

Appendix D

Property Line Setback Report



NIAGARA REGION WIND FARM
PROPERTY LINE SETBACK ASSESSMENT
REPORT

File No. 160950269
April 2013

Prepared for:

Niagara Region Wind Corporation
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1.0 Introduction

The purpose of the Property Line Setback Assessment Report is to demonstrate that siting some of the turbines within the prescribed hub height setback from non-participating properties will not result in any adverse impacts on neighbouring businesses, infrastructure, or land use activities. This assessment is based on evaluating land uses within the vicinity of the turbines, confirming the presence of any structures that may occur closer than the hub height of the adjacent turbines, and to describe preventative measures to address potential adverse impacts.

1.1 PROJECT OVERVIEW

Niagara Region Wind Corporation (NRWC) is proposing to develop, construct, and operate the 230 Megawatt (MW) Niagara Region Wind Farm (the 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, in response to the Government of Ontario's initiative to promote the development of renewable electricity in the province. Project infrastructure such as collector lines and transmission lines will be sited along the boundaries of the Township of Pelham and Town of Grimsby, but will be sited outside of these municipalities on the opposite side of the road.

The basic components of the Project include 77 wind turbine generators (80 potential locations identified) each with a rated capacity ranging from approximately 2.3 MW to 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 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 MVA base rated transformer with two stages of cooling (via fans). A 115kV transmission line transports power from each of the two transformer substations north to the tap-in location where the Project is connected to the Hydro One Networks Inc. (HONI) owned transmission line, south of the Queen Elizabeth Way (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.

Alternate transmission and collector lines routes have been identified and assessed to provide options during detailed design, the final selection of which route to follow will be confirmed following the consultation process with local distribution companies, agency review and detailed design.

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.

1.2 REPORT REQUIREMENTS

This Property Line Setback Assessment Report is one component of the REA application for the Project, and has been prepared in accordance with O. Reg. 359/09, the Ontario Ministry of Natural Resources' (MNR's) Approval and Permitting Requirements Document for Renewable Energy Projects (September 2009), and MOE's "Technical Guide to renewable Energy Approvals (2012)". This report is required in accordance with section 53(3) of O. Reg. 359/09 to reduce the property line setback from hub height to the length of the turbine blade (blade length) plus 10 metres.

The following table summarizes the documentation requirements as specified under O. Reg. 359/09.

Table 1.1: Property Line Setback Assessment Report Requirements: O. Reg. 359/09

Requirements	Completed	Section Reference
As part of an application for the issues of a renewable energy approval or a certificate of approval in respect of the construction, installation or expansion of the wind turbine, the person who is constructing, installing or expanding the wind turbine submits a written assessment,		
1. Demonstrating that the proposed location of the wind turbine will not result in adverse impacts on nearby business, infrastructure, properties or land use activities, and	✓	Appendix B
2. Describing any preventative measures that are required to be implemented to address the possibility of any adverse impacts.	✓	Section 2.0, Appendix B

1.3 SETBACK REQUIREMENTS

Property boundary setbacks are the equivalent of the turbine hub height in accordance with section 53(1)(b) of O. Reg. 359/09, which can be reduced to blade length plus 10 m if the REA application includes a Property Line Setback Assessment Report per section 53(3) of O. Reg. 359/09. This report is intended to address a reduction of the property line setback by identifying and evaluating land uses on neighbouring properties and by demonstrating that siting the turbine in such a location will not result in any adverse impacts on neighbouring businesses, infrastructure or land use activities through the implementation of appropriate preventative measures.

The proposed turbine hub height for the Project is either 124 m or 135 m, to be confirmed through detailed design. In order to accommodate either scenario, both hub height cases have been identified in this report with the more conservative setback (135 m) used to identify where a property line assessment is required and to assess impacts on adjacent land uses. The turbine blade length of the E101 turbine is 48.6 m and the blade length of the E82 turbine is 38.8m, as confirmed in the Wind Turbine Specification Report. As such, the more conservative

blade length of the E101 turbine has been assessed in this report when considering the blade length plus 10 m setback from property lines and roadways.

All of the proposed turbine sites meet the minimum setback requirement of at least 550 metres (m) from any non-participating noise receptor in accordance with section 54(1) of O. Reg. 359/09.

All of the proposed turbines meet the minimum setback of at least blade length plus 10 m (48.6 m blade length + 10m = 58.6 m) from any public road or railway in accordance with section 53(1)(a) of O. Reg. 359/09.

Fifty-four (54) turbines are located less than hub height (135 m) to a non-participating property line. Eighty-two (82) non-participating property lines are within 135m of the proposed turbines.

One of the proposed turbines is located less than blade length plus 10 m (58.6 m) from a non-participating property line. Specifically, Turbine T3 is located 56m from an adjacent property line. NRW has entered into a written agreement with the landowner of this adjacent property to permit the location of the turbine at a distance of 56m from the property line in accordance with section 53(2)(b) of O. Reg. 359/09. A copy of the redacted agreement between the NRW and the adjacent non-participating property owner is included in **Appendix C**.

In no case are any turbine blades “overhanging” onto a non-participating property. All turbines are located more than the blade length (48.6m) from all non-participating properties.

Mapping of all turbine locations demonstrating the 124m, 135m and 58.6m setbacks are provided in **Appendix A**.

1.4 PREVENTATIVE MEASURES

Possible adverse impacts to adjacent land uses or structures caused by constructing and operating wind turbines within the property line setback distance are related to catastrophic failure or collapse of a turbine or concerns over “ice throw” during winter operation.

1.4.1 Catastrophic Failure

The primary preventative measure against turbine collapse relates to the design, construction and maintenance of the turbines. All ENERCON wind energy converters are designed and certified according to the latest international standards. Currently, the basis for design are the internationally acknowledged IEC-61400 standards. These standards identify the assumptions and conditions used to define the load cases for which the wind turbine has to be designed. Furthermore, all ENERCON wind turbines are verified by independent third party engineer firms to assure conformity with the IEC standards.

In addition to adhering to the IEC standards, the ENERCON wind turbines incorporate safety systems which feature various control sensors that protect the turbine and its components from damage. This includes high and low temperatures, vibrations, oscillations and physical strain. In the case that one or more of these sensors detect conditions outside the design limits, the main control of the turbine will take the appropriate measures to halt or reduce the turbine rotation and power production.

To the extent of ensuring survivability and preventing turbine collapse, ENERCON incorporates cast iron components, concrete towers and gravity foundations in the design of its wind turbines. The cast iron components are used in key load bearing sections of the turbine, such as the main carrier, thus adding strength. The concrete tower provides a more rigid tower which considerably reduces lateral movement of the turbine due to high wind speeds. The gravity foundation is essentially a large mass heavy enough to weigh down the turbine even in extreme wind conditions approaching 60 metres per second (216 km/h).

ENERCON has been manufacturing commercial wind turbines since the early 1980's. As of mid-2012, ENERCON has installed over 19,600 wind turbines worldwide for an installed capacity of over 28,200 MW. Due to ENERCON's conservative design methodology, there have been no collapse of megawatt scale wind turbines currently being operated and maintained by ENERCON and the likelihood of turbine collapse due to design is negligible.

In addition, preventative maintenance of these turbines is completed on an on-going basis to ensure proper functioning, maximize efficiency and maintain longevity of the turbines. Maintenance activities include both scheduled and unscheduled maintenance, as discussed in the Design and Operations Report. Maintenance including regular visual inspections, inspection of mechanical components, inspection of electrical components, greasing and other general maintenance will occur on a regular basis. Unscheduled maintenance activities could include replacement of major components such as blades or generators. Such maintenance activities are undertaken to ensure the turbines operate in accordance with their intended energy production and safety design measures.

NRWC will hire a specialized Operation and Maintenance Contractor for specific maintenance tasks. It is expected that up to 12 full-time operation and maintenance staff from NRWC and the Operation and Maintenance Contractor would be employed by the wind project during the operation phase to carry out the various on-going maintenance activities. Additional staff would be brought in on an as needed basis to support the maintenance activities required for the project. The operations and maintenance logs and checks will be documented by NRWC and/or the Operation and Maintenance Contractor.

1.4.2 Ice Throw

During operation of the turbines, concerns surrounding possible damage to structures or human health relating to "ice throw" have been raised. Ice throw is caused when ice that has accumulated on the blades of a turbine during sub-zero temperatures, primarily as a result of

freezing rain, becomes dislodged from the blades and falls to the ground. In order to prevent this phenomenon from occurring, the turbines for this Project will be equipped with a preventative blade de-icing system and a contingent control system.

The blade de-icing system detects conditions for potential ice formation and heats the blades to prevent the buildup of ice during winter operation. Technology incorporated into the turbines themselves will monitor for conditions conducive to potential ice formation, which when detected will enact heaters in the blades to circulate warm air and prevent ice formation.

An additional control and monitoring system will take action should the de-icing system not be effective in preventive ice during extreme weather conditions. In this case, sensors will detect ice on the blades by analysing the real-time power curve of the turbine and noting a change in power performance due to the weight and friction from the ice on the blades. The turbine will shut down operation as soon as ice is detected on the blades and will not resume operation until the ice accumulation has been cleared.

2.0 Property Line Setback Analysis

An analysis for each proposed wind turbine site within hub height of any non-participating property boundary is provided in the table in **Appendix B**, which includes an assessment for both hub height scenarios (124 m and 135 m). This assessment defines the distance of each turbine centre point to the non-participating property line and the distance of overlap for the hub height setback. The assessment identifies any features or land uses within the overlap area, such as businesses, infrastructure, natural features and land use activities, along with preventative measures that will be employed to minimize the potential effects.

The primary preventative measures relate to design and construction of the turbines to avoid catastrophic failures and “ice throw”. The turbines would be constructed and designed by professional engineers, undergo regular maintenance and monitoring by operational staff, and contain automatic shutdown mechanisms in instances such as extreme weather. In addition, a blade de-icing system will be installed in the turbines along with a contingent shut-down control in the case of ice accumulation. All of these measures are standard best practices.

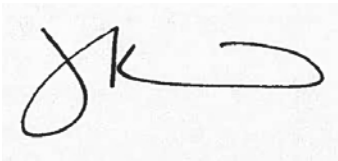
The analysis as presented in **Appendix B** demonstrates that siting the turbines in the identified locations will not result in any adverse impacts on neighbouring businesses, infrastructure or land use activities.

3.0 Closure

The Niagara Region Wind Farm Property Line Setback Assessment Report has been prepared by Stantec for NRWC in accordance with Item 4, Table 1 of Ontario Regulation 359/09 and the *Technical Guide to Renewable Energy Approvals* (MOE, 2012). Information compiled in this report has been provided in association with ENERCON, with additional support from Hatch Ltd., PCL Construction Ltd., and the Niagara Region Wind Corporation.

This report has been prepared by Stantec for the sole benefit of Niagara Region Wind Corporation, and may not be used by any third party without the express written consent of the Niagara Region Wind Corporation. 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.



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Senior Review

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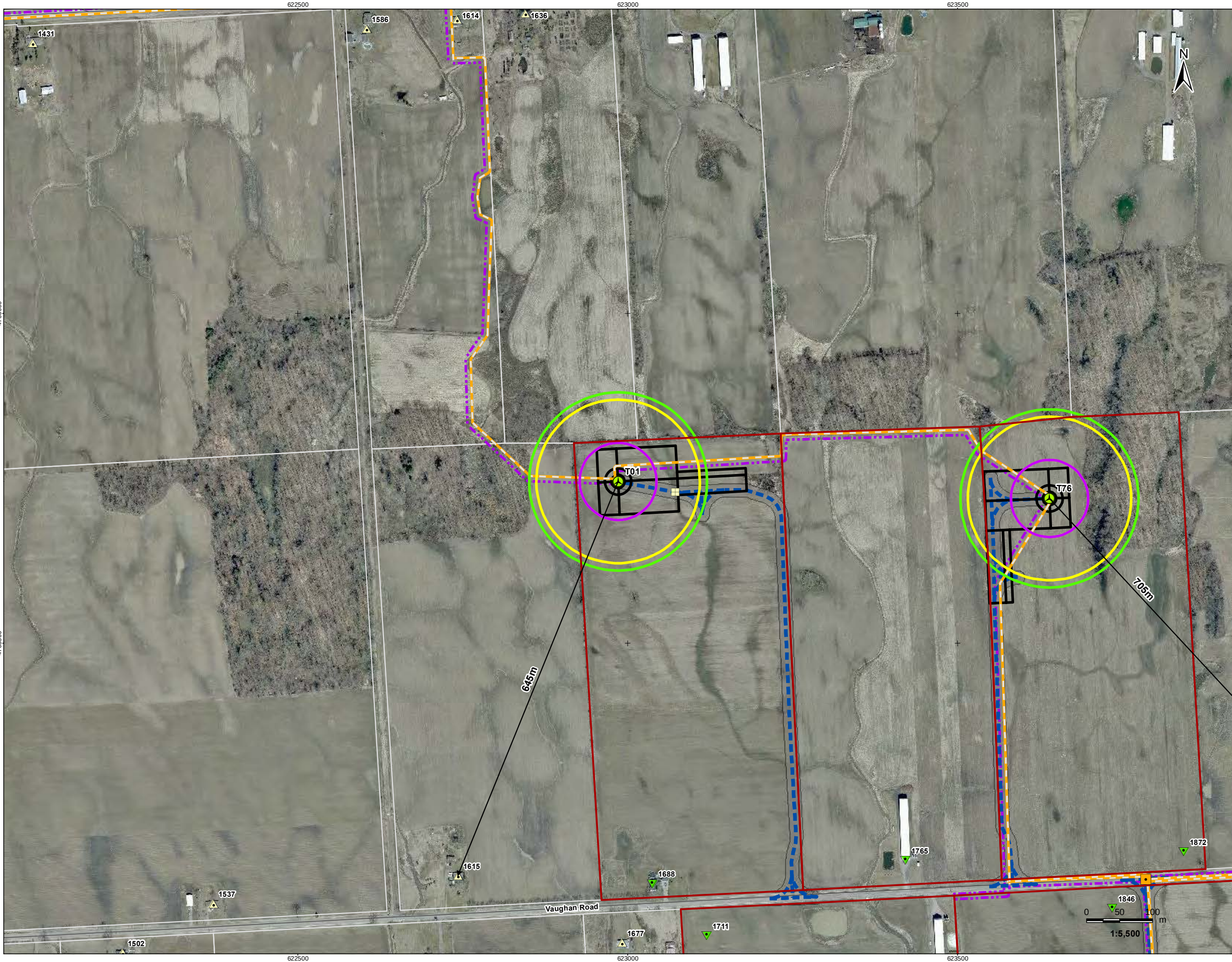
Fax: 905-474-9889

Al.Leggett@stantec.com

Appendix A

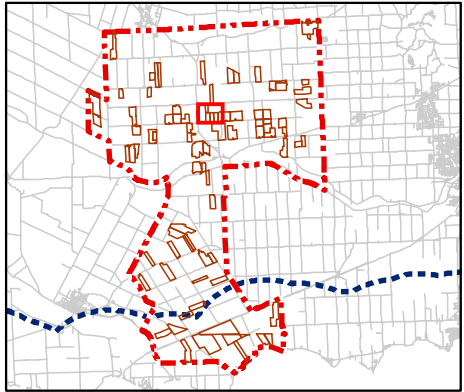
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Revised: 2013-03-01 By: bcowper



Legend

- Project Study Area
- Participating Property
- Property Boundary
- Proposed Turbine Location
- Junction Box
- Proposed Culvert
- Turbine 58.6m Buffer (Blade + 10m)
- Turbine 124m Buffer (Hub Height)
- Turbine 135m Buffer (Hub Height)
- Non-Participating Receptor
- Participating Receptor
- Preferred Transmission Line Route
- Alternate Transmission Route
- Potential Access Road
- Collector Lines - Underground or Overhead
- Fibre Optic Line
- Temporary Laydown Area
- Access Road 20m Construction Area



Notes

- Coordinate System: NAD 1983 UTM Zone 17N).
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Figure No.

