



Design and Operations Report

February 2017

TABLE OF CONTENTS

	<u>Page No.</u>
1.0 SITE PLANS AND FACILITY DESIGN PLAN.....	1
1.1 Nanticoke Solar	1
1.2 Project Contact	1
1.3 Introduction.....	1
1.4 Project Components	4
1.4.1 Solar Photovoltaic Modules	4
1.4.2 Electrical System	4
1.4.3 Access Driveways	5
1.4.4 Communications and SCADA.....	5
1.4.5 Construction Laydown Area.....	5
1.5 Consideration of Natural Features and Watercourses	5
1.5.1 Natural Heritage	6
1.5.2 Water Features.....	8
1.5.3 Noise Study	10
1.6 Consideration of Archaeological Resources, Heritage Resources and Protected Properties	10
1.7 Design Constraints and Setbacks.....	11
1.7.1 Provincial Policy Plans	12
2.0 OPERATIONS	14
2.1 General	14
2.1.1 Routine Maintenance.....	14
2.1.2 Unplanned Maintenance.....	14
2.1.3 Electrical System	14
2.2 Operational Activities – Environmental Effects	15
2.2.1 Solar Farm Operation	15
2.2.1.1 Visual Impacts	15
2.2.1.2 Noise Impacts.....	15
2.2.1.3 Wildlife Disturbances	18
2.2.1.4 Maintenance Activities.....	18
3.0 ENVIRONMENTAL EFFECTS MONITORING PLAN	19
3.1 Construction Staging	19
3.2 Erosion and Sedimentation Control	19
3.3 Vegetation and Wildlife During Construction	24
3.4 Soil Quality and Agricultural Capacity.....	24
3.5 Archaeological Resources	24
3.6 Waste Management	25
3.7 Noise, Air and Dust During Construction	25
3.8 Inspections	26
3.9 Post-Construction Noise Emission Monitoring.....	26
3.10 Potential Environmental Effects, Mitigation Measures and Monitoring	26

4.0	RESPONSE PLAN	38
4.1	Public Complaints.....	38
4.2	External Communications.....	38
4.3	Emergency Response	39

List of Tables

Table 3-1:	Point of Reception Summary Table	16
Table 3-2:	Environmental Effects and Monitoring Requirements.....	27

List of Figures

Figure 1 –	Site Location Plan.....	3
Figure 2 –	Natural Heritage Features and Archaeological Resources	13
Figure 3 –	Location of Receptors and Property Line of Solar Project	17
Figure 4 –	Preliminary Erosion and Sediment Control Plan	21
Figure 5 –	Pre-Development Surface Water Drainage	22
Figure 6 –	Post-Development Surface Water Drainage.....	23

1.0 SITE PLANS AND FACILITY DESIGN PLAN

This report will detail the design activities, the long-term operations of the facility, and any potential environmental effects that could result from these activities and proposed mitigation measures to be applied to the potential environmental effects.

1.1 Nanticoke Solar

The Nanticoke Solar electricity generation project (herein referred to as “The Project”) is being developed by Nanticoke Solar LP (herein referred to as “Nanticoke Solar”), which is an Ontario limited partnership, with Ontario Power Generation Inc. (OPG), SunEdison Canadian Construction LP and 9374264 Canada Limited (the Six Nations of Grand River) as limited partners and Nanticoke Solar Inc. as general partner. OPG owns a majority of the shares and units in Nanticoke Solar Inc. and Nanticoke Solar LP and therefore has a controlling interest in these entities.

Nanticoke Solar LP leased the Nanticoke GS lands and the Central Parcel from OPG. Nanticoke Solar LP leased the West Parcel and the East Parcel from 172965 Canada Limited.

1.2 Project Contact

Name: Phil Shantz
Title: Environmental Planning Lead; ARCADIS
Address: 121 Granton Drive, Suite 12
Richmond Hill, ON L4B 3N4
Email: Phil.Shantz@arcadis.com

Name: Gillian MacLeod
Title: Senior Environmental Advisor; OPG
Address: 700 University Avenue; H18D16
Toronto, ON M5G 1X6
E-mail: Gillian.Macleod@opg.com

1.3 Introduction

Nanticoke Solar is proposing to design, build and operate up to a 44 megawatts alternating current (MW_{AC}) solar electricity generation facility on and near the existing OPG Nanticoke Generating Station (G.S.) site in Haldimand County, Ontario (see Figure 1 – Site Location Plan) (“The Project”). The Project was selected through the Independent Electricity System Operator’s (IESO) Large Renewable Procurement (LRP) I Request for Proposal (RFP). The proposed Project is classified under the O.Reg. 359/09 Renewable Energy Approval (REA) process as a Class 3 Solar Facility and will generate up to 44 MW_{AC}. The Project will convert solar energy into electricity to be fed into the Hydro One transmission grid.

The Project will require approval under Ontario Regulation 359/09 – Renewable Energy Approval (REA) under Part V.0.1. of the *Ontario Environmental Protection Act*. Subject to receiving all approvals, the preliminary schedule anticipates that full commercial operation will be achieved by March 9, 2019. The Project has received a 20-year LRP contract from the IESO to generate electricity and deliver it to the

Ontario electricity grid. As such, the project is anticipated to operate until at least 2039, at which time it may continue to generate electricity or be decommissioned.

Figure 1 – Site Location Plan



THIS DOCUMENT CONTAINS PROPRIETARY INFORMATION OF DNV KEMA RENOVABLES, INC. AND ITS RECEIPT OR POSSESSION DOES NOT CONVEY ANY RIGHTS TO REPRODUCE, DISCLOSE ITS CONTENTS, OR TO MANUFACTURE, USE, OR SELL ANYTHING IT MAY DESCRIBE.

ENGINEER'S STAMP

DRAWING ISSUE	
1	08/18/2016 CLIENT REVIEW
2	12/28/2016 CLIENT REVIEW
3	12/16/2016 CLIENT REVIEW
4	02/09/2017 CLIENT REVIEW

REVISION	

PROJECT NAME
NANTICOKE SOLAR

PROJECT NO.
10027894

CLIENT
OPG

SITE LOCATION
NANTICOKE, ONTARIO

DOCUMENT TITLE
FIGURE 1 – SITE PLAN

DRAWN BY DMB	SHEET E200
CHECKED BY MC	
<p>IF BAR IS NOT ONE INCH, PRINT IS NOT TO SCALE</p>	

FIGURE 1 – SITE PLAN
SCALE: 1:5000

The major components of The Project are as follows:

- Monocrystalline or polycrystalline solar photovoltaic (PV) modules;
- Combiner boxes and cabling;
- Support posts installed in the ground, and a fixed or single-axis mounting structure to hold the PV modules;
- Substation (located on the Nanticoke GS lands), including: a primary transformer; switchgear; PT's, CT's and metering, control and communication equipment and potentially a tower for communication if required by Hydro One;
- Integrated inverter/transformer units to convert electricity from direct current to alternating current, and to step-up the voltage;
- Interior access roads and turnaround areas; and,
- Temporary laydown/staging areas for deliveries of materials and equipment.

1.4 Project Components

1.4.1 Solar Photovoltaic Modules

The solar PV technology proposed for this project is polycrystalline or monocrystalline modules, expected to be approximately 300 W to 400 W of rated power output, and each approximately 2 m long by 1m wide. The modules will be held by a fixed structure or single-axis tracking structure which is to be supported off the ground by vertical posts.

1.4.2 Electrical System

Solar panels will be connected in series, with the collected DC power input into an inverter for conversion to AC power. The power output from the inverter will go to intermediate step-up transformers, where the voltage will be increased. The electrical cables from the intermediate step-up transformers will feed power to the main facility substation, where the main step-up transformer will match the voltage required for interconnection to the provincial power grid.

Interconnection with the provincial power grid will take place within the project site. The point of interconnection is dependent on discussions with Hydro One and the IESO as per System Impact Assessment (SIA) and Connection Impact Assessment (CIA) application process. The proposed point of interconnection is located within the Nanticoke GS lands.

