



Axio Power Canada Inc.

## Project Description Report

For

### Kingston Gardiner TS Unity Road Proposed Solar Photovoltaic Project

H335467

Rev. 1

October 22, 2010

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October 22, 2010

## Axio Power Canada Inc. - Kingston Gardiner TS Unity Road

# Draft Project Description Report

## Table of Contents

### Report Disclaimer

<b>1. Introduction .....</b>	<b>1</b>
<b>2. Project Details.....</b>	<b>2</b>
2.1 Energy Sources to Generate Electricity .....	2
2.2 Facilities, Equipment and Technology .....	2
2.3 Class of the Renewable Energy Facility.....	2
2.4 Federal Involvement.....	2
2.5 Project Activities .....	2
2.5.1 Access Road Construction .....	2
2.5.2 Site Preparation .....	3
2.5.3 Installation of Support Structures .....	3
2.5.4 Electrical Infrastructure and Underground Cable Installation.....	3
2.5.5 Distribution Line Erection.....	3
2.5.6 Site Security .....	3
2.5.7 Operation.....	3
2.5.8 Maintenance and Inspection.....	4
2.5.9 Decommissioning .....	4
2.6 Authorizations Required.....	4
2.7 Nameplate Capacity .....	5
2.8 Ownership of the Land.....	5
<b>3. Description of Environmental Effects .....</b>	<b>6</b>
3.1 General.....	6
3.2 Project Site Description.....	6
3.3 Preliminary Records Review.....	8
3.4 Potential Environmental Constraints .....	8
3.5 Potential Negative Environmental Effects.....	10

## List of Tables

Number	Title
Table 3.1	Potential Negative Environmental Effects

## List of Figures

Number	Title
Figure 3.1	Location Map
Figure 3.2	Potential Environmental Constraints Map

## 1. Introduction

Axio Power Canada Inc. (hereinafter referred to as “Axio”) is proposing to develop a 10-MW solar photovoltaic project titled Kingston Gardiner TS Unity Road (hereinafter referred to as the “Project”). As required, Axio is commencing with the Renewable Energy Approval (REA) process and described in Ontario Regulation 359/09 under the *Environmental Protection Act*. This Project Description Report has been prepared in accordance with O. Reg. 359/09.

The Project is located within the City of Kingston (single tier municipality) within the County of Frontenac.

Axio is the proponent of the Project. The contact information is as follows:

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The Project Description Report is the first step in the REA process. Axio will complete the requirements for obtaining the REA as identified in O.Reg. 359/09.

In April, 2010, Axio was notified that they had obtained a Feed-In-Tariff (FIT) contract with the Ontario Power Authority (OPA). In the application for the FIT contract, the proposed commercial operations date (COD) has been specified as 731 days from the date of contract date, corresponding to April 27, 2012.

## **2. Project Details**

The following sections are intended to satisfy the requirements of Table 1 to O. Reg. 359/09: Section 10 – Project Description Report which directs the proponent to provide a description of the Project. Further details on the design of the Project will be provided in subsequent required reports as per O. Reg. 359/09, including the Construction Plan Report, Design and Operations Report and the Decommissioning Plan Report.

### **2.1 Energy Sources to Generate Electricity**

Solar energy will be used to generate electricity.

### **2.2 Facilities, Equipment and Technology**

The proposed Project is a renewable energy generation facility which will use solar photovoltaic technology. Electricity generated by solar photovoltaic panels will be converted from DC to AC by an inverter, and subsequently stepped-up (via intermediate step up transformers and an interconnection transformer) to 44 kV prior to being connected to the distribution line. In order to meet OPA's FIT Program requirements, a specific percentage of equipment will be manufactured in Ontario.

At this time the solar module information, including make, model, size, dimensions, number of modules, etc. has not been determined.

### **2.3 Class of the Renewable Energy Facility**

The Project will be a Class 3 solar facility. That is, the Project is ground mounted and greater than 10 kW.

### **2.4 Federal Involvement**

No Federal lands or resources will be utilized for the Project and based on the resources within the Project area, issues under Federal jurisdiction are not anticipated. Therefore, no Federal involvement (including permits and approvals) is required.