1.1

Title

**Overview Maps for Property
Line Setback Assessment –
T01**

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Legend

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- Property Boundary
- Proposed Turbine Location
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- Road

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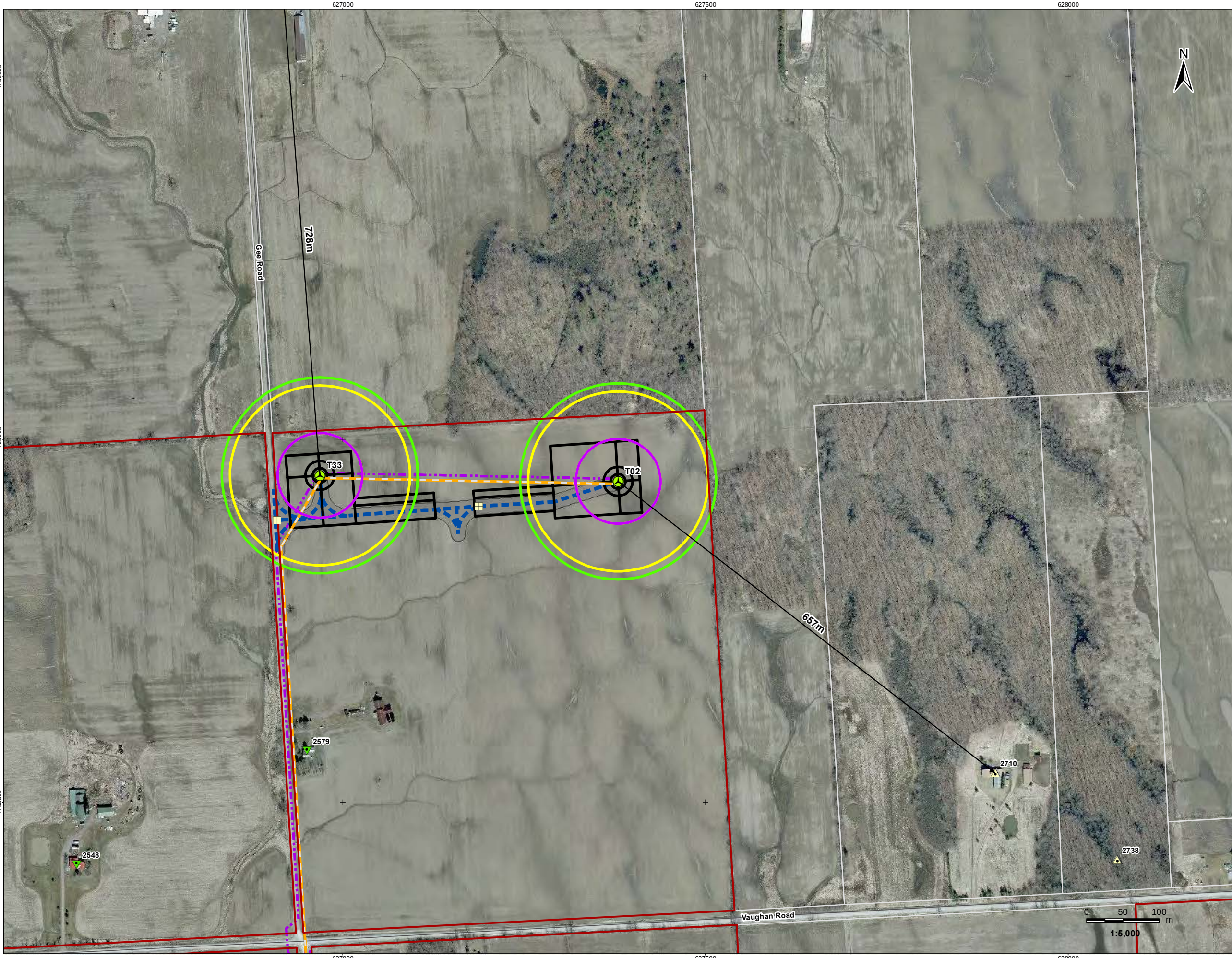
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Figure No.
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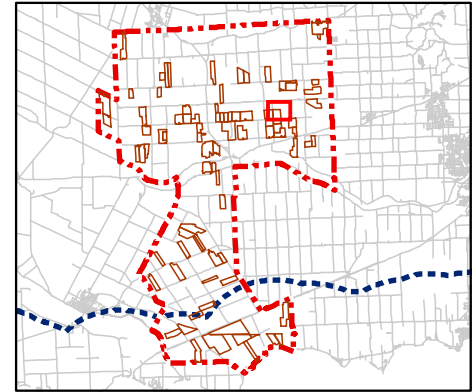
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Legend

- Project Study Area
- Participating Property
- Property Boundary
- Proposed Turbine Location
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- Turbine 58.6m Buffer (Blade + 10m)
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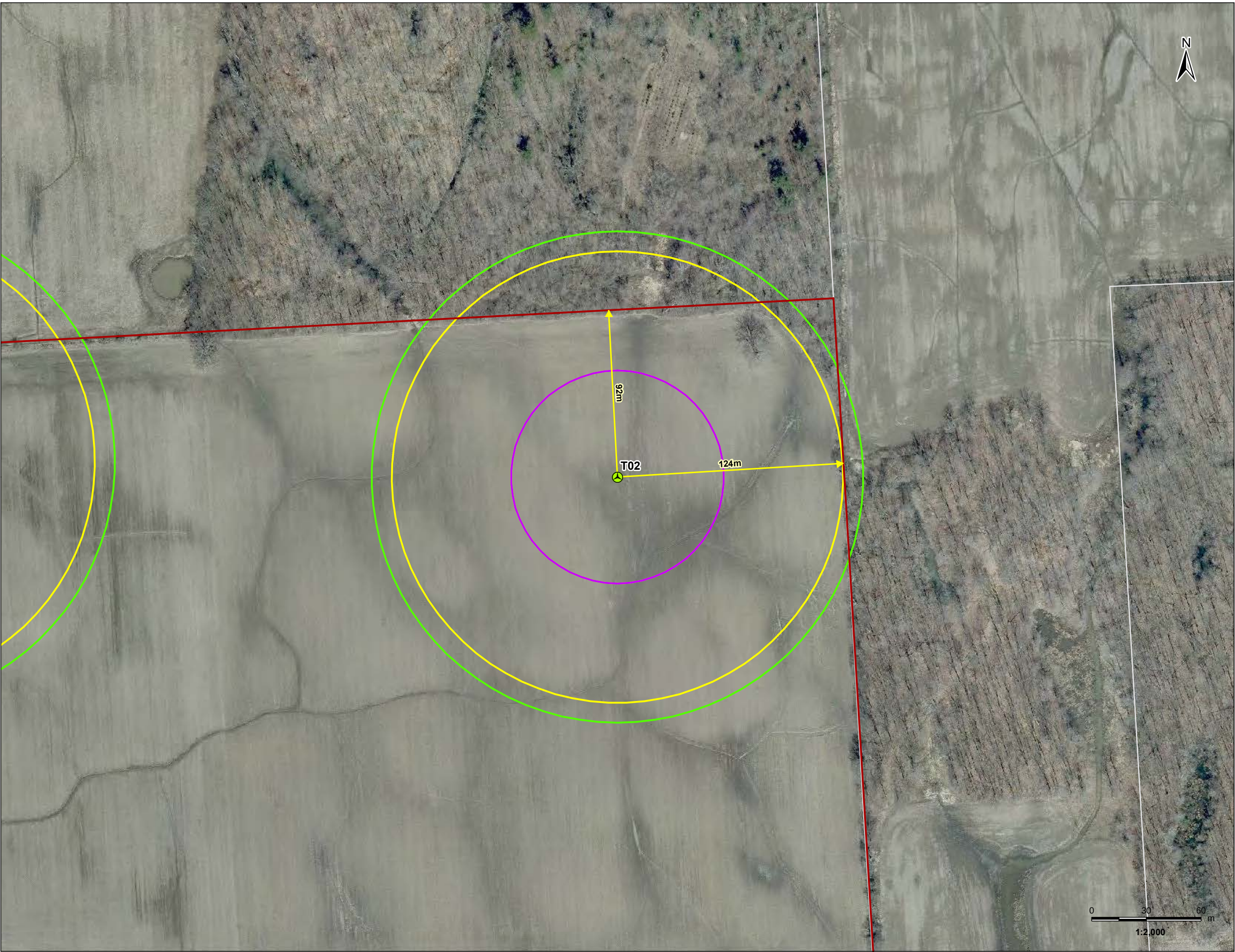
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1.2

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T02**

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Legend

- Project Study Area
- Participating Property
- Property Boundary
- Proposed Turbine Location
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- Railway
- Road

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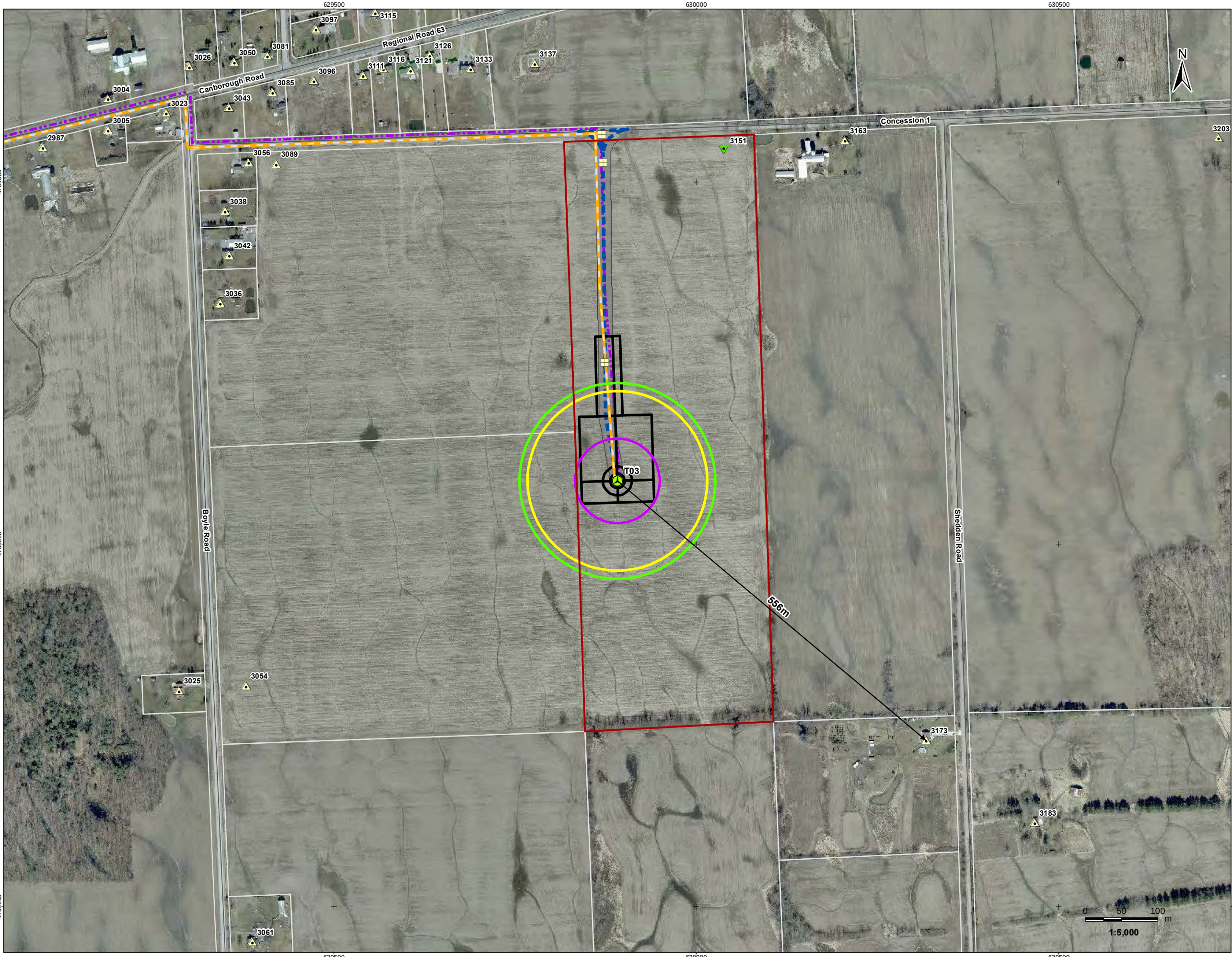
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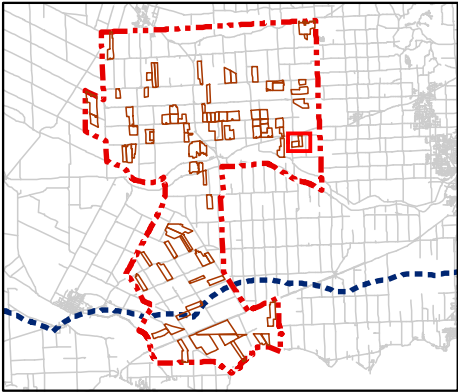
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Legend

- Project Study Area
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- Proposed Turbine Location
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Figure No.