The Project will connect to the Hydro One 230 kV transmission system. We will be in compliance with the Ontario Transmission Codes, IESO Market Rules and North American Electricity Reliability Corporation (NERC) requirements if applicable.

The operational electrical systems will be designed in conformance with best utility safety practices.

In Figure 1, the proposed Site Plan shows two possible alternatives for transmission connection that will be done with AC collection lines/wires that would connect the West, Central and East Parcels to the project located on the coal yard. The AC collection lines/wires may be overhead or buried. Alternative A shows the northern option that runs east-west across or under South Coast Drive and then north-south on either the Nanticoke GS property or the Haldimand Country Right-of-Way. Alternative B or the

southern option has the AC collection lines/wires running south, crossing the environmental buffer (no internal construction) but east of the IOL pipeline and then turning approximately ninety degrees and crossing South Coast Drive toward the Nanticoke GS. As there would be no construction in the environmental buffer the environmental, cultural and socio-economic differences between the two alternatives would be negligible. The two route alternatives show the most likely alignments at this point but these alignments may shift slightly (i.e. up to twenty meters) based on final design. However, Alternative A would be on the west side of the north – south stretch of South Coast Drive and Alternative B would be on the north side of the west east stretch of South Coast Drive.

1.4.3 Access Driveways

Interior roads within the project site will be constructed to provide access to the inverter stations and the substation for construction activities and for maintenance activities during the operation phase. Interior road specifications will be designed in consultation with the local Fire Department. The maximum possible extent of the interior road network is shown in Figure 1 – Site Location Plan, and gravel or dirt roads may be constructed in some or all of the locations identified on the plan.

Municipal road entrances (identified as primary and secondary site entrances) are identified on the Figure 1 – Site Location Plan, and use of these entrances and the municipal roads will be governed by an agreement on roads to be entered into by Nanticoke Solar with Haldimand County.

1.4.4 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. The operation of The Project will be remotely monitored and controlled through the SCADA system using a secure Internet connection.

1.4.5 Construction Laydown Area

Portions of the Nanticoke GS lands, and the West, Centre and East Parcel lands will be used as construction assembly and laydown areas. Construction of laydown areas may include the removal of topsoil, and the installation of clean compacted crushed gravel on an as-needed basis, which is planned to be re-purposed when the laydown area is no longer required. Any topsoil removed will be re-used on site.

Construction equipment will include, at a minimum, trucks, graders and bulldozers.

1.5 Consideration of Natural Features and Watercourses

The preliminary design of The Project took many factors into consideration, however significant woodlots, wetlands and watercourses were the primary factors in the overall site plan layout. To better understand these factors, background studies were undertaken and the results of these studies were used in the design of the layout to minimize any potential environmental impacts. These background studies are presented in the appendices and summarized in the following sections. These studies were discussed with the appropriate agencies.

1.5.1 Natural Heritage

Beacon Environmental Limited (Beacon) prepared a *Natural Heritage Assessment and Environmental Impact Assessment Study*. The *Natural Heritage Assessment and Environmental Impact Study* is required to fulfil the requirement under Ontario Regulation 359/09 - Renewable Energy Approvals under Part V.0.1 of the Act of the *Environmental Protection Act* (O. Reg. 359/09). The Natural Heritage Assessment (NHA) report is provided to the Ministry of Natural Resources and Forestry for review and confirmation as part of the Renewable Energy Approval (REA) application to the Ministry of Environment and Climate Change (MOECC).

A NHA is required for proposed renewable energy projects to determine whether the following natural heritage features are within 120 m and 50 m of the proposed project location: Significant Woodlands; Significant Wetlands; Significant Valleylands; Significant Wildlife Habitat; Provincial Parks; Conservation Reserves; or Area of Natural and Scientific Interest (Earth or Life Science). An Environmental Impact Study (EIS) report was prepared to identify any potential negative environmental effects during construction, operation and decommissioning, and how they will be addressed during mitigation and monitoring.

The *Natural Heritage Assessment and Environmental Impact Study* includes a Records Review, Site Investigation, Evaluation of Significance, and Environmental Impact Study (EIS) where any natural features within the Project Location, and the lands within 50 m of the project location were identified. The following natural heritage features were identified as being in or within 50 m of the Project Location during the background review, consultation with agencies, and field investigation, and were therefore carried forward to the EIS:

- Wetlands;
- Woodlands;
- Planted Tallgrass Prairie;
- Planted Species of Special Concern (Nodding Wild Onion, Pale-Purple Coneflower, Prairie Dock and Tall Coreopsis), which are all associated with the Planted Prairie Feature; and
- Generalized Candidate Significant Wildlife including:
 - Bat Maternity Colonies;
 - Species of Special Concern – Woodland Plants (Harberd-leaved Smartweed, Hirsute Sedge and Weak Stellate Sedge);
 - Bird Species of Special Concern (Eastern Wood-Pewee, Peregrine Falcon and Red-headed Woodpecker);
 - Reptiles and Amphibians of Special Concern (Eastern Ribbonsnake, Jefferson / Blue-Spotted Salamander Complex and Snapping Turtle); and
 - Woodland Vole.

Four of the six wetlands identified through the Site Investigation were assumed to be significant and evaluated using the evaluation of significance criteria. There is no development proposed within any wetlands that are assumed to be significant in or within 50 m of the Project Location. No direct impacts to wetlands that have assumed to be significant that are located in or within 50 m of the Project Location are anticipated as there will be not direct loss of wetland habitat or function, and a minimum 20 m buffer is being maintained from the edge of each woodland to the nearest Project component.

Potential negative effects to wetlands associated with the construction, operation, and decommissioning phases of the Project are outlined in detail within Table 13 of the *Natural Heritage Assessment and Environmental Impact Study* along with mitigation measures.

Three of the woodlands in or within 50 m of the Project Location meet the criteria for significance based on the evaluation of significance criteria outlined in the *NHA Guide for Renewable Energy Projects* (See Figure 2 below, and Figure 6 of the *Natural Heritage Assessment and Environmental Impact Study*). There is no development proposed within any significant woodland. The specific distance from each significant woodland to the Project Location is provided in Table 12 of the *Natural Heritage Assessment and Environmental Impact Study*; a minimum 10 m buffer has been maintained from the boundary of each woodland to the Project Location

No direct impacts to woodlands are anticipated as no woodland is being removed, and a minimum 10 m buffer is being maintained from the edge of each woodland to the nearest Project component.

Indirect negative effects to woodlands resulting from construction and decommissioning activities including dust generation, sediment and erosion, waste management are expected to be temporary, and will be mitigated through standard construction management practices. Other indirect impacts may occur through accidental spills or accidental damage to tree roots or limbs.

All indirect negative effects will be controlled through the use of standard mitigation measures, as outlined *Natural Heritage Assessment and Environmental Impact Study*.

The proposed mitigation measures for wetlands and woodlands would include the following:

- Design and implement erosion and sediment control plan – including silt fences when work is within 30 m of a wetland or woodland;
- Temporarily suspend work if excessive runoff or sediment is observed;
- Stockpile materials at a distance greater than 30 m from wetlands and woodlands;
- Use pervious materials on roads;
- Limit traffic on disturbed soil;
- Maintain existing grading, where feasible;
- Construct roads at or near existing grade, where feasible;
- Maintain fence around perimeter of Project – discourage workers from entering wetland and woodland areas;
- Maintain minimum of 20 m buffer around wetlands and 10 m around woodlands;
- Stabilize and/or re-vegetate all areas of disturbed soils that drain into wetlands and woodlands;
- Identify a designated area for equipment maintenance and fueling;
- Storage of fuel should only occur in permitted areas;
- Maintain an emergency spill kit on-site in case of emergency;
- Develop a spill response plan;
- Use native seed mixes;
- Use native topsoil;
- Clearly delineate work area prior to construction;
- Discourage workers from entering woodland and wetland areas;
- If lighting of the area is proposed as part of the development plan ensure that it is installed in such a way that light is not directed towards natural areas either through the strategic placement of lights or the use of light shields; and
- Clearly post speed limits.

