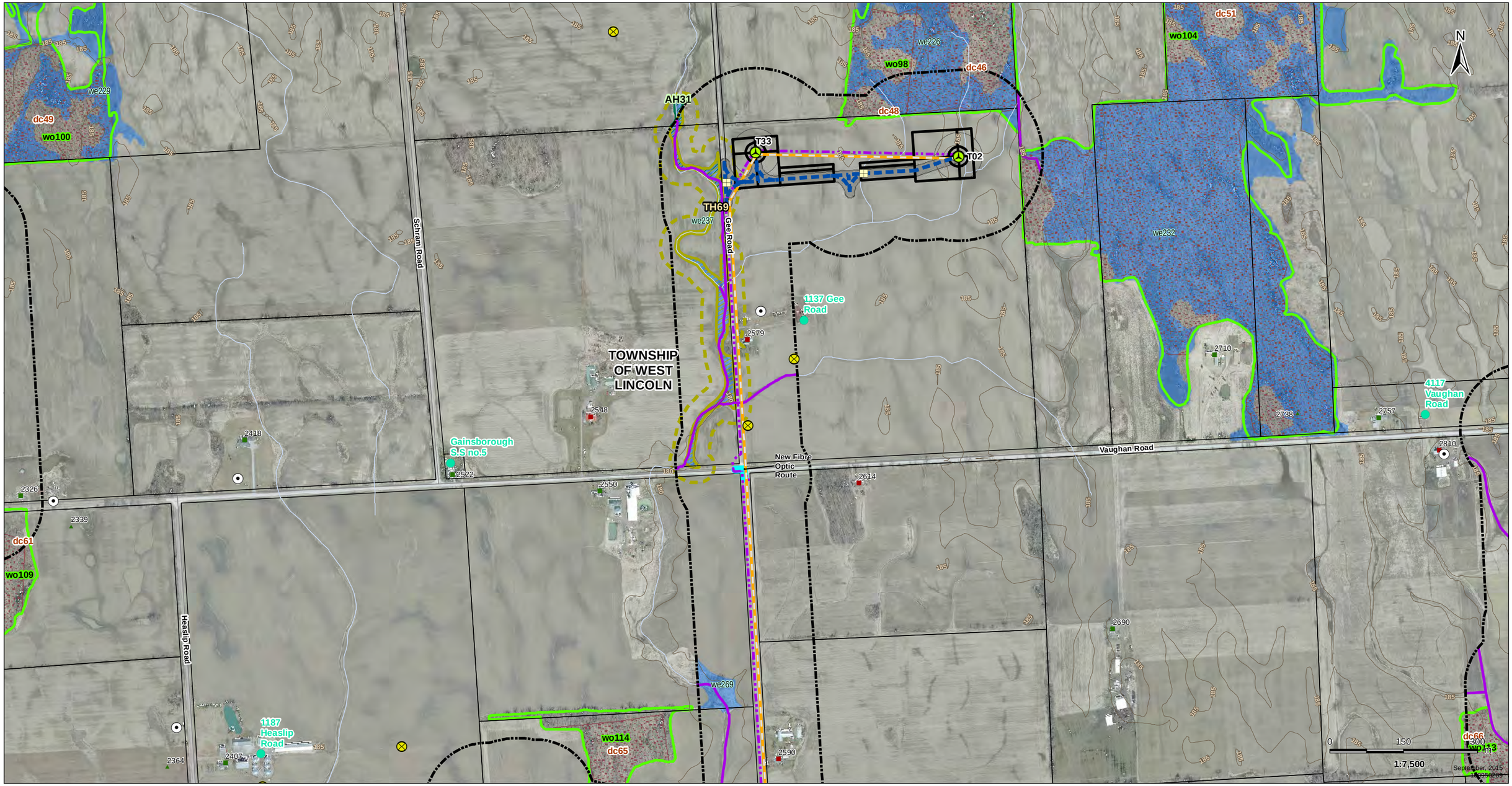

Stantec

Legend

- Project Study Area
- Interconnector Study Area
- 120m Zone of Investigation

Zone of Investigation Adjustments
- Area Added
- Area Removed

Proposed Project Components
- Proposed Turbine Location
- Turbine Blade Length
- Tap-in Location
- Transformer Substation Location
- Junction Box
- Proposed Culvert
- Preferred Transmission Line Route
- Alternate Transmission Line Route
- Temporary Laydown Area
- Collector Lines – Underground or Overhead
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area
- Potential Construction Laydown Area
- Transformer Substation

Existing Features
- Road
- Expressway / Highway
- Unopened Road Allowance
- Active Railway
- Abandoned Railway
- Existing Transmission Line
- Pipeline
- Topographic Contour (mAMSL)
- Watercourse (MNR)
- Waterbody (Stantec)
- Property Boundary
- Municipality Lower Tier
- Niagara Escarpment Plan Area (NEC)
- Greenbelt Natural Heritage System
- Conservation Areas (NPCA)
- Greenbelt Plan Area (MMAH)

Significant Wildlife Habitat
- Snake Hibernacula
- Snake Hibernacula 30m Buffer
- Raptor Wintering Areas
- Deer Congregation Areas (MNR) (Generalized)
- Wetland Amphibian Breeding Habitat
- Woodland Amphibian Breeding Habitat
- Other Rare Vegetation Community
- Landbird Migratory Stopover
- Turtle Nesting Habitat/ Snapping Turtle Habitat
- Turtle Habitat 30m Buffer
- Turtle Wintering Area

Significant Natural Features
- Woodland Communities
- Wetland Communities
- ANSI, Earth Science, Provincially Significant (MNR)
- ANSI, Life Science, Provincially Significant (MNR)

Cultural Heritage Features
- Protected Property
- Cultural Heritage Resource
- Landfill - Active (MOE)
- Landfill - Closed (MOE)
- Petroleum Well (OGSR) [4]
- Water Well (MOE) [5]

Non-participating Receptors [5]
- Occupied
- Vacant

Participating Noise Receptors [5]
- Occupied
- Vacant

Notes

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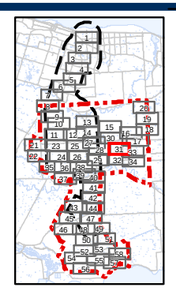
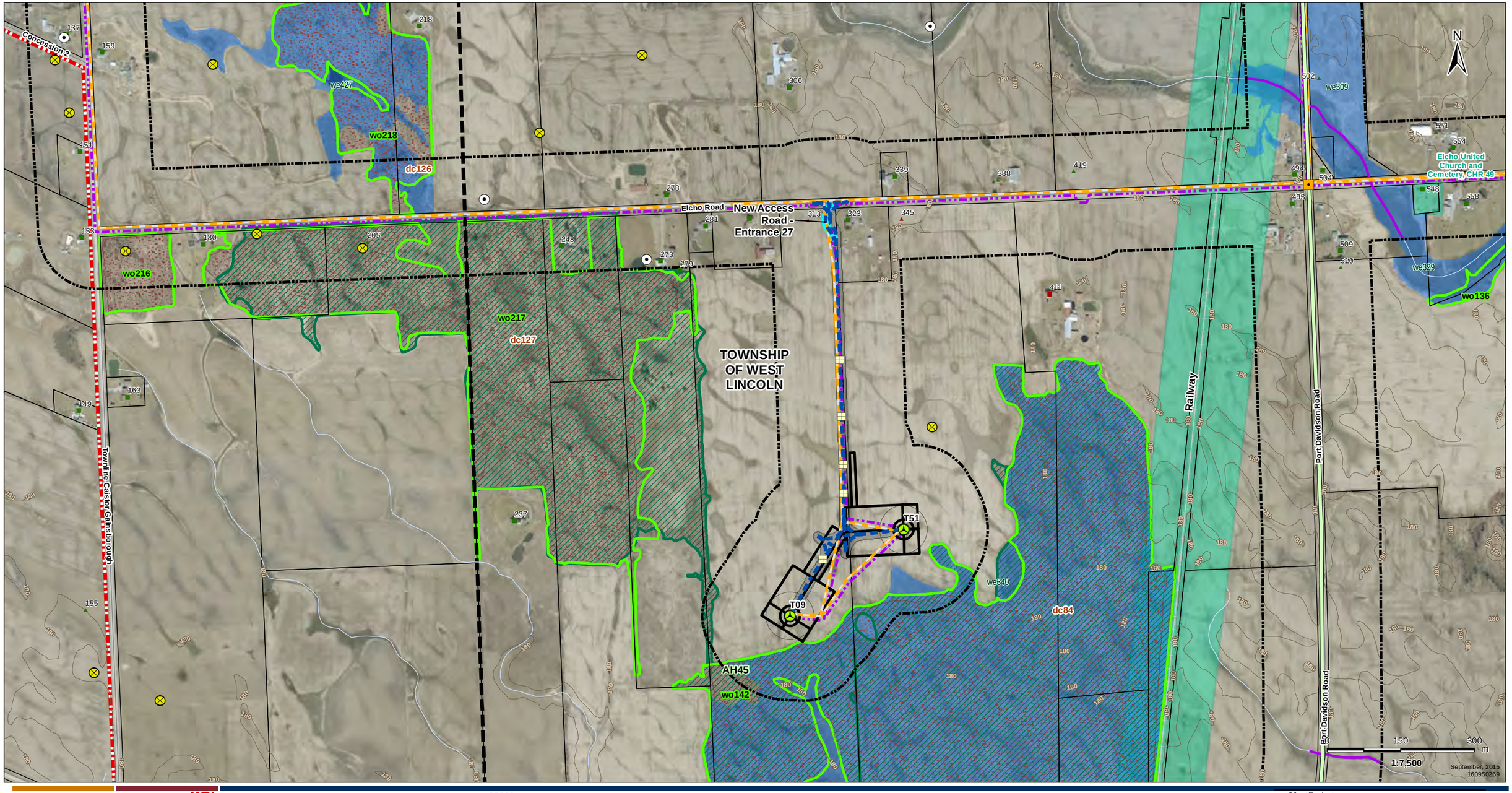
5. MOE Water well locations are approximate and have been positioned based on published UTM coordinates © Queen's Printer for Ontario, 2012.
6. Noise receptors are identified within 1500m of any wind turbine.



Client/Project
FWRN LP
Niagara Region Wind Farm

Figure No.
2.31

Title
Site Plan with Socio-Economic Features, Significant Natural Heritage Features and Water Bodies Figure 2.31



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Revised: 2015-09-21 By: bcowper

Stantec

Legend

- Project Study Area
- Interconnector Study Area
- 120m Zone of Investigation

Zone of Investigation Adjustments
- Area Added
- Area Removed

Proposed Project Components
- Proposed Turbine Location
- Turbine Blade Length
- Tap-in Location
- Transformer Substation Location
- Junction Box
- Proposed Culvert
- Preferred Transmission Line Route
- Alternate Transmission Line Route
- Temporary Laydown Area
- Collector Lines – Underground or Overhead
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area
- Potential Construction Laydown Area
- Transformer Substation

Existing Features
- Road
- Expressway / Highway
- Unopened Road Allowance
- Active Railway
- Abandoned Railway
- Existing Transmission Line
- Pipeline
- Topographic Contour (mAMSL)
- Watercourse (MNR)
- Waterbody (Stantec)
- Property Boundary
- Municipality Lower Tier
- Niagara Escarpment Plan Area (NEC)
- Greenbelt Natural Heritage System
- Conservation Areas (NPCA)
- Greenbelt Plan Area (MMAH)

Significant Wildlife Habitat
- Snake Hibernacula
- Snake Hibernacula 30m Buffer
- Raptor Wintering Areas
- Deer Congregation Areas (MNR) (Generalized)
- Wetland Amphibian Breeding Habitat
- Woodland Amphibian Breeding Habitat
- Other Rare Vegetation Community
- Landbird Migratory Stopover
- Turtle Nesting Habitat/ Snapping Turtle Habitat
- Turtle Habitat 30m Buffer
- Turtle Wintering Area

Significant Natural Features
- Woodland Communities
- Wetland Communities
- ANSI, Earth Science, Provincially Significant (MNR)
- ANSI, Life Science, Provincially Significant (MNR)

Cultural Heritage Features
- Protected Property
- Cultural Heritage Resource
- Landfill - Active (MOE)
- Landfill - Closed (MOE)
- Petroleum Well (OGSR) [4]
- Water Well (MOE) [5]

Non-participating Receptors [5]
- Occupied
- Vacant

Participating Noise Receptors [5]
- Occupied
- Vacant

Notes

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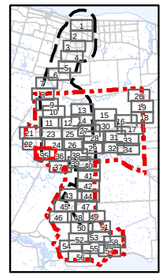
4. Petroleum Well source: © Ontario Oil, Gas and Salt Resource Library, 2010.
5. MOE Water well locations are approximate and have been positioned based on published UTM coordinates © Queen's Printer for Ontario, 2012.
6. Noise receptors are identified within 1500m of any wind turbine.



Client/Project
FWRN LP
Niagara Region Wind Farm

Figure No.
2.35

Title
Site Plan with Socio-Economic Features, Significant Natural Heritage Features and Water Bodies Figure 2.35

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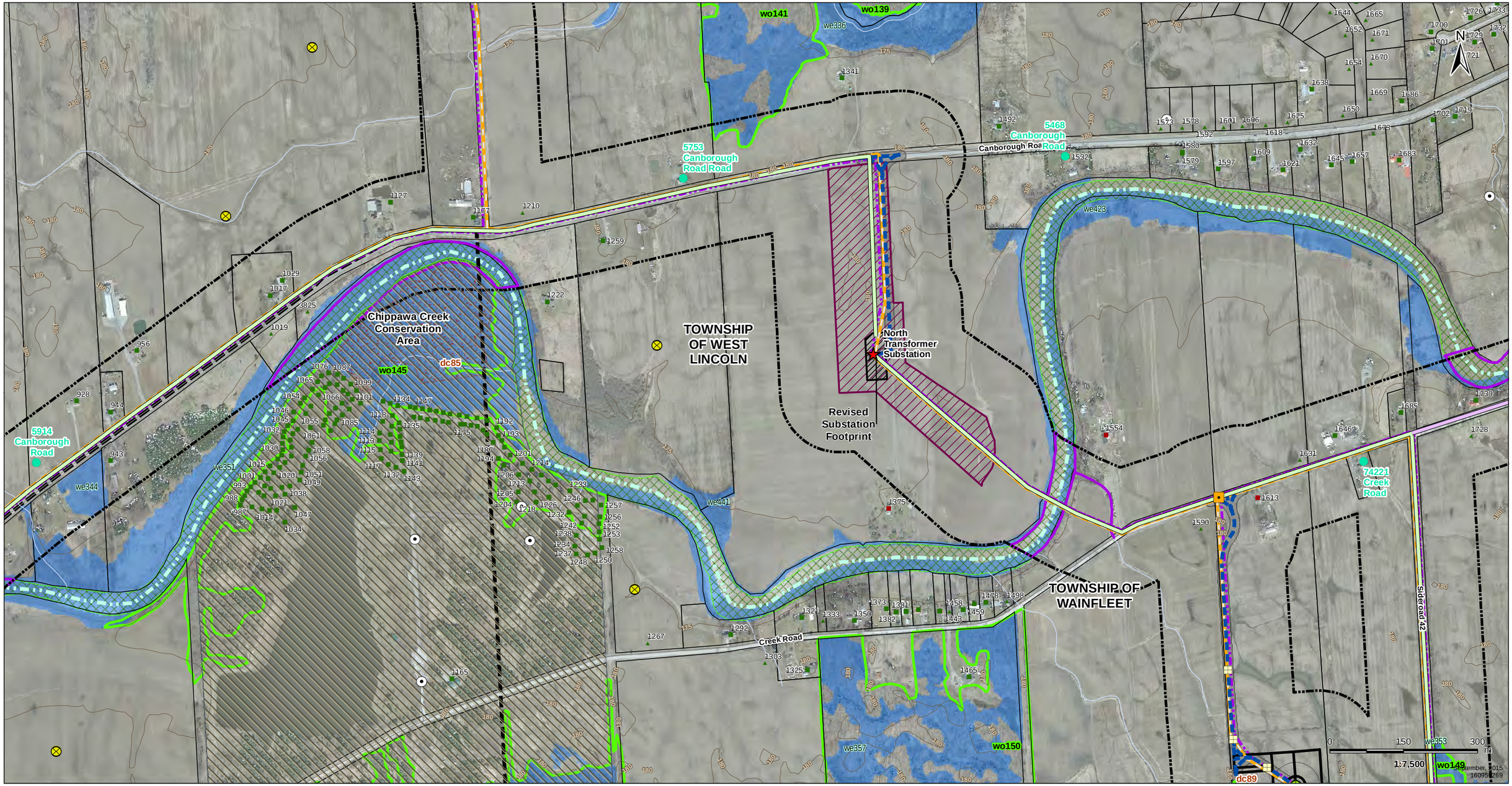

Stantec

Legend

- Project Study Area
- Interconnector Study Area
- 120m Zone of Investigation

Zone of Investigation Adjustments
- Area Added
- Area Removed

Proposed Project Components
- Proposed Turbine Location
- Turbine Blade Length
- Tap-in Location
- Transformer Substation Location
- Junction Box
- Proposed Culvert
- Preferred Transmission Line Route
- Alternate Transmission Line Route
- Temporary Laydown Area
- Collector Lines – Underground or Overhead
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area
- Potential Construction Laydown Area
- Transformer Substation

Existing Features
- Road
- Expressway / Highway
- Unopened Road Allowance
- Active Railway
- Abandoned Railway
- Existing Transmission Line
- Pipeline
- Topographic Contour (mAMSL)
- Watercourse (MNR)
- Waterbody (Stantec)
- Property Boundary
- Municipality Lower Tier
- Niagara Escarpment Plan Area (NEC)
- Greenbelt Natural Heritage System
- Conservation Areas (NPCA)
- Greenbelt Plan Area (MMAH)

Significant Wildlife Habitat
- Snake Hibernacula
- Snake Hibernacula 30m Buffer
- Raptor Wintering Areas
- Deer Congregation Areas (MNR) (Generalized)
- Wetland Amphibian Breeding Habitat
- Woodland Amphibian Breeding Habitat
- Other Rare Vegetation Community
- Landbird Migratory Stopover
- Turtle Nesting Habitat/ Snapping Turtle Habitat
- Turtle Habitat 30m Buffer
- Turtle Wintering Area

Significant Natural Features
- Woodland Communities
- Wetland Communities
- ANSI, Earth Science, Provincially Significant (MNR)
- ANSI, Life Science, Provincially Significant (MNR)

Cultural Heritage Features
- Protected Property
- Cultural Heritage Resource
- Landfill - Active (MOE)
- Landfill - Closed (MOE)
- Petroleum Well (OGSR) [4]
- Water Well (MOE) [5]

Non-participating Receptors [5]
- Occupied
- Vacant

Participating Noise Receptors [5]
- Occupied
- Vacant

Notes

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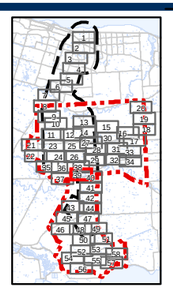
3. Orthoimagery source: First Base Solutions, Date Spring 2010.
4. Petroleum Well source: © Ontario Oil, Gas and Salt Resource Library, 2010.
5. MOE Water well locations are approximate and have been positioned based on published UTM coordinates © Queen's Printer for Ontario, 2012.
6. Noise receptors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



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FWRN LP
Niagara Region Wind Farm

Figure No.
2.39

Title
Site Plan with Socio-Economic Features, Significant Natural Heritage Features and Water Bodies Figure 2.39

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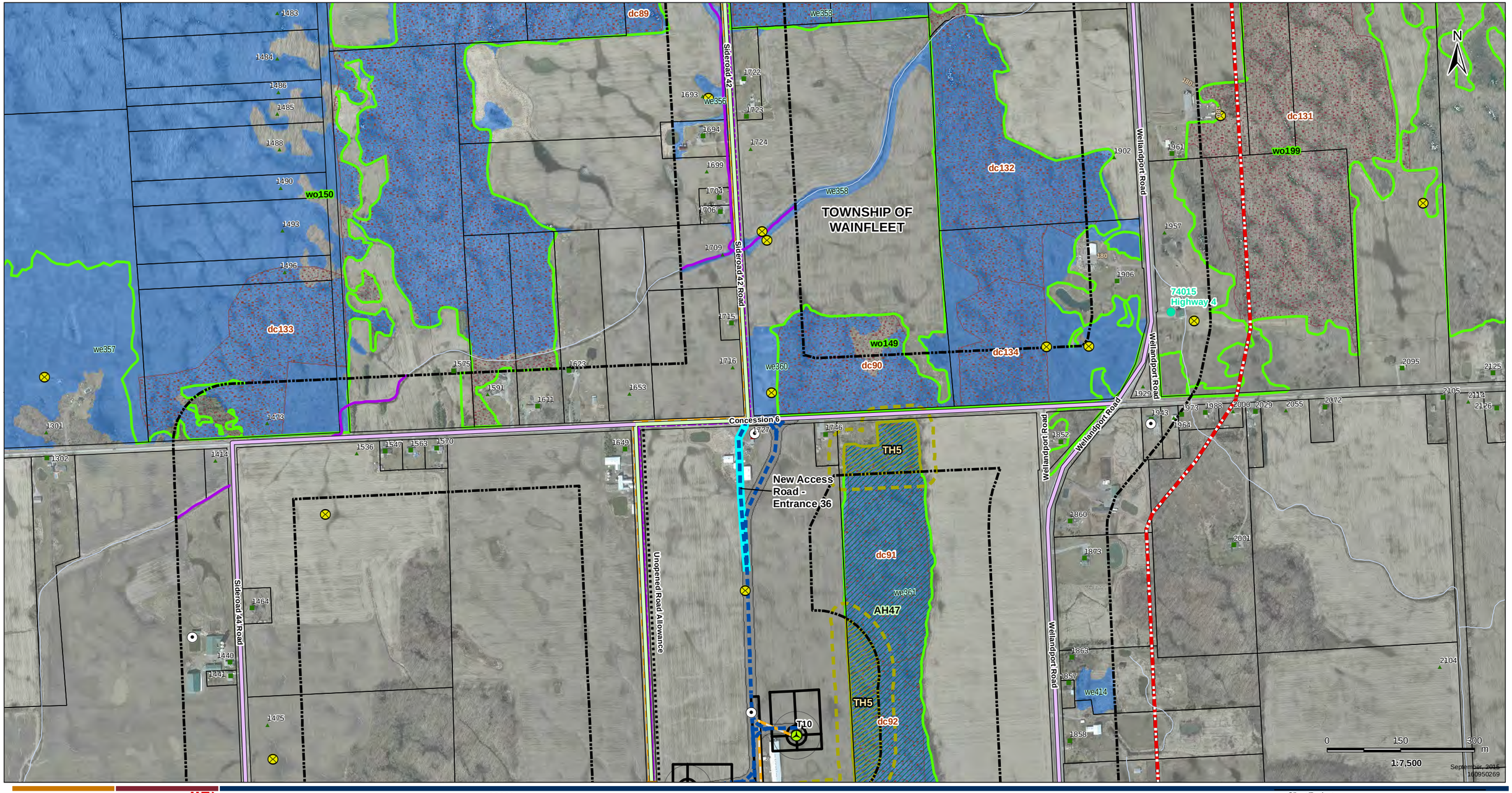

Legend

- Project Study Area
- Interconnector Study Area
- 120m Zone of Investigation

Zone of Investigation Adjustments
- Area Added
- Area Removed

Proposed Project Components
- Proposed Turbine Location
- Turbine Blade Length
- Tap-in Location
- Transformer Substation Location
- Junction Box
- Proposed Culvert
- Preferred Transmission Line Route
- Alternate Transmission Line Route
- Temporary Laydown Area
- Collector Lines – Underground or Overhead
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area
- Potential Construction Laydown Area
- Transformer Substation

Existing Features
- Road
- Expressway / Highway
- Unopened Road Allowance
- Active Railway
- Abandoned Railway
- Existing Transmission Line
- Pipeline
- Topographic Contour (mAMSL)
- Watercourse (MNR)
- Waterbody (Stantec)
- Property Boundary
- Municipality Lower Tier
- Niagara Escarpment Plan Area (NEC)
- Greenbelt Natural Heritage System
- Conservation Areas (NPCA)
- Greenbelt Plan Area (MMAH)

Significant Wildlife Habitat
- Snake Hibernacula
- Snake Hibernacula 30m Buffer
- Raptor Wintering Areas
- Deer Congregation Areas (MNR) (Generalized)
- Wetland Amphibian Breeding Habitat
- Woodland Amphibian Breeding Habitat
- Other Rare Vegetation Community
- Landbird Migratory Stopover
- Turtle Nesting Habitat/ Snapping Turtle Habitat
- Turtle Habitat 30m Buffer
- Turtle Wintering Area

Significant Natural Features
- Woodland Communities
- Wetland Communities
- ANSI, Earth Science, Provincially Significant (MNR)
- ANSI, Life Science, Provincially Significant (MNR)

Cultural Heritage Features
- Protected Property
- Cultural Heritage Resource
- Landfill - Active (MOE)
- Landfill - Closed (MOE)
- Petroleum Well (OGSR) [4]
- Water Well (MOE) [5]

Non-participating Receptors [5]
- Occupied
- Vacant

Participating Noise Receptors [5]
- Occupied
- Vacant

Notes

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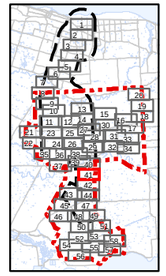

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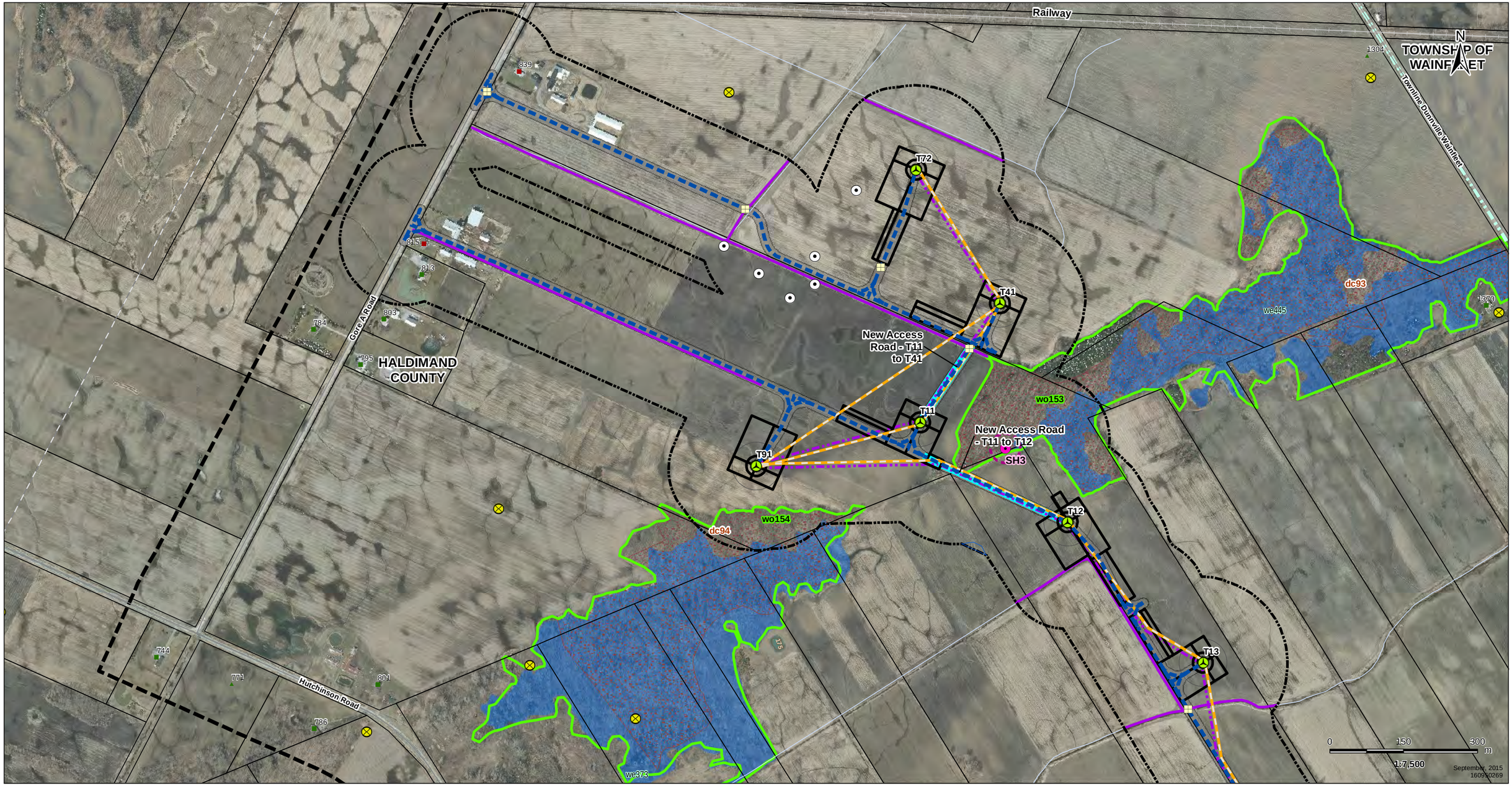
Niagara Region Wind Farm

Figure No.
2.41

Title
Site Plan with Socio-Economic Features, Significant Natural Heritage Features and Water Bodies Figure 2.41



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Stantec

Legend

- Project Study Area
- Interconnector Study Area
- 120m Zone of Investigation

Zone of Investigation Adjustments
- Area Added
- Area Removed

Proposed Project Components
- Proposed Turbine Location
- Turbine Blade Length
- Tap-in Location
- Transformer Substation Location
- Junction Box
- Proposed Culvert
- Preferred Transmission Line Route
- Alternate Transmission Line Route
- Temporary Laydown Area
- Collector Lines – Underground or Overhead
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area
- Potential Construction Laydown Area
- Transformer Substation

Existing Features
- Road
- Expressway / Highway
- Unopened Road Allowance
- Active Railway
- Abandoned Railway
- Existing Transmission Line
- Pipeline
- Topographic Contour (mAMSL)
- Watercourse (MNR)
- Waterbody (Stantec)
- Property Boundary
- Municipality Lower Tier
- Niagara Escarpment Plan Area (NEC)
- Greenbelt Natural Heritage System
- Conservation Areas (NPCA)
- Greenbelt Plan Area (MMAH)

Significant Wildlife Habitat
- Snake Hibernacula
- Snake Hibernacula 30m Buffer
- Raptor Wintering Areas
- Deer Congregation Areas (MNR) (Generalized)
- Wetland Amphibian Breeding Habitat
- Woodland Amphibian Breeding Habitat
- Other Rare Vegetation Community
- Landbird Migratory Stopover
- Turtle Nesting Habitat/ Snapping Turtle Habitat
- Turtle Habitat 30m Buffer
- Turtle Wintering Area

Significant Natural Features
- Woodland Communities
- Wetland Communities
- ANSI, Earth Science, Provincially Significant (MNR)
- ANSI, Life Science, Provincially Significant (MNR)

Cultural Heritage Features
- Protected Property
- Cultural Heritage Resource
- Landfill - Active (MOE)
- Landfill - Closed (MOE)
- Petroleum Well (OGSR) [4]
- Water Well (MOE) [5]

Non-participating Receptors [5]
- Occupied
- Vacant

Participating Noise Receptors [5]
- Occupied
- Vacant

Notes

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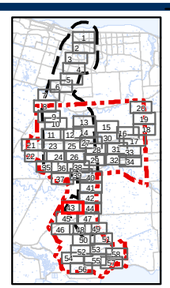

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Niagara Region Wind Farm

Figure No.
2.43

Title
Site Plan with Socio-Economic Features, Significant Natural Heritage Features and Water Bodies Figure 2.43

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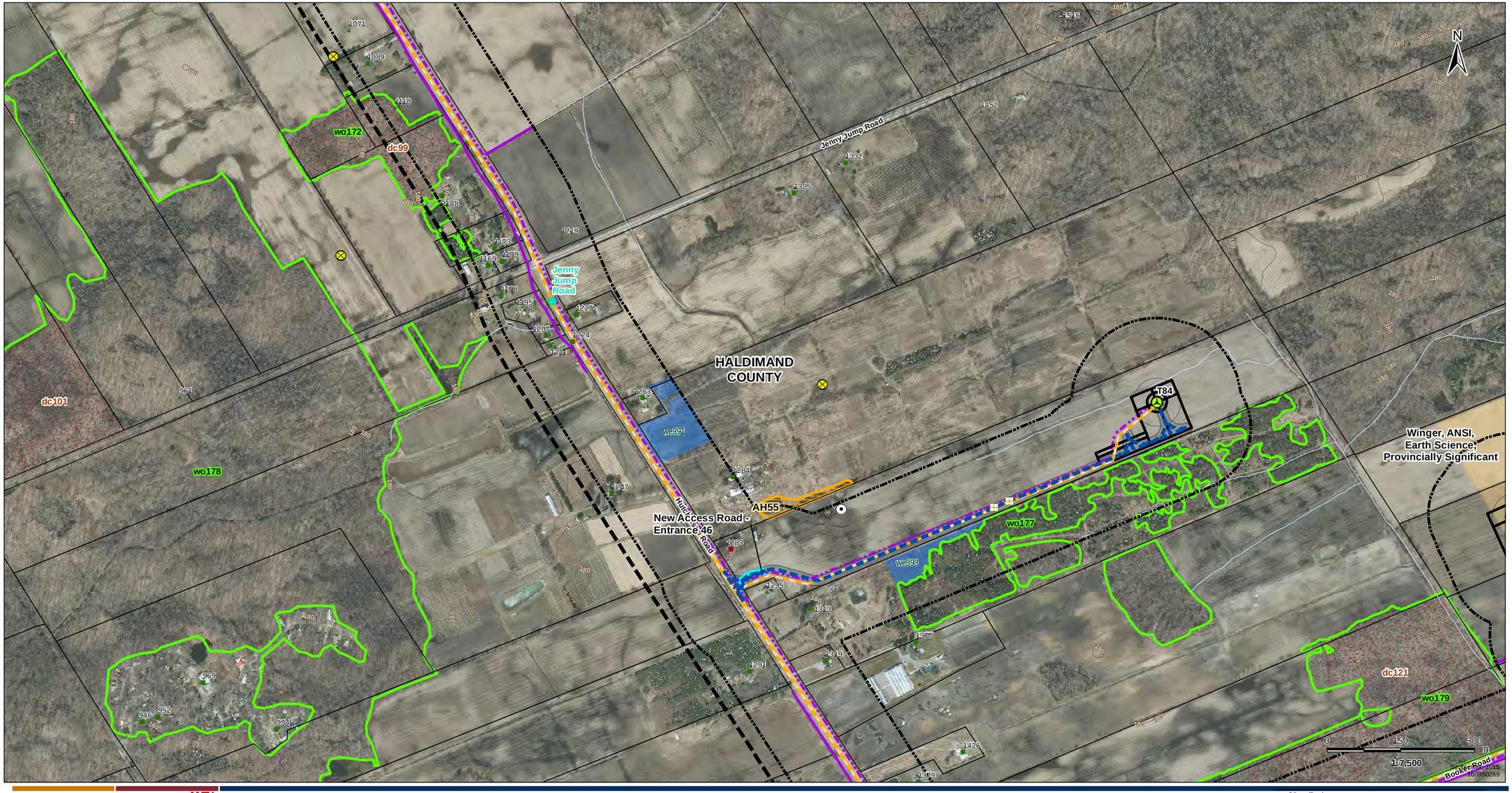

Legend

- Project Study Area
- Interconnector Study Area
- 120m Zone of Investigation

Zone of Investigation Adjustments
- Area Added
- Area Removed

Proposed Project Components
- Proposed Turbine Location
- Turbine Blade Length
- Tap-in Location
- Transformer Substation Location
- Junction Box
- Proposed Culvert
- Preferred Transmission Line Route
- Alternate Transmission Line Route
- Temporary Laydown Area
- Collector Lines – Underground or Overhead
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area
- Potential Construction Laydown Area
- Transformer Substation

Existing Features
- Road
- Expressway / Highway
- Unopened Road Allowance
- Active Railway
- Abandoned Railway
- Existing Transmission Line
- Pipeline
- Topographic Contour (mAMSL)
- Watercourse (MNR)
- Waterbody (Stantec)
- Property Boundary
- Municipality Lower Tier
- Niagara Escarpment Plan Area (NEC)
- Greenbelt Natural Heritage System
- Conservation Areas (NPCA)
- Greenbelt Plan Area (MMAH)

Significant Wildlife Habitat
- Snake Hibernacula
- Snake Hibernacula 30m Buffer
- Raptor Wintering Areas
- Deer Congregation Areas (MNR) (Generalized)
- Wetland Amphibian Breeding Habitat
- Woodland Amphibian Breeding Habitat
- Other Rare Vegetation Community
- Landbird Migratory Stopover
- Turtle Nesting Habitat/ Snapping Turtle Habitat
- Turtle Habitat 30m Buffer
- Turtle Wintering Area

Significant Natural Features
- Woodland Communities
- Wetland Communities
- ANSI, Earth Science, Provincially Significant (MNR)
- ANSI, Life Science, Provincially Significant (MNR)

Cultural Heritage Features
- Protected Property
- Cultural Heritage Resource
- Landfill - Active (MOE)
- Landfill - Closed (MOE)
- Petroleum Well (OGSR) [4]
- Water Well (MOE) [5]

Non-participating Receptors [5]
- Occupied
- Vacant

Participating Noise Receptors [5]
- Occupied
- Vacant

Notes

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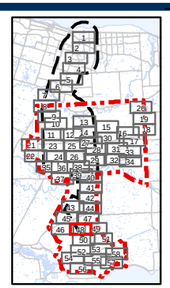
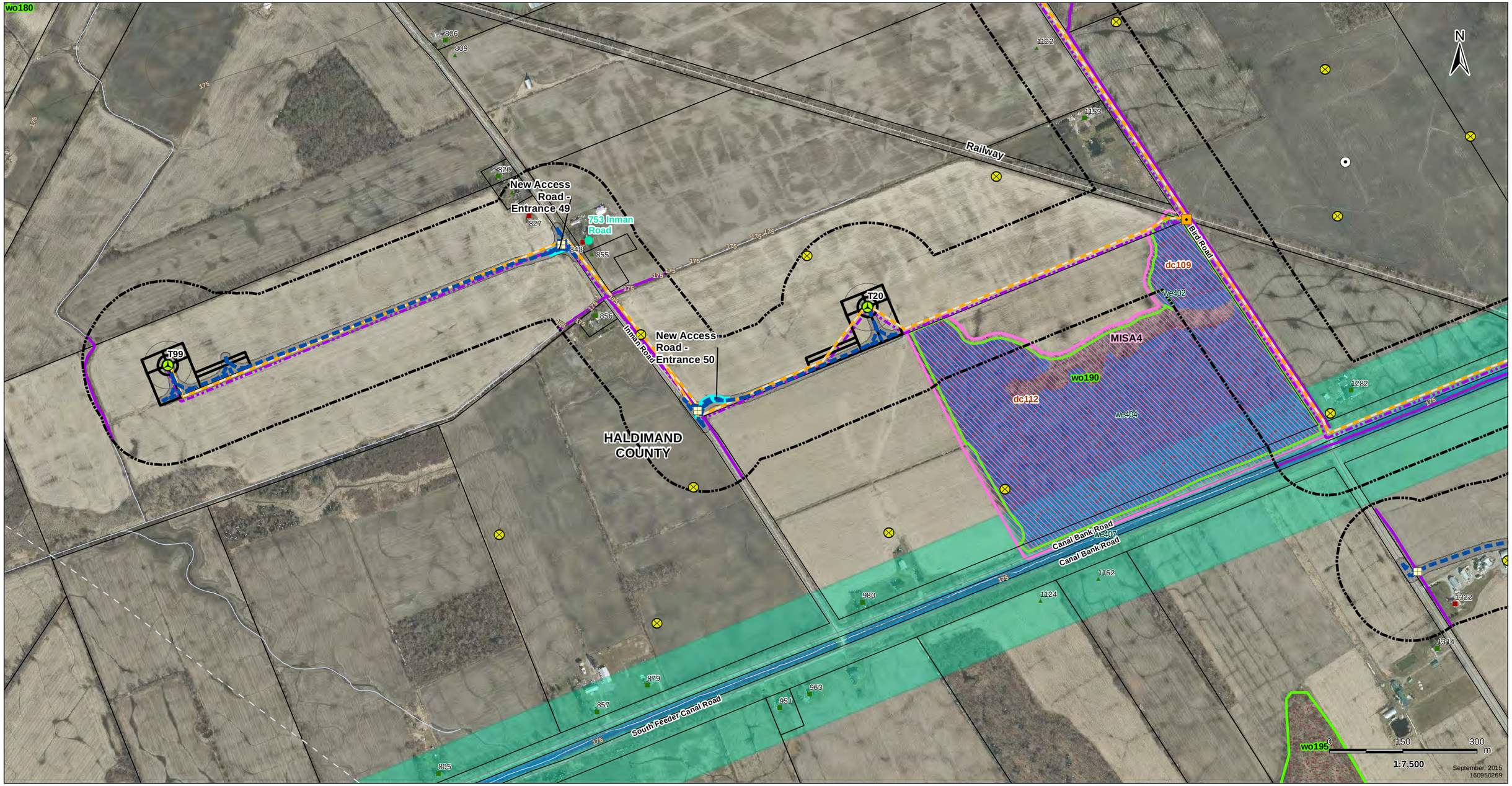


Client/Project
FWRN LP
Niagara Region Wind Farm

Figure No.
2.48

Title
Site Plan with Socio-Economic Features, Significant Natural Heritage Features and Water Bodies Figure 2.48



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Stantec

Legend

- Project Study Area
- Interconnector Study Area
- 120m Zone of Investigation

Zone of Investigation Adjustments
- Area Added
- Area Removed

Proposed Project Components
- Proposed Turbine Location
- Turbine Blade Length
- Tap-in Location
- Transformer Substation Location
- Junction Box
- Proposed Culvert
- Preferred Transmission Line Route
- Alternate Transmission Line Route
- Temporary Laydown Area
- Collector Lines – Underground or Overhead
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area
- Potential Construction Laydown Area
- Transformer Substation

Existing Features
- Road
- Expressway / Highway
- Unopened Road Allowance
- Active Railway
- Abandoned Railway
- Existing Transmission Line
- Pipeline
- Topographic Contour (mAMSL)
- Watercourse (MNR)
- Waterbody (Stantec)
- Property Boundary
- Municipality Lower Tier
- Niagara Escarpment Plan Area (NEC)
- Greenbelt Natural Heritage System
- Conservation Areas (NPCA)
- Greenbelt Plan Area (MMAH)

Significant Wildlife Habitat
- Snake Hibernacula
- Snake Hibernacula 30m Buffer
- Raptor Wintering Areas
- Deer Congregation Areas (MNR) (Generalized)
- Wetland Amphibian Breeding Habitat
- Woodland Amphibian Breeding Habitat
- Other Rare Vegetation Community
- Landbird Migratory Stopover
- Turtle Nesting Habitat/ Snapping Turtle Habitat
- Turtle Habitat 30m Buffer
- Turtle Wintering Area

Significant Natural Features
- Woodland Communities
- Wetland Communities
- ANSI, Earth Science, Provincially Significant (MNR)
- ANSI, Life Science, Provincially Significant (MNR)

Cultural Heritage Features
- Protected Property
- Cultural Heritage Resource
- Landfill - Active (MOE)
- Landfill - Closed (MOE)
- Petroleum Well (OGSR) [4]
- Water Well (MOE) [5]

Non-participating Receptors [5]
- Occupied
- Vacant

Participating Noise Receptors [5]
- Occupied
- Vacant

Notes

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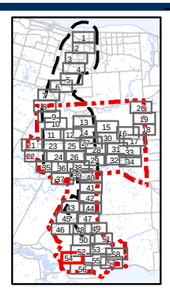

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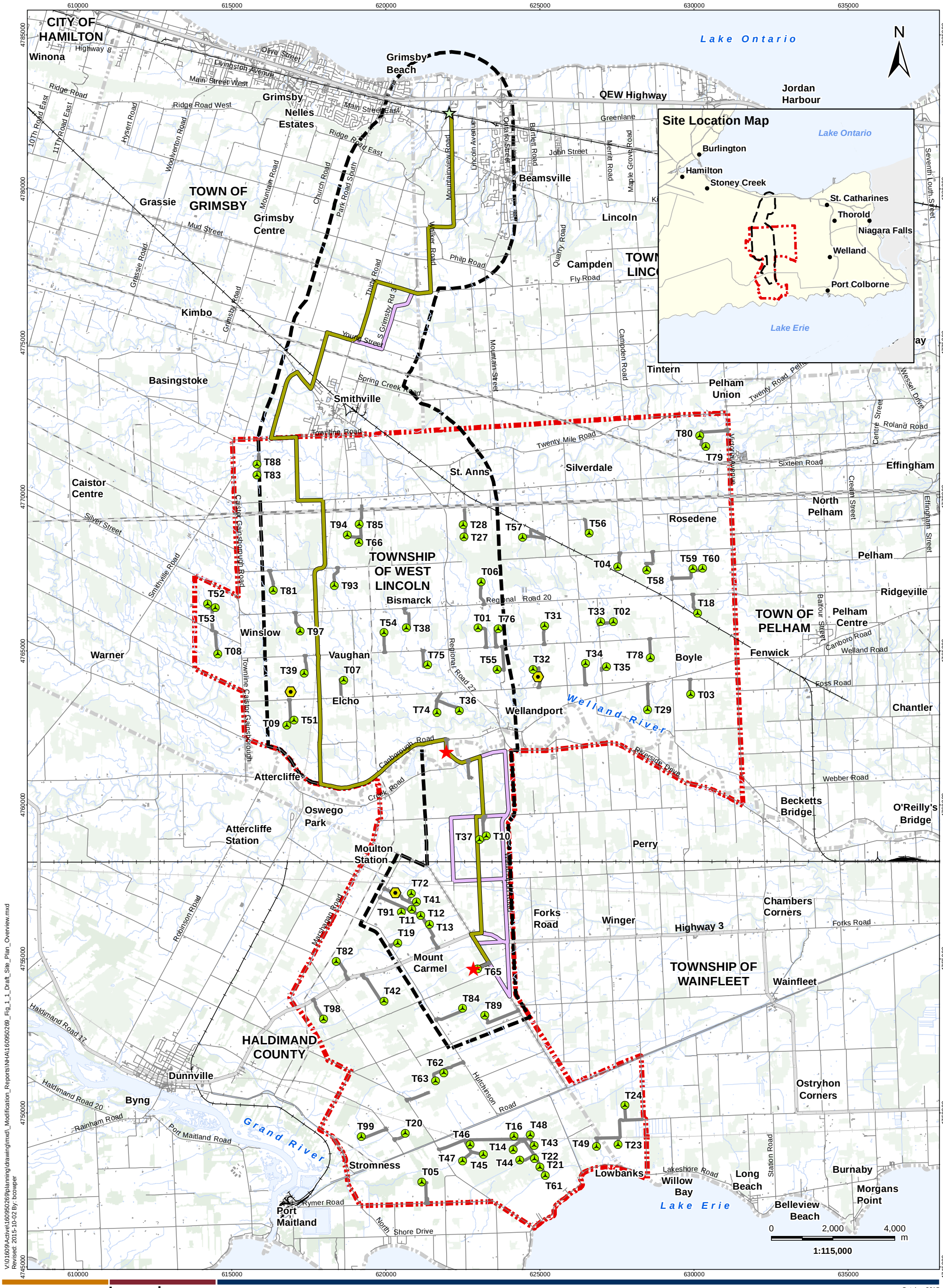
FWRN LP
Niagara Region Wind Farm

Figure No.
2.54

Title
Site Plan with Socio-Economic Features, Significant Natural Heritage Features and Water Bodies Figure 2.54



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Legend

- Project Study Area
- Interconnector Study Area
- Proposed Turbine Location
- Potential Acesss Road
- Transformer Substation
- Tap-in Location
- Existing Met Tower
- Preferred Transmission Line Route
- 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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Client/Project
FWRN LP
Niagara Region Wind Farm

October 2015
160950269

Figure No.
1

Title

Draft Site Plan Overview Revised

621000 621500 622000 622500 623000 623500

4782500

4782000

4781500

North Service Road

QEW Highway

South Service Road

Andrewes Court

Durham Road

Iroquois Trail

Main Street East

Vinatera Drive

Chardonnay Place

King Street

Thirty Road

Mountainview Road

Greenlane

Lincoln Avenue

Cedarbrook Lane

St. Volodymyr Court

Boulevard

Revised Interconnector Footprint

N

0 150 300 m

1:7,500

September, 2015
160950269

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Stantec

Legend

- Project Study Area
- Interconnector Study Area
- 120m Zone of Investigation

Zone of Investigation Adjustments

- Area Added
- Area Removed
- Proposed Turbine Location
- Turbine Relocated
- Turbine Blade Length
- Tap-in Location
- Junction Box
- Proposed Culvert
- Temporary Laydown Area
- Collector Lines - Underground or Overhead
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area
- Potential Construction Laydown Area
- Transformer Substation
- Unevaluated Wetland (NPCA)
- Woodland (MNR)
- Provincially Significant Wetland (MNR)
- Other/Locally Significant Wetland (MNR)
- Deer Wintering Yard (MNR)
- ANSI, Earth Science, Provincially Significant (MNR)
- ANSI, Life Science, Provincially Significant (MNR)
- ANSI, Life Science, Regionally Significant (MNR)
- Greenbelt Natural Heritage System
- Niagara Escarpment

Notes

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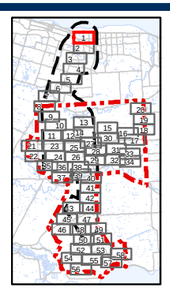

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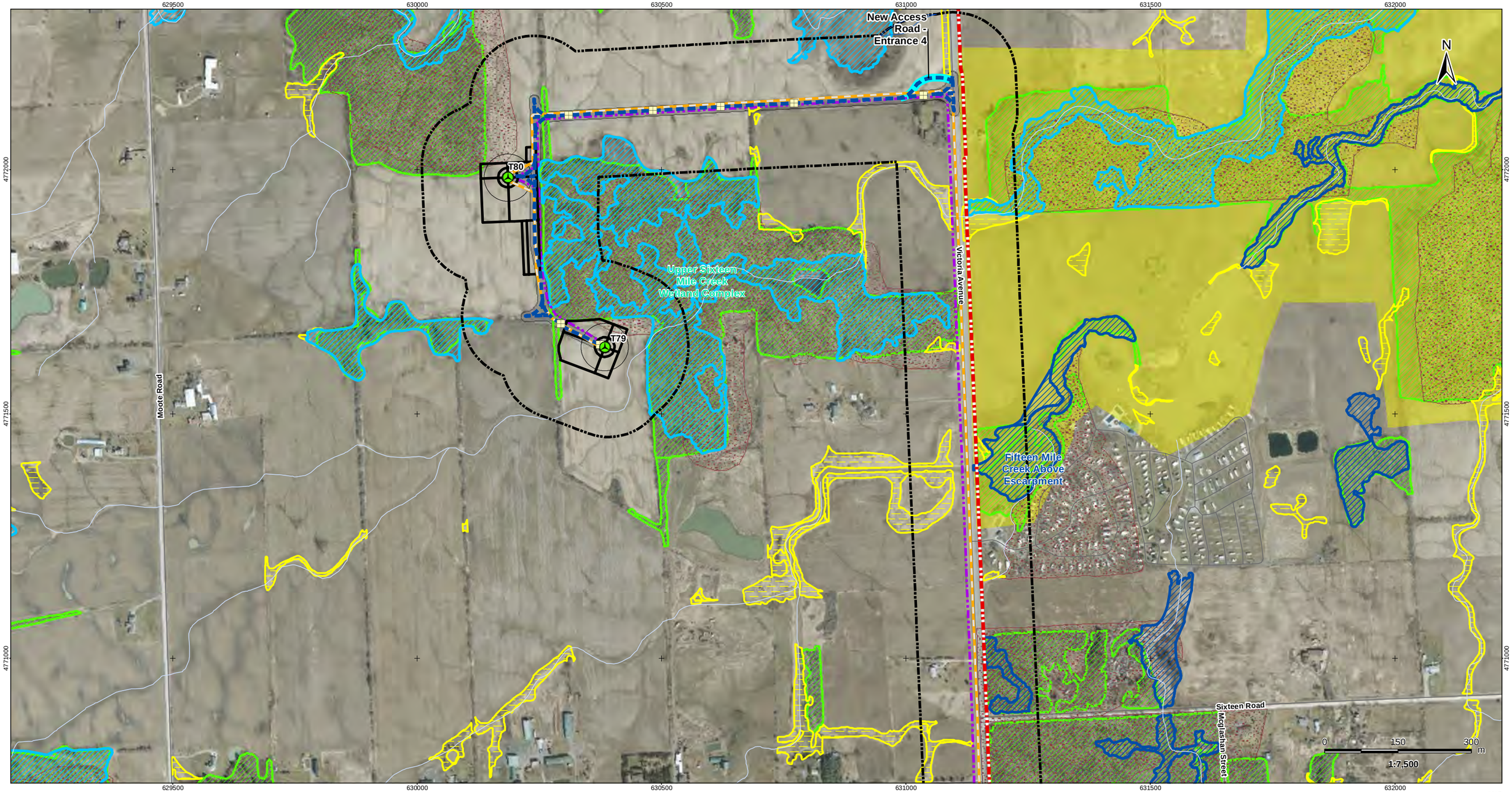
FWRN LP
Natural Heritage Assessment Report

Figure No.
2.1

Title
Records Review - Natural Features Figure 2.1 Revised



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September, 2015
160950269

Stantec

Legend

- Project Study Area
- Interconnector Study Area
- 120m Zone of Investigation

Zone of Investigation Adjustments

- Area Added
- Area Removed
- Proposed Turbine Location
- Turbine Relocated
- Turbine Blade Length
- Tap-in Location
- Junction Box
- Proposed Culvert
- Temporary Laydown Area
- Collector Lines - Underground or Overhead
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- Potential Access Road
- Access Road 20m Construction Area
- Potential Construction Laydown Area
- Transformer Substation
- Unevaluated Wetland (NPCA)
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- Provincially Significant Wetland (MNR)
- Other/Locally Significant Wetland (MNR)
- Deer Wintering Yard (MNR)
- ANSI, Earth Science, Provincially Significant (MNR)
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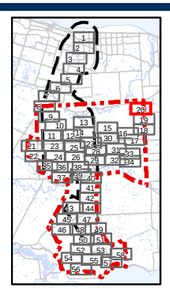

Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
2.20

Title
Records Review - Natural Features Figure 2.20 Revised

623000 623500 624000 624500 625000 625500

4766000 4765500 4765000 4764500

T01 T76 T31

New Access Road - Entrance 22

Vaughan Road

Beaver Creek Wetland Complex

N

0 150 300 m

1:7,500

623000 623500 624000 624500 625000 625500

September, 2015
160950269

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Stantec

Legend

- Project Study Area
- Interconnector Study Area
- 120m Zone of Investigation

Zone of Investigation Adjustments

- Area Added
- Area Removed
- Proposed Turbine Location
- Turbine Relocated
- Turbine Blade Length
- Tap-in Location
- Junction Box
- Proposed Culvert
- Temporary Laydown Area
- Collector Lines - Underground or Overhead
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area
- Potential Construction Laydown Area
- Transformer Substation
- Unevaluated Wetland (NPCA)
- Woodland (MNR)
- Provincially Significant Wetland (MNR)
- Other/Locally Significant Wetland (MNR)
- Deer Wintering Yard (MNR)
- ANSI, Earth Science, Provincially Significant (MNR)
- ANSI, Life Science, Provincially Significant (MNR)
- ANSI, Life Science, Regionally Significant (MNR)
- Greenbelt Natural Heritage System
- Niagara Escarpment

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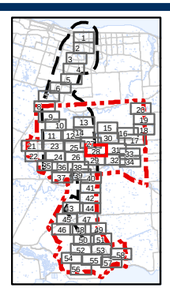

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FWRN LP
Natural Heritage Assessment Report

Figure No.
2.28

Title
Records Review - Natural Features Figure 2.28 Revised

615500 616000 616500 617000 617500 618000

4763500 4763000 4762500

Concession 2

Townline Caistor Gainsborough

Elcho Road

New Access Road - Entrance 27

T51

T09

Beaver Creek Wetland Complex

Port Davidson Slough Forest Wetland Complex

Port Davidson Road

N

0 150 300 m

1:7,500

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September, 2015
160950269

Stantec

Legend

- Project Study Area
- Interconnector Study Area
- 120m Zone of Investigation

Zone of Investigation Adjustments

- Area Added
- Area Removed
- Proposed Turbine Location
- Turbine Relocated
- Turbine Blade Length
- Tap-in Location
- Junction Box
- Proposed Culvert
- Temporary Laydown Area
- Collector Lines - Underground or Overhead
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area
- Potential Construction Laydown Area
- Transformer Substation
- Unevaluated Wetland (NPCA)
- Woodland (MNR)
- Provincially Significant Wetland (MNR)
- Other/Locally Significant Wetland (MNR)
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- Niagara Escarpment

Notes

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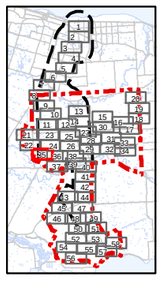
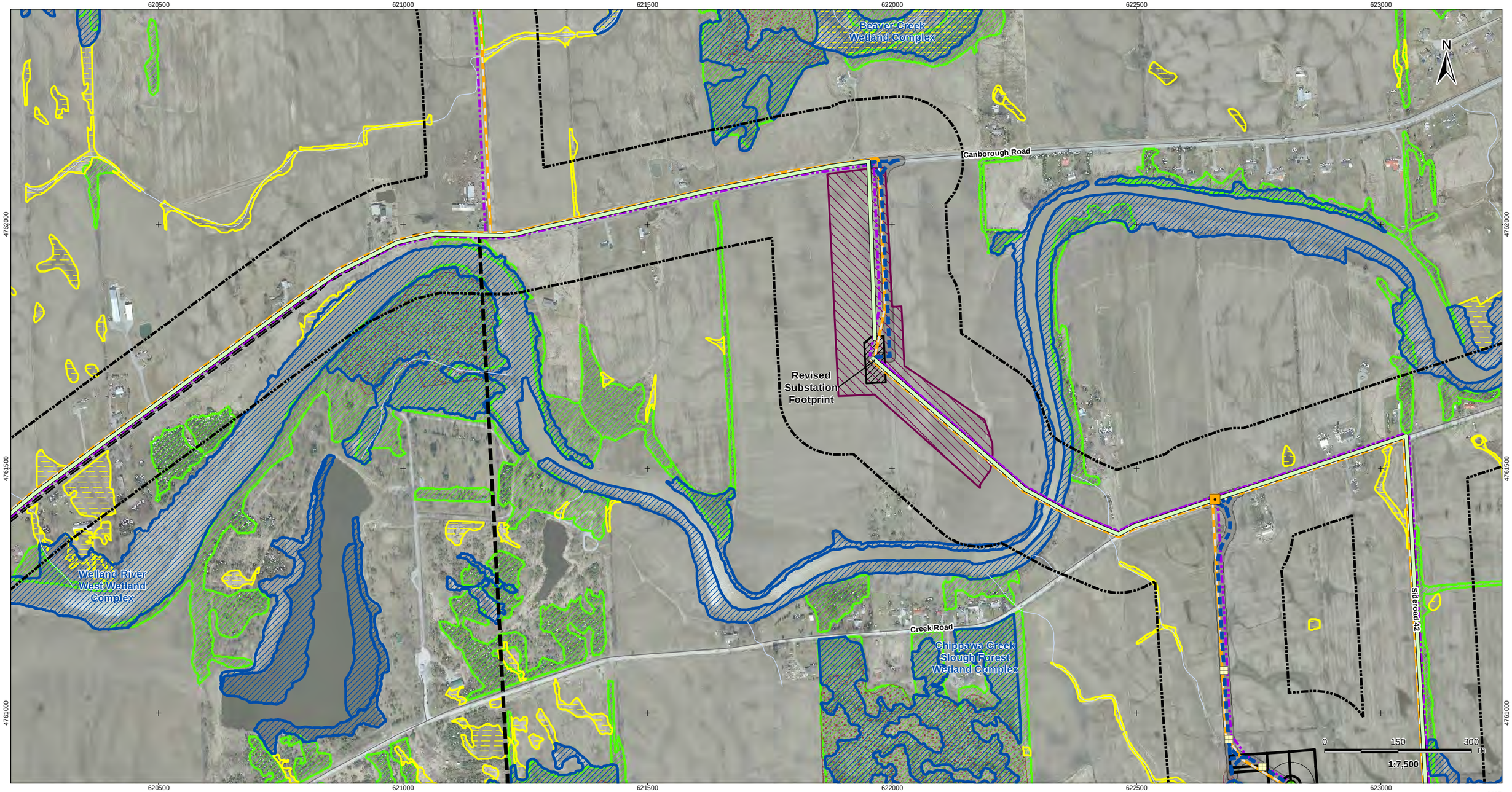


Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
2.35

Title
Records Review - Natural Features Figure 2.35 Revised



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Stantec

Legend

- Project Study Area
- Interconnector Study Area
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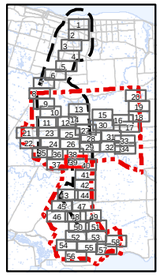
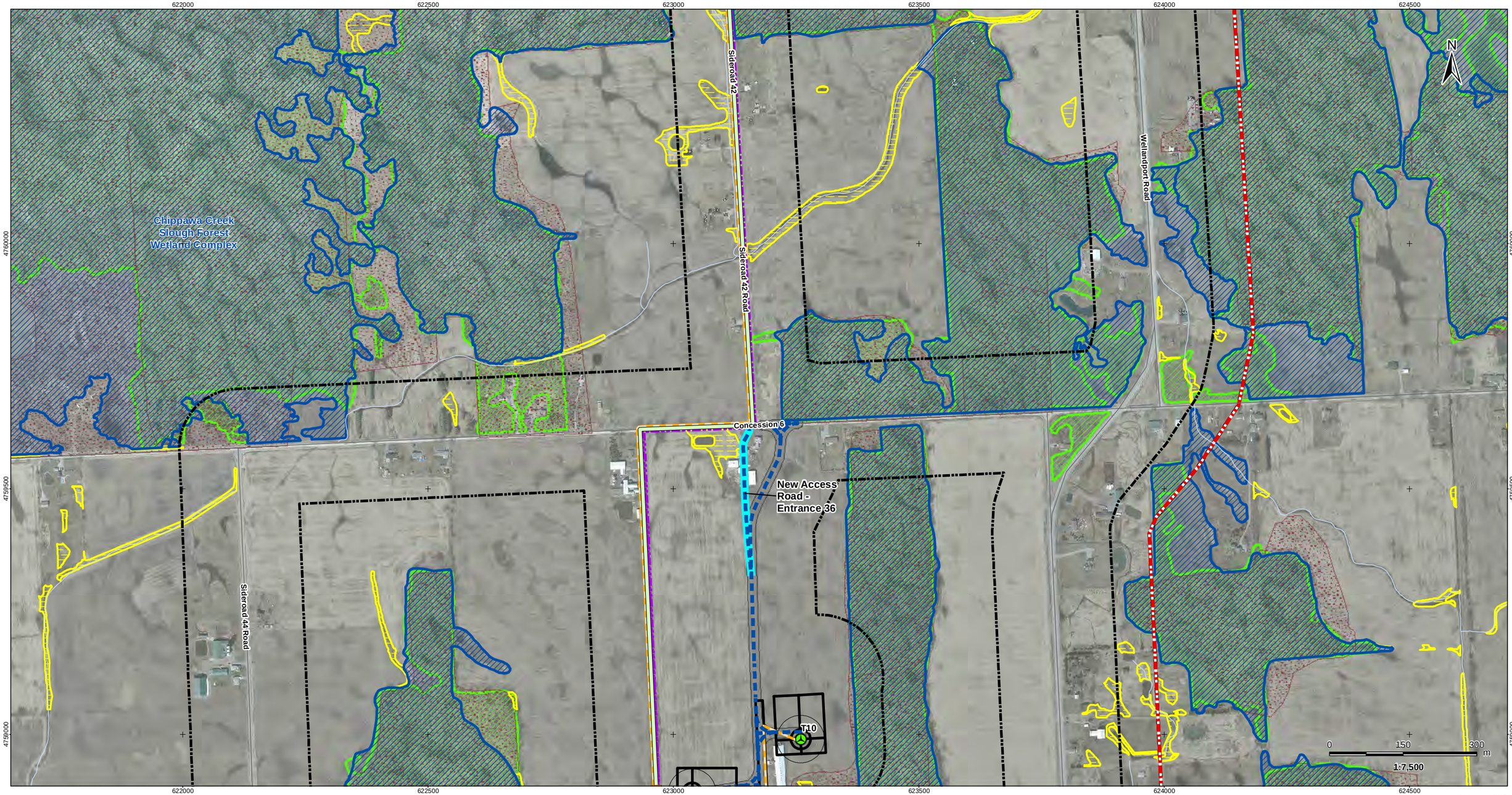


Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
2.39

Title
Records Review - Natural Features Figure 2.39 Revised



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160950269

Stantec

Legend

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Zone of Investigation Adjustments

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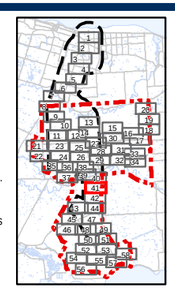

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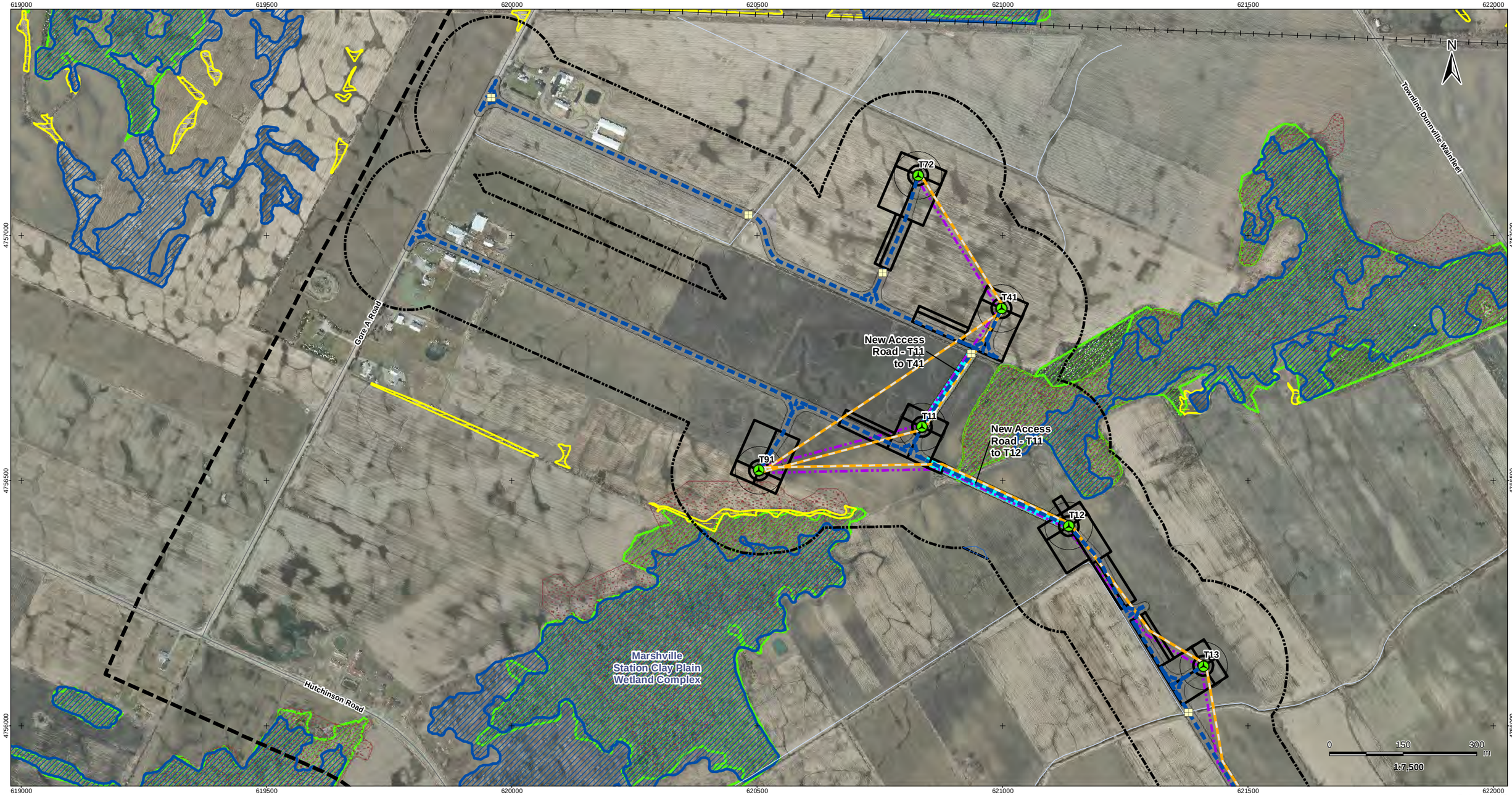
FWRN LP
Natural Heritage Assessment Report

Figure No.
2.41

Title
Records Review - Natural Features Figure 2.41 Revised



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September, 2015
160950269

Stantec

Legend

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- Interconnector Study Area
- 120m Zone of Investigation

Zone of Investigation Adjustments

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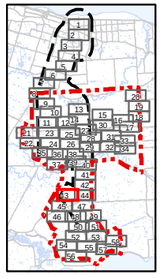

Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
2.43

Title
Records Review - Natural Features Figure 2.43 Revised

620500 621000 621500 622000 622500 623000

4754000 4753500 4753000

N

Jenny Jump Road

Ellsworth Drain Woodlots

T84

Winger, ANSI, Earth Science, Provincially Significant

New Access Road - Entrance 46

East of Dunnville Woodlots

Booker Road

0 150 300 m

1:7,500

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160950269

Legend

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Figure No.
2.48

Title
Records Review - Natural Features Figure 2.48 Revised

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September, 2015
160950269

Stantec

Legend

- Project Study Area
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- 120m Zone of Investigation

Zone of Investigation Adjustments

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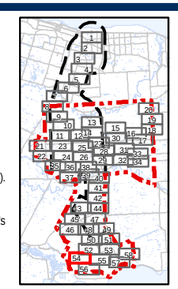

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Figure No.
2.54

Title
Records Review - Natural Features Figure 2.54 Revised

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September, 2015
160950269

Legend

- Interconnector Study Area
- Zone of Investigation Adjustments
- Area Added
- ELC Boundary
- Tap-in Location
- Preferred Transmission Line Route
- Potential Access Road
- Access Road 20m Construction Area
- Transformer Substation

Notes

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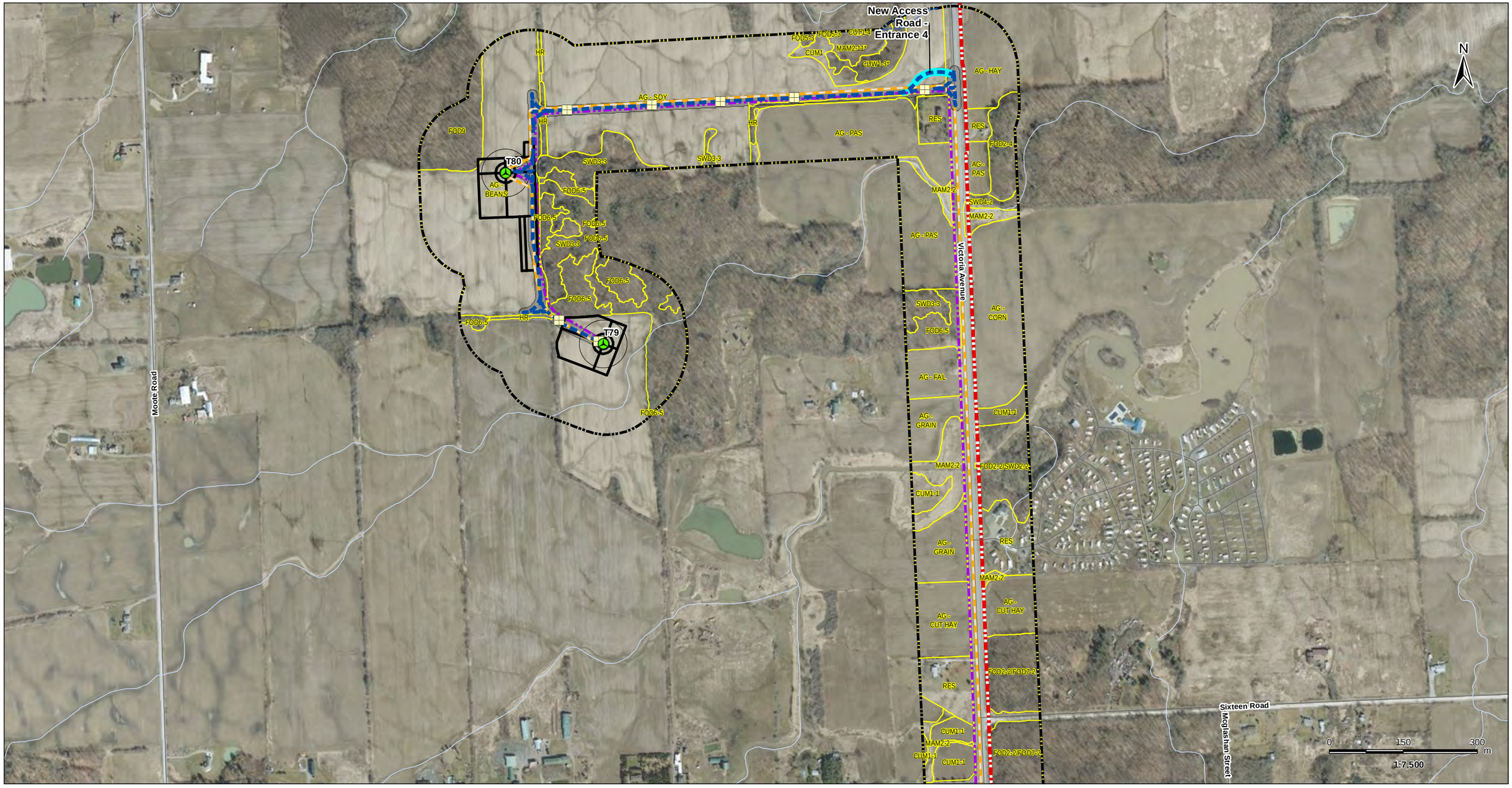
Natural Heritage Assessment Report

Figure No.
3.1

Title
ELC Vegetation Communities - Figure 3.1 Revised



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September, 2015
160950269

Legend

- Project Study Area
- Zone of Investigation Adjustments
  - Area Added
  - ELC Boundary
- Proposed Turbine Location
- Turbine Blade Length
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- Access Road 20m Construction Area

Notes

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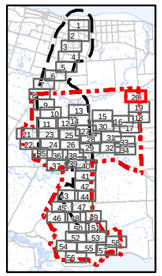

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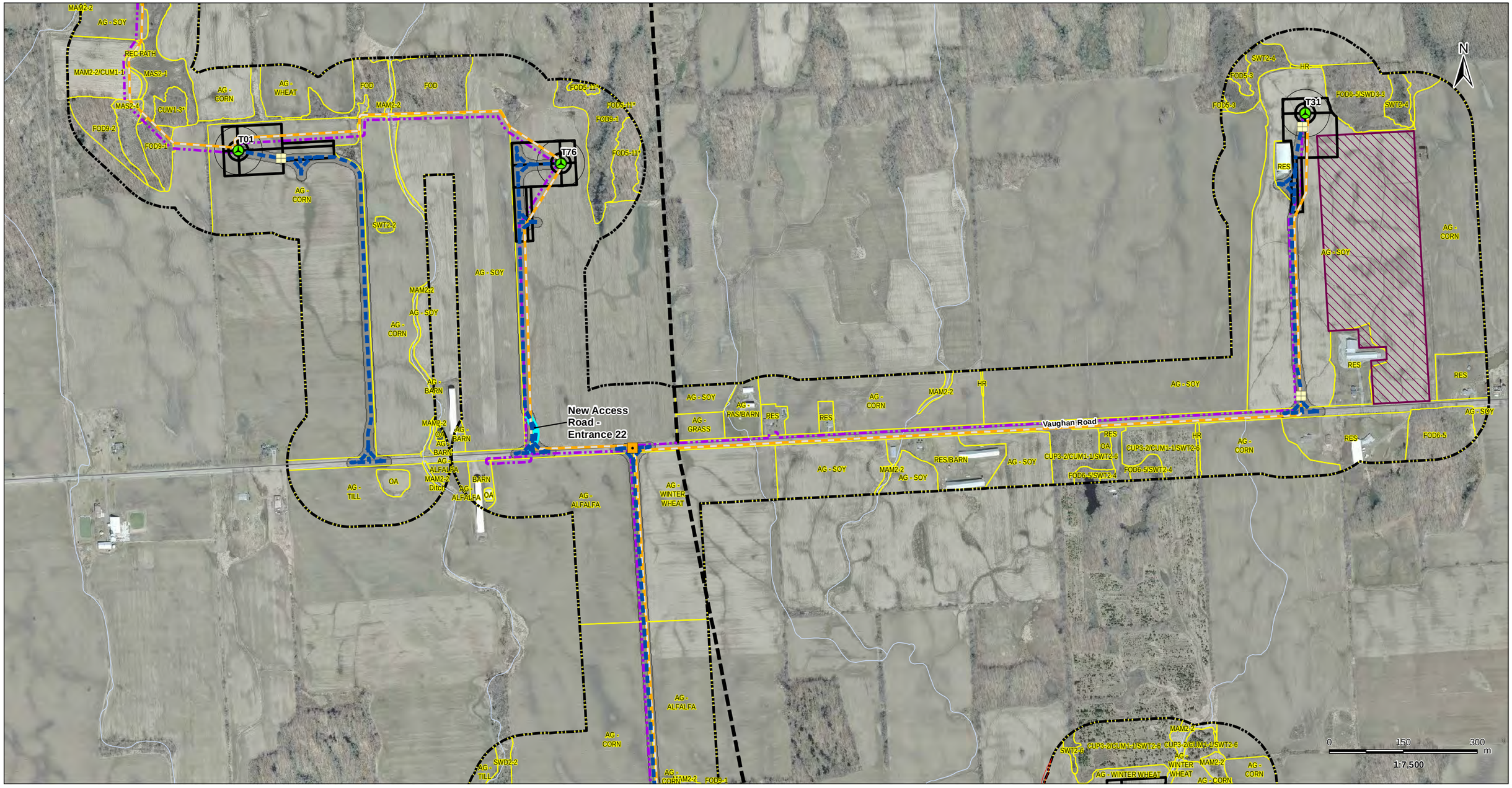
FWRN LP
Natural Heritage Assessment Report

Figure No.
3.20

Title
ELC Vegetation Communities - Figure 3.20 Revised



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160950269

Stantec

Legend

- Project Study Area
- Interconnector Study Area
- Zone of Investigation Adjustments
- Area Removed
- ELC Boundary
- Proposed Turbine Location
- Turbine Blade Length
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- Access Road 20m Construction Area
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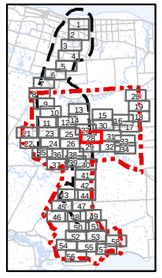

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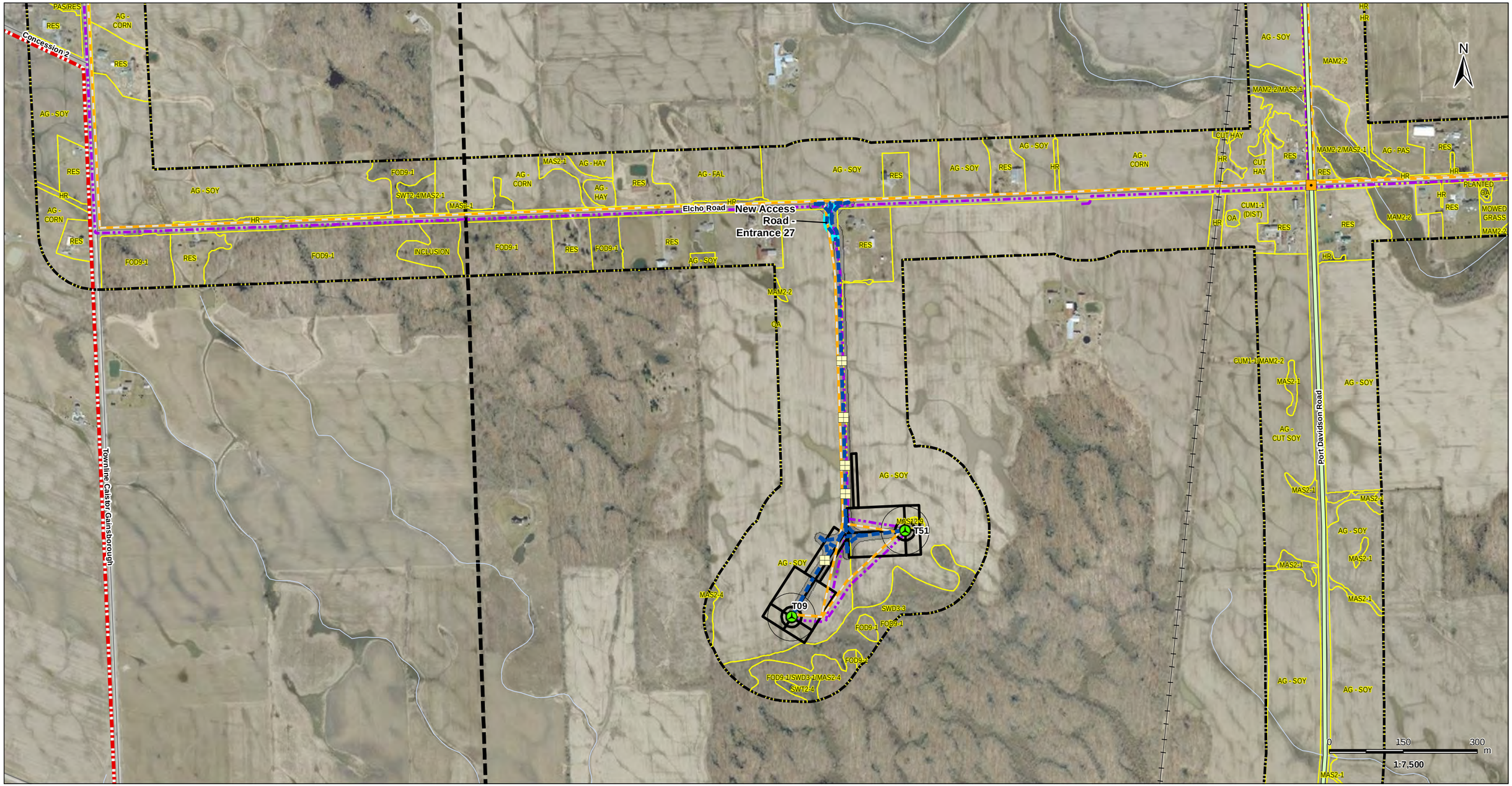
Figure No.
3.28

Title
ELC Vegetation Communities - Figure 3.28 Revised



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Stantec

Legend

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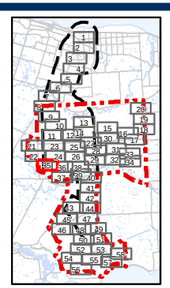

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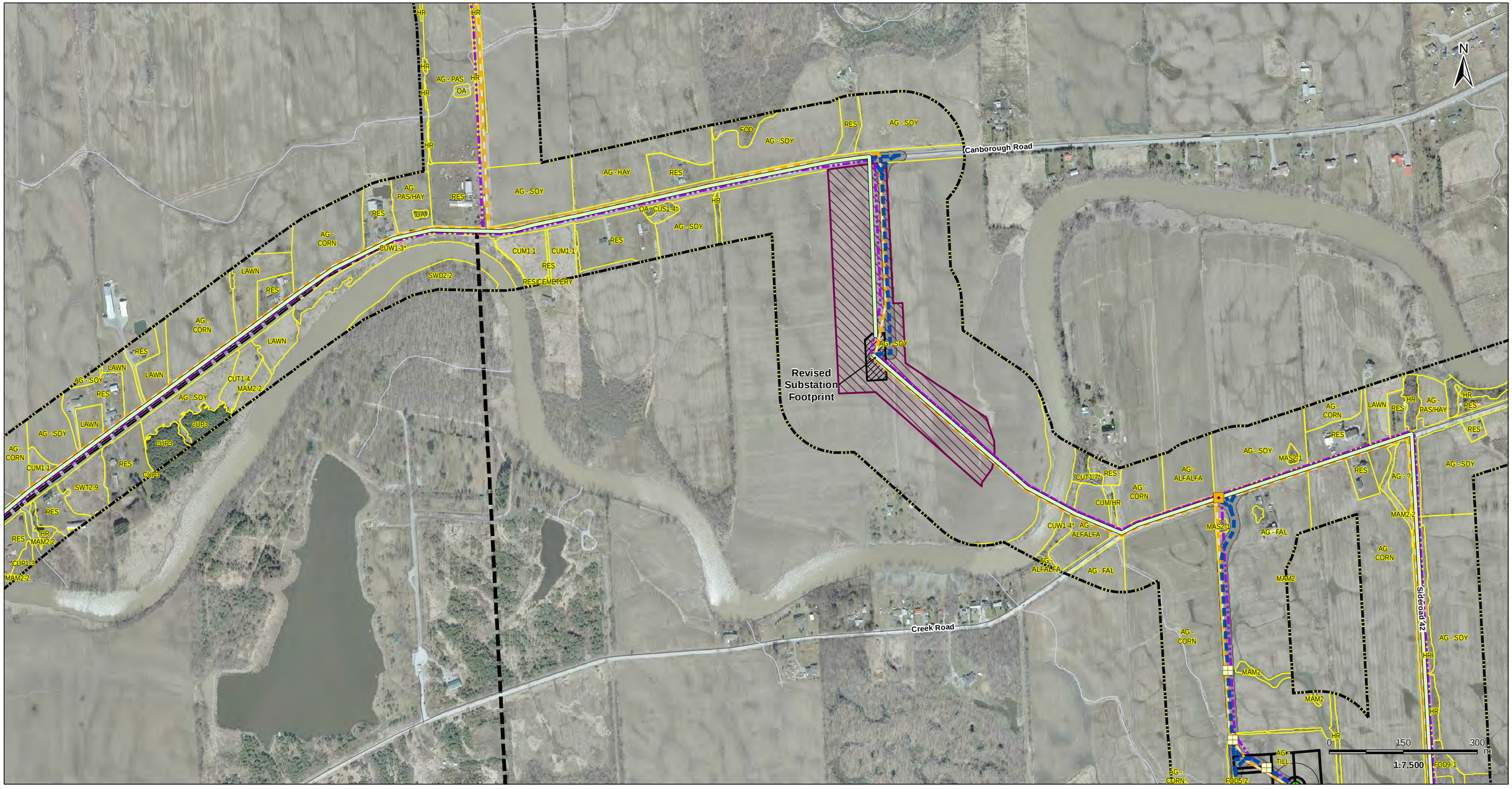
FWRN LP
Natural Heritage Assessment Report

Figure No.
3.35

Title
ELC Vegetation Communities - Figure 3.35 Revised



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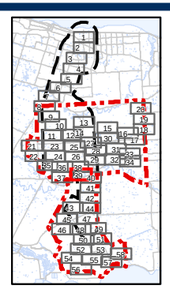

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Figure No.
3.39

Title
ELC Vegetation Communities - Figure 3.39 Revised

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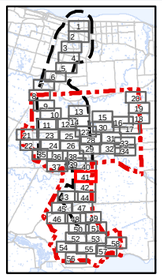

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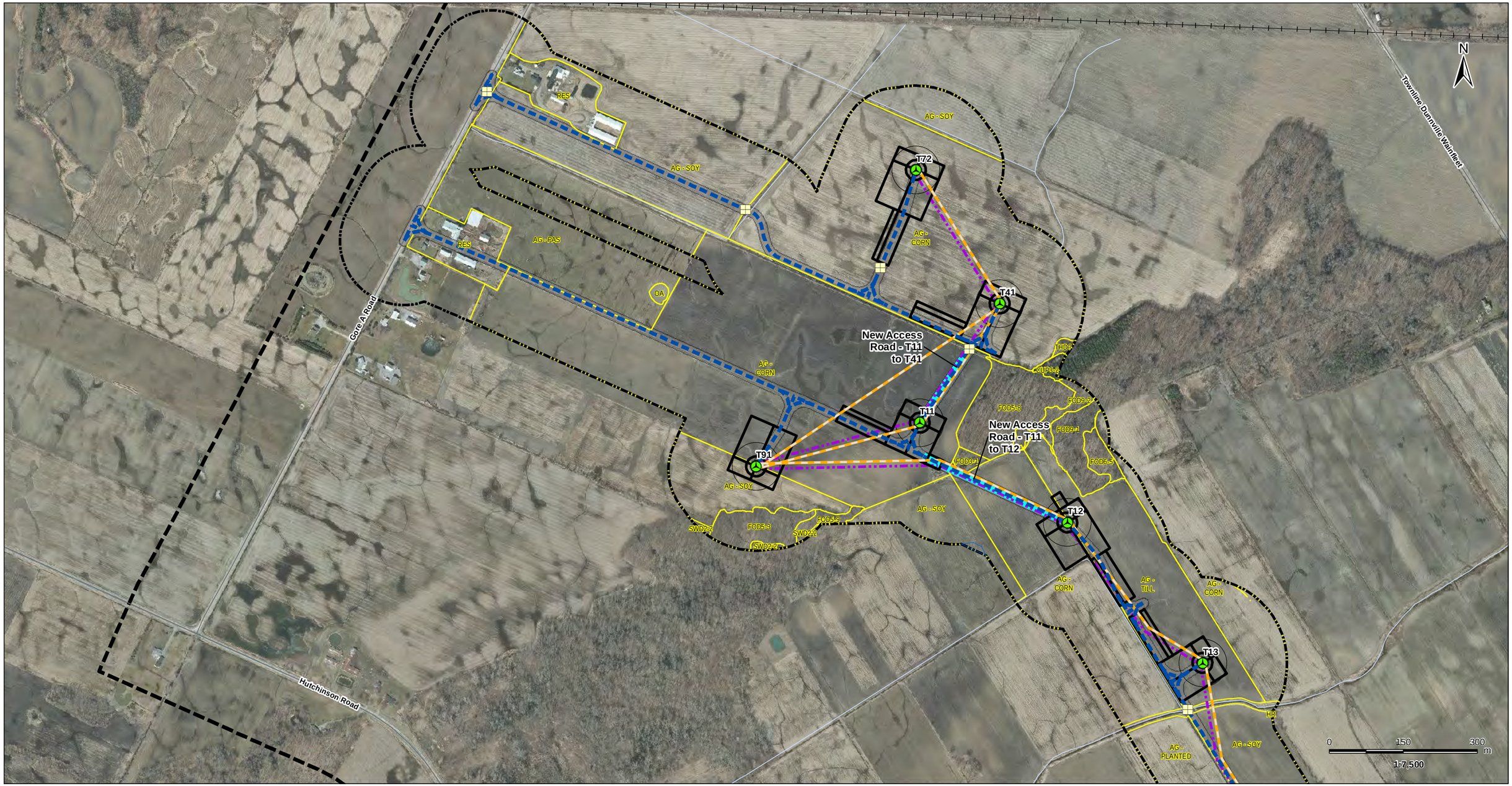
Natural Heritage Assessment Report

Figure No.
3.41

Title
ELC Vegetation Communities - Figure 3.41 Revised



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160950269

Stantec

Legend

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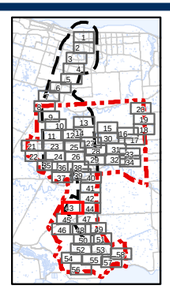

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FWRN LP
Natural Heritage Assessment Report

Figure No.
3.43

Title
ELC Vegetation Communities - Figure 3.43 Revised

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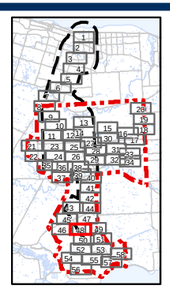

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Figure No.
3.48

Title
ELC Vegetation Communities - Figure 3.48 Revised

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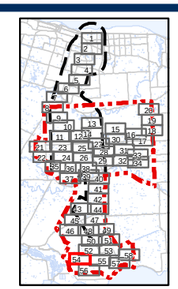

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Figure No.
3.54

Title
ELC Vegetation Communities - Figure 3.54 Revised

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Revised: 2015-09-21 By: bcowper

September, 2015
160950269

Stantec

Legend

- Interconnector Study Area
- Zone of Investigation Adjustments
- Area Added
- Tap-in Location
- Preferred Transmission Line Route
- Potential Access Road
- Access Road 20m Construction Area
- Transformer Substation

Notes

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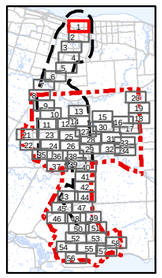

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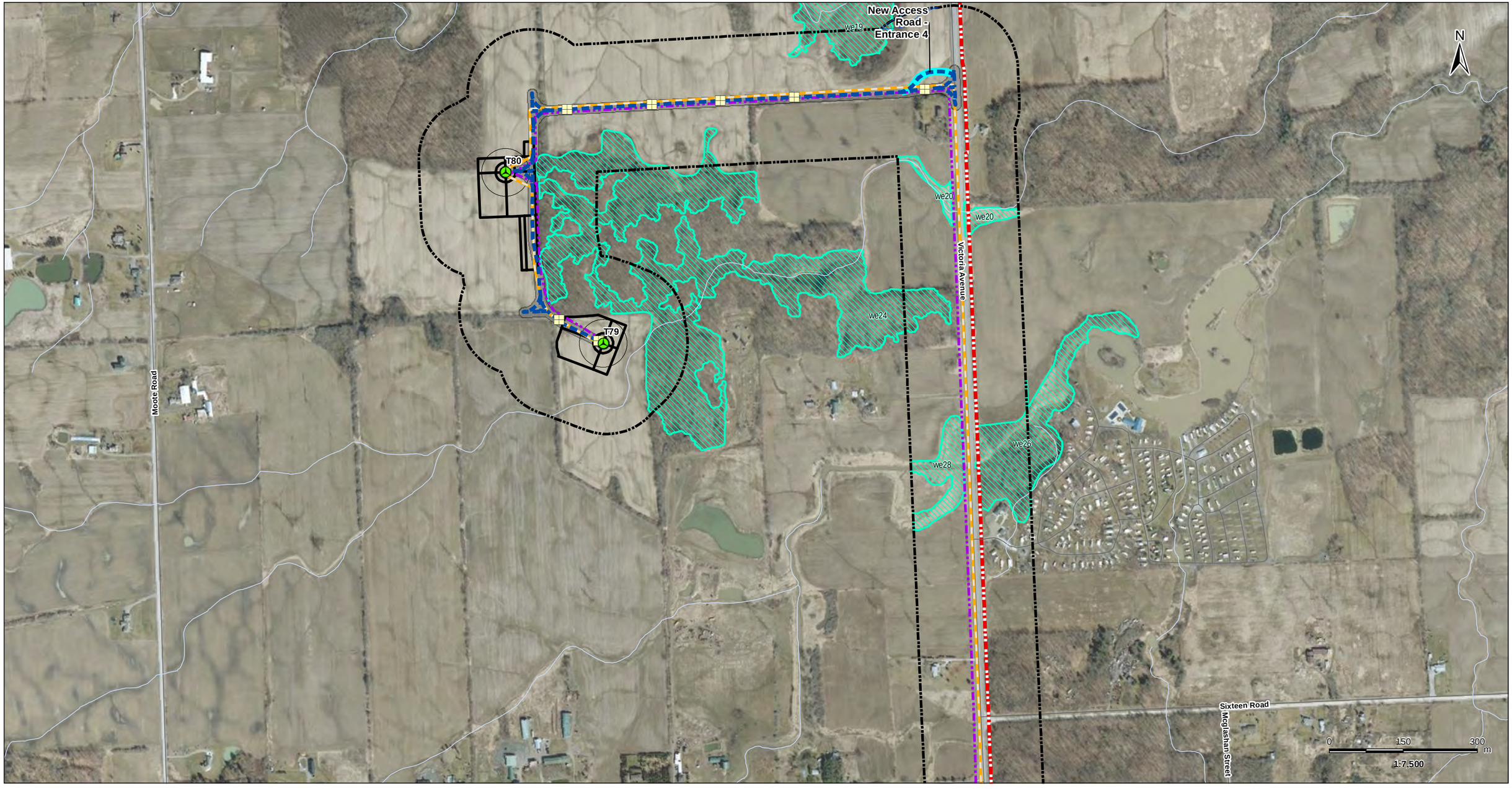
FWRN LP
Natural Heritage Assessment Report

Figure No.
4.1

Title
Wetland Communities
Figure 4.1
Revised



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Revised: 2015-09-22 By: bcowper

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160950269

Stantec

Legend

- Project Study Area
- Zone of Investigation Adjustments
- Area Added
- Proposed Turbine Location
- Turbine Blade Length
- Proposed Culvert
- Temporary Laydown Area
- Collector Lines – Underground or Overhead
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area
- Wetland Communities

Notes

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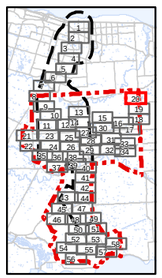

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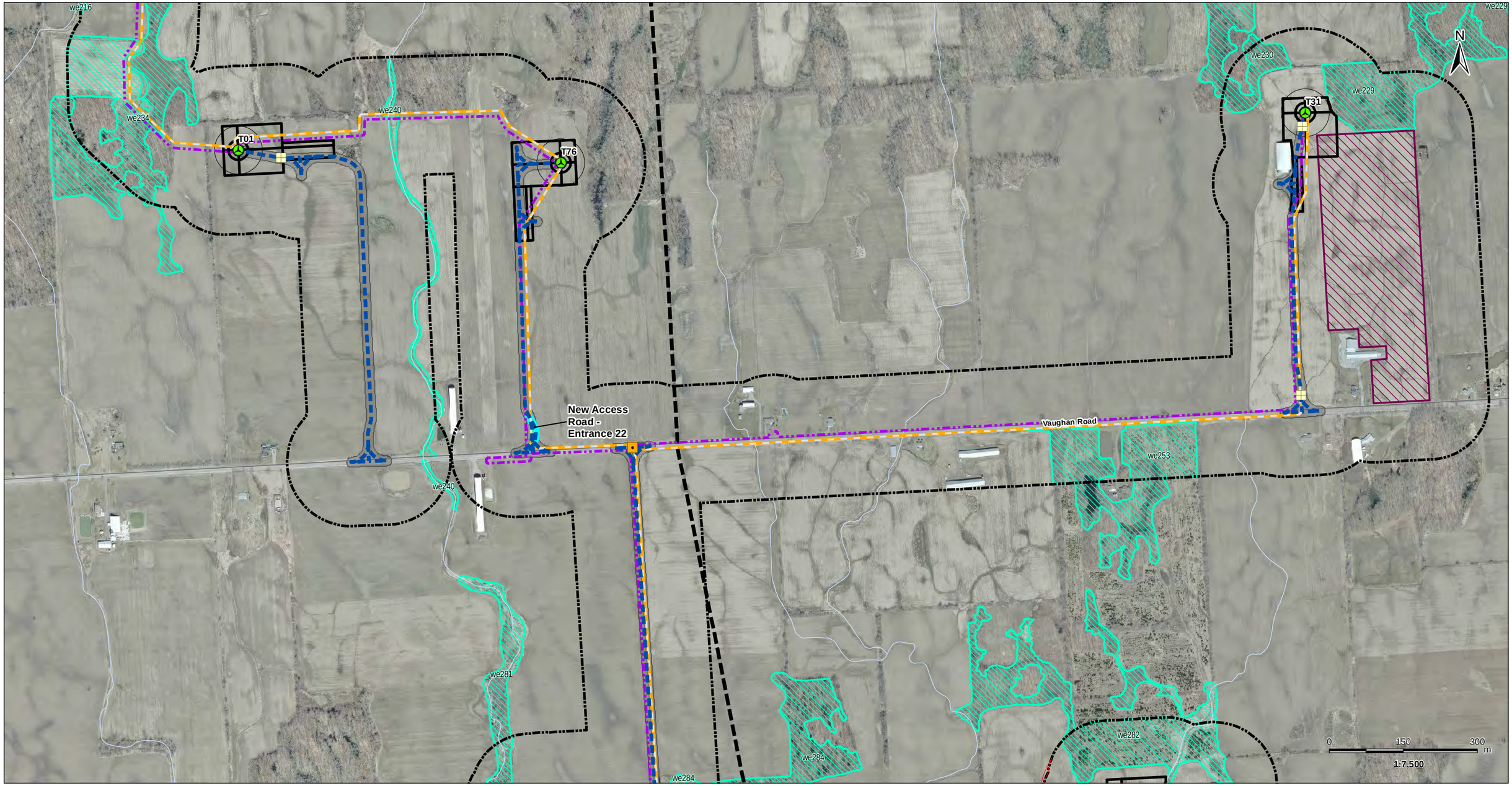
FWRN LP
Natural Heritage Assessment Report

Figure No.
4.20

Title
Wetland Communities
Figure 4.20
Revised



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Revised: 2015-09-21 By: bcowper

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160950269

Stantec

Legend

- Project Study Area
- Interconnector Study Area
- Zone of Investigation Adjustments
- Area Removed
- Proposed Turbine Location
- Turbine Blade Length
- Junction Box
- Proposed Culvert
- Temporary Laydown Area
- Collector Lines – Underground or Overhead
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area
- Potential Construction Laydown Area
- Wetland Communities

Notes

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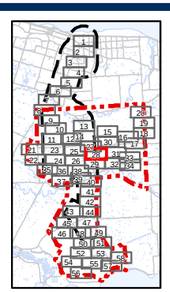

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Natural Heritage Assessment Report

Figure No.
4.28

Title
Wetland Communities
Figure 4.28
Revised

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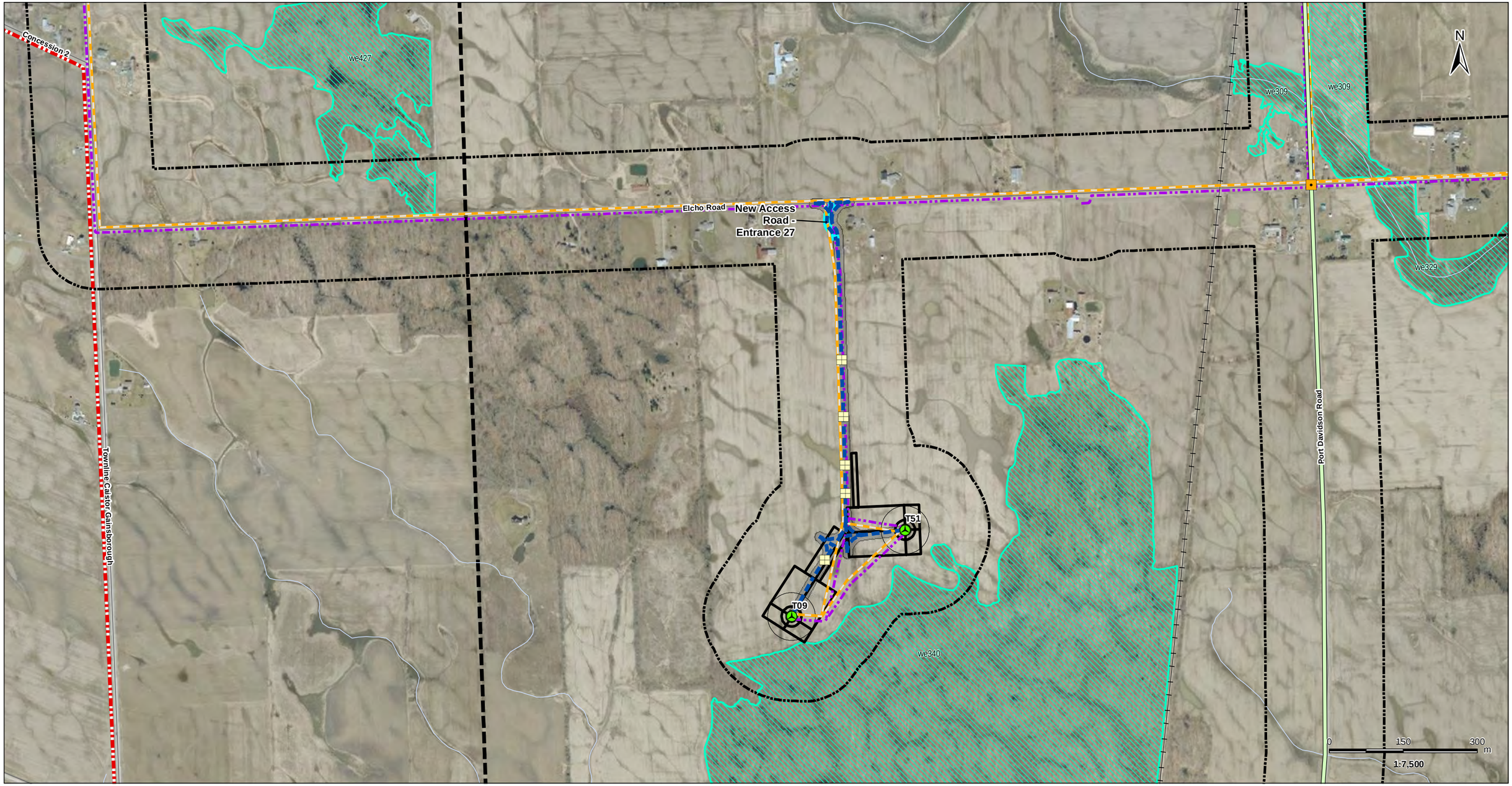

September, 2015
160950269

Stantec

Legend

- Project Study Area
- Interconnector Study Area
- Proposed Turbine Location
- Turbine Blade Length
- Junction Box
- Proposed Culvert
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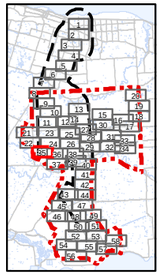

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FWRN LP
Natural Heritage Assessment Report

Figure No.
4.35

Title
Wetland Communities
Figure 4.35
Revised

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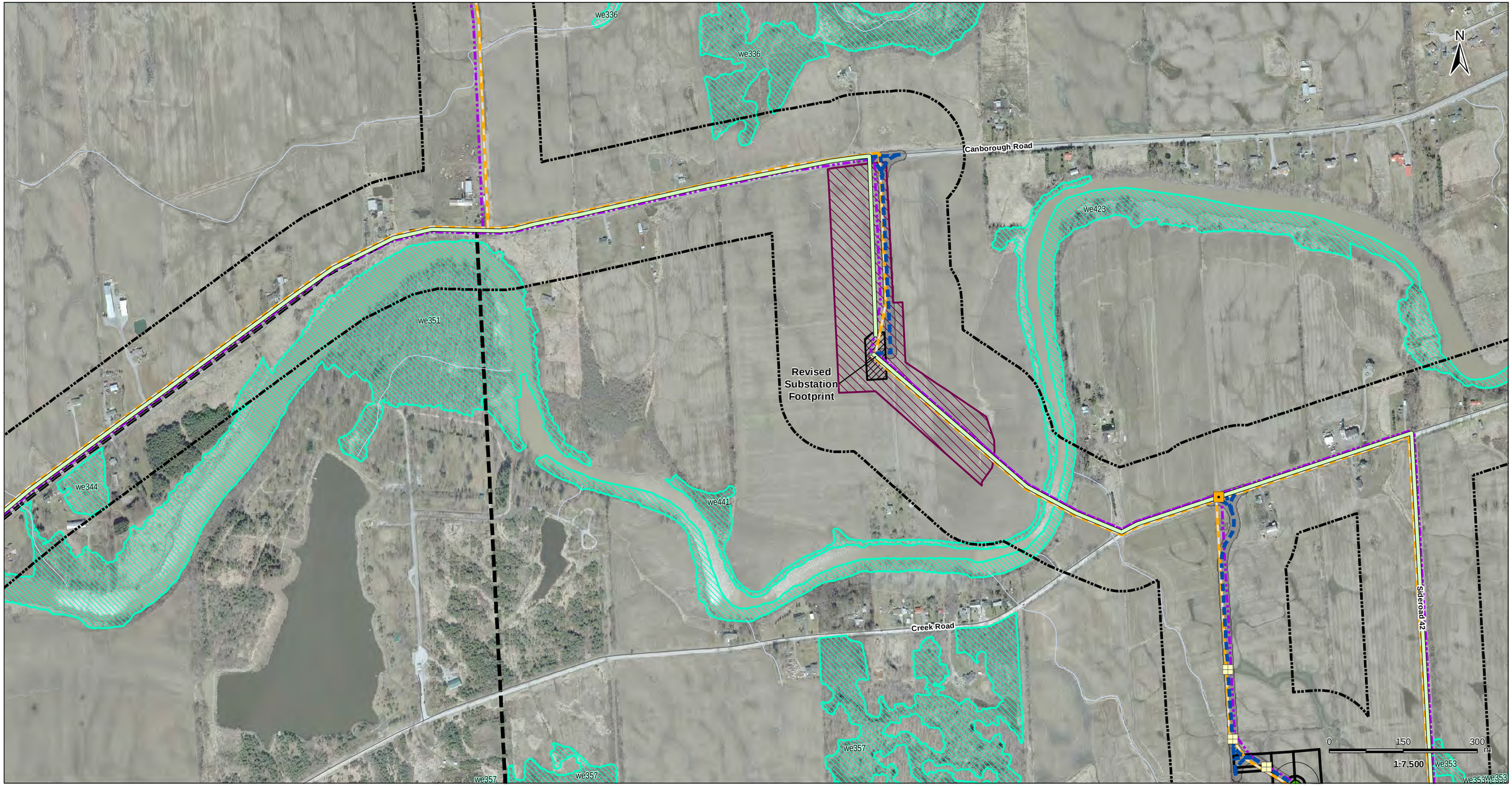

September, 2015
160950269

Legend

- Project Study Area
- Interconnector Study Area
- Proposed Turbine Location
- Turbine Blade Length
- Junction Box
- Proposed Culvert
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Notes

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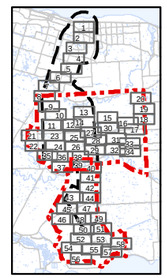

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Figure No.
4.39

Title
Wetland Communities
Figure 4.39
Revised

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160950269

Legend

- Project Study Area
- Interconnector Study Area
- Proposed Turbine Location
- Turbine Blade Length
- Junction Box
- Preferred Transmission Line Route
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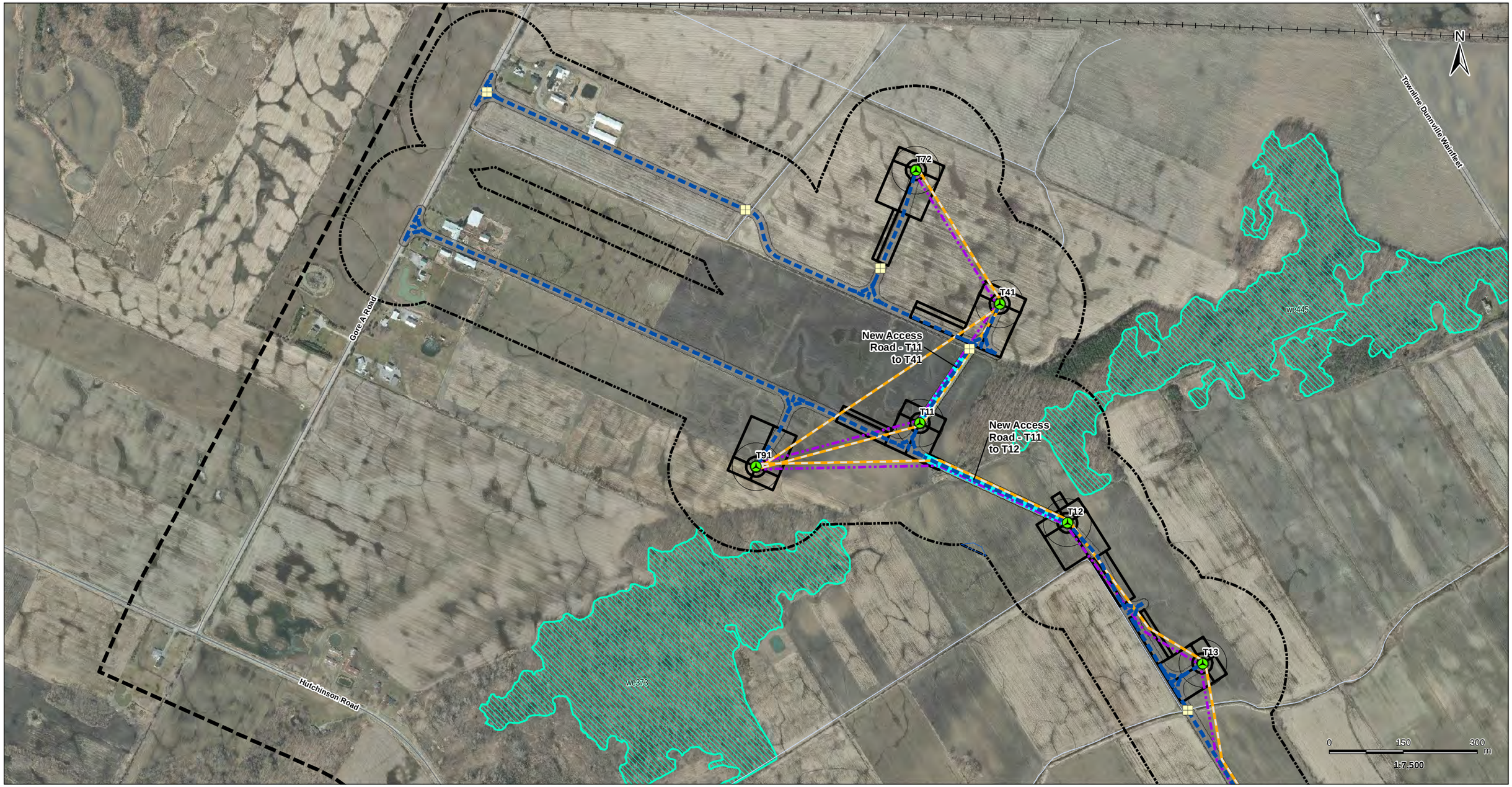
FWRN LP
Natural Heritage Assessment Report

Figure No.
4.41

Title
Wetland Communities
Figure 4.41
Revised



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160950269

Stantec

Legend

- Project Study Area
- Interconnector Study Area
- Zone of Investigation Adjustments
- Area Added
- Proposed Turbine Location
- Turbine Blade Length
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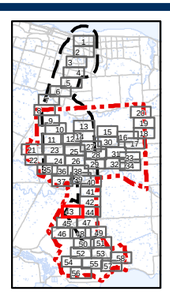

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Figure No.
4.43

Title
Wetland Communities
Figure 4.43
Revised

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Revised: 2015-09-21 By: bcolwyer

September, 2015
160950269

Legend

- Project Study Area
- Interconnector Study Area
- Proposed Turbine Location
- Turbine Blade Length
- Proposed Culvert
- Temporary Laydown Area
- Collector Lines – Underground or Overhead
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area
- Wetland Communities

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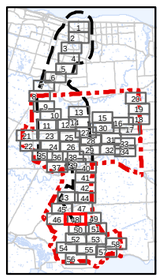

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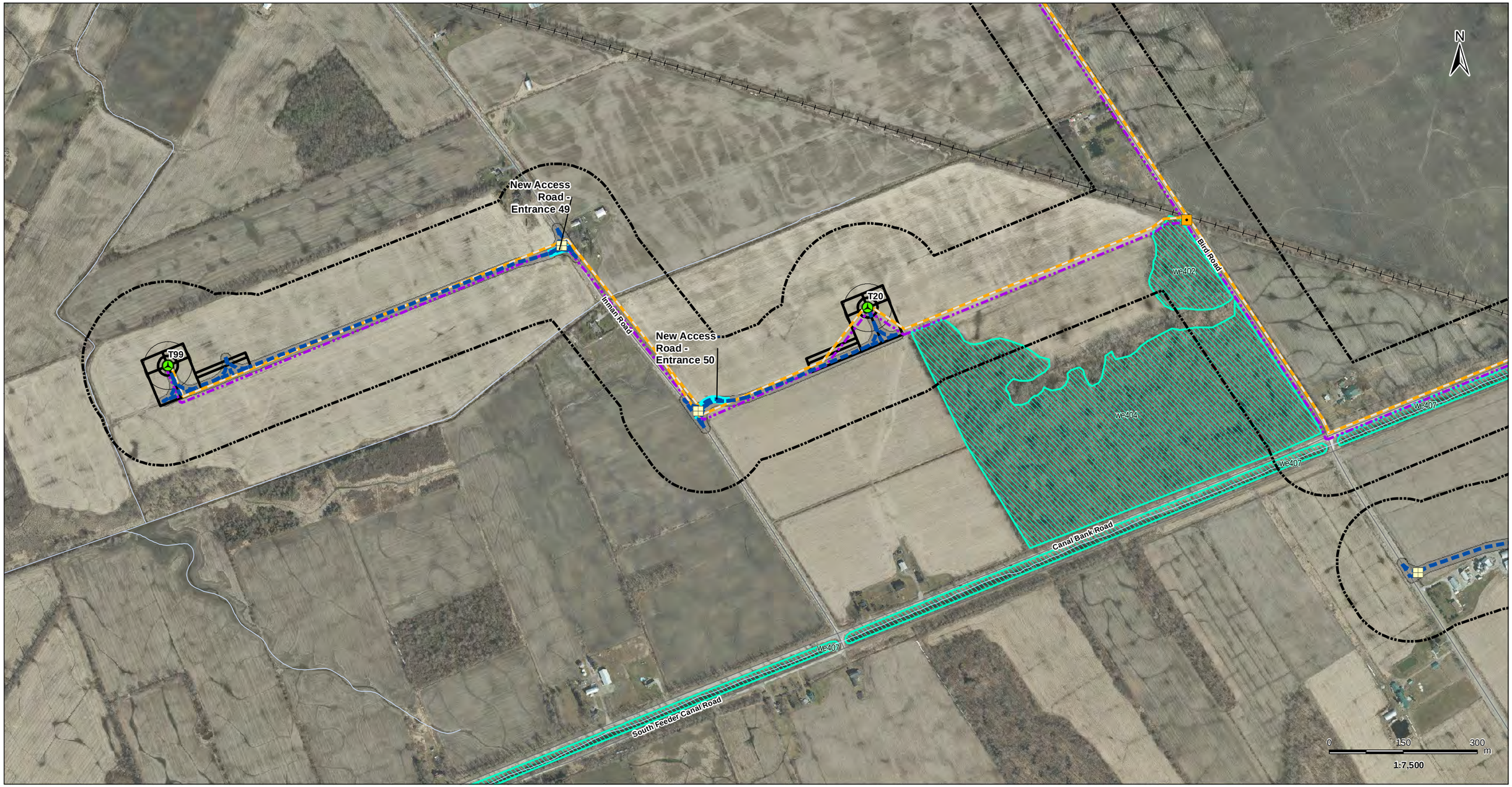
Figure No.
4.48

Title
Wetland Communities
Figure 4.48
Revised



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Revised: 2015-09-21 By: bcowper

September, 2015
160950269

Stantec

Legend

- Project Study Area
- Zone of Investigation Adjustments
- Area Added
- Proposed Turbine Location
- Turbine Blade Length
- Junction Box
- Proposed Culvert
- Temporary Laydown Area
- Collector Lines – Underground or Overhead
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area
- Wetland Communities

Notes

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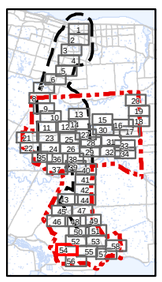

Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
4.54

Title
Wetland Communities
Figure 4.54
Revised

621000 621500 622000 622500 623000 623500

North Service Road
QEW Highway
South Service Road
Andrewes Court
Durham Road
Iroquois Trail
Main Street East
Vinatera Drive
Chardonnay Place
King Street
Thirty Road
Mountainview Road
Greenlane
Lincoln Avenue
St Volodymyr Court
Cedarbrook Lane
Meadowview Boulevard
Revised Interconnector Footprint
WO1

N

0 150 300 m
1:7,500

4782500
4782000
4781500

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Revised: 2015-09-21 By: bcowper

September, 2015
160950269

Stantec

Legend

- Interconnector Study Area
- 120m Zone of Investigation
- Zone of Investigation Adjustments
- Area Added
- Tap-in Location
- Preferred Transmission Line Route (Modification)
- Potential Access Road
- Access Road 20m Construction Area
- Transformer Substation
- Woodland Communities
- MNR Wooded Area

Notes

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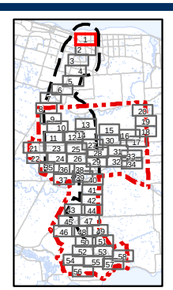
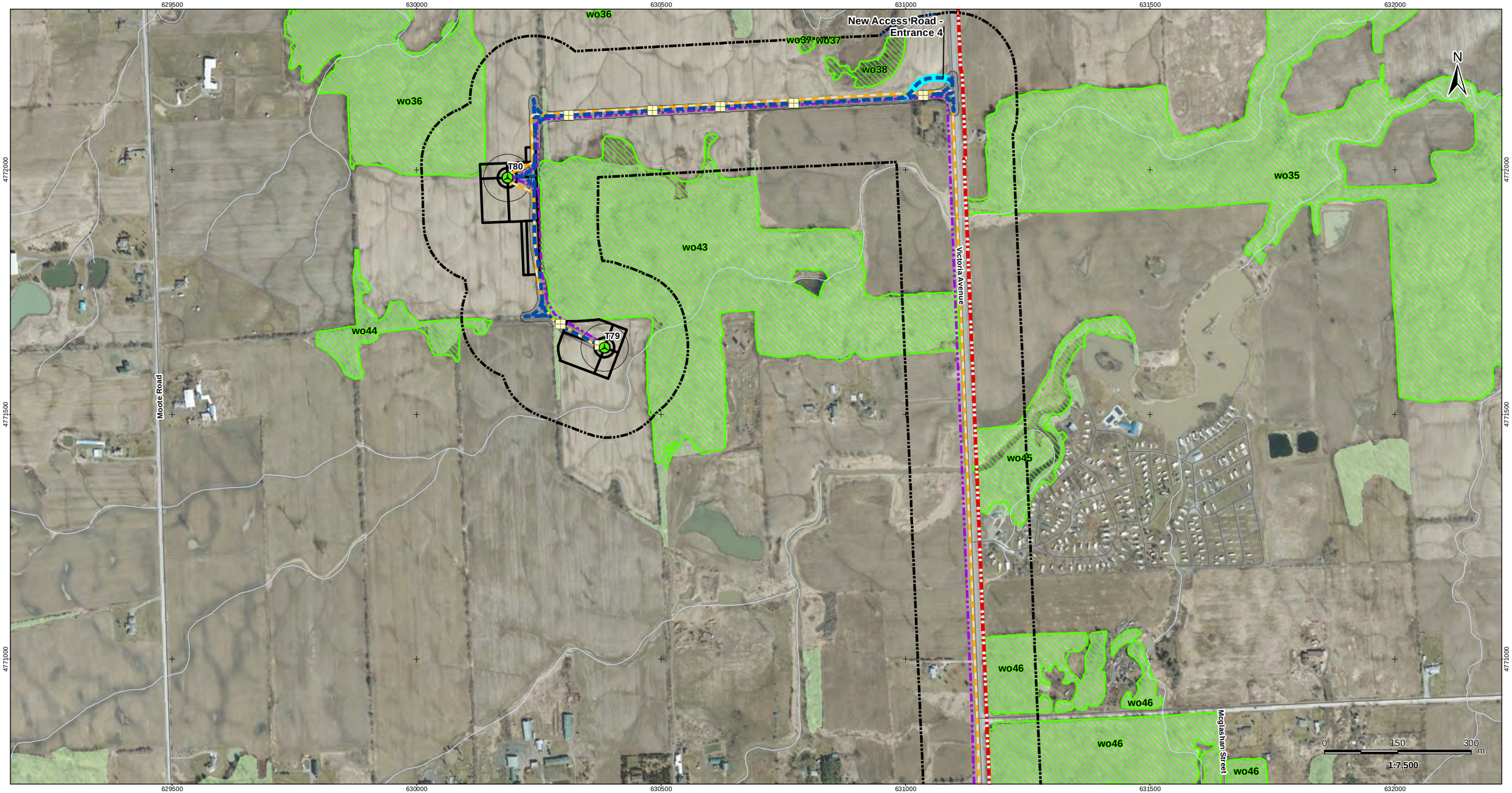


Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
5.1

Title
Woodland Communities
Figure 5.1
Revised



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September, 2015
160950269

Stantec

Legend

- Project Study Area
- 120m Zone of Investigation
- Zone of Investigation Adjustments
- Area Added
- Proposed Turbine Location
- Turbine Blade Length
- Proposed Culvert
- Temporary Laydown Area
- Collector Lines – Underground or Overhead
- Potential Access Road
- Access Road 20m Construction Area
- Fibre Optic Line
- Woodland Communities
- MNR Wooded Area

Notes

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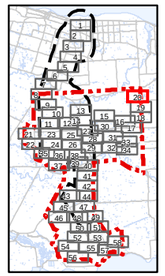

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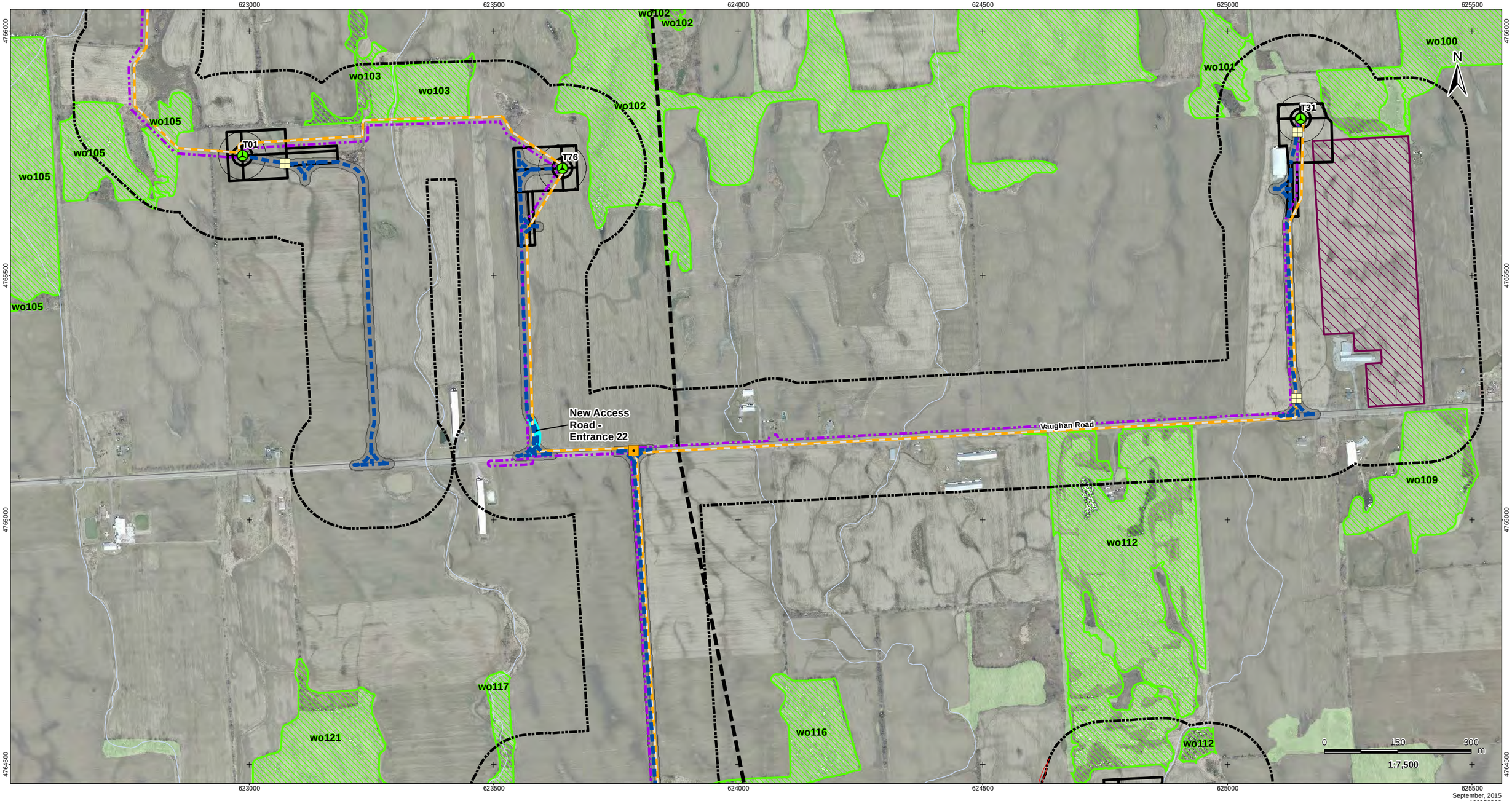
Natural Heritage Assessment Report