1.3

Title

**Overview Maps for Property
Line Setback Assessment –
T03**

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Legend

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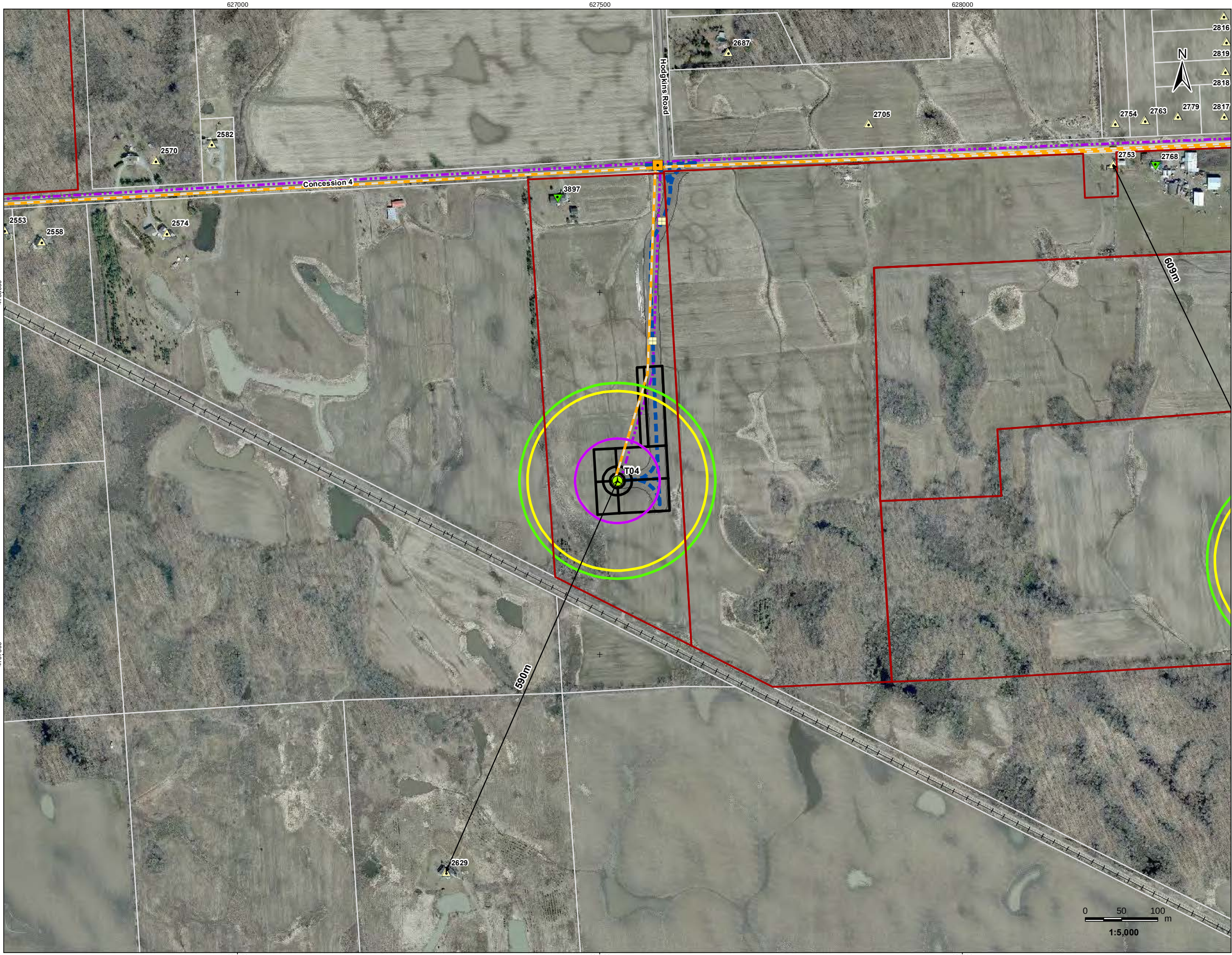
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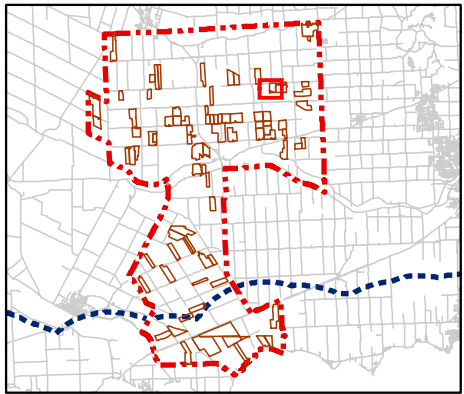
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Legend

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Figure No.

1.4

Title

**Overview Maps for Property
Line Setback Assessment –
T04**

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Legend

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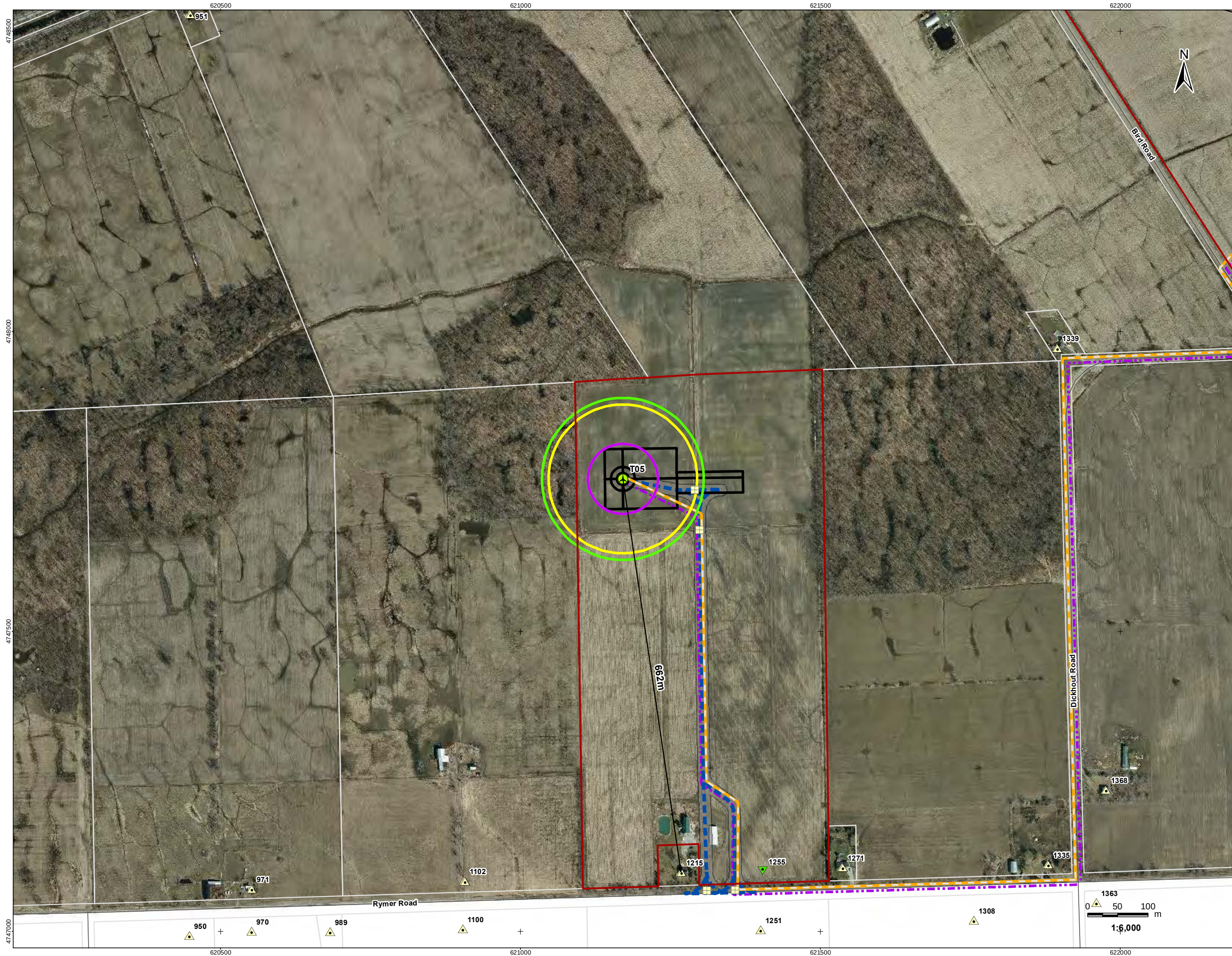
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1.4a

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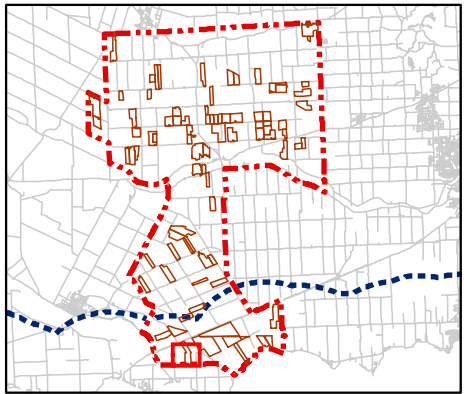
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Figure No.

1.5

Title

**Overview Maps for Property
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T05**

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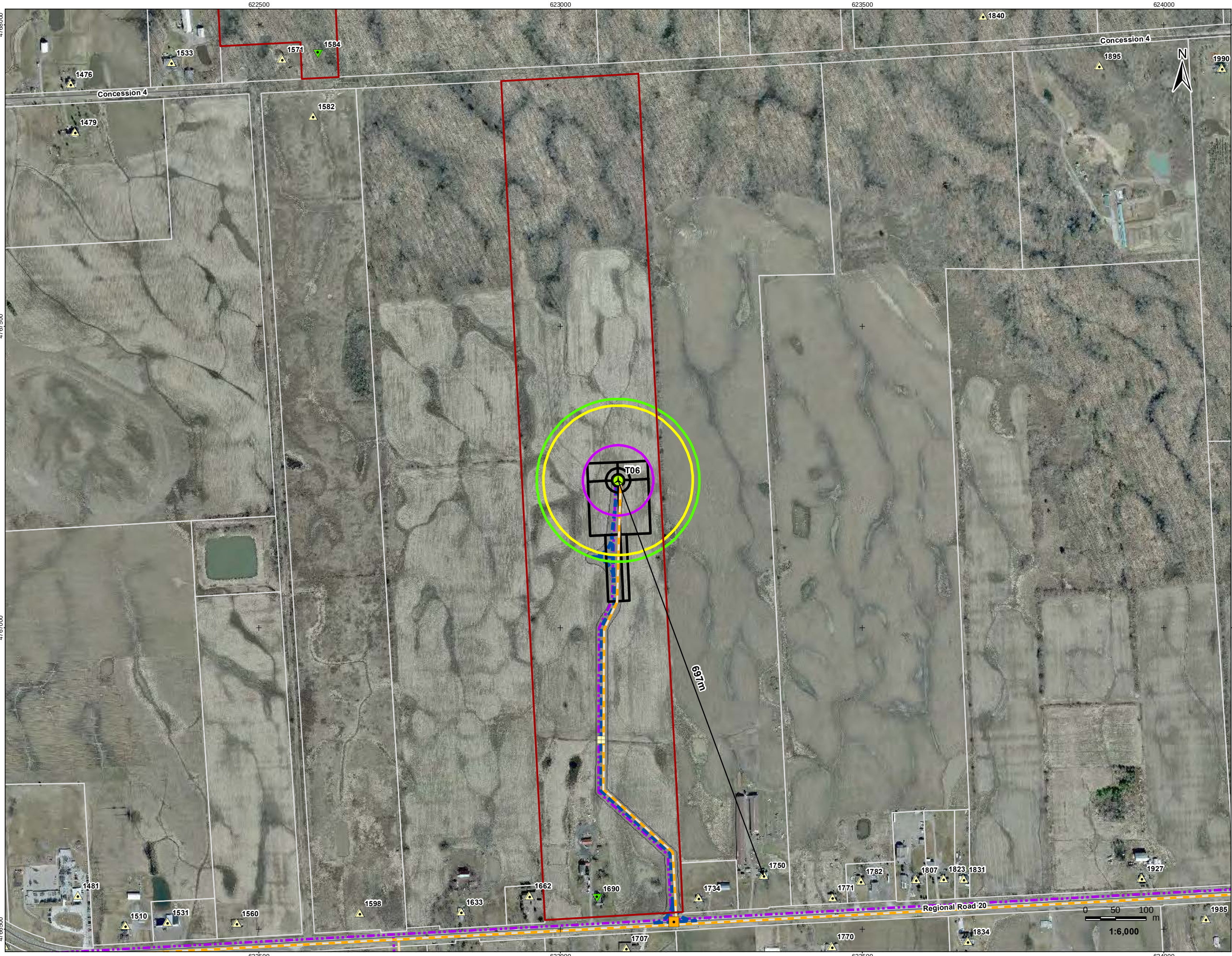
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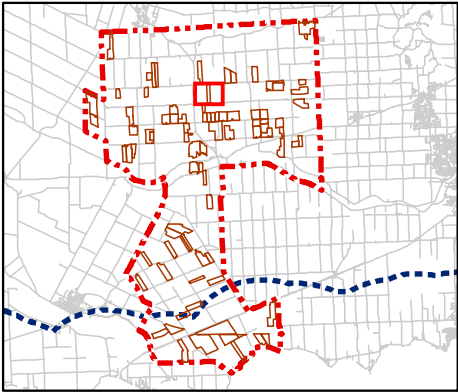
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- Turbine 124m Buffer (Hub Height)
- Turbine 135m Buffer (Hub Height)
- Non-Participating Receptor
- Participating Receptor
- Preferred Transmission Line Route
- Alternate Transmission Route
- Potential Access Road
- Collector Lines - Underground or Overhead
- Fibre Optic Line
- Temporary Laydown Area
- Access Road 20m Construction Area



Notes

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Figure No.

1.6

Title

**Overview Maps for Property
Line Setback Assessment –
T06**

V:\01609\Active\160950269\Planning\Drawing\mxd\20130212_REA_Property_Line_Report\160950269_Fig_1a_Property_Line_Setback_Assessment_Hub_Inset_Mapbook.mxd
Revised: 2013-03-01 By: bcowper



Legend

- Project Study Area
- Participating Property
- Property Boundary
- Proposed Turbine Location
- Distance to Property Boundary
- Turbine 58.6m Buffer (Blade + 10m)
- Turbine 124m Buffer (Hub Height)
- Turbine 135m Buffer (Hub Height)
- Non-Participating Receptor
- Participating Receptor
- Railway
- Road

