

Kent Breeze Corporation  
MacLeod Windmill Project Inc.

## KENT BREEZE WIND FARMS

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Design and Operations Report  
MAY 2010



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## 1. INTRODUCTION

The proposed project is a Class 4 wind facility (land based with a sound rating less than 107dBA) which will consist of eight 2.5MW GE 2.5xl wind turbines on 85 metre towers, for a total nameplate capacity of 20MW. During the operational phase of the project, the main physical components present are wind turbine structures; on-site access roads; underground concrete foundations; underground cabling; two electrical switching stations; and a meteorological testing tower (existing). Total lot coverage (ie. the area of land covered by the components outlined above) will be approximately 120,000 m<sup>2</sup>, or 2.8% of the project areas.

## 2. SITE PLANS

### 2.1 Drawings

**Appendix 1** to this report includes all of the necessary information outlining the existing conditions, proposed site layout, required setbacks, and conceptual design of all project components associated with the Kent Breeze Wind Farms. These drawings outline the required information in Table 1, Item 4, Requirement 1 of Ontario Regulation 359/09. The project is not located on or within 125 metres of any protected properties, archaeological and heritage resources, the Oak Ridges Moraine Conservation Plan Area, the Niagara Escarpment Plan area, the Protected Countryside of the Greenbelt area; or the Lake Simcoe watershed. Requirements 2 and 3 do not apply to this project.

### 2.2 Description

The following describes all of the buildings, structures, roads, utility corridors, rights of way and easements required in respect of the renewable energy generation facility, as well as the above uses that are situated within 300 metres of the facility:

Type	On-site	Within 300 metres
Buildings	1 existing dwelling to be used for temporary office purposes 1 existing machine shed to be used temporary storage purposes	Estate dwellings, farm dwellings and associated farm outbuildings (ie. barns/sheds). See map for specific number and location
Structures	8 proposed wind turbines to harness and generate electricity 2 proposed switching stations	Numerous Farm structures including grain bins, silos, greenhouses 1 existing manufacturing

	to collect generated electricity, meter electrical output, and input energy into HONI distribution lines	operation (see map)
Roads	7 proposed access roads totaling approximately 2978 metres in length and 6 metres in width	Various – all maintained and under the jurisdiction of the Municipality of Chatham-Kent
Utility Corridors	Hydro One Networks (HONI) 36kv overhead distribution line (see map)	Hydro One Networks (HONI) 36kv overhead distribution line (see map)
Rights-of-way	Canadian Pacific Railway (see map)	Canadian Pacific Railway (see map)
Easements	8800 metres of underground cabling	None

### 3. FACILITY DESIGN

The proposed turbines are summarized below, with specific details found within the [Technical Specifications Report](#) that is part of the overall REA application package.

Make and Model:	GE Energy 2.5xl
Name Plate Capacity:	2.5MW
Total Height:	135 metres
Hub Height above grade:	85 metres
Blade Length / Blade Sweep Area:	50 metres / 7854m <sup>2</sup>
Rotational Speeds:	5-14 rpm
Acoustic Emissions Data:	See <a href="#">Technical Specifications Report</a>

### 4. FACILITY OPERATIONS

The Kent Breeze Wind Farms will be controlled and monitored remotely via computer, with no continual human presence associated with the operations phase of the project. However, the project will maintain a minimum of one full-time personnel to co-ordinate ongoing maintenance, emergency response, and dispute resolution. Remote monitoring will include meteorological monitoring to determine operational decisions. During the operational phase of the projects, on-site activities will generally be limited mostly to scheduled maintenance. Activities that will or may occur during the operational phase of the projects includes:

- Periodic movement (weekly – monthly) of personnel (1-2 persons) via passenger truck to and from individual turbines along permanent access roads;

- Additional maintenance personnel as required to maintain and/or repair turbines, which may include limited use of heavy trucks and mobile cranes.
- Field monitoring for impacts to bird and bat populations within the first 3 years of operation;
- Tours of the facility for educational purposes;
- Field monitoring of equipment including performance measurements

## 5. ENVIRONMENTAL EFFECTS MONITORING PLAN

### 5.1 Process

This section gives detailed descriptions of the identified environmental **potential negative effect** expected during the operational phase of the projects and what the **performance objectives** are with respect to potential negative effect. Following each description are details of how the proponents will address any negative effects through **mitigation and impact management measures**. Next, a summarization of expected **net effects** will be outlined based on any mitigation and management measures. Such net effects will be described on the following basis consistent with Natural Resources Canada guidelines:

- Minimal – potential negative effects may be encountered during construction or decommissioning phase, but is otherwise no encountered during life of project;
- Low – potential negative effects may result in small deviations to the baseline data, but further commitments are not normally required;
- Medium – potential negative effects may result in significant but stable deviations to the baseline data, and further commitments through research, monitoring, should be considered;
- High – potential negative effects could create unsustainable impacts and are considered a concern. Further commitments should be considered to reduce effects.

Each subsection will conclude with a discussion of future monitoring and **commitments** where deemed necessary based on level of net effects.

### 5.2 Potential Negative Effects – Surface and Groundwater

#### 5.2.1 IMPACT

Negative environmental impacts to surface and ground water are not anticipated during the twenty year operational phase of the project. Scheduled maintenance of each wind turbine requires the replacement of gear and transformer oil on a periodic basis over the twenty year lifetime. However, there is a remote chance that spills or accidents could occur which may release oil to the surface of

the ground during the transport to and from the wind turbines. Impacts to water resources during construction and decommissioning phases are discussed in separate reports.

#### 5.2.2 PERFORMANCE OBJECTIVES

Ensure operations including handling gear and transformer oils is conducted in accordance with regulations with an emphasis on avoidance of accidental spills of hazardous substances.

#### 5.2.3 MITIGATION AND IMPACT MANAGEMENT MEASURES

During the operational phase any described negative environmental effects are accidental in nature and would be mitigated through safe maintenance and vehicle operations and employee training in handling of hazardous waste materials handling.

#### 5.2.4 NET EFFECT

The net effect of operating the wind farms on surface and ground water features is *minimal*.

#### 5.2.5 COMMITMENTS

Each vehicle and oil storage location will be equipped with an appropriate spill kit complete with absorbent materials and containment dams to limit contamination to surface or groundwater. Should a spill occur, contaminated soil and water will be removed from the site in accordance with O.Reg. 224/07 and O.Reg. 347/07.

### 5.3 Potential Negative Effects – Land

#### 5.3.1 IMPACT

Negative environmental impacts to land and soil resources are not anticipated during the twenty year operational phase of the project. Scheduled maintenance of each wind turbine requires the replacement of gear and transformer oil on a periodic basis over the twenty year lifetime. However, there is a remote chance that spills or accidents could occur which may release oil to the surrounding soils during the transport to and from the wind turbines. Impacts to land and soil resources during construction and decommissioning phases are discussed in separate reports.

#### 5.3.2 PERFORMANCE OBJECTIVES

Ensure operations including handling gear and transformer oils is conducted in accordance with regulations with an emphasis on avoidance of accidental spills of hazardous substances.

### 5.3.3 MITIGATION AND IMPACT MANAGEMENT MEASURES

During the operational phase any described negative environmental effects are accidental in nature and would be mitigated through safe maintenance and vehicle operations and employee training in handling of hazardous waste materials handling.

### 5.3.4 NET EFFECT

The net effect of operating the wind farms on land and soil resources features is *minimal*.

### 5.3.5 COMMITMENTS

If a spill occurs, commitments outlined in Section 5.2.5 will be followed by an excavation of all contaminated soil and disposal at a registered facility. Soil samples will then be undertaken to ensure a proper clean up has been expedited. Finally, the lands will be restored for agricultural purposes with clean fill and topsoil consistent in strata type and depth as adjacent surrounding lands.

## 5.4 Potential Negative Effects – Air and Noise

### 5.4.1 IMPACT

#### 5.4.1.1 Air pollutants

Air pollutants will be limited to emissions produced by the maintenance pickup trucks and the periodic use of transport trucks and cranes to replace large parts of the wind turbine over the operating life of the project.

#### 5.4.1.2 Greenhouse Gas Emissions

GHG's will be limited to those produced by the maintenance pickup trucks and the periodic use of transport trucks and cranes to replace large parts of the wind turbine over the operating life of the project.

#### 5.4.1.3 Dust / Odour

Dust and odour will be limited to those produced by the maintenance pickup trucks and the periodic use of transport trucks and cranes to replace large parts of the wind turbine over the operating life of the project.

#### 5.4.1.4 Construction / Maintenance Noise

There will be no construction noise during the operational phase of the project. Some heavy trucks and machinery may be required periodically for repairs and maintenance.

#### 5.4.1.5 Operational Noise

The operation of wind turbines creates audible sound. The Ontario Ministry of the Environment (MOE) requires that wind farm operations undertake a detailed noise impact assessment. The MOE outlines the criteria for such an assessment in its publication *Noise Guidelines for Wind Farms, Interpretation for Applying MOE NPC Publications to Wind Power Generation Facilities*, which was recently updated (October 2008). The Kent Breeze Wind Farms must comply with these guidelines in order to obtain the necessary Renewable Energy Approval under the Environmental Protection Act.

### 5.4.2 PERFORMANCE OBJECTIVES

#### 5.4.2.1 Air pollutants

Ensure minimal release of air pollutants during operational phase of projects.

#### 5.4.2.2 Greenhouse Gas Emissions

Ensure minimal release of ghg's during operational phase of projects.

#### 5.4.2.3 Dust/Odour

Ensure minimization of dust/odour during operational phase of projects.

#### 5.4.2.4 Construction / Maintenance Noise

Ensure minimization of maintenance noise during operational phase of projects.

#### 5.4.2.5 Operational Noise

To operate the wind farm in accordance with the Renewable Energy Approval, and to work with the complainant and regulatory authority to resolve complaints.

### 5.4.3 MITIGATION AND IMPACT MANAGEMENT MEASURES

#### 5.4.3.1 Air pollutants

None required during operational phase of projects.

#### 5.4.3.2 Greenhouse Gas Emissions

None required during operational phase of projects.

#### 5.4.3.3 Dust/Odour

None required during operational phase of projects.



#### 5.4.3.4 Construction / Maintenance Noise

The proponents will restrict hours of any maintenance and repairs that involve heavy machinery and equipment based on enforced municipal standards. The proponents will ensure effective mufflers are installed on all diesel exhausts.

#### 5.4.3.5 Operational Noise

Obtain MOE Renewable Energy Approval. The Kent Breeze Wind Farm and MacLeod Windmill Project Noise Assessment Report was completed to ensure compliance with the MOE Noise guidelines and obtaining the necessary Renewable Energy Approval.

The Study indicates compliance with the MOE Noise guidelines. The complete report can be found in **Tab 7** of the Kent Breeze Wind Farms Renewable Energy Approval Package.

### 5.4.4 NET EFFECT

#### 5.4.4.1 Air pollutants

*Minimal* during operational phase of projects.