A Planted Tallgrass Prairie is located in the centre of the Project Location. The planted prairie and the planted Species of Conservation Concern will be removed to facilitate the installation of the solar panels, perimeter fence and access road. The removal of the planted prairie feature and these plants will be permanent. A compensation habitat has been identified. The new habitat will include 27.9 ha of grassed habitat and more details are provided in the *Natural Heritage Assessment Report*.

Five Generalized Candidate Significant Wildlife habitat types were identified within the 50 m setback from the Project Location; however, it is not expected that construction or decommissioning activities will have any negative effect on these features. As outlined in the *NHA Guide for Renewable Energy Projects* (OMNR 2012), potential impacts to these habitats are typically associated with the temporary disturbance from construction and decommissioning activities and are grouped together as generalized impacts and mitigation measures.

As described above, removal of vegetation within significant natural features will be limited to the planted tallgrass prairie. Additional vegetation removal will occur within the agricultural fields, and within hedgerows. When vegetation removal is required, the following mitigation measures will be implemented:

- When appropriate, the limits of the vegetation to be cleared will be identified prior to clearing so that the minimum required amount of vegetation is removed;
- When clearing is to occur adjacent to a natural feature, the limit of the clearing area will be staked so that sensitive natural features are not disturbed;
- Clearing limits will be monitored to ensure that no encroachment on natural features has occurred, and the minimum amount of vegetation is removed;
- If encroachment on a natural feature occurs, restoration of the feature may take place under the direction of a qualified biologist.

The federal *Migratory Bird Convention Act* (1994) protects the nests, eggs and young of most bird species from harm or destruction. Environment Canada considers the 'general nesting period' of breeding birds in southern Ontario to be between late March and the end of August. This includes times at the beginning and end of the season when only a few species might be nesting. In light of this we recommend that during the peak period of bird nesting, between April 01 and August 15, no vegetation clearing or disturbance to nesting bird habitat occur. Vegetation includes grasses. In the 'shoulder' seasons of, we suggest that vegetation clearing could occur, but only after an ecologist with appropriate avian knowledge has surveyed the area to confirm lack of nesting. If evidence of nesting is observed, then vegetation clearing (in an area around the nest) has to wait until nesting has concluded. Generally speaking, the smaller and simpler the habitat is, the easier it is to confirm that no nesting is occurring. Likelihood of nesting birds being present in the 'shoulder' seasons also depends on the habitat type. Between September 1 and March 31, vegetation clearing can occur without nest surveys, but the law for nest protection still holds (i.e. if an active nest is known it should be protected).

1.5.2 Water Features

Beacon and ARCADIS prepared a *Water Assessment and Waterbody Report for Nanticoke Solar Project* (Beacon and Arcadis, 2016). A Water Assessment is a required component of a REA application. The Water Assessment includes a records review and a site investigation to determine the presence and the boundaries of waterbodies as defined by O.Reg. 359/09 and are within 120 metres (m) of the Project Location or within 300 m of the average annual high water mark of a Lake Trout lake that is at or above

development capacity. If waterbodies are identified within 120 m of the Project Location, a Waterbody Report (including an EIS) is required.

The Water Assessment and Waterbody Report identified one Lake (Lake Erie) and two of eight watercourses met the definition of waterbodies as specified in O. Reg. 359/09. The remainder of the water features identified through the Records Review either could not be located during ground-truthing (as they were not present) or were features that did not meet the definition of a waterbody under O. Reg. 359/09.

Within the Project Location and 120 m setback; one watercourse, WC2 or an unnamed tributary of Hickory Creek was determined to be a permanent stream; and WC7, also an unnamed tributary of Hickory Creek was determined to be an intermittent stream (see Figure 2 below and Figure 4 in the *Water Assessment and Waterbody Report for Nanticoke Solar Project*). The site investigation confirmed that portions of the Project are located within 120 m of the Lake Erie shoreline and, in the case of the solar panel field proposed for the former coal pile, encroached on the 30 m buffer adjacent to the hardened shoreline. All three features were advanced to an EIS as per sections 39 and 40 of O. Reg 359/09.

With respect to the operations phase, water taking is not required during the operation of the Nanticoke Solar Project.

Potential negative effects to water features associated with the construction, operation, and decommissioning phases of the Project are outlined in detail within Table 9 of the *Water Assessment and Waterbody Report for Nanticoke Solar Project* along with mitigation measures.

The proposed mitigation measures would include:

- Prohibit access to waterbodies and riparian area;
- Maintain a minimum 30 m vegetated buffer from waterbodies;
- Design and implement erosion and sediment controls;
- Stabilize and/or re-vegetate all areas of disturbed soils that drain into watercourse;
- Design drainage system to avoid diversion of, or otherwise minimize changes in drainage;
- Develop a spill response plan;
- Incorporate a designated area for equipment maintenance and fueling;
- Store fuel in permitted areas;
- Maintain an emergency spill kit on-site in case of emergency;
- All equipment should be maintained in good working order and be free of material that could contribute deleterious substances to waterbodies;
- Fuelling areas and storage should be kept at least 30 m from all watercourses and waterbodies;
- Confirm erosion hazard setback limit for any physical structures;
- Stabilize any areas impacted within erosion hazard limits;
- Control post-development flow rates from the site outlets to maintain the pre-development levels in consultation with the Long Point Region Conservation Authority;
- If removal of vegetation within the vicinity of the watercourses is necessary it should be undertaken when the channels are dry or during low flow conditions thereby reducing the potential for increased erosion and sediment transport into the watercourses;
- A comprehensive erosion and sediment control plan will be developed and implemented during the construction and decommissioning phases of the project to reduce or eliminate the transport of sediments, nutrients, contaminants, and increased turbidity within these features (see Conceptual Stormwater Management Plan Report, Arcadis 2016). Siltation and erosion controls should be

installed before any work on the Project Location begins, and removed after the threat of siltation and erosion effects has ceased. The siltation and erosion measures should be checked regularly during the construction and decommissioning phases to ensure it remains in good condition. Any deficiencies in the measures should be repaired;

- Grading activities should aim to minimize changes in natural drainage in order to reduce the potential for changes to hydrological patterns.

The southern portion of the Project Location encroaches within the 30 m setback from the Lake Erie shoreline. This location described above is within the decommissioned Nanticoke GS coal storage facility that is protected from Lake Erie by a berm/perimeter road and armor stone/riprap revetment. Stormwater runoff from the former coal storage area is managed by an onsite treatment system to prevent any contaminated runoff from reaching Lake Erie. The storage facility has been rehabilitated and the stormwater management system will remain in place as outlined in the Conceptual Stormwater Management Report. The specific location where the encroachment occurs is in a portion of the coal storage area that also encroaches within this limit (the berm/perimeter road is modified at this location to allow for the encroachment, while still protecting the area from Lake Erie). The potential project effects and standard mitigation measures outlined above will also be put in place for this area. In addition, and as indicated above any stormwater in this location is managed by the onsite treatment system already in existence.

1.5.3 Noise Study

A temporary increase in ambient environmental noise during construction will occur due to increased traffic and the operation of construction equipment. Nanticoke Solar will adhere to the requirements of all Haldimand County by-laws.

The Project proposes installing transformers, inverters and a substation. Each of these will emit some sound. Noise modeling in accordance with MOE standards is being submitted as part of this REA application and The Project will be in compliance with all applicable requirements, codes, and regulations. Arcadis has completed an *Acoustic Assessment Report* which provides more detail on the modeling and analysis.

1.6 Consideration of Archaeological Resources, Heritage Resources and Protected Properties

Archaeology Assessment

Construction of The Project will result in solar panels covering large portions of the proposed study area. As such, construction has the potential to disturb archaeological resources, should they exist on the site.