Notes

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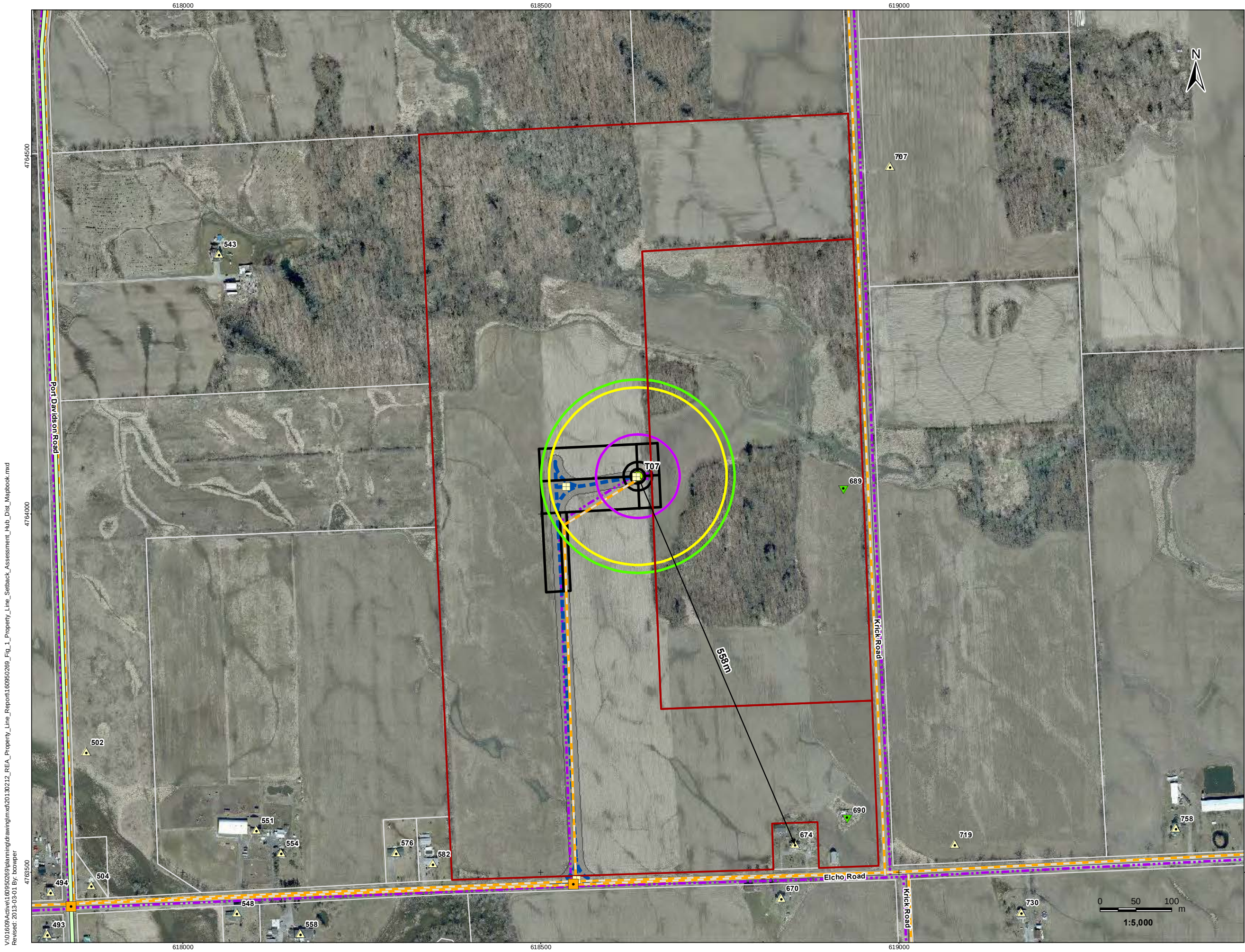


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Figure No.
1.6a

Title
**Inset Maps for
Property Line Setback – T06**



Legend

- Project Study Area
- Participating Property
- Property Boundary
- Proposed Turbine Location
- Junction Box
- Proposed Culvert
- Turbine 58.6m Buffer (Blade + 10m)
- Turbine 124m Buffer (Hub Height)
- Turbine 135m Buffer (Hub Height)
- Non-Participating Receptor
- Participating Receptor
- Preferred Transmission Line Route
- Alternate Transmission Route
- Potential Access Road
- Collector Lines - Underground or Overhead
- Fibre Optic Line
- Temporary Laydown Area
- Access Road 20m Construction Area

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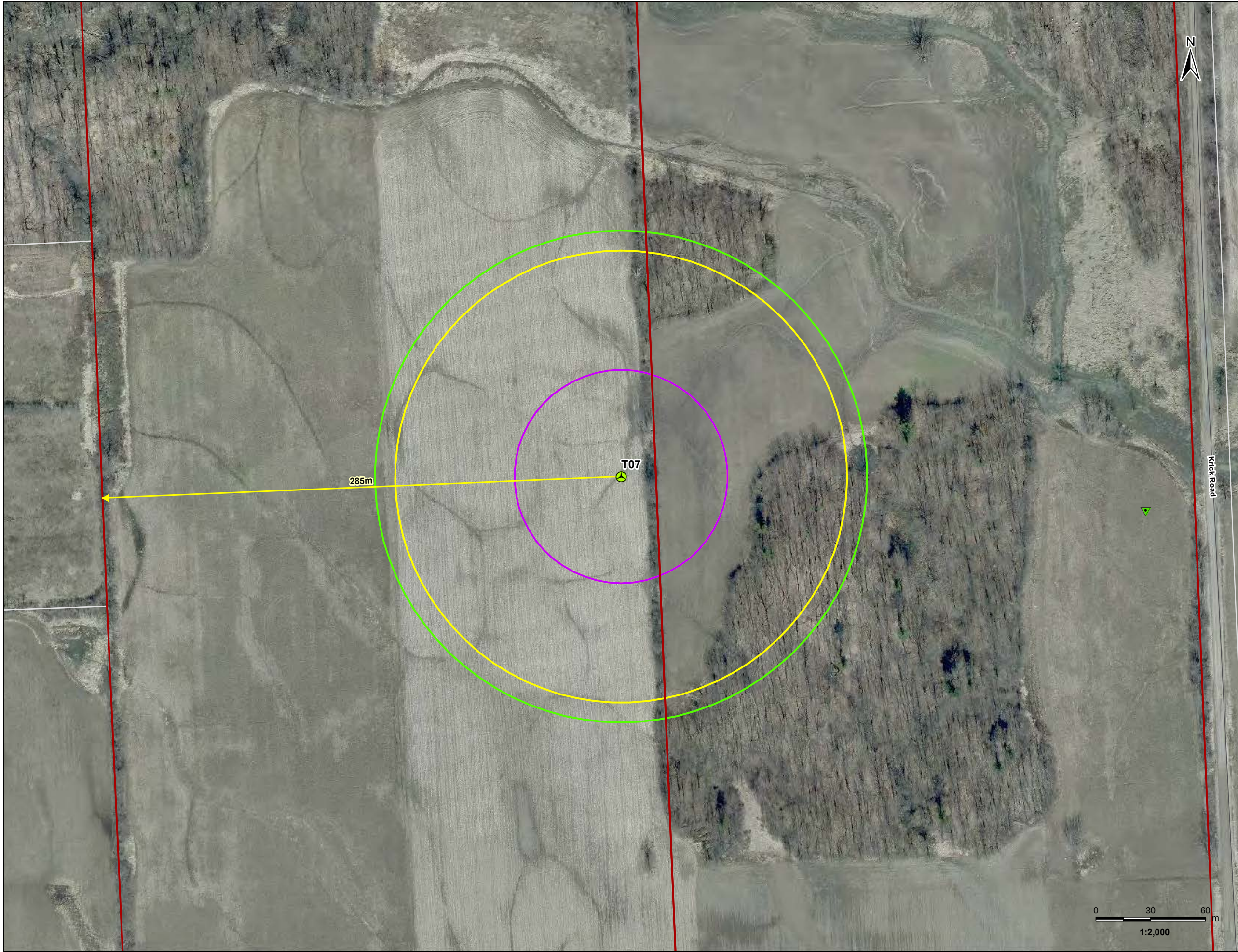
Figure No.

1.7

Title

Overview Maps for Property
Line Setback Assessment –
T07

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Revised: 2013-03-01 By: bcowper



Legend

- Project Study Area
- Participating Property
- Property Boundary
- Proposed Turbine Location
- Distance to Property Boundary
- Turbine 58.6m Buffer (Blade + 10m)
- Turbine 124m Buffer (Hub Height)
- Turbine 135m Buffer (Hub Height)
- Non-Participating Receptor
- Participating Receptor
- Railway
- Road

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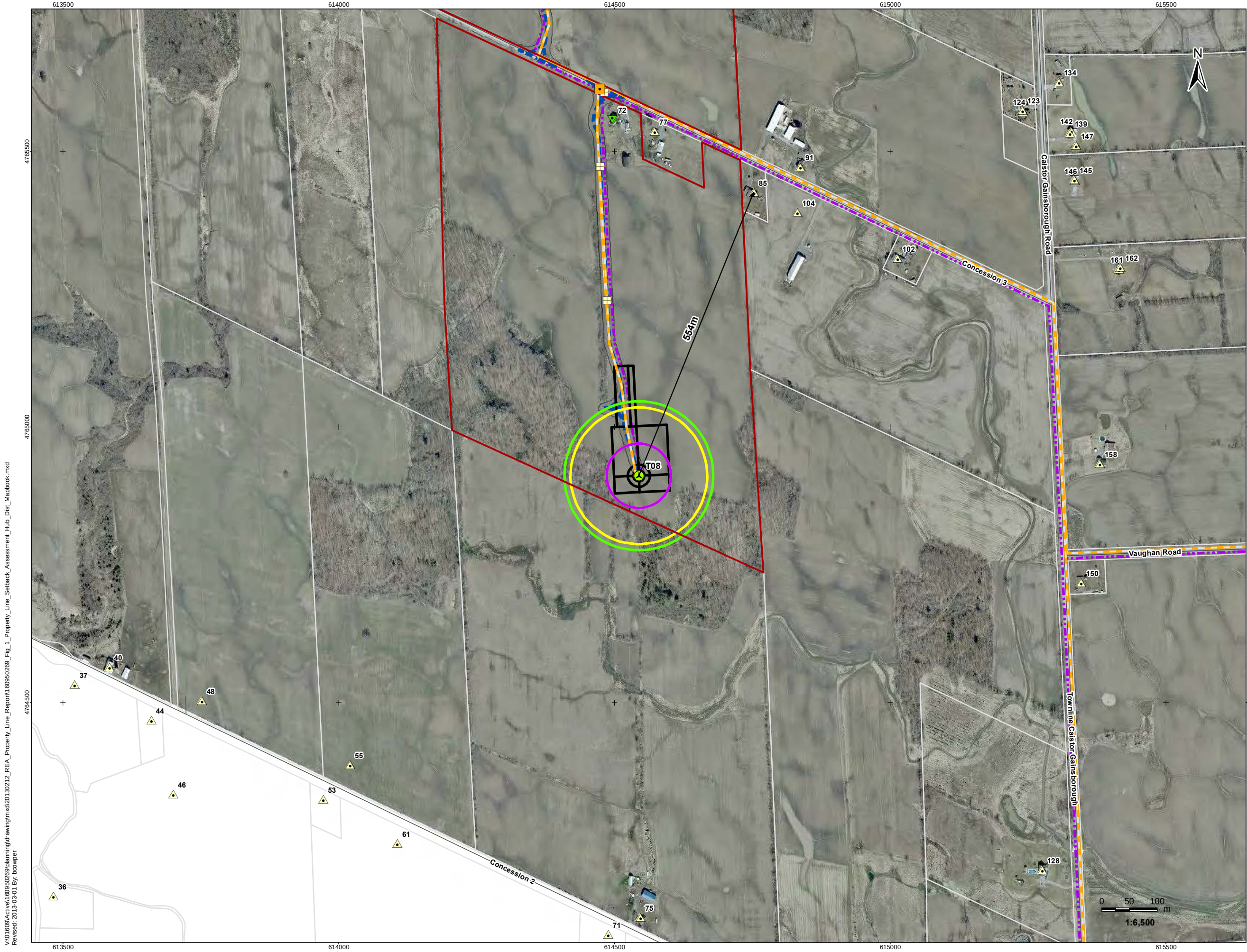
Niagara Region Wind Corporation
Niagara Region Wind Farm

Figure No.

1.7a

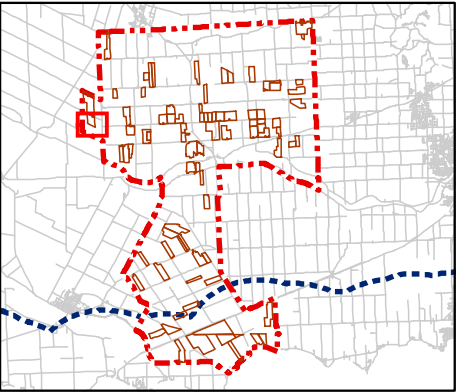
Title

**Inset Maps for
Property Line Setback – T07**



Legend

- Project Study Area
- Participating Property
- Property Boundary
- Proposed Turbine Location
- Junction Box
- Proposed Culvert
- Turbine 58.6m Buffer (Blade + 10m)
- Turbine 124m Buffer (Hub Height)
- Turbine 135m Buffer (Hub Height)
- Non-Participating Receptor
- Participating Receptor
- Preferred Transmission Line Route
- Alternate Transmission Route
- Potential Access Road
- Collector Lines - Underground or Overhead
- Fibre Optic Line
- Temporary Laydown Area
- Access Road 20m Construction Area



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Figure No.

1.8

Title

**Overview Maps for Property
Line Setback Assessment –
T08**

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Revised: 2013-03-01 By: bcowper



Legend

- Project Study Area
- Participating Property
- Property Boundary
- Proposed Turbine Location
- Distance to Property Boundary
- Turbine 58.6m Buffer (Blade + 10m)
- Turbine 124m Buffer (Hub Height)
- Turbine 135m Buffer (Hub Height)
- Non-Participating Receptor
- Participating Receptor
- Railway
- Road

Notes

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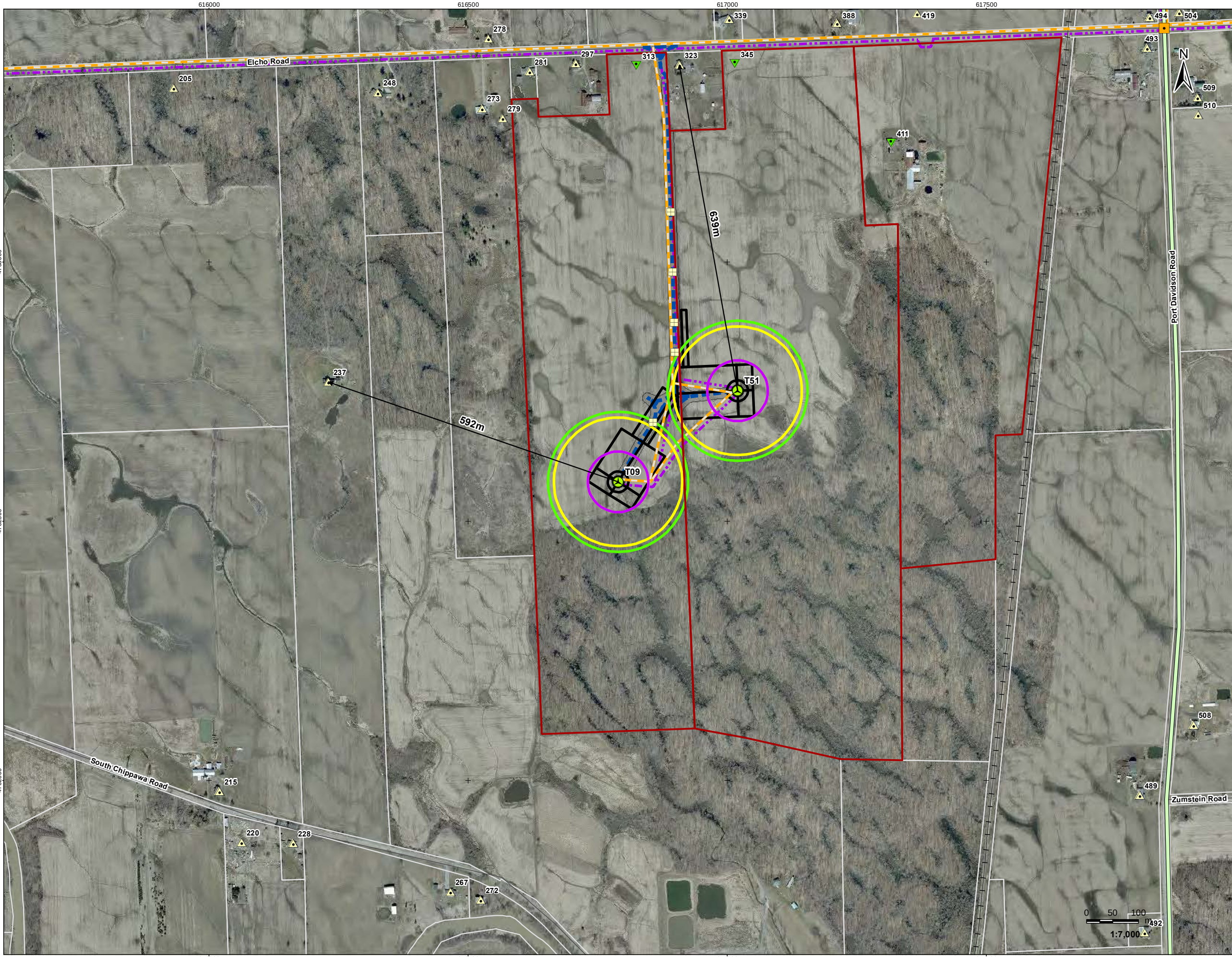
Figure No.