Figure No.
5.20

Title
Woodland Communities
Figure 5.20
Revised



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September, 2015
160950269

Legend

- Project Study Area
- Interconnector Study Area
- 120m Zone of Investigation
- Zone of Investigation Adjustments
- Area Removed
- Proposed Turbine Location
- Turbine Blade Length
- Junction Box
- Proposed Culvert
- Temporary Laydown Area
- Collector Lines – Underground or Overhead
- Potential Access Road
- Access Road 20m Construction Area
- Fibre Optic Line
- Potential Construction Laydown Area
- Woodland Communities
- MNR Wooded Area

Notes

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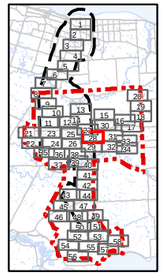

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FWRN LP
Natural Heritage Assessment Report

Figure No.
5.28

Title
Woodland Communities
Figure 5.28
Revised

615500 616000 616500 617000 617500 618000

4763500 4763000 4762500

Concession 2

Townline Caistor Gainsborough

Elcho Road

Port Davidson Road

New Access Road - Entrance 27

wo218

wo216

wo217

wo142

wo136

T51

T09

N

0 150 300 m

1:7,500

615500 616000 616500 617000 617500 618000

September, 2015
160950269

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Stantec

Legend

- Project Study Area
- Interconnector Study Area
- 120m Zone of Investigation
- Proposed Turbine Location
- Turbine Blade Length
- Junction Box
- Proposed Culvert
- Preferred Transmission Line Route (Modification)
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Notes

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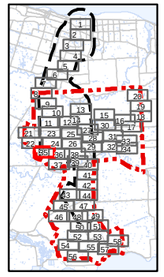

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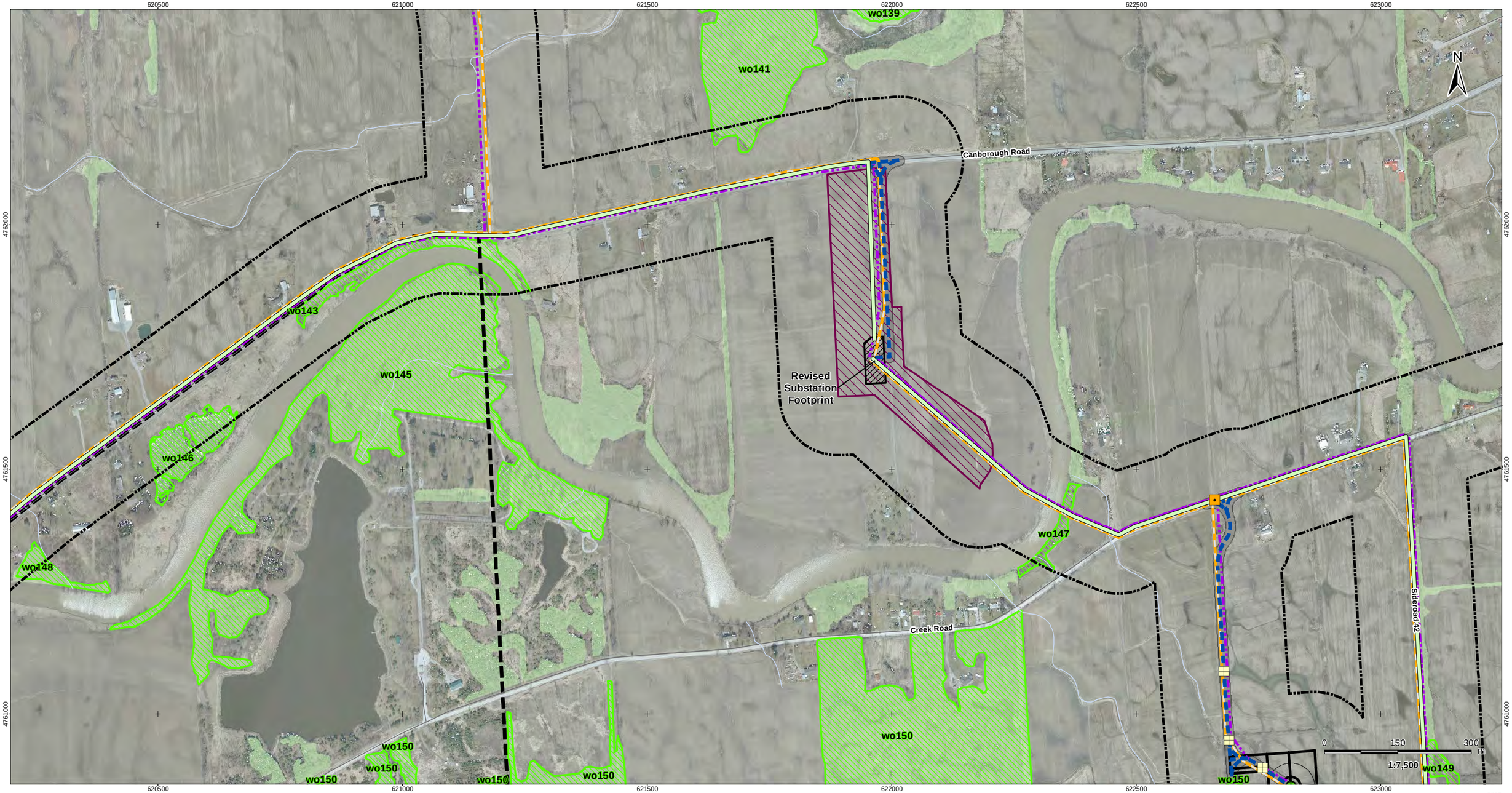
Natural Heritage Assessment Report

Figure No.
5.35

Title
Woodland Communities
Figure 5.35
Revised



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September, 2015
160950269

Stantec

Legend

- Project Study Area
- Interconnector Study Area
- 120m Zone of Investigation
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Notes

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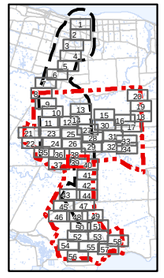

Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
5.39

Title
Woodland Communities
Figure 5.39
Revised

622000 622500 623000 623500 624000 624500

4760000 4759500 4759000

wo150 wo149 wo149 wo149 wo199 wo199 wo199 wo151

Sideroad 42 Sideroad 42 Road Wellandport Road Concession 6 Sideroad 44 Road

New Access Road - Entrance 36

T10

N

0 150 300 m

1:7,500

622000 622500 623000 623500 624000 624500

4760000 4759500 4759000

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160950269

Stantec

Legend

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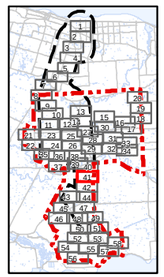

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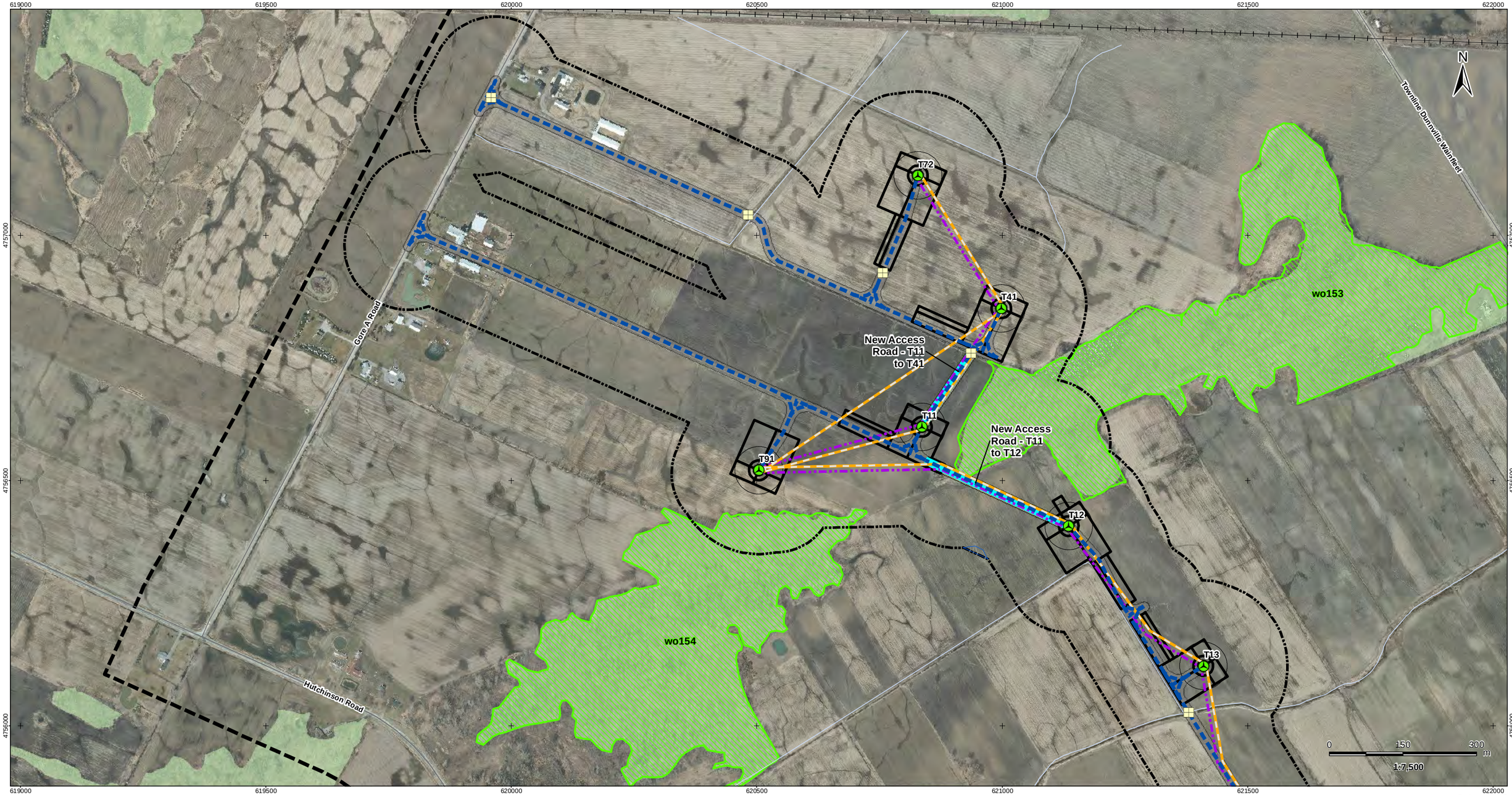
Figure No.
5.41

Title
Woodland Communities
Figure 5.41
Revised



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Legend

- Project Study Area
- Interconnector Study Area
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Notes

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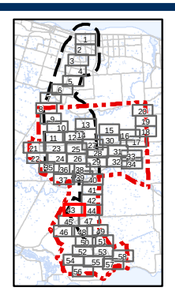
3. Orthoimagery source: First Base Solutions, Date Spring 2010.



Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
5.43

Title
Woodland Communities
Figure 5.43
Revised

620500 621000 621500 622000 622500 623000

4754000 4753500 4753000

Jenny Jump Road

wo172

wo172

wo178

T84

wo177

New Access Road - Entrance 46

wo177

wo177

wo177

wo179

Booker Road

N

0 150 300 m

1:7,500

620500 621000 621500 622000 622500 623000

September, 2015
160950269

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Revised: 2015-09-21 By: bcowper

Stantec

Legend

- Project Study Area
- Interconnector Study Area
- 120m Zone of Investigation
- Proposed Turbine Location
- Turbine Blade Length
- Proposed Culvert
- Temporary Laydown Area
- Collector Lines – Underground or Overhead
- Potential Access Road
- Access Road 20m Construction Area
- Fibre Optic Line
- Woodland Communities
- MNR Wooded Area

Notes

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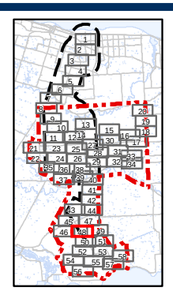

Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
5.48

Title
Woodland Communities
Figure 5.48
Revised

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Revised: 2015-09-21 By: bcowper

September, 2015
160950269

Stantec

Legend

- Project Study Area
- 120m Zone of Investigation
- Zone of Investigation Adjustments
- Area Added
- Proposed Turbine Location
- Turbine Blade Length
- Junction Box
- Proposed Culvert
- Temporary Laydown Area
- Collector Lines – Underground or Overhead
- Potential Access Road
- Access Road 20m Construction Area
- Fibre Optic Line
- Woodland Communities
- MNR Wooded Area

Notes

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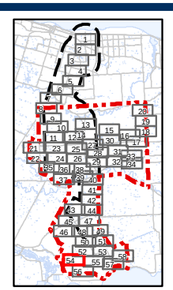
3. Orthoimagery source: First Base Solutions, Date Spring 2010.



Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
5.54

Title
Woodland Communities
Figure 5.54
Revised

North Service Road
QEW Highway
South Service Road
Andrewes Court
Durham Road
Iroquois Trail
Main Street East
Vinatera Drive
Chardonnay Place
King Street
Thirty Road
Mountainview Road
Greenlane
Lincoln Avenue
St Volodymyr Court
Cedarbrook Lane
Meadow Boulevard
Revised Interconnector Footprint
wo1
N
0 150 300 m
1:7,500

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Revised: 2015-09-21 By: bcowper

September, 2015
160950269

Stantec

Legend

- Interconnector Study Area
- 120m Zone of Investigation
- Zone of Investigation Adjustments
- Area Added
- Tap-in Location
- Preferred Transmission Line Route
- Potential Access Road
- Access Road 20m Construction Area
- Transformer Substation
- Woodland Communities
- Woodland Vole Habitat

Notes

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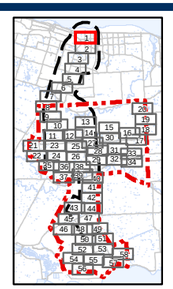
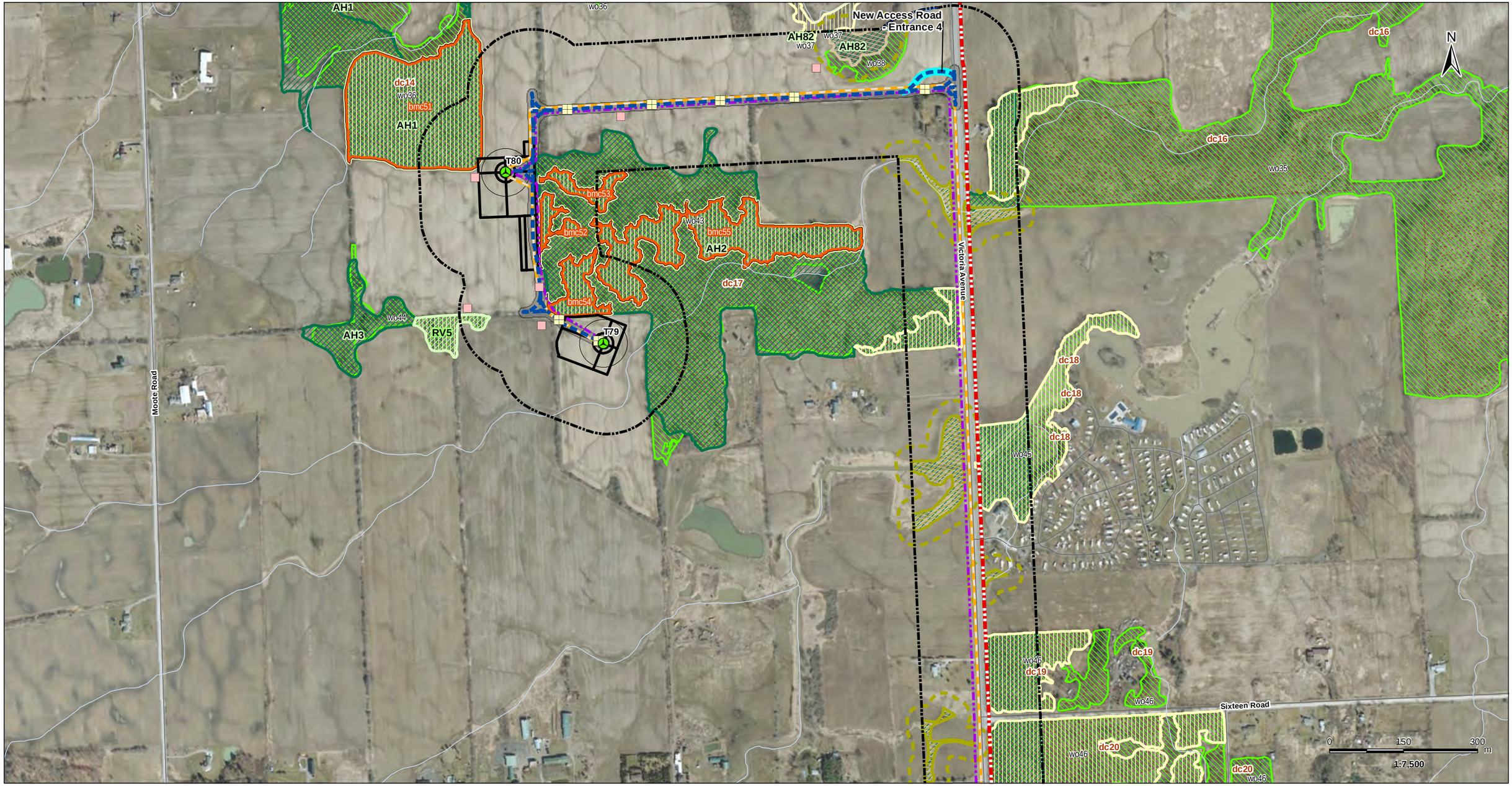


Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
6.1

Title
Candidate Significant Wildlife Habitat Figure 6.1 Revised



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Revised: 2015-09-21 By: bcowper

September, 2015
160950269

Legend

- Project Study Area
- 120m Zone of Investigation
- Zone of Investigation Adjustments
- Area Added
- Proposed Turbine Location
- Turbine Blade Length
- Proposed Culvert
- Temporary Laydown Area
- Collector Lines – Underground or Overhead
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area
- Amphibian Breeding Stations
- Woodland Communities
- Deer Congregation Areas (MNR)
- Other Rare Vegetation Community
- Amphibian Breeding Habitat
- Woodland Vole Habitat
- Terrestrial Crayfish Habitat
- Turtle Habitat 30m Buffer
- Bat Maternity Colonies

Notes

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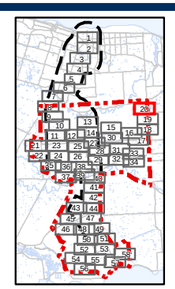

Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
6.20

Title
Candidate Significant Wildlife Habitat Figure 6.20 Revised

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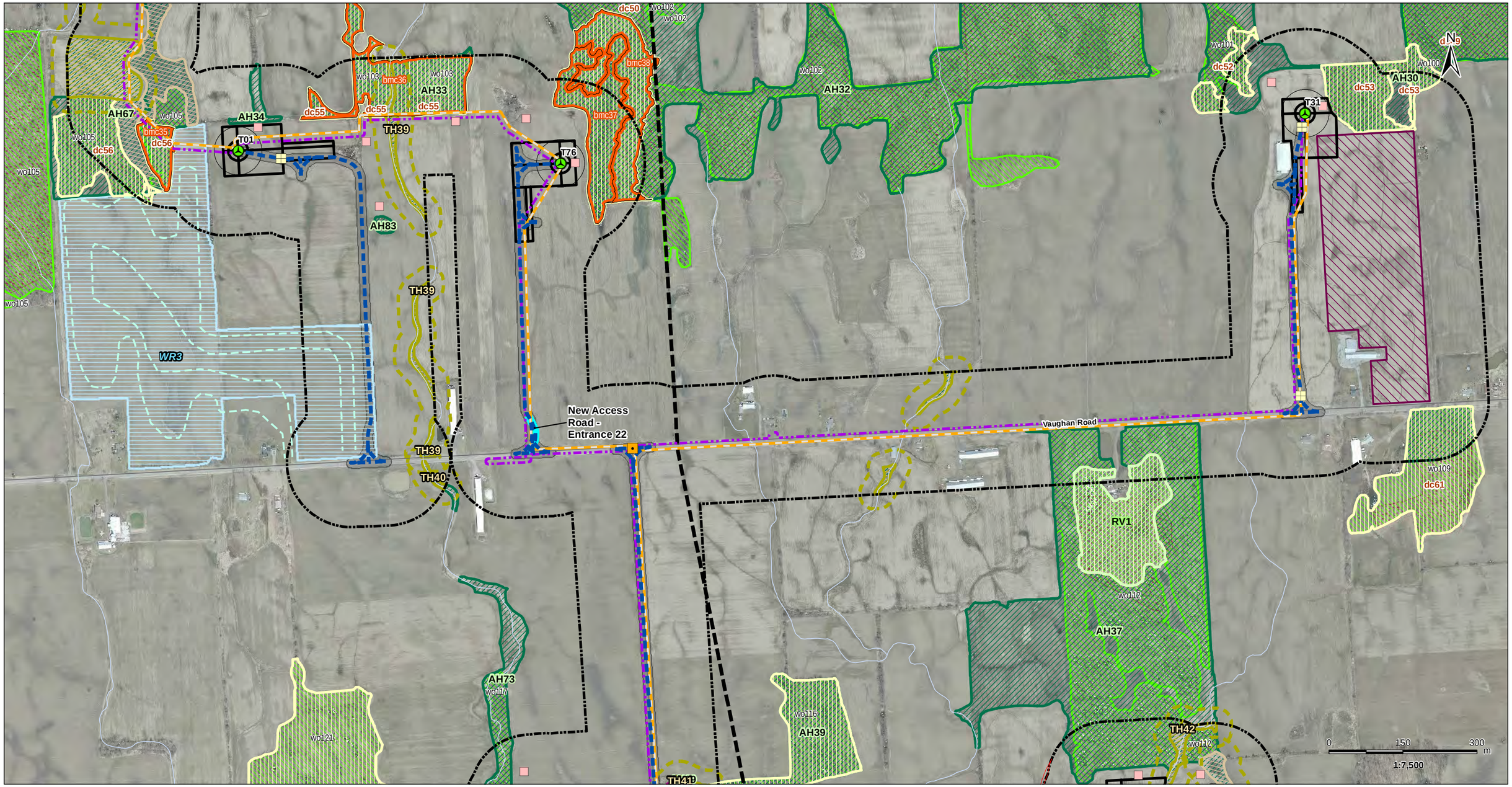
Revised: 2015-09-21 By: bcowper



September, 2015
160950269

Stantec

Legend

- Project Study Area
- Interconnector Study Area
- 120m Zone of Investigation

Zone of Investigation Adjustments

- Area Removed
- Proposed Turbine Location
- Turbine Blade Length
- Junction Box
- Proposed Culvert
- Temporary Laydown Area
- Collector Lines - Underground or Overhead
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area
- Potential Construction Laydown Area
- Amphibian Breeding Stations
- Snake Hibernacula 30m Buffer
- Winter Raptor Transect
- Woodland Communities
- Deer Congregation Areas (MNR)
- Other Rare Vegetation Community
- Amphibian Breeding Habitat
- Raptor Wintering Areas
- Woodland Vole Habitat
- Terrestrial Crayfish Habitat
- Turtle Nesting Habitat/ Snapping Turtle Habitat
- Turtle Habitat 30m Buffer
- Bat Maternity Colonies

Notes

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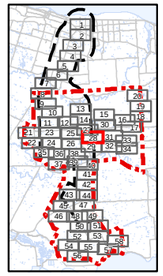
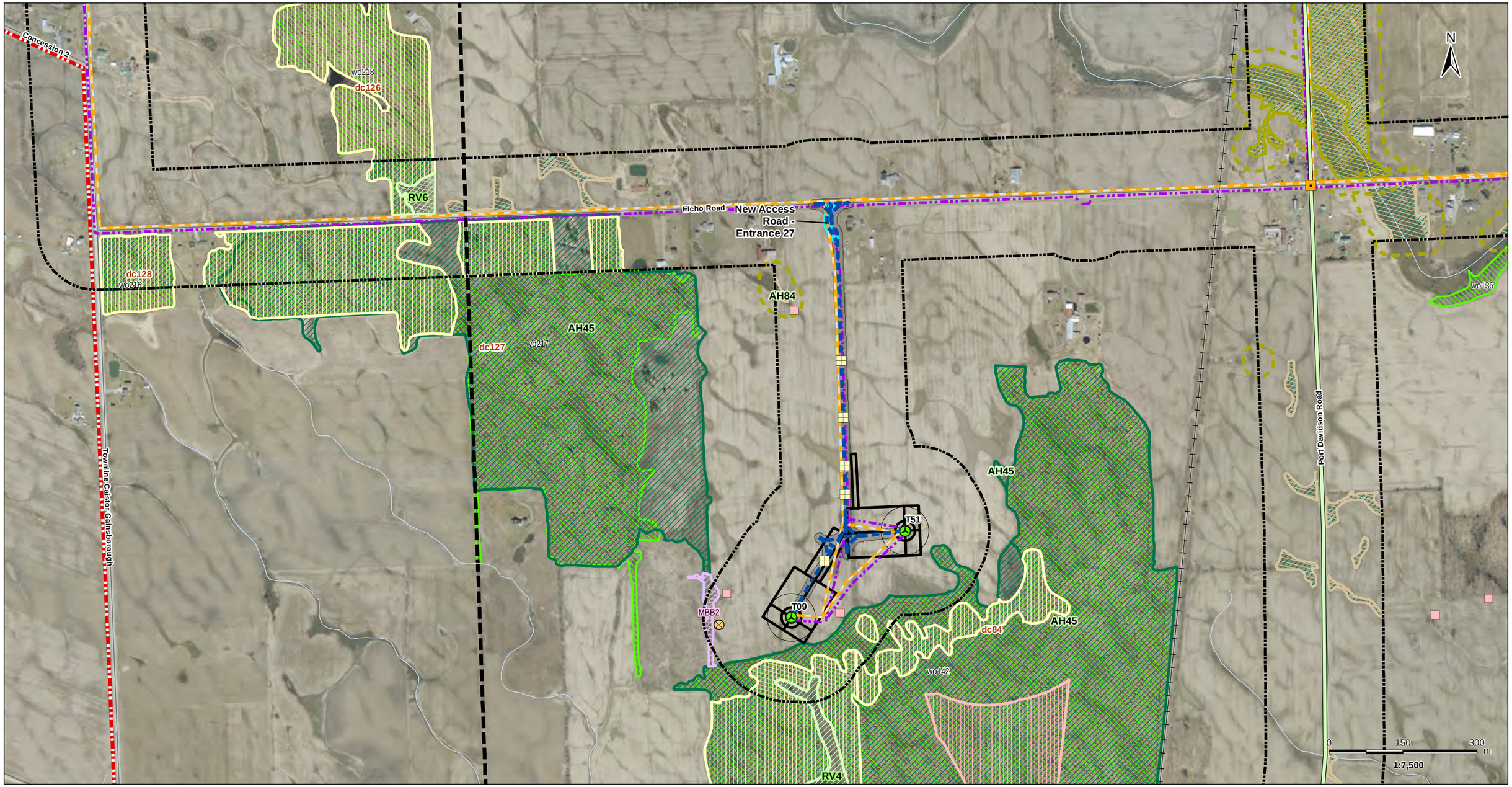


Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
6.28

Title
Candidate Significant Wildlife Habitat Figure 6.28 Revised



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Revised: 2015-09-21 By: bcowper

September, 2015
160950269

Stantec

Legend

- Project Study Area
- Interconnector Study Area
- 120m Zone of Investigation
- Proposed Turbine Location
- Turbine Blade Length
- Junction Box
- Proposed Culvert
- Preferred Transmission Line Route
- Temporary Laydown Area
- Collector Lines – Underground or Overhead
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area
- Amphibian Breeding Stations
- MBB Point Count Location
- Woodland Communities
- Deer Congregation Areas (MNR)
- Other Rare Vegetation Community
- Amphibian Breeding Habitat
- Woodland Raptor Nesting Habitat/ Woodland Area Sensitive Bird Breeding Habitat
- Woodland Vole Habitat
- Terrestrial Crayfish Habitat
- Turtle Habitat 30m Buffer

Notes

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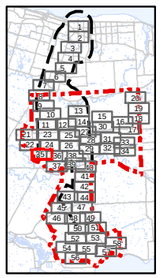

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FWRN LP
Natural Heritage Assessment Report

Figure No.
6.35

Title
Candidate Significant Wildlife Habitat Figure 6.35 Revised

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Revised: 2015-09-21 By: bcowper

September, 2015
160950269

Legend

- Project Study Area
- Interconnector Study Area
- 120m Zone of Investigation
- Proposed Turbine Location
- Turbine Blade Length
- Junction Box
- Proposed Culvert
- Preferred Transmission Line Route
- Temporary Laydown Area
- Collector Lines – Underground or Overhead
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area
- Potential Construction Laydown Area
- Transformer Substation
- Amphibian Breeding Stations
- Woodland Communities
- Deer Congregation Areas (MNR)
- Amphibian Breeding Habitat
- Woodland Vole Habitat
- Terrestrial Crayfish Habitat
- Turtle Habitat 30m Buffer
- Turtle Wintering Area
- Bat Maternity Colonies

Notes

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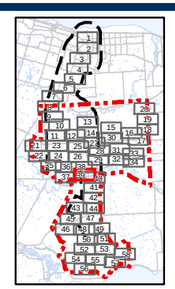

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Natural Heritage Assessment Report

Figure No.
6.39

Title
Candidate Significant Wildlife Habitat Figure 6.39 Revised

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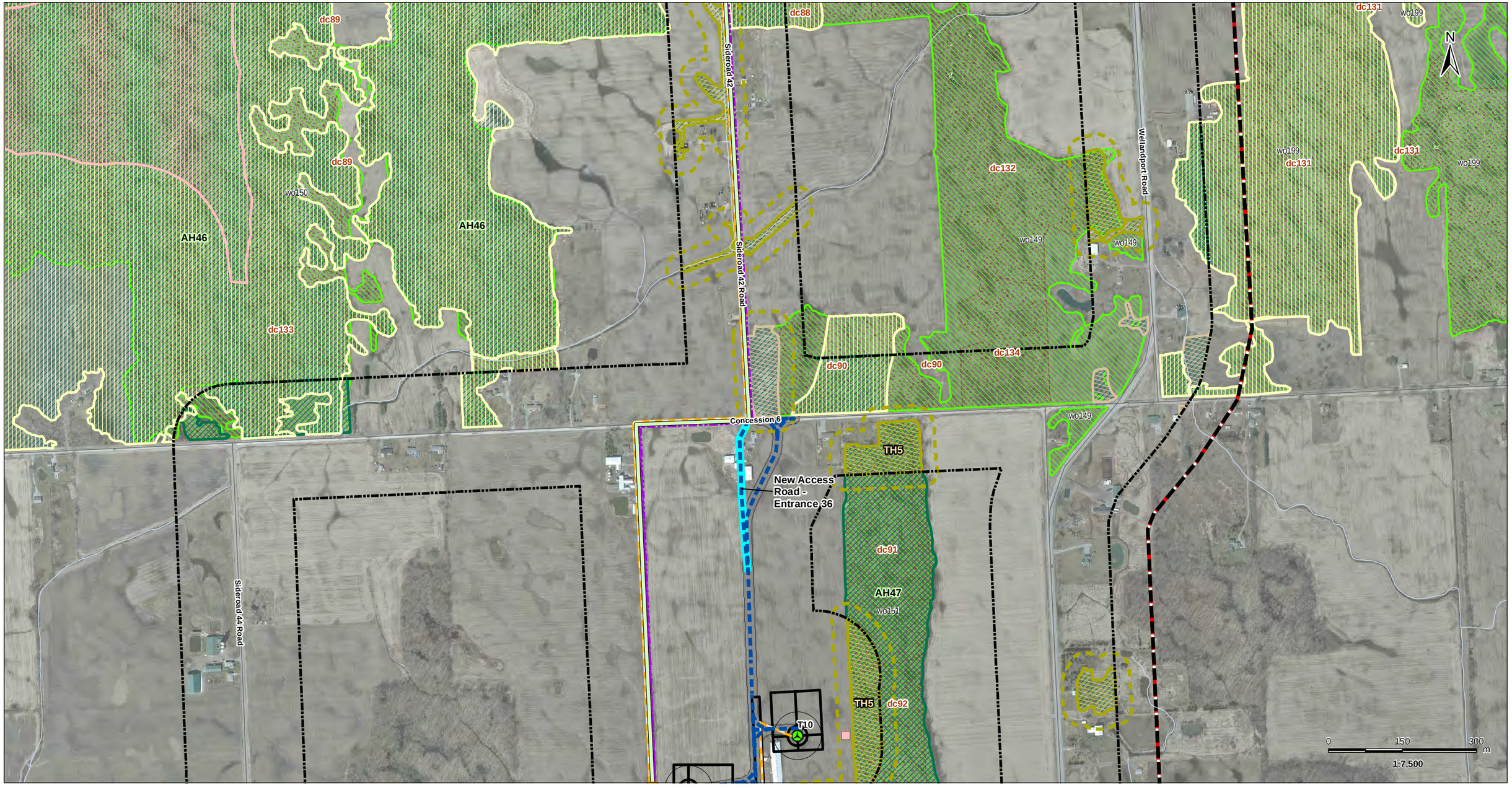

September, 2015
160950269

Stantec

Legend

- Project Study Area
- Interconnector Study Area
- 120m Zone of Investigation
- Proposed Turbine Location
- Turbine Blade Length
- Junction Box
- Preferred Transmission Line Route
- Temporary Laydown Area
- Collector Lines – Underground or Overhead
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area
- Amphibian Breeding Stations
- Woodland Communities
- Deer Congregation Areas (MNR)
- Amphibian Breeding Habitat
- Woodland Raptor Nesting Habitat/ Woodland Area Sensitive Bird Breeding Habitat
- Woodland Vole Habitat
- Terrestrial Crayfish Habitat
- Turtle Nesting Habitat/ Snapping Turtle Habitat
- Turtle Habitat 30m Buffer

Notes

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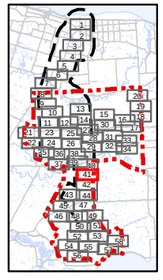

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FWRN LP
Natural Heritage Assessment Report

Figure No.
6.41

Title
Candidate Significant Wildlife Habitat Figure 6.41 Revised

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Revised: 2015-09-21 By: bcowper

September, 2015
160950269

Legend

- Project Study Area
- Interconnector Study Area
- 120m Zone of Investigation

Zone of Investigation Adjustments

- Area Added
- Proposed Turbine Location
- Turbine Blade Length
- Proposed Culvert
- Temporary Laydown Area
- Collector Lines – Underground or Overhead
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area
- Amphibian Breeding Stations
- Snake Hibernacula
- Snake Hibernacula 30m Buffer
- Woodland Communities
- Deer Congregation Areas (MNR)
- Amphibian Breeding Habitat
- Woodland Vole Habitat
- Bat Maternity Colonies

Notes

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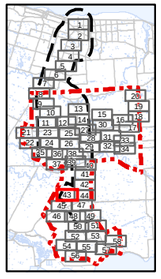

Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
6.43

Title
Candidate Significant Wildlife Habitat Figure 6.43 Revised

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Revised: 2015-09-21 By: bcowper

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160950269

Legend

- Project Study Area
- Interconnector Study Area
- 120m Zone of Investigation
- Proposed Turbine Location
- Turbine Blade Length
- Proposed Culvert
- Temporary Laydown Area
- Collector Lines – Underground or Overhead
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area
- Amphibian Breeding Stations
- Woodland Communities
- Deer Congregation Areas (MNR)
- Amphibian Breeding Habitat
- Woodland Raptor Nesting Habitat/ Woodland Area Sensitive Bird Breeding Habitat
- Woodland Vole Habitat
- Terrestrial Crayfish Habitat

Notes

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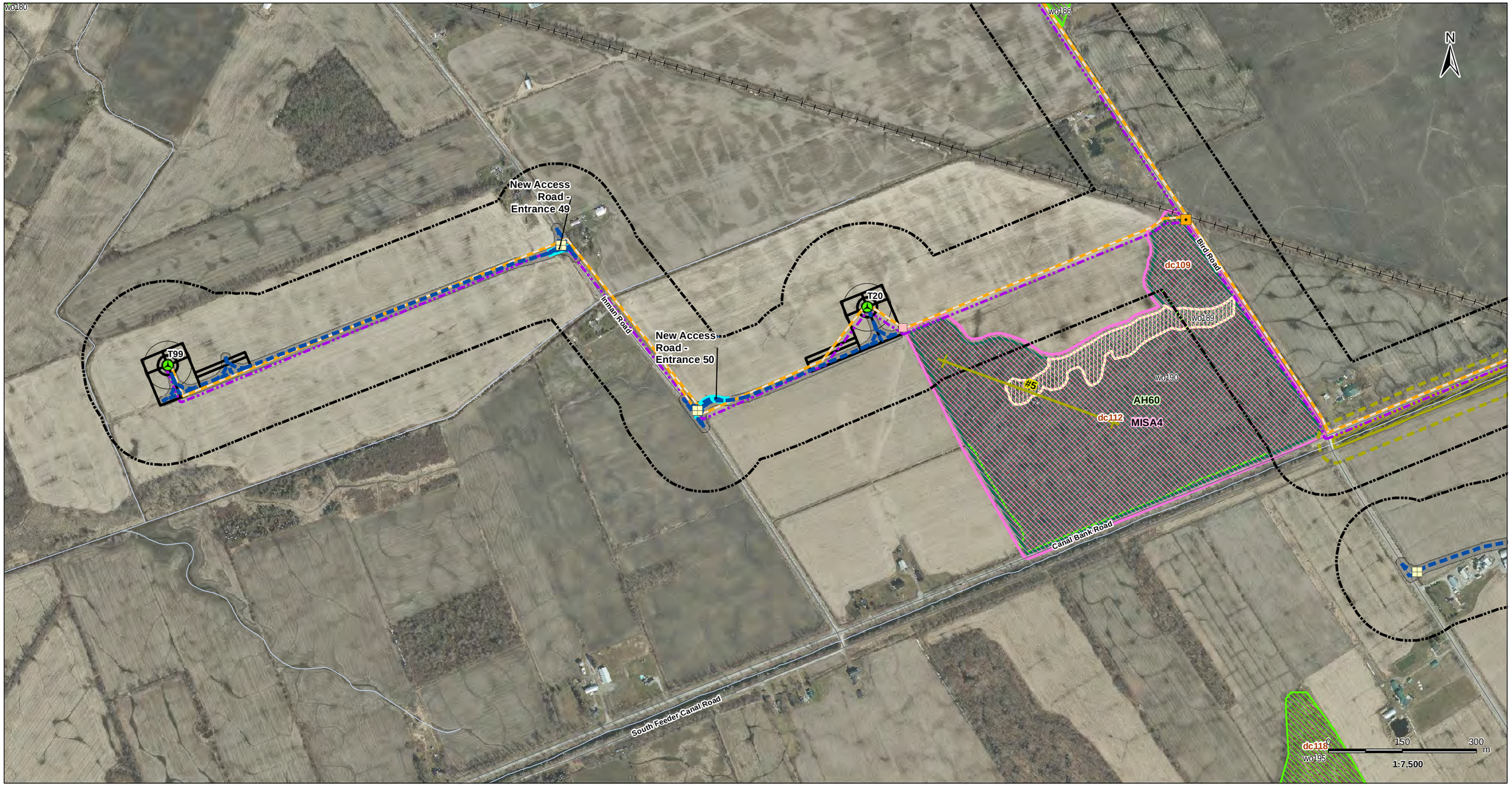
Natural Heritage Assessment Report

Figure No.
6.48

Title
Candidate Significant Wildlife Habitat Figure 6.48 Revised



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September, 2015
160950269

Legend

- Project Study Area
- 120m Zone of Investigation
- Zone of Investigation Adjustments
- Area Added
- Proposed Turbine Location
- Turbine Blade Length
- Junction Box
- Proposed Culvert
- Temporary Laydown Area
- Collector Lines – Underground or Overhead
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area
- Amphibian Breeding Stations
- Migratory Bird Transect
- Woodland Communities
- Deer Congregation Areas (MNR)
- Landbird Migratory Stopover
- Amphibian Breeding Habitat
- Woodland Vole Habitat

Notes

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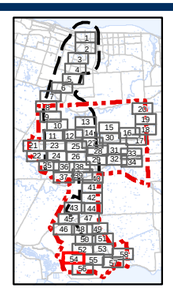

Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
6.54

Title
Candidate Significant Wildlife Habitat Figure 6.54 Revised

North Service Road
QEW Highway
South Service Road
Andrewes Court
Durham Road
Iroquois Trail
Main Street East
Vinatera Drive
Chardonnay Place
King Street
Thirty Road
Mountainview Road
Greenlane
Lincoln Avenue
Cedarbrook Lane
St Volodymyr Court
Peter Meadow Boulevard
Revised Interconnector Footprint
N
0 150 300 m
1:7,500
September, 2015
160950269

621000 621500 622000 622500 623000 623500
4782500 4782000 4781500

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Stantec

Legend

- Interconnector Study Area
- 120m Zone of Investigation
- Zone of Investigation Adjustments
  - Area Added
- Tap-in Location
- Preferred Transmission Line Route
- Potential Access Road
- Access Road 20m Construction Area
- Transformer Substation
- Significant Wildlife Habitat
  - Snake Hibernacula
  - Niagara Escarpment Protection Area
  - Generalized Wildlife Habitat

Notes

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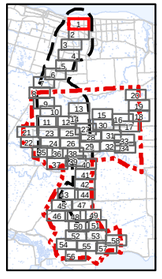

Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
7.1

Title
Significant Natural Features Figure 7.1 Revised

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Revised: 2015-09-21 By: bcowper

629500 630000 630500 631000 631500 632000

4772000 4771500 4771000

Moote Road

Sixteen Road

Meglashan Street

wo36 bmc51 dc14 100.2 101.6 T80 60.2 70.3 69.6 bmc53 bmc52 bmc55 AH2 wo43 dc17 bmc54 T79 114.9 113.2 115.3 58.9 AH3 wo44 New Access Road - Entrance 4 55.1 69.7 95.7 we20 15.9 12.6 6.3 26.2 13.7 we26 wo45 we28 9.5 15.9 17.2 dc16 wo35 dc19 wo46 dc20

N

0 150 300 m

1:7,500

September, 2015
160950269

Stantec

Legend

- Project Study Area
- 120m Zone of Investigation
- Zone of Investigation Adjustments
  - Area Added
  - Proposed Turbine Location
  - Turbine Blade Length
  - Proposed Culvert
  - Temporary Laydown Area
  - Collector Lines – Underground or Overhead
  - Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area
- Significant Wildlife Habitat
  - Snake Hibernacula
  - Wetland Communities
  - Woodland Amphibian Breeding Habitat
  - Woodland Communities
  - Greenbelt Natural Heritage System
  - Generalized Wildlife Habitat
  - Deer Congregation Areas (MNR) (Generalized)
  - Bat Maternity Colonies

Notes

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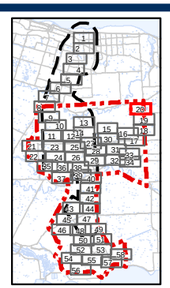
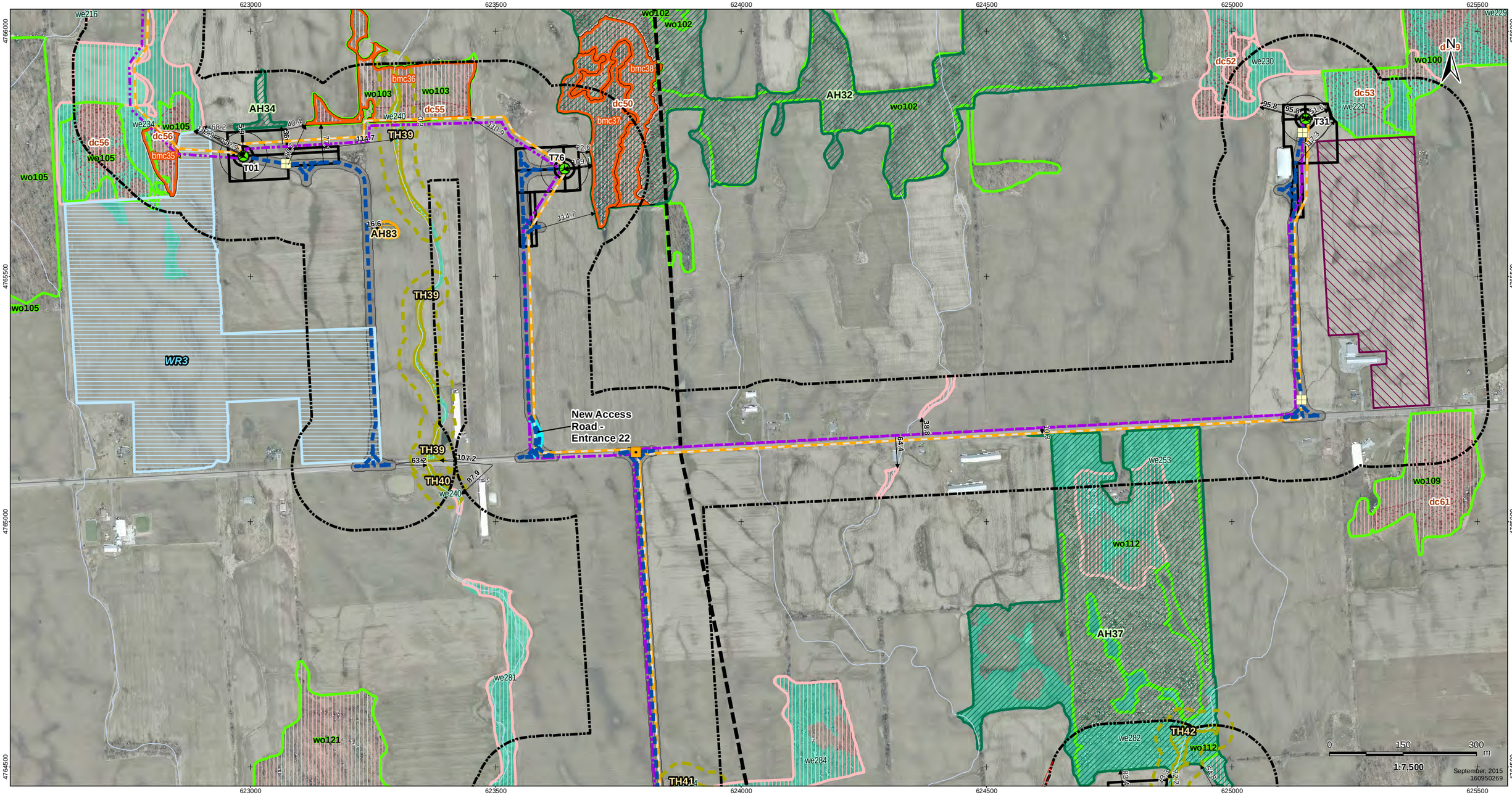


Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
7.20

Title
Significant Natural Features Figure 7.20 Revised



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Revised: 2015-09-21 BY: bobwper

Legend

- Project Study Area
- Interconnector Study Area
- 120m Zone of Investigation
- Zone of Investigation Adjustments
- Area Removed
- Proposed Turbine Location
- Turbine Blade Length
- Junction Box
- Proposed Culvert
- Temporary Laydown Area
- Collector Lines – Underground or Overhead
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area
- Potential Construction Laydown Area

Significant Wildlife Habitat

- Snake Hibernacula
- Snake Hibernacula 30m Buffer
- Raptor Wintering Areas
- Wetland Communities
- Woodland Amphibian Breeding Habitat
- Wetland Amphibian Breeding Habitat
- Woodland Communities
- Turtle Nesting Habitat/Snapping Turtle Habitat
- Turtle Habitat 30m Buffer
- Concealized Wildlife Habitat

Notes

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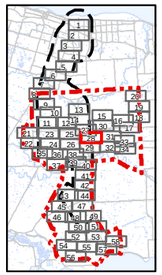

Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
7.28

Title
Significant Natural Features Figure 7.28 Revised

615500 616000 616500 617000 617500 618000

4763500 4763000 4762500

Concession 2

Townline Caistor Gainsborough

Elcho Road

New Access Road - Entrance 27

Port Davidson Road

we427 wo218 dc126 dc128 wo216 wo217 dc127 AH45 we309 we329 wo136 wo142 we340 dc84

T09 T51

N

0 150 300 m

1:7,500

September, 2015
160950269

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Revised: 2015-09-21 By: bcowper

Stantec

Legend

- Project Study Area
- Interconnector Study Area
- 120m Zone of Investigation
- Proposed Turbine Location
- Turbine Blade Length
- Junction Box
- Proposed Culvert
- Preferred Transmission Line Route
- Temporary Laydown Area
- Collector Lines – Underground or Overhead
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area

Significant Wildlife Habitat

- Snake Hibernacula
- Wetland Communities
- Woodland Amphibian Breeding Habitat
- Woodland Communities
- Generalized Wildlife Habitat
- Deer Congregation Areas (MNR) (Generalized)

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N).
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Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
7.35

Title
Significant Natural Features Figure 7.35 Revised

620500 621000 621500 622000 622500 623000

4762000 4761500 4761000

N

Canborough Road

Creek Road

Sideroad 42

Revised Substation Footprint

wo139 bmc33 wo141 we336 we423 twa1 we351 dc85 wo145 we344 we441 we357 wo150 bmc34 we353 wo149

62.2 45.4 94.4 58 40.3 96.3 37.5 118-2-119-1 2.1 30.4

0 150 300 m

1:7,500

September, 2015

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Revised: 2015-09-21 By: bcowper

Stantec

Legend

- Project Study Area
- Interconnector Study Area
- 120m Zone of Investigation
- Proposed Turbine Location
- Turbine Blade Length
- Junction Box
- Proposed Culvert
- Preferred Transmission Line Route
- Temporary Laydown Area
- Collector Lines – Underground or Overhead
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area
- Potential Construction Laydown Area
- Transformer Substation

Significant Wildlife Habitat

- Snake Hibernacula
- Wetland Communities
- Woodland Communities
- Turtle Wintering Area
- Generalized Wildlife Habitat
- Deer Congregation Areas (MNR) (Generalized)
- Bat Maternity Colonies

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N).
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Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
7.39

Title
Significant Natural Features Figure 7.39 Revised

622000 622500 623000 623500 624000 624500

4760000

4759500

4759000

dc88 we353 115.7 115.7 1.3 we356 dc89 we357 wo150 we358 7.7 7.5 5.7 dc132 we360 wo149 Wellandport Road wo199 dc131 dc133 dc90 dc134 28.2 70 93.6 93.6 108.1 118.2 124.6 TH5 New Access Road - Entrance 36 dc91 we361 wo151 AH47 41.1 we414 T10 112.9 112.9 62.6 dc92 Sideroad 44 Road

N

0 150 300 m

1:7,500

September, 2015
160950269

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Revised: 2015-09-21 By: bcowper

Stantec

Legend

- Project Study Area
- Interconnector Study Area
- 120m Zone of Investigation
- Proposed Turbine Location
- Turbine Blade Length
- Junction Box
- Preferred Transmission Line Route
- Temporary Laydown Area
- Collector Lines – Underground or Overhead
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area

Significant Wildlife Habitat

- Snake Hibernacula
- Wetland Communities
- Woodland Amphibian Breeding Habitat
- Woodland Communities
- Turtle Nesting Habitat/Snapping Turtle Habitat
- Turtle Habitat 30m Buffer
- Generalized Wildlife Habitat
- Deer Congregation Areas (MNR) (Generalized)

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N).
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Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
7.41

Title
Significant Natural Features Figure 7.41 Revised

619000 619500 620000 620500 621000 621500 622000

4757000 4756500 4756000

N

Townline Dunnville Wainfleet

Gore A Road

Hutchinson Road

T72

T41

T11

T91

T12

T13

New Access Road - T11 to T41

New Access Road - T11 to T12

SH3

wo153

we445

dc93

bmc25

bmc23

bmc26

bmc27

bmc20

dc94

wo154

we373

0 150 300 m

1:7,500

September, 2015
160950269

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Revised: 2015-09-21 By: bcowper

Stantec

Legend

- Project Study Area
- Interconnector Study Area
- 120m Zone of Investigation

Zone of Investigation Adjustments

- Area Added
- Proposed Turbine Location
- Turbine Blade Length
- Proposed Culvert
- Temporary Laydown Area
- Collector Lines – Underground or Overhead
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area

Significant Wildlife Habitat

- Snake Hibernacula
- Snake Hibernacula 30m Buffer
- Wetland Communities
- Woodland Communities
- Generalized Wildlife Habitat
- Deer Congregation Areas (MNR) (Generalized)
- Bat Maternity Colonies

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N).
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Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
7.43

Title
Significant Natural Features Figure 7.43 Revised

620500 621000 621500 622000 622500 623000

4754000 4753500 4753000

N

wo172 dc99 wo172 dc101 wo178 wo172

Jenny Jump Road

T84 wo177 wo177 wo177 wo177 wo177

Winger, ANSI, Earth Science, Provincially Significant

dc121 wo179

we391 we391 we393

AH55 New Access Road - Entrance 46

Booker Road

0 150 300 m

1:7,500

Sept 15, 2015
160950269

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Revised: 2015-09-21 By: bcowper

Stantec

Legend

- Project Study Area
- Interconnector Study Area
- 120m Zone of Investigation
- Proposed Turbine Location
- Turbine Blade Length
- Proposed Culvert
- Temporary Laydown Area
- Collector Lines – Underground or Overhead
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area

Significant Wildlife Habitat

- Snake Hibernacula
- Wetland Communities
- Wetland Amphibian Breeding Habitat
- Woodland Communities
- ANSI, Earth Science, Provincially Significant
- Generalized Wildlife Habitat
- Deer Congregation Areas (MNR) (Generalized)

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N).
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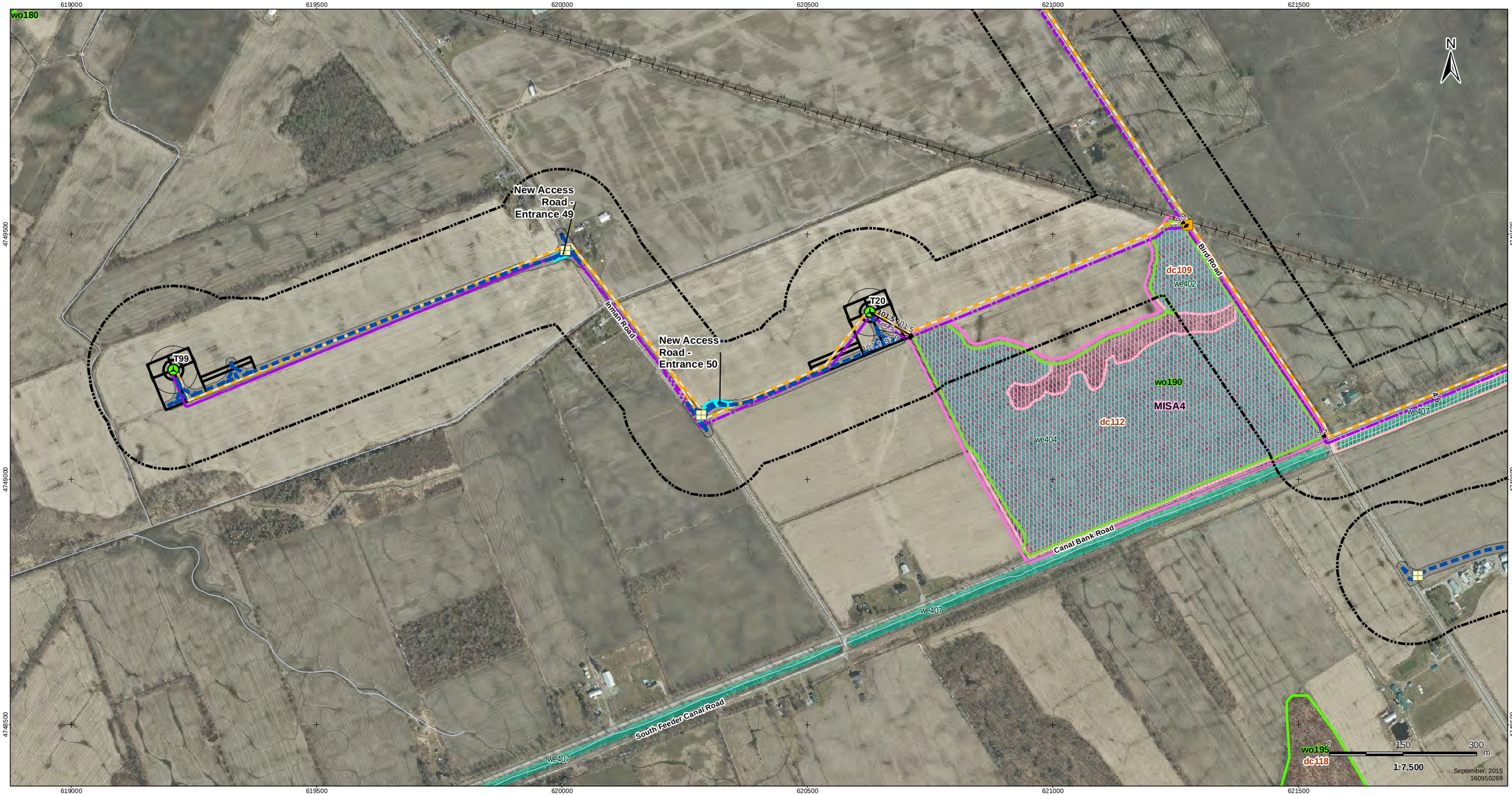
Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
7.48

Title
Significant Natural Features Figure 7.48 Revised



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Revised: 2015-09-21 By: bcowper

Stantec

Legend

- Project Study Area
- 120m Zone of Investigation
- Zone of Investigation Adjustments
  - Area Added
- Proposed Turbine Location
- Turbine Blade Length
- Junction Box
- Proposed Culvert
- Temporary Laydown Area
- Collector Lines – Underground or Overhead
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area
- Significant Wildlife Habitat
  - Snake Hibernacula
  - Landbird Migratory Stopover
  - Wetland Communities
  - Woodland Communities
  - Generalized Wildlife Habitat
  - Deer Congregation Areas (MNR) (Generalized)

Notes

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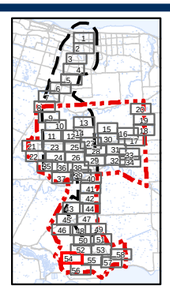
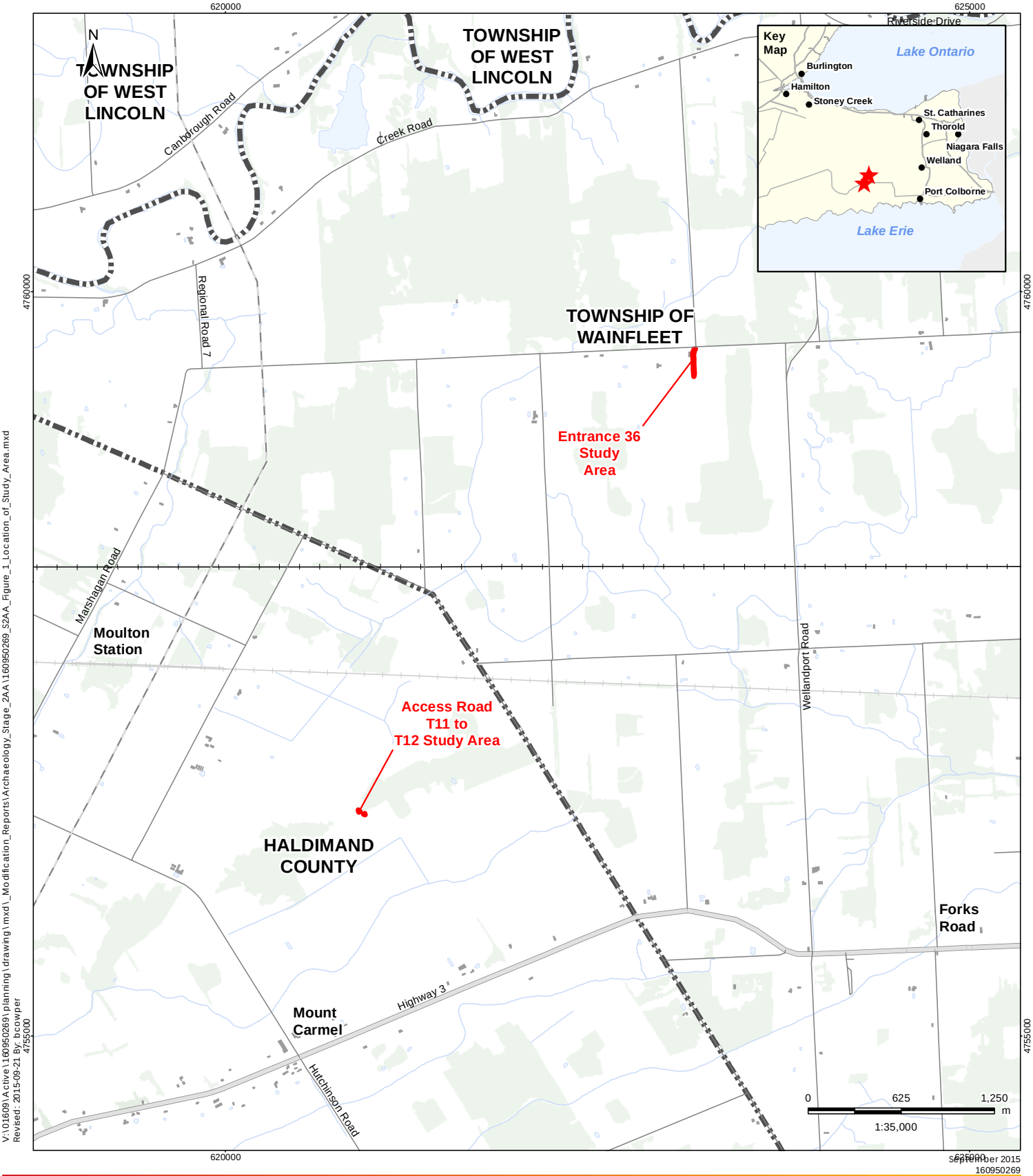
3. Orthoimagery © First Base Solutions, 2010.



Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
7.54

Title
Significant Natural Features Figure 7.54 Revised



Stantec

Legend

- Study Area
- 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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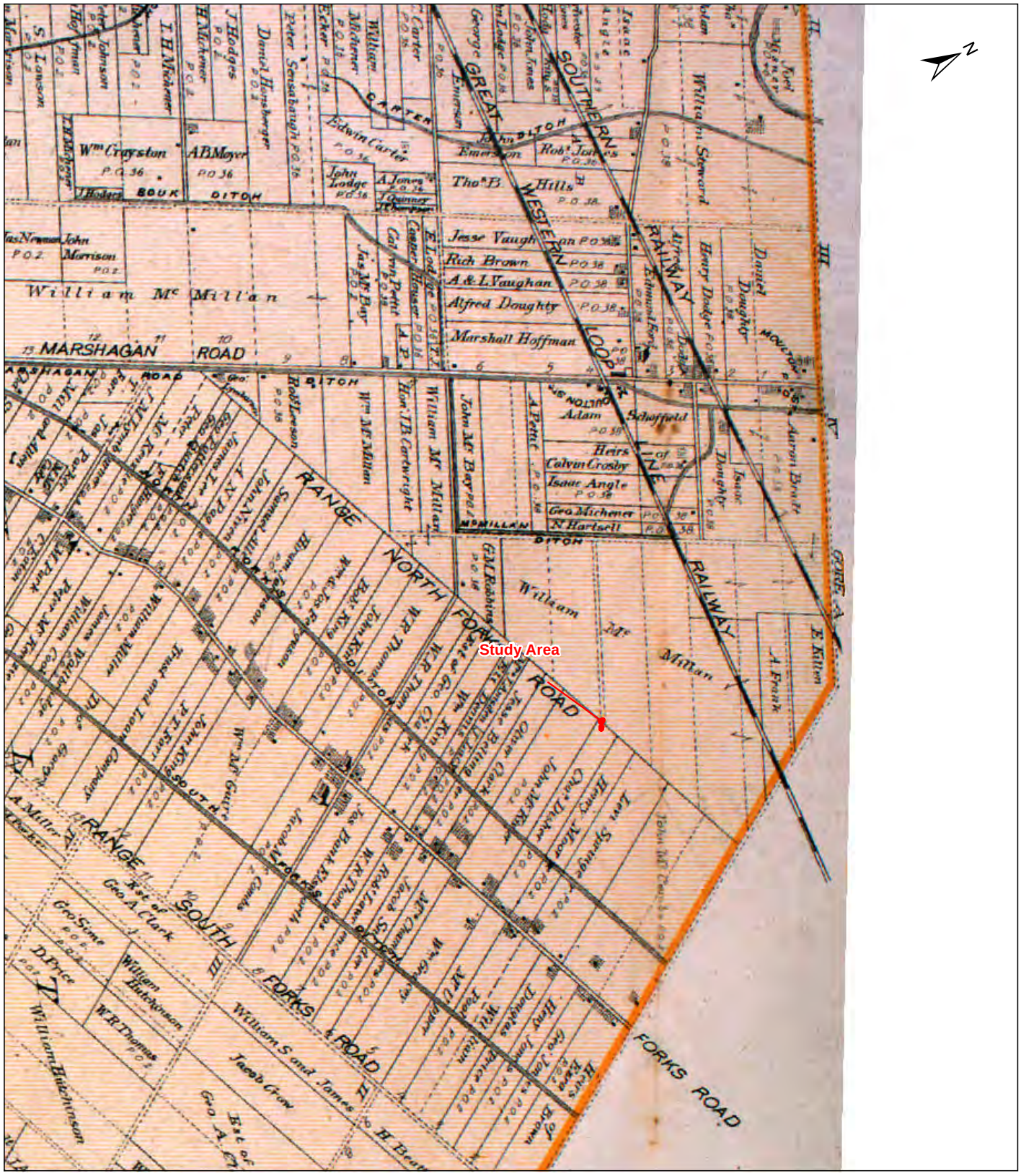
FWRN LP
Niagara Region Wind Farm
Stage 2 Archaeological Assessment

Figure No.

1

Title

Location of Study Area



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Revised: 2015-09-21 By: bcowper

September 2015
160950269

Legend

Study Area

Stantec

Client/Project

FWRN LP
Niagara Region Wind Farm
Stage 2 Archaeological Assessment

Figure No.

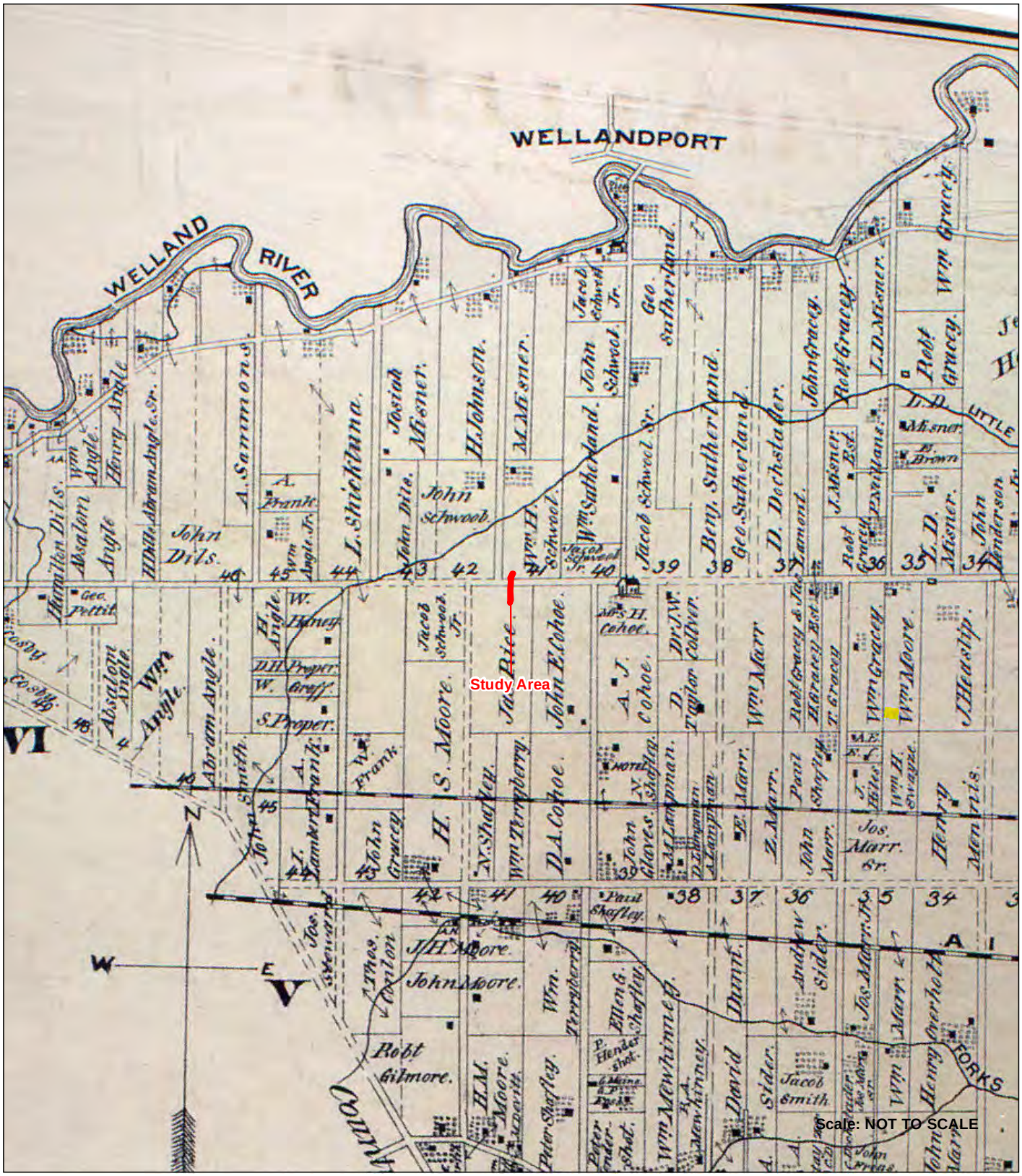
2

Title

Portion of 1879 Historic Atlas Map of the Township of Wainfleet

Notes

1. Historic Map reference: Illustrated Historical Atlas of the County of Haldimand, Ont. Toronto: H.R. Page & Co., 1879.
2. Not Scale.



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Revised: 2015-09-21 By: bcowper

September 2015
160950269

Stantec

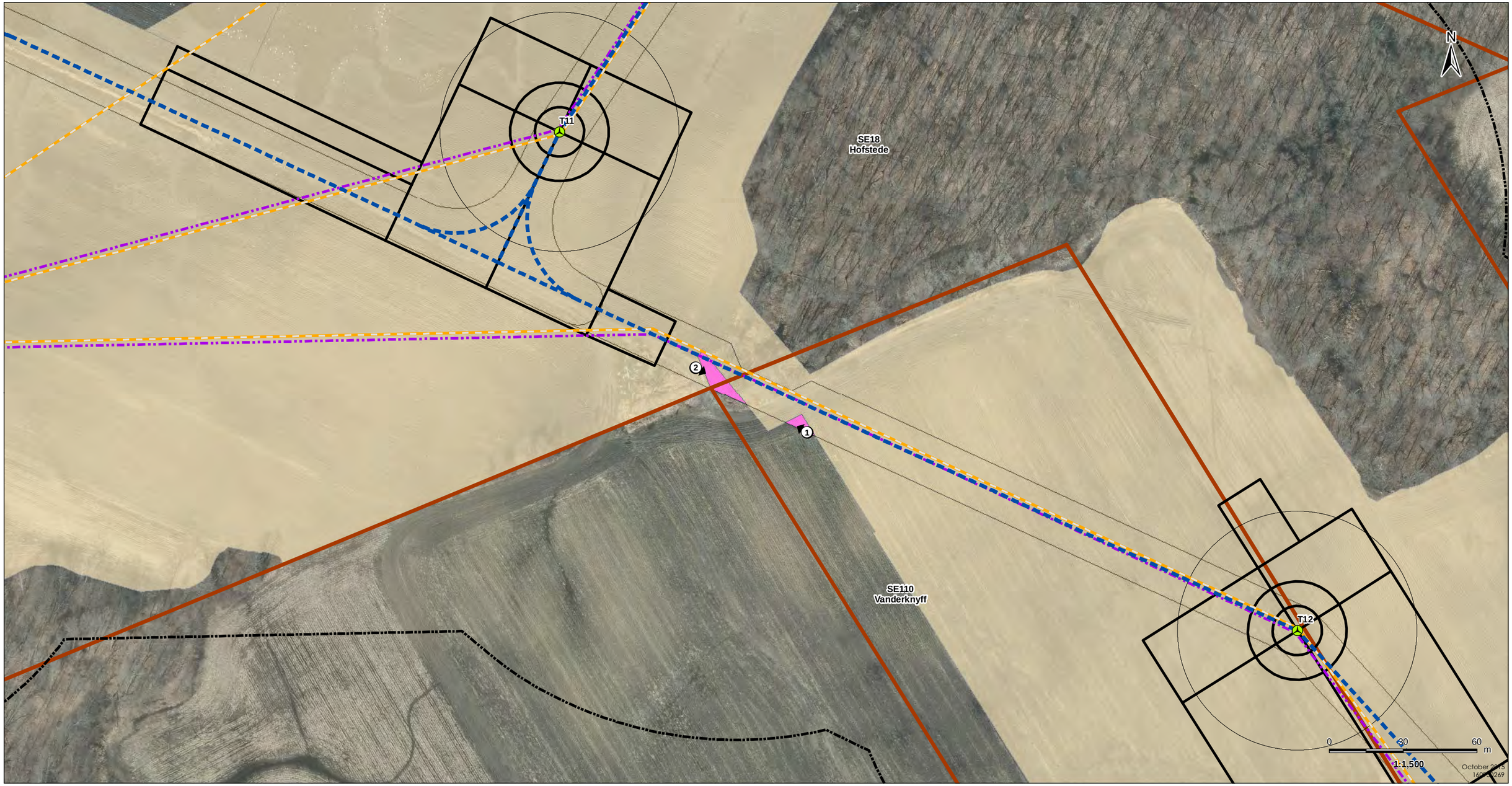
Legend
Study Area

Notes
1. Historic Map reference: Page, H.R. and Co. 1876. Illustrated Historical Atlas of the Counties of Lincoln and Welland, Ontario. Toronto: H.R. Page and Co.
2. Not Scale.

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

Figure No.
3

Title
Portion of 1876 Historic Atlas Map of the Township of Wainfleet



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Revised: 2015-10-05 By: bcowper

Stantec

Notes
1. Coordinate System: NAD 1983 UTM Zone 17N
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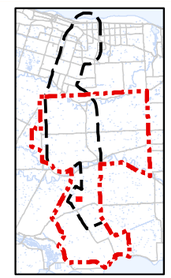
3. Orthoimagery © First Base Solutions, 20xx.

Legend

- Signed Property
- 120m Zone of Investigation
- Proposed Turbine Location
- Turbine Blade Length
- Temporary Laydown Area
- Collector Lines – Underground or Overhead
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area

Stage 2 Archaeological Assessment

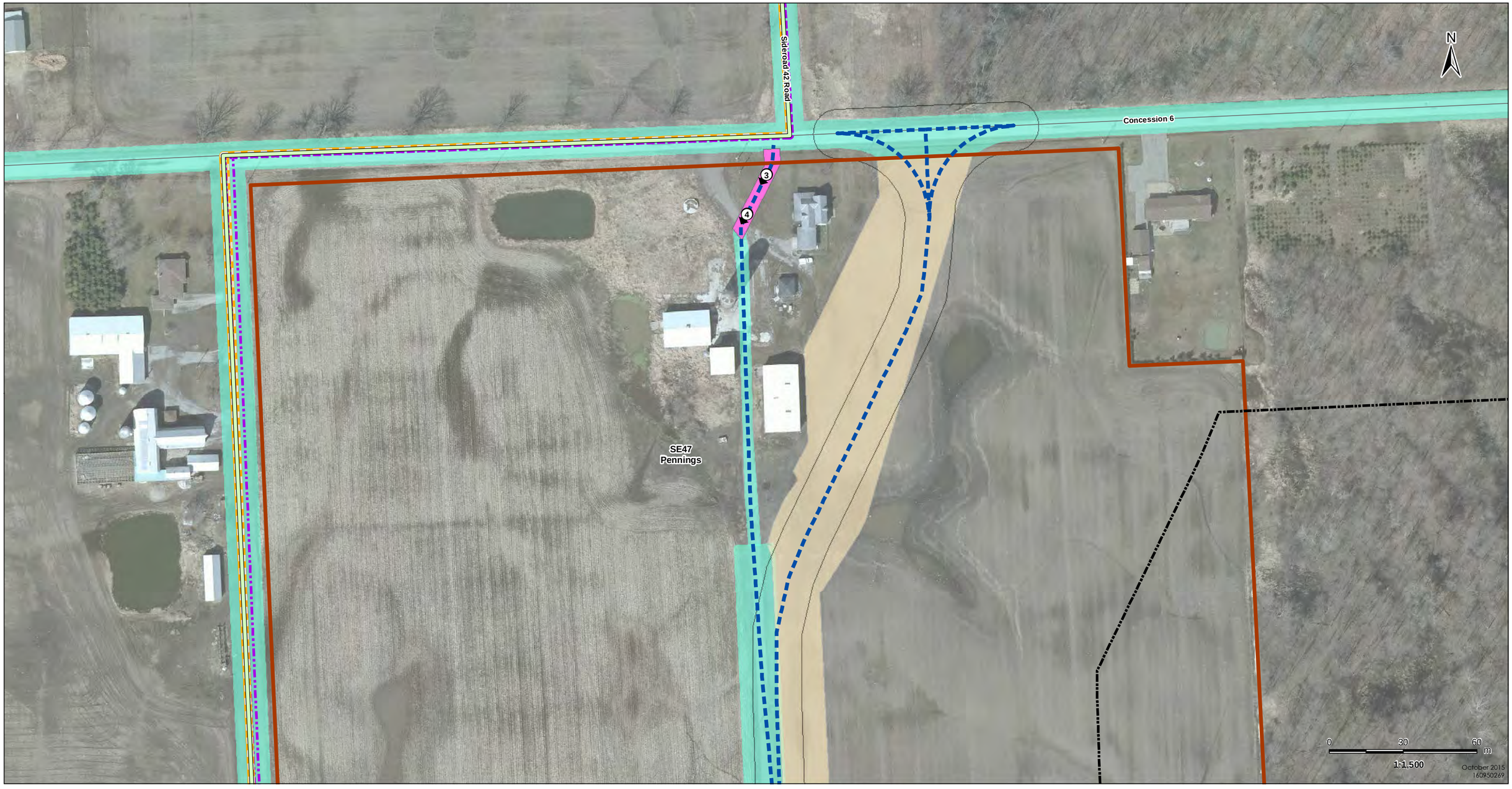
- Test Pitted at 5 metre Intervals
- Previously Assessed, 2012 (P002-289-2012)
- Photograph Location and Direction



Client/Project
FWRN LP
Niagara Region Wind Farm

Figure No.
4

Title
Stage 2 Results
Access Road T11 to T12



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Revised: 2015-10-05 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.
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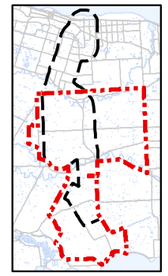
Legend
- Signed Property
- 120m Zone of Investigation
- Preferred Transmission Line Route
- Collector Lines – Underground or Overhead
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area

Stage 2 Archaeological Assessment
- Test Pitted at 5 metre Intervals
- Previously Assessed, 2012 (P002-289-2012)
- Previously Disturbed, not Surveyed
- Photograph Location and Direction



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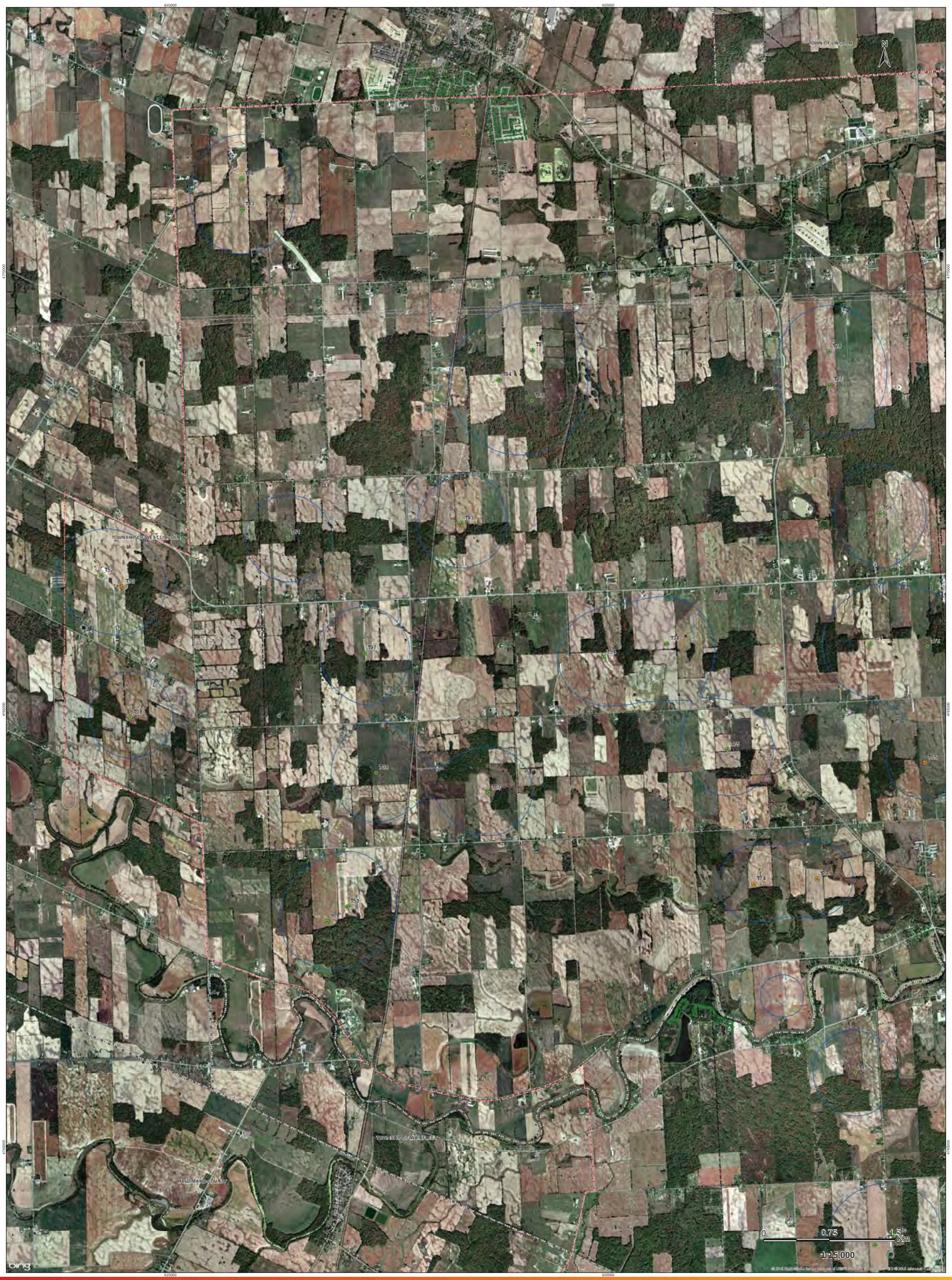
FWRN LP
Niagara Region Wind Farm

Figure No.
5

Title
Stage 2 Results
Entrance 36



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Revised: 2015-09-18 By: bcamper

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160950269

Stantec

Notes

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

- Project Study Area
- Interconnector Study Area
- Proposed Turbine Location - E101 3.0 MW
- Proposed Turbine Location - E101 2.9 MW G2/G3
- Transformer Substation
- Tap-in Location
- Existing Met Tower
- Sound Level Contours (40 dBA)
- Road
- Expressway / Highway
- Active Railway
- Abandoned Railway
- Existing Structures
- Existing Transmission Line
- Municipality Lower Tier

Participating Noise Receptors

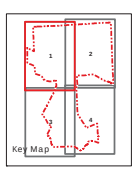
- Occupied
- Vacant

Non-participating Receptors

- Occupied
- Vacant

Other Wind Turbines

- Mohawk Wind Farm (Existing)
- Rosa Flora Turbine (Existing)
- Wainfleet Wind Energy Project (Proposed)
- HAF Wind Energy Project (Proposed)
- Grand Renewable Energy Park (Proposed)
- Other Wind Farm Project (Proposed)



Client/Project
FWRN LP
Niagara Region Wind Farm
Acoustic Assessment Report

Figure No.
1-1

Title
Predicted Equivalent Sound Level Contours (Cumulative Effects - Day/Nighttime Hours) – Map 1

Legend

- Project Study Area
- Interconnector Study Area
- Proposed Turbine Location - E101 3.0 MW
- Proposed Turbine Location - E101 2.9 MW G2/G3
- Transformer Substation
- Tap-in Location
- Existing Met Tower
- Sound Level Contours (40 dBA)
- Road
- Expressway / Highway
- Active Railway
- Abandoned Railway
- Existing Structures
- Existing Transmission Line
- Municipality Lower Tier

Participating Noise Receptors

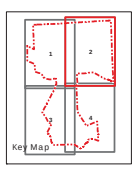
- Occupied
- Vacant

Non-participating Receptors

- Occupied
- Vacant

Other Wind Turbines

- Mohawk Wind Farm (Existing)
- Rosa Flora Turbine (Existing)
- Wainfleet Wind Energy Project (Proposed)
- HAF Wind Energy Project (Proposed)
- Grand Renewable Energy Park (Proposed)
- Other Wind Farm Project (Proposed)



Notes

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Niagara Region Wind Farm
Acoustic Assessment Report

Figure No.
1-2

Title
Predicted Equivalent Sound Level Contours (Cumulative Effects - Day/Nighttime Hours) – Map 2

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Revised: 2015-09-30 By: tcampbell

September 2015
160950269

Stantec

Notes

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

- Project Study Area
- Interconnector Study Area
- Proposed Turbine Location - E101 3.0 MW
- Proposed Turbine Location - E101 2.9 MW G2/G3
- Transformer Substation
- Tap-in Location
- Existing Met Tower
- Sound Level Contours (40 dBA)
- Road
- Expressway / Highway
- Active Railway
- Abandoned Railway
- Existing Structures
- Existing Transmission Line
- Municipality Lower Tier

Participating Noise Receptors

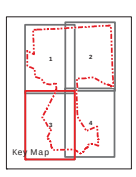
- Occupied
- Vacant

Non-participating Receptors

- Occupied
- Vacant

Other Wind Turbines

- Mohawk Wind Farm (Existing)
- Rosa Flora Turbine (Existing)
- Wainfleet Wind Energy Project (Proposed)
- HAF Wind Energy Project (Proposed)
- Grand Renewable Energy Park (Proposed)
- Other Wind Farm Project (Proposed)



Client/Project
FWRN LP
Niagara Region Wind Farm
Acoustic Assessment Report

Figure No.
1-3

Title
Predicted Equivalent Sound Level Contours (Cumulative Effects - Day/Nighttime Hours) – Map 3

Stantec

Notes

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

- Project Study Area
- Interconnector Study Area
- Proposed Turbine Location - E101 3.0 MW
- Proposed Turbine Location - E101 2.9 MW G2/G3
- Transformer Substation
- Tap-in Location
- Existing Met Tower
- Sound Level Contours (40 dBA)
- Road
- Expressway / Highway
- Active Railway
- Abandoned Railway
- Existing Structures
- Existing Transmission Line
- Municipality Lower Tier

Participating Noise Receptors

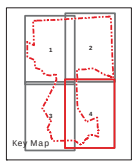
- Occupied
- Vacant

Non-participating Receptors

- Occupied
- Vacant

Other Wind Turbines

- Mohawk Wind Farm (Existing)
- Rosa Flora Turbine (Existing)
- Wainfleet Wind Energy Project (Proposed)
- HAF Wind Energy Project (Proposed)
- Grand Renewable Energy Park (Proposed)
- Other Wind Farm Project (Proposed)

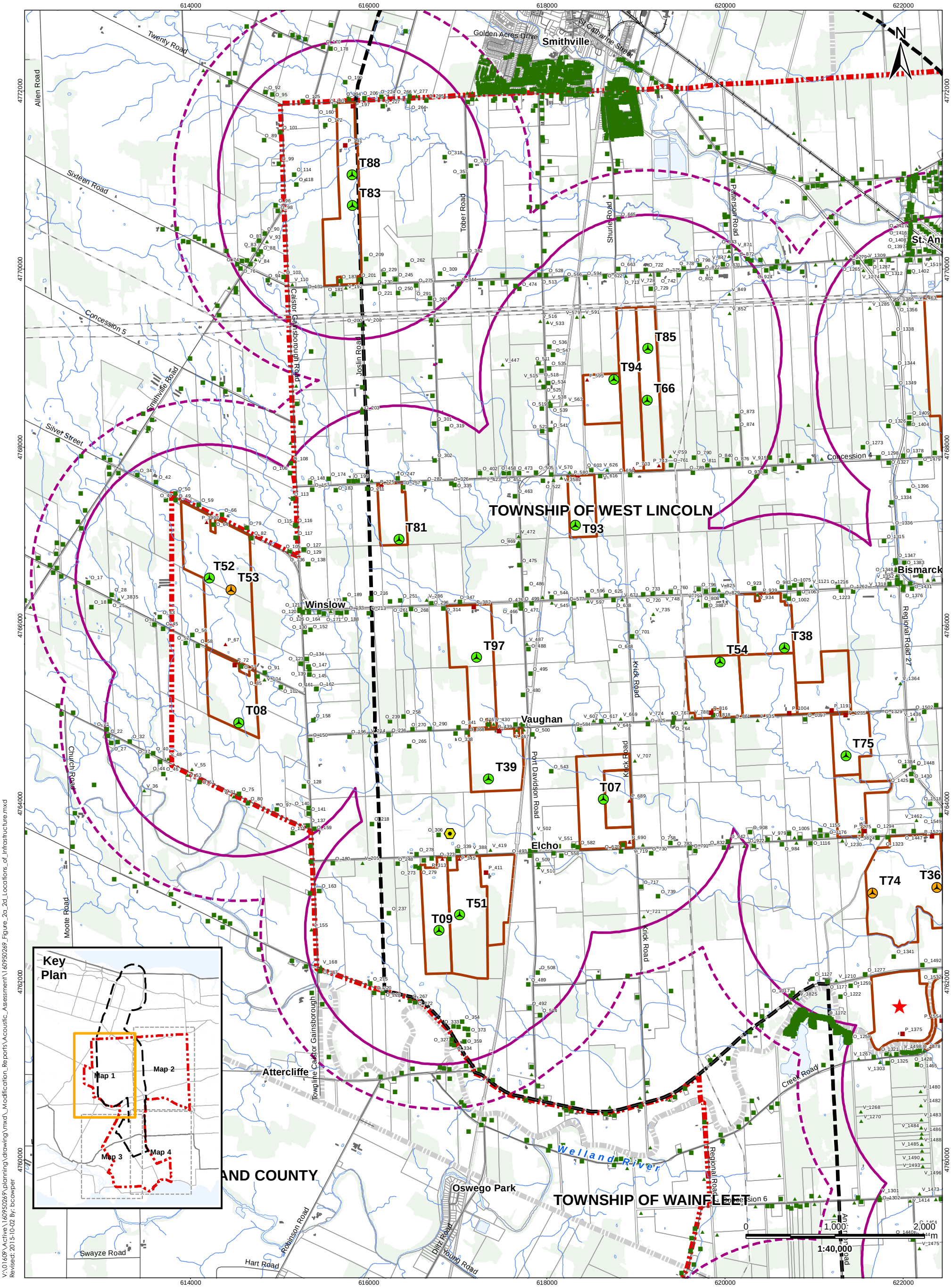


September 2015
160950269

Client/Project
FWRN LP
Niagara Region Wind Farm
Acoustic Assessment Report

Figure No.
1-4

Title
Predicted Equivalent Sound Level Contours (Cumulative Effects - Day/Nighttime Hours) – Map 4



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Revised: 2015-10-02 By: bcowper

Stantec

Legend

- Project Study Area
- Interconnector Study Area
- Proposed Turbine Location - E101 3.0 MW
- Proposed Turbine Location - E101 2.9 MW G2/G3
- Transformer Substation
- Tap-in Location
- Existing Met Tower
- 1.5 km Radius from Proposed Turbine Centre Point
- 2km Radius from Proposed Turbine Centre Point
- Road
- Expressway / Highway
- Active Railway
- Abandoned Railway
- Existing Transmission Line
- Existing Structures
- Watercourse
- Waterbody
- Wooded Area
- Municipal Boundary

Participating Noise Receptors
- Occupied
- Vacant

Non-participating Noise Receptors
- Occupied
- Vacant

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.

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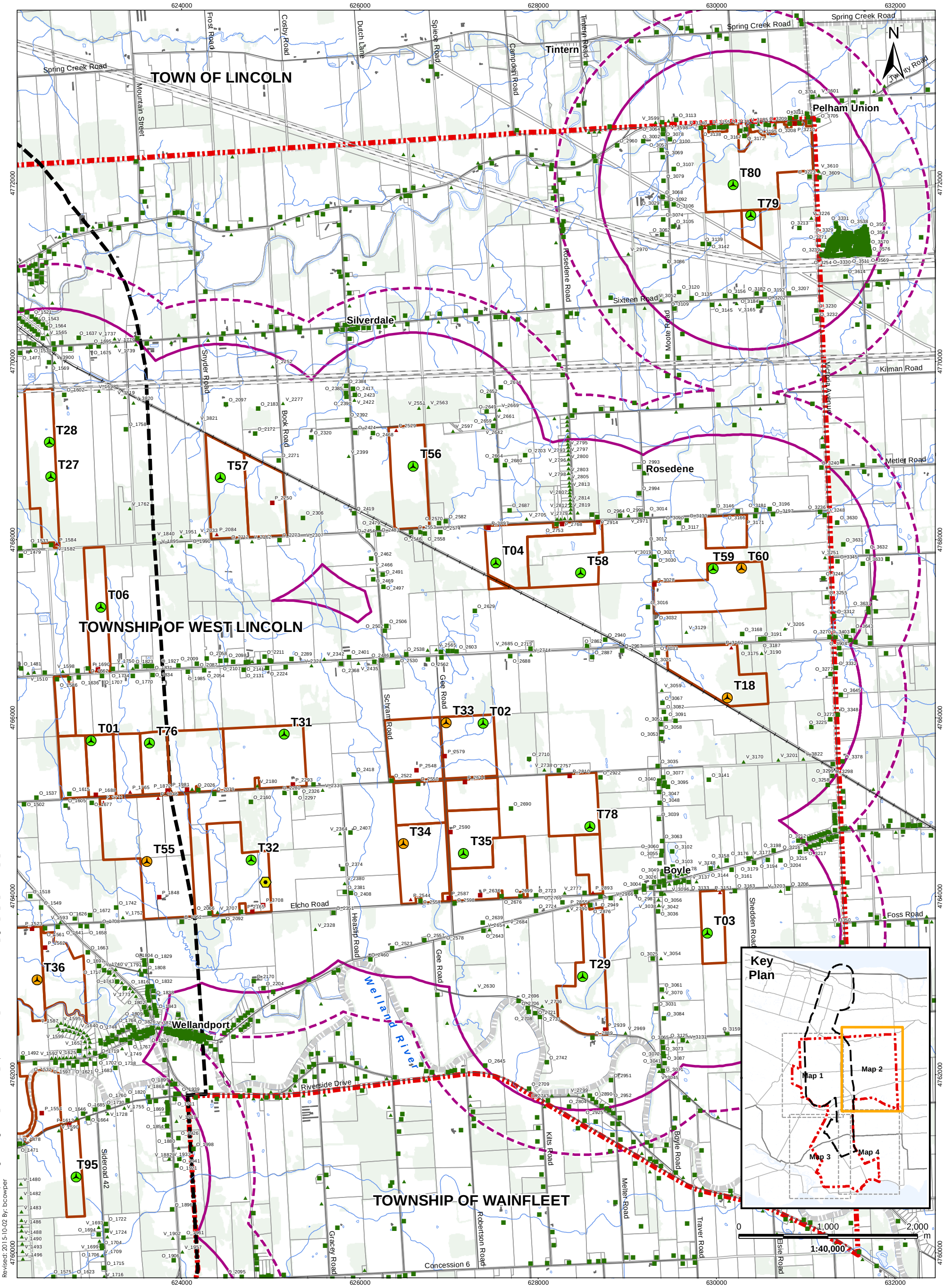
Figure No.
2.1a

Title
Locations of Project Infrastructure within Study Area: Map 1 of 4



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Revised: 2015-10-02 By: bcowper

Stantec

Notes

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

Legend

- Project Study Area
- Interconnector Study Area
- Proposed Turbine Location - E101 3.0 MW
- Proposed Turbine Location - E101 2.9 MW G2/G3
- Transformer Substation
- Tap-in Location
- Existing Met Tower
- 1.5 km Radius from Proposed Turbine Centre Point
- 2km Radius from Proposed Turbine Centre Point
- Road
- Expressway / Highway
- Active Railway
- Abandoned Railway
- Existing Transmission Line
- Existing Structures
- Watercourse
- Waterbody
- Wooded Area
- Municipal Boundary

Participating Noise Receptors
- Occupied
- Vacant

Non-participating Noise Receptors
- Occupied
- Vacant

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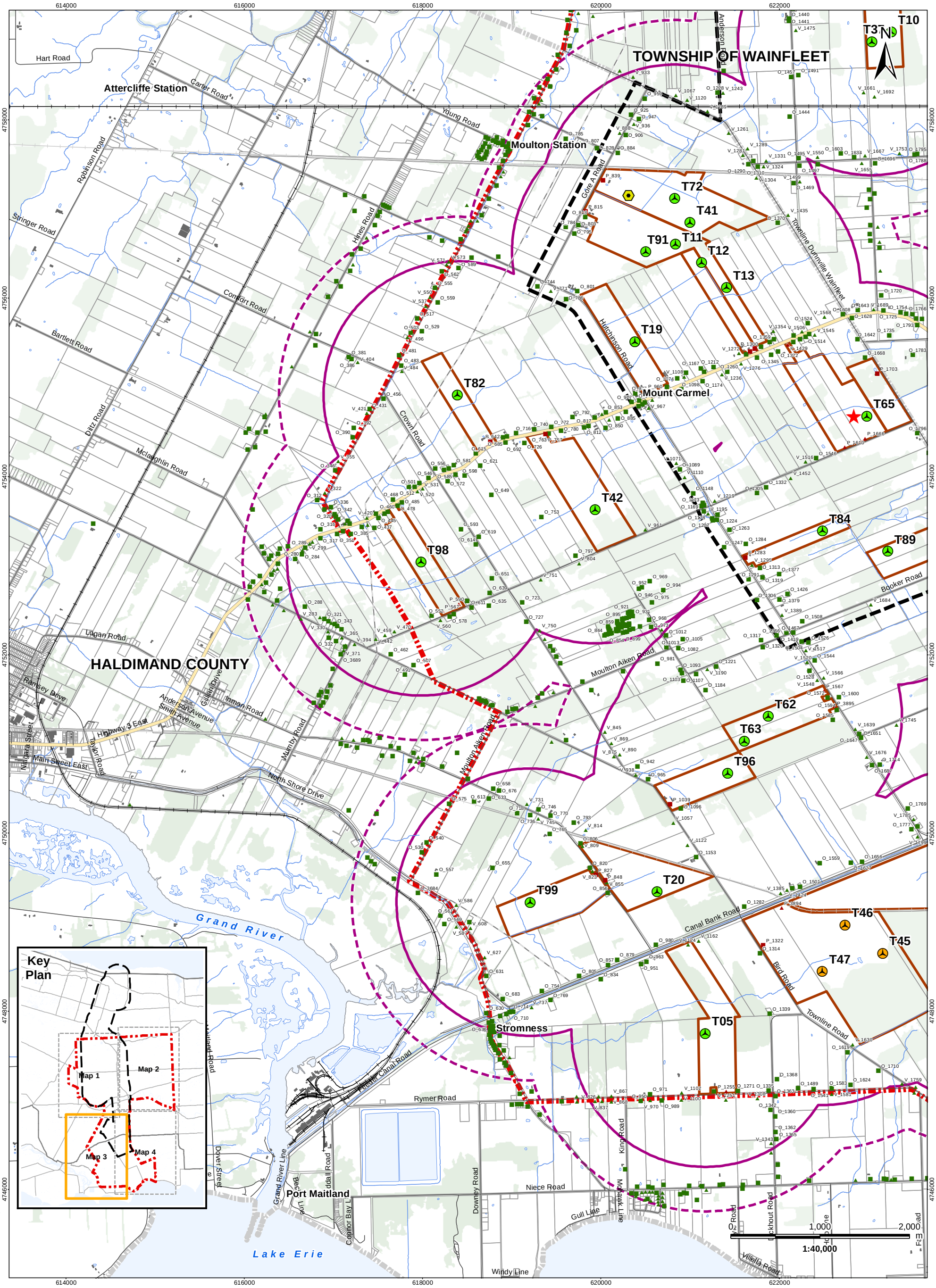
Figure No.
2.1b

Title
Locations of Project Infrastructure within Study Area: Map 2 of 4



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   Scenario 2 - T36, T46, T53 are E82 model at hub height 135 metre; and the rest are E101 model at hub height 135 metre.

Legend

- Project Study Area
- Interconnector Study Area
- Proposed Turbine Location - E101 3.0 MW
- Proposed Turbine Location - E101 2.9 MW G2/G3
- Transformer Substation
- Tap-in Location
- Existing Met Tower
- 1.5 km Radius from Proposed Turbine Centre Point
- 2km Radius from Proposed Turbine Centre Point
- Road
- Expressway / Highway
- Active Railway
- Abandoned Railway
- Existing Transmission Line
- Existing Structures
- Watercourse
- Waterbody
- Wooded Area
- Municipal Boundary

Participating Noise Receptors
- Occupied
- Vacant

Non-participating Noise Receptors
- Occupied
- Vacant

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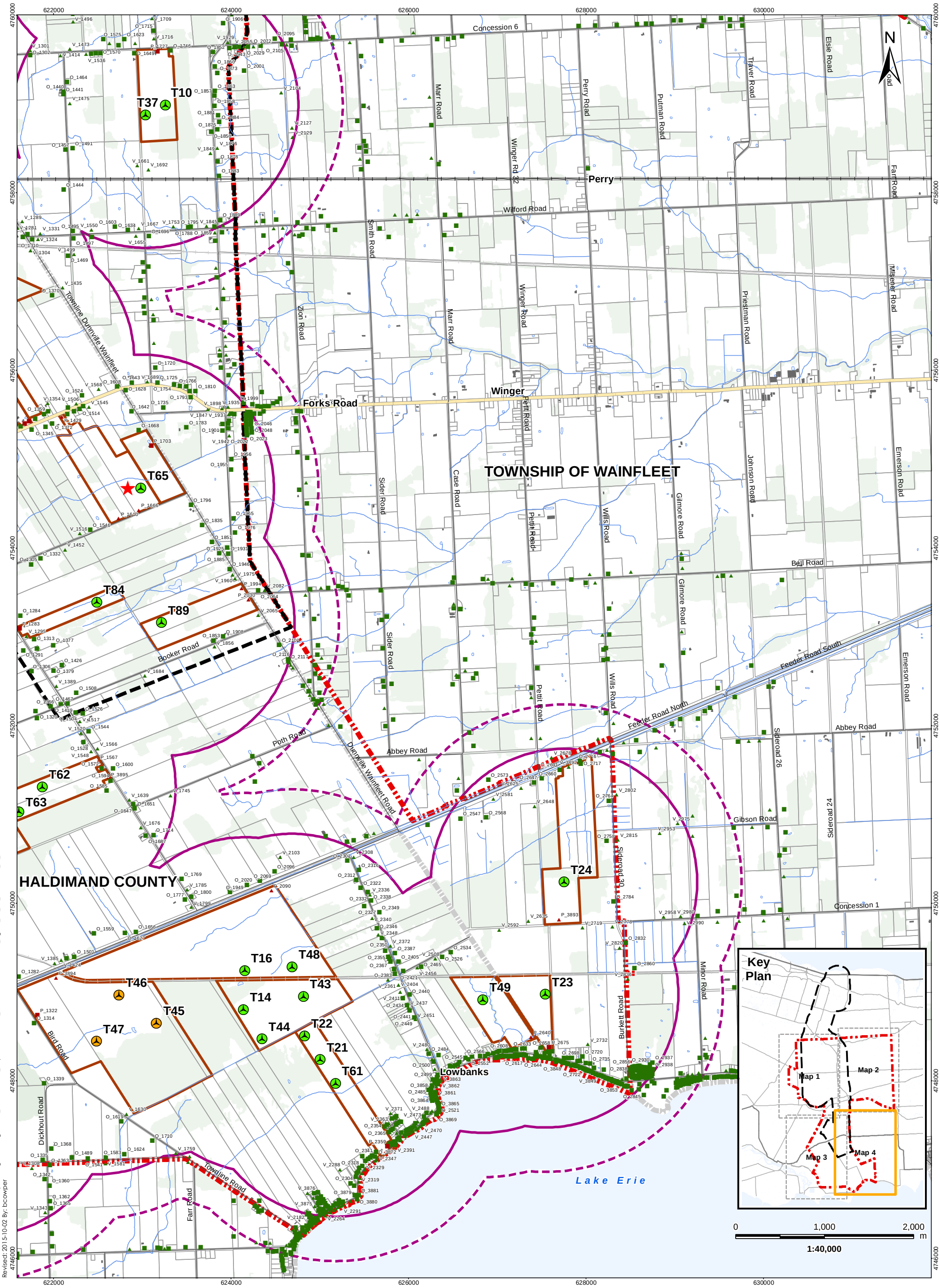
Figure No.
2.1c

Title
Locations of Project Infrastructure within Study Area: Map 3 of 4



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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.

Legend

- Project Study Area
- Interconnector Study Area
- Proposed Turbine Location - E101 3.0 MW
- Proposed Turbine Location - E101 2.9 MW G2/G3
- Transformer Substation
- Tap-in Location
- Existing Met Tower
- 1.5 km Radius from Proposed Turbine Centre Point
- 2km Radius from Proposed Turbine Centre Point
- Road
- Expressway / Highway
- Active Railway
- Abandoned Railway
- Existing Transmission Line
- Existing Structures
- Watercourse
- Waterbody
- Wooded Area
- Municipal Boundary

Participating Noise Receptors
- Occupied
- Vacant

Non-participating Noise Receptors
- Occupied
- Vacant

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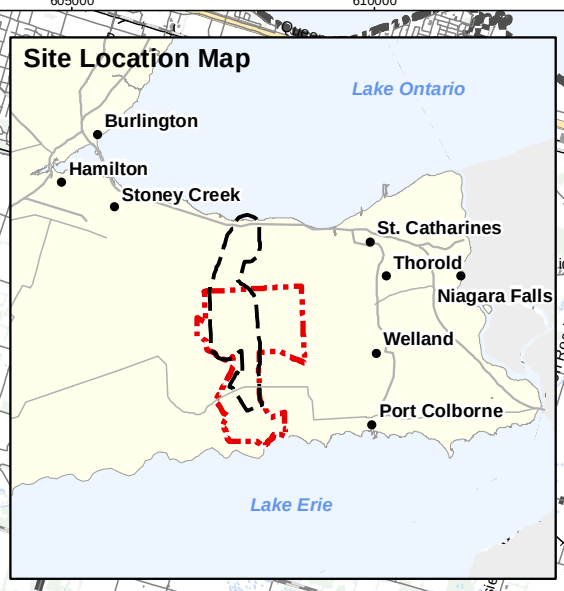
Figure No.
2.1d

Title
Locations of Project Infrastructure within Study Area: Map 4 of 4



TOWN OF GRIMSBY
TOWN OF LINCOLN
TOWNSHIP OF WEST LINCOLN
TOWN OF PELHAM
TOWNSHIP OF WAINFLEET
HALDIMAND COUNTY
Lake Ontario
Lake Erie
Welland River
Grand River
Olive Street
Livingston Avenue
Main Street West
Main Street East
Lake Street
South Service Road
QEW Highway
Greenlane
John Street
Ridge Road East
Elm Tree Road West
Kemp Road West
Elmtree Road East
Kemp Road East
King Street
Hillside Drive
Fourth Avenue
Mud Street
Regional Road 20
Young Street
Spring Creek Road
Fly Road
Eighth Avenue
Pelham Road
Sixteen Road
Silver Street
Caistorville Road
Smithville Road
Canborough Road
Dunnville Road
Highway 3
Haldimand Road 17
Haldimand Road 20
Haldimand Road 49
Rainham Road
Robinson Road
Port Maitland Road
Rymer Road
Highway 3 East
Forks Road
Concession 1
Lakeshore Road
Riverside Drive
Welland Road
Webber Road
Foss Road
Canboro Road
Balfour Street
Cream Street
Centre Street
Victoria Avenue
Nineteenth Street
Jordan Road
Glen Road
Campden Road
Mountain Road
Mountainview Road
Ontario Street
Bartlett Road
Sunn Road
Tufford Road
Merritt Road
Maple Grove Road
Quarry Road
Walker Road
Thirty Road
Park Road South
Church Road
Russ Road
Grimsby Road
Stewart Street
Grassie Road
Mountain Street

0 2,000 4,000 m
1:125,000

605000 610000 615000 620000 625000 630000 635000
4785000 4780000 4775000 4770000 4765000 4760000 4755000 4750000 4745000

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Revised: 2015-09-30 By: bcowper

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Notes
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Legend
- Project Study Area
- Interconnector Study Area
- Proposed Turbine Location - E101 3.0 MW
- Proposed Turbine Location - E101 2.9 MW G2/G3
- Transformer Substation
- Tap-in Location
- Existing Met Tower
- 5km Buffer from Proposed Turbine Locations
- Sound Level Contours (40 dBA)
- Road
- Expressway / Highway
- Active Railway
- Abandoned Railway
- Existing Structures
- Existing Transmission Line
- Waterbody
- Wooded Area
- Municipality Lower Tier
- Participating Noise Receptors: Occupied
- Participating Noise Receptors: Vacant
- Non-participating Receptors: Occupied
- Non-participating Receptors: Vacant
- Other Wind Turbines: Mohawk Wind Farm (Existing)
- Other Wind Turbines: Rosa Flora Turbine (Existing)
- Other Wind Turbines: Wainfleet Wind Energy Project (Proposed)
- Other Wind Turbines: HAF Wind Energy Project (Proposed)
- Other Wind Turbines: Grand Renewable Energy Park (Proposed)
- Other Wind Turbines: Other Wind Farm Project (Proposed)

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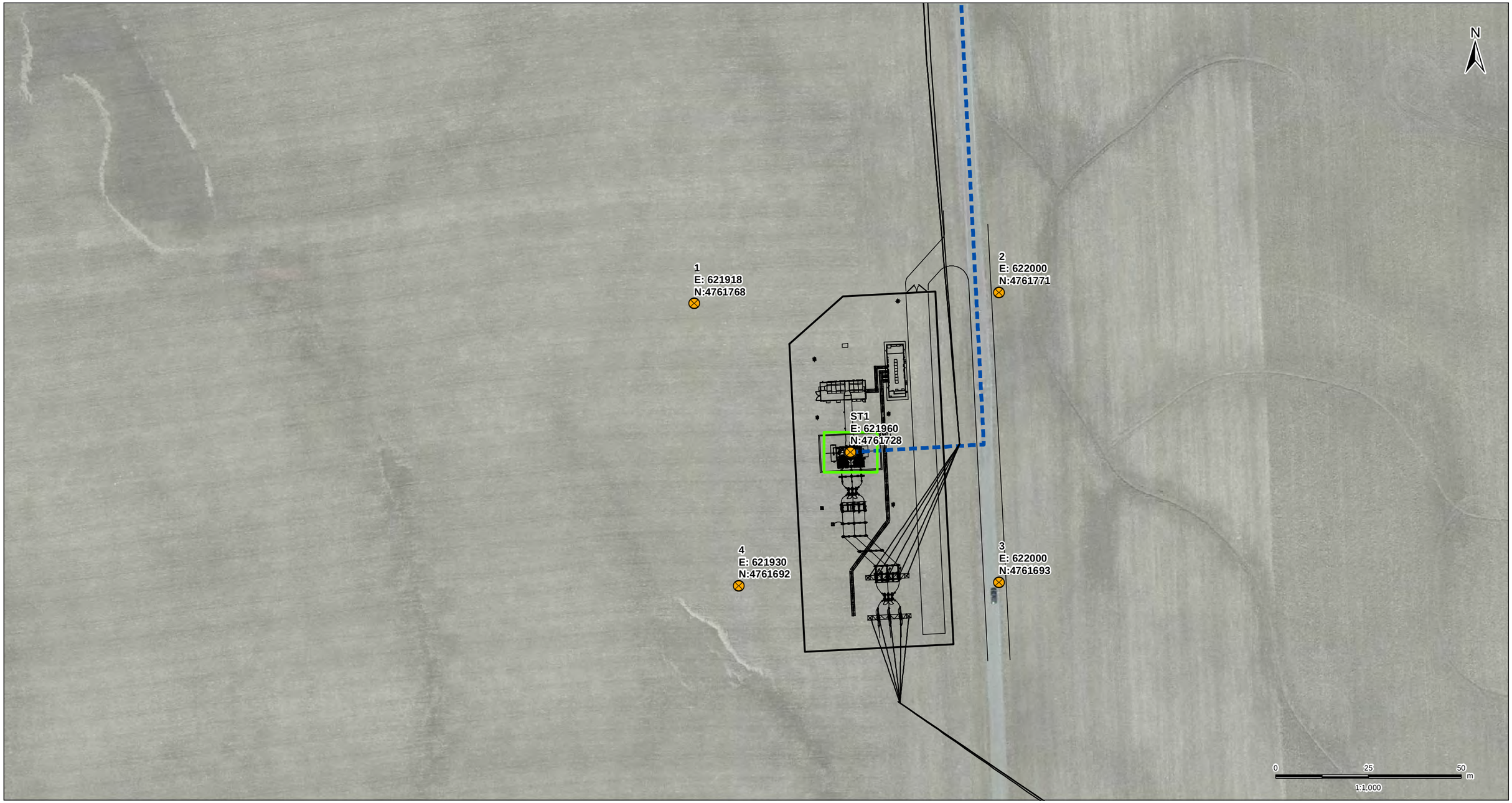
Figure No.
6.1

Title
Predicted Equivalent Sound Level Contours (Cumulative Effects - Day/Nighttime Hours)



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Revised: 2015-09-30 By: bcowper

September 2015
133560006

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Legend
- Noise Emission Locations
- Barrier
- Potential Access Road
- Transformer Substation

Notes
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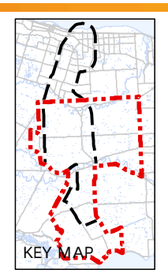

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Niagara Region Wind Farm
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Figure No.
F.1

Title
North Transformer Station

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Notes
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Legend
- Noise Emission Locations
- Barrier
- Proposed Turbine Location - E101 3.0 MW
- Potential Access Road
- Temporary Laydown Area
- Watercourse
- Transformer Substation
- Turbine Blade Length

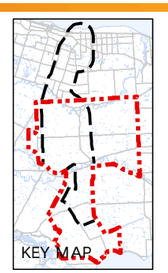

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Figure No.
F.2

Title
South Transformer Station

Appendix B:

Correspondence with MNRF

Ministry of Natural Resources and Forestry

Confirmation Email

From: Beal, Jim (MNRF)
To: St. James, Katherine
Subject: RE: Niagara Region Wind Farm - NHA Addendum
Date: Wednesday, September 30, 2015 1:12:51 PM

Based on the information you have just provided in the email below, no re-confirmation is required.

JB

From: St. James, Katherine [mailto:Katherine.St.James@stantec.com]
Sent: September-30-15 7:45 AM
To: Beal, Jim (MNRF)
Cc: Skillen, Kerrie; Powell, Chris; Adam Rosso (adam.rosso@boralex.com)
Subject: Niagara Region Wind Farm - NHA Addendum

Hi Jim,

We've completed the NHA Addendum document which we discussed last week. As discussed, the amendments have resulted in a few changes to the 120m zone of investigation as a result of minor adjustments to the location of some project components (i.e. entrances, access roads, interconnection station footprint). No new vegetation communities were added to the project previously addressed in the NHA. One natural heritage feature type has been updated: since the original NHA, the MNRF has added a new community to the Marshville Station Provincially-Significant Wetland Complex. This feature was previously identified and assessed as part of the original NHA as a lowland forest; however, has now been updated to a wetland to match MNRF records. Mitigation for this feature will follow what is described for significant wetlands in the original NHA.

No new features have been added and no new mitigation is required.

Please download the addendum for full details: ftp://s1014053815:1806089@ftptmp.stantec.com. Upon your review, please provide written re-confirmation for the NHA/EIS and let us know if you have any concerns with the amendments.

Thank you!

Katherine St. James
Terrestrial Ecologist
Stantec
1-70 Southgate Drive Guelph ON N1G 4P5
Phone: (519) 780-8173
Cell: (226) 979-8230
Fax: (519) 836-2493
Katherine.StJames@stantec.com

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

September 22, 2015
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: Natural Heritage Assessment Addendum - Technical and Project Design Changes Niagara Region Wind Farm

The purpose of this memo is to provide the Ministry of Natural Resources and Forestry (MNRF) with an addendum to the 'Natural Heritage Assessment and Environmental Impact Study for the Niagara Region Wind Farm' (Stantec, 2013) to address proposed modifications to the Niagara Region Wind Farm (NRWC, the 'Project').

Since the proposed adjustments are minor, the majority of information contained in the NHA/EIS as confirmed by the MNRF through their letter dated April 2, 2013 remains applicable to this Project. The following information is provided to update to the records review, site investigation, evaluation of significance, and environmental impact study sections of the Natural Heritage Assessment and Environmental Impact Study (NHA/EIS) for the expanded zone of investigation (ZOI) where the modifications would trigger the need for additional information.

Section 1 – Description of Project Changes

The proposed modifications include:

A. Revised footprint of interconnection station to accommodate additional equipment requested by Hydro One Networks Inc. and associated construction area – this project design change does require a new ZOI area (**Figure 2.1, Attachment A**);

B. Alternate access road between T12, T11, and T41 to avoid delivery of components from Gore A Road which was identified as a concern by Haldimand County – this project design change does require a new ZOI area (**Figure 2.43, Attachment A**);

C. Revised footprint of north substation to avoid archaeological resources identified nearby – this technical change does not require a new ZOI area (**Figure 2.39, Attachment A**);

D. Relocation of junction boxes to increase operational flexibility and help with municipal concerns of the current locations – this technical change does not require a new ZOI (text change only);

Reference: Natural Heritage Assessment Addendum - Technical and Project Design Changes
Niagara Region Wind Farm

E. Alternate turbine model for 11 of the Project's 80 turbines – customized Enercon E101-2.9 MW turbines on 124 m towers in place of Enercon E82-2.3 MW and Enercon E101-3.0MW turbines – this technical change does not require a new ZOI, and as a conservative approach for the project footprint was included in the original NHA/EIS with regards to blade length, height, and noise, no changes to original NHA/EIS or ZOI are required (text change only);

F. Alternate transformer to reduce sound power level as well as move noise barriers closer to transformer location – this technical change does not require a new ZOI (text change only); and,

G. Revised access road entrances (T79/T80, T76, T09/T51, T10/T37, T84, T99, and T20) to allow for increased turning radii for component delivery – this technical change does not require a new ZOI with the exception of the entrance to T79/80 (**Figures 2.20, 2.28, 2.35, 2.41, 2.48, and 2.54, Attachment A**).

As a result, the modifications which require a new ZOI will be addressed in this letter, including modifications A, B, and G (entrance to T79/T80 only).

The other technical changes (C, D, E, F, and the remaining entrances listed under G) do not result in any changes to the Natural Heritage Assessment and Environmental Impact Study (NHA/EIS), and all other commitments within the NHA/EIS and Environmental Effects Monitoring Plan (EEMP) for post-construction monitoring, mitigation and contingency measures remain unchanged for these modifications.

Section 2 – Policies

Ontario Regulation 359/09 (as amended by O. Reg. 195/12) issued under the *Environmental Protection Act* outlines the application, approval, consultation and reporting requirements necessary to obtain approval of a renewable energy project, such as a wind, solar, thermal treatment or anaerobic digestion facility. This NHA and EIS Addendum report is intended to satisfy sections 24 through 28, 37 and 38 of O. Reg. 359/09. The policy framework for this NHA/EIS addendum has not changed from the NHA/EIS.

Section 3 – Records Review

The records review included in the NHA/EIS, which was completed in accordance with Section 25 of O. Reg. 359/09, included the entire Study Area (**Figure 1, Attachment A**), which encompasses the minor modifications.

Because the Study Area expanded further than the 120 m ZOI for the Project, the original NHA/EIS encompassed the new ZOI for modifications A, B, and G (entrance to T79/T80). The other modifications listed under G did not result in a change to the ZOI.

Reference: Natural Heritage Assessment Addendum - Technical and Project Design Changes
Niagara Region Wind Farm

Following the same methods found in the NRWC NHA/EIS, an additional records review was conducted for the new ZOI to confirm if new known natural features are present. According to the Natural Heritage Information Centre (NHIC, 2015) and Land Information Ontario (LIO, 2015) databases, there are no new areas designated as significant woodland, Area of Natural or Scientific Interest (ANSI), or significant wildlife habitat within the new ZOI. Near modification B, one new area of Provincially-Significant Wetland (PSW) has been added: Marshville Station PSW Complex. This feature is shown on **Figure 2.43, Attachment A**. The Project is located within 120 m of this natural feature. The Marshville Station PSW Complex is included in the NHA/EIS; however, this additional wetland community has been added by the MNRF to the Marshville Station PSW complex since the original records review.

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

Section 4 - Site Investigation

The new ZOI for modifications A, B, and G (entrance to T79/T80) was surveyed on foot in the field as part of the original NHA/EIS. No new site investigations were required to assess the new ZOI; however, additional site investigations were conducted at modification B.

Detailed dates, time and weather conditions of the site investigations are provided in **Table 1**. Additional staff qualifications have been added to **Attachment B**.

Table 1. Survey Details and Summary

Survey Date and Time	Surveyor(s)	Type of Survey	Weather Conditions
July 22, 2015 9:00-11:00	Lisa Uskov	Site Investigation (modification B)	17°C, Wind 1 (Beaufort scale), cloud cover 15%, no precipitation

* Note: Site investigations for other modifications were completed as part of the original NHA/EIS.

No new vegetation communities have been added in the new ZOI. Near modification B, the boundary of woodland wo153 has been updated following removal of a portion of this woodland by the landowner for agricultural purposes. The update to this woodland boundary is shown on **Figure 5.43, Attachment A**. This also resulted in the change of corresponding candidate significant wildlife habitats that followed this boundary, including candidate amphibian woodland breeding habitat AH48 (no vernal pooling found in this section), deer winter congregation area dc93, and generalized woodland vole habitat. These features have all been reduced by 0.06 ha (0.2 %). No vegetation removal is required in this woodland or candidate significant wildlife habitat features.

Reference: Natural Heritage Assessment Addendum - Technical and Project Design Changes Niagara Region Wind Farm

Near modification B, wetland we445 (now part of the Marshville Station PSW Complex) is a new wetland feature. No additional site investigation work was undertaken for this feature as it had been included in the original ZOI. This feature was not identified by Stantec as wetland in the NHA/EIS. The ELC communities in this feature were identified as FOD6-5 Fresh-Moist Sugar Maple-Hardwood Deciduous Forest, FOD9-1 Fresh-Moist Oak-Sugar Maple Deciduous Forest, FOD3-1 Dry to Fresh Poplar Deciduous Forest, FOD5-8 Dry-Fresh Sugar Maple-White Ash Deciduous forest, and FOD9-2 Fresh-Moist Oak-Maple Deciduous Forest (as described for woodland wo153 in the NHA/EIS). The FOD9-1 and FOD9-2 communities have since been identified as PSW by the MNRF, so a conservative approach has been used for this addendum and these ELC communities will be included as a wetland feature (we445) in this NHA addendum.

Site investigations focused on determining whether candidate significant wildlife habitats have the potential to occur in the new ZOI. 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, 2015). Specific emphasis was placed on determining whether the critical habitat features required to support significant wildlife habitat were present in natural features in the new ZOI. No new candidate significant wildlife habitats have been added as a result of the modifications. No changes to the original NHA/EIS for the candidate significant wildlife habitat assessments are required. The results of this assessment in the new ZOI are provided in Table 2 below.