#### 5.4.4.2 Greenhouse Gas Emissions

*Minimal* during operational phase of projects.

#### 5.4.4.3 Dust/Odour

*Minimal* during operational phase of projects.

#### 5.4.4.4 Construction / Maintenance Noise

*Minimal* during operational phase of projects.

#### 5.4.4.5 Operational Noise

The net effect of the project will be an increased level of audible noise. These projects comply with the Ministry of the Environment's Noise Guidelines and as such will result in the net effect of noise effects as *low*.

### 5.4.5 COMMITMENTS

#### 5.4.5.1 Air pollutants

None required relating to operational phase of projects.

#### 5.4.5.2 Greenhouse Gas Emissions

None required relating to operational phase of projects.

#### 5.4.5.3 Dust/Odour

None required relating to operational phase of projects.

#### 5.4.5.4 Construction / Maintenance Noise

The proponents will commit to any maintenance activities in accordance with local noise and hours of operation by-laws. In addition, the Dispute Resolution Protocol (Appendix 3) included with this report is a condition of REA by the Province.

#### 5.4.5.5 Operational Noise

The Dispute Resolution Protocol (Appendix 3) included with this report is a condition of REA by the Province. In addition, the proponents will work with MOE during operational inspections to determine compliance.

## 5.5 Potential Negative Effects – Natural Environment

### 5.5.1 IMPACT

#### 5.5.1.1 Wildlife

The Avian Impact Study specifically noted the bald eagle nesting location along the Thames River as a potential area of concern. However, the nesting location is located over 1.7km south of any proposed turbine locations.

#### 5.5.1.2 Fish

Small amounts of gearbox and transformer oil will be periodically transported to and from the wind turbines. Fish and fish habitat could be affected should spills of these substances occurs near ditches or waterways.

#### 5.5.1.3 Migratory Birds

During operational phases of the project there may exist a potential for negative effects to migratory birds. However, the vertical distribution of birds observed during spring migration were primarily (93%) identified within 40 metres of ground (ie. below blade swept area). In addition, the project areas include no staging areas for migratory birds.

#### 5.5.1.4 Bats

The NHS indicates that bat mortality is lowest in open grassland and farmland away from forests and shorelines. The NHS also indicates there are no known bat hibernacula or linear habitat features in the project areas.

### 5.5.2 PERFORMANCE OBJECTIVES

#### 5.5.2.1 Wildlife

Ensure that wind farm operations are located away from bald eagle nesting area (800 metres tertiary buffer zone from nest) and locate as much infrastructure as possible within cultivated fields.

#### 5.5.2.2 Fish

Ensure that wind farm infrastructure is located away from water resources and that any petroleum products used for turbine maintenance is handled and transported in a safe manner.

#### 5.5.2.3 Migratory Birds

Ensure that operation of turbines does not result in significant fatalities to migratory birds.

#### 5.5.2.4 Bats

Ensure that operation of turbines does not result in significant fatalities to bats or the destruction of bat habitat.

### 5.5.3 MITIGATION AND IMPACT MANAGEMENT MEASURES

#### 5.5.3.1 Wildlife

To mitigate any potential impacts on wildlife habitat, the wind farms have been designed to locate all project components including turbines, access roads, cabling and switching station outside of any woodlots located on the subject lands.

Recommended impact management measures related to ensuring the protection of the local bald eagles and their nest site(s) included:

- Placement of turbines at maximum practical distance from the noted nest locations, and the Thames River in general.

#### 5.5.3.2 Fish

During the operational phase any described negative environmental effects are accidental in nature and would be mitigated through safe transportation of hazardous waste materials handling.

#### 5.5.3.3 Migratory Birds

Mitigation efforts if required will be concluded based on post construction mortality surveys under supervision of the Ministry of Natural Resources. Should mortality rates prove to be unacceptable then the proponent will work with the MNR to reduce mortalities at the wind farm.

#### 5.5.3.4 Bats

Design mitigation measures for bats include locating wind turbines at least 50 metres from woodlots. All turbines are located in excess of 125 metres from any woodlot in the project areas.

Operational mitigation measures for bat mortality will consist of changing the wind turbine cut-in speed, or feathering of wind turbine blades, where post-construction monitoring identifies a significant impact (see Section 5.5.4.4).

#### 5.5.4 NET EFFECT

##### 5.5.4.1 Wildlife

It is anticipated based on the recommended mitigation and impact management measures and subsequent wind farm design that the net effects to any faunal wildlife will be *low*.

In regards to the bald eagle nesting locations, the initial Avian Impact Study included studying lands for potential project components south of Longwoods Road and adjacent to the Thames River. Subsequent wind farm design work has removed lands south of Longwoods Road from the project area and placed the nearest turbine approximately 1.7 kilometres from the identified bald eagle nesting site. Based on these mitigation measures, the expected net effects of the operational phase of the project to bald eagles and their nesting sites in the area is *low*.

##### 5.5.4.2 Fish

The expected net effects to fish habitat are *minimal* as a result of the operational phase of the projects.

##### 5.5.4.3 Migratory Birds

Based on the monitoring conducted on-site and location and features of Study Area, there is no obvious reason to expect significant occurrence of migratory birds, particularly at turbine height, in the Project Area. As such the expected net effects to migratory birds are *low*.

##### 5.5.4.4 Bats

Based on the background research and placement of turbines almost 3 times beyond the recommended 50 metre setback, it is expected the net effect to bats and bat habitat will be *minimal*.

#### 5.5.5 COMMITMENTS

##### 5.5.5.1 Wildlife

Future commitments for determining effects to wildlife include additional field monitoring efforts conducted in the first year of operations (See Section 5.5.5.3). Details of such commitments will be confirmed by the Province, in consultation with the local conservation authorities and/or Environment Canada – Canadian Wildlife Service.

##### 5.5.5.2 Fish

Each vehicle and oil storage location will be equipped with an appropriate spill kit complete with absorbent materials and containment dams to limit contamination to fish habitat. Should a spill occur, contaminated soil and water will be removed from the site in accordance with O.Reg. 224/07 and O.Reg. 347/07.

#### 5.5.5.3 Migratory Birds

The Environmental Effects Monitoring Plan for bats and birds is attached as Appendix 5 to this report and was submitted to the Ministry of Natural Resources (MNR) on July 9, 2010. MNR has stated that this report may be reviewed separately provided that final REA approval is not given prior to their approval of the Monitoring Plan.

#### 5.5.5.4 Bats

The Environmental Effects Monitoring Plan for bats and birds is attached as Appendix 5 to this report and was submitted to the Ministry of Natural Resources (MNR) on July 9, 2010. MNR has stated that this report may be reviewed separately provided that final REA approval is not given prior to their approval of the Monitoring Plan.

## 5.6 Potential Negative Effects – Resources

### 5.6.1 IMPACT

#### 5.6.1.1 Prime Agricultural Lands

The project components will require approximately 75,000 m<sup>2</sup> of Canada Land Inventory Class 2 soils to be taken out of agricultural production.

#### 5.6.1.2 Agricultural Production

The owners will lose approximately 1.7% of their lands that are currently used for cash crop purposes.

### 5.6.2 PERFORMANCE OBJECTIVES

#### 5.6.2.1 Prime Agricultural Lands

Protect soils for continued agricultural use consistent with pre-construction farming types and activities.

#### 5.6.2.2 Agricultural Production

Use only approximately 75,000 m<sup>2</sup> to allow owner of lands to farm lands efficiently and to its fullest potential.

### 5.6.3 MITIGATION AND IMPACT MANAGEMENT MEASURES

#### 5.6.3.1 Prime Agricultural Lands

All topsoil excavated will be used elsewhere on-site for agricultural improvements where possible.

#### 5.6.3.2 Agricultural Production

Access roads will be designed in a manner that minimizes the length required and locates them as close to the edge of cultivated fields as possible. During the operational phase of the projects, all access roads will be reduced to a minimum width required to safely operate standard maintenance vehicles (ie. pick-up truck).

#### 5.6.4 NET EFFECT

##### 5.6.4.1 Prime Agricultural Lands

The proposed mitigation measures will result in a net effect on prime agricultural lands which is *minimal*.

##### 5.6.4.2 Agricultural Production

The proposed mitigation measures will result in a net effect on agricultural production which is *minimal*.

#### 5.6.5 COMMITMENTS

##### 5.6.5.1 Prime Agricultural Lands

None required for operational phase of projects.

##### 5.6.5.2 Agricultural Production

None required for operational phase of projects.

## 5.7 Potential Negative Effects – Socio-Economic

#### 5.7.1 IMPACT

##### 5.7.1.1 Adjacent Land Uses

- The presence of large scale wind turbines on the landscape will alter the view of surrounding landowners.
- While the erection of large scale wind turbines may impact the ability of erecting large scale turbines on adjacent properties, there are no planned turbines within the Study

##### 5.7.1.2 Traffic

There are no expected traffic impacts during the operation phase of the project. Any such traffic between access roads and public rights-of-way would be sporadic in nature and similar to normal farming activities in the general area.

##### 5.7.1.3 Public health and Safety

- Mechanical failure and catastrophic failure of the turbines may result in threats to public health and safety due to falling ice or turbine collapse.

## 5.7.2 PERFORMANCE OBJECTIVES

### 5.7.2.1 Adjacent Land Uses

Ensure that wind farm information is made available to determine impacts on prospective future renewable energy developments.

### 5.7.2.2 Traffic

Ensure a safe interaction between motor vehicles travelling on adjacent public roads, and service vehicles entering and exiting private turbine access roads.

### 5.7.2.3 Public Health and Safety

- Site turbines in a manner that reduces impacts of falling ice and catastrophic failure to a level where the risk to human safety is considered negligible.

## 5.7.3 MITIGATION AND IMPACT MANAGEMENT MEASURES

### 5.7.3.1 Adjacent Land Uses

- The issue of the turbines impact on a rural landscape is subjective in nature. The subject lands are not part of any significant cultural heritage landscape. Additional studies have been completed to determine the impacts of the scale of the turbines on neighbouring land uses as it relates to public health and safety.
- No mitigation or impact management measures are proposed for wind farm development rights as there are no planned projects within the Study Area.

### 5.7.3.2 Traffic

None required during operational phase of projects.

### 5.7.3.3 Public Health and Safety

- Compliance with the Provincial regulations with respect to setbacks from public roads and sensitive land uses (ie. dwellings) results in extremely low risk of mechanical failure or catastrophic failure. The agricultural setting is common for large-scale wind turbines as a means to avoid areas of high human activity.

## 5.7.4 NET EFFECT

### 5.7.4.1 Adjacent Land Uses

- The net effect of project during operation will be low from the standpoint that the project areas are all agricultural lands with no significant viewsheds being altered.
- The net effect on wind development rights is considered minimal.

### 5.7.4.2 Traffic

The impacts of traffic during the operational phase of the project on surrounding roads are typical of land use activities in the area and therefore considered to have *minimal* net effect.