### **2.5 Project Activities**

The Project activities involved in the construction, operation and decommissioning phases of the Project are outlined in the following sections. It is anticipated that the time for construction is 4 to 8 months, depending on time of year and various other factors. Prior to construction, the area will be surveyed. Any buried utilities or infrastructure will be located prior to commencing with the access road construction and site preparation.

#### **2.5.1 Access Road Construction**

New access roads on private land will be required to allow transport of equipment from the main (municipal) road to the Project site. If necessary, trees will be cut and vegetation cleared, and topsoil removed prior to placement of a granular road base. A one-lane, 5-m wide access road will be constructed for the transportation of equipment to the site. The minimum thickness of the access road granular base and top course material will be at least 30 cm. Ditches and culverts will be constructed, as necessary, to maintain site drainage. Erosion and sedimentation control measures

(e.g., silt fence barriers, rock flow check dams, etc) will be installed if needed. If temporary access roads are to be removed following completion of construction, topsoil will be replaced.

### **2.5.2 Site Preparation**

Trees and large standing vegetation will be cleared from areas where the photovoltaic arrays will be constructed. Where practical, merchantable timber, non-merchantable timber (e.g. firewood) and other cleared vegetation, along with any removed topsoil will be stockpiled adjacent to the access road(s). Locations of topsoil, timber and vegetation stockpiles will be determined and not within 30 m of a water body. If necessary to control sediment, erosion and sedimentation control measures will be installed.

### **2.5.3 Installation of Support Structures**

Foundations and/or support structures will be required beneath transformers, inverters and photovoltaic panels. Detailed engineering for the design of the foundations and support structures are to be completed. However, it is expected that the pads for the transformers and inverters will be concrete slab-on-grade. It is also anticipated that drilling will be completed for the purposes of stabilizing the support structures of the photovoltaic arrays. The photovoltaic panels will be installed on fixed racking structures. Foundation construction and the installation of support structures will be subject to inspection prior to the installation of photovoltaic modules, and wiring.

### **2.5.4 Electrical Infrastructure and Underground Cable Installation**

DC wiring will run along the structural supports of the photovoltaic arrays. A network of underground DC cabling will be required at the termination point of the photovoltaic arrays to centrally located inverters which will then convert the electricity to AC. Intermediate transformers will step the voltage up to 27.6 kV. A simple trenching device will be used to install the DC cables, whereby a trench is opened, the cable laid, and the soil replaced.

### **2.5.5 Distribution Line Erection**

An underground distribution line, will be constructed which transports the electricity from the inverters to the transformer. The transformer will step up the voltage, and a distribution connection from the transformer will be erected to transport the generated power from the Project to the 44-kV connection point. The connection point and feeder line are on the road allowance adjacent to the Project and are owned by Hydro One Networks Inc. (HONI) which is the local distribution company.

### **2.5.6 Site Security**

The Project will be gated and fenced, with additional security measures installed as deemed necessary by Axio. This will include security cameras and motion sensor flood lighting.

### **2.5.7 Operation**

The Project will operate year round and generate electricity during daylight hours. The amount of power generated will depend on daily weather conditions and sufficient solar irradiation. The Project will be operated remotely and therefore no full-time employees will be on site with the exception of maintenance and inspections.

### **2.5.8 Maintenance and Inspection**

The Project will typically be scheduled for maintenance every 2 to 3 months. Typically, maintenance includes checking the structures, interconnections and cleaning the photovoltaic panels. It is anticipated that the panels will be washed twice a year using on-site water with no cleaning solutions. All maintenance materials (e.g., hydraulic fluids) will be brought to the site as required so no on-site storage of this material will be necessary. The Project will also be inspected if the power output is lower than anticipated as this would be indicative of a mechanical, wiring, or electrical problem.

### **2.5.9 Decommissioning**

A 35 to 40-year lifespan is typically anticipated for the Project. At that time (or earlier if the power purchase agreements are not extended), the Project will be decommissioned or refurbished depending on market conditions and/or technological changes.