1.8a

Title

**Inset Maps for
Property Line Setback – T08**

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Revised: 2013-03-01 By: bcowper



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Revised: 2013-03-01 By: bcowper



Legend

- Project Study Area
- Participating Property
- Property Boundary
- Proposed Turbine Location
- Distance to Property Boundary
- Turbine 58.6m Buffer (Blade + 10m)
- Turbine 124m Buffer (Hub Height)
- Turbine 135m Buffer (Hub Height)
- Non-Participating Receptor
- Participating Receptor
- Railway
- Road

Notes

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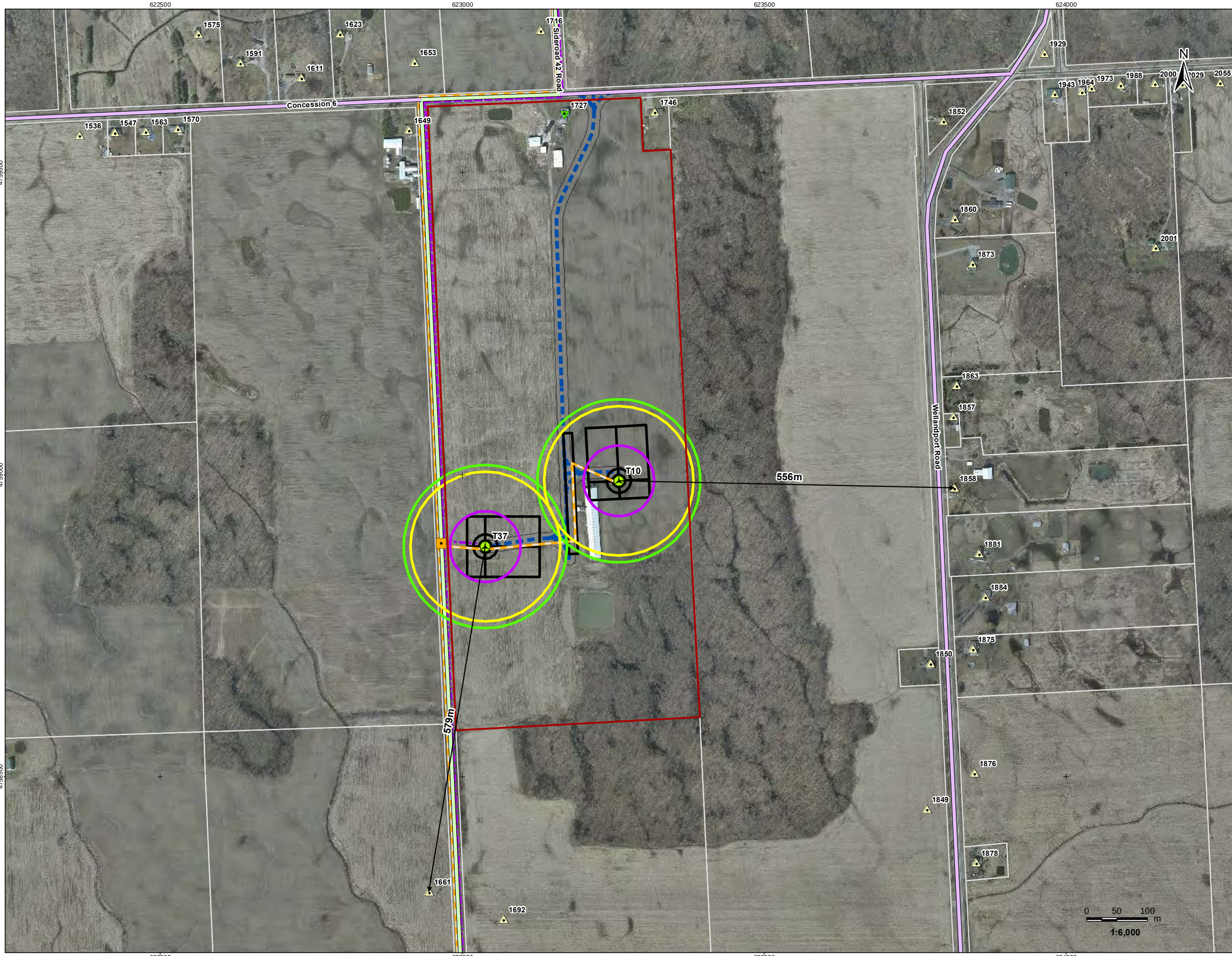
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Niagara Region Wind Corporation
Niagara Region Wind Farm

Figure No.
1.9a

Title
**Inset Maps for
Property Line Setback – T09**

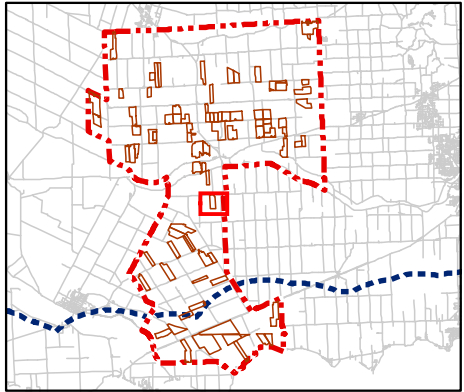
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Revised: 2013-03-01 By: bcowper



Legend

- Project Study Area
- Participating Property
- Property Boundary
- Proposed Turbine Location
- Junction Box
- Proposed Culvert
- Turbine 58.6m Buffer (Blade + 10m)
- Turbine 124m Buffer (Hub Height)
- Turbine 135m Buffer (Hub Height)
- Non-Participating Receptor
- Participating Receptor
- Preferred Transmission Line Route
- Alternate Transmission Route
- Potential Access Road
- Collector Lines - Underground or Overhead
- Fibre Optic Line
- Temporary Laydown Area
- Access Road 20m Construction Area



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Figure No.

1.10

Title

**Overview Maps for Property
Line Setback Assessment –
T10**

0 50 100 m
1:6,000

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Revised: 2013-03-01 By: bcowper



Legend

- Project Study Area
- Participating Property
- Property Boundary
- Proposed Turbine Location
- Distance to Property Boundary
- Turbine 58.6m Buffer (Blade + 10m)
- Turbine 124m Buffer (Hub Height)
- Turbine 135m Buffer (Hub Height)
- Non-Participating Receptor
- Participating Receptor
- Railway
- Road

Notes

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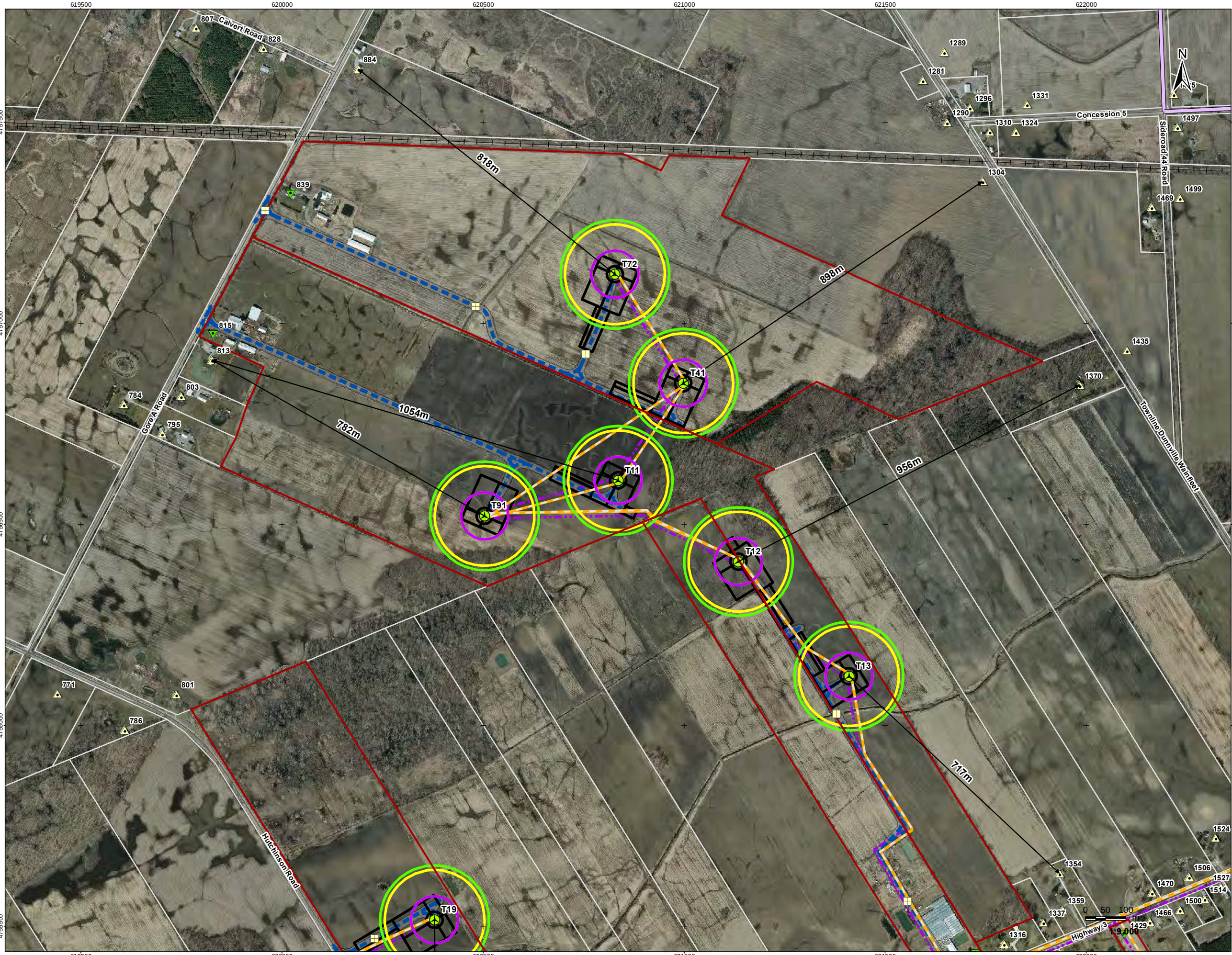
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Niagara Region Wind Corporation
Niagara Region Wind Farm

Figure No.
1.10a

Title
**Inset Maps for
Property Line Setback – T10**

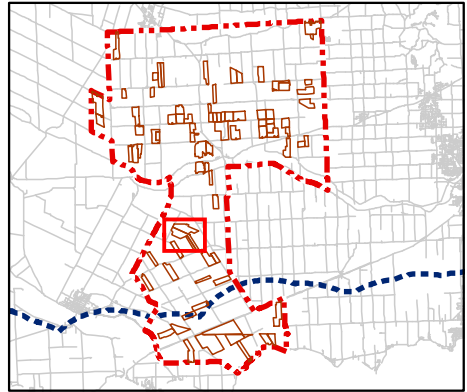
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Revised: 2013-03-01 By: bcowper



Legend

- Project Study Area
- Participating Property
- Property Boundary
- Proposed Turbine Location
- Junction Box
- Proposed Culvert
- Turbine 58.6m Buffer (Blade + 10m)
- Turbine 124m Buffer (Hub Height)
- Turbine 135m Buffer (Hub Height)
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- Fibre Optic Line
- Temporary Laydown Area
- Access Road 20m Construction Area



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Figure No.

1.11

Title

**Overview Maps for Property
Line Setback Assessment –
T11**

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Revised: 2013-03-01 By: bcowper



Legend

- Project Study Area
- Participating Property
- Property Boundary
- Proposed Turbine Location
- Distance to Property Boundary
- Turbine 58.6m Buffer (Blade + 10m)
- Turbine 124m Buffer (Hub Height)
- Turbine 135m Buffer (Hub Height)
- Non-Participating Receptor
- Participating Receptor
- Railway
- Road

Notes

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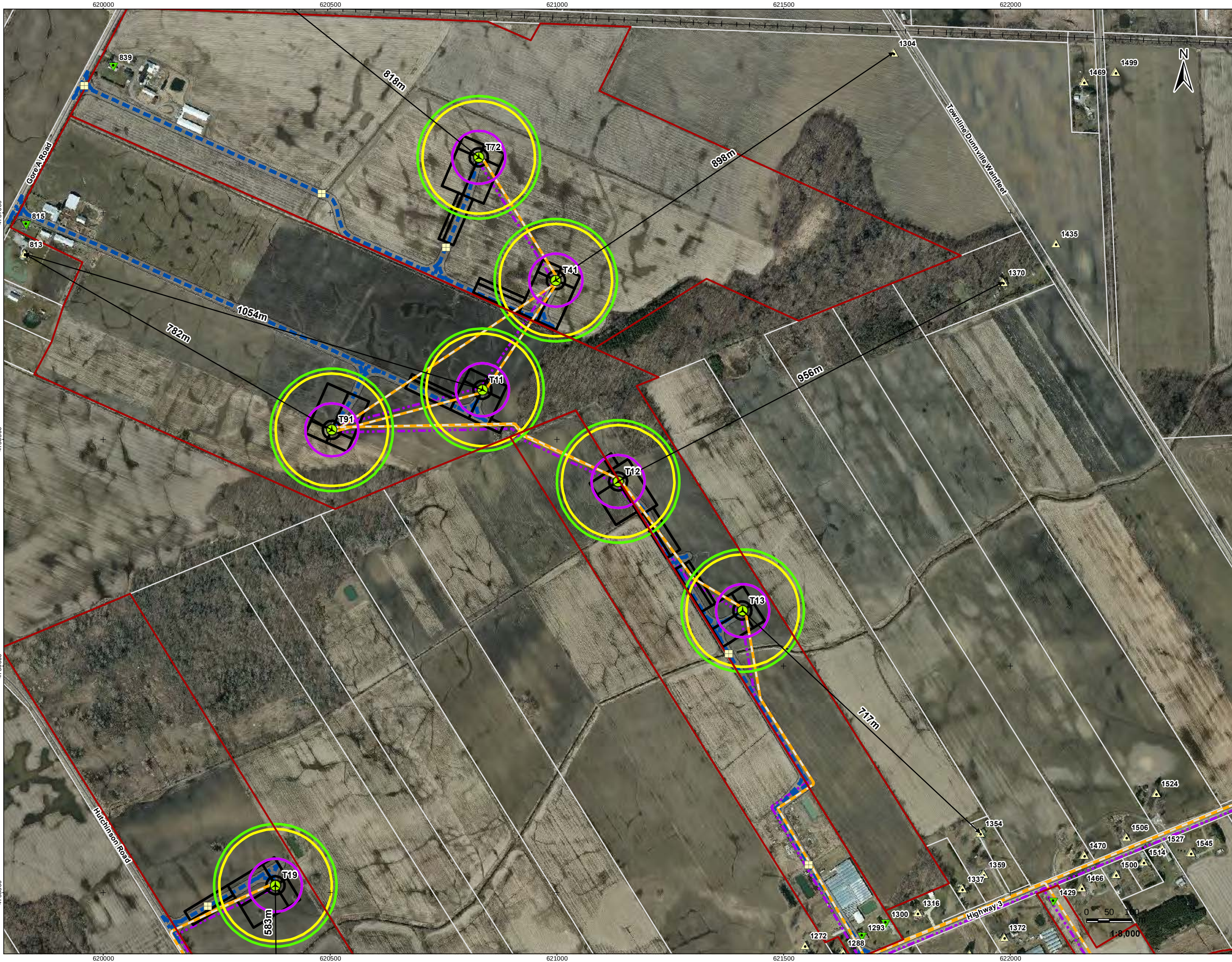
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1.11a