#### 5.7.4.3 Public health and Safety

- The agricultural field settings which exhibit limited human activity, combined with the Provincial setbacks, and the extremely low probability of mechanical or catastrophic failure results in a net effect of this development on public health and safety which is minimal.

#### 5.7.5 COMMITMENTS

##### 5.7.5.1 Adjacent Land Uses

- There are no proposed future commitments to address any net effect of the visual impact of the project components, as they relate to aesthetics. The Dispute Resolution Protocol discussed later in this report, is intended to address any potential public health and safety issues.
- There are no proposed future commitments to address any net effect on wind development rights.

##### 5.7.5.2 Traffic

None required for operational phase of projects.

##### 5.7.5.3 Public health and Safety

- The Response Protocol outlined later in this report as required by the Province to address issues related to response measures and funding for any specialized equipment/training of municipal emergency response team.

## 5.8 Potential Negative Effects – Heritage and Culture

### 5.8.1 IMPACT

Impacts to archaeological resources are discussed in the Construction Plan Report and are not relevant at the operational phase of the projects. Impacts to cultural heritage resources as a result of operations of the wind farms are subjective, but could be considered negative based on visual impacts. However, based on background research there are no identified protected heritage properties or cultural heritage resources identified by the Municipality within the vicinity of the project areas. The closest designated heritage properties within Chatham-Kent are 3 London Road (Thamesville Library), located in the centre of Thamesville approximately 3.8 kilometres east of the closest proposed turbine location. The next closest designated heritage property is 29251 Uncle Tom Road (Josiah Henson House) located approximately 15 kilometres east of the closest proposed turbine location.

### 5.8.2 PERFORMANCE OBJECTIVES

Ensure wind turbine operations do not interfere with the public enjoyment of designated built heritage sites and facilities, or cultural heritage landscapes.



### 5.8.3 MITIGATION AND IMPACT MANAGEMENT MEASURES

Not relevant to operational phase of projects for archaeological resources. No considerations for heritage resources based on there being none present within the vicinity of the subject areas.

### 5.8.4 NET EFFECT

The net effect to archaeological resources is considered *minimal* given the mitigation measures used to document and recover any potential materials during the construction phase of the projects. The net effect to cultural heritage resources is considered *minimal* given the absence of such resources within the vicinity of the project areas.

### 5.8.5 COMMITMENTS

None required for operational phase of projects.

## 5.9 Potential Negative Effects – Radiocommunication, Radar and Seismo-acoustic Systems

### 5.9.1 IMPACT

#### 5.9.1.1 Electro Magnetic Interference

The operation of the wind turbines may cause electro-magnetic interference with point-to-point systems, particularly in the form of direct-to-home (DTH) satellite systems. A detailed study of existing DTH satellite systems was not undertaken, but a worst-case scenario analysis was used, assuming all off-site dwellings to potential DTH satellite system locations.

### 5.9.2 PERFORMANCE OBJECTIVES

#### 5.9.2.1 Electro Magnetic Interference

Site wind turbines an adequate distance from all likely DTH satellite systems (ie. dwellings).

### 5.9.3 MITIGATION AND IMPACT MANAGEMENT MEASURES

#### 5.9.3.1 Electro Magnetic Interference

Based on past research on wind turbine interference to DTH systems, particularly those in Southern Ontario, a typical satellite angle (20° - 30°) combined with wind turbine height (140m) would produce a setback of 240-385 metres required to not interfere with DTH satellite signals. As such, the Provincial regulations requiring a minimum 550 metre setback from noise receptors is an effective mitigation measure to avoid electro-magnetic interference in most instances.

#### 5.9.4 NET EFFECT

##### 5.9.4.1 Electro Magnetic Interference

Compliance with the Provincial regulations and proper siting of the turbines will result in a *minimal* net effect to electro-magnetic signals in the Project Area.

#### 5.9.5 COMMITMENTS

##### 5.9.5.1 Electro Magnetic Interference

None proposed for operational phase of projects.

## 6. EMERGENCY RESPONSE AND COMMUNICATIONS PLAN

### 6.1 Emergency Management

Emergency management establishes safety practices in response to risks associated with injury to persons or damage/loss to property. The local fire, police and ambulance services are trained for the majority of emergency response situations associated with wind farms, with the possible exception of situations involving high angle rescue. **Appendix 2** to this report outlines the emergency response protocol.

### 6.2 Dispute Resolution

The Dispute Resolution Protocol is based on the principle that two parties should work together to resolve their disputes. This process provides a protocol for neighbours living within the study area of the Kent Breeze Wind Farms (hereafter referred to as the Neighbours) and the operators of the Kent Breeze Wind Farms (hereafter referred to as the Operators) to resolve concerns related to noise. The protocol is intended to expeditiously resolve concerns locally and encourage positive relationships within the Municipality. The protocol will be effective for the operating phase of the projects. The Dispute Resolution Protocol can be found in **Appendix 3** to this report.

### 6.3 Communications Plan

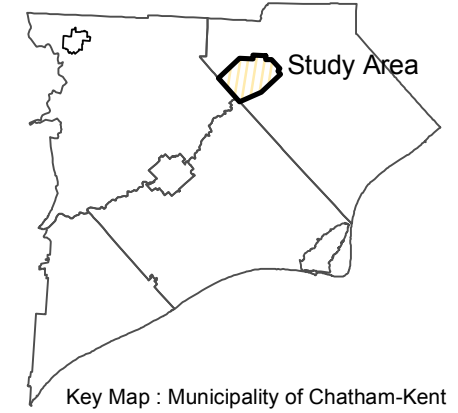
**Appendix 4** outlines the Operators Communications Plan. During the operational phase of the projects, the owners will make available the appropriate contact information including telephone numbers, mailing information, and email addresses. This information will connect parties with the appropriate on-site or on-call operators responsible for operations of the projects. This information will be made available in the following manners:

- Contact information posted strategically on-site at suitable locations such as switching stations and operations buildings;
- Forwarded to the Municipality of Chatham-Kent with all necessary revisions forwarded as necessary (ie. Change in personnel, change in contact info);
- Forwarded to all members of the public as identified on the public consultation mailing list with all necessary revisions forwarded as necessary (ie. Change in personnel, change in contact info);

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## APPENDIX 1 – CONCEPTUAL SITE PLANS

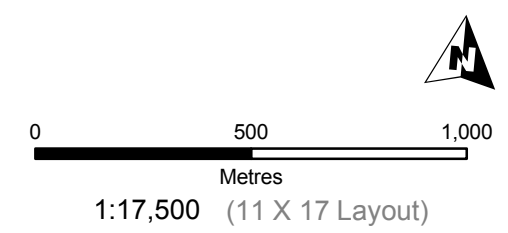
# Kent Breeze Wind Farms & Macleod Windmill Project



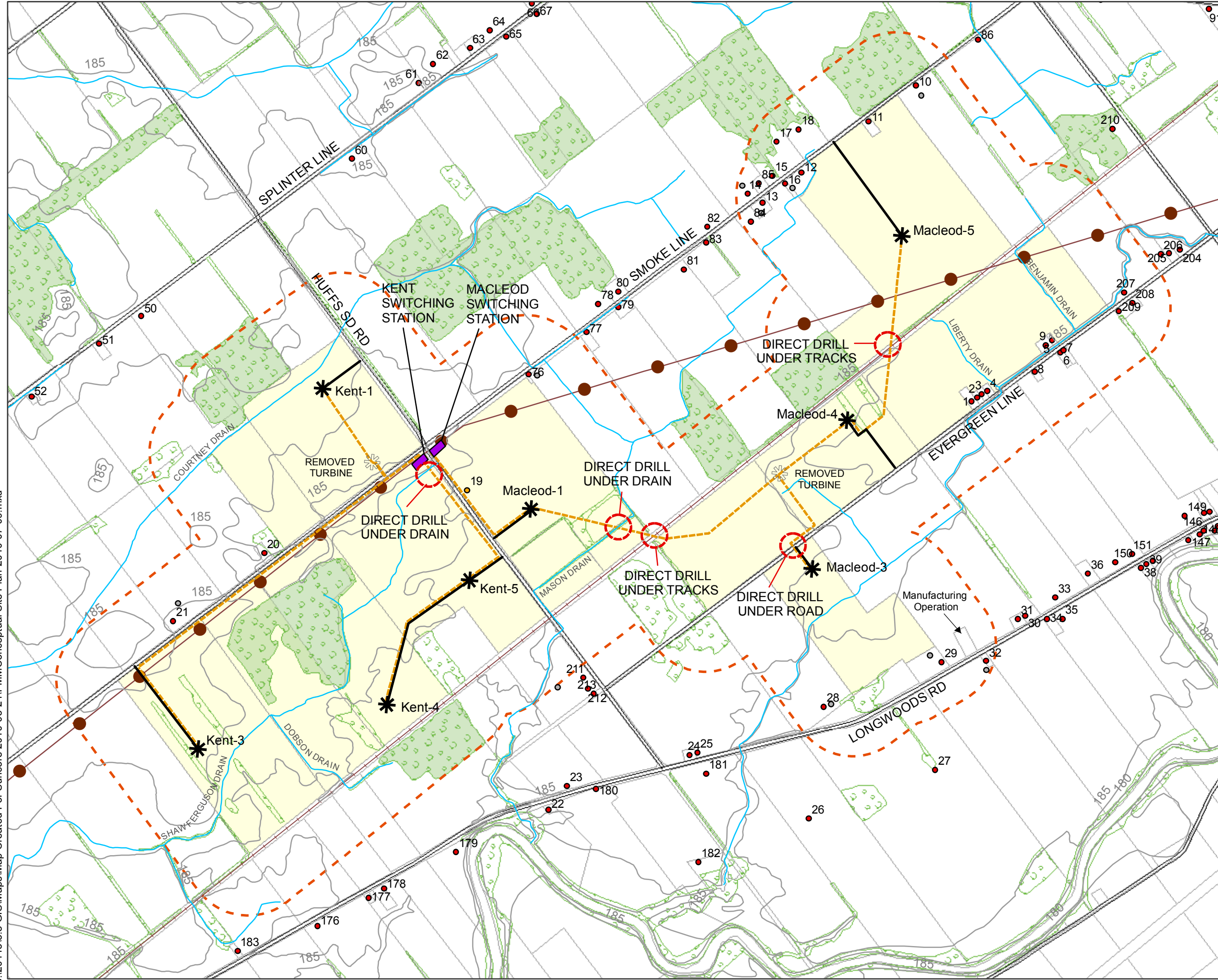
## Conceptual Site Plan

### Legend

- Turbine
- Removed Turbine
- Points of Reception
- Points of Reception (Participating)
- Farm Buildings
- Access Road
- Underground Cable
- Utility Line
- 300m Project Area Buffer
- Significant Woodlot (As per Official Plan)
- Other Vegetation
- Contour Line
- Railroad
- Road
- Watercourse
- Agriculture