Table 2: Summary of Site Investigation Results for Significant Wildlife Habitat for the New ZOI

Candidate Significant Wildlife Habitat	Present in or within 120 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.	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

Reference: Natural Heritage Assessment Addendum - Technical and Project Design Changes Niagara Region Wind Farm

Table 2: Summary of Site Investigation Results for Significant Wildlife Habitat for the New ZOI

Candidate Significant Wildlife Habitat	Present in or within 120 m of Project Location	Rationale	Carried Forward to Summary and EOS (Y/N)
Bat Hibernacula	No	There were no caves, abandoned mine shafts, underground foundations, or karsts or crevice/cave communities identified within 1120 m of the new Project Location.	No
Turtle Wintering Areas	No	No large bodies of water or wetlands with permanent water were identified in the ZOI.	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
Colonial-Nesting Bird Breeding Habitat (tree/shrub)	No	No stick nest colonies were observed in the new ZOI.	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	No	No new deer winter congregation areas were identified during the Records Review in the new ZOI.	No
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 forest communities were not observed during vegetation surveys and woodland assessment of woodlands in the new ZOI.	No

Reference: Natural Heritage Assessment Addendum - Technical and Project Design Changes Niagara Region Wind Farm

Table 2: Summary of Site Investigation Results for Significant Wildlife Habitat for the New ZOI

Candidate Significant Wildlife Habitat	Present in or within 120 m of Project Location	Rationale	Carried Forward to Summary and EOS (Y/N)
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 were not observed during ELC and vegetation surveys in the new ZOI.	No
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)	No	No new wetland features or woodlands with vernal pooling were observed during site investigations in the new ZOI.	No
Amphibian Breeding Habitat (Wetland)	No	No vernal pooling 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

Reference: Natural Heritage Assessment Addendum - Technical and Project Design Changes Niagara Region Wind Farm

Table 2: Summary of Site Investigation Results for Significant Wildlife Habitat for the New ZOI

Candidate Significant Wildlife Habitat	Present in or within 120 m of Project Location	Rationale	Carried Forward to Summary and EOS (Y/N)
Marsh Bird Breeding Habitat	No	No marsh communities with shallow standing water or emergent aquatic vegetation were identified in the new ZOI.	No
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	No	No terrestrial crayfish chimneys were observed in the new ZOI.	No
S1-S3, Special Concern Species and Communities	No	Candidate significant habitat for S1-S3, Special Concern Species and Communities was searched for during site investigations. Methods for site investigation followed those described in the NHA/EIS. No new habitat features for S1-S3 and Special Concern species and communities were identified in the new ZOI.	No
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

Section 5 - Evaluation of Significance

No new woodlands or candidate significant wildlife habitats were added in the new ZOI. The following updates to the evaluation of significance are required:

- New wetland we445 (part of the Marshville Station PSW Complex) is provincially-significant, as determined by the MNRF. No additional evaluation of significance of this feature is required;
- Wo153 has changed from 25.98 ha to 25.92 ha, and it is still considered a significant woodland;
- Dc93 has changed from 25.98 ha to 25.92 ha, and it is still considered a generalized significant deer winter congregation area; and,

- Generalized woodland vole habitat corresponding with the boundary of wo153 has changed from 25.98 ha to 25.92 ha, and it is still considered a generalized significant woodland vole habitat.

Snake hibernaculum feature SH3, located within 120 m of the new access road to T12 (modification B), was found to be not significant during pre-construction surveys (Stantec, 2014). Candidate amphibian woodland breeding habitat AH48 was found to be not significant in the original NHA (Stantec, 2013).

Section 6 - Environmental Impact Study

An assessment of the impacts associated with the installation of all project components within the original ZOI was undertaken as part of the original NHA/EIS. Parts of the Project are located within 120 m of significant wetlands, woodlands, and wildlife habitat and as such, an EIS was required to assess the potential negative environmental effects and identify mitigation measures designed to prevent or minimize potential negative effects. No changes to distances between Project components and significant features are required for modifications A and G. The addition of access roads at modification B has resulted in changes to distances between Project components and significant features, as described in **Table 3**.

Table 3: Updates to Distances to Project Components for Modification B

Feature Number	Feature Size (ha)	Project Component(s) located within 120 m (approximate closest point in parenthesis)
Woodland wo153	25.92	• Access Road (0.7m) • Collector Line (2.4m) • Laydown Area (8.1m, 14.0m, 8.6m) • Fibre Optic Line (within 0.5m, 110.7m, 61.3m, 37.2m) • T11 (64.2m to turbine base, 28.2m to blade tip) • T12 (58.8m to turbine base, 22.8m to blade tip) • T41 (98.2m to turbine base, 62.2m to blade tip)
Wetland we445	17.03	• Access Road (55.3m) • Collector Line (65.2m) • Laydown Area (12.4m) • Fibre Optic Line (65.2m) • T12 (65.2 to turbine base, 29.2m to blade tip)
Generalized significant wildlife habitats (deer winter congregation area dc93 and woodland vole habitat)	25.92	• Access Road (0.7m) • Collector Line (2.4m) • Laydown Area (8.1m, 14.0m, 8.6m) • Fibre Optic Line (within 0.5m, 110.7m, 61.3m, 37.2m) • T11 (64.2m to turbine base, 28.2m to blade tip) • T12 (58.8m to turbine base, 22.8m to blade tip) • T41 (98.2m to turbine base, 62.2m to blade tip)

Reference: Natural Heritage Assessment Addendum - Technical and Project Design Changes
Niagara Region Wind Farm

The constructible area for the access road to T12 is now located within 120 m of wo153, we445, dc93, and woodland vole habitat.

Impacts to wo153

Potential impacts of access roads on woodlands within 120 m include temporary dust generation, sedimentation and erosion, accidental intrusion and vegetation removal, the potential for spills and contamination to the woodland, and temporary disturbance to habitat from construction noise. The constructible area for access roads and underground collector lines has been sited away from woodlands. Given access roads would be narrow, relatively flat, unpaved roads that will receive relatively little regular traffic during the operation of the Project, they are not anticipated to cause significant root zone disturbance or changes to surface water flow from existing conditions.

Mitigation measures specific to all significant woodlands are outlined in Table 6.1, Appendix B in the NHA/EIS. No changes are required for wo153.

Impacts to we445

Changes in surface water drainage can affect wetlands. Access roads would be narrow, relatively flat, unpaved roads that would receive relatively little regular traffic. Mitigation measures will be implemented to ensure there is no alteration of surface runoff quantity and patterns.

During construction, there will be increased vehicular traffic and the potential for accidental spills. These potential impacts will be avoided where possible and mitigated via implementation of a sediment and erosion protection plan, including the identification of specific locations for material stock-piling and maintenance activities to isolate any spills from the wetland. The proposed development plan may slightly alter surface water inputs to the wetland. New access roads and infrastructure can alter surface flow, and the small increase in hard surface area could result in increased run-off quantities during precipitation events. The percent area converted to hard surfaces is negligible and no effect to the water balance is anticipated. In some instances, new access roads cross drainage features in the upstream catchment of wetlands. Construction of these crossings may disrupt the quality of surface water input to wetlands. Consideration of these crossings is also required to maintain existing flow conditions through the duration of the Project.

Mitigation measures specific to all significant wetlands are outlined in Table 6.1, Appendix B in the NHA/EIS. No changes are required for we445.

Reference: Natural Heritage Assessment Addendum - Technical and Project Design Changes
Niagara Region Wind Farm

Impacts to Generalized Significant Wildlife Habitat (Deer Winter Congregation Area dc93 and Woodland Vole Habitat)

No operational impacts to these features are anticipated from the Project on these two features. In accordance with the Natural Heritage Assessment Guide (OMNR, 2011), potential impacts to these habitats are typically associated with the temporary disturbance of construction activity and can be grouped together as generalized impacts and mitigation measures.

A comprehensive list of general construction mitigation measures that will be implemented during the construction and decommissioning phases of the Project is provided in Table 6.2, Appendix B of the NHA/EIS. No changes are required for these two features.

Monitoring

The pre and post construction disturbance and mortality monitoring as proposed in Section 6.11 of the NHA/EIS and the Environmental Effects Monitoring Plan (EEMP) applies to this EIS Addendum. No changes to the monitoring program are required to address the modifications.

SUMMARY AND CONCLUSION

Given the results of this assessment, the modifications can be implemented with no new net negative environmental effects.

If you have any questions or concerns, please do not hesitate to contact us (contact information provided below) at any time.

Regards,

STANTEC CONSULTING LTD.

Katherine St. James
Terrestrial Ecologist
Phone: (519) 836-6050
Fax: (519) 836-2493
katherine.stjames@stantec.com

Shari Muscat
Project Manager/Environmental Planner
Phone: (519) 575-4116
Fax: (519) 579-6733
shari.msucat@stantec.com

Attachments: A) Figures
B) Additional Staff CVs

c. Chris Powell (Stantec), Kerrie Skillen (Stantec), Adam Rosso (Boralex)

REFERENCES

Ontario Ministry of Natural Resources (OMNR). 2011. Natural Heritage Assessment Guide for Renewable Energy Projects. 99 pp. First Edition. July, 2011.

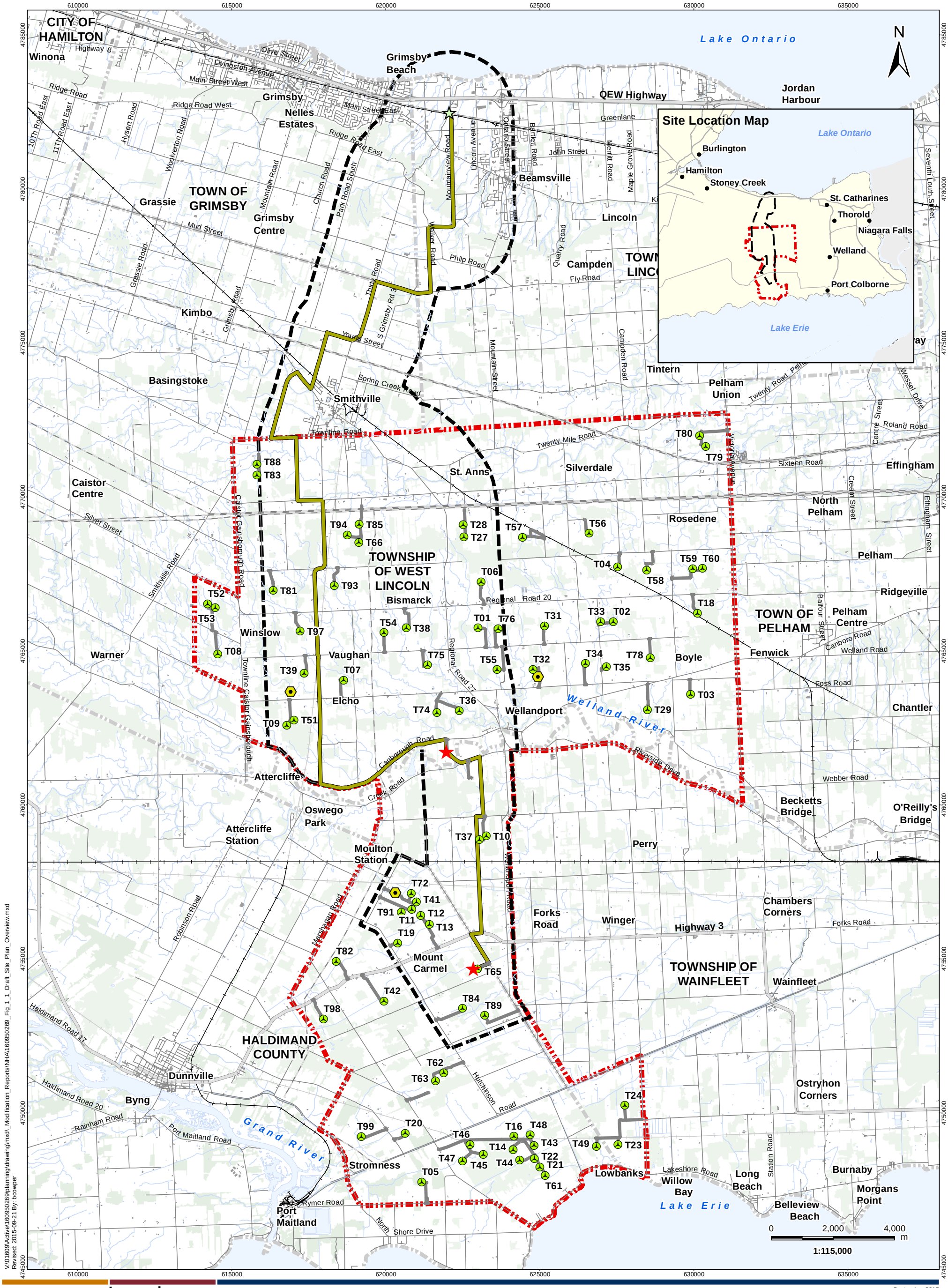
Stantec Consulting Ltd. 2013. Natural Heritage Assessment and Environmental Impact Study for the Niagara Region Wind Farm. 661 pgs.

Stantec Consulting Ltd. 2014. Pre-Construction Monitoring Report: Niagara Region Wind Farm. 159 pgs.

September 22, 2015
Jim Beal

Reference: Natural Heritage Assessment Addendum - Technical and Project Design Changes
Niagara Region Wind Farm

Attachment A: Figures



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Revised: 2015-09-21 By: bcowper

Legend

- Project Study Area
- Interconnector Study Area
- Proposed Turbine Location
- Potential Acesss Road
- Transformer Substation
- Tap-in Location
- Existing Met Tower
- Preferred Transmission Line 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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FWRN LP
Niagara Region Wind Farm

September 2015
160950269

Figure No.
1

Title
Draft Site Plan Overview Revised

621000 621500 622000 622500 623000 623500

4782500

4782000

4781500

North Service Road

QEW Highway

South Service Road

Andrewes Court

Durham Road

Iroquois Trail

Main Street East

Vinatera Drive

Chardonnay Place

King Street

Thirty Road

Mountainview Road

Greenlane

Lincoln Avenue

Cedarbrook Lane

St. Volodymyr Court

Boulevard

Revised Interconnector Footprint

N

0 150 300 m

1:7,500

September, 2015
160950269

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Stantec

Legend

- Project Study Area
- Interconnector Study Area
- 120m Zone of Investigation

Zone of Investigation Adjustments

- Area Added
- Area Removed
- Proposed Turbine Location
- Turbine Relocated
- Turbine Blade Length
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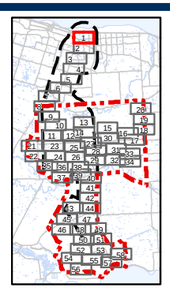

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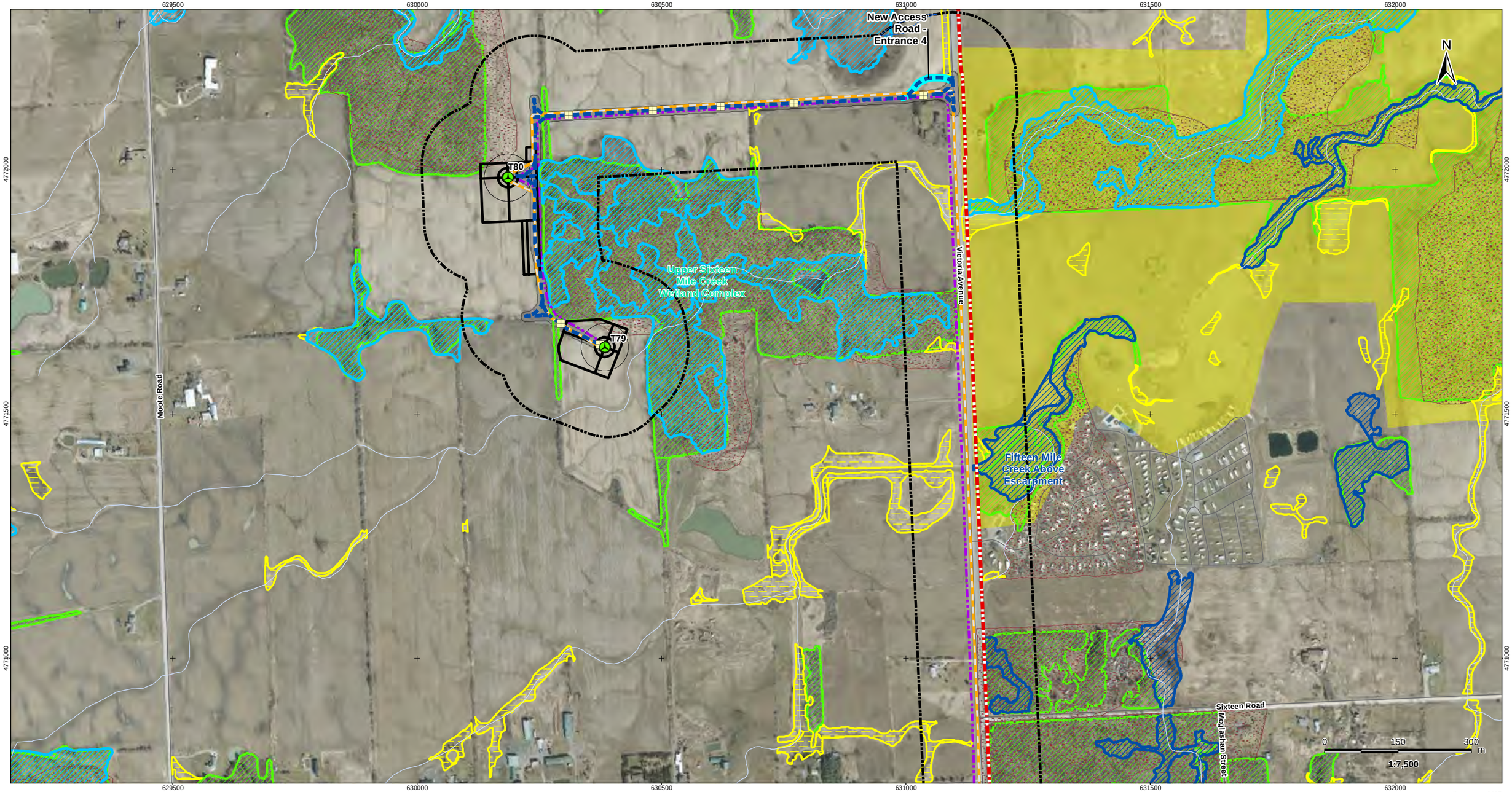
Figure No.
2.1

Title
Records Review - Natural Features Figure 2.1 Revised



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160950269

Stantec

Legend

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Zone of Investigation Adjustments

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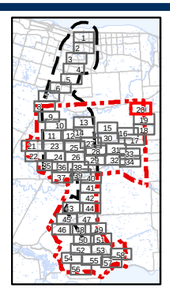

Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
2.20

Title
Records Review - Natural Features Figure 2.20 Revised

623000 623500 624000 624500 625000 625500

4766000 4765500 4765000 4764500

T01 T76 T31

New Access Road - Entrance 22

Vaughan Road

Beaver Creek Wetland Complex

N

0 150 300 m

1:7,500

623000 623500 624000 624500 625000 625500

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160950269

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Stantec

Legend

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Zone of Investigation Adjustments

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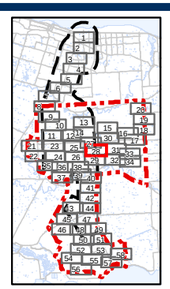

Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
2.28

Title
Records Review - Natural Features Figure 2.28 Revised

615500 616000 616500 617000 617500 618000

4763500 4763000 4762500

Concession 2

Townline Caistor Gainsborough

Elcho Road

New Access Road - Entrance 27

T51

T09

Beaver Creek Wetland Complex

Port Davidson Slough Forest Wetland Complex

Port Davidson Road

N

0 150 300 m

1:7,500

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September, 2015
160950269

Stantec

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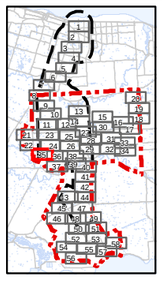

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Natural Heritage Assessment Report

Figure No.
2.35

Title
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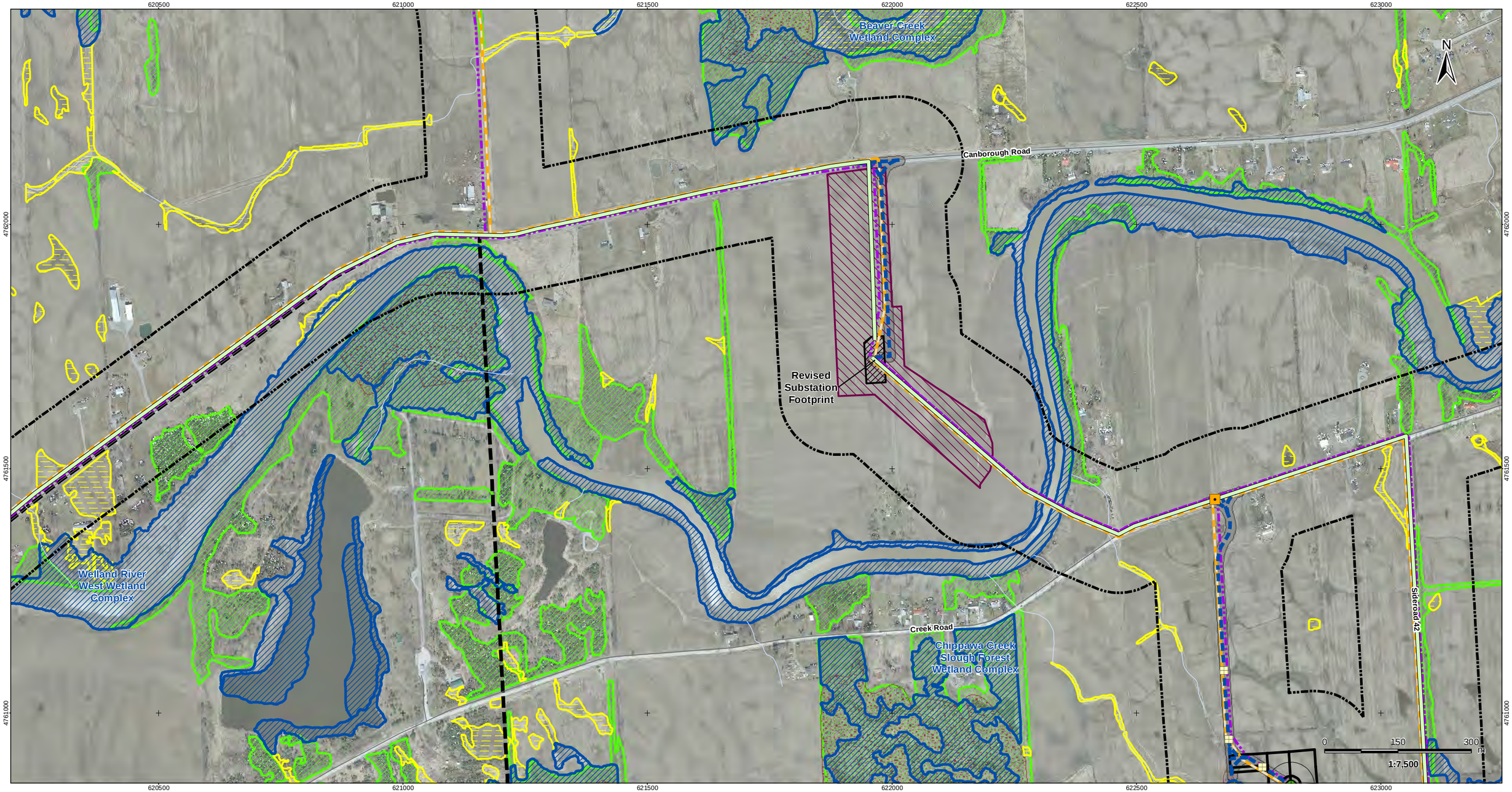

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September, 2015
160950269

Stantec

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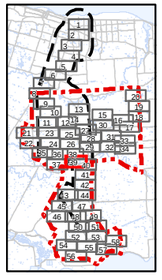

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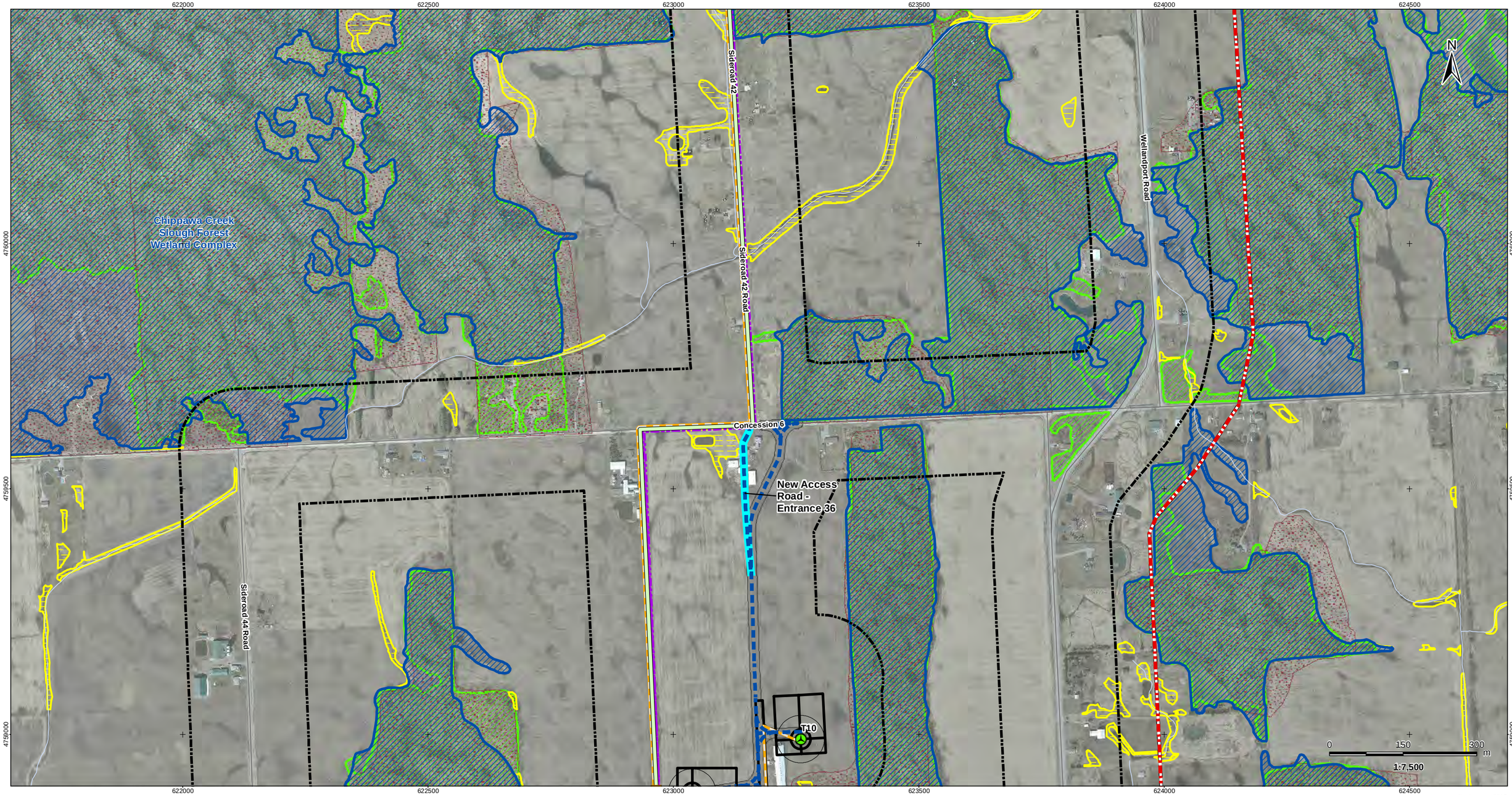
Natural Heritage Assessment Report

Figure No.
2.39

Title
Records Review - Natural Features Figure 2.39 Revised



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September, 2015
160950269

Stantec

Legend

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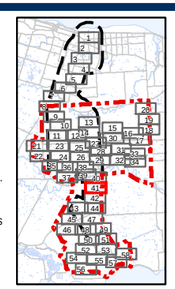
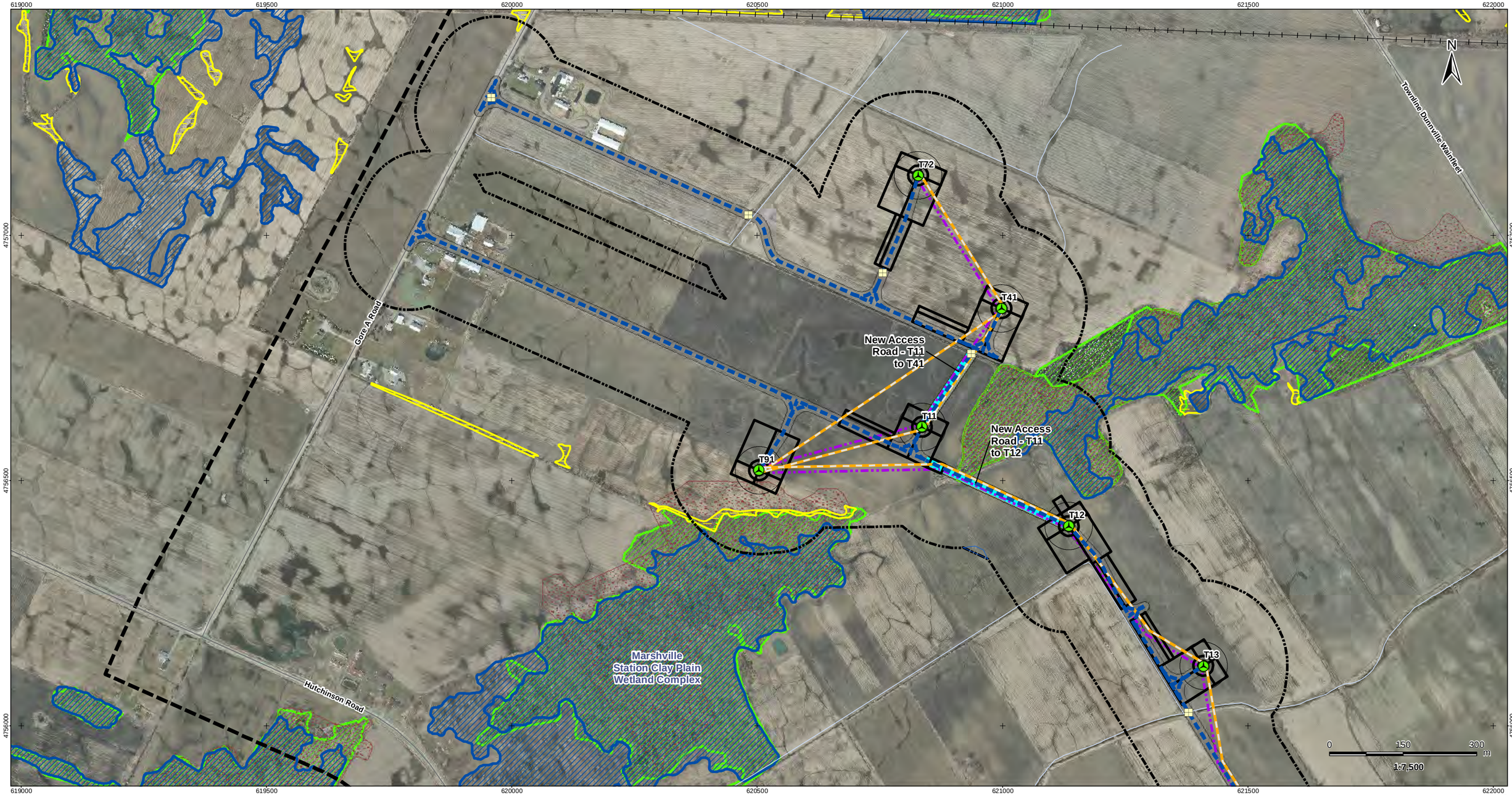


Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
2.41

Title
Records Review - Natural Features Figure 2.41 Revised



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Revised: 2015-09-21 By: bcowper

September, 2015
160950269

Stantec

Legend

- Project Study Area
- Interconnector Study Area
- 120m Zone of Investigation

Zone of Investigation Adjustments

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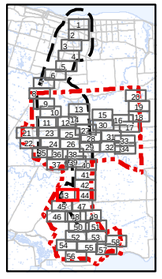

Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
2.43

Title
Records Review - Natural Features Figure 2.43 Revised

620500 621000 621500 622000 622500 623000

4754000 4753500 4753000

N

Jenny Jump Road

Ellsworth Drain Woodlots

T84

Winger, ANSI, Earth Science, Provincially Significant

New Access Road - Entrance 46

East of Dunnville Woodlots

Booker Road

0 150 300 m

1:7,500

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September, 2015
160950269

Legend

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Zone of Investigation Adjustments

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- ANSI, Life Science, Regionally Significant (MNR)
- Greenbelt Natural Heritage System
- Niagara Escarpment

Notes

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Figure No.
2.48

Title
Records Review - Natural Features Figure 2.48 Revised

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Revised: 2015-09-21 By: bcowper

September, 2015
160950269

Stantec

Legend

- Project Study Area
- Interconnector Study Area
- 120m Zone of Investigation

Zone of Investigation Adjustments

- Area Added
- Area Removed
- Proposed Turbine Location
- Turbine Relocated
- Turbine Blade Length
- Tap-in Location
- Junction Box
- Proposed Culvert
- Temporary Laydown Area
- Collector Lines - Underground or Overhead
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area
- Potential Construction Laydown Area
- Transformer Substation
- Unevaluated Wetland (NPCA)
- Woodland (MNR)
- Provincially Significant Wetland (MNR)
- Other/Locally Significant Wetland (MNR)
- Deer Wintering Yard (MNR)
- ANSI, Earth Science, Provincially Significant (MNR)
- ANSI, Life Science, Provincially Significant (MNR)
- ANSI, Life Science, Regionally Significant (MNR)
- Greenbelt Natural Heritage System
- Niagara Escarpment

Notes

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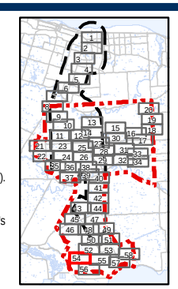

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Natural Heritage Assessment Report

Figure No.
2.54

Title
Records Review - Natural Features Figure 2.54 Revised

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Revised: 2015-09-21 By: bcowper

September, 2015
160950269

Legend

- Interconnector Study Area
- Zone of Investigation Adjustments
- Area Added
- ELC Boundary
- Tap-in Location
- Preferred Transmission Line Route
- Potential Access Road
- Access Road 20m Construction Area
- Transformer Substation

Notes

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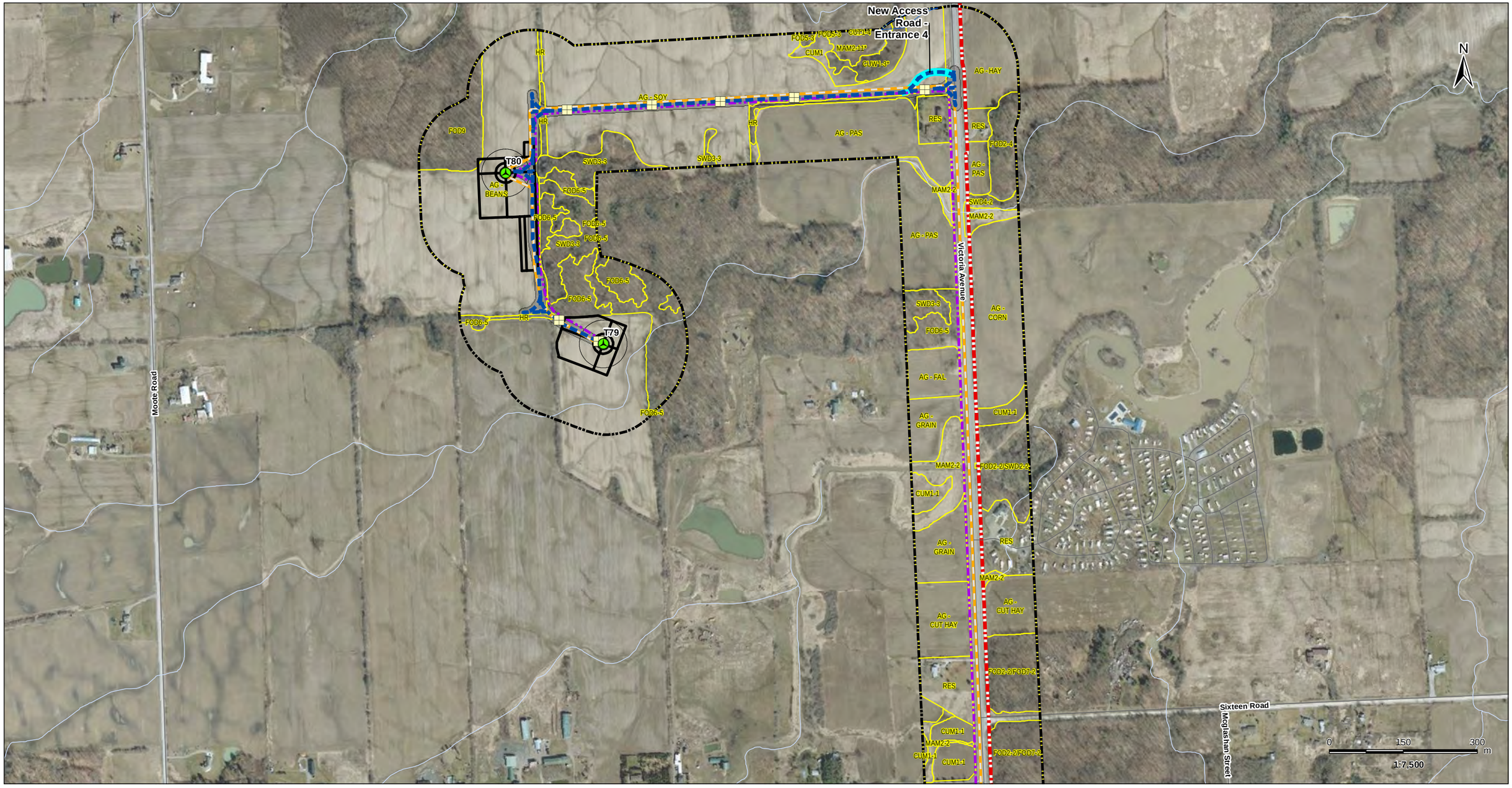
Figure No.
3.1

Title
ELC Vegetation Communities - Figure 3.1 Revised



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September, 2015
160950269

Legend

- Project Study Area
- Zone of Investigation Adjustments
  - Area Added
  - ELC Boundary
- Proposed Turbine Location
- Turbine Blade Length
- Proposed Culvert
- Collector Lines – Underground or Overhead
- Temporary Laydown Area
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area

Notes

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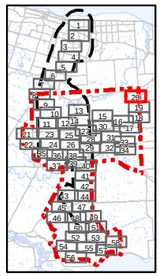

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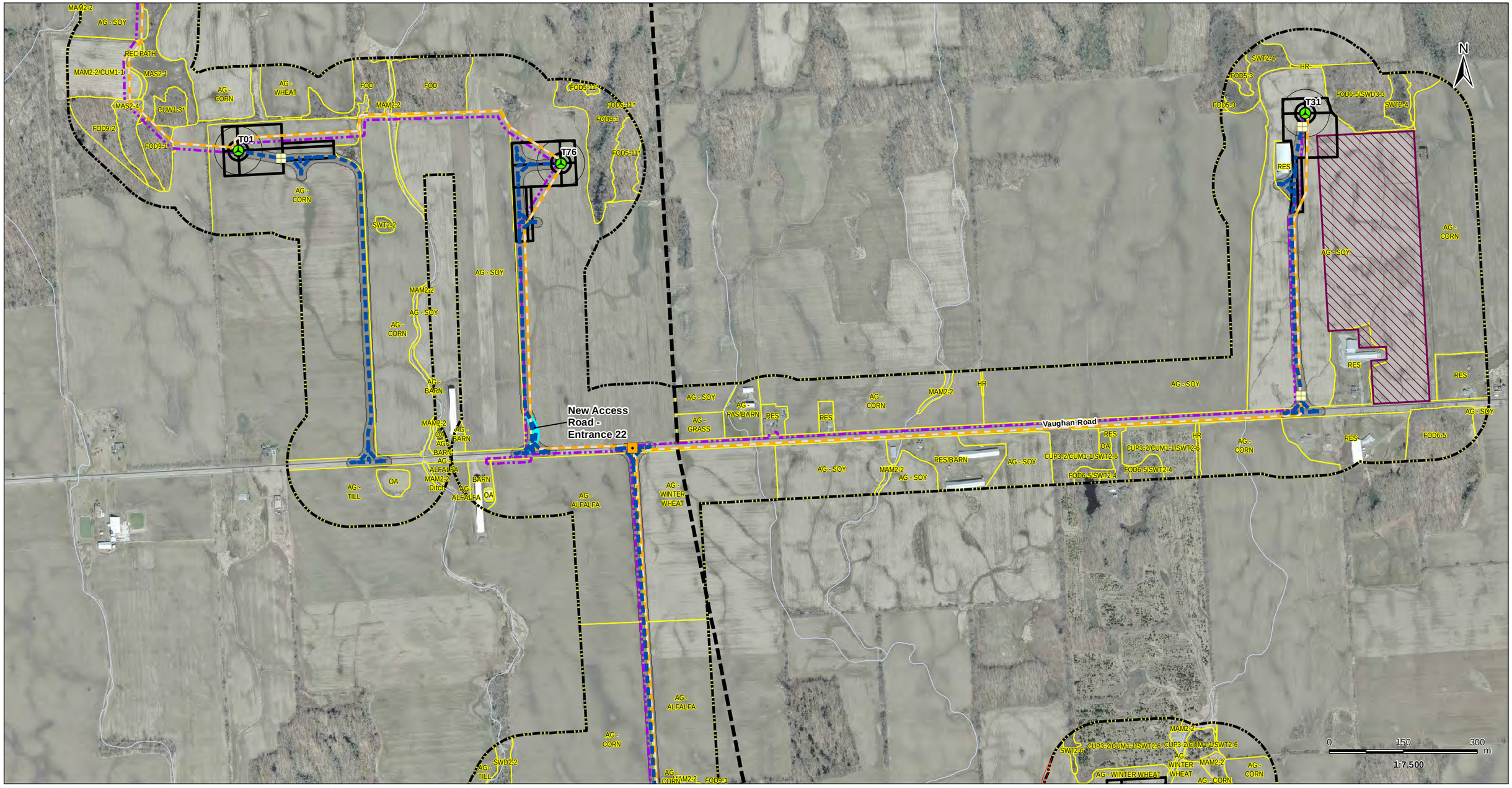
FWRN LP
Natural Heritage Assessment Report

Figure No.
3.20

Title
ELC Vegetation Communities - Figure 3.20 Revised



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September, 2015
160950269

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Legend

- Project Study Area
- Interconnector Study Area
- Zone of Investigation Adjustments
- Area Removed
- ELC Boundary
- Proposed Turbine Location
- Turbine Blade Length
- Junction Box
- Proposed Culvert
- Collector Lines – Underground or Overhead
- Temporary Laydown Area
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area
- Potential Construction Laydown Area

Notes

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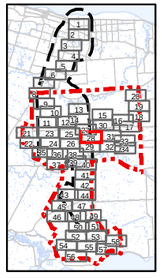

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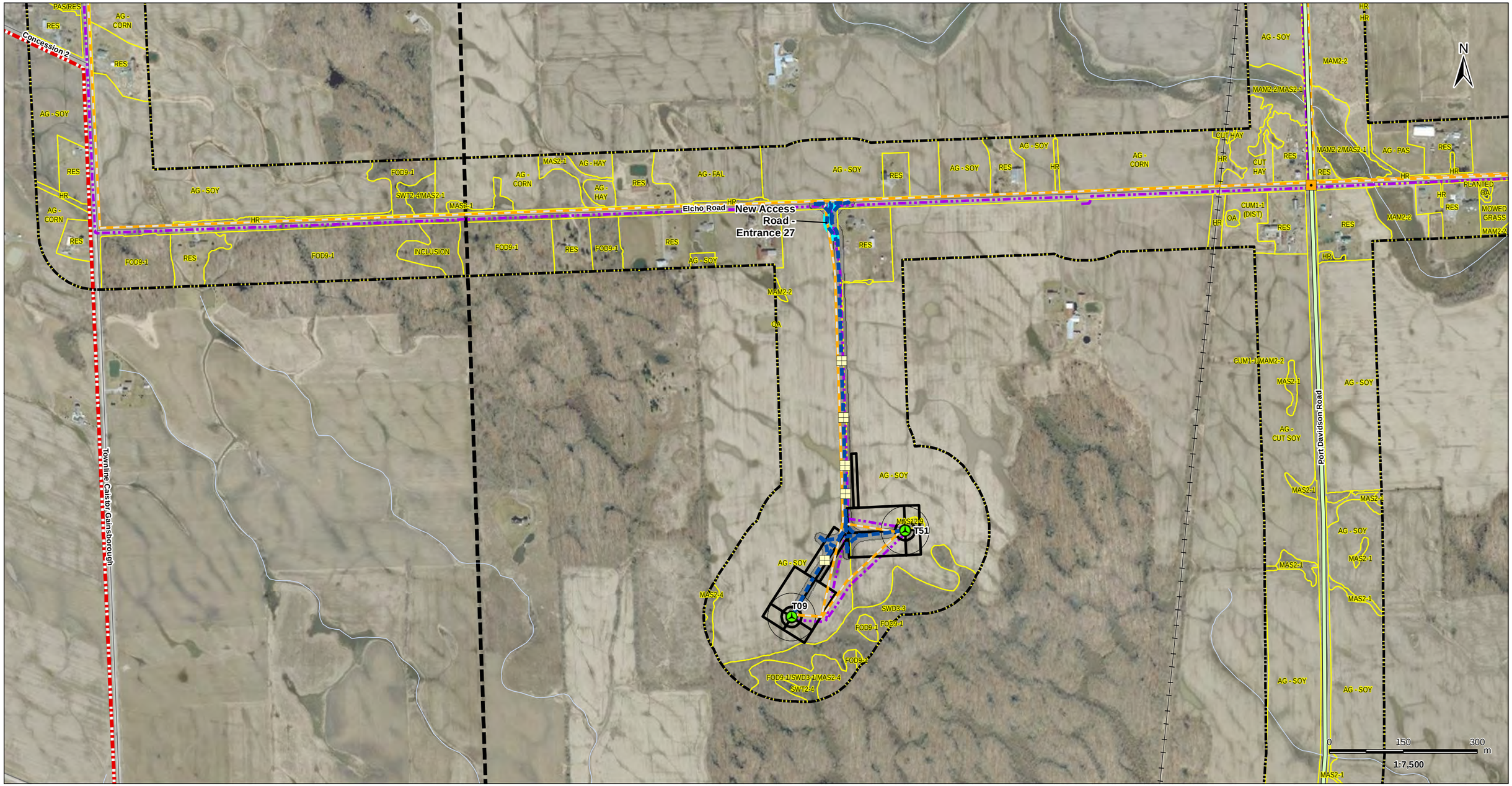
Natural Heritage Assessment Report

Figure No.
3.28

Title
ELC Vegetation Communities - Figure 3.28 Revised



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160950269

Stantec

Legend

- Project Study Area
- Interconnector Study Area
- ELC Boundary
- Proposed Turbine Location
- Turbine Blade Length
- Junction Box
- Proposed Culvert
- Preferred Transmission Line Route
- Collector Lines – Underground or Overhead
- Temporary Laydown Area
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area

Notes

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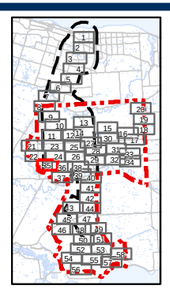

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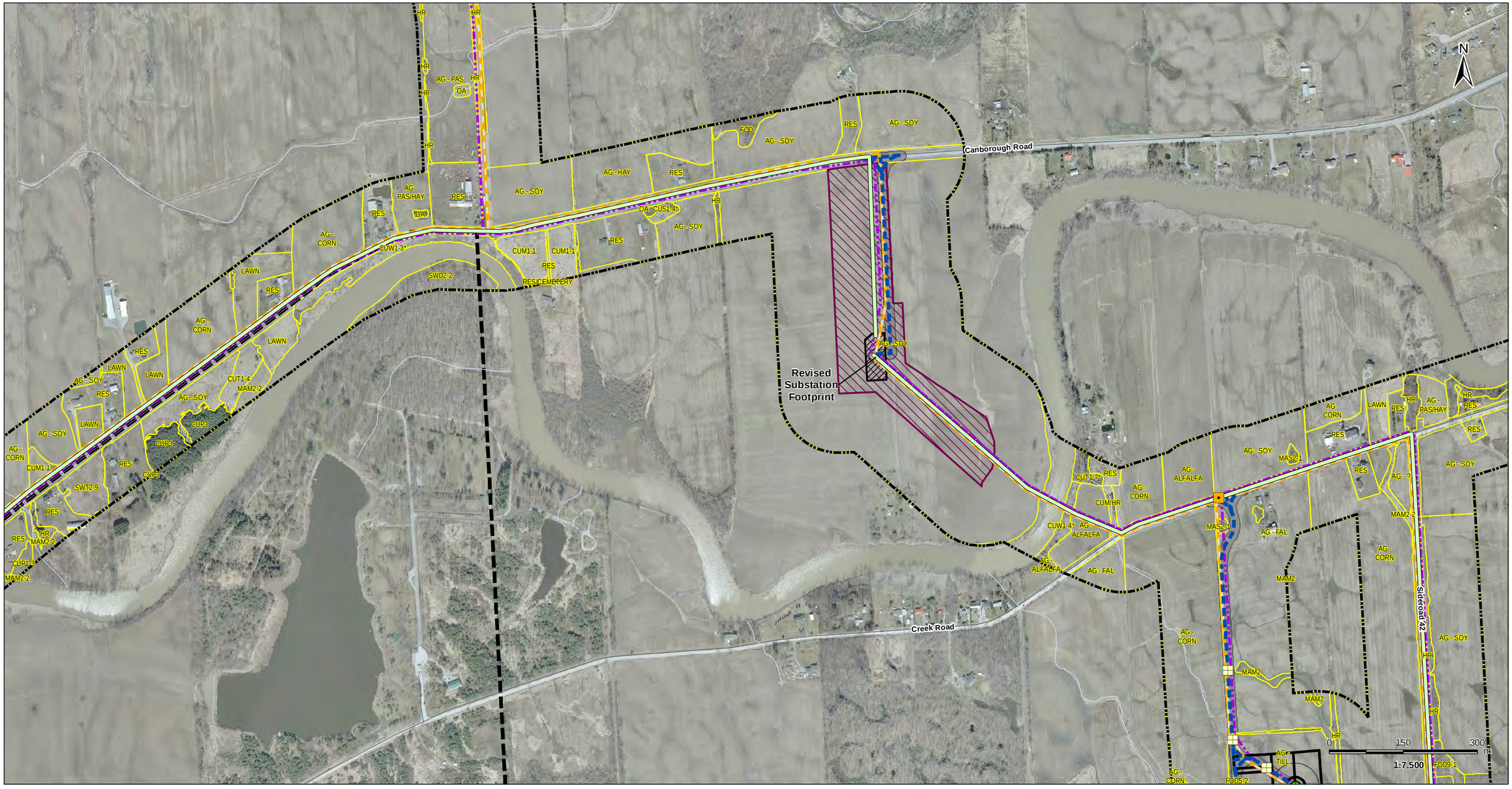
Natural Heritage Assessment Report

Figure No.
3.35

Title
ELC Vegetation Communities - Figure 3.35 Revised



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Stantec

Legend

- Project Study Area
- Interconnector Study Area
- ELC Boundary
- Proposed Turbine Location
- Turbine Blade Length
- Junction Box
- Proposed Culvert
- Preferred Transmission Line Route
- Collector Lines – Underground or Overhead
- Temporary Laydown Area
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area
- Potential Construction Laydown Area
- Transformer Substation

Notes

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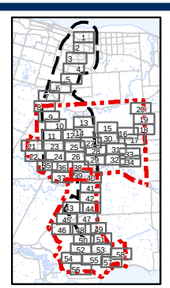

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Figure No.
3.39

Title
ELC Vegetation Communities - Figure 3.39 Revised

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160950269

Legend

- Project Study Area
- Interconnector Study Area
- ELC Boundary
- Proposed Turbine Location
- Turbine Blade Length
- Junction Box
- Preferred Transmission Line Route
- Collector Lines – Underground or Overhead
- Temporary Laydown Area
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area

Notes

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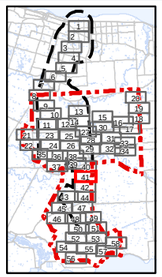

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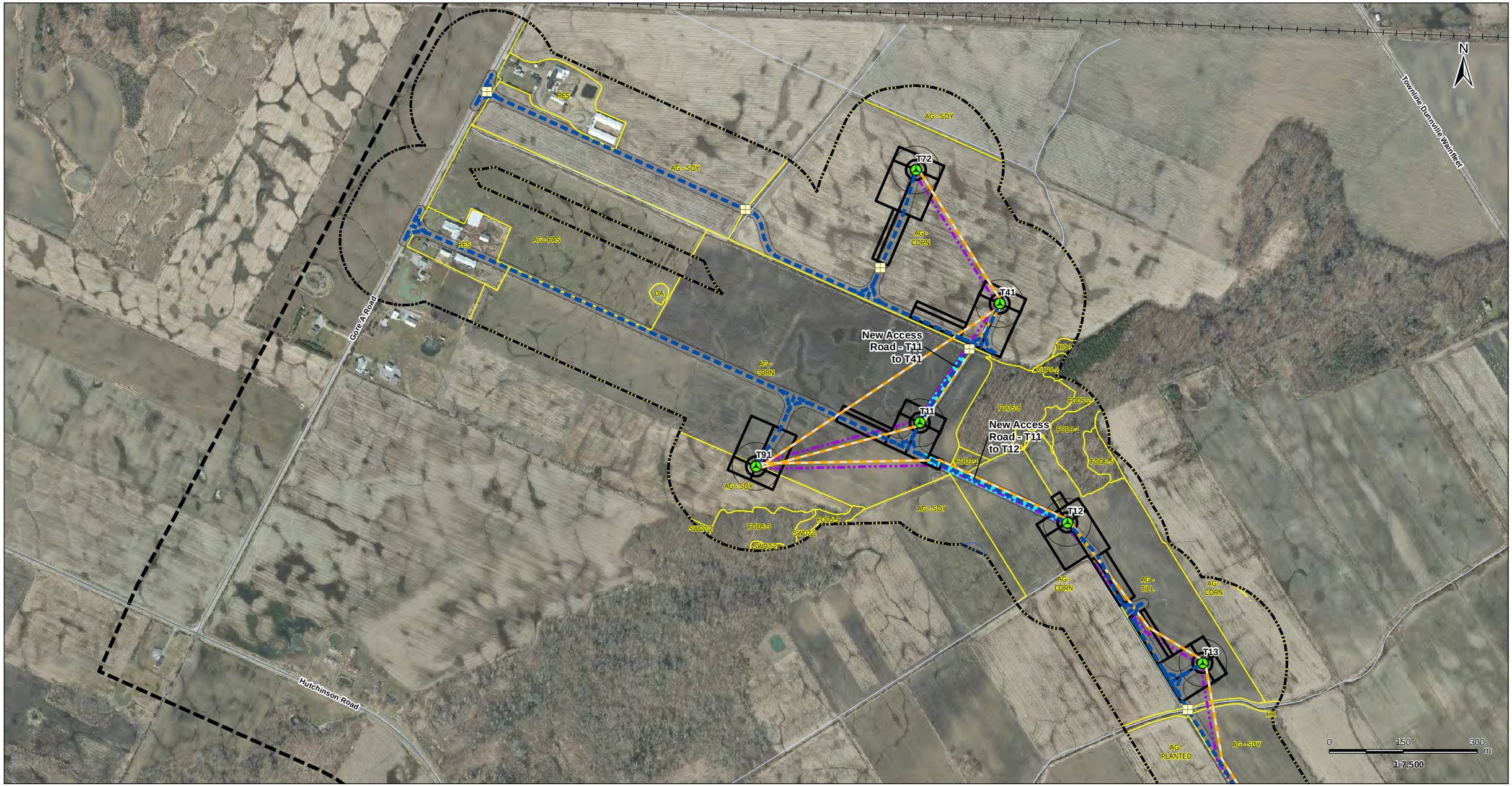
Figure No.
3.41

Title
ELC Vegetation Communities - Figure 3.41 Revised



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September, 2015
160950269

Stantec

Legend

- Project Study Area
- Interconnector Study Area
- Zone of Investigation Adjustments
  - Area Added
  - ELC Boundary
- Proposed Turbine Location
- Turbine Blade Length
- Proposed Culvert
- Collector Lines – Underground or Overhead
- Temporary Laydown Area
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area

Notes

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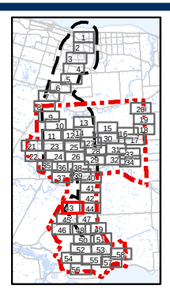

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Natural Heritage Assessment Report

Figure No.
3.43

Title
ELC Vegetation Communities - Figure 3.43 Revised

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Revised: 2015-09-21 By: bcowper

September, 2015
160950269

Legend

- Project Study Area
- Interconnector Study Area
- ELC Boundary
- Proposed Turbine Location
- Turbine Blade Length
- Proposed Culvert
- Collector Lines – Underground or Overhead
- Temporary Laydown Area
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area

Notes

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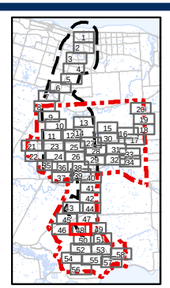

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Figure No.
3.48

Title
ELC Vegetation Communities - Figure 3.48 Revised

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September, 2015
160950269

Legend

- Project Study Area
- Zone of Investigation Adjustments
  - Area Added
  - ELC Boundary
- Proposed Turbine Location
- Turbine Blade Length
- Junction Box
- Proposed Culvert
- Collector Lines – Underground or Overhead
- Temporary Laydown Area
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area

Notes

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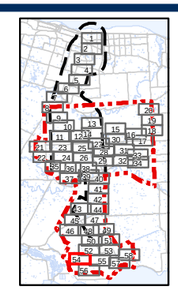

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Figure No.
3.54

Title
ELC Vegetation Communities - Figure 3.54 Revised

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Revised: 2015-09-21 By: bcowper

September, 2015
160950269

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Legend

- Interconnector Study Area
- Zone of Investigation Adjustments
- Area Added
- Tap-in Location
- Preferred Transmission Line Route
- Potential Access Road
- Access Road 20m Construction Area
- Transformer Substation

Notes

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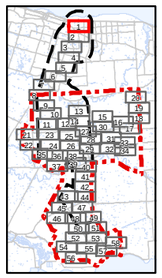

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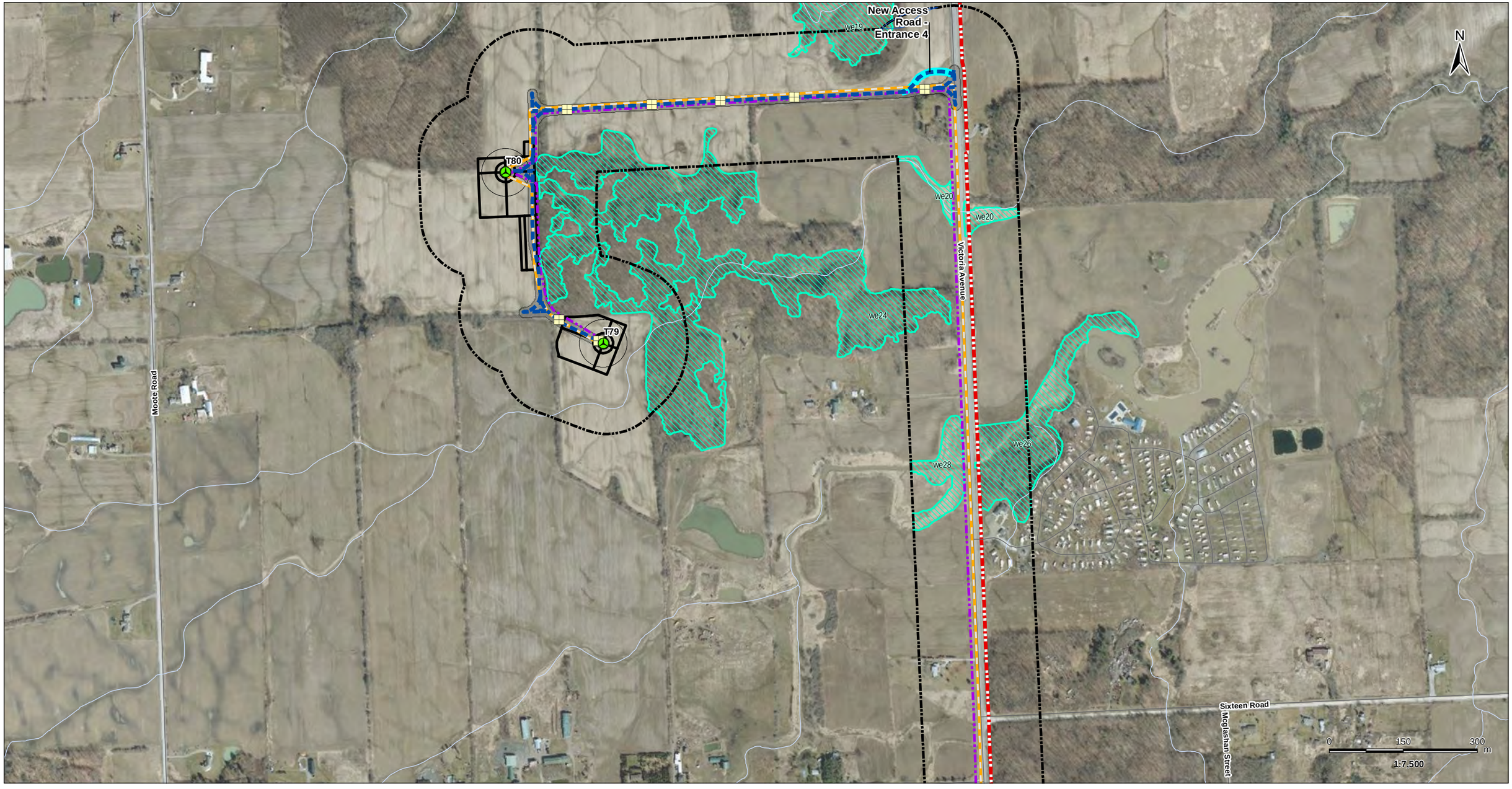
Natural Heritage Assessment Report

Figure No.
4.1

Title
Wetland Communities
Figure 4.1
Revised



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Stantec

Legend

- Project Study Area
- Zone of Investigation Adjustments
- Area Added
- Proposed Turbine Location
- Turbine Blade Length
- Proposed Culvert
- Temporary Laydown Area
- Collector Lines – Underground or Overhead
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area
- Wetland Communities

Notes

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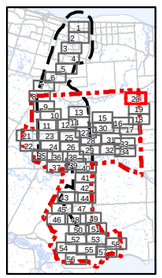

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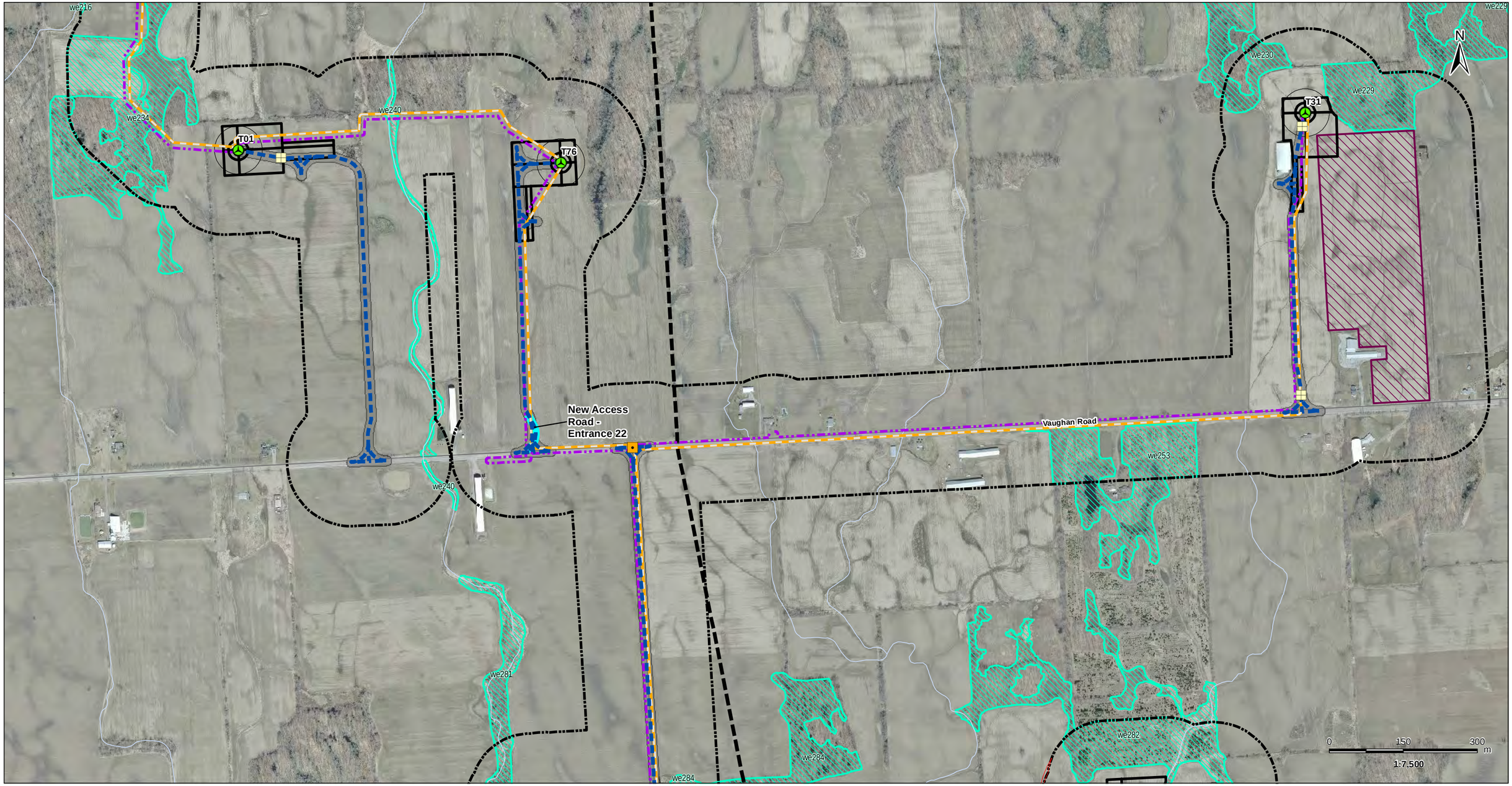
Natural Heritage Assessment Report