A Stage 1 and 2 archaeological assessment has been completed by This Land Archaeology Inc. along with participation from monitors from Six Nations Council and Mississaugas of New Credit. The Report is titled: *Report on the Stage 1 & 2 Archaeological Assessment in Support of the Nanticoke Solar Project, Located on Part of Lots 7 – 11, Concession 3, Town of Nanticoke, Regional Municipality of Haldimand County, Geographic Township of Walpole, Ontario*. That Report: describes the development, historical and archaeological context of the area and the subject lands; describes the archaeological assessment methodology; and, provides an analysis of the various finds and their associated locations.

The completed Stage 1 and 2 archaeological assessment resulted in the discovery of 60 archaeological resources; 39 Isolated Findspots, 15 Informal Archaeological Sites and 6 Archaeological Sites; of these resources 6 are recommended for further investigation via Stage 3 assessment (further recommendations for Stage 4 mitigation may follow upon completion of Stage 3 assessment).

The report is submitted to the Ministry of Tourism, Culture and Sport as a condition of licensing in accordance with Part VI of the Ontario Heritage Act, R.S.O. 1990, c 0.18. A letter of concurrence from the Ministry of Tourism, Culture and Sport will be sought in the fall of 2016 for the above noted report.

As the Stage 1 and 2 assessment did result in the identification of certain sites that will require Stage 3 and 4 assessments. Nanticoke Solar expects to complete Stage 4 assessments on all the sites and therefore free up all the lands for construction. If however, decisions are made to not undertake specific Stage 4 assessments the finds will be appropriately protected and buffered from development. The Stage 3 and 4 work would be undertaken in 2017 with the resultant studies submitted to MTCS and concurrence letters obtained prior to the start of construction.

Archaeological sites recommended for further archaeological fieldwork or protection remain subject to Section 48 (1) of the Ontario Heritage Act and may not be altered, or have artifacts removed from them, except by a person holding an archaeological licence. See Figure 2 below for general location of archaeological resources at the project site.

If during construction any previously undocumented archaeological resources are discovered, work will be immediately suspended in the vicinity of the find and a licensed archaeologist will be contracted to assess the find and make further recommendations.

The Cemeteries Act, R.S.O. 1990 c. C. 4 and the Funeral, Burial and Cremation Services Act, 2002, S.O. 2002, c.33 (when proclaimed in force) require any person discovering human remains must notify the police or coroner and the Registrar of Cemeteries at the Ministry of Consumer Services.

Cultural Heritage Assessment

A cultural heritage assessment titled: *Cultural Heritage Assessment Report: Proposed Nanticoke OPG Solar Project* by Chris Uchiyama Heritage has been undertaken and submitted to MTCS. This Report is available for public review and is available on the Nanticoke Solar website. Based on the current design of the project, no negative project related impacts on potential heritage attributes have been identified. No protected properties, as described in O.Reg.359/09, section 19 are located on or adjacent to the study area.

1.7 Design Constraints and Setbacks

The results of the background studies were used to aid in the layout of the solar array, roads and electrical collector systems. Wetland, woodland and watercourses limits and buffers were identified through the Natural Heritage Assessment including the Records Review, Site Investigation, Evaluation of significance and Environmental Impact Study and the Water Assessment and Waterbody Report (Beacon 2016a and 2016b). Buffers (or a minimum setback distance) were established through and EIS. Wetlands located in or within 50 m of the Project Location were identified and delineated following the protocols provided in the Ontario Wetland Evaluation System (OWES) Southern Manual (MNR 2013). A minimum 20 m buffer was applied to wetlands assumed to be significant through the Evaluation of Significance that took place as part of the *Natural Heritage Assessment* (Beacon 2016). The limits of the woodlands were established

though a staking exercise, which used the dripline to define the limits and a minimum 10 m buffer was applied to all woodland features in or within 50 m of the Project Location. A minimum 30 m buffer was applied to all watercourses, which is consistent with the buffer recommendations of the MNRF Natural Heritage Reference Manual and the Haldimand County Official Plan for the protection of sensitive aquatic systems or Type 1 Fish Habitat (OMNR 2010 and Haldimand County 2009).

Setback	Distance (m)	Notes
Wetlands	Minimum of 20 m	From the nearest edge of the construction area (fence line) to the nearest point of the wetland.
Woodlands	Minimum of 10 m	From the nearest edge of the construction area (fence line) to the nearest point of the woodland.
Waterbodies	Minimum of 30 m	From the nearest edge of the construction area (fence line) to the nearest point of the waterbody

1.7.1 Provincial Policy Plans

The Project is not located in any of the Provincial Land Use Plan areas (Niagara Escarpment, Lake Simcoe, Oak Ridges Moraine or the Greenbelt).

Figure 2 – Natural Heritage Features and Archaeological Resources



2.0 OPERATIONS

2.1 General

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

Solar panels operate during daytime hours, in both direct and diffuse light. Each block of modules connected to one inverter/transformer unit has a comprehensive control system that monitors the panel and electrical subsystems, as well as the local solar irradiance conditions to determine whether maintenance is required. If an event occurs which is considered to be outside the normal operating parameters 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 block to the monitoring hub, which closely monitors and, as required, controls the operation of the array.

2.1.1 Routine Maintenance

Routine preventative maintenance activities are scheduled at regular intervals with specific maintenance tasks scheduled for each interval. Maintenance is performed by removing the 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 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 are planned to be used during maintenance activities. The majority of the routine maintenance can occur in evening hours.

2.1.2 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 sections of The Project out of service until the faulty component is replaced. These repairs can usually be carried out by a single technician visiting The Project for several hours.

2.1.3 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. Regular confirmation checks between the Hydro One and Nanticoke Solar communication system will be done on a semi-annual basis.

2.2 Operational Activities – Environmental Effects

The following discussion on the potential environmental effects has been provided for the operational activities associated with the solar farm. This discussion will help to put into perspective the environmental effects monitoring plan provided in the next section.

2.2.1 Solar Farm Operation

2.2.1.1 Visual Impacts

Activities	Project Operation
Environmental Component Affected	Visual Landscape
Potential Impacts	Passersby may be able to see the solar panels and some may perceive this to be a reduction in the aesthetic quality of the landscape.
Mitigation Measures	Working directly with affected neighbours, and where appropriate, developing suitable landscaping plans to mitigate the visual impact of the solar farm in the rural environment. Examples of mitigation could include wooden fences, vegetative buffers on neighbours properties, Nanticoke Solar's property, or both, depending on the situation and needs.
Residual Impacts	Minimal residual impacts are anticipated. A change to the landscape will occur for the duration of the project and the site will be somewhat visible to the public.

2.2.1.2 Noise Impacts

Activities	Project Operation
Environmental Component Affected	Noise Levels – Local Residents
Potential Impacts	The anticipated noise comes from the inverter and transformer which results in an electrical hum. No noise will be greater than the prescribed limit, 40 dBA, after 7:00 pm and before 7:00 am. Since there is no sunshine at night, there will be no power being generated by the inverters. Please see the <i>Acoustic Assessment Report</i> .
Mitigation Measures	None required.
Residual Impacts	No residual impacts are anticipated.