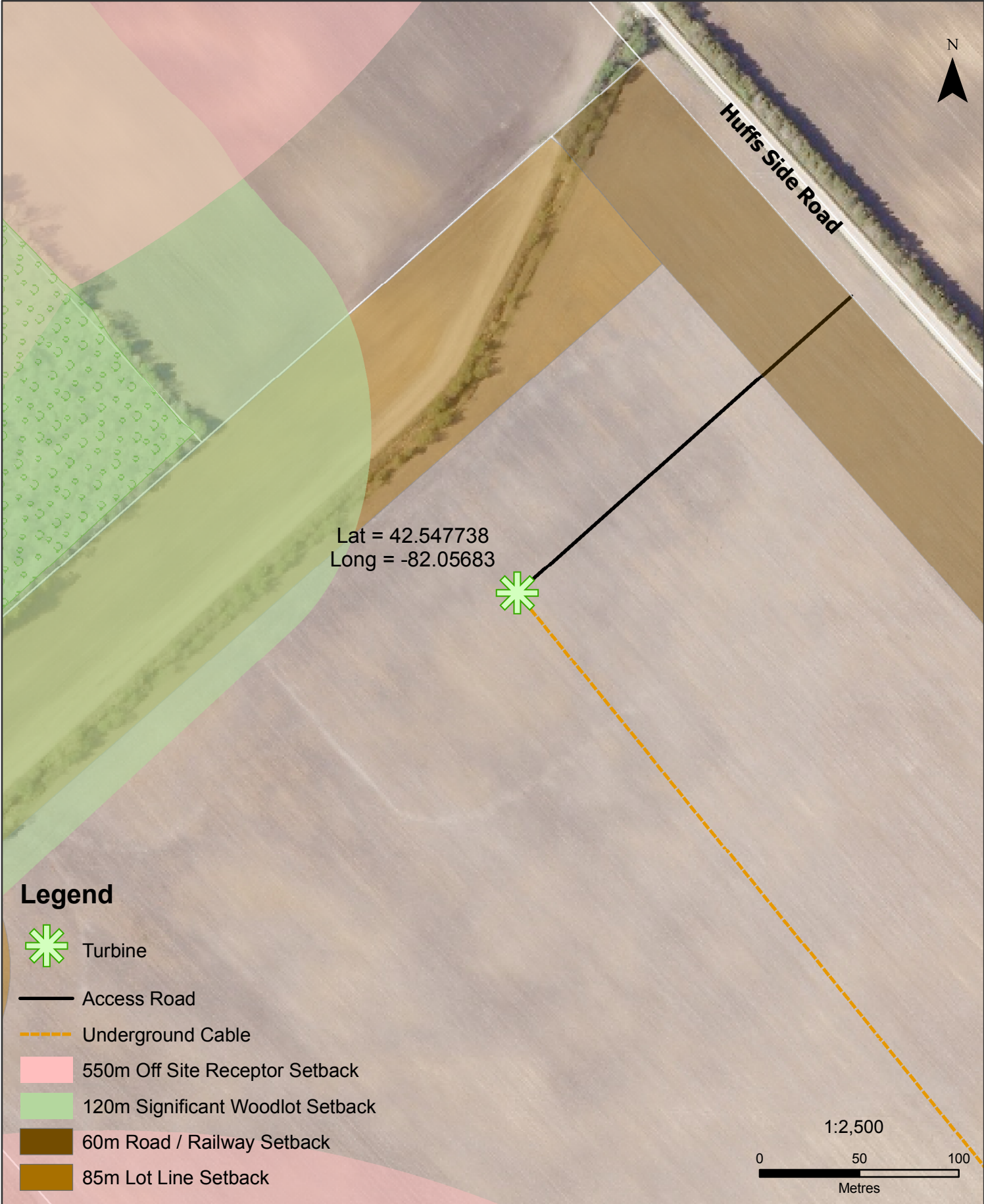


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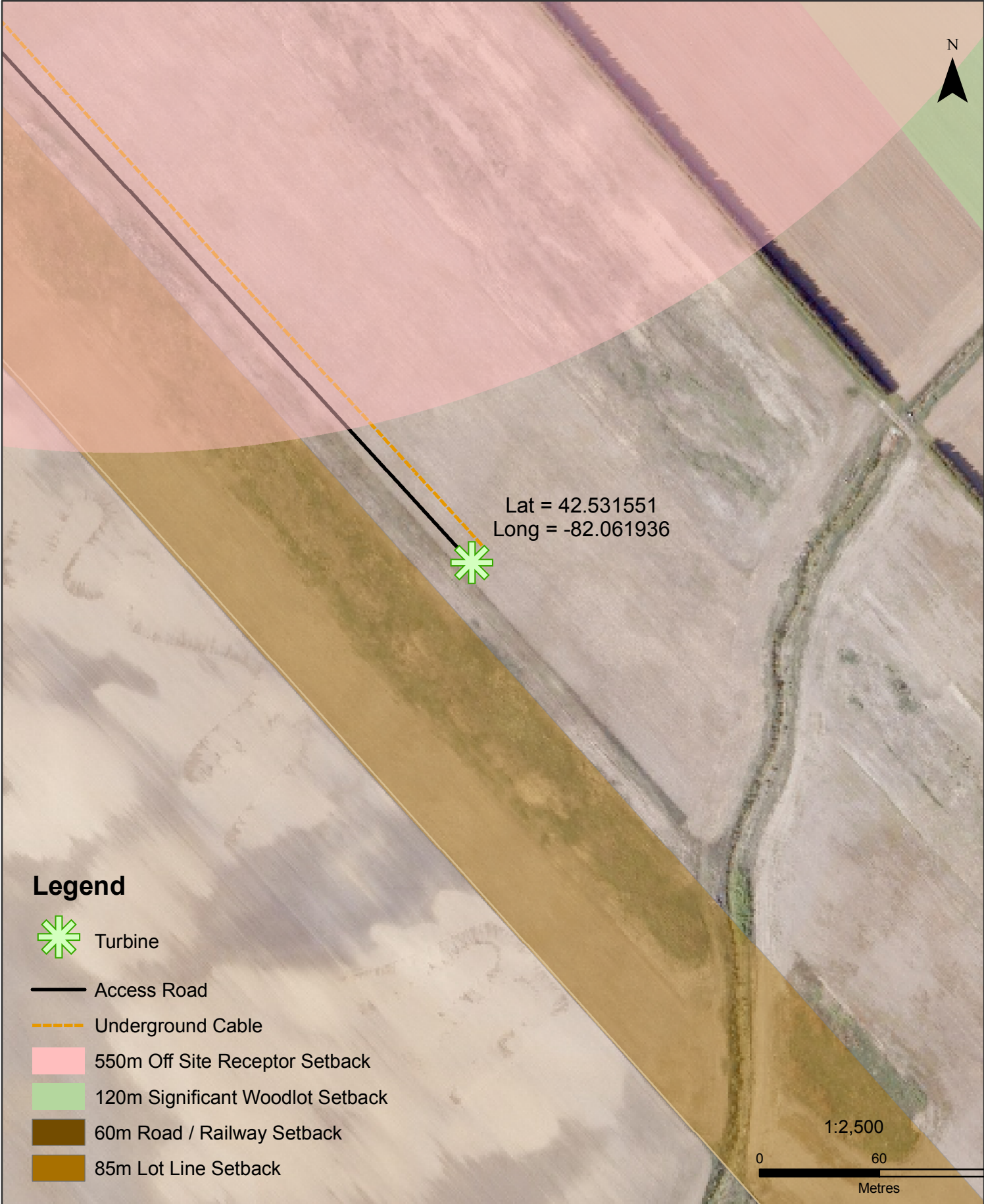


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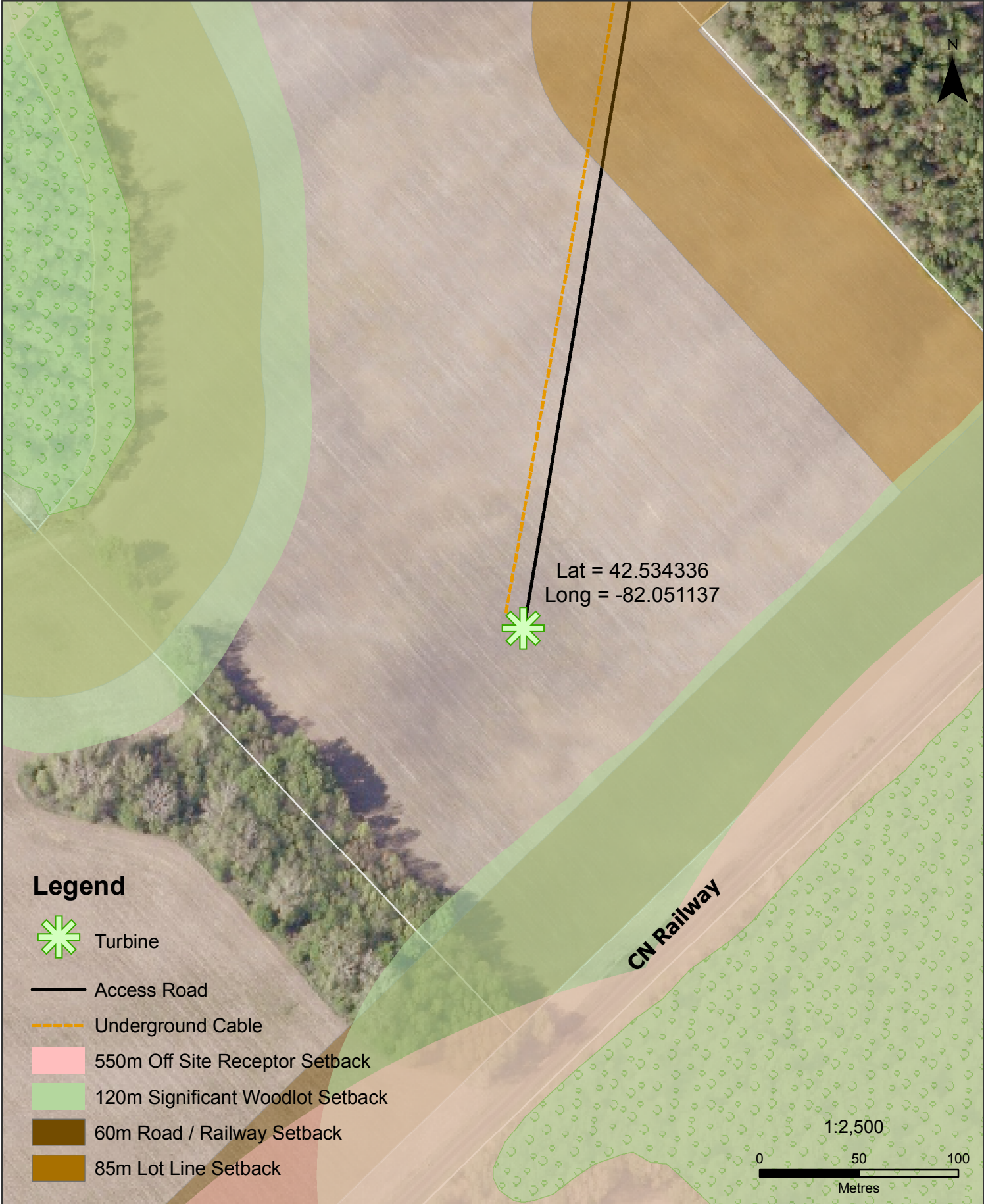
# Kent-1 Detailed Location