If the decision is to discontinue renewable energy generation, the process of decommissioning the Project would involve the following:

- removal of the solar panels for reuse in another location if possible. Otherwise, the glass and silicon will be reclaimed and the aluminum frames will be recycled
- removal of the scrap metal and cabling. Where possible, these materials will be recycled, with non-recyclables taken to an approved disposal site
- removal of support structures and foundations unless the landowner requests otherwise. These materials will be recycled where possible
- site cleanup and regrading to original contours and, if necessary, restoration of surface drainage swales and ditches
- planting of leguminous crops and/or other native vegetation as appropriate to provide a rapid return of nutrients and soil structure
- removal of the access road.

## **2.6 Authorizations Required**

Permits, licenses and authorizations such as those listed below, in addition to the REA may be required for the Project to proceed:

- Entrance & Building Permit – The local municipality will likely require an entrance permit and may require a building permit to undertake construction.
- Conservation Authority Permit – Approval from the Cataraqui Region Conservation Authority (CRCA) may be required should development or site alteration occur within the Conservation Authority's Regulated Area pursuant to the CRCA's *Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulations* (Ontario Regulation 148/06).
- Ministry of Natural Resources (MNR) Work Permit and/or Lakes and Rivers Improvement Act Approval.



## **2.7 Nameplate Capacity**

The nameplate capacity of the Project will be up to 10 MW AC. The project may be up to approximately 12.2 MW DC.

## **2.8 Ownership of the Land**

The Project will be located on privately owned lands. The Project lands are identified as Part of Lot 12, Concession 6, City of Kingston, County of Fontenac. The lands encompass approximately 66 hectares. Axio has entered into an option to purchase agreement with the landowner and will own the property for the duration of facility operation.

The legal description of the Project land is: Part of Lot 12, Concession 6, as in Instrument No. FR90074, Except Expropriation Plan 1398; Kingston Township Being all of PIN 36133-0031 (R), LRO #13.

### **3. Description of Environmental Effects**

#### **3.1 General**

This Section presents the results of a preliminary assessment of the potential negative environmental effects that may result from the Project.

The purpose of the assessment is to establish a preliminary identification of those critical aspects of the environment that: (i) may pose a development constraint to the Project (e.g., significant natural heritage feature that requires protection or preservation); (ii) may require a detailed Environmental Impact Study (EIS) (e.g., for potential Project development of lands adjacent to a significant natural heritage feature); and/or (iii) may require specific public, agency or aboriginal input and information specific to the planning and assessing the Project.

It is important to note that at this initial stage in the Renewal Energy Approvals process, the assessment of potential negative environmental effects is largely interpretive based on the experience and judgement of various environmental specialists involved in the planning and design of the Project. At this stage, no detailed site investigations activities have been conducted, nor have any consultation activities been carried out with municipalities, ministry agencies or conservation authorities by the Project environmental consultant. Such activities are proposed to be initiated following MOE's review of this Project Description.

The following activities were conducted as part of the preliminary assessment of potential negative environmental effects:

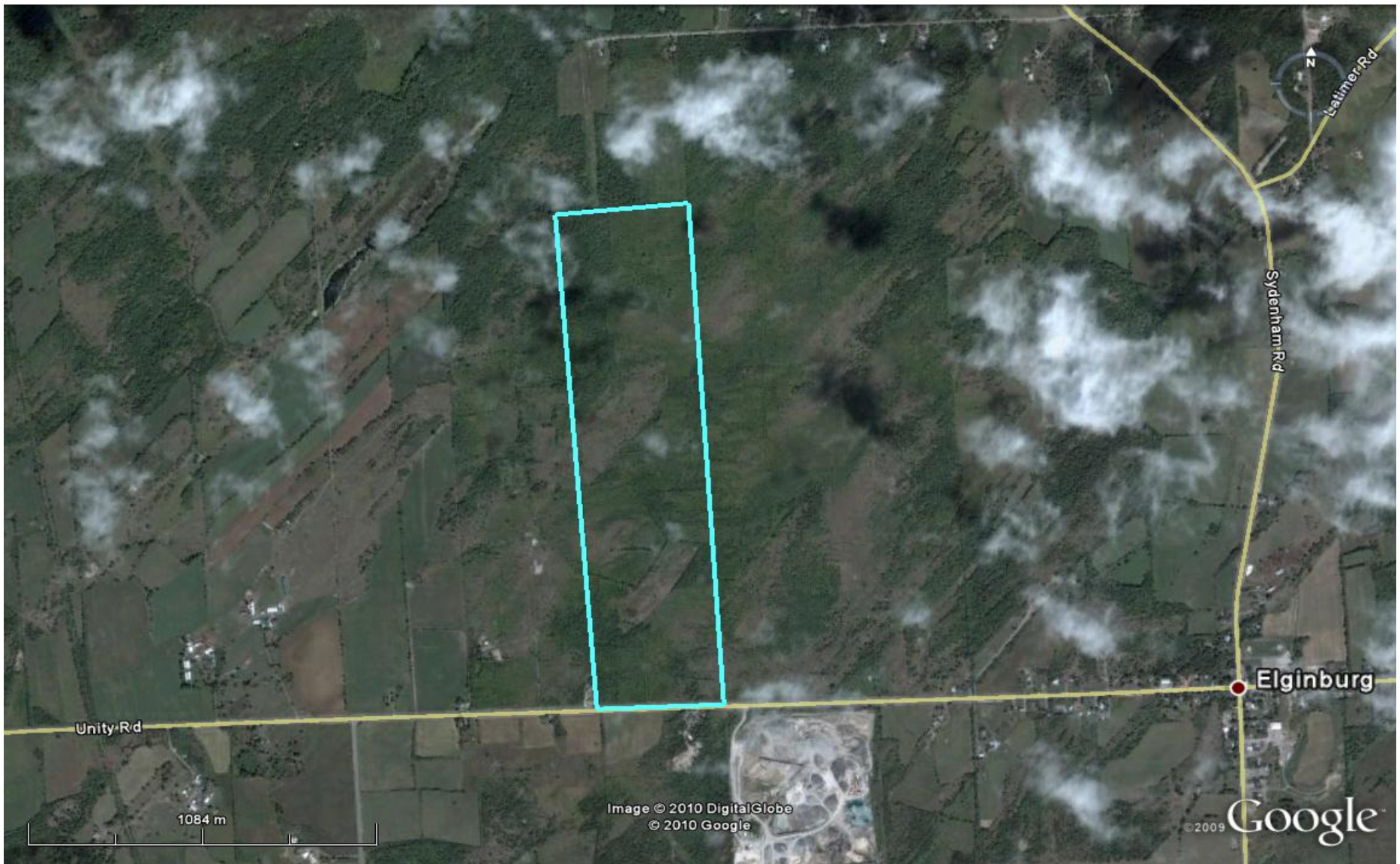
- Project Site Description.
- Preliminary Records Review.
- Potential Environmental Constraints.
- Preliminary Negative Environmental Effects.

#### **3.2 Project Site Description**

The location of the Project site is depicted in Figure 3.1. The site encompasses an area of approximately 66 hectares. The longitude and latitude are 44° 19' 33.88" and 76° 33' 54.87".

Nearby communities include the village of Elginburg, about 1.6 km east of the site. Local roads include Unity Road immediately south of the site and Sydenham Road further east of the site.

Presumably, the site was used for agriculture, but is now covered with successional vegetation and some trees. A watercourse tributary of Collins Creek is situated about 350 m from the northwest corner of the site. The watercourse is under the jurisdiction of the Cataraqui Region Conservation Authority. There does not appear to be any major natural watercourses on the site. An electrical transmission corridor passes by the site to the southwest corner of the property.



Google Imagery Date July 2005



Figure 3.1  
Axio Power Canada Inc.  
**Kingston Gardiner TS Unity Road  
Location Map**

Properties to the west and south of the site are active agriculture with some lands covered by successional vegetation. Properties to the east are undeveloped woodlands interspaced with former agricultural lands. A rural residential subdivision aligning Horning Road is situated to the north of the site. An active sand or gravel quarry is present southeast of the site.