Noise Sensitive Receptors

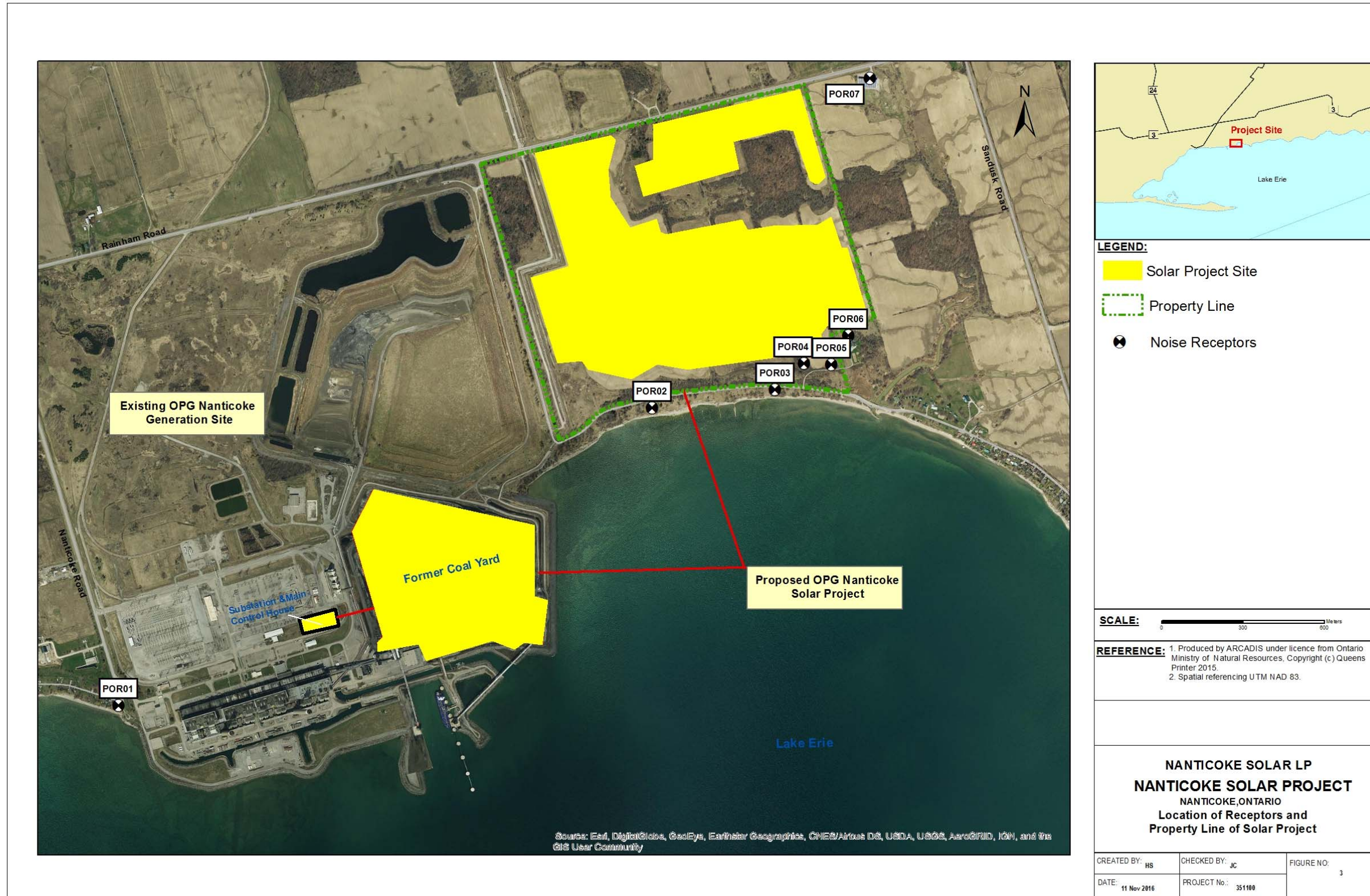
A total of seven (7) Points of Reception (PORs) have been identified as being representative of the most sensitive PORs within one (1) kilometer distance from the Site using property survey information, land use information, and information provided by NSLP (labelled POR1 through POR7 in Figure 3). As per MOECC noise guidelines, a POR means any location on a noise sensitive land use where noise from a stationary source is received. Vacant lots were also included as PORs based on the information provided by NSLP.

The ambient noise levels near the noise sensitive receptor locations can be classified as a Class 3 (rural area) in accordance with MOECC's Noise Pollution Control (NPC) publication NPC-300. For an acoustic assessment, the points with the predictable worst-case noise impacts were considered. The point(s) representing the worst-case noise impact at each property are summarized in Table 3-1 and depicted in Figure 3.

Table 3-1: Point of Reception Summary Table

Point of Reception ID	Description	Approximate Location	Height (m)	UTM Coordinates	
				x	y
POR01	single storey residence (property line)	730 m south-west of Transformer Substation	1.5	577043	4738806
POR02	single storey residence (property line)	50 m south of the Site's property line	1.5	579012	4739904
POR03	single storey residence (property line)	20 m south of the Site's property line	1.5	579467	4739970
POR04	vacant lot (centre of lot)	inside the Site's property line	4.5	579573	4740067
POR05	vacant lot (centre of lot)	inside the Site's property line	4.5	579675	4740063
POR06	vacant lot (centre of lot)	25 m south of the Site's property line	4.5	579737	4740170
POR07	vacant lot (centre of lot)	245 m east of the Site's property line	4.5	579817	4741119

Figure 3 – Location of Receptors and Property Line of Solar Project



2.2.1.3 Wildlife Disturbances

Activities	Project Operation
Environmental Component Affected	Natural Heritage
Potential Impacts	Based on experience at other operating solar projects, no negative impacts are anticipated for natural heritage features or the wildlife that inhabit them during operations. However, some mitigation measures could be considered.
Mitigation Measures	Adherence to setbacks. Discourage workers from entering woodlands and wetlands. Ensure lighting is not directed towards natural areas either through the strategic placement of lights or the use of light shields. Enforce speed limits.
Residual Impacts	The small amount of noise associated with inverters and transformers is limited to a small area around each structure, and will not cause any disturbance to birds or other wildlife.

2.2.1.4 Maintenance Activities

Activities	The Project will be visited by maintenance staff for routine inspections monthly after commissioning
Environmental Component Affected	Wildlife and Birds
Potential Impacts	Routine maintenance visits will be less of a disturbance than the regularly occurring farming activities now taking place on farmlands surrounding the site. Maintenance activities include regular lubrication of the tracking units which generates some waste material. Potential spills Potential dust Potential interactions between wildlife and staff conducting maintenance
Mitigation Measures	Land will remain privately held, limiting access to the sites. Maintenance personnel will be instructed not to disturb wildlife if encountered during activities at the site. Post and adhere to speed limits Develop and implement a spill response plan, identify designated areas for equipment maintenance and fueling, maintain emergency spill-kits onsite. Educate staff about no encroachment of wetlands, woodlands, and watercourses Any waste material from the maintenance activities will be properly disposed of by authorized and approved offsite vendors.
Residual Impacts	Infrequent visits by maintenance staff will have little residual impacts.

3.0 ENVIRONMENTAL EFFECTS MONITORING PLAN

The intent of monitoring will be to verify compliance with federal, provincial and/or requirements and to assess the actual impacts of the operation. Detailed post-construction monitoring plans, if required, will be developed, following discussions with the applicable agencies (e.g., Ministry of Natural Resources, and Ministry of Environment and Climate Change) and in accordance with any conditions prescribed in the REA.

3.1 Construction Staging

The timing and execution of construction activities will be scheduled to minimize the potential impacts on the natural environment. Construction and reclamation activities will be scheduled as close to each other as feasible, in an effort to minimize the time any one area is disturbed.

3.2 Erosion and Sedimentation Control

Erosion and Sediment Control will be used to prevent the release of sediment from construction works within or adjacent to sensitive environmental features, and/or to contain sediments within the work area in cases where erosion is unavoidable.

In general, the E&S control plan will consist of silt fencing around the site boundaries as well as along any creeks or streams, and will also utilize hay bales or geotextile lined check dams in ditches.

During the site preparation phase, in advance of construction and soil excavation, site grading activities will occur. These activities will expose a large portion of the site which could generate sediment-laden stormwater. Sediment control measures, in advance of significant earthwork, will include the installation of silt fencing in concert with the existing perimeter fencing around the site, local runoff protection including hay bales and ditch checks will be used in this transitory stage to minimize any sediment in runoff to adjacent properties from existing agricultural ditches.