# Kent-3 Detailed Location



# Kent-4 Detailed Location

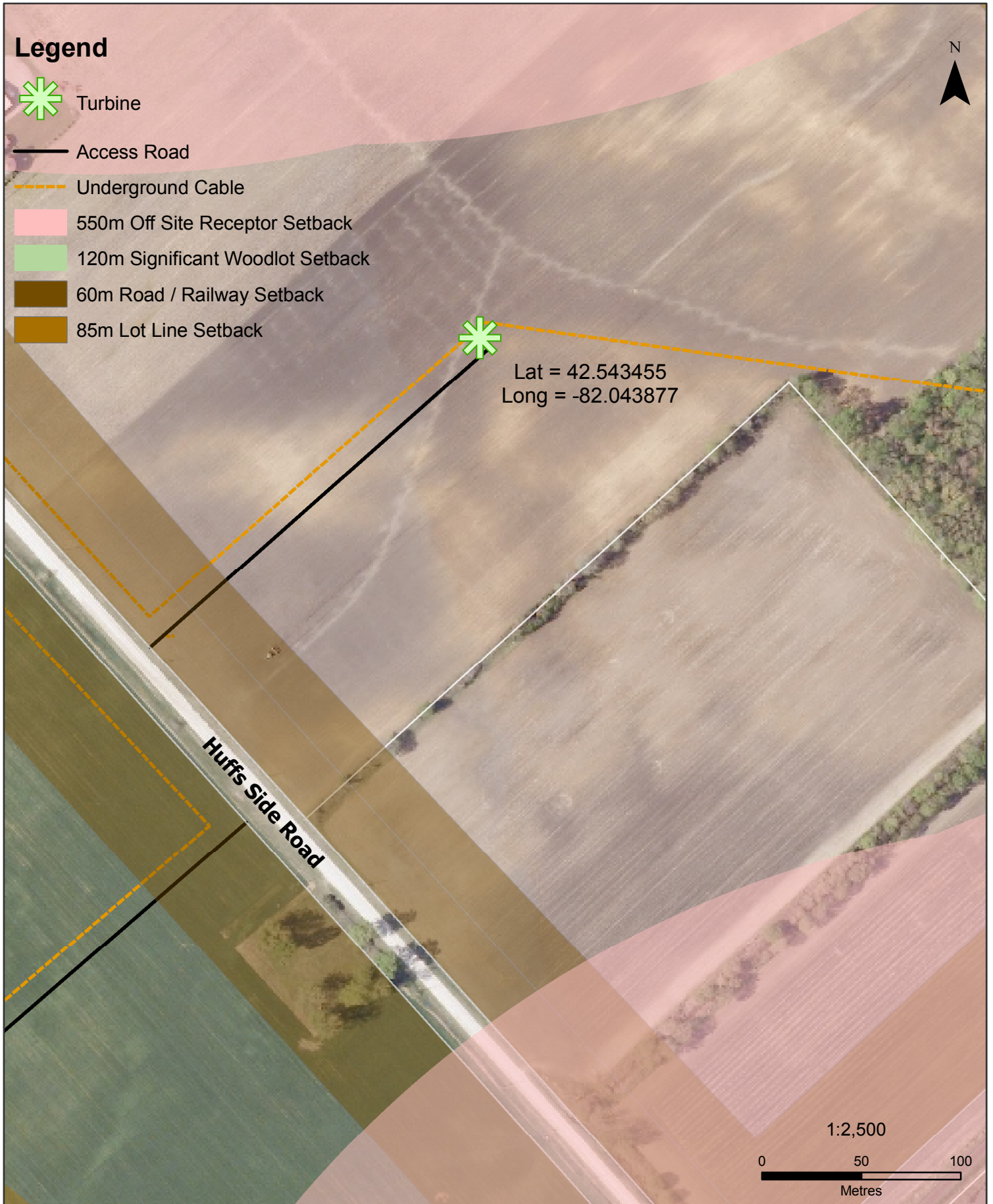




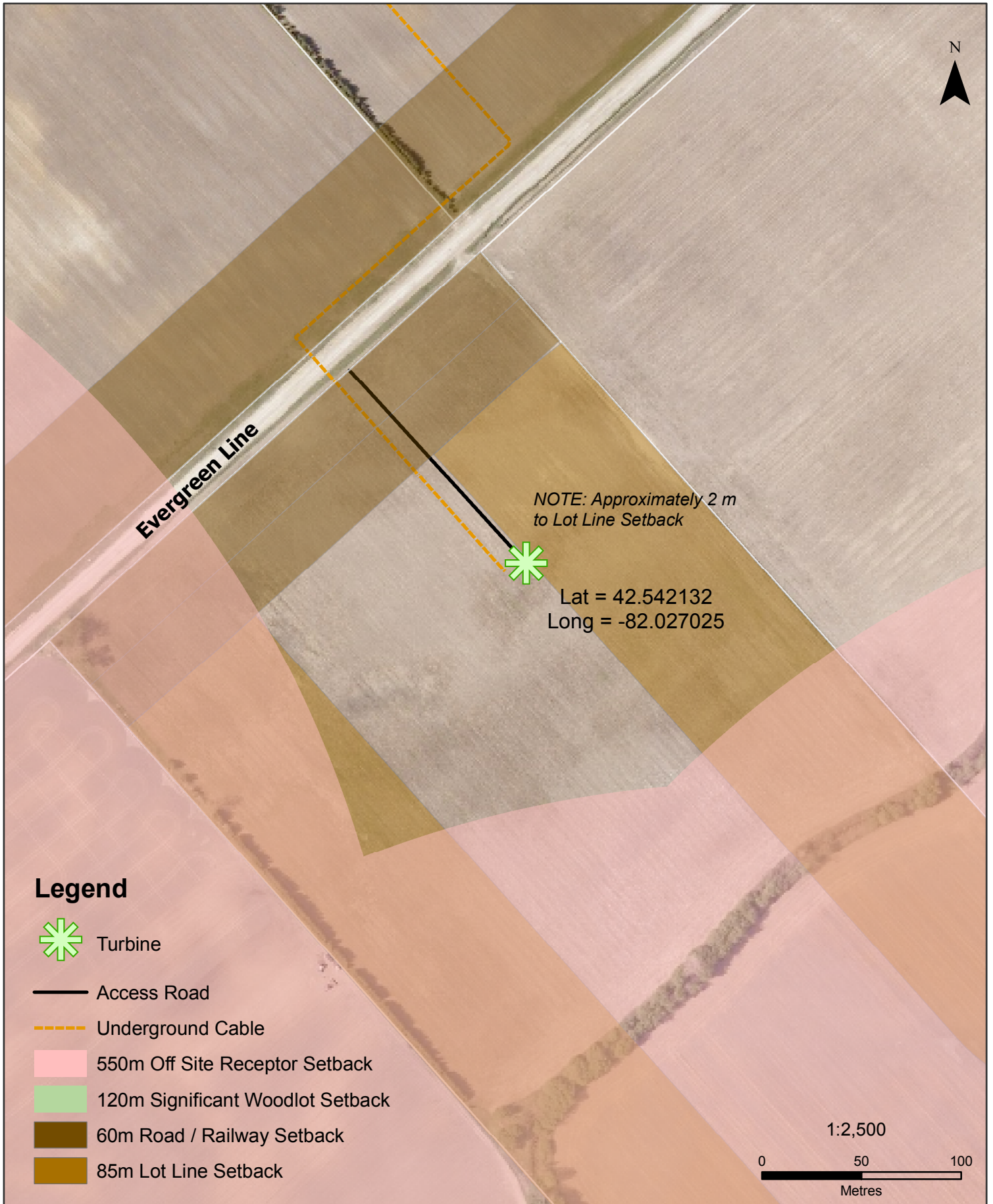
# Kent-5 Detailed Location



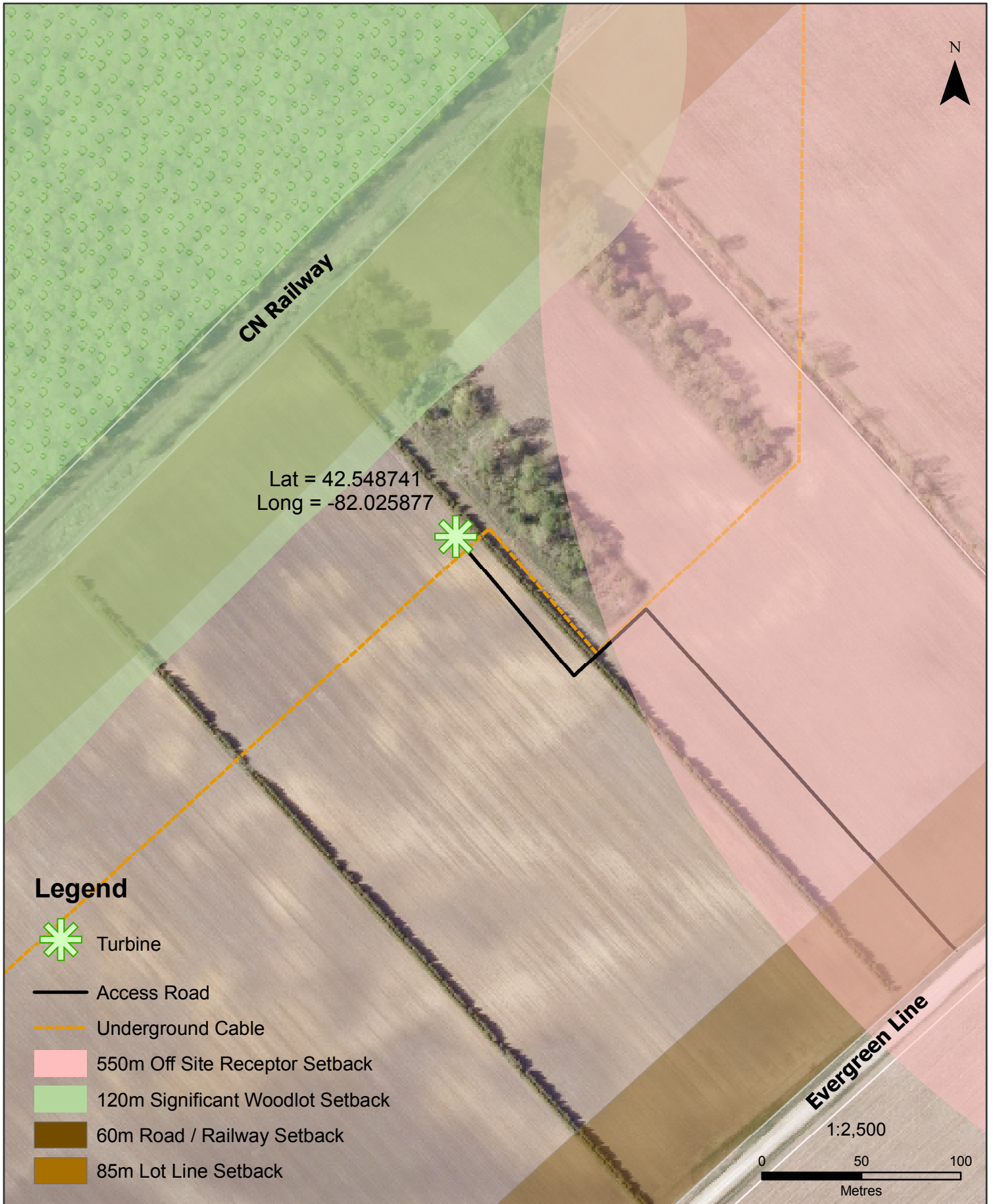
# Macleod-1 Detailed Location



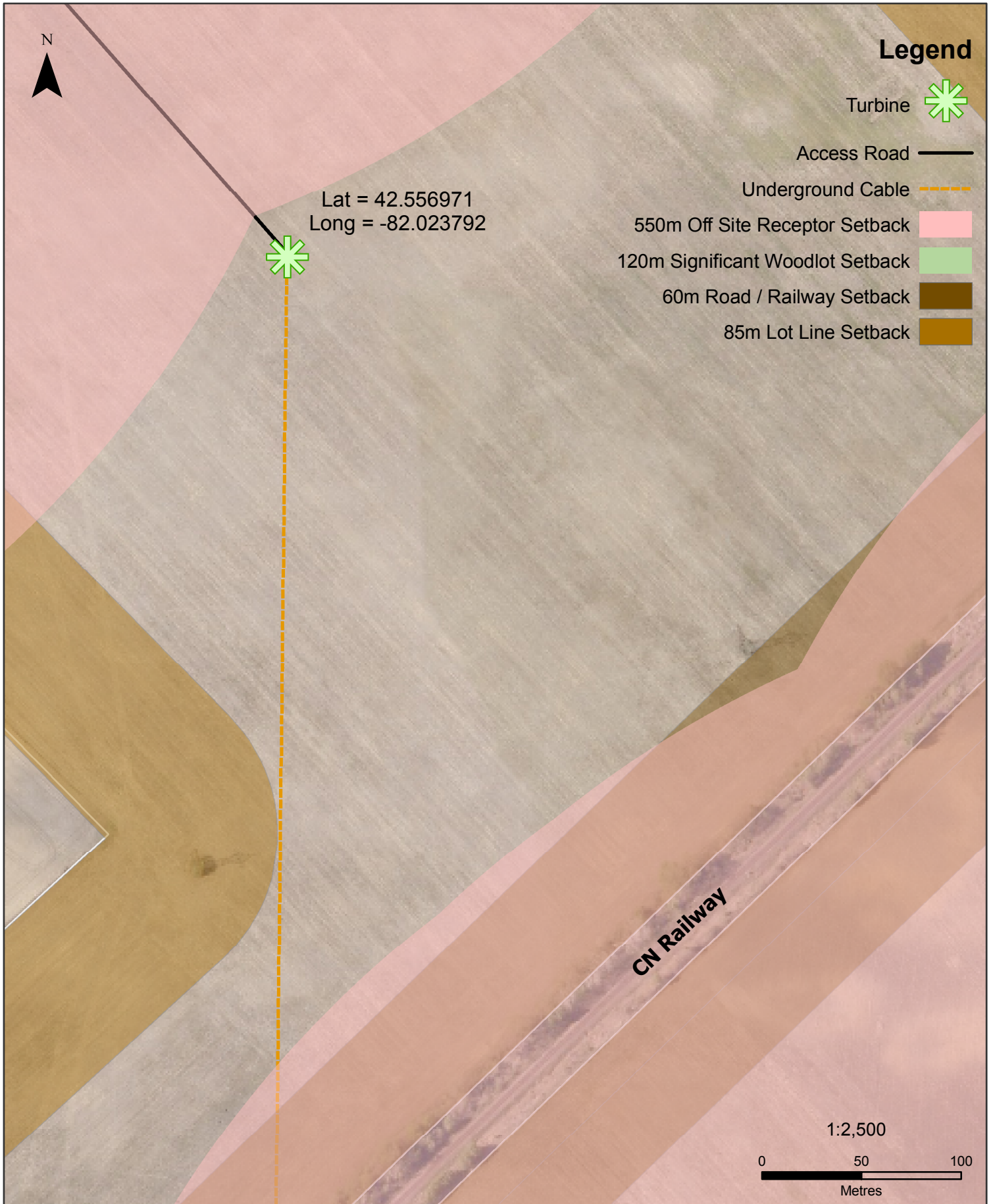
# Macleod-3 Detailed Location



# Macleod-4 Detailed Location

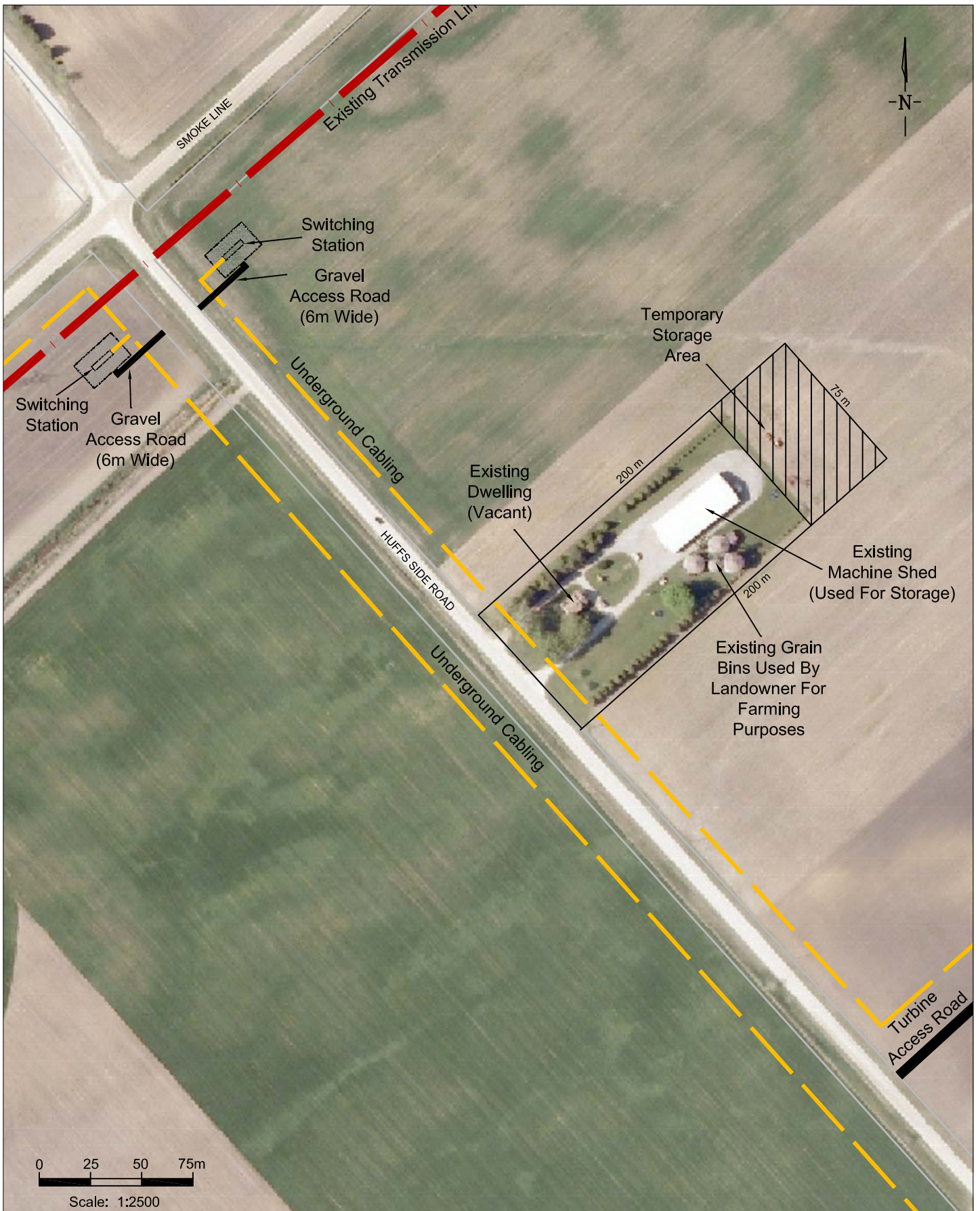


# Macleod-5 Detailed Location



# Detailed Location

## Switching Stations, Construction Service Area, and Temporary Storage Area



## APPENDIX 2 – EMERGENCY RESPONSE PROTOCOL

# Emergency Response Protocol

## 1. OVERVIEW

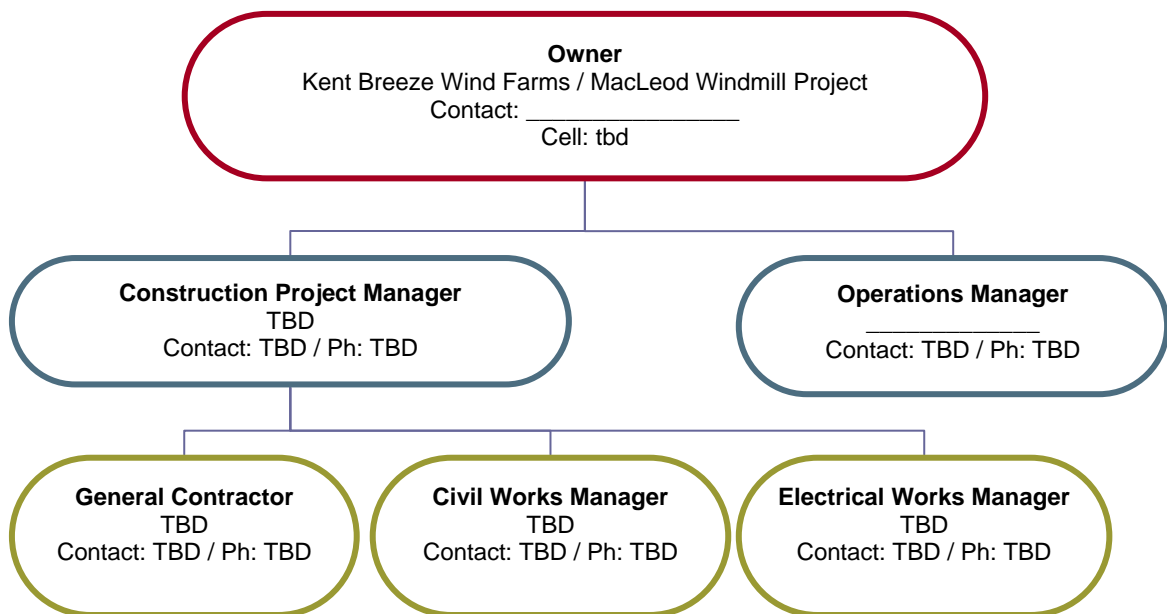
Whereas an emergency is defined as “a situation or an impending situation that constitutes a danger of major proportions that could result in serious harm to persons or substantial damage to property and that is caused by the forces of nature, a disease or other health risk, an accident or an act whether intentional or otherwise.”, the owners of the Kent Breeze Wind Farms are committed to emergency response events involving the proposed wind turbine development in the Municipality of Chatham-Kent.

