BRUINING 1 SOLAR

SunE Bruining 1 Solar Farm

Project Description Report

November 5, 2012

Project No. MA-111-18738-00-MA

GENIVAR

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1. Project Description Report

1.1 General Information

The SunE Bruining 1 Solar Farm is being developed by SunEdison Canada, LLC (SunEdison). The project will be owned and operated by SunE Ray LP, which is majority owned by SunEdison. SunEdison is North America's largest solar energy services provider. The company finances, installs and operates distributed power plants using photovoltaic technologies, delivering fully managed solar energy services for its commercial, government and utility customers. SunEdison is a global leader in solar energy generation with a current operating portfolio of more than 350 facilities generating over 100 Megawatts (MW) of solar power across the globe. Active Ontario solar farms currently owned and operated by SunEdison include First Light 1 (9.1 MW) located in Stone Mills, north of Napanee, Norfolk I and II (18 MW combined) located in Norfolk County and Erie Ridge (9.3 MW) in Ridgetown, Chatham-Kent.

1.1.1 Project Contact

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1.2 Project Overview

SunEdison is proposing a single Class 3 Solar Facility with a nameplate capacity of 10 MW (AC) in the area of Ingleside, Township of South Stormont, Ontario. If approved, this facility will convert solar energy into electricity to be fed into the Hydro One distribution grid. The defined project location, presented as Figure 1 in Appendix A, covers approximately 130 hectares (ha).

Subject to receiving all approvals, the preliminary schedule anticipates that full commercial operation will be achieved by the end of 2013. The project has received a 20-year Feed-in-Tariff contract from the Ontario Power Authority to sell the generated electricity to the Ontario electricity grid. As such, the project is anticipated to operate until at least 2033, at which time in may continue to generate electricity or the site may be decommissioned and the land returned to its former vacant use.

1.3 Project Location and Land Ownership

The project is located on Anderson Road, west of Ingleside, Ontario. Figure 1 in Appendix A shows the study area. The area is generally bounded by:

- → Anderson Road along the south (immediately north of Stormont, Dundas and Glengarry County Road 2)
- → CN Rail (Kingston Subdivision) along the north

The following coordinates (in UTM NAD 83, Zone 18N coordinate system) define the extremities of the Study Area for the project:

North-west: Easting 498286 Northing 4982550

North-east: Easting 497526 Northing 4981939

South-east: Easting 499059 Northing 4981245

South-west: Easting 498080 Northing 4980997

The solar farm will be located on privately owned land. The project's electrical substation will also be located on site. One overhead electrical connection line would run directly south to connect to the existing Hydro One distribution line running east-west along Anderson Road.

1.3.1 Renewable Energy Generation Facility Class

Under O.Reg. 359/09, this project is classified as a Class 3 Solar Facility.

1.3.2 Land Ownership and Parcel Description

The table below lists the legal description of the parcels which will be used for the proposed SunE Bruining 1 Solar Farm.

The land hosting the project is privately owned. The land rights have been acquired by SunEdison through an option to purchase agreement. Figure 1 in Appendix A shows the project study area and land within 300 metres of the project location.

Ownership (Public or Private)	Parcel Description
Private	Part of Lots 26, 27 and 28, Concession 2, South Stormont Township, Stormont County, Ontario

1.4 Other Approvals Required

It is anticipated that in addition to the Renewable Energy Approval (REA), the SunE Bruining 1 Solar Farm project will need a Notice to Proceed (NTP) from the Ontario Power Authority, building permits from the Township of South Stormont, permits from the Electrical Safety Authority (ESA) and the Ontario Energy Board (OEB), possible entrance and road use permits from the Township of South Stormont, and possibly permits from the Raisin Region Conservation Authority.

1.5 Federal Involvement

There is no expectation for requirement of a federal environmental assessment under the Canadian Environmental Assessment Act. Nor is there any expectation for the requirement of federal permits or approvals under the Fisheries Act, Species at Risk Act or any other Act.