During the construction phase, erosion and sediment controls will be implemented to minimize off-site deposition of site soils on adjacent properties, roadways, and Lake Erie. The *Erosion and Sediment Control Plan* for the construction phase is provided in Figure 4 below. The following key elements of E&S control will be followed during the construction phase:

1. Silt fencing consisting of permeable fabric fence material installed vertically and fastened to wooden stakes or existing chain link fencing at grade level downstream of stormwater drainage areas across the site to prevent loss of loose surficial soils via stormwater transport (sheet flow).
2. Hay bales or geotextile lined check dams will be used for existing culverts and ditches to prevent off-site soil deposition.
3. Erosion control blankets will be utilized on any constructed slopes steeper than 2H:1V.
4. Mud mats will be used on site entrances directed to local roadways to prevent off-site soil deposition from departing vehicles.

Pre-development surface water drainage and post-development surface water drainage of the project site are illustrated in Figure 5 and Figure 6 respectively, below.

In order for proper function of the E&S control measures it is vital to perform routine maintenance and inspections to ensure the integrity of the control measures. E&S control measures shall be inspected on a weekly basis and after rainfall events. Any noted concerns in the integrity of an E&S control measure shall be rectified in a timely manner. E&S control measures shall be carefully cleaned as required. E&S controls 1 and 2, shall be maintained until the construction phase has been completed and grass cover has grown over the development area.

Figure 4 – Preliminary Erosion and Sediment Control Plan



Figure 5 – Pre-Development Surface Water Drainage



Figure 6 – Post-Development Surface Water Drainage



3.3 Vegetation and Wildlife During Construction

The facility has been designed so that the disturbance of native vegetation and wildlife habitat will be minimized. Additional procedures to be employed include:

- Adherence to woodland and wetland setbacks;
- Minimize time required to complete activities;
- If Vegetation clearing required, it will occur outside the breeding bird period;
- Discourage workers from entering woodlands and wetlands;
- Ensure lighting is not directed towards natural areas either through the strategic placement of lights or the use of light shields;
- Nuisance wildlife will be reported to the environmental inspector. If the situation poses a danger to the crew or animals, the Ministry of Natural Resources will be contacted;
- Vehicle traffic will be limited to 30 km/h or less on access driveways to reduce the potential for collisions with wildlife;
- Use of perimeter fencing;
- No encroachment on woodlands or wetlands;
- Adhere to sediment and erosion control plan;
- If vegetation clearing required, it will occur outside the breeding bird period;
- Develop a spill response plan and incorporate a designated area for equipment maintenance and fueling;
- Clearly delineate work area prior to construction; and
- Wildlife will not be harassed or fed.

3.4 Soil Quality and Agricultural Capacity

The project will attempt to minimize any impacts to the agricultural capacity of the land. Procedures to ensure this include:

- Spill clean-up equipment will be on-site at all times and any spills will be reported to the environmental inspector and, if the spill is of sufficient size, to the MOE spill response centre;
- All work areas will be clearly marked;
- Stripped topsoil will be stockpiled during construction and replaced on site over disturbed areas; and
- Upon completion of the construction work, the work areas will be de-compacted and the topsoil will be used to restore all non-used work areas to their pre-construction capacity.

3.5 Archaeological Resources

Potential impact to archaeological resources are impacted through the following series of mitigation measures:

- A Stage 3 and 4 archaeological assessment will be undertaken as per the recommendations in the Stage 1 and 2 Report;
- If a Stage 4 assessment is not completed on certain finds the areas will be protected and appropriately buffered;

- If during construction any previously undocumented archaeological resources are discovered, work will be immediately suspended in the vicinity of the find and a licensed archaeologist will be contracted to assess the find and make further recommendations; and,
- Any person discovering human remains must notify the police or coroner and the Registrar of Cemeteries at the Ministry of Consumer Services.

3.6 Waste Management

Solar projects generate very little waste. Most of the waste associated with the project will come from the packaging associated with the original delivery of the panels. The delivery of the panels is likely to generate one-time about 8,000 pallets resulting in the generation of approximately 36,000 kilograms of wood, 72,000 kilograms of cardboard and 10,900 kilograms of plastic. Annually it is expected that there would be some replacement resulting in the annual generation of 1,300 of wood 2,700 of cardboard and 400 of plastic. The wood and cardboard would be expected to be recycled, however the plastic would likely be waste. All other waste would be negligible. It is expected that the materials would be left on site less than one month.

All wastes will be handled and disposed of in accordance with applicable regulatory requirements and in a manner which is protective of the environment. Proposed procedures to ensure this include:

- Compliance with all applicable regulations including the Environmental Protection Act (EPA)'s Regulation 347 (as amended);
- The contractor will implement a re-use and recycling program in accordance with available municipal programs;
- The Contractor will provide sufficient and appropriate waste containers around all active work sites;
- No waste will be buried or otherwise disposed of onsite;
- Good housekeeping practices including daily work site clean-up will be implemented;
- All oil, grease, hydraulic fluids and any hazardous wastes will be stored in a designated and secure area with secondary containments. These materials will be periodically removed by a licensed contractor;
- All sewage will be collected in holding tanks (portable toilets) and removed from the site by a licensed contractor for disposal at a licensed facility.

3.7 Noise, Air and Dust During Construction

Construction activities have the potential to impact local air quality and increase local noise levels. The following measures will be implemented in order to avoid or minimize these effects:

- Construction traffic will be limited to 30 km/h or less on access driveways to minimize dust generation;
- Dust will be controlled using watering when necessary;
- Construction equipment idling will be minimized;
- All engines (vehicles and generators) will meet all emission requirements specified by the MOE and MTO;
- Stockpiled soil will be covered or wetted during dry and/or windy conditions as needed to minimize dust; and

- The Partnership representatives will respond to any concerns or complaints in an expeditious and courteous manner.

3.8 Inspections

An environmental site representative will make frequent site inspections and to ensure compliance with all environmental policies and plans. Duties of the inspector(s) will include:

- Daily inspections and weekly reports completed by the contractor's inspector;
- Prior to construction the Partnership and the contractor will jointly determine that all required permits, licenses and approvals are in place prior to the commencement of construction. The contractor will also review the permits on a regular basis and report to the Partnership any which may be approaching the expiry date;
- The environmental site representative will make daily inspections of all activities which may cause adverse effects and of any implemented mitigation measures (sediment traps and fencing); and
- Should any activities which may cause and adverse effect be observed, the environmental site representative will make a verbal report to the project manager and a Nanticoke Solar representative. This will be followed up with a written report.

3.9 Post-Construction Noise Emission Monitoring

The EPA requires that noise emissions for any new project must not have any adverse effects on the natural environment. The REA process is the means by which this is controlled under the EPA. Prior to construction, an REA will be obtained. Any conditions of approval and follow-up measures with respect to the noise ECA that may be identified in the REA will be strictly adhered to.

Prior to construction, a monitoring process to address all complaints, including those dealing with noise levels, will be established.

3.10 Potential Environmental Effects, Mitigation Measures and Monitoring

The potential environmental effects, mitigation measures, monitoring objectives and monitoring plan are presented in Table 3-2.