Title

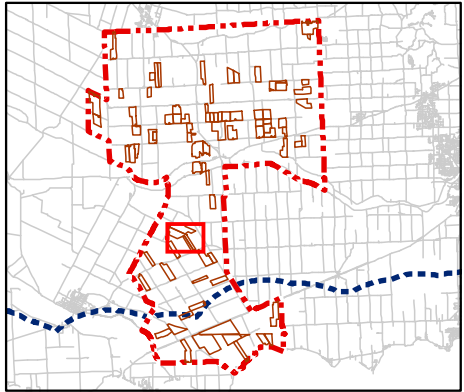
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Property Line Setback – T11**

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Revised: 2013-03-01 By: bcowper



Legend

- Project Study Area
- Participating Property
- Property Boundary
- Proposed Turbine Location
- Junction Box
- Proposed Culvert
- Turbine 58.6m Buffer (Blade + 10m)
- Turbine 124m Buffer (Hub Height)
- Turbine 135m Buffer (Hub Height)
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- Participating Receptor
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- Alternate Transmission Route
- Potential Access Road
- Collector Lines - Underground or Overhead
- Fibre Optic Line
- Temporary Laydown Area
- Access Road 20m Construction Area



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Figure No.

1.12

Title

**Overview Maps for Property
Line Setback Assessment –
T12**

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Revised: 2013-03-01 By: bcowper



Legend

- Project Study Area
- Participating Property
- Property Boundary
- Proposed Turbine Location
- Distance to Property Boundary
- Turbine 58.6m Buffer (Blade + 10m)
- Turbine 124m Buffer (Hub Height)
- Turbine 135m Buffer (Hub Height)
- Non-Participating Receptor
- Participating Receptor
- Railway
- Road

Notes

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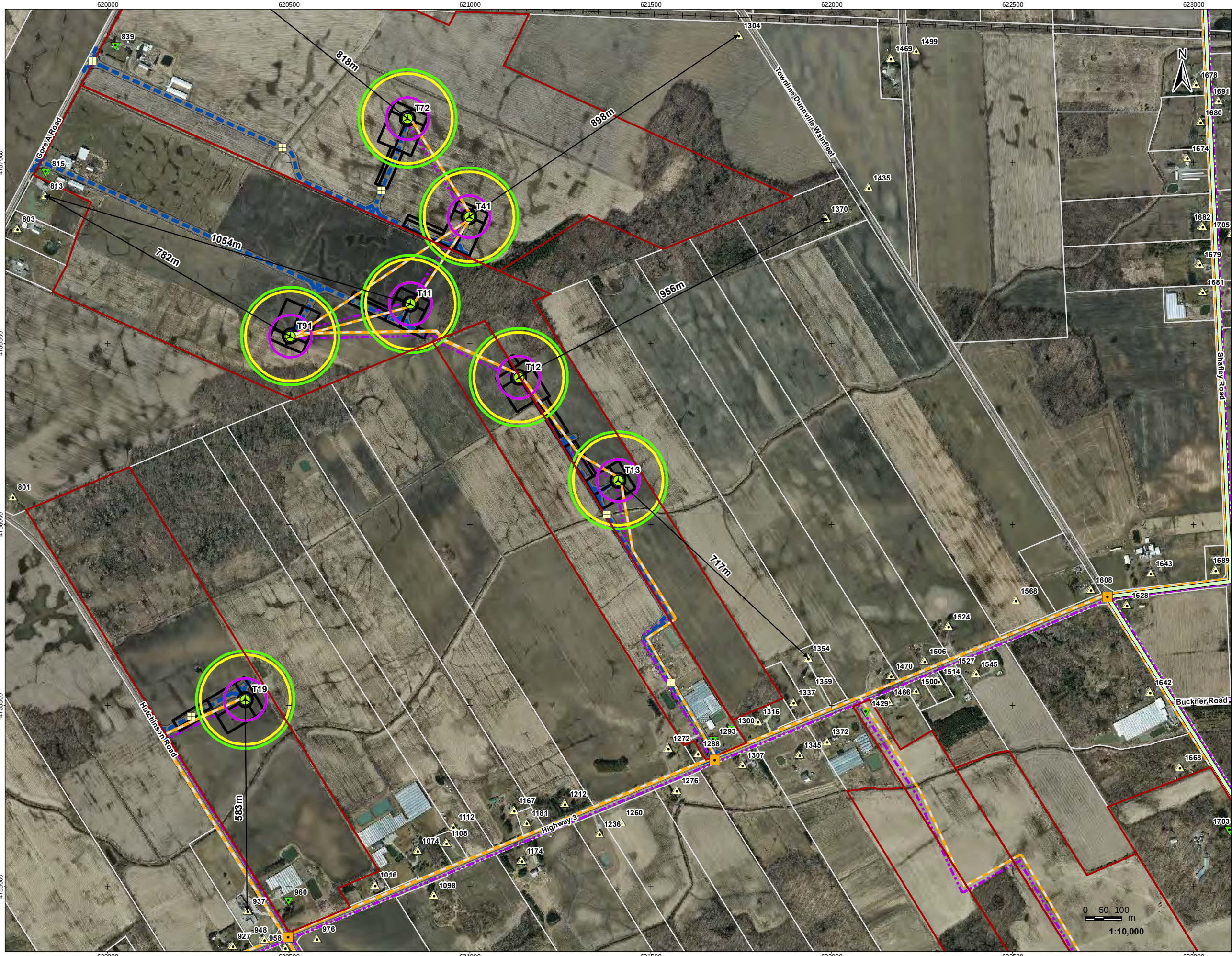
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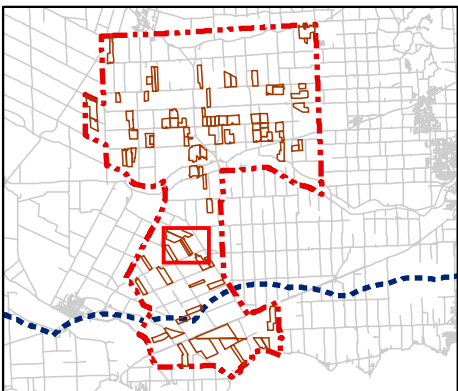
Figure No.
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Title
**Inset Maps for
Property Line Setback – T12**

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Revised: 2013-03-01 By: bcowper



- ### Legend
- Project Study Area
 - Participating Property
 - Property Boundary
 - Proposed Turbine Location
 - Junction Box
 - Proposed Culvert
 - Turbine 58.6m Buffer (Blade + 10m)
 - Turbine 124m Buffer (Hub Height)
 - Turbine 135m Buffer (Hub Height)
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 - Participating Receptor
 - Preferred Transmission Line Route
 - Alternate Transmission Route
 - Potential Access Road
 - Collector Lines - Underground or Overhead
 - Fibre Optic Line
 - Temporary Laydown Area
 - Access Road 20m Construction Area



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Figure No.
1.13

Title
**Overview Maps for Property
Line Setback Assessment –
T13**

V:\01609\Active\160950269\Planning\Drawing\mxd\20130212_REA_Property_Line_Report\160950269_Fig_1a_Property_Line_Setback_Assessment_Hub_Inset_Mapbook.mxd
Revised: 2013-03-01 By: bcowper



Legend

- Project Study Area
- Participating Property
- Property Boundary
- Proposed Turbine Location
- Distance to Property Boundary
- Turbine 58.6m Buffer (Blade + 10m)
- Turbine 124m Buffer (Hub Height)
- Turbine 135m Buffer (Hub Height)
- Non-Participating Receptor
- Participating Receptor
- Railway
- Road

Notes

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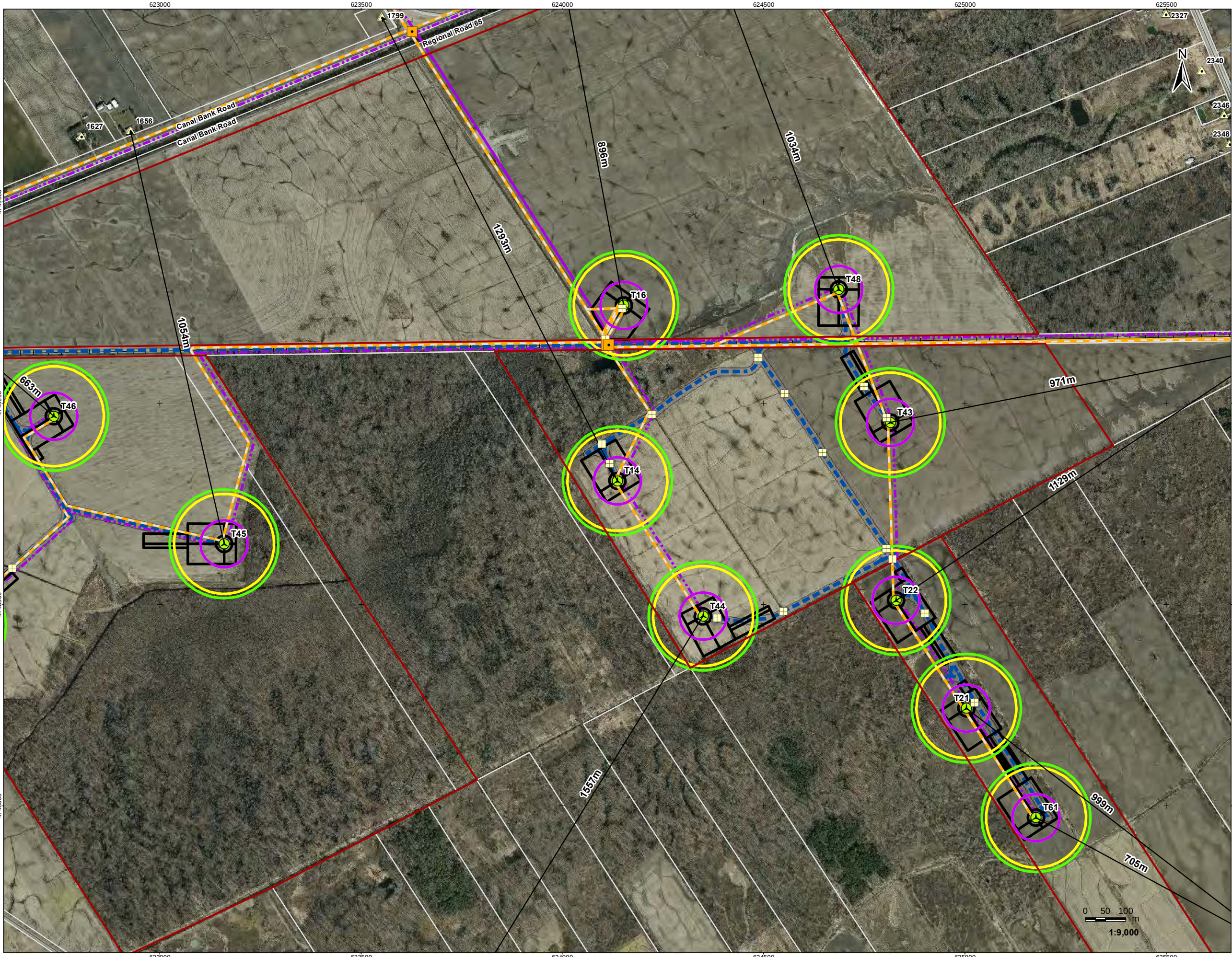
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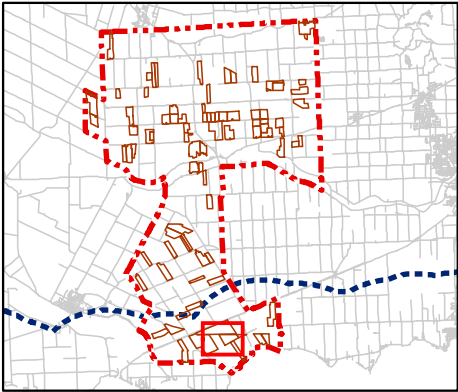
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Property Line Setback – T13**

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Revised: 2013-03-01 By: bcowper



Legend

- Project Study Area
- Participating Property
- Property Boundary
- Proposed Turbine Location
- Junction Box
- Proposed Culvert
- Turbine 58.6m Buffer (Blade + 10m)
- Turbine 124m Buffer (Hub Height)
- Turbine 135m Buffer (Hub Height)
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- Fibre Optic Line
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- Access Road 20m Construction Area



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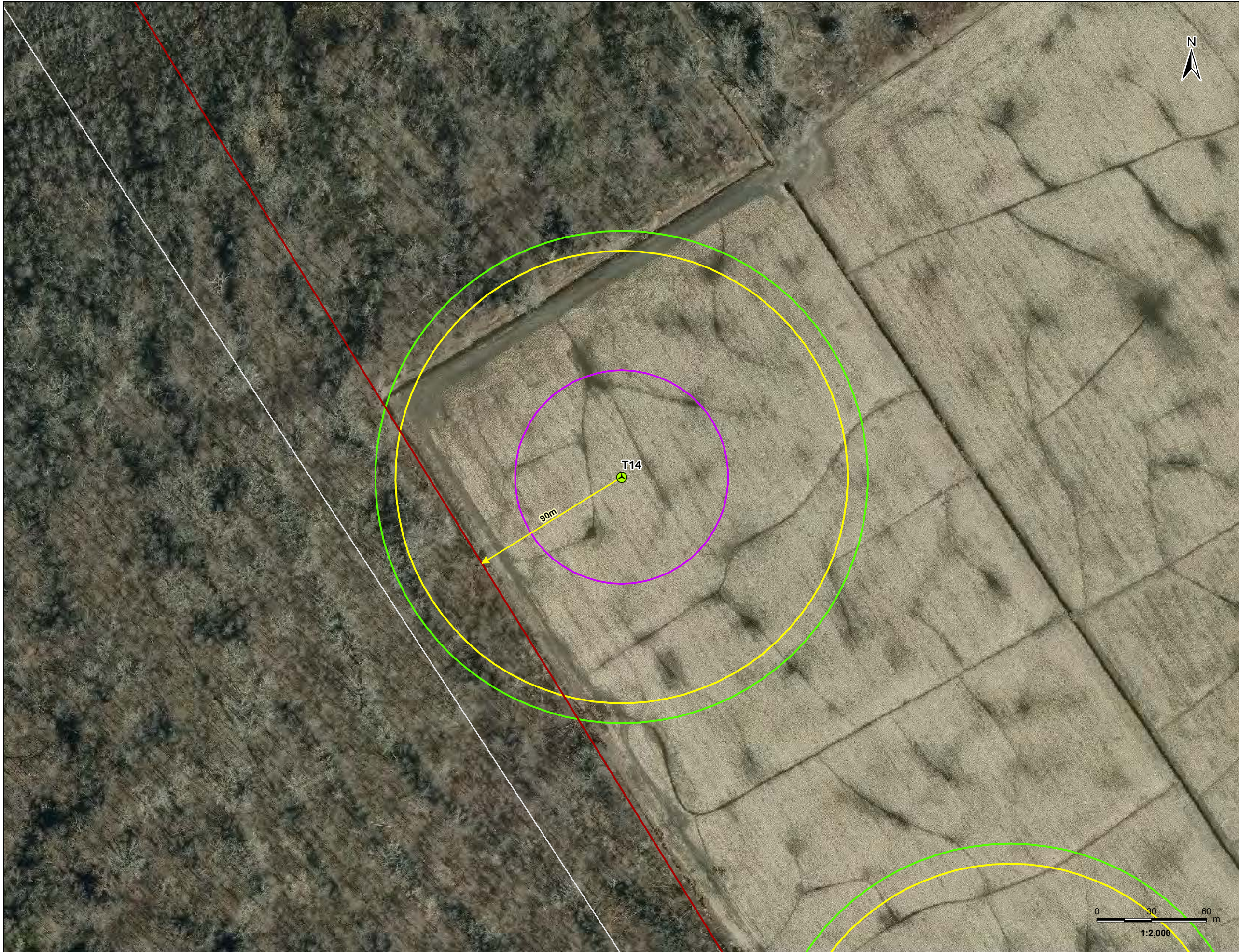
Figure No.