The purpose of this document is to provide an Emergency Response Protocol for the Kent Breeze Wind Farm and MacLeod Windmill Project, hereafter referred to as the Kent Breeze Wind Farms. This protocol is to be used by the owners and operators of the Kent Breeze Wind Farms, in coordination with the Municipality of Chatham-Kent emergency services (ie. Fire / Police / EMS) as a guideline for handling emergency response during all phases of the projects.

## 2. ORGANIZATION AND CONTACT LIST

### 2.1 Organization

The Kent Breeze Wind Farms stakeholders are structured as follows with the intent of providing adequate information for the construction and operation phases of the projects. This chart will be updated as necessary where changes in ownership or project roles may change.





## 2.2 Contact List

Contact information will be forwarded to the Chatham-Kent Fire Department (CKFD) on an ongoing basis as contracts for construction are awarded. The Contact information will naturally change over the duration of the construction and operation phases of the projects. The contact list will be actively managed and updated with all revisions forwarded to the CKFD.

<b>Names</b>	<b>Contact Information</b>
Ambulance / Fire / Police	911
On Site Qualified First Aiders – To Be Determined:	TBD
Owner’s Representative – To Be Determined:	TBD
Construction Project Manager – To Be Determined:	TBD
General Contractor’s Representatives	
Project Manager– To Be Determined:	TBD
H&S Manager– To Be Determined:	TBD
Electrical Contractor’s Representative	
Project Manager– To Be Determined:	TBD
H&S Manager– To Be Determined:	TBD
Civil Works Contractor’s Representative	
Project Manager– To Be Determined:	TBD
H&S Manager– To Be Determined:	TBD
Ministry of Environment (MOE) Spills Action Centre :	1-800-268-6060
Call Before You Dig (Ontario One Call):	1-800-400-2255
Hydro-One Control Centre:	1-800-664-9376
Municipality of Chatham-Kent:	1-519-360-1998

### 3. RESPONSIBILITIES

#### 3.1 Responsibilities in the Event of an Emergency Situation

All personnel who work in or on the wind turbines during the construction or operation of the projects will undergo comprehensive training to ensure the highest level of safety and an understanding of the protocols to be followed in the event of an emergency situation (location of muster points, etc.).

All construction personnel shall be trained in High Angle and Confined Space rescue procedures to assist coworkers who are injured or are in dangerous situations and are unable to utilize the self-rescue procedures. The Owners will provide CKFD personnel with training in High Angle and Confined Space rescue procedures if such training is required. Any such training will occur prior to the commencement of the operations phase of the Projects.

Any specialized rescue equipment for High Angle rescue that is required will be provided to the CKFD by the Owner. The Owners and the CKFD will also establish a specific communication protocol between the parties to be utilized in the event of High Angle and Confined Space situations, to be reviewed and updated as required.

#### 3.2 Emergency Preparedness

During construction and prior to the commencement of operations the Construction Project Manager will ensure the following preparatory measures are undertaken:

- Provide all workers and work vehicles with a copy of emergency numbers and emergency procedures to be carried and/or easily accessed within vehicles at all times.
- Provide all workers with location of muster point for emergency situations;
- Review training requirements for all personnel involved in the project.
- Review the contents of this plan with all personnel involved in the project to familiarize them with their duties and responsibilities.
- Ensure all workers are aware of the communication devices for emergencies, including emergency horns, cellular phones, two-way systems, etc.
- Ensure all workers know the location of the turbine they are working at.
- Conduct practice drills to train on-site personnel to carry out the correct response to an emergency condition.
- Ensure all adequate safety equipment is available on-site and all personnel are using the appropriate Personal Protection Equipment (PPE).

- Ensure all workers on site have WHMIS training.

## 4. EMERGENCY RESPONSE

### 4.1 Emergency Response to Activities

After an emergency event, the scene of the emergency must be preserved until approval to resume to normal operations is obtained from the relevant authorities. These authorities include the Chatham-Kent emergency services and authorities with jurisdiction and where applicable, and other Jurisdiction of Authority, including the Ministry of Labour. With all emergency events, the necessary paper work/forms should be completed by the On-site Construction Manager in conjunction with any other applicable on-site personnel. Emergency events include:

- Fire / Explosion
- Injury / Trauma
- High Angle Rescue / Confined Space Rescue
- Breakdown / Collapse / Collision
- Environmental Spill
- Site Evacuation

#### 4.1.1 EMERGENCY PROTOCOL – FIRE / EXPLOSION

- Evaluate further risks of explosion; evacuate area in case of doubt.
- Locate extinguish gear and attempt to extinguish the fire if possible.
- If safe extinguishing is not possible, then evacuate (see evacuation procedure below)
- Contact CKFD (911)
- Inform On-site Construction Manager and applicable Foreman
- Secure the area and direct traffic as applicable

#### 4.1.2 EMERGENCY PROTOCOL – INJURY / TRAUMA

- Remove any hazards (stop tools and machinery).
- Summon a First Aid Attendant.
- Treat any life threatening injuries and care for other injuries.
- Inform On-site Construction Manager and applicable Foreman.

- Contact Sun Parlour EMS (911).

#### 4.1.3 HIGH ANGLE / CONFINED SPACE RESCUE

- Remove any hazards (stop tools and machinery).
- Bring injured person in safe area for evaluation.
- Treat any life threatening injuries.
- Bring injured person to ground level.
- Contact CKFD if necessary (911).
- Inform On-site Construction Manager and applicable Foreman.

#### 4.1.4 BREAKDOWN / COLLAPSE / COLLISION

- Evaluate further risks; evacuate area in case of doubt.
- Remove any hazards (stop work).
- Contact CKFD (911)
- Inform On-site Construction Manager and applicable Foreman
- Secure the area and direct traffic as applicable

#### 4.1.5 ENVIRONMENTAL SPILL

- Ensure the safety of all persons
- Contain the hazard if possible; evacuate if necessary
- Inform On-site Construction Manager and applicable Foreman.
- Contact MOE's Environmental Emergency Services.

#### 4.1.6 EVACUATION

- Stop work actions and relocate to identified muster point.
- On-site Construction Manager and/or applicable Foreman take census of personnel.
- All personnel remain at muster point until accounted for by On-site Construction Manager or applicable Foreman.
- On-site Construction Manager and/or appointed Foreman investigate any missing personnel.
- Phone CKFD if required (911).

## 4.2 Emergency Response to Maintenance

Scheduled maintenance occurs every three months and includes visual inspection, grease maintenance, mechanical and electrical maintenance. Owner will provide CKFD with a detailed schedule of maintenance activities prior to commencing operational phase of projects. Any possible emergency events and subsequent response would be identical in nature to those identified in Section 4.1.

## 4.3 Emergency Response to Accidents and Malfunctions

Potential accidents or malfunction include aeronautical collision, ice fall and ice throw, fire, explosion and turbine component failure. In addition to any associated emergency event and subsequent response outlined in Section 4.1, the additional measures to address accidents and malfunctions are as follows:

- Evaluate further risks and shut down operations of all plant components as necessary (to be determined by on-call / on-site operator).
- Remove any hazards (stop tools and machinery).
- Re-direct traffic if applicable.
- Contact CKFD and or Sun Parlour EMS as applicable (911).

## 5. POST EMERGENCY ACTIONS AND REPORTING

Any incident or accident will be reported to the owners of Kent Breeze Wind Farms immediately. All subcontractors shall ensure that all accidents or incidents are recorded with their own company following any incident or injury to their personnel as required. The owners will subsequently investigate all reported events. An accident investigation report shall be submitted to the applicable authorities as required.

Accidents involving the general public, fatalities, or that are considered a threat to public or environmental health shall be reported to the appropriate authorities with jurisdiction as applicable, including but not limited to:

- CKFD, C-K Police, C-K EMS (Sun Parlour);
- Ministry of Labour;
- Ministry of Environment

## APPENDIX 3 – DISPUTE RESOLUTION PROTOCOL

# Dispute Resolution Protocol

## 1. NOISE

Kent Breeze Corp contracted Hatch to complete noise modeling for the Kent Breeze Wind Farms. The results are documented in the Kent Breeze Wind Farm and MacLeod Windmill Project Noise Assessment Report (Hatch).

### 1.1 Noise – Neighbour(s) Complaint Resolution

The Operators will establish a call-in telephone number where comments from the Neighbour(s) can be received and recorded twenty-four hours a day, seven days a week. The Operator at the wind farm's Operation Centre will receive the calls during normal working hours. The message center will advise the caller of an emergency number to be used if they need immediate contact with the on-call operator.

The Operators will respond to the complaint by telephone within one business day. Upon discussions with the Neighbour(s) and documentation of all pertinent data, the Operators will schedule a site visit at an appropriate time with the Neighbour(s). The Operator commits to setting up the meeting within two business days of the phone contact. The Operator will notify the MOE in writing of the Neighbour's complaint within two business days of receiving the complaint and, as soon as possible thereafter, will advise the Ministry of the actions being implemented.

Where a preliminary noise assessment is determined to be required, the Operators will undertake preliminary on-site sound measurement with a hand held portable sound level meter mounted on a tripod. The assessment will be conducted under similar conditions experienced by the Neighbour(s). Consideration will be given to wind speed, wind direction, sunlight intensity, sunlight direction, time of day, precipitation and other relevant conditions. The Operators will conduct this assessment within ten business days of the site visit. The assessment will be conducted using currently accepted industry practices, standards and equipment, including MOE guideline procedures, specifically NPC-103, to determine the actual impact on the resident, in relation to the MOE noise guideline criteria. The preliminary testing will be conducted by the Operators. Qualified professional staff will be consulted during the preliminary testing period to ensure proper test methods are carried out.

The Operators will, within ten business days of the preliminary assessment, complete a report identifying the complaint, confirming the site visit, provide an analysis of the preliminary measurement results and determine if any of the impact(s) exceeds the standard. The Operator commits to meet with the resident as soon as possible after the report is complete to share the data

collected. If the results collected during the preliminary testing confirm that additional testing is warranted, the Operators will contract the services of professional staff or arrange for third party training for the Operators employees and have the employee install an ambient sound monitor complete with wind measurement equipment at the Neighbour's home.

The Operators commit to installing the equipment within 15 business days following the data sharing meeting with the resident. Test data collected over the test period as agreed to by the Operators and the Neighbour(s) will be analyzed by third party professional staff using accepted industry practice. The company contracted by the Operators will be instructed to prepare a report within 10 business days after the completion of testing. The Operators will share all data with the resident and the MOE. If the test equipment is installed at another Neighbour's home within the project area, the testing will be completed as soon as the equipment becomes available.