Table 3-2: Environmental Effects and Monitoring Requirements

Project Activity	Potential Effects	Performance Objective	Mitigation Strategy	Monitoring Plan and Contingency Measures
Construction Activities				
Construction Activities	Disturbances to wildlife & birds due to construction activities	<ul style="list-style-type: none"> • No wildlife mortality • Preservation of significant wildlife habitat • No clearing during general nesting period for breeding birds 	<ul style="list-style-type: none"> • Adherence to woodland and wetland setbacks. • Use of perimeter fencing. • No encroachment on woodlands or wetlands. • Adhere to sediment and erosion control plan. • Minimize time required to complete activities. • If vegetation clearing required, it will occur outside the breeding bird period. • Develop a spill response plan and incorporate a designated area for equipment maintenance and fueling. • Clearly delineate work area prior to construction. • Discourage workers from entering woodlands and wetlands. • Ensure lighting is not directed towards natural areas either through the strategic placement of lights or the use of light shields. • Enforce speed limits. • Wildlife will not be harassed or fed. • Nuisance wildlife will be reported to the environmental inspector. If the situation poses a danger to the crew or animals, the Ministry of Natural Resources will be contacted. • Vehicle traffic will be limited to 30 km/h or less on access driveways to reduce the potential for collisions with wildlife. 	<ul style="list-style-type: none"> • Construction inspection and surveying to maintain setbacks and integrity of exclusion fencing <p><u>Contingency Measures</u></p> <ul style="list-style-type: none"> • Alter location of project components • Suspend construction during breeding periods

Design and Operations Report

Project Activity	Potential Effects	Performance Objective	Mitigation Strategy	Monitoring Plan and Contingency Measures
Construction Activities (Cont'd)				
	Impacts to vegetation and soil through site clearing, grubbing and soil excavation	<ul style="list-style-type: none"> • No loss of soil or soil fertility • No damage to wetland and woodland vegetation 	<ul style="list-style-type: none"> • Adherence to conceptual stormwater management plan. • Implement erosion and sedimentation control plan. • Minimal amount of site grading. • Storing of topsoil. • Erect perimeter fencing and ensure buffers are maintained. • Revegetate areas that drain into wetlands, woodlands and watercourse, immediately after construction. • Store topsoil a minimum of 30 m from wetlands, woodlands, and watercourses. 	<ul style="list-style-type: none"> • Inspection of top soil separating • Construction inspection and surveying • Daily inspections and weekly reporting <p><u>Contingency Measures</u></p> <ul style="list-style-type: none"> • Store available topsoil on site. • Repair, replacement of perimeter fencing.

Design and Operations Report

Project Activity	Potential Effects	Performance Objective	Mitigation Strategy	Monitoring Plan and Contingency Measures
Construction Activities (Cont'd)				
	Impacts to surface water features from construction	<ul style="list-style-type: none"> No increase in sedimentation in watercourses Existing drainage patterns, grades as well as final discharge points will be maintained, where possible. Minor alterations to site grading will be implemented to ensure the flood plain is controlled from proposed development plan area 	<ul style="list-style-type: none"> Prohibit access to waterbodies and riparian area. Maintain a minimum 30 m vegetated buffer from watercourses. Design and implement erosion and sediment controls. Stabilize and/or re-vegetate all areas of disturbed soils which drain into watercourse. Design drainage system to avoid diversion of, or otherwise minimize changes in drainage. Develop a spill response plan and incorporate a designated area for equipment maintenance and fueling. Storage of fuel should only occur in permitted areas and maintain an emergency spill kit on-site in case of emergency. All equipment should be maintained in good working order and be free of deleterious substances. Fuelling areas and storage should be kept at least 30 m from all watercourses and waterbodies. Confirm erosion hazard setback limit for any physical structures. Control post-development flow rates from the site outlets to maintain the pre-development levels. A comprehensive erosion and sediment control plan will be developed and implemented. 	<ul style="list-style-type: none"> Routine inspection of erosion control devices (at least weekly and after rainfalls) Inspection of final restored surfaces to ensure vegetation re-growth <p><u>Contingency Measures</u></p> <ul style="list-style-type: none"> Repair, replace or installation of additional erosion control measures Temporarily suspend work if increased erosion is noted, or erosion and sediment control features are not functioning properly If accidental damage to feature occurs, it will be restored under the supervision of a qualified biologist and in consultation with MNRF and the LPRCA

Design and Operations Report

Project Activity	Potential Effects	Performance Objective	Mitigation Strategy	Monitoring Plan and Contingency Measures
Construction Activities (Cont'd)				
	Impact to local groundwater quality	<ul style="list-style-type: none"> No decrease in groundwater quality 	<ul style="list-style-type: none"> Avoid installing piles in bedrock, where possible. Install pile using industry best practice to prevent the excessive migration of surface water off-site. 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. Refuelling of all vehicles will be done away from watercourses during. construction and no re-fuelling on-site during the operation phase. Develop a spill response plan and incorporate a designated area for equipment maintenance and fueling. Storage of fuel should only occur in permitted areas and maintain an emergency spill kit on-site in case of emergency. All equipment should be maintained in good working order and be free of deleterious substances. Fuelling areas and storage should be kept at least 30 m from all watercourses and waterbodies. 	<ul style="list-style-type: none"> Pre-construction groundwater monitoring and geotechnical assessment of soils and/or bedrock Post-construction groundwater monitoring

Design and Operations Report

Project Activity	Potential Effects	Performance Objective	Mitigation Strategy	Monitoring Plan and Contingency Measures
Construction Activities (Cont'd)				
	<p>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.</p> <p>The municipality indicated concern about: project construction vehicles leaving dirt, mud and debris on county roads; and, maintaining roads in same condition as round.</p>	<ul style="list-style-type: none"> Minimal delays Maintain roads in same conditions as existing situation 	<ul style="list-style-type: none"> Complete Traffic Management Plan with input from the municipality and roads departments. Delivery of equipment will be coordinated with local traffic patterns (e.g., scheduling of large deliveries that could require temporary road closures). Traffic control plan will be developed (with input from the municipality and roads departments). Inform the public on the road closures well in advance. Survey Highway 55 and Rainham Road conditions prior to initiation of construction. Nanticoke Solar will have appropriate mitigations reduce the amount of debris material on the roads from the project construction site. Such as at the construction entrances an area of clear rip-rap, shot rock or bars which will be used for vehicles to cross and shake/vibrate excess dirt and debris from vehicles prior to going on county roads. 	<ul style="list-style-type: none"> Complaint tracking <p><u>Contingency Measures</u></p> <ul style="list-style-type: none"> Establish alternate delivery routes

Design and Operations Report

Project Activity	Potential Effects	Performance Objective	Mitigation Strategy	Monitoring Plan and Contingency Measures
Construction Activities (Cont'd)				
	Archaeological resources	<ul style="list-style-type: none"> No negative effect on archaeological resources 	<ul style="list-style-type: none"> A Stage 3 and 4 archaeological assessment will be undertaken as per the recommendations in the Stage 1 and 2 Report. If a Stage 4 assessment is not completed on certain finds the areas will be protected and appropriately buffered. If during construction any previously undocumented archaeological resources are discovered, work will be immediately suspended in the vicinity of the find and a licensed archaeologist will be contracted to assess the find and make further recommendations. Any person discovering human remains must notify the police or coroner and the Registrar of Cemeteries at the Ministry of Consumer Services. 	<u>Contingency Measures</u> <ul style="list-style-type: none"> If during construction any previously undocumented archaeological resources are discovered, work will be immediately suspended in the vicinity of the find and a licensed archaeologist will be contracted to assess the find and make further recommendations.
	Fuel or transformer oil spill	<ul style="list-style-type: none"> No spills 	<ul style="list-style-type: none"> 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. Refuelling of all vehicles and equipment will be done away from watercourses during construction. Spill Containment kits are available and readily deplore if required. 	<u>Contingency Measures</u> <ul style="list-style-type: none"> Notification of Spills Action Centre, if required Assess and remediate impact soils
	May experience annoyance with dust and/or noise	<ul style="list-style-type: none"> Meet Noise By-law 	<ul style="list-style-type: none"> Dust suppression measures will be employed, as necessary. On-site supervisor to address any noise complaints. 	<ul style="list-style-type: none"> Recording and communication of complaints to local authorities <u>Contingency Measures</u> <ul style="list-style-type: none"> Suspension of construction during high winds Suspension of construction during evening hours