The City of Kingston Official Plan (<http://www.cityofkingston.ca/residents/development/officialplan/>) (2010) identifies the Project lands as a Rural Area land use policy category (Schedule 3-B, Land Use). The Official Plan, Schedule 8-B (Natural Heritage Area 'B') identifies the woodlands on and adjacent to the Project site as Significant Woodlands. The Official Plan states that development and site alteration will not be permitted in Significant Woodlands unless it has been demonstrated that there will be no negative impacts on the natural heritage features or areas or ecological functions. Further, the Official Plan, Schedule 11 (Constraint Mapping) identifies the groundwater conditions on the site as having Moderate to Very High Sensitivity.

The Central Cataraqui Region Natural Heritage Study (2006) prepared by the CRCA, City of Kingston and Loyalist Township (<http://www.cataraquiregion.on.ca/management/naturalheritage.htm>) has produced natural heritage maps which identifies the woodlands on and adjacent to the Project site as Significant Woodlands.

### 3.3 Preliminary Records Review

A preliminary records review was completed to determine where the natural heritage features, water bodies, wetlands (including Provincially Significant Wetlands), quarries/pits, Areas of Natural and Scientific Interest (ANSIs), etc, are located on and in proximity to the Project site.

The preliminary record reviews involved obtaining and reviewing geographic information system (GIS) data available through the Ontario Ministry of Natural Resources (MNR) Land Information Ontario (LIO) database (online at <http://www.mnr.gov.on.ca/en/Business/LIO/index.html>).

Information requested through LIO included, but was not limited to, the following:

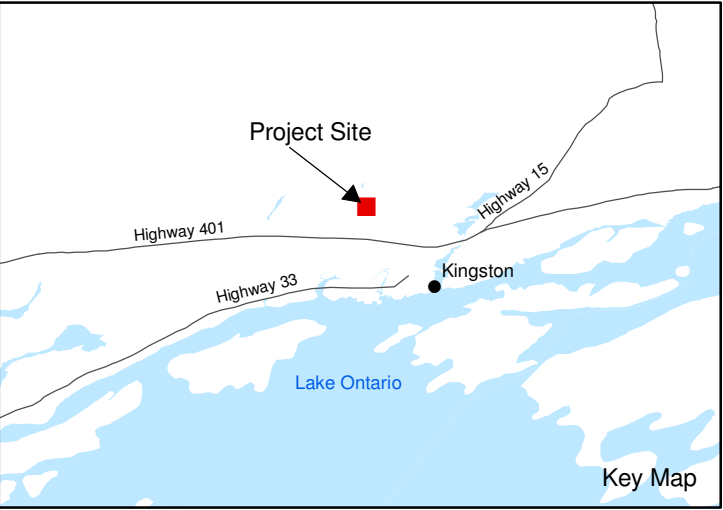
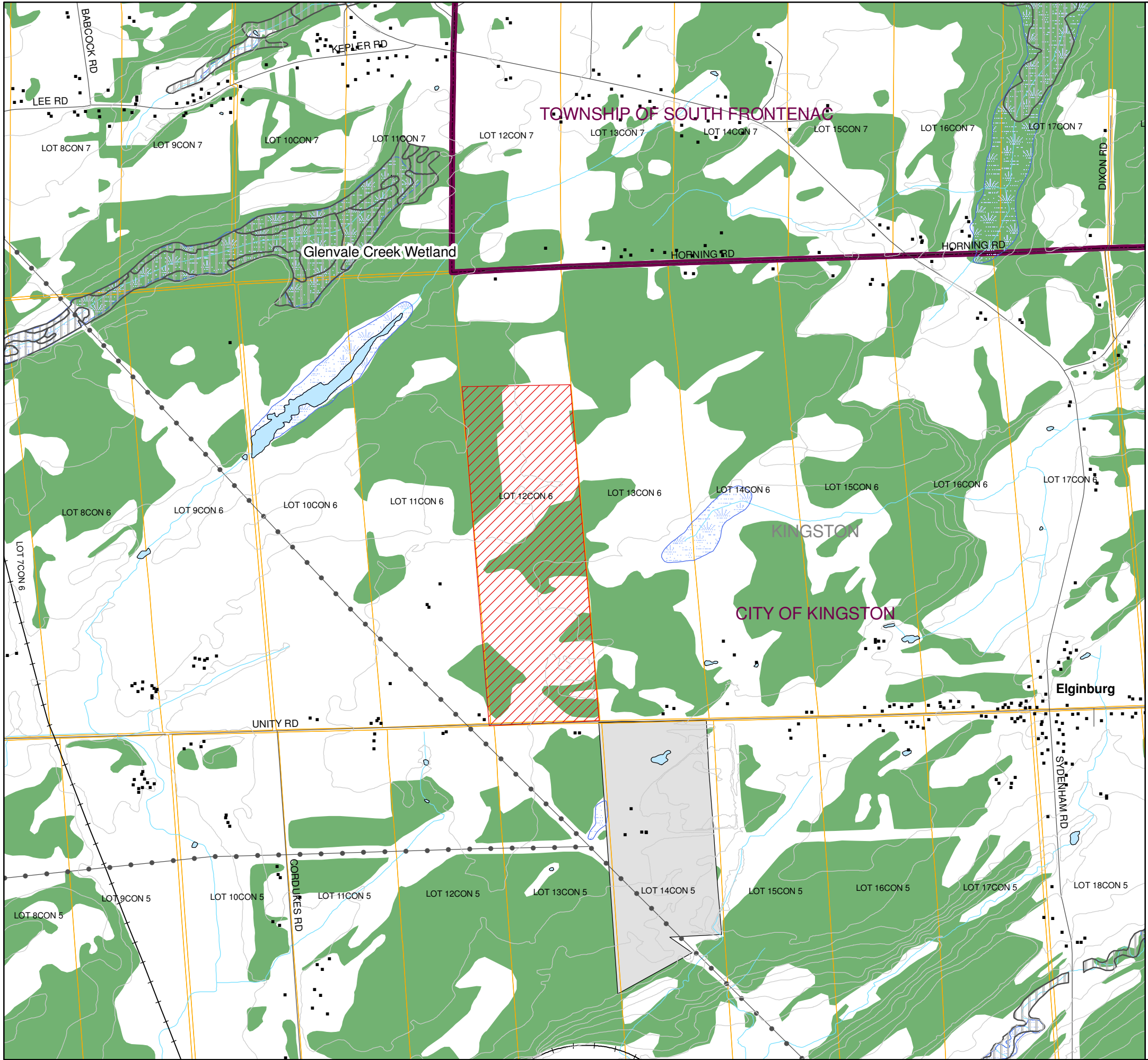
- Areas of Natural and Scientific Interest (ANSI)
- Wetlands (incl. significant wetlands)
- Conservations Areas and Reserves
- Environmentally Sensitive Areas
- Significant Wildlife Habitat (such as Deer Wintering Areas)
- Waterbodies and Valleylands
- Provincial/National Parks
- Agreement Forests
- Woodlands
- Aggregate Sites