1.14

Title

**Overview Maps for Property
Line Setback Assessment –
T14**

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Revised: 2013-03-01 By: bcowper



Legend

- Project Study Area
- Participating Property
- Property Boundary
- Proposed Turbine Location
- Distance to Property Boundary
- Turbine 58.6m Buffer (Blade + 10m)
- Turbine 124m Buffer (Hub Height)
- Turbine 135m Buffer (Hub Height)
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- Participating Receptor
- Railway
- Road

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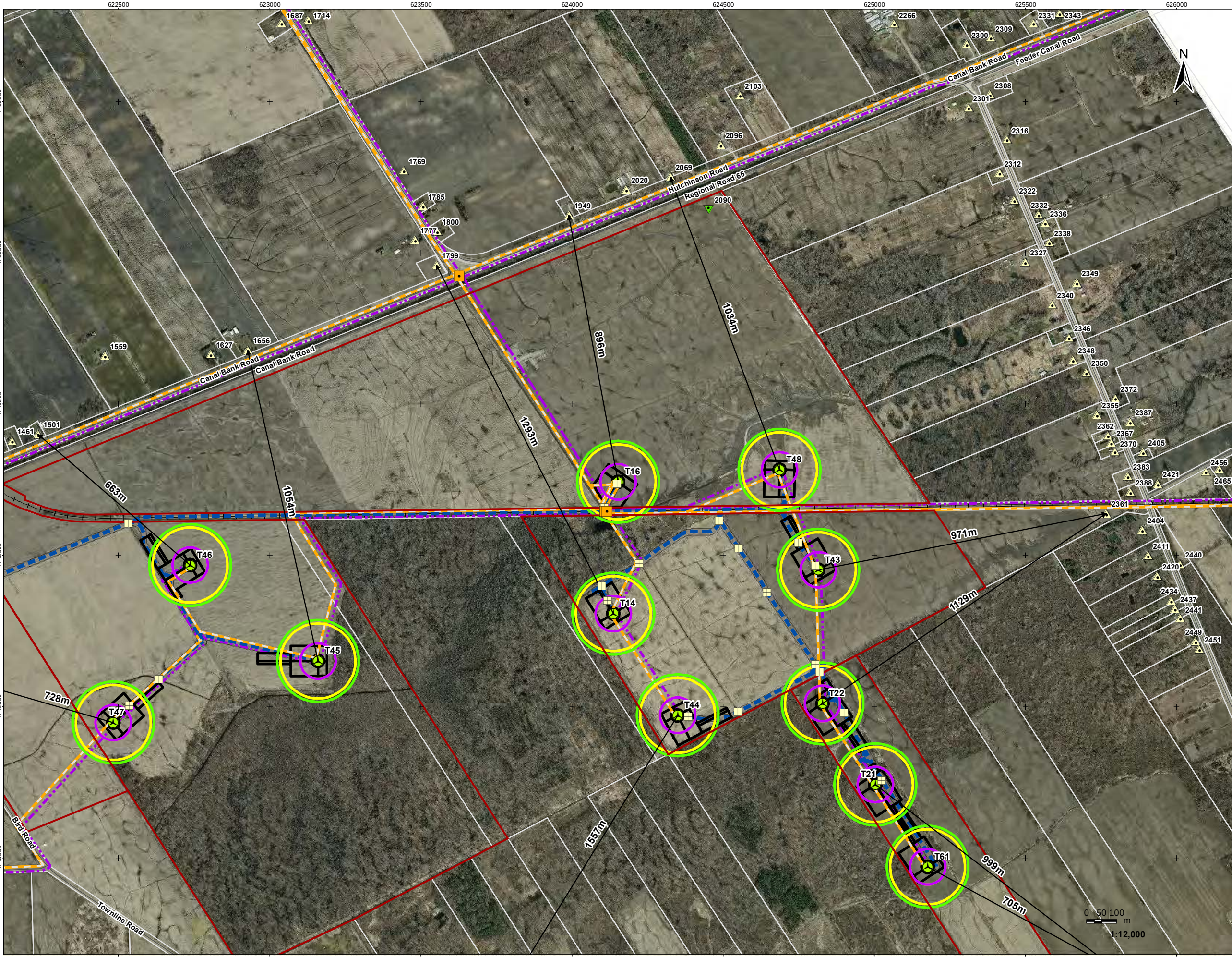
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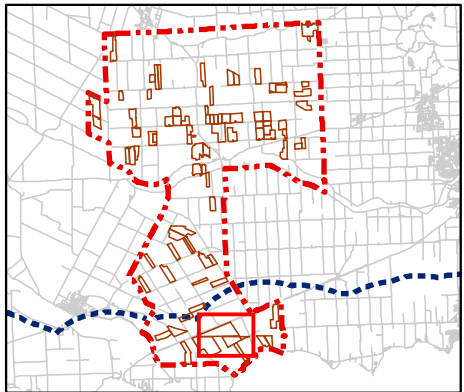
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Property Line Setback – T14**

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Revised: 2013-03-01 By: bcowper



Legend

- Project Study Area
- Participating Property
- Property Boundary
- Proposed Turbine Location
- Junction Box
- Proposed Culvert
- Turbine 58.6m Buffer (Blade + 10m)
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- Fibre Optic Line
- Temporary Laydown Area
- Access Road 20m Construction Area



Notes

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Figure No.

1.15

Title

**Overview Maps for Property
Line Setback Assessment –
T16**

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Revised: 2013-03-01 By: bcowper



Legend

- Project Study Area
- Participating Property
- Property Boundary
- Proposed Turbine Location
- Distance to Property Boundary
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- Participating Receptor
- Railway
- Road

Notes

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Figure No.
1.15a

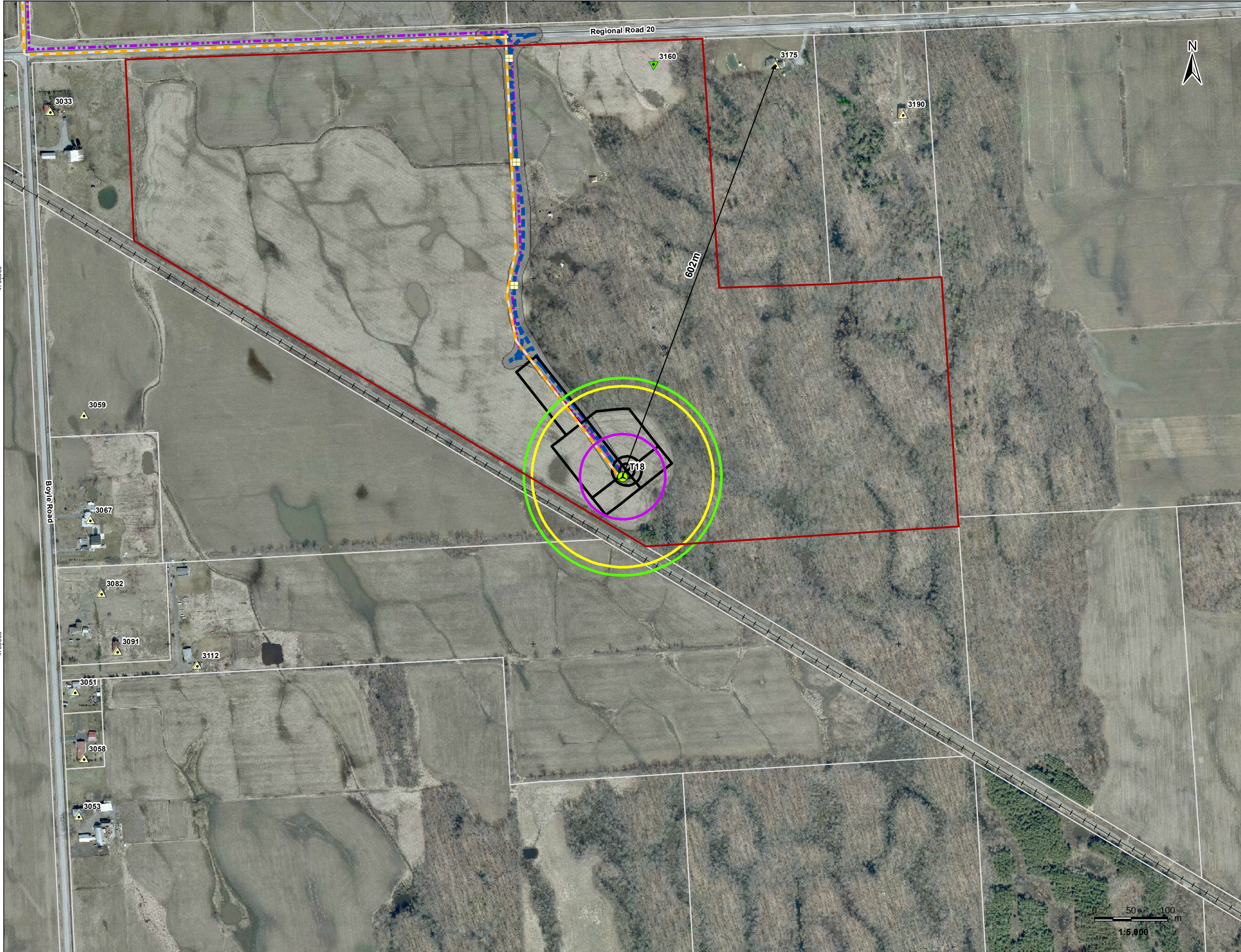
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Inset Maps for
Property Line Setback – T16

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Revised: 2013-04-17 By: bcowper

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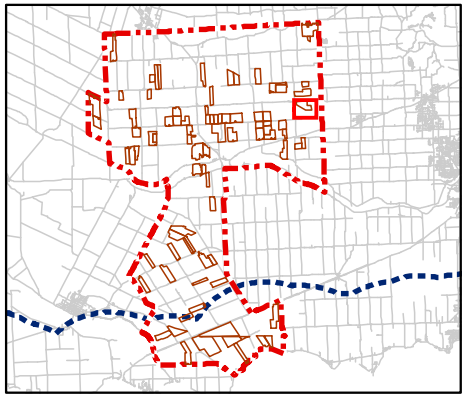
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629500 630000 630500



Legend

- Project Study Area
- Participating Property
- Property Boundary
- Proposed Turbine Location
- Junction Box
- Proposed Culvert
- Turbine 58.6m Buffer (Blade + 10m)
- Turbine 124m Buffer (Hub Height)
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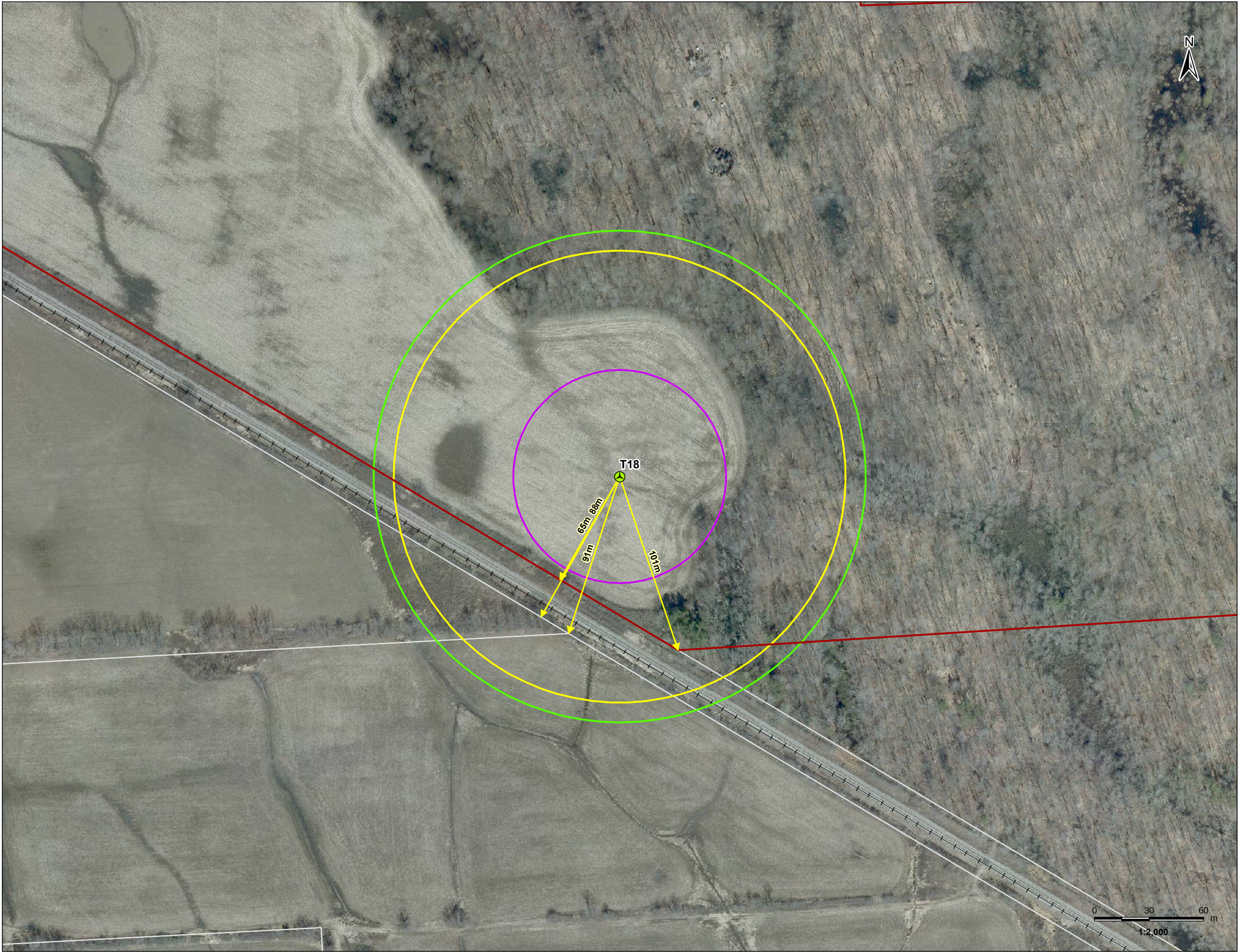
Figure No.