Figure No.
4.20

Title
Wetland Communities
Figure 4.20
Revised



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160950269

Stantec

Legend

- Project Study Area
- Interconnector Study Area
- Zone of Investigation Adjustments
- Area Removed
- Proposed Turbine Location
- Turbine Blade Length
- Junction Box
- Proposed Culvert
- Temporary Laydown Area
- Collector Lines – Underground or Overhead
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area
- Potential Construction Laydown Area
- Wetland Communities

Notes

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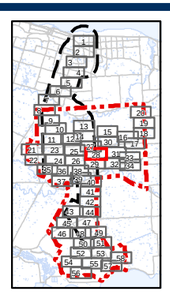

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Natural Heritage Assessment Report

Figure No.
4.28

Title
Wetland Communities
Figure 4.28
Revised

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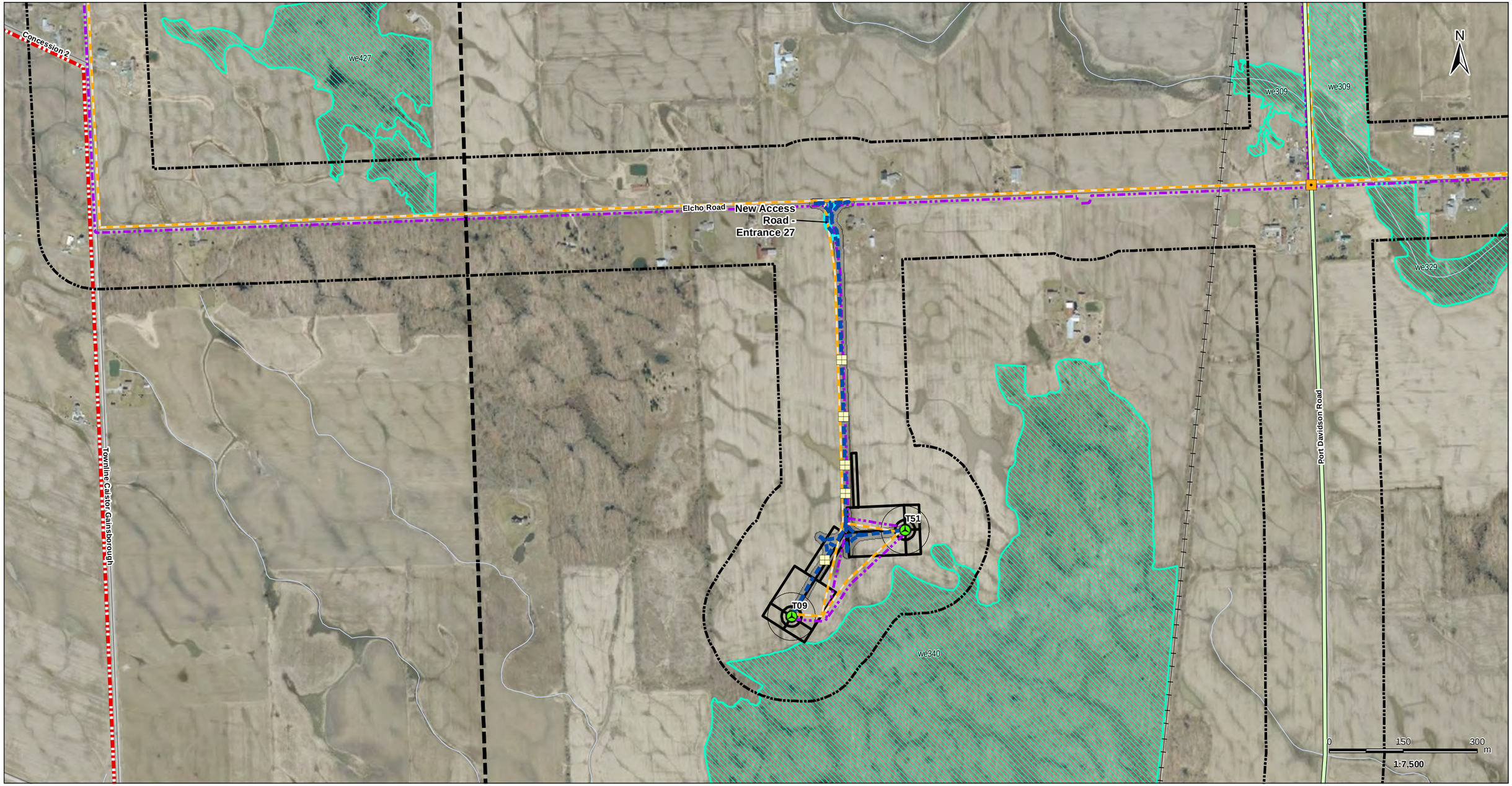

September, 2015
160950269

Stantec

Legend

- Project Study Area
- Interconnector Study Area
- Proposed Turbine Location
- Turbine Blade Length
- Junction Box
- Proposed Culvert
- Preferred Transmission Line Route
- Temporary Laydown Area
- Collector Lines – Underground or Overhead
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area
- Wetland Communities

Notes

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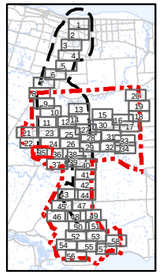

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Figure No.
4.35

Title
Wetland Communities
Figure 4.35
Revised

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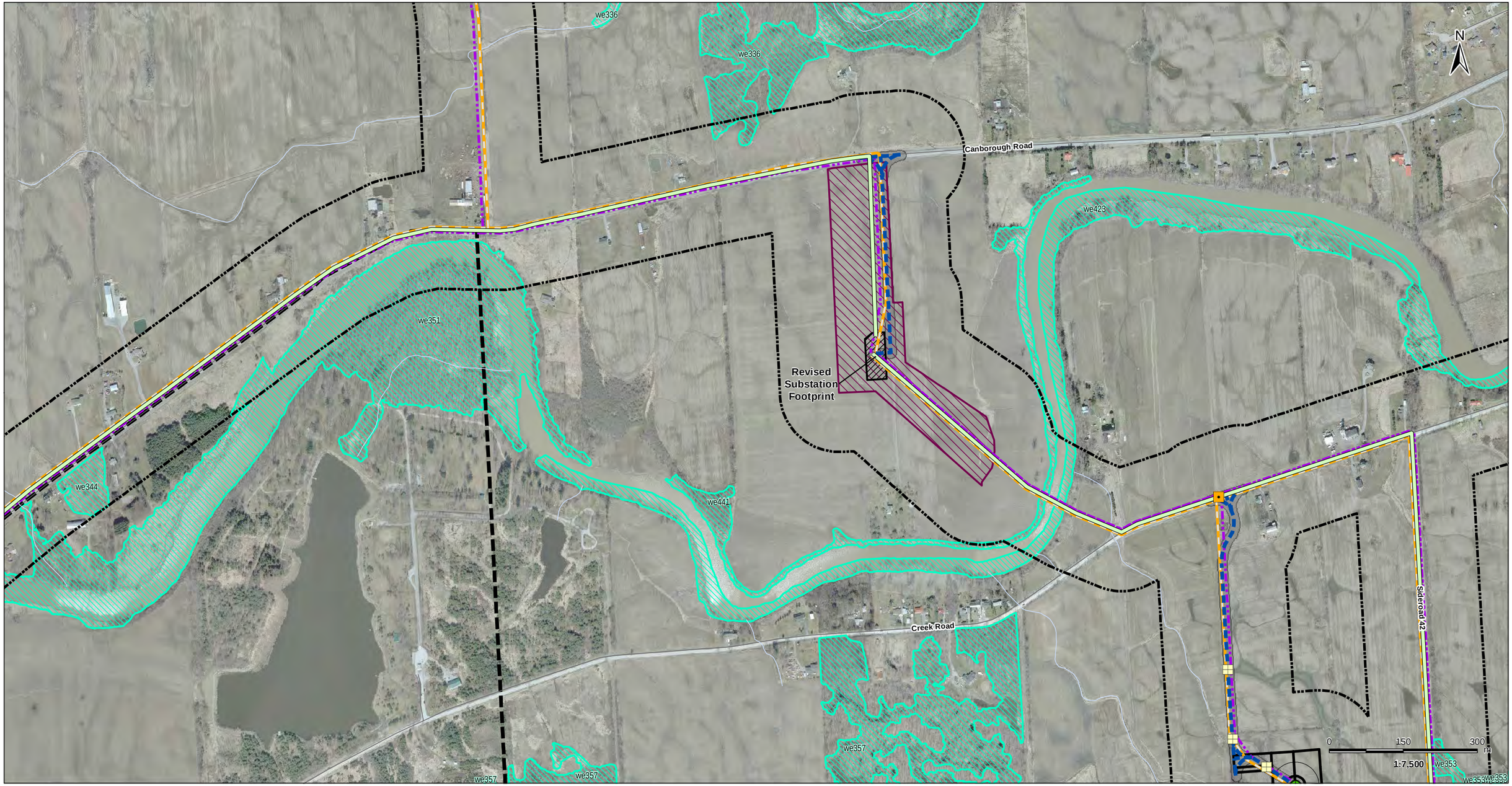

September, 2015
160950269

Legend

- Project Study Area
- Interconnector Study Area
- Proposed Turbine Location
- Turbine Blade Length
- Junction Box
- Proposed Culvert
- Preferred Transmission Line Route
- Temporary Laydown Area
- Collector Lines – Underground or Overhead
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area
- Potential Construction Laydown Area
- Transformer Substation
- Wetland Communities

Notes

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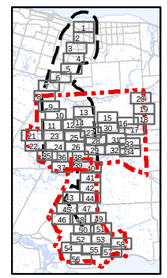

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Natural Heritage Assessment Report

Figure No.
4.39

Title
Wetland Communities
Figure 4.39
Revised

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160950269

Legend

- Project Study Area
- Interconnector Study Area
- Proposed Turbine Location
- Turbine Blade Length
- Junction Box
- Preferred Transmission Line Route
- Temporary Laydown Area
- Collector Lines – Underground or Overhead
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area
- Wetland Communities

Notes

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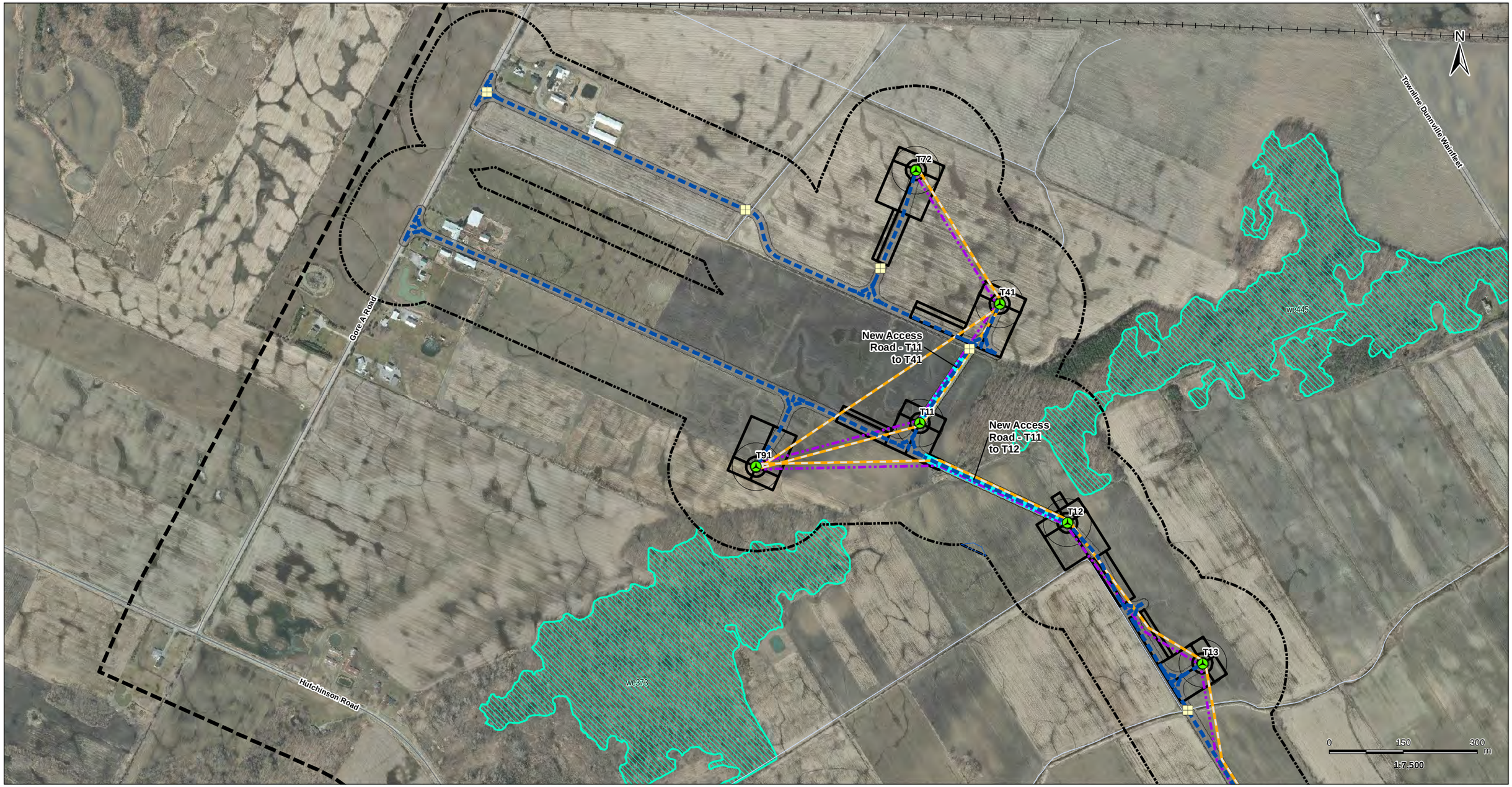
Figure No.
4.41

Title
Wetland Communities
Figure 4.41
Revised



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Stantec

Legend

- Project Study Area
- Interconnector Study Area
- Zone of Investigation Adjustments
- Area Added
- Proposed Turbine Location
- Turbine Blade Length
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- Temporary Laydown Area
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- Access Road 20m Construction Area
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Notes

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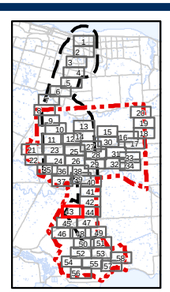
3. Orthoimagery source: First Base Solutions, Date Spring 2010.



Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
4.43

Title
Wetland Communities
Figure 4.43
Revised

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Revised: 2015-09-21 By: bcolwyer

September, 2015
160950269

Legend

- Project Study Area
- Interconnector Study Area
- Proposed Turbine Location
- Turbine Blade Length
- Proposed Culvert
- Temporary Laydown Area
- Collector Lines – Underground or Overhead
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area
- Wetland Communities

Notes

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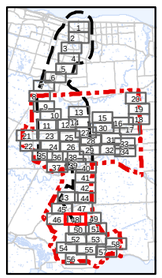
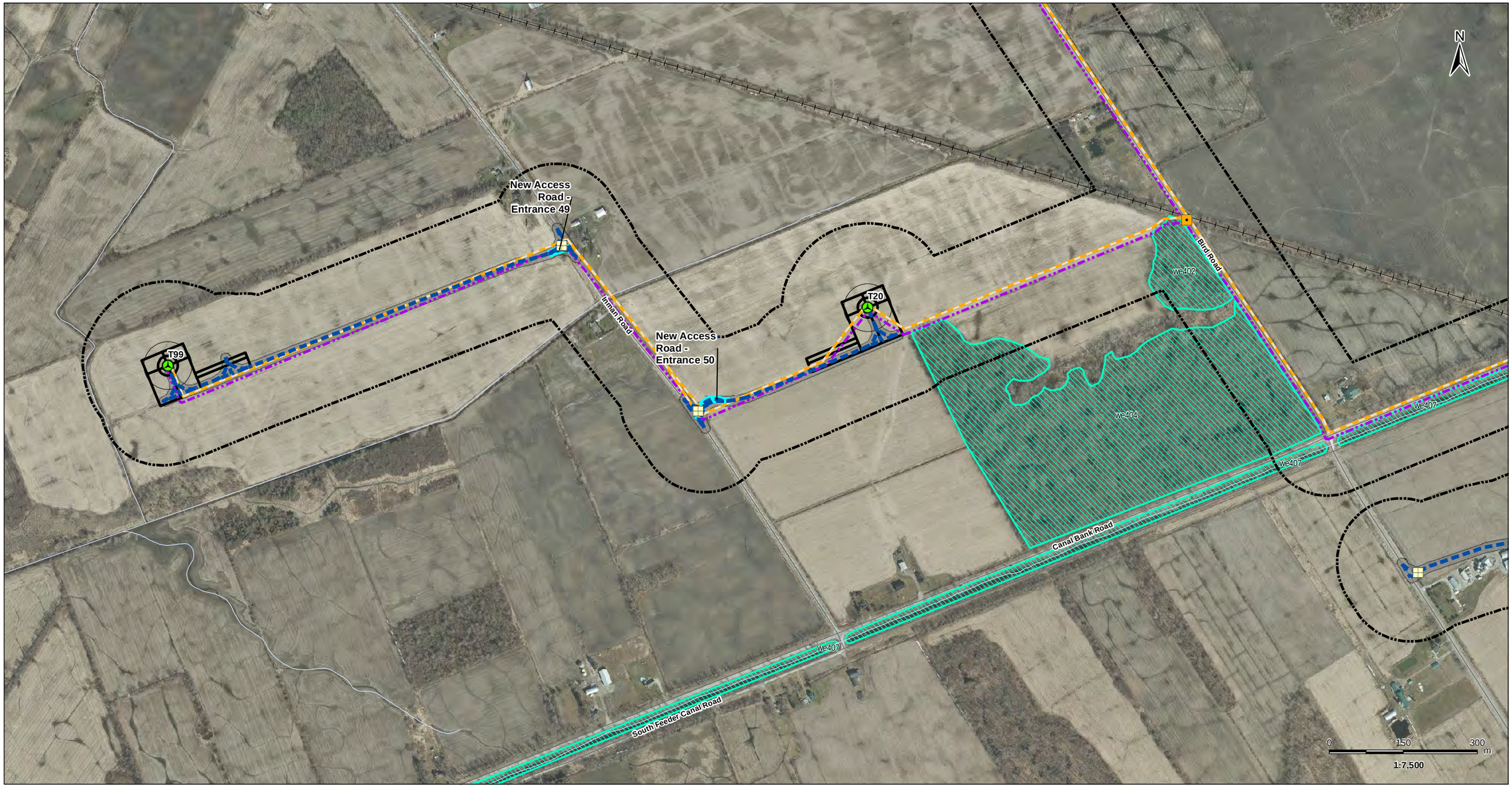


Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
4.48

Title
Wetland Communities
Figure 4.48
Revised



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Revised: 2015-09-21 By: bcowper

September, 2015
160950269

Stantec

Legend

- Project Study Area
- Zone of Investigation Adjustments
- Area Added
- Proposed Turbine Location
- Turbine Blade Length
- Junction Box
- Proposed Culvert
- Temporary Laydown Area
- Collector Lines – Underground or Overhead
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area
- Wetland Communities

Notes

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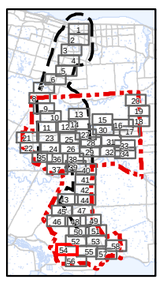

Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
4.54

Title
Wetland Communities
Figure 4.54
Revised

621000 621500 622000 622500 623000 623500

North Service Road
QEW Highway
South Service Road
Andrewes Court
Durham Road
Iroquois Trail
Main Street East
Vinatera Drive
Chardonnay Place
King Street
Thirty Road
Mountainview Road
Greenlane
Lincoln Avenue
St Volodymyr Court
Cedarbrook Lane
Meadowview Boulevard
Revised Interconnector Footprint
WO1

N

0 150 300 m
1:7,500

4782500
4782000
4781500

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Revised: 2015-09-21 By: bcowper

September, 2015
160950269

Stantec

Legend

- Interconnector Study Area
- 120m Zone of Investigation
- Zone of Investigation Adjustments
- Area Added
- Tap-in Location
- Preferred Transmission Line Route (Modification)
- Potential Access Road
- Access Road 20m Construction Area
- Transformer Substation
- Woodland Communities
- MNR Wooded Area

Notes

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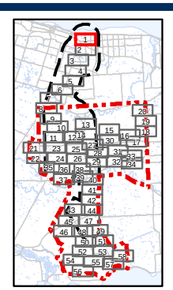
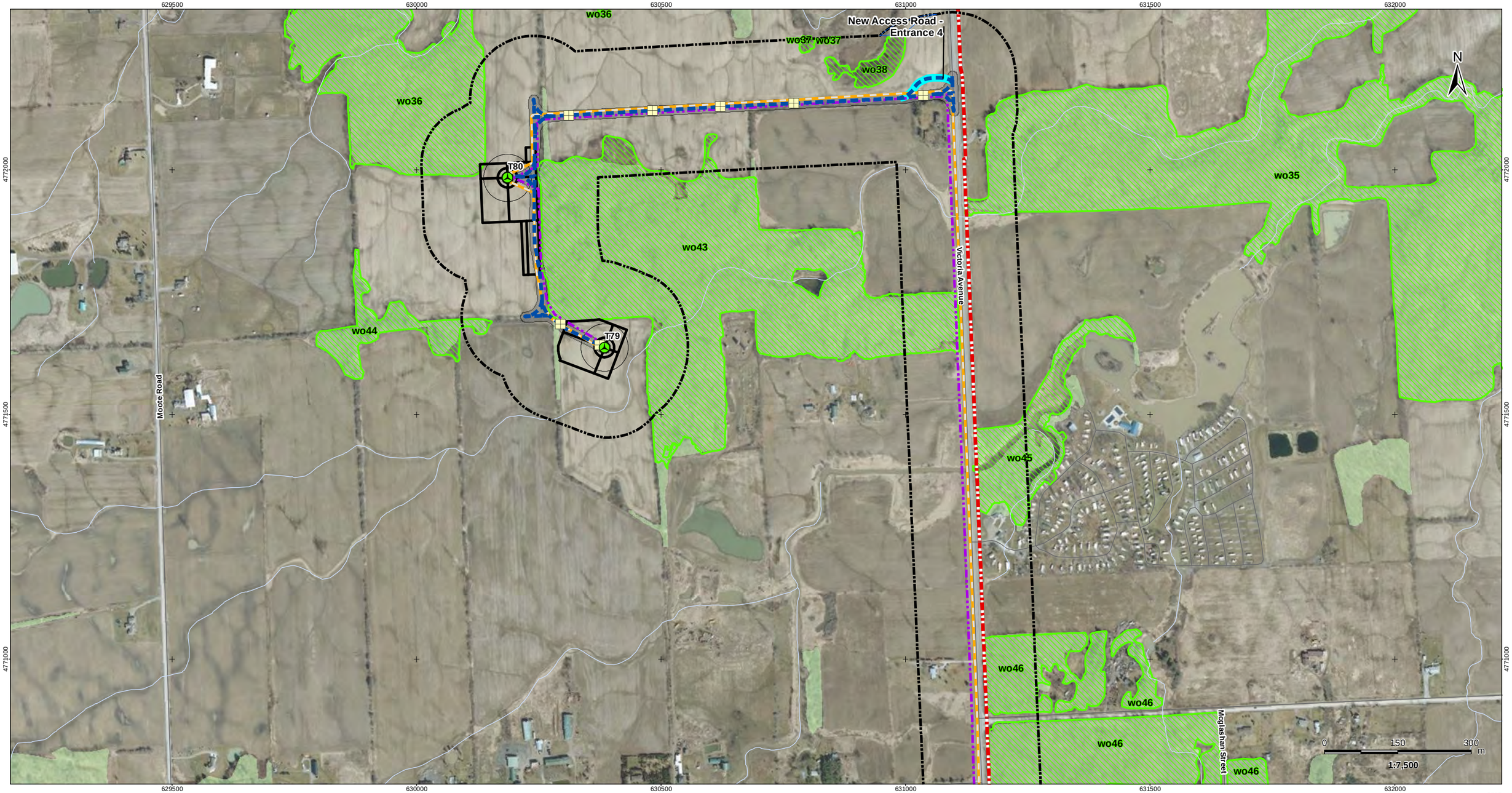
3. Orthoimagery source: First Base Solutions, Date Spring 2010.



Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
5.1

Title
Woodland Communities
Figure 5.1
Revised



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Revised: 2015-09-21 By: boxwper

September, 2015
160950269

Stantec

Legend

- Project Study Area
- 120m Zone of Investigation
- Zone of Investigation Adjustments
- Area Added
- Proposed Turbine Location
- Turbine Blade Length
- Proposed Culvert
- Temporary Laydown Area
- Collector Lines – Underground or Overhead
- Potential Access Road
- Access Road 20m Construction Area
- Fibre Optic Line
- Woodland Communities
- MNR Wooded Area

Notes

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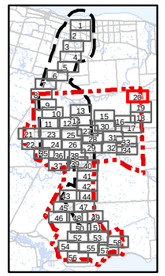
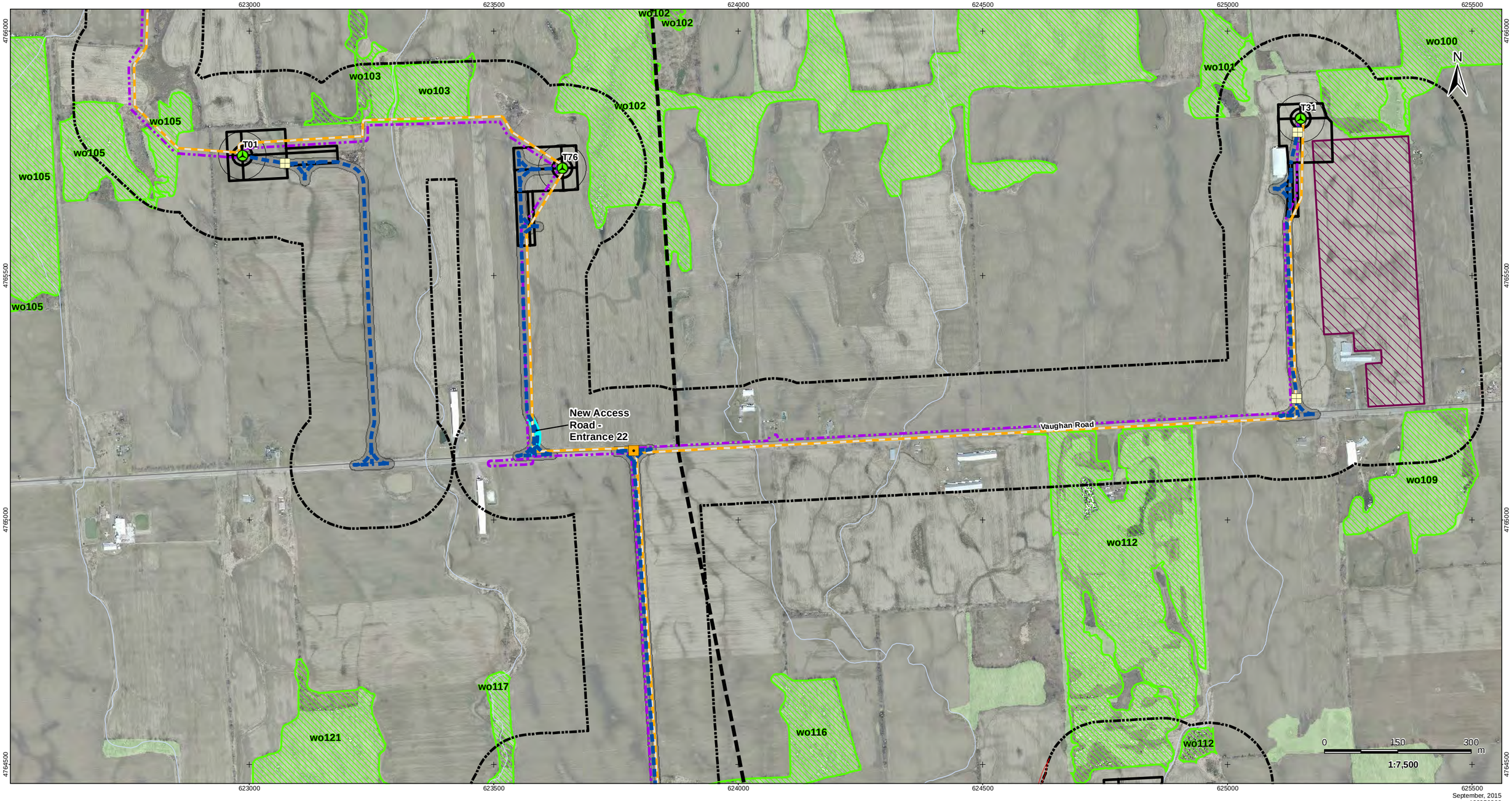


Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
5.20

Title
Woodland Communities
Figure 5.20
Revised



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Revised: 2015-09-21 By: bcowper

September, 2015
160950269

Legend

- Project Study Area
- Interconnector Study Area
- 120m Zone of Investigation
- Zone of Investigation Adjustments
- Area Removed
- Proposed Turbine Location
- Turbine Blade Length
- Junction Box
- Proposed Culvert
- Temporary Laydown Area
- Collector Lines – Underground or Overhead
- Potential Access Road
- Access Road 20m Construction Area
- Fibre Optic Line
- Potential Construction Laydown Area
- Woodland Communities
- MNR Wooded Area

Notes

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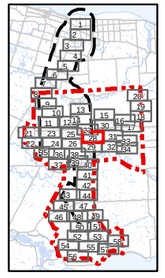

Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
5.28

Title
Woodland Communities
Figure 5.28
Revised

615500 616000 616500 617000 617500 618000

4763500 4763000 4762500

Concession 2

Townline Caistor Gainsborough

Elcho Road

Port Davidson Road

New Access Road - Entrance 27

wo218

wo216

wo217

wo142

wo136

T51

T09

N

0 150 300 m

1:7,500

615500 616000 616500 617000 617500 618000

September, 2015
160950269

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Stantec

Legend

- Project Study Area
- Interconnector Study Area
- 120m Zone of Investigation
- Proposed Turbine Location
- Turbine Blade Length
- Junction Box
- Proposed Culvert
- Preferred Transmission Line Route (Modification)
- Temporary Laydown Area
- Collector Lines – Underground or Overhead
- Potential Access Road
- Access Road 20m Construction Area
- Fibre Optic Line
- Woodland Communities
- MNR Wooded Area

Notes

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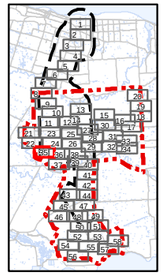
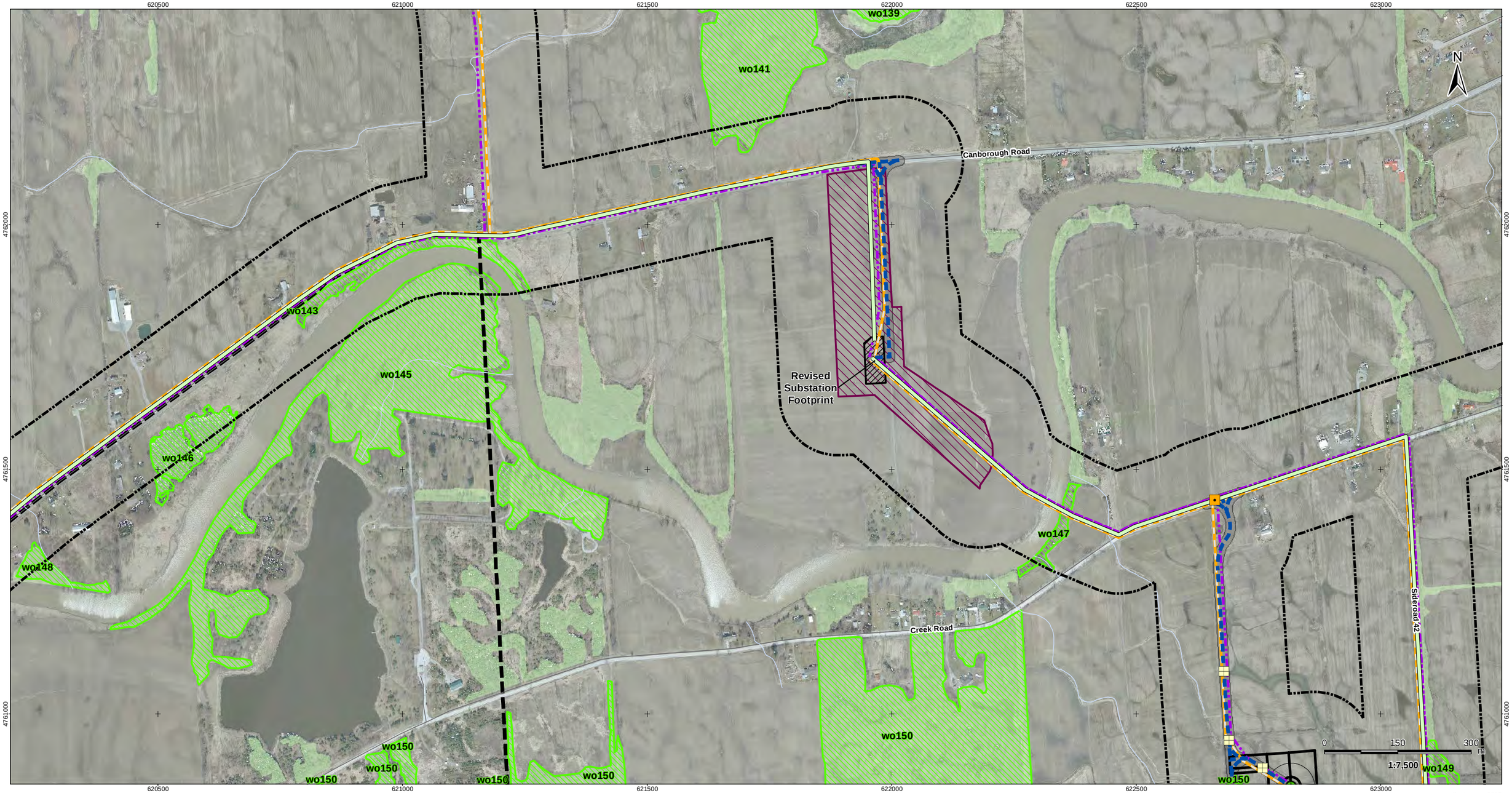


Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
5.35

Title
Woodland Communities
Figure 5.35
Revised



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Revised: 2015-09-21 By: bcowper

September, 2015
160950269

Stantec

Legend

- Project Study Area
- Interconnector Study Area
- 120m Zone of Investigation
- Proposed Turbine Location
- Turbine Blade Length
- Junction Box
- Proposed Culvert
- Preferred Transmission Line Route (Modification)
- Temporary Laydown Area
- Collector Lines – Underground or Overhead
- Potential Access Road
- Access Road 20m Construction Area
- Fibre Optic Line
- Potential Construction Laydown Area
- Transformer Substation
- Woodland Communities
- MNR Wooded Area

Notes

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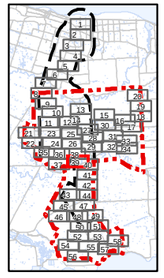

Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
5.39

Title
Woodland Communities
Figure 5.39
Revised

622000 622500 623000 623500 624000 624500

4760000 4759500 4759000

wo150 wo149 wo149 wo149 wo199 wo199 wo199 wo151

Sideroad 42 Sideroad 42 Road Wellandport Road Concession 6 Sideroad 44 Road

New Access Road - Entrance 36

T10

N

0 150 300 m

1:7,500

622000 622500 623000 623500 624000 624500

4760000 4759500 4759000

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Revised: 2015-09-21 By: bcowper

September, 2015
160950269

Stantec

Legend

- Project Study Area
- Interconnector Study Area
- 120m Zone of Investigation
- Proposed Turbine Location
- Turbine Blade Length
- Junction Box
- Preferred Transmission Line Route (Modification)
- Temporary Laydown Area
- Collector Lines – Underground or Overhead
- Potential Access Road
- Access Road 20m Construction Area
- Fibre Optic Line
- Woodland Communities
- MNR Wooded Area

Notes

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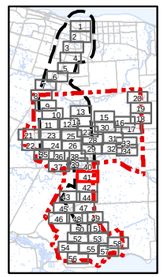

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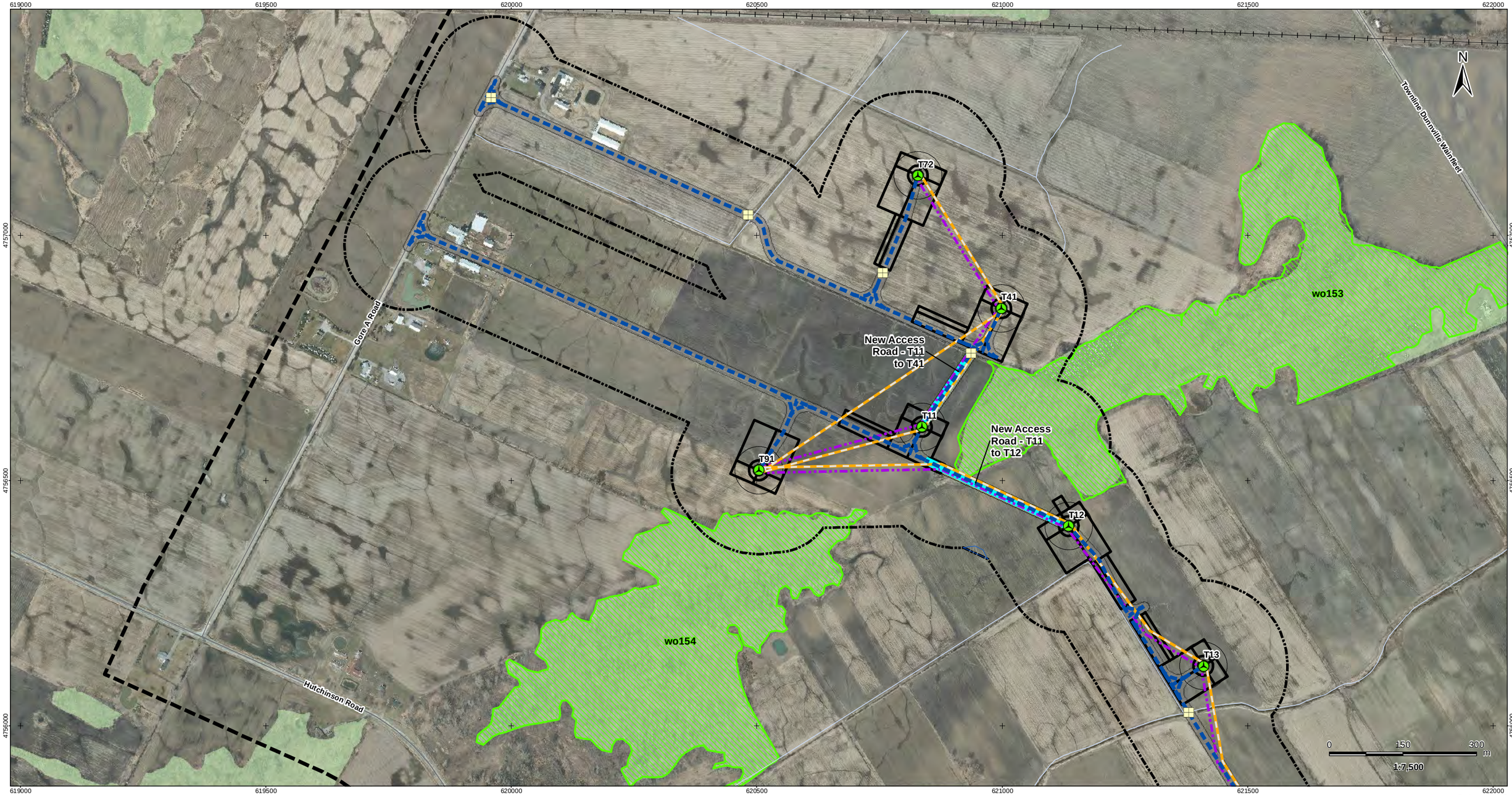
FWRN LP
Natural Heritage Assessment Report

Figure No.
5.41

Title
Woodland Communities
Figure 5.41
Revised



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Revised: 2015-09-21 By: boowper

Legend

- Project Study Area
- Interconnector Study Area
- 120m Zone of Investigation
- Zone of Investigation Adjustments
  - Area Added
- Proposed Turbine Location
- Turbine Blade Length
- Proposed Culvert
- Temporary Laydown Area
- Collector Lines – Underground or Overhead
- Access Road 20m Construction Area (Modification)
- Potential Access Road
- Access Road 20m Construction Area
- Fibre Optic Line
- Woodland Communities
- MNR Wooded Area

Notes

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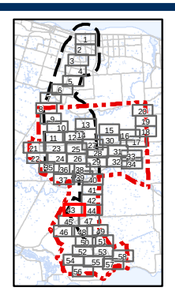

Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
5.43

Title
Woodland Communities
Figure 5.43
Revised

620500 621000 621500 622000 622500 623000

4754000 4753500 4753000

Jenny Jump Road

wo172

wo172

wo178

T84

wo177

New Access Road - Entrance 46

wo177

wo177

wo177

wo179

Booker Road

N

0 150 300 m

1:7,500

620500 621000 621500 622000 622500 623000

September, 2015
160950269

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Stantec

Legend

- Project Study Area
- Interconnector Study Area
- 120m Zone of Investigation
- Proposed Turbine Location
- Turbine Blade Length
- Proposed Culvert
- Temporary Laydown Area
- Collector Lines – Underground or Overhead
- Potential Access Road
- Access Road 20m Construction Area
- Fibre Optic Line
- Woodland Communities
- MNR Wooded Area

Notes

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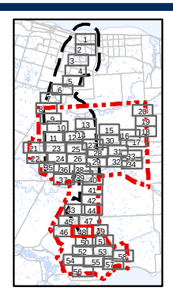

Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
5.48

Title
Woodland Communities
Figure 5.48
Revised

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Revised: 2015-09-21 By: bcowper

September, 2015
160950269

Stantec

Legend

- Project Study Area
- 120m Zone of Investigation
- Zone of Investigation Adjustments
- Area Added
- Proposed Turbine Location
- Turbine Blade Length
- Junction Box
- Proposed Culvert
- Temporary Laydown Area
- Collector Lines – Underground or Overhead
- Potential Access Road
- Access Road 20m Construction Area
- Fibre Optic Line
- Woodland Communities
- MNR Wooded Area

Notes

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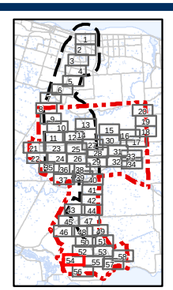

Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
5.54

Title
Woodland Communities
Figure 5.54
Revised

North Service Road
QEW Highway
South Service Road
Andrewes Court
Durham Road
Iroquois Trail
Main Street East
Vinatera Drive
Chardonnay Place
King Street
Thirty Road
Mountainview Road
Greenlane
Lincoln Avenue
St Volodymyr Court
Cedarbrook Lane
Meadow Boulevard
Revised Interconnector Footprint
wo1
N
0 150 300 m
1:7,500

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Revised: 2015-09-21 By: bcowper

September, 2015
160950269

Stantec

Legend

- Interconnector Study Area
- 120m Zone of Investigation
- Zone of Investigation Adjustments
- Area Added
- Tap-in Location
- Preferred Transmission Line Route
- Potential Access Road
- Access Road 20m Construction Area
- Transformer Substation
- Woodland Communities
- Woodland Vole Habitat

Notes

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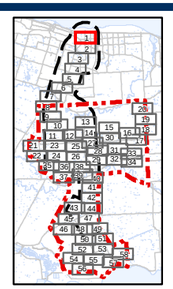

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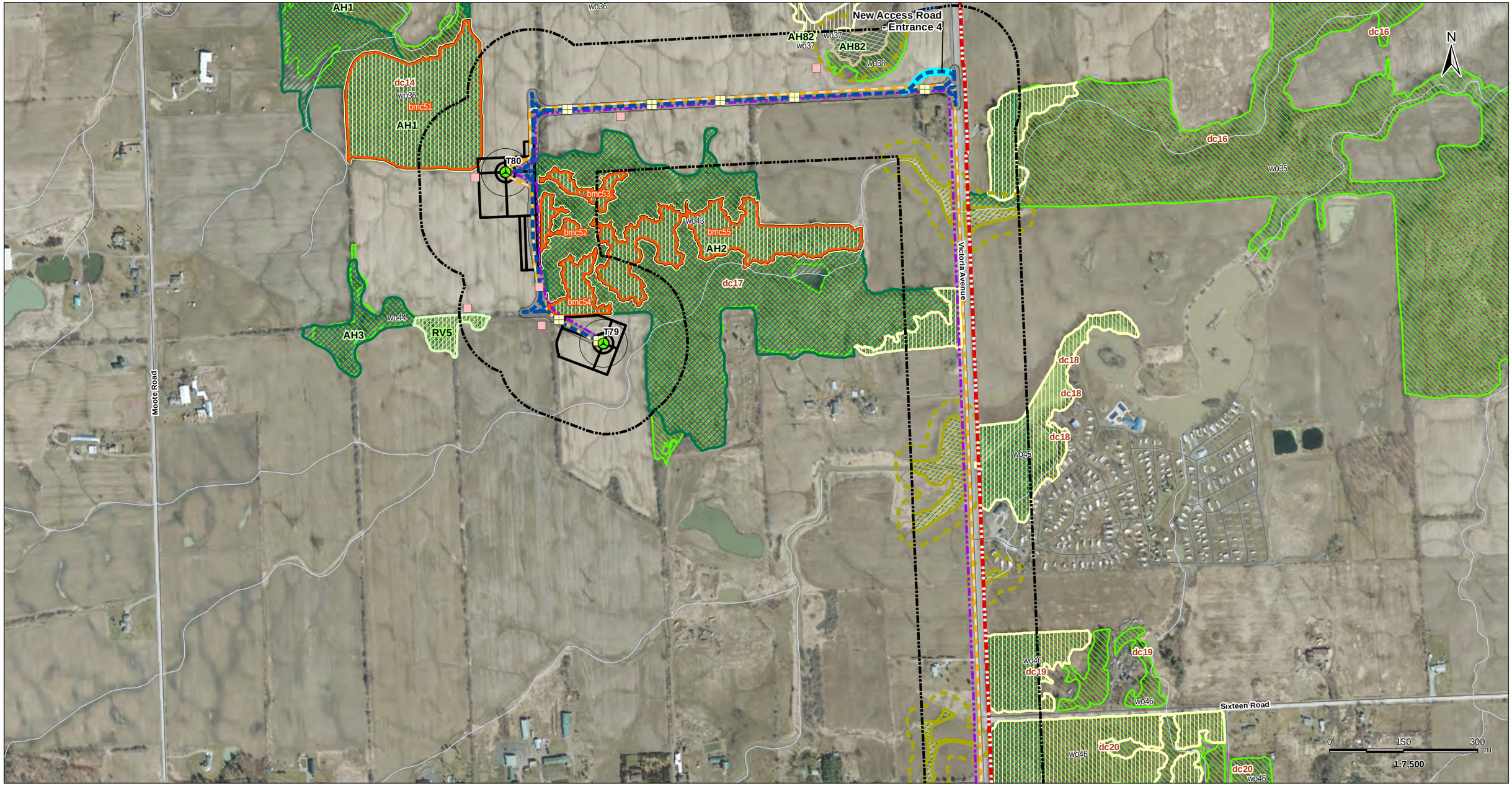
FWRN LP
Natural Heritage Assessment Report

Figure No.
6.1

Title
Candidate Significant Wildlife Habitat Figure 6.1 Revised



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Revised: 2015-09-21 By: bcowper

September, 2015
160950269

Legend

- Project Study Area
- 120m Zone of Investigation
- Zone of Investigation Adjustments
- Area Added
- Proposed Turbine Location
- Turbine Blade Length
- Proposed Culvert
- Temporary Laydown Area
- Collector Lines – Underground or Overhead
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area
- Amphibian Breeding Stations
- Woodland Communities
- Deer Congregation Areas (MNR)
- Other Rare Vegetation Community
- Amphibian Breeding Habitat
- Woodland Vole Habitat
- Terrestrial Crayfish Habitat
- Turtle Habitat 30m Buffer
- Bat Maternity Colonies

Notes

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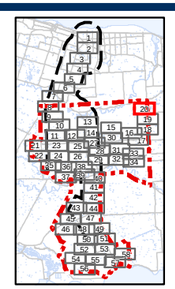

Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
6.20

Title
Candidate Significant Wildlife Habitat Figure 6.20 Revised

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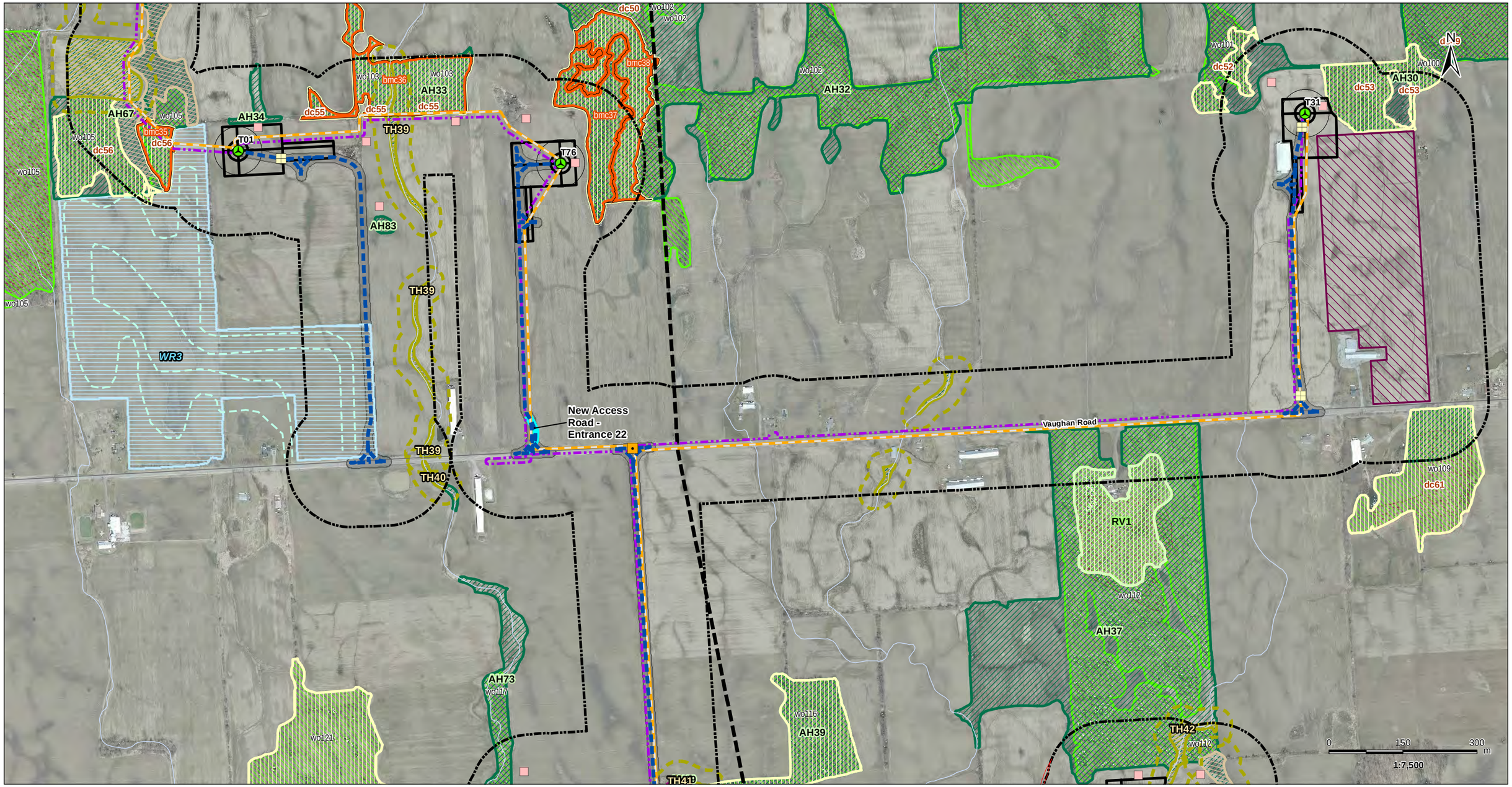
Revised: 2015-09-21 By: bcowper



September, 2015
160950269

Stantec

Legend

- Project Study Area
- Interconnector Study Area
- 120m Zone of Investigation

Zone of Investigation Adjustments

- Area Removed
- Proposed Turbine Location
- Turbine Blade Length
- Junction Box
- Proposed Culvert
- Temporary Laydown Area
- Collector Lines - Underground or Overhead
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area
- Potential Construction Laydown Area
- Amphibian Breeding Stations
- Snake Hibernacula 30m Buffer
- Winter Raptor Transect
- Woodland Communities
- Deer Congregation Areas (MNR)
- Other Rare Vegetation Community
- Amphibian Breeding Habitat
- Raptor Wintering Areas
- Woodland Vole Habitat
- Terrestrial Crayfish Habitat
- Turtle Nesting Habitat/ Snapping Turtle Habitat
- Turtle Habitat 30m Buffer
- Bat Maternity Colonies

Notes

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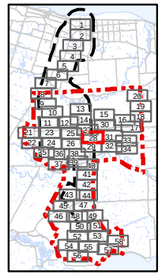
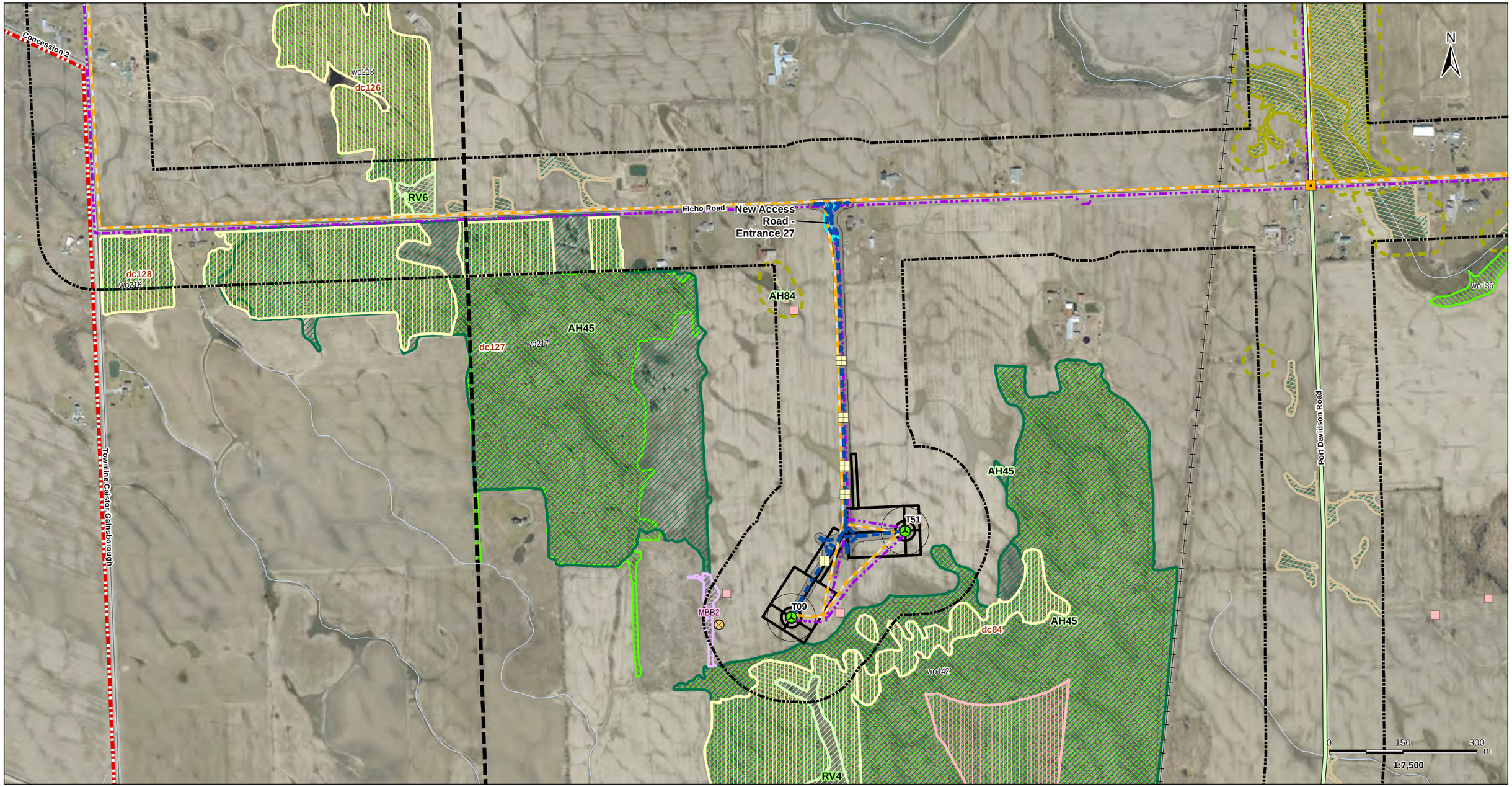


Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
6.28

Title
Candidate Significant Wildlife Habitat Figure 6.28 Revised



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Revised: 2015-09-21 By: bcowper

September, 2015
160950269

Stantec

Legend

- Project Study Area
- Interconnector Study Area
- 120m Zone of Investigation
- Proposed Turbine Location
- Turbine Blade Length
- Junction Box
- Proposed Culvert
- Preferred Transmission Line Route
- Temporary Laydown Area
- Collector Lines – Underground or Overhead
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area
- Amphibian Breeding Stations
- MBB Point Count Location
- Woodland Communities
- Deer Congregation Areas (MNR)
- Other Rare Vegetation Community
- Amphibian Breeding Habitat
- Woodland Raptor Nesting Habitat/ Woodland Area Sensitive Bird Breeding Habitat
- Woodland Vole Habitat
- Terrestrial Crayfish Habitat
- Turtle Habitat 30m Buffer

Notes

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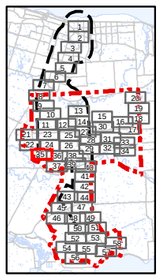

Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
6.35

Title
Candidate Significant Wildlife Habitat Figure 6.35 Revised

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Revised: 2015-09-21 By: bcowper

September, 2015
160950269

Legend

- Project Study Area
- Interconnector Study Area
- 120m Zone of Investigation
- Proposed Turbine Location
- Turbine Blade Length
- Junction Box
- Proposed Culvert
- Preferred Transmission Line Route
- Temporary Laydown Area
- Collector Lines – Underground or Overhead
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area
- Potential Construction Laydown Area
- Transformer Substation
- Amphibian Breeding Stations
- Woodland Communities
- Deer Congregation Areas (MNR)
- Amphibian Breeding Habitat
- Woodland Vole Habitat
- Terrestrial Crayfish Habitat
- Turtle Habitat 30m Buffer
- Turtle Wintering Area
- Bat Maternity Colonies

Notes

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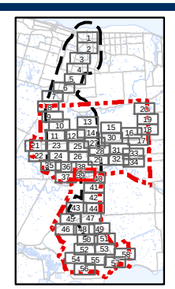

Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
6.39

Title
Candidate Significant Wildlife Habitat Figure 6.39 Revised

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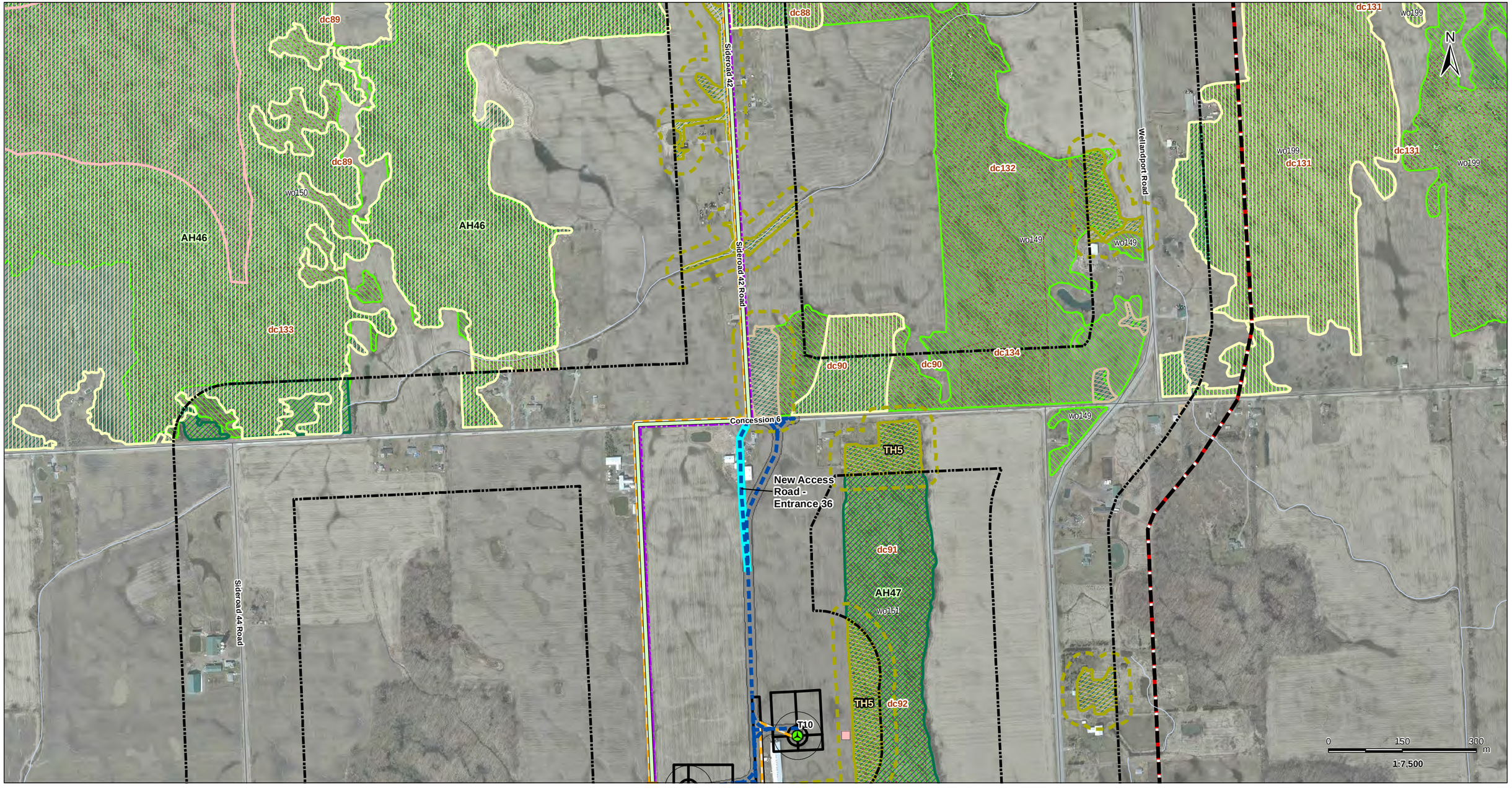
Revised: 2015-09-21 By: bcowper