2. Project Information

2.1 Project Facility and Equipment

The major components of the proposed project are as follows:

- → Approximately 40,000 x MEMC solar modules (260 to 300-watt generation capacity)
- → Approximately 320 disconnect combiners
- → 44 kV Substation including pole-top motor-operated disconnect; 44kV switchgear; 10 MVA oil filled pad-mount transformer; interrupter switches, communication equipment, etc.
- → Approximately 20 x 500-kW inverters and 10 corresponding 1000 kVA transformers
- → Internal access driveways
- → Temporary staging areas for the installation of the solar panels
- → A 30-m tall communications tower (if required by Hydro One)

2.1.1 Solar Photovoltaic Modules

The solar PV technology to be used on this project will be MEMC modules, manufactured in Newmarket, Ontario. There will be a total of approximately 40,000 modules, each approximately 2 m long x 1 m wide. The modules will be held by a single-axis tracking system which is supported off the ground by vertical posts. Racks will be arranged north-south (tracking) in rows each approximately 110 m long and 3 m wide.

All components are certified for application in a solar farm generation configuration.

2.1.2 Electrical System

The solar farm will connect to the east-west Hydro One distribution line along Anderson Road, which is south of Highway 401. DC power collected from modules will be directed to approximately ten inverter/step-up transformer units placed on concrete pads. The AC power from the step-up transformers will be collected via 12.47-kV buried lines and connected to the main substation. This substation will include a transformer (12.47 kV to 44 kV) and associated switchgear and will be on a concrete pad. An overhead line will transfer the 44-kV power to the point of interconnection along the Hydro One distribution line along Anderson Road.

The project will be designed in full conformance with all applicable electrical, building and other codes.

2.1.3 Access Driveways

Gravel driveways within the project site will be constructed to provide access to the equipment during the construction phase and later for maintenance access over the project's 20-year minimum life.

2.1.4 Communications and SCADA

It is proposed to provide Supervisory Control and Data Acquisition (SCADA) functions for remote supervisory monitoring and control. This system allows data on performance of the arrays, inverters, substations and weather conditions to be recorded and displayed at a control station, and also provides warnings if there are abnormal conditions. If required by Hydro One, a single 30-m tall communications tower will be installed to facilitate communications with the electricity grid.

2.2 Project Activities

The project will be composed of the following general activities:

1. Land Acquisition
2. Planning
3. Permitting
4. Detailed Design
5. Construction
6. Operations
7. Decommissioning

2.3 Construction Activities

2.3.1 Surveying and Geotechnical Study Activities

Surveys will be required to accurately locate the racking, inverters, access driveways, electrical lines and the substation. Crews will drive light trucks to reach sites primarily using existing roads. They will then walk the site for the surveying and mark the locations using stakes.

Existing buried infrastructure located on public property or easements will be located using the Ontario One Call service and buried infrastructure located on private property will be located by private contractors prior to construction or geotechnical sampling and updated throughout construction, as required.

Geotechnical sampling will also be required. Typically a truck-mounted drill rig visits the sampling locations, drills the survey hole and collects geotechnical information.

2.3.2 Site Preparation and Land Clearing

Prior to construction, the construction area will need to be cleared, grubbed and fenced. The topsoil is typically removed and some material may need to be added depending upon site specific geotechnical conditions. During clearing or excavation, if any significant archaeological resources are found to be in

conflict with the proposed facilities, then consideration will be given to modifying the location of the construction. This will be determined in consultation with the Ministry of Tourism, Culture and Sport and registered archaeologists.

The project location will be surrounded by a chain-link fence approximately 2.5 m tall and topped with barbed wire for site security. The fence post holes will be augured and the fence posts placed into concrete and allowed to set. Once the posts have set, the metal chain link fence will then be secured. The fencing used will allow the free passage of small animals but prevent access to large animals and humans.

Equipment will include—at minimum— trucks, graders, light cranes, tractor trailers and bulldozers.

2.3.3 Road and Inverter Pad Construction

No permanent paved roads will need to be constructed to bring equipment to the solar farm. Municipal and provincial roads will be used for transportation of equipment to the construction sites. Minor modifications might be required to some of the existing roads (for example, widen the turning radius) for equipment transportation. Any road damages will be repaired in consultation with the applicable road authority.