In addition to LIO information, a geographic query of the MNR Natural Heritage Information Centre (NHIC) database (online at [http://nhic.mnr.gov.on.ca/MNR/nhic/queries/geographic\\_old.cfm](http://nhic.mnr.gov.on.ca/MNR/nhic/queries/geographic_old.cfm)) was conducted to determine if any known federal or provincial species at risk have been identified within 1 km of the Project site.

### 3.4 Potential Environmental Constraints

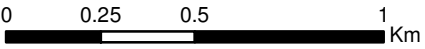
All relevant feature information obtained from the preliminary records review was mapped and is illustrated on Figure 3.2.





Legend

- Building
- Roads
- Railway
- Transmission Line
- Topographic Contour (5m Interval)
- Watercourse
- Parcels
- Municipality
- Township
- Authorized Aggregate Site
- Wooded Area
- Waterbody
- Wetland Area
- Provincially Significant Wetland



1:20,000

Notes: OBM and NRVIS data downloaded from LIO, with permission. GCS NAD 83, May 2010.

Figure 3.2  
Axio Power Canada Inc.  
**Gardiner TS Unity Road**  
**Potential Environmental Constraints**



Based on the results of the records review, the following features were identified that could potentially constrain development of portions of the site:

- Waterbodies – A tributary of Collins Creek approaches the northwest corner of the Project site. The REA Regulation states that no solar panels or transformers can be located within 30 m of a waterbody.
- Woodlands – There are several wooded areas overlapping the Project site.
- Wetlands – There is a wetland located west of the Project site. This wetland, the Glenvale Creek Wetland appears to be located more than 120 m away from the Project site.
- Species at Risk – There are no known records of federal or provincial species at risk within the vicinity of the Project site. However, species at risk could potentially occur. Any critical habitat of species identified as threatened or endangered under the *Endangered Species Act, 2007* or the *Species at Risk Act* would likely impact the development of certain portions of the Project site.

As part of the REA process for the Project, if environmental features are determined to be significant and within required setbacks from the Project, an Environmental Impact Study (EIS) will be prepared. It is anticipated the EIS will determine the impacts to these features and mitigation measures will be developed to minimize or eliminate the negative effects. In addition, if any water bodies are within the specified setbacks, an EIS will also be prepared.

### 3.5 Potential Negative Environmental Effects

The potential negative environmental effect of the Project on the environmental components identified from the records review and constraint mapping are provided in Table 3.1.

In addition, other environmental components (i.e., not related to natural heritage features, wetlands, ANSIs, water bodies, etc.) have been included in Table 3.1. However, since these environmental components have not been researched and field studies and impact assessments have not been completed, these potential impacts provided are generic to some solar projects and will not necessarily be realized on this Project.

**Table 3.1 Potential Negative Environmental Effects**

Environmental Component	Potential Environmental Effect
<b>Natural Environment</b>	
Physiography/Topography	During construction, regrading of excavated soils and some minor alterations to local topography may occur.
Soils	Reductions in soil quality/loss of soils as a result of accidental spills, erosion, soil compaction during construction.
Aggregate Resources	Not applicable.
Surface Water	Surface water quality could be impaired due to contamination due to accidental spills or increased turbidity due to erosion during construction.
Groundwater	No negative effects to local availability of groundwater are expected since no major changes to ground water recharge conditions are expected, nor are major excavations involving significant groundwater dewatering. Impairment of groundwater quality by contamination could occur due to accidental spills during construction.

Environmental Component	Potential Environmental Effect
Aquatic Habitats/Biota	The installation of the Project may result in negative impacts to fish and fish habitat, if watercourse crossings are required.
Areas of Natural and Scientific Interest	Not applicable.
Wetlands	Glenvale Creek Wetland is located west of the Project site. The wetland may be indirectly effected by Project activities, such as the generation of dust during construction and alterations to surface water flow.
Valleylands	Not applicable.
Woodlands	Clearing of the woodlands on the Project site may be required. Woodlands adjacent to the Project site may be indirectly effected by Project activities, such as the generation of dust during construction which could impact vegetation communities.
Vegetation	Vegetation clearing within natural vegetation communities will be required, which may result in negative impacts to vegetation communities and wildlife habitat.
Terrestrial Wildlife / Wildlife Habitat (including species at risk)	Potential loss of wildlife habitat and potential wildlife avoidance of the Project area during construction and operation may occur as a result of disturbance.
Air Quality	Reductions in local air quality from operation of construction equipment and dust displacement may occur due to vehicle traffic.
<b>Social Environment</b>	
Land Use	Current land use will be discontinued within the Project footprint.
Tourism and Recreation	Any tourism or recreational resources existing within the immediate Project vicinity will be considered in determining potential impacts.
Archaeological and Cultural Heritage Resources	Excavations during Project construction may result in the discovery of archaeological resources. Archaeological assessments will be conducted to determine potential. Potential heritage resources will be determined as per the requirements of the Ministry of Culture.
Sound Levels	Temporary disturbance to neighbouring residents may occur during construction. The operation of inverters and transformers may result in increased ambient sound levels. However, noise studies in accordance with O.Reg. 359/09 are required to meet sound levels.
Visual Landscape	Installation of the Project will result in a change to the local landscape.
Community Safety	Construction of the Project will result in a risk to community and workforce safety. During operation, potential risks to public safety are limited.
Local Traffic	Construction of the Project may result in increased local area traffic and temporary delays as a result of equipment delivery to the Project site.
Waste Management and Disposal Sites	Construction and operation of the Project will likely result in the generation of recyclable material, and municipal hazardous and sanitary waste.



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