September, 2015
160950269

Stantec

Legend

- Project Study Area
- Interconnector Study Area
- 120m Zone of Investigation
- Proposed Turbine Location
- Turbine Blade Length
- Junction Box
- Preferred Transmission Line Route
- Temporary Laydown Area
- Collector Lines – Underground or Overhead
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area
- Amphibian Breeding Stations
- Woodland Communities
- Deer Congregation Areas (MNR)
- Amphibian Breeding Habitat
- Woodland Raptor Nesting Habitat/ Woodland Area Sensitive Bird Breeding Habitat
- Woodland Vole Habitat
- Terrestrial Crayfish Habitat
- Turtle Nesting Habitat/ Snapping Turtle Habitat
- Turtle Habitat 30m Buffer

Notes

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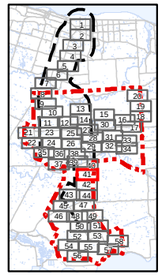

Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
6.41

Title
Candidate Significant Wildlife Habitat Figure 6.41 Revised

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Revised: 2015-09-21 By: bcowper

September, 2015
160950269

Legend

- Project Study Area
- Interconnector Study Area
- 120m Zone of Investigation

Zone of Investigation Adjustments

- Area Added
- Proposed Turbine Location
- Turbine Blade Length
- Proposed Culvert
- Temporary Laydown Area
- Collector Lines – Underground or Overhead
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area
- Amphibian Breeding Stations
- Snake Hibernacula
- Snake Hibernacula 30m Buffer
- Woodland Communities
- Deer Congregation Areas (MNR)
- Amphibian Breeding Habitat
- Woodland Vole Habitat
- Bat Maternity Colonies

Notes

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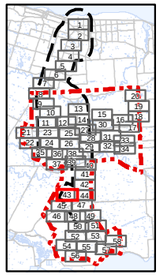

Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
6.43

Title
Candidate Significant Wildlife Habitat Figure 6.43 Revised

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Revised: 2015-09-21 By: bcowper

September, 2015
160950269

Legend

- Project Study Area
- Interconnector Study Area
- 120m Zone of Investigation
- Proposed Turbine Location
- Turbine Blade Length
- Proposed Culvert
- Temporary Laydown Area
- Collector Lines – Underground or Overhead
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area
- Amphibian Breeding Stations
- Woodland Communities
- Deer Congregation Areas (MNR)
- Amphibian Breeding Habitat
- Woodland Raptor Nesting Habitat/ Woodland Area Sensitive Bird Breeding Habitat
- Woodland Vole Habitat
- Terrestrial Crayfish Habitat

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N).
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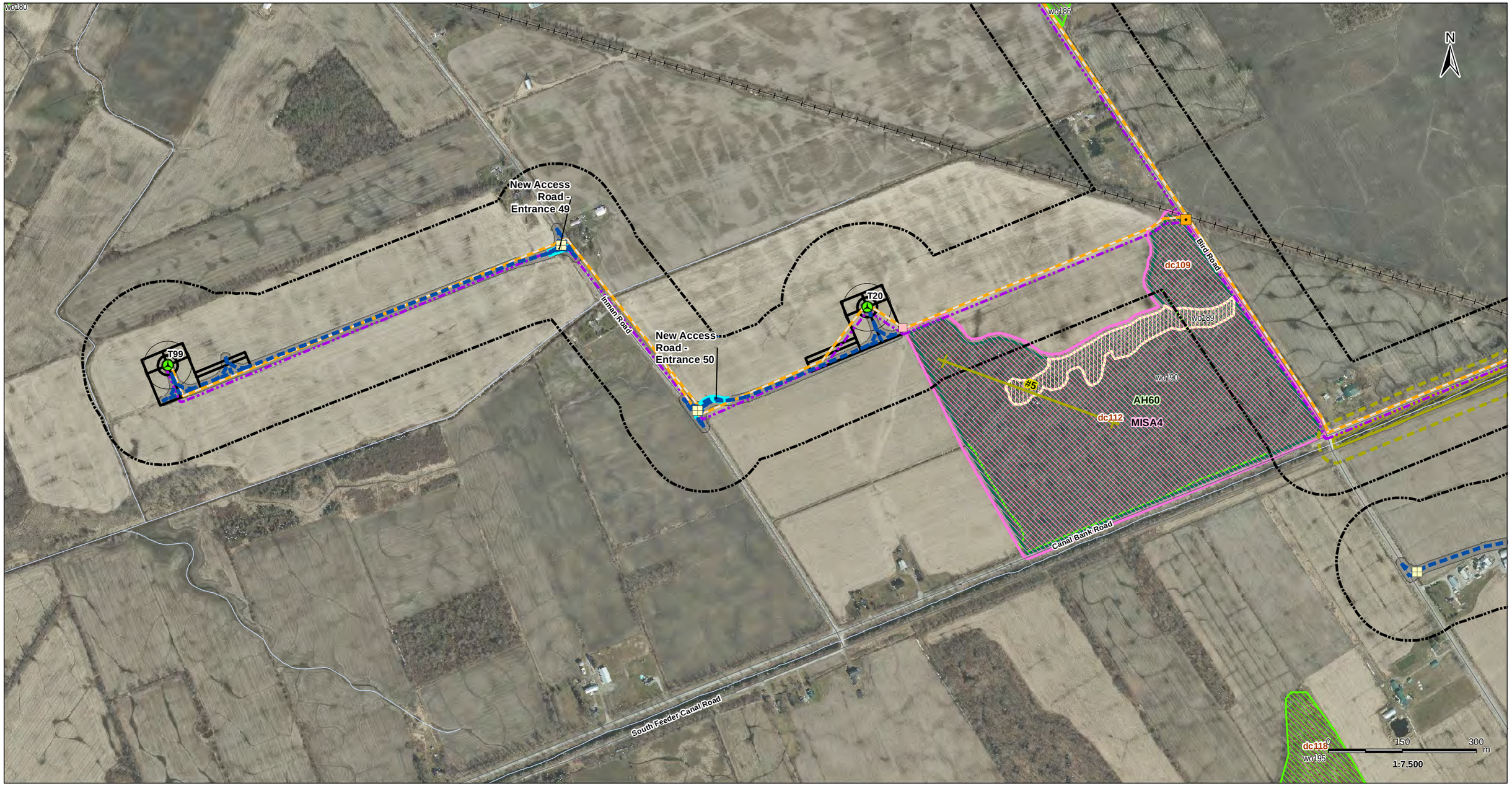
Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
6.48

Title
Candidate Significant Wildlife Habitat Figure 6.48 Revised



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Revised: 2015-09-21 By: bcowper

September, 2015
160950269

Legend

- Project Study Area
- 120m Zone of Investigation
- Zone of Investigation Adjustments
- Area Added
- Proposed Turbine Location
- Turbine Blade Length
- Junction Box
- Proposed Culvert
- Temporary Laydown Area
- Collector Lines – Underground or Overhead
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area
- Amphibian Breeding Stations
- Migratory Bird Transect
- Woodland Communities
- Deer Congregation Areas (MNR)
- Landbird Migratory Stopover
- Amphibian Breeding Habitat
- Woodland Vole Habitat

Notes

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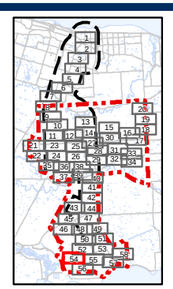

Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
6.54

Title
Candidate Significant Wildlife Habitat Figure 6.54 Revised

North Service Road
QEW Highway
South Service Road
Andrewes Court
Durham Road
Iroquois Trail
Main Street East
Vinatera Drive
Chardonnay Place
King Street
Thirty Road
Mountainview Road
Greenlane
Lincoln Avenue
Cedarbrook Lane
St Volodymyr Court
Peter Meadow Boulevard
Revised Interconnector Footprint
N
0 150 300 m
1:7,500
September, 2015
160950269

621000 621500 622000 622500 623000 623500
4782500 4782000 4781500

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Revised: 2015-09-21 By: bcowper

Stantec

Legend

- Interconnector Study Area
- 120m Zone of Investigation
- Zone of Investigation Adjustments
  - Area Added
- Tap-in Location
- Preferred Transmission Line Route
- Potential Access Road
- Access Road 20m Construction Area
- Transformer Substation
- Significant Wildlife Habitat
  - Snake Hibernacula
  - Niagara Escarpment Protection Area
  - Generalized Wildlife Habitat

Notes

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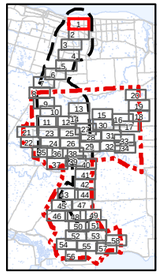

Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
7.1

Title
Significant Natural Features Figure 7.1 Revised

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Revised: 2015-09-21 By: bcowper

629500 630000 630500 631000 631500 632000

4772000 4771500 4771000

Moote Road

Sixteen Road

Meglashan Street

wo36 bmc51 dc14 100.2 101.6 T80 60.2 70.3 69.6 bmc53 bmc52 bmc55 AH2 wo43 dc17 bmc54 T79 114.9 113.2 115.3 58.9 AH3 wo44 New Access Road - Entrance 4 55.1 69.7 95.7 we20 15.9 12.6 6.3 26.2 13.7 we26 wo45 we28 9.5 15.9 17.2 dc16 wo35 dc19 wo46 dc20

N

0 150 300 m

1:7,500

September, 2015
160950269

Stantec

Legend

- Project Study Area
- 120m Zone of Investigation
- Zone of Investigation Adjustments
  - Area Added
  - Proposed Turbine Location
  - Turbine Blade Length
  - Proposed Culvert
  - Temporary Laydown Area
  - Collector Lines – Underground or Overhead
  - Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area
- Significant Wildlife Habitat
  - Snake Hibernacula
  - Wetland Communities
  - Woodland Amphibian Breeding Habitat
  - Woodland Communities
  - Greenbelt Natural Heritage System
  - Generalized Wildlife Habitat
  - Deer Congregation Areas (MNR) (Generalized)
  - Bat Maternity Colonies

Notes

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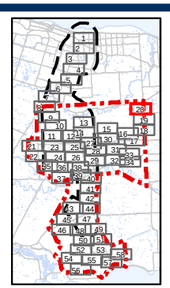
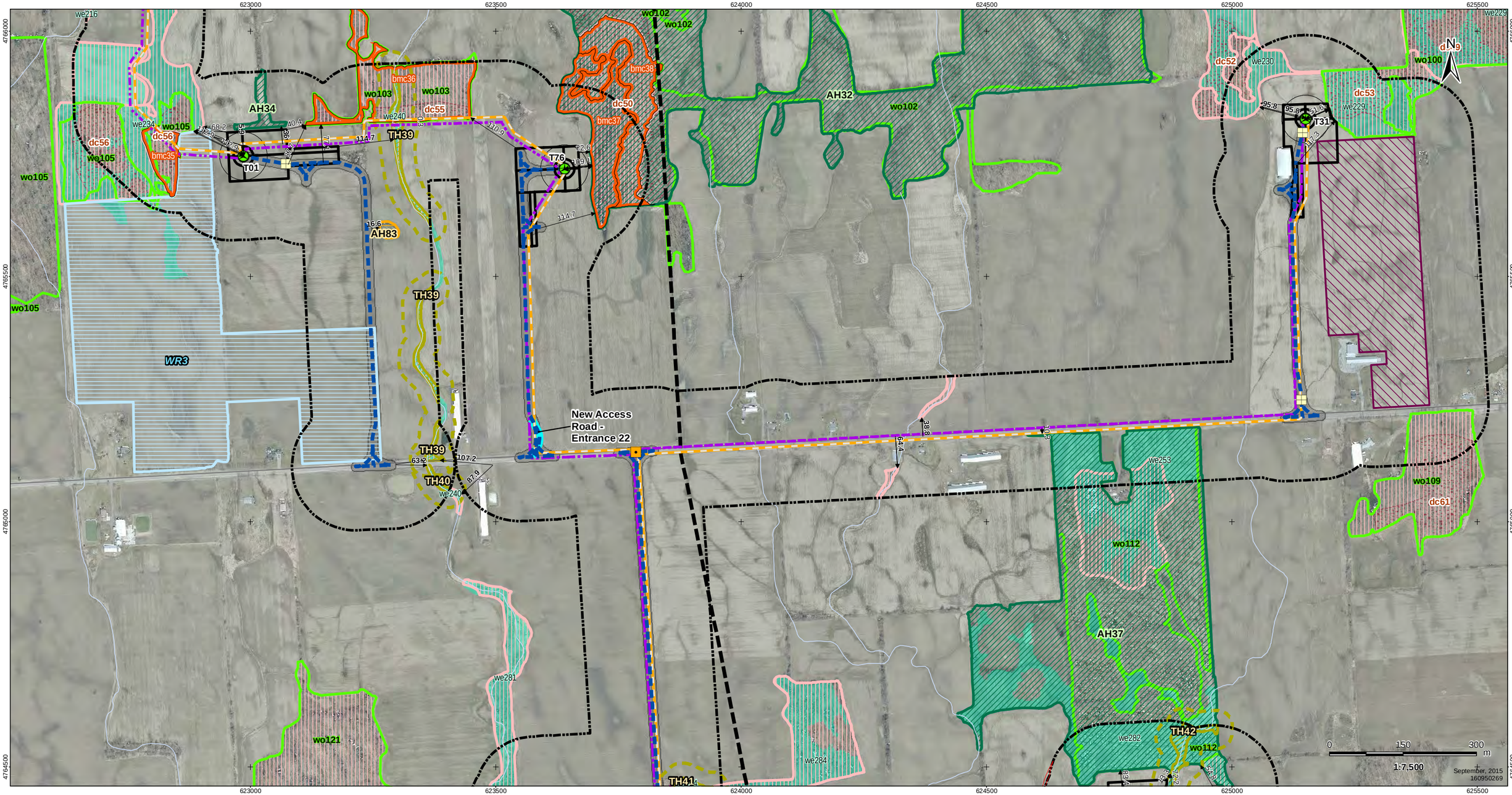


Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
7.20

Title
Significant Natural Features Figure 7.20 Revised



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Revised: 2015-09-21 BY: bobwper

Legend

- Project Study Area
- Interconnector Study Area
- 120m Zone of Investigation
- Zone of Investigation Adjustments
- Area Removed
- Proposed Turbine Location
- Turbine Blade Length
- Junction Box
- Proposed Culvert
- Temporary Laydown Area
- Collector Lines – Underground or Overhead
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area
- Potential Construction Laydown Area

Significant Wildlife Habitat

- Snake Hibernacula
- Snake Hibernacula 30m Buffer
- Raptor Wintering Areas
- Wetland Communities
- Woodland Amphibian Breeding Habitat
- Wetland Amphibian Breeding Habitat
- Woodland Communities
- Turtle Nesting Habitat/Snapping Turtle Habitat
- Turtle Habitat 30m Buffer
- Concealized Wildlife Habitat

Notes

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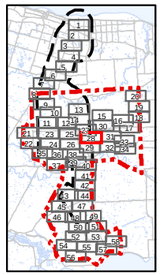

Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
7.28

Title
Significant Natural Features Figure 7.28 Revised

615500 616000 616500 617000 617500 618000

4763500 4763000 4762500

Concession 2

Townline Caistor Gainsborough

Elcho Road

New Access Road - Entrance 27

Port Davidson Road

we427 wo218 dc126 dc128 wo216 wo217 dc127 AH45 we309 we329 wo136 wo142 we340 dc84

T09 T51

N

0 150 300 m

1:7,500

September, 2015
160950269

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Stantec

Legend

- Project Study Area
- Interconnector Study Area
- 120m Zone of Investigation
- Proposed Turbine Location
- Turbine Blade Length
- Junction Box
- Proposed Culvert
- Preferred Transmission Line Route
- Temporary Laydown Area
- Collector Lines – Underground or Overhead
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area

Significant Wildlife Habitat

- Snake Hibernacula
- Wetland Communities
- Woodland Amphibian Breeding Habitat
- Woodland Communities
- Generalized Wildlife Habitat
- Deer Congregation Areas (MNR) (Generalized)

Notes

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Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
7.35

Title
Significant Natural Features Figure 7.35 Revised

620500 621000 621500 622000 622500 623000

4762000 4761500 4761000

N

Canborough Road

Creek Road

Sideroad 42

Revised Substation Footprint

wo139 bmc33 wo141 we336 we423 twa1 we351 dc85 wo145 we344 we441 we357 wo150 bmc34 we353 wo149

62.2 45.4 94.4 58 40.3 96.3 37.5 118-2-119-1 2.1 30.4

0 150 300 m

1:7,500

September, 2015

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Stantec

Legend

- Project Study Area
- Interconnector Study Area
- 120m Zone of Investigation
- Proposed Turbine Location
- Turbine Blade Length
- Junction Box
- Proposed Culvert
- Preferred Transmission Line Route
- Temporary Laydown Area
- Collector Lines – Underground or Overhead
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area
- Potential Construction Laydown Area
- Transformer Substation

Significant Wildlife Habitat

- Snake Hibernacula
- Wetland Communities
- Woodland Communities
- Turtle Wintering Area
- 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.
7.39

Title
Significant Natural Features Figure 7.39 Revised

622000 622500 623000 623500 624000 624500

4760000

4759500

4759000

dc88 we353 115.7 115.7 1.3 we356 dc89 we357 wo150 we358 7.7 7.5 5.7 dc132 we360 wo149 Wellandport Road wo199 dc131 dc133 dc90 dc134 28.2 70 93.6 93.6 108.1 118.2 124.6 TH5 New Access Road - Entrance 36 dc91 we361 wo151 AH47 41.1 we414 T10 112.9 112.9 62.6 dc92 Sideroad 44 Road

N

0 150 300 m

1:7,500

September, 2015
160950269

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Stantec

Legend

- Project Study Area
- Interconnector Study Area
- 120m Zone of Investigation
- Proposed Turbine Location
- Turbine Blade Length
- Junction Box
- Preferred Transmission Line Route
- Temporary Laydown Area
- Collector Lines – Underground or Overhead
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area

Significant Wildlife Habitat

- Snake Hibernacula
- Wetland Communities
- Woodland Amphibian Breeding Habitat
- Woodland Communities
- Turtle Nesting Habitat/Snapping Turtle Habitat
- Turtle Habitat 30m Buffer
- Generalized Wildlife Habitat
- Deer Congregation Areas (MNR) (Generalized)

Notes

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Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
7.41

Title
Significant Natural Features Figure 7.41 Revised

619000 619500 620000 620500 621000 621500 622000

4757000 4756500 4756000

N

Townline Dunnville Wainfleet

Gore A Road

Hutchinson Road

T72

T41

T11

T91

T12

T13

New Access Road - T11 to T41

New Access Road - T11 to T12

SH3

wo153

we445

dc93

bmc25

bmc23

bmc26

bmc27

bmc20

dc94

wo154

we373

0 150 300 m

1:7,500

September, 2015
160950269

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Stantec

Legend

- Project Study Area
- Interconnector Study Area
- 120m Zone of Investigation

Zone of Investigation Adjustments

- Area Added
- Proposed Turbine Location
- Turbine Blade Length
- Proposed Culvert
- Temporary Laydown Area
- Collector Lines – Underground or Overhead
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area

Significant Wildlife Habitat

- Snake Hibernacula
- Snake Hibernacula 30m Buffer
- Wetland Communities
- Woodland Communities
- 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.
7.43

Title
Significant Natural Features Figure 7.43 Revised

620500 621000 621500 622000 622500 623000

4754000 4753500 4753000

N

wo172 dc99 wo172 dc101 wo178 wo172

Jenny Jump Road

T84 wo177 wo177 wo177 wo177 wo177

Winger, ANSI, Earth Science, Provincially Significant

dc121 wo179

we391 we391 we393

AH55 New Access Road - Entrance 46

Booker Road

0 150 300 m

1:7,500

Sept 15, 2015
160950269

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Stantec

Legend

- Project Study Area
- Interconnector Study Area
- 120m Zone of Investigation
- Proposed Turbine Location
- Turbine Blade Length
- Proposed Culvert
- Temporary Laydown Area
- Collector Lines – Underground or Overhead
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area

Significant Wildlife Habitat

- Snake Hibernacula
- Wetland Communities
- Wetland Amphibian Breeding Habitat
- Woodland Communities
- ANSI, Earth Science, Provincially Significant
- Generalized Wildlife Habitat
- Deer Congregation Areas (MNR) (Generalized)

Notes

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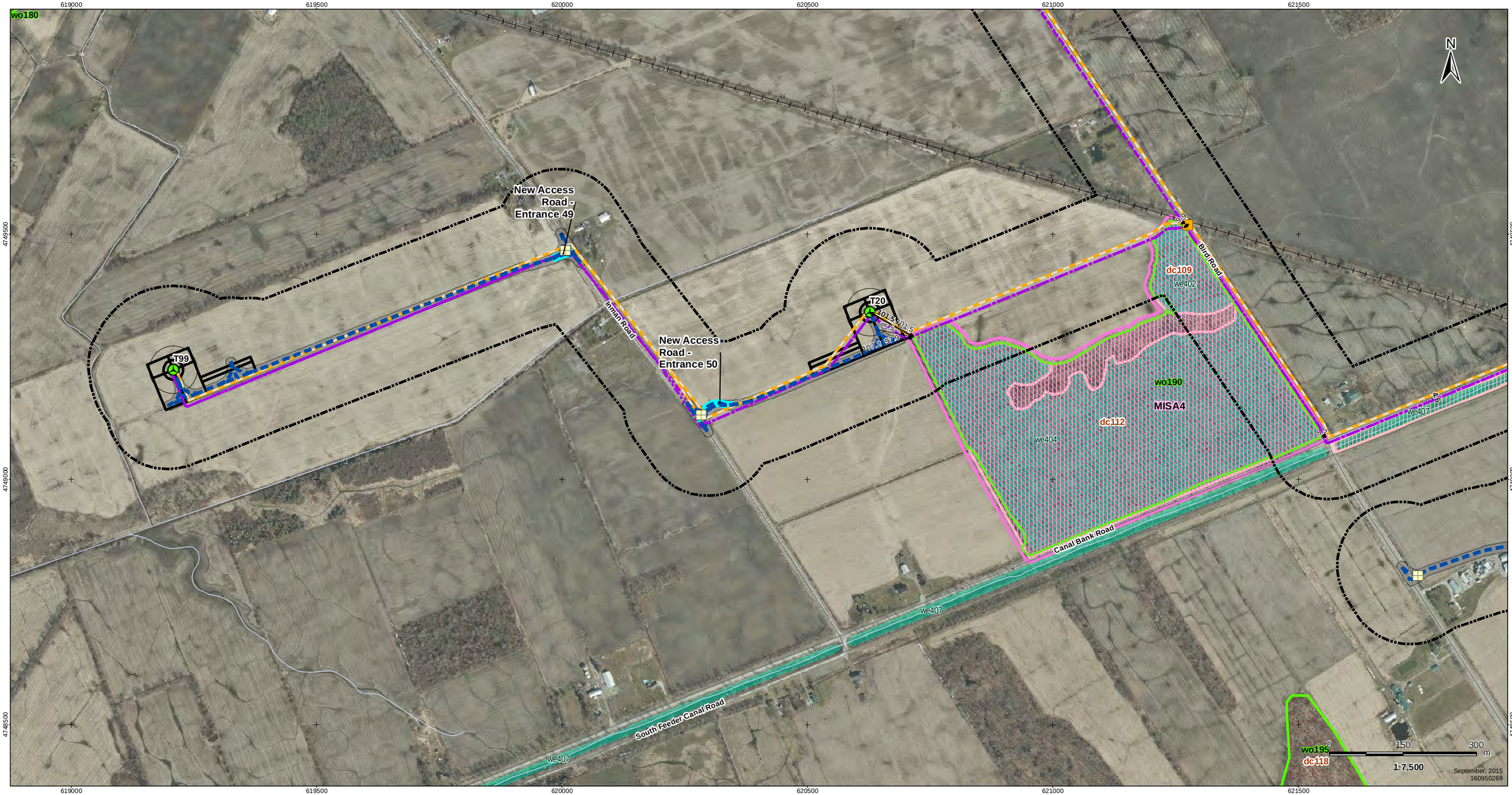
Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
7.48

Title
Significant Natural Features Figure 7.48 Revised



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Revised: 2015-09-21 By: bcowper

Stantec

Legend

- Project Study Area
- 120m Zone of Investigation
- Zone of Investigation Adjustments
  - Area Added
- Proposed Turbine Location
- Turbine Blade Length
- Junction Box
- Proposed Culvert
- Temporary Laydown Area
- Collector Lines – Underground or Overhead
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area
- Significant Wildlife Habitat
  - Snake Hibernacula
  - Landbird Migratory Stopover
  - Wetland Communities
  - Woodland Communities
  - Generalized Wildlife Habitat
  - Deer Congregation Areas (MNR) (Generalized)

Notes

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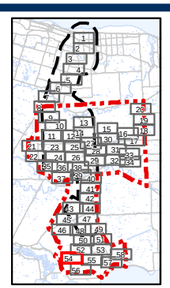

Client/Project
FWRN LP
Natural Heritage Assessment Report

Figure No.
7.54

Title
Significant Natural Features Figure 7.54 Revised

September 22, 2015
Jim Beal

Reference: **Natural Heritage Assessment Addendum - Technical and Project Design Changes**
Niagara Region Wind Farm

Attachment B: Additional Staff CVs

Lisa Uskov Tech. Dipl.

Ecologist

Lisa Uskov is a terrestrial ecologist with a broad range of natural heritage-focused skills, who has practiced in the wildlife biology and forest management fields for several years in various capacities, for both public and private organizations. Lisa had authored environmental reports under federal, provincial and municipal standards, she has coordinated and performed aquatic and terrestrial field surveys, liaised with regulatory agency representatives, as well as technical disciplines and members of the public, and has provided technical guidance on species at risk and invasive species occurrences. Lisa is familiar with applicable policies and regulations including, but not limited to, the Provincial Policy Statement, the Endangered Species Act, the Species at Risk Act, the Migratory Birds Convention Act, and the Aggregate Resources Act.

Lisa Uskov is knowledgeable about Ontario's native wildlife species, having coordinated targeted surveys for such species as Chimney Swift, Eastern Whip-poor-will and Wood Turtle for the Ministry of Natural Resources and Bird Studies Canada. Lisa has monitored and audited forest operations and developed compliance monitoring plans in Algonquin Park. Lisa is certified to perform Ontario Wetland Evaluation System (OWES), as well as Ecological Land Classification (ELC) assessments, in addition to other certifications. Her extensive experience in the field has equipped Lisa to work safely in a wide range of environments, including remote areas, and she is skilled at using GPS, GIS, wildlife acoustics monitoring, and other relevant equipment and software.

EDUCATION

Technical Diploma, Algonquin College / Forestry Technician Diploma, Pembroke, Ontario, 2010

CERTIFICATIONS & TRAINING

Certificate, Ontario Ministry of Natural Resources / Ontario Wetland Evaluation System (OWES), North Bay, Ontario, 2013

Certificate, Ministry of Natural Resources / Ecological Land Classification (ELC), Mattawa, Ontario, 2012

Certificate, University of New Brunswick and Environment Canada / Canadian Aquatic Biomonitoring Network (CABIN) Field Technician, Pembroke, Ontario, 2009

Certificate, Ontario Ministry of Natural Resources / Ontario Forest Operations Compliance Inspector, Elk Lake, Ontario, 2015

Certificate, Ontario Ministry of Natural Resources / Ontario Lands Technician, Pembroke, Ontario, 2010

Certificate, Ontario Ministry of Natural Resources / Ontario Tree Marker, Pembroke, Ontario, 2010

Certificate, St. John Ambulance / Standard First Aid with CPR C + AED, Hamilton, Ontario, 2015

Certificate, Ontario Ministry of Natural Resources / Restricted Radio Operator, Pembroke, Ontario, 2010

Certificate, Ontario Forestry Safe Workplace Association / Professional Chainsaw Operation, Pembroke, Ontario, 2009

Certificate, Ontario Ministry of Natural Resources / SP-102 Forest Industry Firefighter, Pembroke, Ontario, 2010

Certificate, Ontario Ministry of Natural Resources / Installing Culverts on Forest Access Roads, Pembroke, Ontario, 2009

Certificate, Ontario Ministry of Natural Resources / Forest Practices Competency Steering Committee Sediment and Erosion Control for Water Crossings on Forest Access Roads, Pembroke, Ontario, 2009

AWARDS

2010 Canadian Institute of Forestry Gold Medal Award for Outstanding Academic Achievement and Citizenship

** denotes projects completed with other firms*

Lisa Uskov Tech. Dipl.

Ecologist

PROJECT EXPERIENCE

Oil & Gas

Enbridge Gas Distribution Inc. GTA Project Natural Gas Pipeline Reinforcement, Greater Toronto Area, Ontario (Ecologist)

Conducted avian nest sweeps and nest checks, and incidental wildlife observations in project Right of Way, demarcated appropriate buffer zones, and reported results to lead Environmental Inspector for the project; identified hazards onsite and performed safety reporting

TransCanada Pipelines Ltd. Energy East Pipeline Project, Ontario (Ecologist)

Coordinated the provincial vegetation assessment and monitoring program for Ontario project components. Led field crews in terrestrial field programs. Provided technical guidance on species at risk and significant natural vegetation features for project discipline lead. Collated and interpreted large datasets for inclusion in reporting

Renewable Energy

Niagara Region Wind Corporation (NRWC) Wind Project, Niagara Region, Ontario (Ecologist)

Conducted turtle exclusion fencing inspections, turtle nesting surveys, avian nest sweeps and nest checks, and Ecological Land Classification assessments. Liaised with Environmental Inspector for the project and imposed and demarcated appropriate setbacks on natural features. Identified hazards on site and performed safety reporting

Environmental Site Remediation

Georgia-Pacific Remediation Project, Thorold, Ontario (Ecologist)

Performed vegetation assessments on project remediation site, identify flora and apply ecological principles to determine success rate of planted species, report on findings to client and regulatory agencies and provide supporting guidance to client

Natural Sciences & Heritage Resources

Private Consulting Firm*, Pembroke, Ontario (Biologist)

Planned and performed field survey programs for development projects in various sectors, including species at risk inventories, monitoring, ecological assessments and rehabilitation. Served as field crew lead responsible for conducting assessments efficiently and safely. Identified flora and fauna species, mapped and categorized habitats using ELC and OWES methodologies, and liaised with clients, consultants and regulatory agencies for aspects of project environmental planning. Authored Class Environmental Assessment biological reports for renewable energy projects, Natural Environment Levels I and II reports, Environmental Impact Studies and Letters of Opinion. Prepared and submitted permit applications and monitoring reports for activities that may affect species or habitats protected under the Endangered Species Act. Provided technical advice for permitting requirements, restoration projects, development potential and mitigation techniques. Authored survey protocols, and trained and supervised staff in their implementation

Ontario Ministry of Natural Resources, Ontario Parks*, Pembroke, Ontario (Resource Management Technician, Level 2)

Coordinated the 2010 silvicultural effectiveness monitoring (SEM) program for Algonquin Park. Assessed requirements for effective survey program and implemented appropriate plans. Prepared field survey maps, conducted field surveys and SEM audits, and supervised survey staff in the field. Completed Forest Operations Inspection reports for auditing activities and assisted in Algonquin Park compliance monitoring planning. Authored final 2010 SEM report for Algonquin Park

Pembroke District Ministry of Natural Resources and Forestry*, Pembroke, Ontario (Volunteer)

Responsible for the collection and submission of data for MNR NRVIS database. Coordinated a team of 17 volunteers in the assessment and observation of over 100 chimneys within the City of Pembroke for Chimney Swift studies under Bird Studies Canada (BSC). Participated in multiple White-nose Syndrome bat hibernacula field studies across eastern Ontario. Conducted Eastern Whip-poor-will surveys according to BSC protocols

** denotes projects completed with other firms*

Lisa Uskov Tech. Dipl.

Ecologist

Toronto Wildlife Centre*, Toronto, Ontario (Rescue and Release/Senior Wildlife Care Staff)

Supervised volunteer, public, and staff assistants on wildlife rescues and hospital procedures. Kept accurate records of field activities. Conducted public tours and education sessions with enthusiasm. Performed on-camera interviews and demonstrations for television and documentary programs. Tactfully resolved wildlife issues with members of the public. Developed management protocols and trained volunteers and staff in field and office settings

** denotes projects completed with other firms*

Appendix C:

Correspondence with MTCS

Ministry of Tourism, Culture and Sport

Confirmation Letter

Ministry of Tourism, Culture and Sport

Archaeology Programs Unit
Programs and Services Branch
Culture Division
401 Bay Street, Suite 1700
Toronto ON M7A 0A7
Tel.: (416) 314-7123
Email: meagan.brooks@ontario.ca

Ministère du Tourisme, de la Culture et du Sport

Unité des programmes d'archéologie
Direction des programmes et des services
Division de culture
401, rue Bay, bureau 1700
Toronto ON M7A 0A7
Tél. : (416) 314-7123
Email: meagan.brooks@ontario.ca

Ontario

Aug 26, 2015

Walter Frank McCall (P389)
Stantec Consulting
835 Paramount Stoney Creek ON L8J 0B4

RE: Review and Entry into the Ontario Public Register of Archaeological Reports: Archaeological Assessment Report Entitled, "Stage 2 Archaeological Assessment: Niagara Region Wind Project Tap-In Location Part of Lot 21, Concession 1, Geographic Township of Clinton, Regional Municipality of Niagara, Ontario ", Dated Aug 6, 2015, Filed with MTCS Toronto Office on Aug 18, 2015, MTCS Project Information Form Number P389-0021-2013

Dear Dr. McCall:

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.[2]

The report documents the assessment/mitigation of the study area as depicted in Tile 1 of the Supplementary Documentation and Figure 1 of the above titled report and recommends the following:

The Stage 2 assessment of Location 51 (AhGu-31) resulted in the recovery of more than five non-diagnostic pre-contact Aboriginal artifacts from combined test pit and test unit excavations. In accordance with Section 2.2 Standard 1a and Table 3.1 of the 2011 Standards and Guidelines for Consultant Archaeologists (Government of Ontario 2011), Location 51 (AhGu-31) retains cultural heritage value or interest and meets the criteria for a Stage 3 archaeological assessment. Therefore, Stage 3 archaeological assessment is recommended for Location 51 (AhGu-31).
The Stage 3 archaeological assessment of Location 51 (AhGu-31) will be conducted according to the procedures outlined in the MTCS's 2011 Standards and Guidelines for Consultant Archaeologists (Government of Ontario 2011). The Stage 3 archaeological assessment will include the removal of a series of one metre square Stage 3 test units excavated by hand at five metre intervals over the full extent of the site in systematic levels and into the first five centimetres of subsoil. Additional test units amounting to 20% of the total number of 5 metre grid units will then be placed in the vicinity of positive Stage 2 test pits and adjacent to high-yielding units. All excavated soil will be screened through six millimetre mesh; any artifacts being recovered will be recorded and catalogued by the corresponding grid unit designation. If a subsurface

cultural feature is encountered, the plan of the exposed feature will be recorded and geotextile fabric will be placed over the unit before backfilling the unit.The artifact assemblage recovered from Location 52 (AhGu-32) does not meet any of the criteria listed in Section 2.2 or Table 3.1 of the Standards and Guidelines for Consultant Archaeologists (Government of Ontario 2011) and does not retain cultural heritage value or interest. Therefore, no further archaeological assessment is recommended for Location 52 (AhGu-32). Two archaeological sites were documented during the Stage 1-2 archaeological assessment, Location 51 (AhGu-31) and Location 52 (AhGu-32). Location 51 (AhGu-31) has been recommended for Stage 3 archaeological assessment, while Location 52 (AhGu-32) has not been recommended for Stage 3 archaeological assessment.

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
Shiloh Berriman,Enercon Canada Inc.
Sarah Paul,Ministry of the Environment

[1]This letter constitutes the Ministry of Tourism, Culture and Sport's written comments where required pursuant to section 22 of O. Reg. 359/09, as amended (Renewable Energy Approvals under the Environmental Protection Act), regarding the archaeological assessment undertaken for the above-captioned project. Depending on the study area and scope of work of the archaeological assessment as detailed in the report, further archaeological assessment reports may be required to complete the archaeological assessment for the project under O. Reg. 359/09. In that event Ministry comments pursuant to section 22 of O. Reg. 359/09 will be required for any such additional reports.

[2]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: Niagara Region Wind Project Tap-In Location

Part of Lot 21, Concession 1,
Geographic Township of Clinton,
Regional Municipality of Niagara,
Ontario

Prepared for:

Enercon Canada Inc.
4672 Bartlett Road South
Beamsville, ON L0R 1B1

Prepared by:
Stantec Consulting Ltd.
200 - 835 Paramount Drive
Stoney Creek ON L8J 0B4
Tel: (905) 385-3234
Fax: (905) 385-3534

Licensee: Walter McCall, Ph.D.
License Number: P389
PIF Number: P389-0021-2013
FIT# FIT-FLKZ509

REVISED REPORT

File No. 160950269

August 6, 2015

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Executive Summary

A Stage 2 archaeological assessment of a Tap-In Station was conducted by Stantec Consulting Ltd. (Stantec) on behalf of Niagara Region Wind Corporation for the proposed Niagara Region Wind Project. The Stage 2 assessment was undertaken in order to meet the requirements for an application for a Renewable Energy Approval, as outlined in Ontario Regulation 359/09 sections 21 and 22 under Part V.0.1 of the *Environmental Protection Act* (Government of Ontario 1990a).

The Stage 2 assessment of the proposed Tap-In Station was conducted on October 14, 2013 and October 15, 2013 under the PIF P389-0021-2013 issued to Walter McCall, Ph.D. by the Ministry of Tourism, Culture and Sport (MTCS). The proposed area of impact is approximately 35 by 35 metres. It is an agricultural parcel, located on part of Lot 21, Concession 1, Geographic Township of Clinton, Regional Municipality of Niagara, Ontario. The study area consists of an orchard and was assessed by test pit survey. The project lands were subject to Stage 1 archaeological assessment by Stantec in 2010 (Stantec 2010) and are adjacent to lands surveyed during the Stage 2 assessment of the proposed Niagara Region Wind Project (Stantec 2013). The Stage 2 archaeological assessment of the Niagara Region Wind Project Tap-In Location covers lands additional to those assessed under the previous Niagara Region Wind Project Stage 2 report.

Stantec's Stage 2 survey of the area of the proposed Tap-In Location resulted in the identification of two archaeological sites: Location 51 (AhGu-31) and Location 52 (AhGu-32). The artifact assemblage from Location 51 (AhGu-31) contains more than five pre-contact Aboriginal artifacts. In accordance with Section 2.2 Standard 1c and Table 3.1 of the 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011), Location 51 (AhGu-31) retains cultural heritage value or interest and meets the criteria for a Stage 3 archaeological assessment. Therefore, **Stage 3 archaeological assessment is recommended for Location 51 (AhGu-31).**

The Stage 3 archaeological assessment of Location 51 (AhGu-31) will be conducted according to the procedures outlined in the MTCS's 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011). The Stage 3 archaeological assessment will include the removal of a series of one metre square Stage 3 test units excavated by hand at five metre intervals over the full extent of the site in systematic levels and into the first five centimetres of subsoil. Additional test units amounting to 20% of the total number of 5 metre grid units will then be placed in the vicinity of positive Stage 2 test pits and adjacent to high-yielding units. All excavated soil will be screened through six millimetre mesh; any artifacts being recovered will be recorded and catalogued by the corresponding grid unit designation. If a subsurface cultural feature is encountered, the plan of the exposed feature will be recorded and geotextile fabric will be placed over the unit before backfilling the unit.

The artifact assemblage from Location 52 (AhGu-32) does not meet any of the criteria listed in Section 2.2 and Table 3.1 of the *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011) and does not retain cultural heritage value or interest and does not meet the criteria for Stage 3 archaeological assessment. Therefore, **a Stage 3 archaeological assessment is not recommended for Location 52 (AhGu-32).**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.

Project Personnel

Project Director:	Jim Wilson, MA Principal, Regional Discipline Leader, Archaeology (P001)
Project Manager:	Adam Hossack, BA
Licensed Archaeologist:	Walter McCall, Ph.D. (P389)
Licensed Field Directors:	Jennifer Schumacher, MA (R465)
Field Technicians:	Joel Lebaron
Lab/Office Assistants:	Brian Cowper; Jennifer Schumacher, MA (R465); Lorraine Spence-Claro
Report Writers:	Jennifer Schumacher, MA (R465); Adam Hossack, BA
Technical Review:	Colin Varley, MA (P002)
Senior Review:	Jim Wilson, MA (P001)
Proponent Contact:	Darren Croghan, Niagara Region Wind Corporation
Ministry of Tourism, Culture and Sport:	Robert von Bitter

1.0 Project Context

1.1 DEVELOPMENT CONTEXT

Stantec Consulting Ltd. (Stantec) was contracted by Niagara Region Wind Corporation (NRWC) to conduct the Stage 2 archaeological assessment of a Tap-In Station located along the 20 kilometre long overhead 115 kV transmission line linking the Niagara Region Wind Project to Ontario's power grid (Figure 1).

The Tap-In Station is part of a proposed 230 Megawatt (MW) Niagara Region Wind Project (the Project) within the Townships of West Lincoln and Wainfleet and the Towns of Grimsby and 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 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 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 MVA base rated transformer with two stages of cooling. A 115kV transmission line transports power from each of the two transformer substations north to the Tap-In Station 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.

The transmission line is being constructed along the municipal Right-of-Way on overhead poles. The Project Location for the Tap-In Station includes the structure itself and its concrete foundation upon a 20 metre by 20 metre prepared base of engineered fill and crushed stone. The Project Location for the station also includes additional land to account for any construction impacts. The Tap-In Station Project Location is approximately 35 by 35 metres in size and is collectively referred to as the Tap-In Location. This assessment is being conducted as part of the pre-construction phase of the Niagara Region Wind Project's development process. An additional area was added to the north of the Tap-In Station after the Stage 2 assessment was completed by Stantec (2013). This additional area is the subject of the current Stage 2 assessment.

The Stage 2 archaeological assessment of Tap-In Location was undertaken by Stantec on behalf of NRWC in order to meet the requirements for an application for a Renewable Energy Approval, as outlined in Ontario Regulation 359/09 sections 21 and 22 under Part V.0.1 of the *Environmental Protection Act* (Government of Ontario 1990a). 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 2011).

Permission to enter the optioned lot within the study area and remove archaeological resources was provided by Darren Croghan of NRWC.

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 2011).

The objectives of the Stage 2 assessment were to document archaeological resources present within the study area, to determine whether any of the resources might be artifacts or archaeological sites with cultural heritage value or interest requiring further assessment, and to provide specific Stage 3 direction for the protection, management and/or recovery of the identified archaeological resources (Government of Ontario 2011).

1.2 HISTORICAL CONTEXT

The study area consists of approximately 0.2 hectares of orchard on part of Lot 21, Concession 1, Geographic Township of Clinton, Regional Municipality of Niagara, Ontario.

1.2.1 Pre-contact Aboriginal Archaeological Resources

This portion of southwestern Ontario has been demonstrated to have been occupied by people as far back as 11,000 years ago as the glaciers retreated. For the majority of this time, people were practicing hunter gatherer lifestyles with a gradual move towards more extensive farming practices. Table 1 provides a general outline of the cultural chronology of the Regional Municipality of Niagara based on Ellis and Ferris (1990).

Table 1: Cultural Chronology of Regional Municipality of Niagara

Period	Characteristics	Time Period	Comments
Early Paleo-Indian	Fluted Projectiles	9000 - 8400 B.C.	spruce parkland/caribou hunters
Late Paleo-Indian	Hi-Lo Projectiles	8400 – 8000 B.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 – 1100 B.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

Table 1: Cultural Chronology of Regional Municipality of Niagara

Period	Characteristics	Time Period	Comments
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

1.2.2 Post-contact Aboriginal Archaeological 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). By 1690, Algonkian speakers from the north appear to have begun to repopulate Bruce County (Rogers 1978:761). This is the period in which the Mississaugas are known to have moved into southern Ontario and the lower Great Lakes watersheds (Konrad 1981). In southwestern Ontario, however, members of the Three Fires Confederacy (Chippewa, Ottawa and Potawatomi) were immigrating from Ohio and Michigan in the late 1700s (Feest and Feest 1978:778-779).

In 1763 King George III issued the *Royal Proclamation* to establish how territories acquired from the cessation of New France, including the portion of Ontario occupied by the Mississaugas, would be managed, making the provision that lands occupied by the First Nations in the interior of the continent would be reserved to them exclusively (Rogers 1978).

The study area first entered the record as a result of Treaty No. 3, December 2nd, 1792 (Mississauga) (Figure 2):

> *...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)

1.2.3 Historic Euro-Canadian Archaeological Resources

The study area is situated in the former County of Lincoln and in the Geographic Township of Clinton on the Niagara Peninsula. The earliest written record of the Niagara Peninsula dates to an account of Niagara Falls published in 1604. The account had been written by Samuel de Champlain and was based on the stories of First Nations populations he encountered during his first trip to what is now Canada in 1603 (de Volpi 1966). Etienne Brûlé may have visited the Niagara Region as early as 1611, but it was not until 1615 that Champlain, personally, explored Lake Ontario. The Niagara River between Lake Ontario and Lake Erie was outlined in the 1632 Les Voyages de la Nouvelle France Occidentale, Dicte Canada, Faits par le Sr. De Champlain (de Volpi 1966). In 1678 Father Jean Louis Hennepin sketched the Falls (de Volpi 1966). The sketch was reproduced in 1697 in Father Hennepin's Nouvelle découverte d'un très grand pays situé dans l'Amerique, entre le Nouveau Mexique et la mer glaciale. An illustration, showing a ladder ascending the Falls, accompanied a story in a 1751 edition of *The Gentleman's Magazine*. Although French explorers, missionaries and traders would continue to pass through the area during the 17th and 18th centuries, no concerted effort was made by the French to settle the region, although a series of forts, blockhouses and fortified trading posts were constructed near present-day Youngstown, New York at the mouth of Niagara River, including: Fort Conti, 1678-1679 (destroyed by fire); Fort De Nonville, 1687-1688 (abandoned); and Fort Niagara, 1726 (captured by British forces in 1759) (Porter 1896).

The stone fort at Niagara was enlarged to its present-day size around 1755 in response to increased tension in the region between the French and British. The fort was captured by the British following a 19-day siege led by Sir William Johnson (Porter 1896). When writing about Fort Niagara and the Niagara Pennisula in his 1770 *A General History of the British Empire in America*, John Huddlestone wrote that, "Niagara is without exception the most important post in America and secures a greater number of communications, through a more extensive country, than perhaps any other pass in the world" (Wynne 1770). When the Province of Quebec was divided into Upper and Lower Canada in 1791, Lieutenant-Governor John Graves Simcoe chose Niagara as the first seat of government for Upper Canada (1792 until 1794) and began surveying the region to accommodate settlement (de Volpi 1966).

During the War of 1812, the Niagara Peninsula was the setting for a number of pivotal battles, including those at Queenston Heights, Fort George, Chippewa, Fort Niagara, and Lundy's Lane. Owing to its close proximity to the United States, the region was one of the first settled as a result of the war by United Empire Loyalists (UELs), German mercenaries, Pennsylvania German settlers, First Nations, and those wishing to take advantage of generous land grants and low tax rates aimed at stimulating settlement along the Canadian-United States border.

The Welland Canal, built between 1824 and 1830, provided a gateway between Lake Ontario and Lake Erie and established the Niagara Peninsula as an economic and commercial centre, particularly given the superior agricultural conditions in the area.

Clinton Township grew quickly as a result of incentives to settle in Upper Canada at the end of the 18th century. By 1800, at least 66 families were living in Clinton Township (Lincoln County Council 1956). Among the earliest settlers in the area was Jacob Beam, a UEL and member of Butler's Rangers. It was after Jacob Beam that Beamsville, established as a police village only three years after the founding of Lincoln County, was named. As a UEL, Jacob Beam was originally granted 400 acres of land in Clinton Township and an additional 500 acres in Grimsby Township (Lincoln County Council 1956).

Agricultural land in the former Clinton Township is fertile, being comprised of nutrient rich sandy loam soils. Excellent agricultural conditions, coupled with the township's advantageous location along the Niagara Escarpment, along the south shore of Lake Ontario made the area attractive to early settlement. By 1876 there were 600 residents, a court, Free Mason's lodge, Orange Hall, wine factory and a bell factory as well as numerous specialists including a tinsmith, druggist and doctor in the Village of Beamsville alone (Page & Co. 1876).

The 1876 *Illustrated Historic Atlas of the Counties of Lincoln and Welland* (Page & Co. 1876) shows Lot 21, Concession 1 as being owned by the Book, Adams, and Konkle families (Figure 3). The study area appears to be owned by the Konkle family. One structure is shown on the property, located outside of the study area to the north. This historic map shows a high level of settlement and supports the determination of increased Euro-Canadian archaeological potential made in the Stage 1 report (Figure 3; Stantec 2012). The property was used for agricultural purposes in the last 100 years and is an active orchard today.

1.2.4 Reports with Relevant Background Information

Two archaeological assessment reports have been written for the Niagara Region Wind Project; Table 2 provides a listing of the Stage 1 and 2 archaeological reports.

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

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

Year	Title	Author	PIF Number
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

The Stage 2 field assessment for the study area was conducted on October 15, 2013 and October 16, 2013 under PIF P389-0021-2013 issued to Walter McCall, Ph.D. by the MTCS. The study area consists of approximately 0.2 hectares of tree farm that have been under agricultural cultivation for the past 100 years.

1.3.1 The Natural Environment

The Study Area is located in the Iroquois Plain physiographic region, which surrounds the present day western shore line of Lake Ontario (Chapman and Putnam, 1984) and is markedly different in characteristics from the topographic region at the top of the Niagara Escarpment to the south. The Iroquois Plain is a lowland which borders Lake Ontario and which in the Grimsby-Beamsville area is composed largely of sandy soils which lay in beds over clay till sediments.

The vast majority of the surficial geology around the Project Area is sandy loam with pockets of silty clay loam interspersed. More specifically the soil series is Vineland sandy loam which is imperfectly drained and has a mottled subsoil due to the high water table (Wicklund and Mathews 1963). Lot 21, Concession 1 has been in agricultural use for over 100 years, and is still an orchard today. The imperfect drainage of these soils is attested to by the fact that drainage pipes have been installed throughout the orchard.

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 is an unnamed creek approximately 100 metres to the west of the study area which flows north into Lake Ontario.

1.3.2 Previously Known 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 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 AhGu.

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 showed that NRWC-48 (AhGx-690) was located 25 metres from the study area. NRWC-48 (AhGx-690) was identified through a test pit survey during the Stage 2 assessment conducted by Stantec (2013). NRWC-48 (AhGX-690) consisted of one Onondaga chert spokeshave, approximately 18 pieces of Onondaga chert debitage, a piece of Bois Blanc chert debitage, and a piece of Selkirk chert debitage. With the identification of at least five non-diagnostic artifacts in a 10 metre by 10 metre area, it was determined that NRWC-48 (AhGx-690) retained cultural heritage value or interest. Based on these considerations, NRWC-48 (AhGx-690) was recommended for a Stage 3 archaeological assessment as per Section 2.2 Standard 1a.ii.2 of the MTCS's 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011).

No archaeological studies other than the previous Niagara Region Wind Project Stage 1 and Stage 2 archaeological assessments (Stantec 2012 and 2013) have been undertaken within 50 metres of the study area (personal communication, Robert von Bitter, March 31, 2014; Government of Ontario n.d.).

1.3.3 Archaeological Potential

Archaeological potential is established by determining the likelihood that archaeological resources may be present on a subject property. Criteria commonly used by the Ontario MTCS (Government of Ontario 2011) to determine areas of archaeological potential include: proximity to previously identified archaeological sites; distance to various types of water sources; soil texture and drainage; glacial geomorphology, elevated topography and the general topographic variability of the area; resource areas including food or medicinal plants, scarce raw materials and early Euro-Canadian industry; areas of early Euro-Canadian settlement and early transportation routes; properties listed on municipal register of properties designated under the *Ontario Heritage Act* (Government of Ontario 1990b); properties that local histories or informants have identified with possible archaeological sites, historical events, activities or occupants; and historic landmarks or sites.

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 current study area contains elevated potential for both pre-contact Aboriginal and historic Euro-Canadian archaeological resources (Stantec 2012). Pre-contact and post-contact Aboriginal potential are moderate to high given the study area's proximity to nearby water sources. Historic Euro-Canadian potential is moderate to high given the study area's proximity to the extant historic road grid and the structure shown on the historic mapping

When the above listed criteria are applied to the study area, the archaeological potential for pre-contact Aboriginal, post-contact Aboriginal, and historic Euro-Canadian sites is deemed to be moderate to high. Thus, in accordance with Section 1.3.1 of the *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011), this report concurs with the Stage 1 archaeological assessment of the Niagara Region Wind Project (Stantec 2012) and has determined that the current study area exhibits moderate to high potential for the identification and recovery of archaeological resources.

1.3.4 Existing Conditions

The current study area comprises approximately 0.2 hectares of generally flat agricultural land. The entire study area is currently in use as an orchard and, although it has been under agricultural cultivation for the past 100 years, is currently inaccessible to ploughing.

2.0 Field Methods

The Stage 2 field assessment of the approximately 35 by 35 metre area which comprises the Tap-In Location study area was conducted on October 15, 2013 and October 16, 2013. During the Stage 2 field investigations the weather was warm and sunny. Assessment conditions were excellent and at no time were the field, weather, or lighting conditions detrimental to the recovery of archaeological material. Photos 1 to 3 confirm that field conditions met the requirements for a Stage 2 archaeological assessment, as per the *Standards and Guidelines for Consultant Archaeologists* (Section 7.8.6, Standard 1a; Government of Ontario 2011). Figure 4 provides an illustration of the Stage 2 assessment methods, as well as photograph locations and directions.

The study area lies within an active orchard and is inaccessible to ploughing. The entire extent of this area was subject to test pit assessment at a five metre interval in accordance with Section 2.1.2 of the MTCS's 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011). Each test pit was approximately 30 centimetres in diameter and excavated five centimetres into sterile subsoil. The soils were then examined for stratigraphy, cultural features, or evidence of fill. All soil was screened through six millimetre mesh hardware cloth to facilitate the recovery of small artifacts and then used to backfill the pit. All cultural material encountered was collected and recorded to the associated test pit and returned to Stantec's Hamilton office for laboratory analysis. UTM readings were taken using a Trimble Geo XH GeoExplorer 2008 Series handheld GPS unit using the North American Datum (NAD) 83 with a minimal accuracy of three metres. UTM coordinates were recorded for all positive test pits, site centroids, landmarks and site boundaries. These coordinates are presented in the supplementary documentation to this report. Figure 4 illustrates the field assessment methods across the study area and Tile 1 in the supplementary documentation illustrates the field methods and results.

Stage 2 test pitting resulted in the identification of two archaeological sites, designated Location 51 (AhGu-31) and Location 52 (AhGu-32). Following the discovery of cultural material, test pitting was completed over the entire extent of the study area. When this failed to produce sufficient archaeological resources to result in the recommendation of Stage 3 archaeological assessment, intensification following Option A for Section 2.1.3 Standard 2 of the MTCS's 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011) was undertaken on both sites. This involved the excavation of additional test pits at 2.5 metre intervals within a 5 metre radius of all positive test pits, followed by the excavation of two one-metre test units over positive test pits on each site. This resulted in the excavation of a total of seven positive test pits and four one metre test units within the study area. No subsurface features were encountered during Stage 2 assessment.

One First Nations Observer each from the Haudenosaunee Development Institute, the Mississaugas of the New Credit First Nation, and Six Nations participated in the Stage 2 archaeological assessment. Their roles are summarized in the supplementary documentation. All three Observers were present for both days of Stage 2 field work.

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. A total of two archaeological sites were found during the Stage 2 archaeological assessment of the study area.

Table 3: Inventory of Documentary Record

Document Type	Current Location of Document Type	Additional Comments
9 Pages of Field Notes	Stantec office in Hamilton	In original field book and photocopied in project file
2 Hand Drawn Maps	Stantec office in Hamilton	In original field book and photocopied in project file
2 Maps Provided by Client	Stantec office in Hamilton	Hard and digital copies in project file
36 Digital Photographs	Stantec office in Hamilton	Stored digitally in project file

All of the material culture collected during the Stage 2 archaeological assessment of the study area is contained in one banker's box. It will be temporarily housed at the Stantec office in London until formal arrangements can be made for its transfer to a MTCS collections facility.

3.1 LOCATION 51 (AHGU-31)

Location 51 (AhGu-31) is located within an orchard (see Tile 1 of the Supplementary Documentation). The Stage 2 archaeological assessment of this location resulted in the recovery of 40 artifacts collected from five positive test pits and two one metre test units distributed over an area measuring approximately 6 metres east to west by 8 metres north to south. Table 4 provides an artifact summary for the Stage 2 archaeological assessment of Location 51 (AhGu-31) (Plate 1 and 2).

Table 4: Location 51 (AhGu-31) Artifact Summary

Artifacts	Frequency	%
pre-contact Aboriginal	10	25.00
structural	9	22.50
ceramic	9	22.50
household	8	20.00
miscellaneous metal and tools	2	5.00
recent material	2	5.00
Total	**40**	**100.00**

3.1.1 Pre-contact Aboriginal Artifacts

A total of 10 pieces of pre-contact Aboriginal cultural material were recovered from Location 51 (AhGu-31). Of these, nine were chipping detritus and one was a drill (Plate 1).

The flake assemblage was subject to morphological analysis following the classification scheme described by Lennox *et al*. (1986) and expanded upon by Fisher (1997). The results of the morphological analysis can be found in Table 5.

Table 5: Location 51 (AhGu-31) Flake Analysis

Material	Secondary		Tertiary		Broken		Total Analyzed	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Onondaga	3	33.33	1	11.11	2	22.22	**6**	**66.7**
Lockport	2	22.22	0	0.00	1	11.11	**3**	**33.3**
Total	5	**55.56**	1	**11.11**	**3**	**33.33**	**9**	**100.00**

Secondary flakes were the type most often encountered and comprised 55.56% of the total assemblage. Broken flakes followed at 33.33%, with the least common being tertiary (11.11%). Secondary flakes are produced when a primary blank is further reduced through the removal of material from both sides of the piece. Pressure flaking generally produces smaller, thinner flakes than does percussion flaking. Tertiary flakes are produced during the further reduction of blanks 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.

The majority of flakes recovered from Location 51 (AhGu-31) (66.70%) were manufactured from Onondaga chert. 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). 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).

Approximately 33.30% of the flakes recovered from Location 51 (AhGu-31) were composed of Lockport chert. Also known as “Ancaster” chert, Lockport variety chert is found at the crest of the Niagara escarpment between Ancaster and the Niagara River. It is a mid-quality material found in the Middle Silurian Goat Island member of the Lockport formation. The chert is light to dark grey in colour, dull to waxy in lustre and occurs both in the form of nodules and as beds of up to 8 centimetres thickness (Fox 2009).

The single formal lithic tool recovered from this location consists of the hafting element of an expanding stem drill (Plate 1:A). The drill is manufactured on Onondaga chert and measures

29.63 millimetres long by 12.74 millimetres wide by 6.49 millimetres thick. It terminates at its approximate mid-point in a torsion fracture and is missing its bit end. This artifact is not temporally diagnostic, beyond the fact that it dates to the pre-contact Aboriginal period.

3.1.2 Ceramic Artifacts

A total of nine ceramic artifacts were recovered during the Stage 2 assessment of Location 51 (AhGu-31). Of those, four are whiteware, two are ironstone, two are utilitarian, and 1 is semi-porcelain. Table 4 summarizes the ceramic artifacts by ware type. The different ware types recovered from the Stage 2 assessment are discussed below and presented in Table 9 and further summarized by decorative type in Table 10. Plate 2 illustrates an example of the ceramic artifacts recovered from Location 51 (AhGu-31).

Table 6: Location 51 (AhGu-31) Ceramic Assemblage by Ware Type

Ceramic Artifacts	Frequency	%
whiteware	4	44.45
utilitarian	2	22.22
ironstone	2	22.22
porcelain, semi	1	11.11
Total	**9**	**100.00**

Table 7: Location 51 (AhGu-31) Ceramic Assemblage by Decorative Type

Ceramic Artifacts	Frequency	%
whiteware, plain	3	33.34
earthenware, red	2	22.22
ironstone, painted	1	11.11
ironstone, plain	1	11.11
whiteware, painted	1	11.11
porcelain, semi	1	11.11
Total	**9**	**100.00**

Whiteware

Four pieces of whiteware were recovered from Location 51 (AhGu-31). Whiteware is a variety of earthenware with a near colourless glaze that replaced earlier near-white ceramics such as pearlware and creamware by the early 1830s. Early whiteware tends to have a porous paste, with more vitrified and harder ceramics becoming increasingly common during the late 19th century (Kenyon 1985). Of the 4 pieces of whiteware collected from Location 51 (AhGu-31) 3 pieces were plain and 1 was painted.

Painted whiteware vessels of the 19th century typically featured a *horror vacui* decorative style in which the majority of the piece was covered with pattern and very little of the underlying white showed through. Blue and black were the dominant colours during the first quarter of the 19th century, while polychrome patterns became increasingly popular from 1830 to 1860 (Stelle 2001). The one piece of painted whiteware recovered from Location 51 (AhGu-31) was blue (Plate 2:B).

Utilitarian Earthenware

Two pieces of utilitarian earthenware were recovered from Location 51 (AhGu-31), both clear-glazed with an unrefined red paste. From the late 18th through to the late 19th century unrefined earthenwares with red or yellow paste were the most common type of utilitarian vessels (Adams 1994).

Ironstone

Two pieces of ironstone were collected from Location 51 (AhGu-31). Ironstone, also known as white granite, stone china and graniteware, is a variety of white earthenware which was introduced to Canada by the 1820s. It was widely available in the 1840s and was extremely popular in Upper Canada by the 1860s (Collard 1967; Kenyon 1985). Decorated ironstone, including hand painted, transfer printed, sponged, and stamped, generally dates to between 1805 and 1840; undecorated ironstone was most common after 1840 (Miller 1991). Of the ironstone fragments recovered from Location 51 (AhGu-31), one is plain and one is painted with a green leaf pattern.

Semi-Porcelain

Only one piece of plain semi-porcelain was collected from Location 51 (AhGu-31). During the first half of the 19th century, improved ceramic techniques resulted in the production of a durable ware known as semi-porcelain. This hard earthenware was manufactured to emulate expensive porcelain imports, but lacked true translucency. Despite this, semi-porcelains dominated the marketplace after 1850 (Hughes 1961).

3.1.3 Non-ceramic Artifacts

A total of 21 non-ceramic Euro-Canadian artifacts were recovered from Location 51 (AhGu-31) including 9 structural, 8 household, 2 miscellaneous metal and tools, and 2 pieces of modern material. Plate 2 illustrates a sample of the non-ceramic artifacts recovered from Location 51 (AhGu-31). The various non-ceramic artifacts are discussed in further detail below.

Structural Artifacts

A total of nine structural artifacts were recovered from Location 51 (AhGu-31) including 4 pieces of window glass, 2 pieces of brick, 2 cut nails, and 1 wire nail (Plate 2). Window glass can be

temporally diagnostic. In the 1840s window glass thickness changed dramatically. This shift was a result of the lifting of the English import tax on window glass in 1845, which taxed glass by weight and encouraged manufacturers to produce thin panes. Thus, most window glass manufactured before 1845 tends to be less than 1.6 millimetres thick, while later glass is thicker (Adams 1994; Kenyon 1980). All four pieces of window glass recovered from Location 51 (AhGu-31) are greater than 1.6 millimetres in thickness, suggesting a production date after 1845.