On-site access to the array will require new internal roads/driveways. Following completion of the construction phase, the internal driveways will be used for maintenance activities for the duration of the facility's operation.

The construction of the internal driveways typically requires excavation of the top soil layer and adding a layer of compacted material to a typical thickness of 300 mm (depending upon site specific geotechnical conditions). Clean granular material (typically "A" or "B" gravel) will be brought to the site on an as-needed basis and will not be stockpiled onsite. The topsoil will be kept and re-used on site. New culverts may be required to maintain site drainage in ditches and these will be constructed sufficient to support the construction equipment and delivery trucks. The exact culvert details (if any are required), installation details and erosion-control measures will be determined in conjunction with the Raisin Region Conservation Authority as a part of their permitting process.

Inverter pads will be constructed at the same time as the internal driveways and will typically be 14 m x 5 m in size. The topsoil at the inverter pad will be removed and approximately 600 mm of clean compacted crushed gravel will be imported on an as-needed basis. The pads will be constructed of poured concrete reinforced with rebar. The excavated topsoil will be re-used on site as feasible.

Vegetation will be cleared within the project location except where it is within 30 m of the Ingleside Swamp Wetland and Upper Canada Migratory Bird Sanctuary Wetland or the unnamed watercourse crossing to the north and east of the site. Trees will be cleared in accordance with the Township of South Stormont by-laws and no vegetation will be cleared during the May to July period.

Equipment will include—at minimum— trucks, graders, light cranes, cement trucks, tractor trailers and bulldozers.

2.3.4 Construction Laydown Area

One area (< 2 hectares) will be used for construction activities and will be located along the Anderson Road allowance. The topsoil at the Construction Laydown Areas will be removed and approximately 600 mm of clean compacted crushed gravel will be imported on an as-needed basis. The excavated topsoil will be re-used on site as feasible.

Equipment will include—at a minimum—trucks, graders and bulldozers.

2.3.5 Delivery of Equipment

Equipment will be delivered by truck and trailer as needed throughout the construction phase and stored at the temporary construction laydown area. These deliveries will typically occur during normal construction hours, typically 8 am to 5 pm and may include weekends. A traffic management plan will be

developed using MTO Book 7 standards. Prior to the start of construction, a road assessment of Anderson Road will be undertaken. An agreement with the Township of South Stormont for rehabilitation of Anderson Road following the completion of construction will be put in place prior to the start of construction.

2.3.6 Installation of Racking System

The racking system will consist of a fixed or a single-axis tracker rack system with the solar modules affixed to a supportive metal rack. The rack/array is then connected to the ground via piles which are buried. Variations on the rack connections to the ground are essentially variations on a common theme, and are dependent on the mount type (fixed/tracking) and the geotechnical conditions – regardless of connection method, the piles will be buried.

The general procedure for rack installation varies slightly depending on geotechnical conditions as outlined above, but is essentially performed as follows:

1. piles are either vibrated, driven or screwed into the ground, to specified/engineered depth*
    a. in cases where special foundations/footing/boreholes are required, *temporary* soil excavation and/or drilling will be required to expose subsurface conditions and prepare them for pile insertion*;
2. soil directly beneath the future racking/surrounding inserted piles is compacted and covered with crushed engineered fill (and further compacted/settled); and
3. racking, hardware and module assembly are built over top of the piles.

*The preferred pile installation method is via a vibratory system, with no pre-excavation requirements. However, if subsurface conditions are less favourable, subsurface pile work may include borehole pre-drilling, rock grouting and/or cement casting. No blasting is required for either installation method. Once the piles are secured in the ground, the excavated soil will be re-filled and steps 2 and 3 above are completed.

2.3.7 Solar Panel Assembly and Installation

This portion of the work is labour intensive and requires significant manual assembly. An array row typically holds up to 44 modules, and a 10-MW solar farm can have as many as 900 array rows. With the exception of light crane trucks and flatbed trailers (storage and module transfer), the assembly work is essentially manual and requires little more than hand tools; welding is required to join tubes that comprise the array skeleton (where appropriate – assembly via hardware connection remains the main form of rack assembly).