1.16

Title

**Overview Maps for Property
Line Setback Assessment –
T18**

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Revised: 2013-04-17 By: bcowper



Legend

- Project Study Area
- Participating Property
- Property Boundary
- Proposed Turbine Location
- Distance to Property Boundary
- Turbine 58.6m Buffer (Blade + 10m)
- Turbine 124m Buffer (Hub Height)
- Turbine 135m Buffer (Hub Height)
- Non-Participating Receptor
- Participating Receptor
- Railway
- Road

Notes

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



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Figure No.

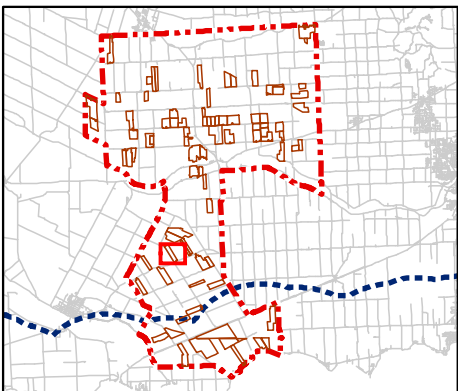
1.16a

Title

**Inset Maps for
Property Line Setback – T18**



- ### Legend
- Project Study Area
 - Participating Property
 - Property Boundary
 - Proposed Turbine Location
 - Junction Box
 - Proposed Culvert
 - Turbine 58.6m Buffer (Blade + 10m)
 - Turbine 124m Buffer (Hub Height)
 - Turbine 135m Buffer (Hub Height)
 - Non-Participating Receptor
 - Participating Receptor
 - Preferred Transmission Line Route
 - Alternate Transmission Route
 - Potential Access Road
 - Collector Lines - Underground or Overhead
 - Fibre Optic Line
 - Temporary Laydown Area
 - Access Road 20m Construction Area



Notes

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Figure No.
1.17

Title
**Overview Maps for Property
Line Setback Assessment –
T19**

V:\01609\Active\160950269\Planning\Drawing\mxd\20130212_REA_Property_Line_Report\160950269_Fig_1_Property_Line_Setback_Assessment_Hub_Dist_Mapbook.mxd
Revised: 2013-03-01 By: bcowper

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Revised: 2013-03-01 By: bcowper



Legend

- Project Study Area
- Participating Property
- Property Boundary
- Proposed Turbine Location
- Distance to Property Boundary
- Turbine 58.6m Buffer (Blade + 10m)
- Turbine 124m Buffer (Hub Height)
- Turbine 135m Buffer (Hub Height)
- Non-Participating Receptor
- Participating Receptor
- Railway
- Road

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Figure No.

1.17a

Title

**Inset Maps for
Property Line Setback – T19**

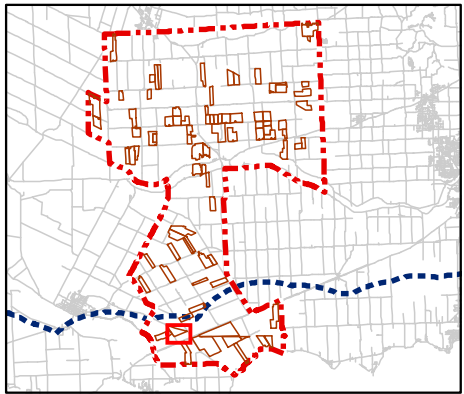
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Revised: 2013-03-01 By: bcowper



Legend

- Project Study Area
- Participating Property
- Property Boundary
- Proposed Turbine Location
- Junction Box
- Proposed Culvert
- Turbine 58.6m Buffer (Blade + 10m)
- Turbine 124m Buffer (Hub Height)
- Turbine 135m Buffer (Hub Height)
- Non-Participating Receptor
- Participating Receptor
- Preferred Transmission Line Route
- Alternate Transmission Route
- Potential Access Road
- Collector Lines - Underground or Overhead
- Fibre Optic Line
- Temporary Laydown Area
- Access Road 20m Construction Area



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Figure No.

1.18

Title

**Overview Maps for Property
Line Setback Assessment –
T20**

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Revised: 2013-03-01 By: bcowper



Legend

- Project Study Area
- Participating Property
- Property Boundary
- Proposed Turbine Location
- Distance to Property Boundary
- Turbine 58.6m Buffer (Blade + 10m)
- Turbine 124m Buffer (Hub Height)
- Turbine 135m Buffer (Hub Height)
- Non-Participating Receptor
- Participating Receptor
- Railway
- Road

Notes

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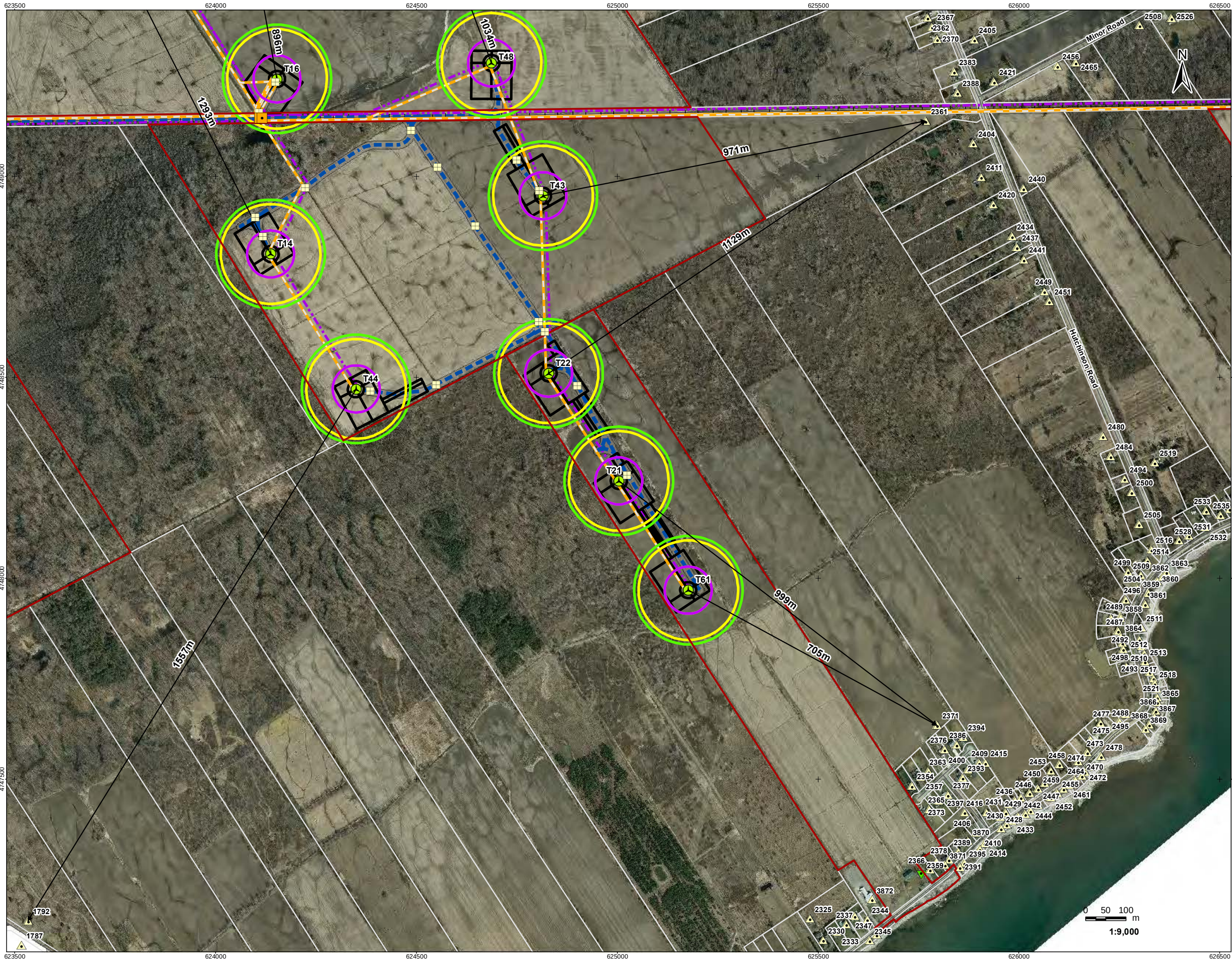
Figure No.

1.18a

Title

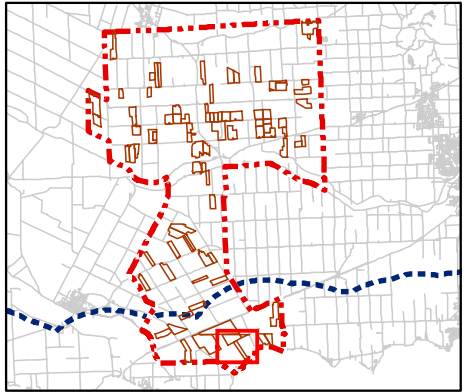
**Inset Maps for
Property Line Setback – T20**

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Revised: 2013-03-01 By: bcowper



Legend

- Project Study Area
- Participating Property
- Property Boundary
- Proposed Turbine Location
- Junction Box
- Proposed Culvert
- Turbine 58.6m Buffer (Blade + 10m)
- Turbine 124m Buffer (Hub Height)
- Turbine 135m Buffer (Hub Height)
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- Temporary Laydown Area
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Figure No.

1.19

Title

**Overview Maps for Property
Line Setback Assessment –
T21**

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Revised: 2013-03-01 By: bcowper



Legend

- Project Study Area
- Participating Property
- Property Boundary
- Proposed Turbine Location
- Distance to Property Boundary
- Turbine 58.6m Buffer (Blade + 10m)
- Turbine 124m Buffer (Hub Height)
- Turbine 135m Buffer (Hub Height)
- Non-Participating Receptor
- Participating Receptor
- Railway
- Road

Notes

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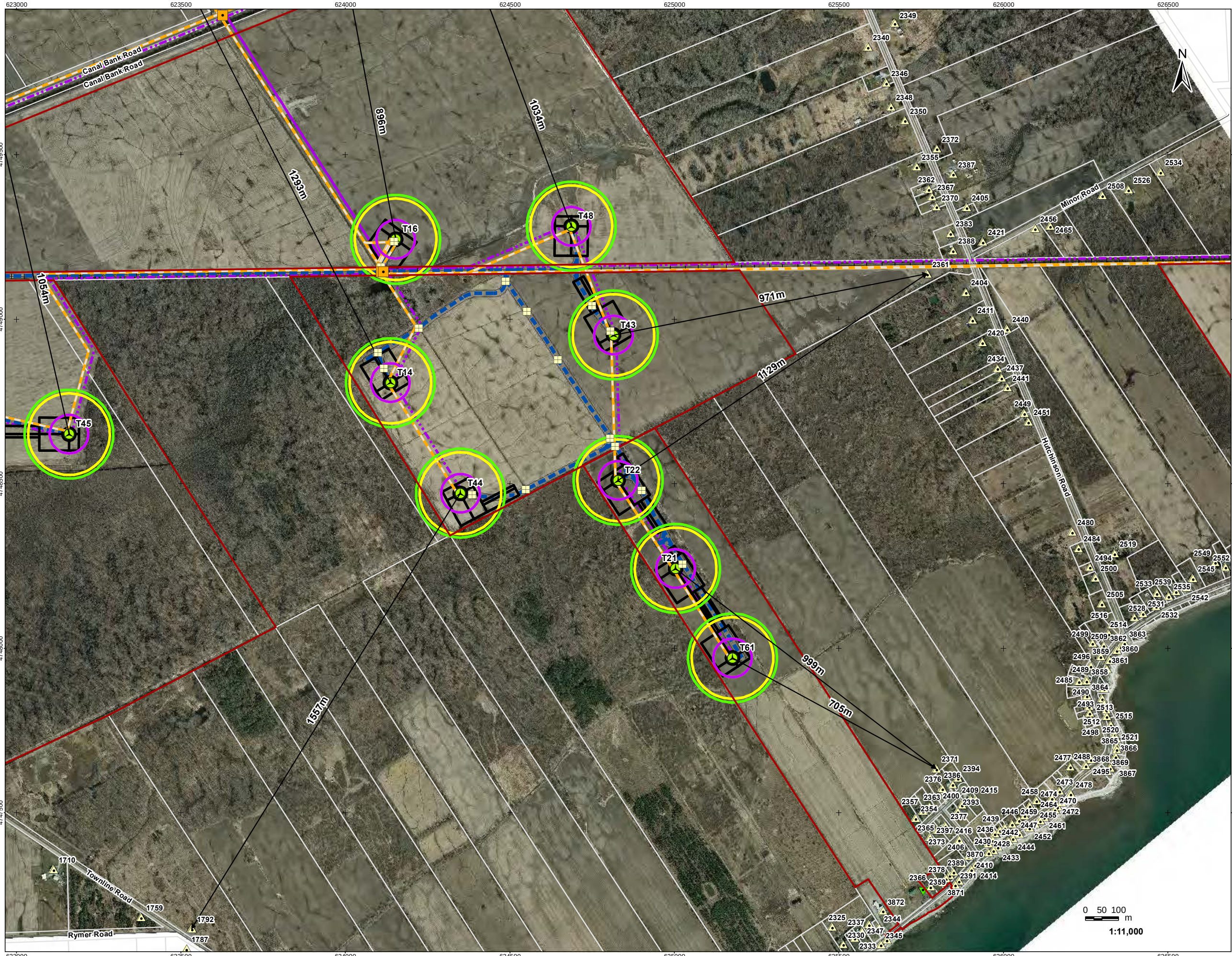
March, 2013
160950269

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Figure No.
1.19a

Title
**Inset Maps for
Property Line Setback – T21**

V:\01609\Active\160950269\Planning\Drawing\mxd\20130212_REA_Property_Line_Setback_Assessment_Hub_Dist_Mapbook.mxd
Revised: 2013-03-01 By: bcowper



Legend

- Project Study Area
- Participating Property
- Property Boundary
- Proposed Turbine Location
- Junction Box
- Proposed Culvert
- Turbine 58.6m Buffer (Blade + 10m)
- Turbine 124m Buffer (Hub Height)
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Notes

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1.20

Title

Overview Maps for Property
Line Setback Assessment –
T22