A total of two machine cut nails and one wire nail were recovered from Location 51 (AhGu-31). Machine cut nails were cut from a flat sheet of iron and as a result their shanks have a rectangular cross-section. The head is usually rectangular and was often welded into place. Invented about 1790, cut nails saw common use from the 1830s until the 1890s. Wire nails are still in widespread use today, with a round cross-section and round head. First developed in the 1850s, they began to replace the cut nail in the 1890's (Adams 1994). The two pieces of red brick recovered are not temporally diagnostic.

Household Artifacts

The eight household artifacts recovered from Location 51 (AhGu-31)consist of six glass bottle fragments and two faunal remains. Bottle glass colour can provide a tentative temporal range for Euro-Canadian domestic sites. Colourless, or clear, glass is relatively uncommon prior to the 1870s but becomes quite widespread in the 1910s (Kendrick 1971; Fike 1987). Of the six glass bottle fragments recovered, five are clear or colourless and date to after 1870 while one is sun-coloured amethyst. The inclusion of manganese oxide, a de-colourizing agent used to offset residual iron impurities, reacts with sun exposure to give clear glass a colour similar to amethyst over time. This glass, referred to as sun coloured amethyst glass, dates from the 1880s to 1920. The two pieces of faunal material recovered from Location 51 (AhGu-31) consist of fragmentary avian skeletal elements and are temporally non-diagnostic.

Metal Artifacts

Two pieces of miscellaneous metal and metal tools were recovered from Location 51 (AhGu-31): one washer and one unidentified metal artifact. These artifacts are temporally non-diagnostic.

Recent Material

Two pieces of plastic cultural material dating to the late 20th or early 21st century were recovered from this location.

3.1.4 Artifact Catalogue

Table 8: Location 51 (AhGu-31) Complete Artifact Catalogue

Cat. #	Subunit or Context	Depth (m)	Artifact	Quantity	Comments	Chert	Morph	Form
1	Test Pit 5	0.18	porcelain, semi	1	pink			1 bowl

Table 8: Location 51 (AhGu-31) Complete Artifact Catalogue

Cat. #	Subunit or Context	Depth (m)	Artifact	Quantity	Comments	Chert	Morph	Form
2	Test Pit 5	0.18	faunal	1	avian			
3	Test Pit 5	0.18	glass, window	2	1.74mm, 2.00mm			
4	Test Pit 5	0.18	glass, bottle	1	clear			
5	Test Pit 6	0.21	whiteware, plain	1				
6	Test Pit 6	0.21	ironstone, painted	1	green leaf			1 bowl
7	Test Pit 6	0.21	chipping detritus	1		lockport	secondary	
8	Test Pit 2	0.20	drill	1	expanding stem, base	onondaga		
9	Test Pit 7	0.21	brick	1				
10	Test Pit 7	0.21	chipping detritus	1		lockport	broken	
11	Test Pit 7	0.21	glass, bottle	1	clear			
12	Test Pit 7	0.21	whiteware, plain	1				1 plate
13	Test Pit 1	0.20	glass, bottle	1	clear			
14	Test Pit 1	0.20	whiteware, plain	1				1 plate
15	Test Pit 1	0.20	metal hardware, miscellaneous	1				
16	Test Unit 1	0.23	chipping detritus	1		onondaga	secondary	
17	Test Unit 1	0.23	glass, window	2	2.22mm, 1.66mm			
18	Test Unit 1	0.23	glass, bottle	2	1 amethyst, 1 clear			
19	Test Unit 1	0.23	washer	1				
20	Test Unit 1	0.23	brick	1				
21	Test Unit 1	0.23	earthenware, red	2				2 bowl
22	Test Unit 1	0.23	plastic	2				
23	Test Unit 1	0.23	nail, cut	2				
24	Test Unit 1	0.23	faunal	1	avian			

Table 8: Location 51 (AhGu-31) Complete Artifact Catalogue

Cat. #	Subunit or Context	Depth (m)	Artifact	Quantity	Comments	Chert	Morph	Form
25	Test Unit 2	0.24	nail, wire	1				
26	Test Unit 2	0.24	ironstone, plain	1				1 plate
27	Test Unit 2	0.24	whiteware, painted	1	blue			
28	Test Unit 2	0.24	chipping detritus	1		Lockport	secondary	
29	Test Unit 2	0.24	glass, bottle	1	clear			
30	Test Unit 2	0.24	chipping detritus	2		Onondaga	secondary	
31	Test Unit 2	0.24	chipping detritus	1		Onondaga	tertiary	
32	Test Unit 2	0.24	chipping detritus	2		Onondaga	broken	

3.2 LOCATION 52 (AHGU-32)

Location 52 (AhGu-32) is located approximately 20 metres to the east of Location 51 (AhGu-31) within the orchard and immediately west of a municipal road Right-of-Way on the eastern edge of the study area (see Tile 1 in the Supplementary Documentation). The Stage 2 archaeological assessment of this location resulted in the recovery of 15 historic Euro-Canadian artifacts and four pre-contact Aboriginal artifacts collected from two positive test pits and two one metre test units over an area measuring approximately 2 metres east to west by 15 metres north to south. Table 9 provides an artifact summary for the Stage 2 archaeological assessment of Location 52 (AhGu-32).

Table 9: Location 52 (AhGu-32) Artifact Summary

Artifacts	Frequency	%
household	7	36.84
structural	5	26.32
pre-contact Aboriginal	4	21.05
ceramic	2	10.53
recent material	1	5.26
Total	**19**	100.00

3.2.1 Non-ceramic Artifacts

A total of 13 non-ceramic Euro-Canadian artifacts were recovered from Location 52 (AhGu-32), including 7 household items, 5 structural artifacts, and 1 piece of modern material. Plate 3 illustrates a sample of the non-ceramic artifacts recovered from Location 52 (AhGu-32). The various non-ceramic artifacts are discussed in further detail below.

Household Artifacts

A total of seven household artifacts were recovered from Location 52 (AhGu-32) including six pieces of bottle glass and one faunal remain (Plate 3). Bottle glass colour can provide a tentative temporal range for Euro-Canadian domestic sites. Colourless, or clear, glass is relatively uncommon prior to the 1870s but becomes quite widespread in the 1910s (Kendrick 1971; Fike 1987). Of the six glass bottle fragments recovered, two are clear or colourless and date to after 1870. The other colours represented in the bottle glass assemblage from Location 52 (AhGu-32) are green and brown. The one piece of faunal recovered from Location 52 (AhGu-32) was a fragmentary mammalian element and is temporally non-diagnostic.

Structural Artifacts

A total of five structural artifacts were recovered from Location 52 (AhGu-32) including 4 pieces of brick and 1 piece of window glass (Plate 3). Window glass can be temporally diagnostic. In the 1840s window glass thickness changed dramatically. This shift was a result of the lifting of the English import tax on window glass in 1845, which taxed glass by weight and encouraged manufacturers to produce thin panes. Thus, most window glass manufactured before 1845 tends to be less than 1.6 millimetres thick, while later glass is thicker (Adams 1994; Kenyon 1980). The single piece of window glass recovered from Location 52 (AhGu-32) is greater than 1.6 millimetres in thickness, suggesting a production date after 1845. The four pieces of red brick recovered are not temporally diagnostic.

Recent Material

One piece of cultural material dating to the late 20th or early 21st century was recovered from this location.

3.2.2 Pre-contact Aboriginal Artifacts

Four pieces of pre-contact Aboriginal cultural material were recovered from Location 52 (AhGu-32) (Plate 4). The flake assemblage was subject to morphological analysis following the classification scheme described by Lennox *et al* (1986) and expanded upon by Fisher (1997) with the exception that no attempt was made to distinguish 'primary' from 'primary bipolar' flakes. The results of the morphological analysis can be found in Table 10.

Table 10: Location 52 (AhGu-32) Flake Analysis

Material	Primary		Broken		Total Analyzed	
	Freq.	%	Freq.	%	Freq.	%
Onondaga	1	25.00	3	75.00	**4**	**100.0**
Total	**1**	**25.00**	**3**	**75.00**	**4**	**100**

Broken flakes were most often encountered and comprised 75% of the total assemblage. Primary flakes followed at 25%. Primary flakes are produced during removal of the outside, or cortex, of the stone so that a rough tool shape is produced.

All of the flakes recovered from Location 52 (AhGu-32) were manufactured from Onondaga chert. 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). 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).

3.2.3 Ceramic Artifacts

A total of two ceramic artifacts were recovered during the Stage 2 assessment of Location 52 (AhGu-32). Both of these are utilitarian earthenware (Plate 3).

Utilitarian Earthenware

Two pieces of utilitarian earthenware were recovered from Location 52 (AhGu-32), both of which are clear-glazed with unrefined red paste. From the late 18th through to the late 19th century unrefined earthenwares with red or yellow paste were the most common type of utilitarian vessels (Adams 1994).

3.2.4 Artifact Catalogue

Table 11: Location 52 (AhGu-32) Artifact Catalogue

Cat. #	Subunit or Context	Depth (m)	Artifact	Quantity	Comments	Chert	Morph	Form
1	Test Pit 4		earthenware, red	2				2 bowl
2	Test Pit 3		chipping detritus	1		Onondaga	tertiary	
3	Test Unit 3	0.24	glass, bottle	2	green			
4	Test Unit 3	0.24	glass, window	1	2.41mm			
5	Test Unit 3	0.24	brick	2				
6	Test Unit 3	0.24	faunal	1				
7	Test Unit 3	0.24	plastic	1				
8	Test Unit 3	0.29	chipping detritus	2		Onondaga	broken	
9	Test Unit 4	0.23	chipping detritus	1		Onondaga	broken	
10	Test Unit 4	0.23	glass, bottle	4	1 green, 1 brown, and 2 clear			
11	Test Unit 4	0.23	brick	2				

4.0 Analysis and Conclusions

Stantec Consulting Ltd. was retained by NRWC to conduct a Stage 2 archaeological assessment for a study area measuring approximately 0.2 hectares located on part of Lot 21, Concession 1, former Township of Clinton, Regional Municipality of Niagara, Ontario. The Stage 1 archaeological assessment of the Tap-In Station study area determined that the entire study area exhibits moderate to high potential for the identification and recovery of archaeological resources. As such, a Stage 2 archaeological assessment was recommended. Two sites were encountered during Stage 2 survey, Location 51 (AhGu-31) and Location 52 (AhGu-32).

4.1 LOCATION 51 (AHGU-31)

A total of 40 artifacts were recovered from five positive test pits and two one metre test units over an area measuring approximately 6 metres east to west by 8 metres north to south. Artifact analysis of the collected assemblage from Location 51 (AhGu-31) indicates that the area represents a pre-contact Aboriginal occupation with a small historic Euro-Canadian component. Of the 30 historic Euro-Canadian artifacts fewer than 20 date to a period of occupation prior to AD 1900. Of the 10 pre-contact Aboriginal artifacts, none are temporally diagnostic beyond the fact that they date to the pre-contact period.

The presence of 10 pre-contact Aboriginal artifacts meets the criteria listed in Section 2.2 Standard 1 and Table 3.1 of the *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011). Location 51 (AhGu-31) yielded more than five non-diagnostic artifacts from combined test pit and test unit excavations and therefore retains cultural heritage value or interest.

4.2 LOCATION 52 (AHGU-32)

A total of 19 historic Euro-Canadian and pre-contact Aboriginal artifacts were recovered from two positive test pits and two one metre test units over an area measuring approximately 2 metres east to west by 15 metres north to south. Of the 30 historic Euro-Canadian artifacts fewer than 20 date to a period of occupation prior to AD 1900. Of the four pre-contact Aboriginal artifacts, none are temporally diagnostic beyond the fact that they date to the pre-contact period.

Thus, the artifact assemblage from Location 52 (AhGu-32) does not fulfill any of the criteria listed in Section 2.2 and Table 3.1 of the *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011). Location 52 (AhGu-32) does not retain cultural heritage value or interest.

5.0 Recommendations

5.1 LOCATION 51 (AHGU-31)

The Stage 2 assessment of Location 51 (AhGu-31) resulted in the recovery of more than five non-diagnostic pre-contact Aboriginal artifacts from combined test pit and test unit excavations. In accordance with Section 2.2 Standard 1a and Table 3.1 of the 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011), Location 51 (AhGu-31) retains cultural heritage value or interest and meets the criteria for a Stage 3 archaeological assessment. Therefore, **Stage 3 archaeological assessment is recommended for Location 51 (AhGu-31).**

The Stage 3 archaeological assessment of Location 51 (AhGu-31) will be conducted according to the procedures outlined in the MTCS's 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011). The Stage 3 archaeological assessment will include the removal of a series of one metre square Stage 3 test units excavated by hand at five metre intervals over the full extent of the site in systematic levels and into the first five centimetres of subsoil. Additional test units amounting to 20% of the total number of 5 metre grid units will then be placed in the vicinity of positive Stage 2 test pits and adjacent to high-yielding units. All excavated soil will be screened through six millimetre mesh; any artifacts being recovered will be recorded and catalogued by the corresponding grid unit designation. If a subsurface cultural feature is encountered, the plan of the exposed feature will be recorded and geotextile fabric will be placed over the unit before backfilling the unit.

5.2 LOCATION 52 (AHGU-32)

The artifact assemblage recovered from Location 52 (AhGu-32) does not meet any of the criteria listed in Section 2.2 or Table 3.1 of the *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011) and does not retain cultural heritage value or interest. Therefore, **no further archaeological assessment is recommended for Location 52 (AhGu-32).**

5.3 SUMMARY

Two archaeological sites were documented during the Stage 1-2 archaeological assessment, Location 51 (AhGu-31) and Location 52 (AhGu-32). Location 51 (AhGu-31) has been recommended for Stage 3 archaeological assessment, while Location 52 (AhGu-32) has not been recommended for Stage 3 archaeological assessment.

The MTCS is asked to review the results presented and accept this report into the Ontario Public Register of Archaeological Reports.

6.0 Advice on Compliance with Legislation

This report is submitted to the Ontario 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 (Government of Ontario 1990b). 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 Archaeology 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 Ontario Ministry of Consumer Services.

Archaeological sites recommended for further archaeological fieldwork or protection remain subject to Section 48 (1) of the *Ontario Heritage Act* and may not be altered, or have artifacts removed from them, except by a person holding an archaeological license.

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8.0 Images

8.1 PHOTOGRAPHS

Photo 1: Stage 2 Test Pit Survey Field Conditions, facing south

Photo 2: Stage 2 Test Pit Survey Field Conditions, facing north

Photo 3: Stage 2 One Metre Test Unit Excavation on Location 51 (AhGu-31), facing west

8.2 ARTIFACTS

Plate 1: Sample of Pre-contact Aboriginal Artifacts from Location 51 (AhGu-31)

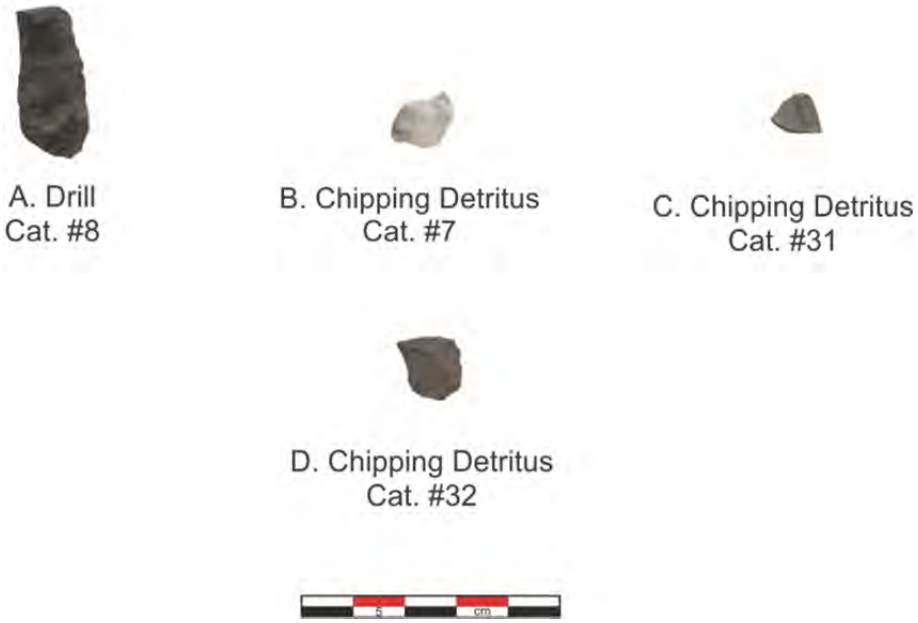


Plate 2: Sample of Historic Euro-Canadian Artifacts from Location 51 (AhGu-31)

Plate 3: Sample of Historic Euro-Canadian Artifacts from Location 52 (AhGu-32)

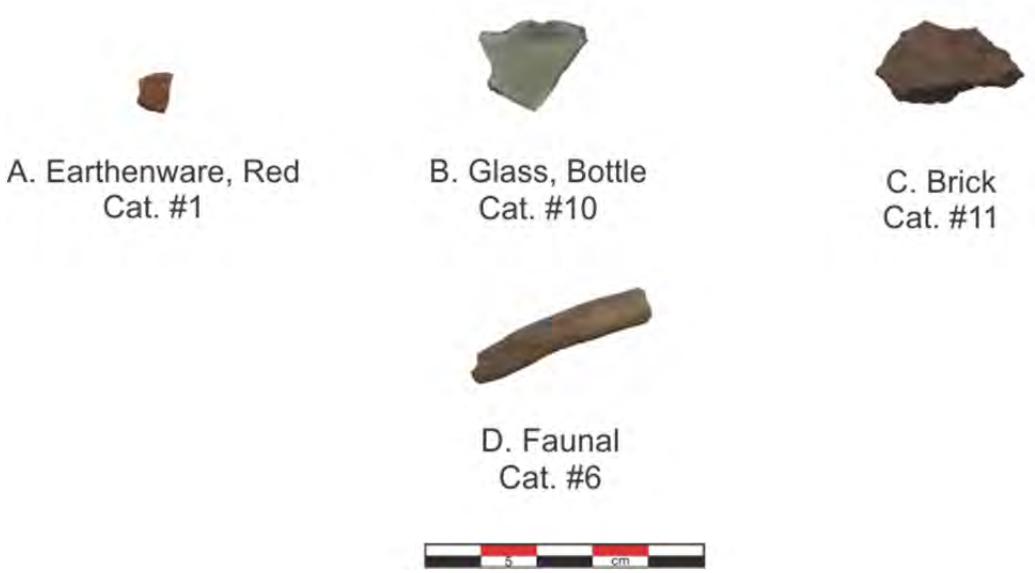
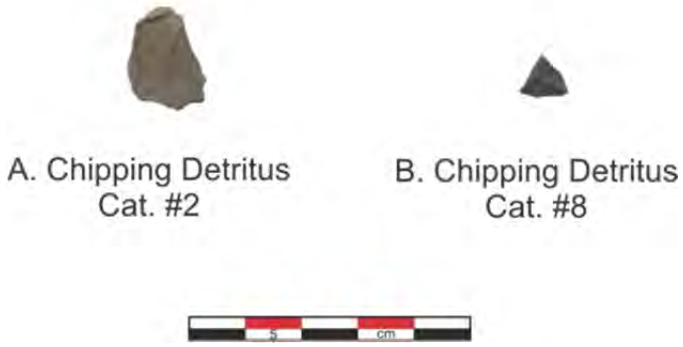


Plate 4: Sample of Pre-contact Aboriginal Artifacts from Location 52 (AhGu-32)



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.

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Revised: 2014-04-04 By: bcowper

April 2014
160950269

Stantec

Legend

- Study Area
- 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
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2013.

Client/Project

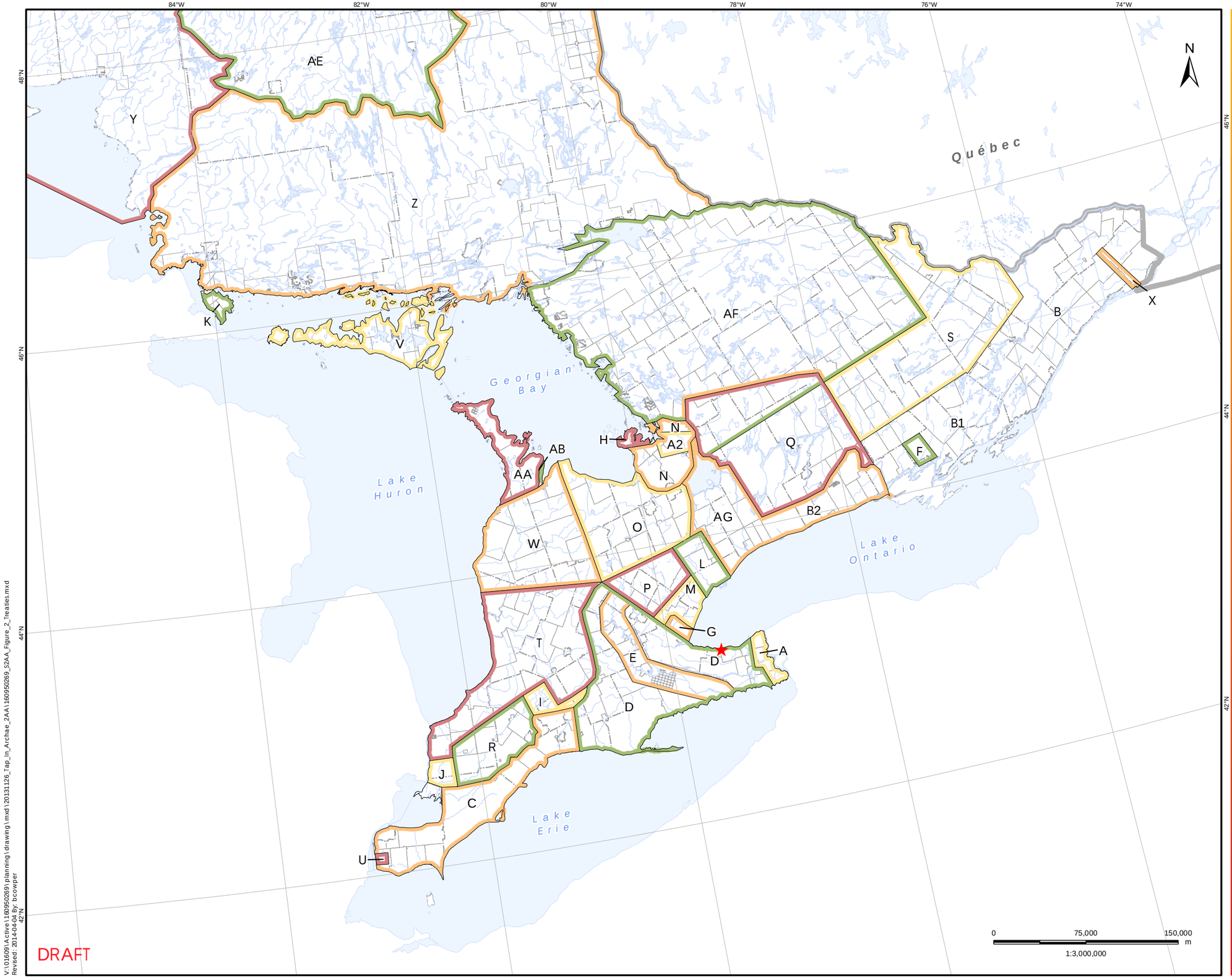
Niagara Region Wind Corporation
Niagara Region Wind Farm
Stage 2 Archaeological Assessment

Figure No.
1

DRAFT

Title

Location of Study Area



Stantec

Legend

- Study Area
- Municipal Boundary - Upper Tier
- Municipal Boundary - Lower or Single Tier
- Watercourse
- Waterbody

A Treaty No. 381, May 9th, 1781 (Mississauga and Chippewa)
B1 Crawford's Purchase, October 9th, 1783 (Mississauga)
B2 Crawford's Purchases, 1784, 1787 And 1788 (Mississauga)
A2 John Collins' Purchase, 1785 (Chippewa)
C Treaty No. 2, May 19th, 1790 (Odawa, Chippewa, Pottawatomi, and Huron)
D Treaty No. 3, December 2nd, 1792 (Mississauga)
E Haldimand Tract:from the Crown to the Mohawk, 1793
F Tyendinaga:from the Crown to theMohawk, 1793
G Treaty No. 3 3/4:from the Crown to Joseph Brant, October 24th, 1795
H Treaty No. 5, May 22nd, 1798 (Chippewa)
U Treaty No. 6, September 7th, 1796 (Chippewa)
J Treaty No. 7, September 7th, 1796 (Chippewa)
L Treaty No. 13, August 1st, 1805 (Mississauga)
M Treaty No. 13A, August 2nd, 1805 (Mississauga)
N Treaty No.16, November 18th, 1815 (Chippewa)
O Treaty No. 18, October 17th, 1818 (Chippewa)
P Treaty No. 19, October 28th 1818 (Chippewa)
Q Treaty No. 20, November 5th, 1818 (Chippewa)
R Treaty No. 21, March 9th, 1819 (Chippewa)
S Treaty No. 27, May 31st, 1819 (Mississauga)
T Treaty No. 27½, April 25th, 1825 (Ojibwa and Chippewa)
U Treaty No. 35, August 13th, 1833 (Wyandot or Huron)
V Treaty No. 45, August 9th, 1836 (Chippewa and Odawa, "For All Indians To Reside Thereon")
W Treaty No. 45½, August 9th, 1836 (Saugeen)
X Treaty No. 57, June 1st, 1847 (Iroquois of St. Regis)
Z Treaty No. 61, September 9th, 1850 (Robinson Treaty:Ojibwa)
AA Treaty No. 72, October 30th, 1854 (Chippewa)
AB Treaty No. 82, February 9th, 1857 (Chippewa)
AF Williams Treaty, October 31st and November 15th, 1923 (Chippewa and Mississauga)
AG Williams Treaty, October 31st, 1923 (Chippewa)

Notes

1. Coordinate System: NAD 1983 Statistics Canada Lambert
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2012.
3. Treaty boundaries adapted from MNR July 1980, based on map compiled by J.L. Morris 2 March 1943. For cartographic representation only.

April 2014
160950269

Client/Project

Niagara Region Wind Corporation
Niagara Region Wind Farm
Stage 2 Archaeological Assessment

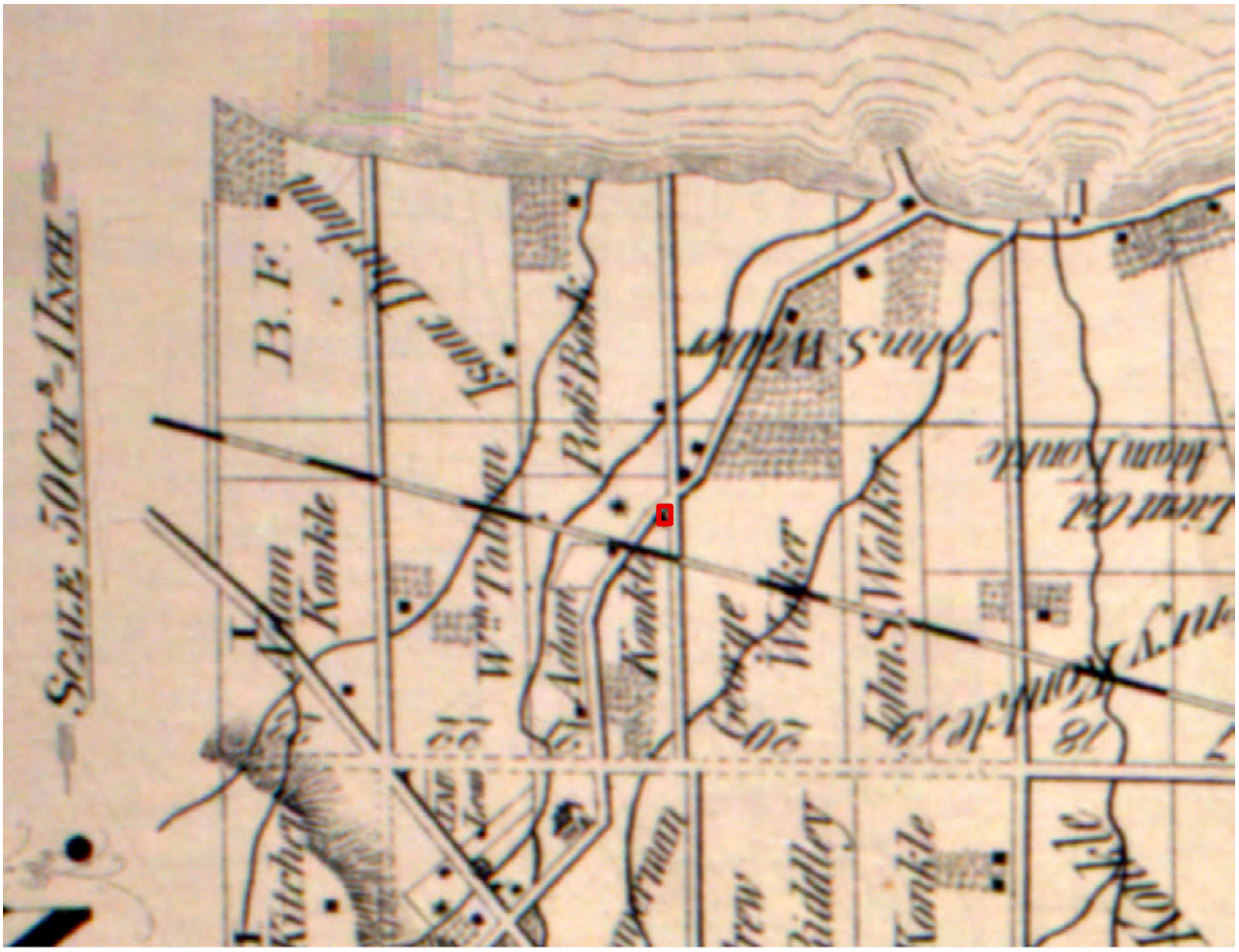
Figure No.
2

DRAFT

Title

Treaties and Purchases (Adapted from Morris 1943)

V:\01609\Active\160950269\planning\drawing\mxd\20131126_Tap_In_Archae_2AA\160950269_S2AA_Figure_2_Treaties.mxd
Revised: 2014-04-04 By: bcowper



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Revised: 2014-04-04 By: bcowper

April 2014
160950269

Stantec

Legend

Study Area

Client/Project

Niagara Region Wind Corporation
Niagara Region Wind Farm
Stage 2 Archaeological Assessment

Figure No.
3

DRAFT

Title

Portion of 1876 Historic Atlas Map of the Township of Clinton

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Revised: 2014-04-07 By: bcowper

April 2014
160950269

Stantec

Legend

- Study Area Limits
- Area of Test Pit Survey, 5 Metre Intervals
- 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, 2013.
3. Orthoimagery © First Base Solutions, 2010.

Client/Project

Niagara Region Wind Corporation
Niagara Region Wind Farm
Stage 2 Archaeological Assessment

Figure No.

1 DRAFT

Title

Stage 2 Methods

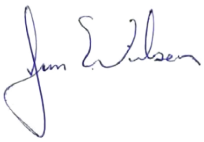
10.0 Closure

This report has been prepared for the sole benefit of NRWC and may not be used by any third party without the express written consent of Stantec Consulting Ltd. and NRWC. Any use which a third party makes of this report is the responsibility of such third party.

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.

STANTEC CONSULTING LTD.

Colin Varley, MA
Senior Archaeologist, Associate
Tel: (613) 738-6087
Fax: (613) 722-2799
Colin. Varley@stantec.com



Jim Wilson, MA
Regional Discipline Leader, Archaeology
Principal
Tel: (613) 722-4420
Fax: (613) 722-2799
Jim.Wilson@stantec.com

Ministry of Tourism, Culture and Sport

Confirmation Letter

From: pastport <pastport@ontario.ca>
Date: September 1, 2015 at 8:42:19 AM EDT
To: "Glenen, Paige" <Paige.Glenen@stantec.com>
Subject: PIF Number has been issued / *

Dear Paige Glenen,

Your Project Information Form (PIF) submitted for **Stage 2 AA Modifications to Access Road T11/T12 and ENT 36** on Aug 31, 2015 has been processed and PIF number **P1084-0018-2015** has been assigned to your project.

Please keep this PIF number for your records and cite it on all reports and correspondence with the ministry about this project.

The report for this project must be filed with the ministry by **Sep 1, 2016**. Please take note of this date to ensure that you file your report on time. If you miss the deadline and the report becomes overdue you will not be eligible to begin new fieldwork projects.

Please note, a PIF number issued by the ministry does not constitute ministry approval of any of your proposed fieldwork strategies. PIF numbers are used by the ministry to track archaeological fieldwork activity under your licence and to establish a due date by which you must file a report with the ministry that documents the archaeological fieldwork carried out as part of this project.

For more information about PIFs and report filing deadlines see the ministry's guide to PIFs on our website: www.mtc.gov.on.ca/en/archaeology/PIF_Protocols_EN.pdf

If you have any questions email us at PIFs@ontario.ca. Please do not reply directly to this e-mail.

Stage 2 Archaeological Assessment Modifications to Access Road T11/T12 and ENT 36, Niagara Region Wind Project

Part of Lot 41, Concession 6
Geographic Township of
Wainfleet, former Lincoln County,
now Regional Municipality of
Niagara and Part of Lots 4 and 5,
North of Forks Road, Geographic
Township of Moulton, Haldimand
County, Ontario

Prepared for:
Enercon Canada Inc.
4672 Bartlett Road South
Beamsville, ON L0R 1B1

Prepared by:
Stantec Consulting Ltd.
400-1331 Clyde Avenue
Ottawa ON CA K2C 3G4

Licensee: Paige Glenen MSc
License Number: P1084
PIF Number: P1084-0018-2015
Project Number: 160961052

ORIGINAL REPORT

September 2, 2015

Insert revision record

Table of Contents

LIST OF TABLES

LIST OF FIGURES

Executive Summary

A Stage 2 archaeological assessment of the Temporary Entrance Realignments Project Area was conducted by Stantec Consulting Ltd. (Stantec) on behalf of Enercon Canada Inc. (Enercon) for the proposed Niagara Region Wind Project. The Stage 2 assessment was undertaken in order to meet the requirements for a modification to the Renewable Energy Approval, as outlined in *Ontario Regulation 359/09* sections 21 and 22 under Part V.0.1 of the *Environmental Protection Act* (Government of Ontario 1990a).

The Stage 2 archaeological assessment of the proposed modifications was undertaken by Stantec on behalf of Enercon in order to meet the requirements for an application for a Renewable Energy Approval, as outlined in Ontario Regulation 359/09 sections 21 and 22 under Part V.0.1 of the *Environmental Protection Act* (Government of Ontario 1990a). 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).

This modification involves adjustments to access road entrances, on private land owned by participating landowners, based on detailed design (engineering) and need for turning radius (driving surface) at nine entrance locations. Only two of these entrance locations extend outside of the area that was already subject to Stage 2 archaeological assessment in 2012 under PIF P002-289-2012:

- Entrance 36 to T10 and T37
- Access Road Amendment T11 and T12

The Stage 2 assessment of the proposed modifications to the access road between T11 to T12 and Entrance 36 was conducted on September 1, 2015 under PIF P1084-0018-2015 issued to Paige Glenen, M.Sc. by the MTCS. The Project Location at the access road between T11 and T12 includes two smaller areas. The northern section encompasses a 30 metre by 5 metre area in a former wooded area that was recently cut and cleared by the landowner for agricultural purposes, and a smaller section to the south within an agricultural field encompasses a 15 metre by 5 metre area. The section of agricultural field was subject to test pit survey as it is a narrow linear survey corridor of less than 10 metres for the purposes of road widening as outlined under Section 2.1.2 Standard 1f in the *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011b). The Project Location at Entrance 36 encompasses a 30 metre by 5 metre area of manicured lawn. The study area consists of a cleared wooded area, agricultural field and manicured lawn with surface conditions consistent with the requirements listed under Section 7.8.6 Standard 1a in the *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011b).

Stantec's Stage 2 survey of the area of the proposed modifications 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.

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

Project Personnel

Licensed Archaeologist:	Paige Glenen, M.Sc. (P1084)
Project Manager:	Chris Powell, MA
Task Manager:	Paige Glenen, M.Sc. (P1084)
Task Coordinator:	Amanda Laprise, BA (R470)
Licensed Field Directors:	Krista Lane, BA (R382)
Field Technicians:	Tavis Maplesden (R467), Kirsty Walker, Quinton Wilson
First Nations Observers:	Haudenosaunee Development Institute: Sheila Silver
	Mississaugas of the New Credit First Nations: Allison LaForme
GIS Specialist:	Brian Cowper
Report Writer:	Paige Glenen, M.Sc. (P1084), Patrick Hoskins, MA (P415)
Technical Review:	Colin Varley, MA, RPA (P002)
Senior Review:	Jim Wilson, MA. (P001)

Acknowledgements

Proponent Contact:	Shiloh Berriman, Enercon Canada Inc.
Ministry of Tourism, Culture and Sport	Robert von Bitter

1.0 PROJECT CONTEXT

1.1 DEVELOPMENT CONTEXT

Enercon Canada Inc. (Enercon) is proposing to develop the Niagara Region Wind Project (FWRN-LP, formerly NRWC or the Project) with a maximum name plate capacity of 230 megawatts (MW), located within the Townships of West Lincoln and Wainfleet and the Towns of Grimsby and Lincoln in Niagara Region, as well as the Geographic Township of Rainham in Haldimand County. The Project Location spans multiple lots across Concession 1-6, Gainsborough Township, Concession 1-7, Clinton Township, Regional Municipality of Niagara and multiple lots across Moulton Township, Haldimand County, Ontario (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.

Stantec Consulting Ltd. (Stantec) was contracted by Enercon Canada Inc. (Enercon) to conduct the Stage 2 archaeological assessment of proposed modifications to the access road between T11 and T12 and Entrance 36 for the Niagara Region Wind Project (FWRN-LP, formerly NRWC or the Project).

The Stage 2 archaeological assessment of the proposed modifications was undertaken by Stantec on behalf of Enercon in order to meet the requirements for an application for a Renewable Energy Approval, as outlined in Ontario Regulation 359/09 sections 21 and 22 under Part V.0.1 of the *Environmental Protection Act* (Government of Ontario 1990a). 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).

This modification involves adjustments to access road entrances, on private land owned by participating landowners, based on detailed design (engineering) and need for turning radius (driving surface) at nine entrance locations, only two of these entrance locations extend outside of the area that was already subject to Stage 2 archaeological assessment in 2012 under PIF P002-289-2012:

- Entrance 36 to T10 and T37
- Access Road Amendment T11 and T12

Permission to access the Project Location to conduct the archaeological assessment and remove artifacts was provided by Shiloh Berriman of Enercon.

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 on the property, specifically within the PDA, 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 2011), the objectives of the Stage 2 Property Assessment are as follows:

- To document archaeological resources within the Project Location;
- To determine whether the Project Location 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). By 1690, Algonkian

speakers from the north appear to have begun to repopulate Bruce County (Rogers 1978:761). This is the period in which the Mississaugas are known to have moved into southern Ontario and the lower Great Lakes watersheds (Konrad 1981). Oral traditions of the Mississauga's recorded in 1904 as told by Chief Robert Paudash indicate that after the Mississauga defeat of Mohawk Nation, who retreated to their homeland south of Lake Ontario, a peace treaty was negotiated and that 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.). In southwestern Ontario, however, members of the Three Fires Confederacy (Chippewa, Ottawa and Potawatomi) were immigrating from Ohio and Michigan in the late 1700s (Praxis Research, 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 Historic 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 modifications to the access road between T11 and T12 are located on Lots 4 and 5, North of the Forks Road, Geographic Township of Moulton, Haldimand County Ontario. The proposed modification to Entrance 36 is located on Lot 41, Concession 6, Geographic Township of Wainfleet, former Lincoln County, now Regional Municipality of Niagara, Ontario. Below is a more specific past and present land use and settlement history of those lots.

The 1879 *Illustrated Historical Atlas of Haldimand County, Ontario*'s map of the Township of Moulton (Page and Co. 1879) indicates that the parts of Lots 4 and 5, North of Forks Road on which the proposed modifications of the access road between T11 and T12 are located were owned by Charles Disher and John McKiver respectively (Figure 2). No structures are depicted

near the assessed areas (Page and Co. 1876). The lots have been in agricultural use for over 100 years and were still used as such at the time of assessment.

The 1876 *Illustrated Historic Atlas of the Counties of Lincoln and Welland* (Page & Co. 1876) shows the part of Lot 41, Concession 6 on which the proposed modification of Entrance 36 is located was owned by James Rice (Figure 3). No structures are shown within the study area. The lot has been in agricultural use for over 100 years and was still used as such at the time of assessment.

1.2.3 Recent Reports

Two archaeological assessment reports document work within 50 metres of the modifications, the Stage 1 and Stage 2 archaeological assessment reports for the Niagara Region Wind Project. Table 1 provides a listing of the Stage 1 and 2 archaeological reports.

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

1.3 ARCHAEOLOGICAL CONTEXT

1.3.1 Natural Environment

The proposed modifications are 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 1,350 square miles 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 region's waterways. The dominant soil series is Haldimand clay loam with small pockets of Lincoln clay till, predominately 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 modification of the access road between T11 and T12 is the North Forks Drain approximately 300 metres to the south. The closest source of potable water to the proposed modification of Entrance 36 is Little Fors Creek, a tributary of the Welland River, located approximately 300 m to the north.

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.

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.

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.

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.

Discrete clusters of politically allied Neutral villages have been identified from the late pre-contact and early post-contact periods. The Project Location 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.

Table 2 provides a general outline of the cultural chronology of Haldimand County, based on Ellis and Ferris (1990).

Table 2: Cultural Chronology for Lincoln and Haldimand Counties

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

As part of the Stage 1 background study the Archaeological Sites Database (ASDB) was consulted. It was determined that there were 166 registered archaeological sites within a 1 km radius of the Study Area (personal communication, Robert von Bitter, MTCS). Of these 166 sites, 3 sites (or components of multi-component sites) date to the Paleo-Indian period, 32 sites date to the Archaic period and 21 sites date to the Woodland period. Another 13 sites date to the Euro-Canadian period, of which 1 is a post-contact Aboriginal site. The remaining 102 registered archaeological sites are of an indeterminate cultural affiliation. One late Woodland period ossuary is located within the Study Area, but not within constructible locations (personal communication, Robert von Bitter, MTCS).

During the Stage 2 assessment conducted by Stantec (2013), an additional 50 archaeological sites, 100 isolated findspots, and 41 artifact clusters were identified within the Project Location. Of these, four were identified within one kilometre of the proposed modification to the access road between T11 and T12. No archaeological sites were identified within one kilometre of the proposed modification to Entrance 36. NRWC-29 (AfGv-136) was recommended for a Stage 3 archaeological assessment and Isolated Findspots 6, 7, and 65 were not recommended for further work (Table 3). NRWC-29 (AfGv-136) consisted of one scraper and over 30 pieces of Onondaga chert debitage within a 50 metre by 50 metre area. Isolated Findspot 6 (AfGv-140) consisted of a Late Woodland (c. 1,100-350 B.P.) Daniels Triangular projectile point type. Isolated Findspot 7 (AfGv-141) consisted of an Early Woodland (c. 2,950-2,400 B.P.) Meadowood projectile point type. Isolated Findspot 65 consisted of one Onondaga chert core. Both Isolated Findspot 6 and 7 were registered with the MTCS and received a Borden number as per the 2011 *Standards and Guidelines for Consultant Archaeologists* Section 7.12 Standard 1.a.

Table 3: Registered and Unregistered Sites within One Kilometre of Modifications

Site Name	Borden Number	Cultural Affiliation	Original Source
NRWC-29	AfGv-136	indeterminate pre-contact Aboriginal	Stantec 2013
Isolated Findspot 6	AfGv-140	Late Woodland	Stantec 2013
Isolated Findspot 7	AgGv-141	Early Woodland	Stantec 2013
Isolated Findspot 65	N/A	indeterminate pre-contact Aboriginal	Stantec 2013

To Stantec's knowledge, the only archaeological field work conducted within 50 metres of the proposed modifications has been concerned with the Niagara Region Wind Project (Stantec 2012; Stantec 2013) and no archaeological sites have been identified within 50 metres of either modification.

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. Criteria commonly used by the Ontario MTCS (Government of Ontario 2011b) to determine areas of archaeological potential include:

- Proximity to previously identified archaeological sites;
- Distance to various types of water sources;
- Soil texture and drainage;
- Glacial geomorphology, elevated topography and the general topographic variability of the area;
- Resource areas including food or medicinal plants, scarce raw materials and early Euro-Canadian industry;
- Areas of early Euro-Canadian settlement and early transportation routes;
- Properties listed on municipal register of properties designated under the *Ontario Heritage Act* (Government of Ontario 1990b);
- Properties that local histories or informants have identified with possible archaeological sites, historical events, activities or occupants; and
- Historic landmarks or sites.

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 current study area contains elevated potential for both pre-contact Aboriginal and historic Euro-Canadian archaeological resources (Stantec 2012). Pre-contact Aboriginal potential is moderate to high for both study areas given the proximity to nearby water sources. Post-contact Aboriginal potential is moderate to high for both study areas given the proximity to nearby water sources. Finally, historic Euro-Canadian potential is moderate to high for the ENT 36 study area given its close proximity to a 19th century road (Figure 3).

1.3.5 Existing Conditions

The Stage 2 assessment of the proposed modifications to the access road between T11 to T12 and Entrance 36 was conducted on September 1, 2015 under PIF P1084-0018-2015 issued to Paige Glenen, M.Sc. by the MTCS. The Project Location at the access road between T11 and T12 includes two smaller areas. The northern section encompasses a 30 metre by 5 metre area in a former wooded area that was recently cut and cleared by the landowner for agricultural purposes, and a smaller section to the south within an agricultural field encompasses a 15 metre by 5 metre area. The section of agricultural field was subject to test pit survey as it is a narrow linear survey corridor of less than 10 metres for the purposes of road widening as outlined under Section 2.1.2 Standard 1f in the *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011b). The Project Location at Entrance 36 encompasses a 30 metre by 5 metre area of manicured lawn. The study area consists of a cleared wooded area, agricultural field and manicured lawn with surface conditions consistent with the requirements listed under Section 7.8.6 Standard 1a in the *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011b). The lands within the study area have been used for the same purposes for over 100 years.

2.0 FIELD METHODS

The Stage 2 assessment involved a survey of all of the land to be impacted by the proposed modifications to the access road between T11 and T12 and the temporary Entrance modification at ENT 36 (T10 and T32). The study area consists of a mix of manicured lawn, agricultural field and wooded areas which was assessed by standard test pit survey survey. Test pit survey was utilized as the area in agricultural field was only approximately 5 metres by 15 meters, as outlined in outlined under Section 2.1.2 Standard 1f in the *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011b). As per the *Standards and Guidelines for Consultant Archaeologists* Section 7.8.6 Standard 1a (Government of Ontario 2011b), Photos 1 to 3 illustrate the field conditions and the visibility within the study area and confirm that conditions met the requirements for Stage 2 archaeological assessment. Photograph locations and directions are provided in the Figures 4 and 5 map which also illustrates the field assessment methods across the study area.

During the Stage 2 archaeological assessment conducted on September 1, 2015 the weather was warm and clear. As a result, field visibility and lighting conditions were excellent and in accordance with the *Standards and Guidelines for Consultant Archaeologists* Section 2.1 Standard 3 (Government of Ontario 2011b). At no time were the field or weather conditions detrimental to the recovery of archaeological material.

The entire study area recommended for Stage 2 survey was subject to a test pit survey at a five metre interval in accordance with Section 2.1.2 of the MTCS's 2011 Standards and Guidelines for Consultant Archaeologists (Government of Ontario 2011). Each test pit was approximately 30 centimetres in diameter and excavated five centimetres into sterile subsoil. The soils were then examined for stratigraphy, cultural features, or evidence of fill. All soil was screened through six millimeter mesh hardware cloth to facilitate the recovery of small artifacts and then used to backfill the pit. No artifacts were identified or collected during the test pit survey and no further archaeological field methods were employed.

First Nations Observers from the Haudenosaunee Development Institute and the Mississauga's of New Credit First Nation also participated in the Stage 2 archaeological assessment; their roles are summarized 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 4 below.

Table 4: Inventory of Documentary Record

Document Type	Current Location of Document Type	Additional Comments
2 Pages of Field Notes	Stantec office in Hamilton	In original field book and photocopied in project file
2 Hand Drawn Maps	Stantec office in Hamilton	In original field book and photocopied in project file
1 Map Provided by Client	Stantec office in Hamilton	Hard and digital copies in project file
8 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 proposed modifications.

4.0 ANALYSIS AND CONCLUSIONS

The Stage 2 assessment of the proposed modifications to the access road between T11 and T12 and Entrance 36 resulted in the identification of no archaeological sites.

5.0 RECOMMENDATIONS

The Stage 2 assessment of the proposed modifications to the access road between T11 and T12 and Entrance 36 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 Ontario 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 Ontario Ministry of Consumer Services.

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8.0 IMAGES

8.1 PHOTOGRAPHS

Photo 1: Stage 2 Test Pit Survey at Five Metre Intervals at Access Road T11/T12, Facing Northwest

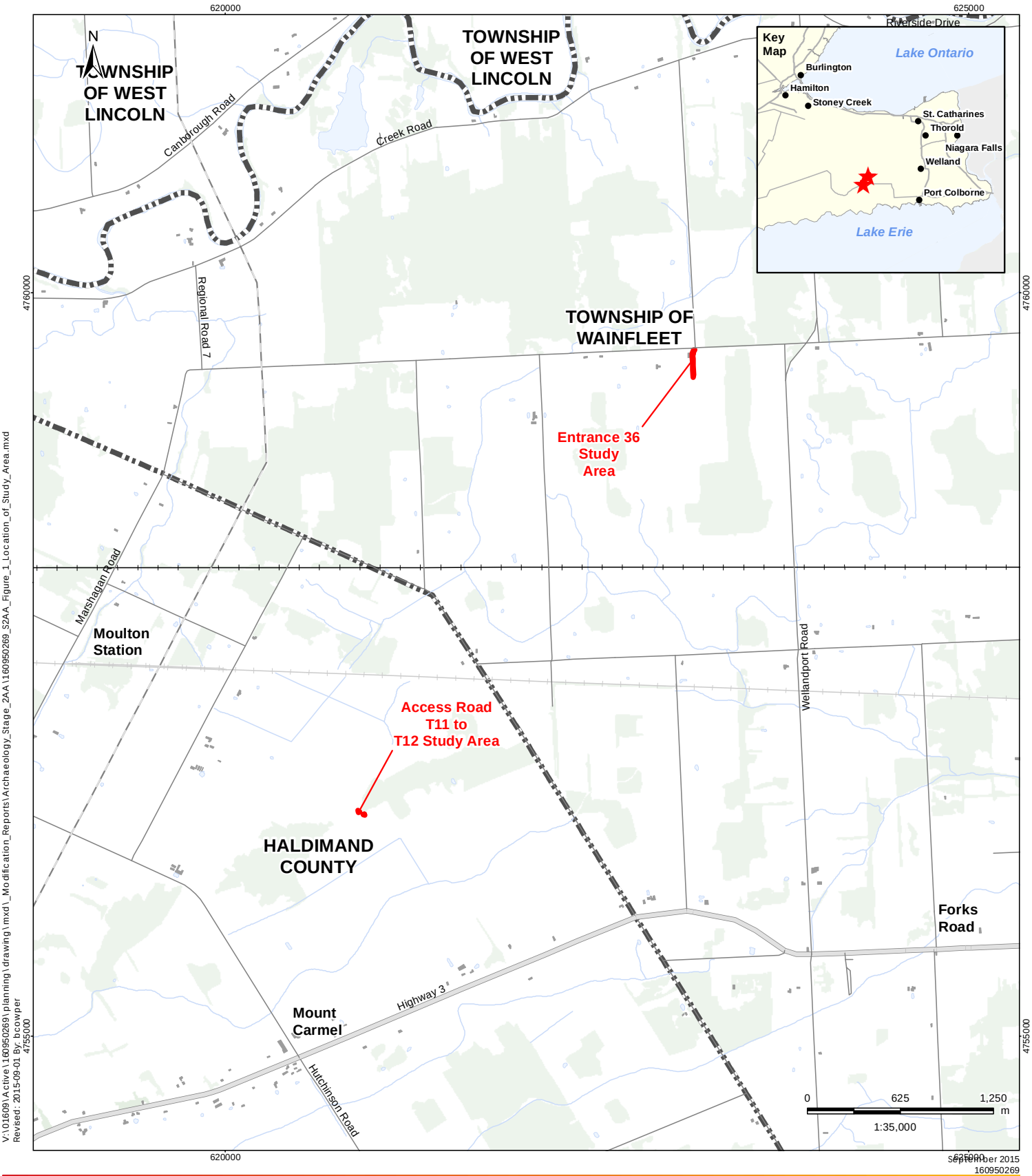
Photo 2: Stage 2 Test Pit Survey at Five Metre Intervals at Access Road T11/T12, Facing Southeast

Photo 3: Stage 2 Test Pit Survey at Five Metre Intervals at Entrance 36, Facing Southwest

Photo 4: Example of Test Pit at Entrance 36, Facing South

9.0 MAPS

All maps will follow on succeeding pages.



Stantec

Legend

- Study Area
- 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
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2013.

Client/Project

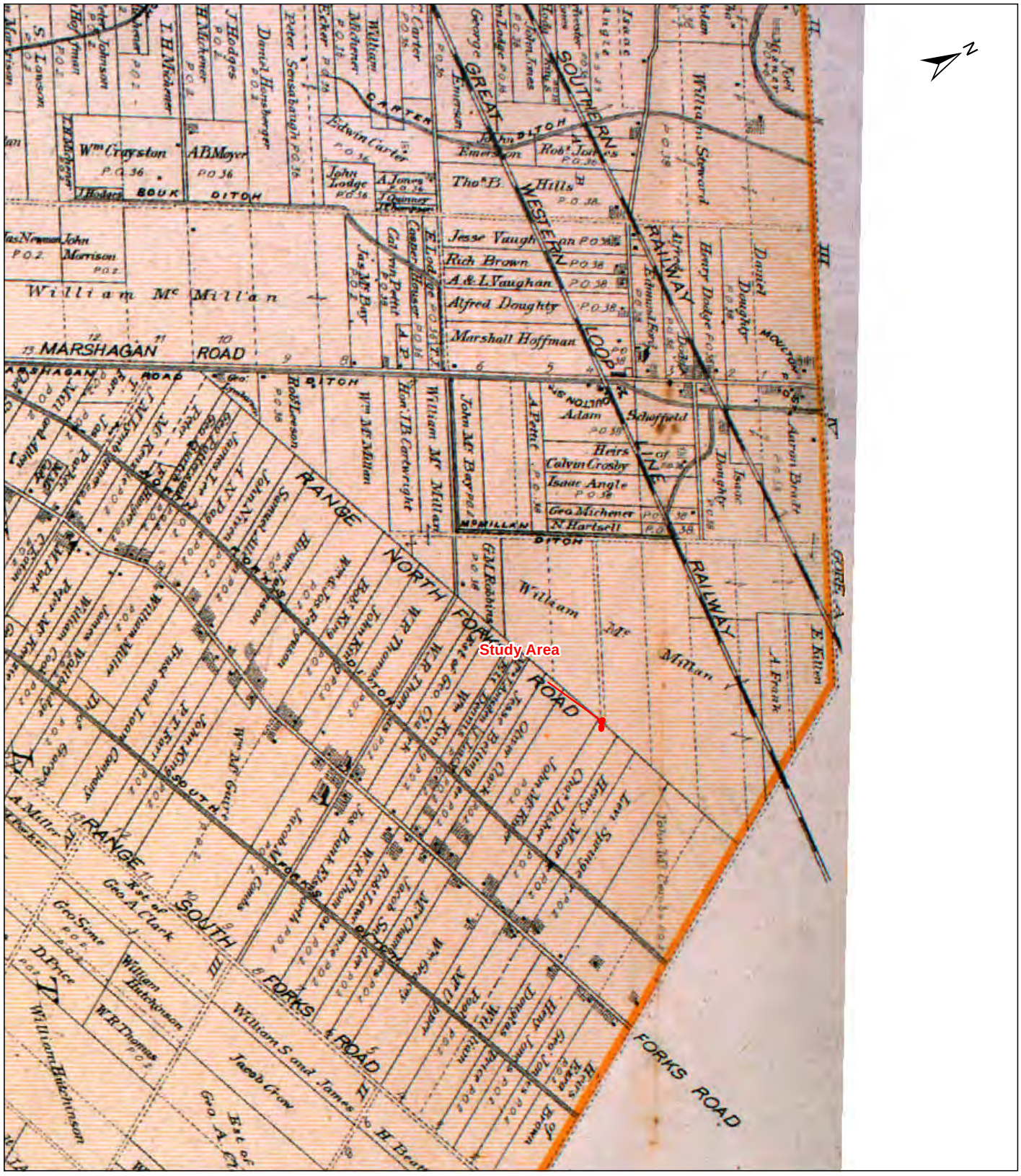
Niagara Region Wind Corporation
Niagara Region Wind Farm
Stage 2 Archaeological Assessment

Figure No.

1

Title

Location of Study Area



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Revised: 2015-09-01 By: bcowper

September 2015
160950269

Legend

Study Area

Stantec

Client/Project

Niagara Region Wind Corporation
Niagara Region Wind Farm
Stage 2 Archaeological Assessment

Figure No.

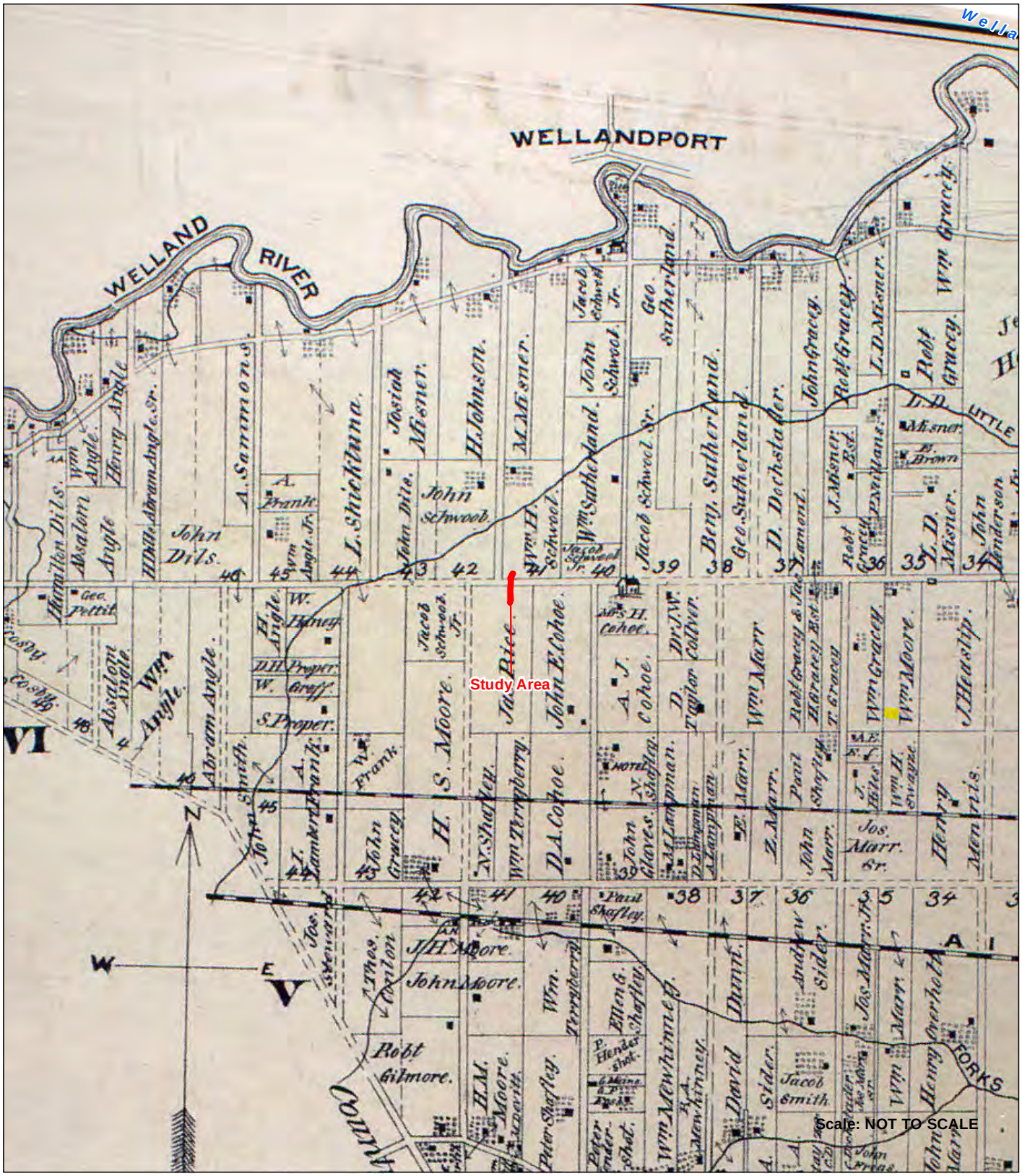
2

Title

Portion of 1879 Historic Atlas Map of the Township of Wainfleet

Notes

1. Historic Map reference: Illustrated Historical Atlas of the County of Haldimand, Ont. Toronto: H.R. Page & Co., 1879.
2. Not Scale.



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Revised: 2015-09-01 By: bcowper

September 2015
160950269

Stantec

Legend
Study Area

Notes
1. Historic Map reference: Page, H.R. and Co. 1876. Illustrated Historical Atlas of the Counties of Lincoln and Welland, Ontario. Toronto: H.R. Page and Co.
2. Not Scale.

Client/Project
Niagara Region Wind Corporation
Niagara Region Wind Farm
Stage 2 Archaeological Assessment

Figure No.
3

Title
Portion of 1876 Historic Atlas Map of the Township of Wainfleet

621000

4756500

N

SE18
Hofstede

SE110
Vanderknyff

T11

T12

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September 2013
160950269

621000

4756500

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Revised: 2013-09-01 By: bcowper

Stantec

Notes

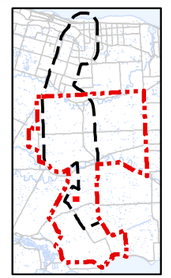
1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2013.
3. Orthoimagery © First Base Solutions, 20xx.

Legend

- Signed Property
- 120m Zone of Investigation
- Proposed Turbine Location
- Turbine Blade Length
- Temporary Laydown Area
- Collector Lines – Underground or Overhead
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area

Stage 2 Archaeological Assessment

- Test Pitted at 5 metre Intervals
- Previously Assessed, 2012 (P002-289-2012)
- Photograph Location and Direction



Client/Project

Niagara Region Wind Corporation
Niagara Region Wind Farm

Figure No.

4

DRAFT

Title

Stage 2 Results
Access Road T11 to T12

623000

4759500

Sideroad 42 Road

Concession 6

3

4

SE47
Pennings

N

0 30 60 m

1:1,500

September 2015
160950269

623000

4759500

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Revised: 2015-09-01 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.
3. Orthoimagery © First Base Solutions, 20xx.

Legend

- Signed Property
- 120m Zone of Investigation
- Preferred Transmission Line Route
- Collector Lines – Underground or Overhead
- Fibre Optic Line
- Potential Access Road
- Access Road 20m Construction Area

Stage 2 Archaeological Assessment

- Test Pitted at 5 metre Intervals
- Previously Assessed, 2012 (P002-289-2012)
- Previously Disturbed, not Surveyed
- Photograph Location and Direction

Client/Project

Niagara Region Wind Corporation
Niagara Region Wind Farm

Figure No.

5

DRAFT

Title

Stage 2 Results
Entrance 36

10.0 CLOSURE

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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.

STANTEC CONSULTING LTD.

Technical Review _____
(signature)

Colin Varley, MA, RPA, Associate, Senior Archaeologist

Senior Review _____
(signature)

Jim Wilson, MA, Principal, Regional Discipline Lead, Archaeology