The installation and assembly procedure consists of mounting rack components to the support columns (piles), fastening the rack elements together, joining and welding tubes, mounting and assembling tracking motors and their associated hardware (where tracking systems are utilized), and finally, mounting and fastening the PV modules to the assembled rack.

2.3.8 Electrical Collector System

The electrical collector system will consist of wiring from the panel strings to the disconnect combiner boxes which are connected to the pad-mounted inverters/transformers. Cabling will run from the inverters/transformers to a 12.47-kV / 44-kV transformer which will upgrade the voltage to connect to the Hydro One distribution system. Underground cabling will generally be used on private property and aboveground collector lines will be used along public rights-of-way.

For the installation of electricity poles, the holes are typically augured in the ground using a truck-mounted auger device. The poles are then inserted using special cranes to a typical depth of 1 to 2 m below grade. The poles are then “dressed” (made ready to accept conductors) using a boom truck. Typically, one crew will install the poles and one crew will dress them. Once the poles are in place and dressed, cables are strung in place using boom trucks and special cable reel trucks. It is still to be

determined, in conjunction with Hydro One, whether the pole installation work will be done by the proponent or by Hydro One.

2.3.9 Substation

The electrical substation for the solar farm will be located on the site property. The substation equipment will include an isolation switch, a circuit breaker, a step-up power transformer (12.47 to 44 kV), switch gear, instrument transformers, grounding and metering equipment. It will be surrounded by a chain-link fence with a locked gate and topped with barbed wire to meet Ontario Electrical Safety Authority requirements. The substation area will be gravelled with clean material imported to the site on an as-needed basis and sloped to facilitate drainage.

During the construction of the substation, the topsoil will be removed and approximately 600 mm of clean compacted crushed gravel will be imported on an as-needed basis. The pad will be constructed of poured concrete reinforced with rebar. The excavated topsoil will be re-used on site as feasible

2.3.10 Clean-up and Reclamation

Waste and debris generated during the construction activities will be collected and disposed of at an approved facility. All reasonable efforts will be made to minimize waste generated and to recycle materials including returning packaging material to suppliers for reuse/recycling. During construction, industry best practices for spill prevention will be utilized. In the unlikely event of a minor spill, this will be cleaned up immediately and any impacted soils will be removed from site and disposed of at an approved and appropriate facility. At the conclusion of construction, vehicles and construction equipment will be removed from the site.

Stripped soil will be replaced and re-contoured in the construction areas and disturbed areas will be re-seeded, as appropriate. If possible. native plant species will be used for the re-vegetation of disturbed areas. Erosion control equipment will be removed once inspections have determined that the threat of erosion has diminished to the original land-use level or lower.

2.3.11 Facility Commissioning

The facility commissioning will occur once the Solar Panels and electrical system are fully installed and Hydro One is ready to accept grid interconnection. The commissioning activities will consist of testing and inspection of the electrical, mechanical and communications systems.

2.4 Operation Activities

2.4.1 General

The solar farm will require technical and administrative staff to maintain and operate the facility. Most of the farm's operation will be controlled automatically or remotely, through a central monitoring hub. It is expected that a team of 1-2 full-time workers will be required to keep the facility operating properly and maintained regularly. Generally, a team of maintenance personnel covers a regional territory that houses multiple solar farms. The primary workers will be electricians, grounds keepers and mechanics, as well as software technicians who carry out maintenance on the equipment, along with a general supervisor.

Solar panels should operate during daytime hours, in both direct and diffuse light conditions (although at a lesser power output). Each 1-MW block (i.e., a series of array rows connected to two 500-kW inverters) has a comprehensive control system that monitors the panel and electrical subsystems, as well as the local insolation conditions to determine whether operations should be carried out. If an event occurs which is considered to be outside the normal operating range of the array (such as electrical trips, panel weight overload (e.g., snow, extremely high winds), the array will immediately take itself out of service and report the condition to the SCADA system. A communication line connects each 1-MW block to the monitoring hub, which closely monitors and, as required, controls the operation of the array.