Where the assessment identifies the need for mitigation measures, the Operators shall implement these actions within fifteen business days of the submission of the report or at a date mutually agreeable to all parties. In the event it is not possible to complete the mitigation measures within the agreed time frame, the Operators will temporarily idle the turbine until such mitigation measures are implemented.

If the testing confirms that the Operators are compliant with the Certificate of Approval, no further action will be taken by the Operator. The Neighbour(s) will be asked to acknowledge, in a letter, all site visits, impact assessments and mitigation measures taken, if any, to resolve the issue, within 30 days of the complaint resolution. Where no written acknowledgement is received within the time frame, it will be determined the issue is resolved.

## 1.2 Noise – Ministry of the Environment Resolution

If the Neighbour(s) does not accept the findings by the Operator, the resident has the option of registering a complaint with the MOE at the address listed below:

Ministry of the Environment  
London Area Office  
2<sup>nd</sup> Floor  
733 Exeter Road  
London ON. N6E 1L3  
Toll free number: 1-800-265-7672  
Tel: (519) 873-5000  
Fax: (519) 873-5020



## 2. OTHER DISPUTES

The Operators will establish a call-in telephone number where comments from the Neighbour(s) can be received and recorded twenty-four hours a day, seven days a week. The Operator at the wind farm's Operation Centre will receive the calls during normal working hours. The message center will advise the caller of an emergency number to be used if they need immediate contact with the on-call operator. All communications will be recorded in an electronic database including name, time and date, address, contact information, nature of complaint, actions required by proponent to address complaint, and follow up actions after investigation.

The Operators will respond to the complaint by telephone within one business day. Upon discussions with the Neighbour(s) and documentation of all pertinent data, the Operators will schedule a site visit at an appropriate time with the Neighbour(s). The Operator commits to setting up the meeting within two business days of the phone contact. The Operator will notify the MOE in writing of the Neighbour's complaint within two business days of receiving the complaint and, as soon as possible thereafter, will advise the Ministry of the actions being implemented.

The Operators will complete a report identifying the complaint, confirming the site visit, provide an analysis of the complaint, and determine if any actions are warranted. The Operator commits to meet with the resident as soon as possible after the report is complete to review the report and determine what further actions may be required. If the report warrants further action or there is a disagreement about the findings in the report, the Operators will contract the services of professional staff or arrange for third party review to review further and make recommendations for any furthering monitoring or mitigation activities. If third party review confirms that no further monitoring or mitigation activities are required, no further action will be taken by the Operator.

Where the assessment identifies the need for further monitoring or mitigation measures, the Operators shall implement these actions within fifteen business days of the submission of the report or at a date mutually agreeable to all parties. In the event it is not possible to complete the mitigation measures within the agreed time frame, the Operators will temporarily idle the turbine until such mitigation measures are implemented.

The Neighbour(s) will be asked to acknowledge, in a letter, all site visits, monitoring and mitigation measures taken, if any, to resolve the issue, within 30 days of the complaint resolution. Where no written acknowledgement is received within the time frame, it will be determined the issue is resolved.

### 3. IMPLEMENTATION

This Dispute Resolution Protocol is intended to address concerns between Neighbour(s) and the Operators quickly and in a cost effective manner. This process is voluntary for all participants on the basis that it is in everyone's interest to resolve matters prior to complex and costly alternative processes.

The information collected with respect to the complaint, assessment, mitigation measures and any mediation reports shall be maintained by the Operator through the life of the project. This resolution process will help residents in the Project Area understand the nature, response and mitigation measures for the complaints received.

This Dispute Resolution Protocol will be reviewed annually or more frequently if required, after commissioning of the wind farm, to determine opportunities for improvement.

## APPENDIX 4 – COMMUNICATIONS PLAN

## Communications Plan

The purpose of this document is to provide a communications protocol for the Kent Breeze Wind Farm and McLeod Windmill Project, hereafter referred to as the Kent Breeze Wind Farms. The communications protocol is to be used by the owners and operators of the Kent Breeze Wind Farms as a guideline for receiving and providing information to the general public.

During the operational phase of the projects, the owners will make available the appropriate contact information including telephone numbers, mailing information, and email addresses. This information will connect parties with the appropriate on-site or on-call operators responsible for operations of the projects. The contacts for the owner will be determined once the owner is closer to the operational phase.

This information will be made available in the following manner:

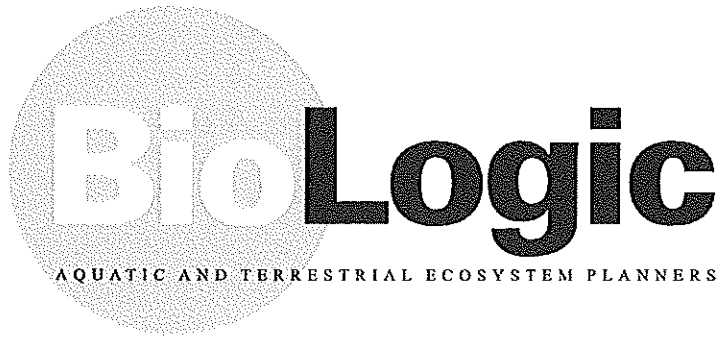
- Contact information posted strategically on-site at suitable locations such as switching stations;
- Contact information will be forwarded to the Municipality of Chatham-Kent with all necessary revisions forwarded as necessary (ie. Change in personnel, change in contact info);
- Contact information will be forwarded to all local stakeholders as identified on the public consultation mailing list with all necessary revisions forwarded as necessary (ie. change in personnel, change in contact info);
- On an annual basis, the owners will provide an operational update that will include appropriate contact information. This will be provided through a company newsletter, distributed through local media or regional mail.

The following list of contacts will be included:

Ambulance / Fire / Police	911
24 hour / 7 days a week control center	TBD
Suncor Operations Manager	TBD
Hydro One Control Center	1-800-664-9376
Municipality of Chatham-Kent	1(519)360-1998



## APPENDIX 5 – ENVIRONMENTAL EFFECTS MONITORING PLAN



## **Environmental Effects Monitoring Plan For Bats and Birds**

**Prepared for Kent Breeze Wind Farm**

**By BioLogic  
July 2010**

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## **1.0 INTRODUCTION**

The Kent Breeze Wind Farms is a Class 4 wind facility which will consist of eight 2.5MW GE wind turbines on 85 metre towers, for a total nameplate capacity of 20MW. The wind farm is located in northeast Chatham-Kent, about 6 km west of Thamesville. The turbines are located east and west of Huff's Side Road between Evergreen Line and Splinter Line. Land use in the area is primarily row crop agriculture. No turbines are located within 125 metres of any woodlot.

### **1.1 Pre-Consultation**

#### **1.1.1 Bats**

No pre-construction data was collected for bats. No turbines were sited within 125 metres of any significant bat habitat.

#### **1.1.2 Birds**

Pre-construction monitoring for birds involved spring and fall migration and breeding bird surveys in a 3,000 ha study area. The study area was much larger than the final footprint of the 8 turbines, which are only 4 to 8 ha. The survey methodologies included point counts and transects. Transects were done primarily in and along the edges of the woodlands in the study area. Breeding season surveys took place on July 5 and 6, 2006. Fall migration monitoring was done on October 4 and 5, 2006. Spring migrant monitoring was carried out on May 11 and May 19, 2007.

Very few spring or fall migrants were observed. Migrants consisted mostly of woodland species noted in the woodlands and the treed corridor along the Thames River, 1.7 km south of the closest turbine. Blackbirds, starlings, robins and Tree Swallows made up the bulk of the species observed during both the spring and fall migrations. 93% of all spring migrants and 78% of all fall migrants observed were perched or in flight at a height considerably lower or higher than the blade sweep of the turbines. In spring, Turkey Vultures accounted for 70% of all birds observed in flight at 40 m or higher. During the breeding season, the most commonly encountered species were robins, blackbirds, cardinals and Tree Swallows.

No Species at Risk, no significant concentrations of spring or fall migrants and no significant concentrations of Partners in Flight breeding birds were observed in the study area or in the turbine footprint. An active Bald Eagle nest is located at the periphery of the broader study area about 1.7 km south of the closest turbine.

## **2.0 POST-CONSTRUCTION MONITORING**

### **2.1 Bats**

Post-construction mortality monitoring for bats will follow the requirements, protocols and methodologies described in Appendix C Post Construction Monitoring Methods of the draft OMNR Guidelines for Wind Power Projects for Bats and Bat Habitat (March 2010) and will consist of the following components:

- mortality surveys
- carcass removal rate trials
- searcher efficiency trials

Mortality monitoring will take place at all 8 turbines every three days from May 1 to September 30 for three years following the beginning of operations of at least 50% of the turbines. If significant mortality is observed and operational mitigation implemented, monitoring will continue for an additional 3 years from the implementation of the operational mitigation.

### **2.2 Birds**

#### **2.2.1 Avian survey replication**

No Species at Risk, no significant concentrations of migrants and no significant concentrations of Partners in Flight breeding species were found during the pre-construction surveys. There are no shorelines, ridges, wooded river corridors or other habitat features in the immediate area of the turbines that would attract significant concentrations or provide habitat for any species or guilds of species of concern. Hence, there is no need to replicate the pre-construction surveys.

#### **2.2.2 Avian mortality monitoring**

Given the results of the pre-construction surveys there is no reason to conduct mortality monitoring specific to birds. However, given that bat mortality monitoring will take place from May 1 to September 30, bird casualty monitoring can take place at for limited

additional effort. Therefore, bat and bird casualty monitoring will be conducted simultaneously.

## 3.0 OPERATIONAL MITIGATION

### 3.1 Bats

Mitigation operations will take place when a threshold of 10 bats per turbine per year is detected by mortality monitoring.

Operational mitigation will consist of changing the wind turbine cut-in speed to 5.5 m/s or partial feathering the turbine blades when wind speeds are below 5.5 m/s. If the threshold of 10 bats per turbine per year is exceeded, operational mitigation will be implemented from July 15 to September 30 for the duration of the project.

When possible, maintenance shutdown periods will be scheduled to coincide with any high mortality periods.

If the threshold is reached during a monitoring period, **Contingency Plans** will be implemented immediately. Mortality monitoring surveyors will inform operations immediately and the operation managers will implement operational mitigation as described above. The relevant OMNR staff will be consulted to determine whether additional actions are warranted.

## 4.0 REFERENCES

CWS, 2007. Recommended Protocols for Monitoring Impacts of Wind Turbines on Birds. April 2007. Environment Canada – Canadian Wildlife Service.

IBI Group 2010. Design and Operations Report. March 2010. Kent Breeze Wind Farms. IBI Group.

MNR, 2007. Guideline to Assist in the Review of Wind Power Proposals. Potential Impacts to Birds and Bat Habitats. August 2007. V1.0. Ontario Ministry of Natural Resources.

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