2.4.2 Routine Maintenance

Routine preventative maintenance activities are scheduled at six-month intervals with specific maintenance tasks scheduled for each interval. Maintenance is performed by removing the MW block from service and inspecting the electrical, control and mechanical systems on the array. Consumables are used, such as the various greases used to keep the mechanical components operating at peak performance. Following all maintenance work on the MW block, the area is cleaned. All surplus lubricants and grease-soaked rags are removed and disposed of in a prescribed manner. All maintenance activities will adhere to the same spill prevention industry best practices undertaken during the construction phase. Additional maintenance activities will include grass cutting, vegetation removal and fence repair. No pesticides or herbicides will be used during maintenance activities.

2.4.3 Unplanned Maintenance

Modern Solar Panels are very reliable and the major components are designed to operate for over 25 years. However, with large numbers of modules it is inevitable that component failures will occur despite the high reliability. Most commonly, the failure of small components such as switches, fans, or sensors will take a MW block, or even the entire farm out of service until the faulty component is replaced. These repairs can usually be carried out by a single technician visiting the farm for several hours.

2.4.4 Electrical System

The collector lines and substation will require periodic preventative maintenance activities. Routine maintenance will include condition assessment and protective relay maintenance of the substation as well as vegetation control.

2.5 Decommissioning Activities

2.5.1 Procedures for Dismantling

If the facility is to be decommissioned and the solar array is to be removed at the end of its Feed-in-Tariff contract, the impacts will be similar to the construction phase, but in reverse sequence. The procedures will include:

- The creation of temporary work areas. In order to provide sufficient area for the lay-down of the disassembled panels and racking and loading onto trucks, an area must be cleared, levelled and made accessible. The topsoil will be removed and some material may need to be added;
- Equipment will include, at a minimum: The use of cranes to remove the panels, racking, inverters and transformers and the use of trucks for the removal of panels, racking, inverters and transformers;
- Driveways and culverts (if installed) will be removed unless the landowner requests that they be left in place. Driveway bedding material will be removed and replaced with clean sub- and top-soil for reuse by the landowner for agricultural or other purposes. If requested by the landowner, and subject to approval by the Raisin Region Conservation Authority and the Ministry of Natural Resources, the culverts (if installed) will be removed and the land will be contoured to maintain the current drainage patterns; and
- Decommissioning of on site electrical lines and foundations.

2.5.2 Land Restoration Activities

Once the equipment has been removed the land will be restored to its previous agricultural use. This will be accomplished by removing the foundations (or part of foundation), granular material from roadways and culverts (if installed), depending on the landowner preference. Land use will be restored using stockpiled subsoils and topsoil. If there is insufficient material onsite, topsoil and/or subsoil will be imported form a source acceptable to the landowner.

Although strict spill prevention procedures will be in place, there is the potential through the decommissioning process for small spills of solvents or fuels. The soil conditions of the site will be surveyed to the standards of the day to determine if any impacts have occurred. Should soil impacts be noted, the impacted soils will be delineated, excavated and removed, to the standards of the day, from the site for disposal at an approved and appropriate facility. The removed soils will be replaced with stockpiled sub- and topsoil, if available. If none are available, clean fill and topsoil will be imported. If possible native plant species will be used for the re-vegetation of disturbed areas.

2.5.3 Waste Disposal

As discussed above, the waste generated by the installation, operation and decommissioning of the solar farm is minimal, and there are no toxic residues. Any wastes generated will be disposed of according to standards of the day with the emphasis of recycling materials whenever possible.

2.6 Activities Schedule

Though not confirmed, the tentative timing for the general activities are Summer 2013 for construction, Fall 2013 to Fall 2033 for operation and Fall 2033 for decommissioning. Specific timing of activities listed above will be provided in the Construction Plan Report, Design and Operations Report and Decommissioning Plan Report in the complete REA submission.

3. Potential Environmental Effects

The following sections describe the potential environmental effects of the construction, operation and decommissioning of the project. A summary of the effects as they relate to project activities is included in Table 1.

3.1 Cultural Heritage

Archaeology

Construction of the project will result in the disturbance to land. As such, there is potential to disturb archaeological and heritage resources, should they exist on the site. A preliminary desktop (Stage 1) Archaeological study was completed to assess the potential for archaeological resources.

Stage 1 & 2 surveys have been completed with the results reported in Appendix D. No significant archaeological finds were identified within the project location.

Should any archaeological resources be found during construction, work will suspended within the immediate area of the find site and the MTCS will be contacted immediately. A licensed archaeologist will be contracted to assess the find make recommendations on avoidance or removal should the find be determined to be significant.

Built Heritage

A built cultural heritage assessment was conducted on the Bruining 1 solar farm and is reported in Appendix D. Cultural heritage resources were identified adjacent to the project location retain a level of significance based on their exterior architectural styles, their historical associations with early settlers in the former Township of Osnaburck and the retention of physical and visual links to their late eighteenth and early nineteenth-century agricultural roots.

Based on the results of the background data collection, the field review and a cultural heritage evaluation of the identified features and impact assessment the following recommendations were refined for the project as follows:

1. There are no identified cultural heritage resources within the project location, however as the solar facility will be located to the north of three sites there may be impacts to vegetation and views. It was recommended, where possible, to maintain portions of the extant woodlots and brush area in order to provide screening between these resources and the solar facility.

2. Vegetation should be maintained and/or replacement plantings should be planted as much as possible in the grassy area between Highway 2 and Anderson Road in order to provide screening and to preserve the current visual experience of travelling along Highway 2.
3. Should the proposed work plans be revised significantly, all activities should be reviewed by a qualified heritage consultant in order to ensure that the cultural heritage resources are not impacted.

A letter of confirmation was from the MTCS was received on July 18, 2012 that agreed with the recommendations in the Built Cultural Heritage Assessment.

3.2 Natural Heritage and Water Features

A Natural Heritage Assessment (NHA) has been conducted and submitted as part of the REA package. This assessment included a records review, site investigation, evaluation of significance and impact assessment of all potentially significant natural features within 120 m of the project area. Details of these studies can be found in Appendix B.

The property vegetation is typically characterized by fresh-moist mixed thickets in the east and west portions of the project location, fresh-moist mixed forests to the north (including the northwest corner of the project location), east and south of the project location and wetlands dominating to the north and south of the project location. The property has a water feature in the vicinity which is a creek that flows north and east within 120 m of the project location.

The natural features were evaluated for their significance (*Natural Heritage Assessment Evaluation of Significance Report*, Appendix B) and the following significant natural features were identified:

- Two provincially significant wetlands (Ingleside Swamp Wetland (to the north) and Upper Canada Migratory Bird Sanctuary Wetland (to the south)), neither of which will be directly impacted by the proposed project;
- Amphibian breeding habitat (woodland);
- Shrub/early successional bird breeding habitat;
- Waterfowl Nesting Area Habitat; and
- Marsh Bird Breeding habitat.

Project design has been designed to avoid natural features and wildlife habitat as much as possible and to minimize impacts Natural features and wildlife habitat may be affected during construction due to site grading or other earth-moving activities, accidental spills, removal of vegetation or direct loss of areas. In order to prevent and/or minimize adverse effects on these features the mitigation measures proposed are shown in Table1 and detailed in the *Natural Heritage Assessment Environmental Impact Study Report*, Appendix B.

3.3 Surface Water and Ground Water

No water taking is anticipated for any project activities.

The MOE has regulations related to water takings. Provided less than 50,000 litres per day is taken, no permit is required if there is greater than 50,000 litres per day taken, this requires a Permit to Take Water from the MOE. Regardless for the Bruining 1 project, there will not be any installing of a well, or taking of any surface water. If any water is required it will be trucked in by a licensed hauler.

No discharge of any kind in to a water body is anticipated for any project activities.

There is potential for water contamination due to accidental spills of contaminants, specifically oils and lubricants during construction or operation. Only small quantities of lubricants are present during operation. Any leaks or spills from trucks or machinery will be contained, properly cleaned and disposed

of at a registered disposal facility. Refuelling of all vehicles and equipment will be conducted away from watercourses during construction and off-site during operation.

The project location will maintain a minimum 30 m setback from the creek in the southeast portion of the site. An environmental impact study has been conducted and the results can be seen in the *Water Report*. Potential impacts include potential loss of riparian vegetation and increased sedimentation.

3.4 Air, Odour, Dust

The project is a Class 3 solar project and will not emit any air or odour emissions beyond those described in section 2.0. Some dust is expected to be created during construction and decommissioning but standard construction dust suppression and control may be used. Further discussion of the potential effects and mitigation measures is included in section 2.0.

3.5 Noise

A temporary increase in ambient environmental noise during construction will occur due to increased traffic and the operation of construction equipment.

The project proposes installing transformers, inverters and a substation. Each of these will emit some sound. Noise modeling in accordance with MOE standards will be completed and all standards will be adhered to. The regulatory requirement of noise emissions less than 40 dBA before 7:00 am and after 7:00 pm will be met during construction and operation of the site.

3.6 Local Interest, Land Use and Resources

According to the Ontario Oil, Gas & Salt Resources library there are no oil or gas wells in the study area.

Potential short term impacts to local traffic may result from increased traffic due to construction and decommissioning. A traffic control plan will be developed.

The typical land use of the area is rural. The land is not used for agricultural purposes. The soil classification of the property is Class 4 or higher. The project will occupy approximately 80 ha of the 130 ha property and will not be accessible for the duration of the operation phase.

3.7 Public Health and Safety

The construction, operation and decommissioning of the proposed project is not expected to significantly affect public health and safety. The equipment and substation locations will adhere to all regulatory requirements, including those to preserve public safety including setbacks from roads, property lines and residences. All electrical equipment will be designed and installed in accordance with ESA standards and will be equipped with proper safety signage and the transformer substation will be surrounded by a fence to prevent public and large animal access. Some individuals may find the sound from the equipment, under certain operational conditions, to be somewhat annoying.

The project will connect to the local distribution system, owned and operated by Hydro One Networks Inc. There is very low potential for stray voltage to occur. Stray voltage occurs when there is a voltage potential difference between grounded equipment and the customer neutral from the electrical distribution supply at a customer connection. When this Neutral to Earth Voltage exists then there can be a voltage difference between ground at various locations on the customer's facilities due the currents flowing from the distribution system neutral to the ground. At a voltage difference above about 10 volts people may detect a tingle. Livestock such as dairy cattle are sensitive to these small tingle voltages that are not a health hazard to humans. Hydro One has a standard for how they will deal with stray or tingle voltage complaints. The local distribution company is responsible for addressing stray voltage concerns. Moreover, all electrical equipment and design must meet the Ontario Electrical Safety Code and be certified by the ESA. A complaints tracking system will also be documented in the Environmental Effects Monitoring Plan.

3.8 Areas Protected under Provincial Plans and Policies

The project will not impact any lands under Provincial Plans and Policies. The site is not located in an area covered by: the *Greenbelt Act* or plan; The Oak Ridges Moraine Conservation Plan Area; The Niagara Escarpment Plan Area; or The Lake Simcoe Watershed Plan.

3.9 Provincial and Local Infrastructure

The construction, operation and decommissioning of the proposed project is not expected to negatively affect provincial or local infrastructure. Some increase in local traffic will occur during construction and decommissioning activities.

3.10 Summary of Potential Effects and Potential Mitigation Measures

A preliminary summary of these potential effects and potential mitigation measures are presented in the table on the following pages.

Project Activity	Potential Effects	Mitigation Strategy	Residual Effects
Construction Activities			
1.1 Construction Activities	Disturbances to wildlife & birds due to construction activities	○ Adherence to setbacks from Ingleside Swamp Wetland and Upper Canada Migratory Bird Sanctuary Wetland and watercourse ○ Clearly marked construction limits ○ Minimal time required to complete activities ○ Site will be re-vegetated as an open meadow after construction	○ None Anticipated
	Clearing and grubbing and soil excavation	○ Site clearing and grubbing will be kept to a minimum area on-site by staking and marking off the areas that define limits of the work to be done ○ Adherence to setbacks from Ingleside Swamp Wetland and Upper Canada Migratory Bird Sanctuary Wetland and watercourse ○ No vegetation clearing adjacent between May and July ○ Excavated soil will be re-used on-site where feasible, or disposed of in a proper facility off-site. ○ Sedimentation and erosion controls	○ Minor loss of bird and amphibian habitat
	Impacts to surface water features from construction	○ Adherence to 30 m setback ○ Complete permitting process with the RRCA, if required ○ Proper sizing and installation of culverts (if required) ○ Stabilization of disturbed surfaces to prevent erosion ○ Installation of light duty sedimentation fencing installed around work area during construction	○ None Anticipated
	Potential short-term closures on local roads to provide room for trucks to deliver project components. A short-term increase in truck traffic during construction period.	○ Delivery of equipment will be coordinated with local traffic patterns ○ Traffic control plan will be developed	○ Minor traffic delays

Project Activity	Potential Effects	Mitigation Strategy	Residual Effects
	Potential short-term closures on local roads to provide room for trucks to deliver project components. A short-term increase in truck traffic during construction period.	○ Delivery of equipment will be coordinated with local traffic patterns ○ Traffic control plan will be developed	○ Minor traffic delays during construction
	Archaeological resources	○ Completion of an archaeological field survey of all areas to be disturbed prior to the start of construction ○	○ None Anticipated
	Fuel or transformer oil spill	○ Any leak or spills from trucks or machinery would be contained and site would be properly cleaned up and disposed of at registered disposal facilities ○ Transformers used in the project are silicone based and do not contain hydrocarbons ○ Refuelling of all vehicles and equipment will be done away from watercourses during construction and no re-fuelling on-site during the operation phase	○ None Anticipated
	May experience annoyance with dust and/or noise	○ Dust suppression measures will be employed, as necessary ○ On-site supervisor to address any noise complaints	○ Minor short-term annoyances
Operational Activities			
2.1 Solar Farm Operation	Reduction in aesthetic quality of landscape	○ Complaints tracking ○ Adherence to noise setbacks will site inverters away from residents	○ Change in view for nearest neighbours
	Noise impacts on receptors (residents located on non-lease properties) from transformer station	○ Adherence to noise setbacks ○ Noise modelling to predict sound levels ○ Repair equipment in a timely manner ○ Complaints tracking	○ None Anticipated
	Impacts to wildlife from grass cutting	○ Delay grass cutting until mid-July	○ None Anticipated
	Reflection	○ Complete reflection study ○ Planting of trees or shrubs near affected houses	○ None Anticipated

Project Activity	Potential Effects	Mitigation Strategy	Residual Effects
	Spill of transformer oil	○ Secondary containment system in transformer sub-station ○ Proper disposal of waste materials	○ None Anticipated
Decommissioning Activities			
3.1 Removal of Equipment	Sensory disturbance (sound and visual presence)	○ Complaints tracking ○ Impacts from equipment usage & personnel present will be short term	○ Minor short-term annoyance
	Dust	○ Watering of exposed soils ○ Maximum speeds	○ Minor short-term annoyance
	Surficial disturbance	○ Re-grading of site & land use restored after equipment disturbances complete ○ Install erosion control measures	○ None Anticipated, will improve bird and amphibian habitat after re-vegetation is completed
3.2 Removal of Transformer	Spill of transformer oil	○ An oil containment system will be maintained during decommissioning to prevent soil contamination in the event of a leak ○ Proper disposal of waste materials	○ None Anticipated

Accidents and Malfunctions			
4.1 Accidents & Malfunctions	Land contamination from lubricant/transformer fluid leak or spill and lightning strikes	○ Small quantities of lubricants present in the tracking system ○ Any leak or spills from trucks or machinery would be contained and site would be properly cleaned up and disposed of at registered disposal facilities ○ Transformers used in the project are silicone based and do not contain hydrocarbons ○ Refuelling of all vehicles and equipment will be done away from watercourses during construction and no re-fuelling on-site during operation phase ○ Use of lightning protection equipment	○ None Anticipated
	Public safety	○ Siting on private property which restricts public access to the array ○ Equipment conforms to CSA standards ○ Fencing of the substation for security based on standard utility practices	○ None Anticipated