Design and Operations Report

Project Activity	Potential Effects	Performance Objective	Mitigation Strategy	Monitoring Plan and Contingency Measures
Operational Activities				
Solar Project Operation	Reduction in aesthetic (visual) quality of landscape	<ul style="list-style-type: none"> Address any nuisance visual concern if issues are significant. 	<ul style="list-style-type: none"> Complaints tracking. Adherence to noise setbacks will site inverters away from residents, minimizing visual impact from solar farm operation. 	<ul style="list-style-type: none"> Recording and communication of complaints to MOE Vegetative buffers and site landscape plan
	Noise impacts on receptors (residents located on non- lease properties)	<ul style="list-style-type: none"> <40 dBA at non-participating receptors No noise complaints Meet local noise bylaw 	<ul style="list-style-type: none"> Adherence to noise requirements and terms and conditions of ECA including setbacks. Noise modelling to predict sound levels. Repair equipment in a timely manner. Complaints tracking. 	<ul style="list-style-type: none"> Complaints Tracking Follow up monitoring in response to complaints <p><u>Contingency Measures</u></p> <ul style="list-style-type: none"> Repair damaged components
	Impacts to wildlife & birds	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> Adherence to setbacks. Discourage workers from entering woodlands and wetlands. Maintain perimeter fence Ensure lighting is not directed towards natural areas either through the strategic placement of lights or the use of light shields. Enforce speed limits. Report any nuisance wildlife to MNRF if causing problems. 	<ul style="list-style-type: none"> None needed
	Reflection	<ul style="list-style-type: none"> No public complaints 	<ul style="list-style-type: none"> Planting of trees or shrubs near affected houses as required. 	<ul style="list-style-type: none"> Complaints Tracking Follow up monitoring in response to complaints <p><u>Contingency Measures</u></p> <ul style="list-style-type: none"> Additional plantings and/or shades
	Spill of transformer oil	<ul style="list-style-type: none"> No spills 	<ul style="list-style-type: none"> Secondary containment system in transformer sub-station. Proper disposal of waste materials. No re-fuelling on-site. Spill Containment kits are available and readily deplore if required. 	<p><u>Contingency Measures</u></p> <ul style="list-style-type: none"> Notification of Spills Action Centre, if required Assess and remediate impact soils

Design and Operations Report

Project Activity	Potential Effects	Performance Objective	Mitigation Strategy	Monitoring Plan and Contingency Measures
Decommissioning Activities				
Removal of Equipment	Sensory disturbance (sound and visual presence)	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> Complaints tracking. Impacts from equipment usage & construction noise. Personnel present will be short term. 	<ul style="list-style-type: none"> Recording and communication of complaints to MOE
	Dust	<ul style="list-style-type: none"> No offsite impacts 	<ul style="list-style-type: none"> Watering of exposed soils. Maximum speeds. 	<ul style="list-style-type: none"> Recording and communication of complaints to local authorities
	Surficial disturbance	<ul style="list-style-type: none"> No increase in sedimentation in water bodies 	<ul style="list-style-type: none"> Re-grading of site & land use restored after equipment disturbances complete. Installation of light duty sedimentation fencing between proposed development and all water features. 	<ul style="list-style-type: none"> Frequent inspection of erosion control devices Inspection of final restored surfaces On-going consultation with landowners <p><u>Contingency Measures</u></p> <ul style="list-style-type: none"> Repair, replace or installation of additional erosion control measures
	Disturbances to wildlife & birds due to decommissioning activities	<ul style="list-style-type: none"> No wildlife mortality Preservation of significant wildlife habitat 	<ul style="list-style-type: none"> Adherence to woodland and wetland setbacks. Use of perimeter fencing. No encroachment on woodlands or wetlands. Adhere to sediment and erosion control plan. Minimize time required to complete activities. If vegetation clearing required, it will occur outside the breeding bird period. Develop a spill response plan and incorporate a designated area for equipment maintenance and fueling. Clearly delineate work area prior to construction. Discourage workers from entering woodlands and wetlands. 	<ul style="list-style-type: none"> Routine inspection and surveying to maintain setbacks and integrity of exclusion fencing <p><u>Contingency Measures</u></p> <ul style="list-style-type: none"> Alter location of project components Suspend work during breeding periods

Design and Operations Report

Project Activity	Potential Effects	Performance Objective	Mitigation Strategy	Monitoring Plan and Contingency Measures
Decommissioning Activities (Cont'd)				
			<ul style="list-style-type: none"> • Ensure lighting is not directed towards natural areas either through the strategic placement of lights or the use of light shields. • Enforce speed limits. • Wildlife will not be harassed or fed. • Nuisance wildlife will be reported to the environmental inspector. If the situation poses a danger to the crew or animals, the Ministry of Natural Resources will be contacted. • Vehicle traffic will be limited to 30 km/h or less on access driveways to reduce the potential for collisions with wildlife. 	
Removal of Transformer	Spill of transformer oil	<ul style="list-style-type: none"> • No spills 	<ul style="list-style-type: none"> • An oil containment system will be maintained during decommissioning to prevent soil contamination in the event of a leak. • Proper disposal of waste materials. • Spill Containment kits are available and readily deplete if required. 	<u>Contingency Measures</u> <ul style="list-style-type: none"> • Notification of Spills Action Centre, if required • Assess and remediate impact soils

Design and Operations Report

Project Activity	Potential Effects	Performance Objective	Mitigation Strategy	Monitoring Plan and Contingency Measures
Accidents and Malfunctions				
Accidents & Malfunctions	Land contamination from lubricant/transformer fluid leak or spill and lightning strikes	<ul style="list-style-type: none"> No spills 	<ul style="list-style-type: none"> 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. Refuelling of all vehicles and equipment will be done away from watercourses during construction and no re-fuelling. On-site during operation phase. Spill Containment kits are available and readily deplore if required. Use of lightning protection equipment. 	<u>Contingency Measures</u> <ul style="list-style-type: none"> Notification of Spills Action Centre, if required Assess and remediate impact soils
	Public safety	<ul style="list-style-type: none"> No Accidents 	<ul style="list-style-type: none"> Siting on private property which restricts public access to the array. Equipment conforms to CSA/UL/IEC Standards. Fencing of the substation for security based on standard utility practices. 	<u>Contingency Measures</u> <ul style="list-style-type: none"> Activation of emergency response plan

Compensation

Compensation will be required for a planted tallgrass prairie. The planted tallgrass prairie is located in the centre of the Project Location. It has an area of approximately 25.38 ha. This planted prairie was created by OPG in consultation with MNRF in 2010 as part of a habitat creation project. This area was previously under cultivation. A compensation area has been identified and is described in the natural Heritage Evaluation and Environmental Impact Study (Beacon 2017). The new planted prairie will include 27.9 ha of grassed habitat dominated by Big Bluestem (*Andropogon gerardii*), Canada Wild Rye Grass (*Elymus canadensis*), Virginia Wild Rye (*Elymus virginicus*), Switchgrass (*Panicum virgatum*), Little Bluestem (*Sorghastrum nutans*) and Indian Grass (*Sorghastrum nutans*). The habitat will be monitored annually for five years. The land will be maintained, as required, by undertaking the following practices:

- 1) Topseed in order to maintain required grass coverage;
- 2) Mowing or cutting in order to stimulate growth; and/or
- 3) Shrub removal to maintain grassland habitat.

All management activities will take place outside the breeding bird season. A Habitat Management Plan will be created and maintained by Nanticoke Solar, which will outline habitat monitoring, maintenance and a contingency plan.

4.0 RESPONSE PLAN

4.1 Public Complaints

A procedure for receiving, responding and managing public complaints will be established with the contractor for complaints during construction; similar plan to be established for operations. Contact information about the local operations and maintenance site will be established and communicated to all local residents. The complainant will be asked to provide the following information:

- Name / Address / Phone number / Cell phone number;
- E-mail address;
- Location of problem;
- Problem or complaint;
- Time;
- Frequency;
- Other details.

In addition, the District Manager of the Ministry of the Environment will be notified, in writing, of each environmental complaint. The notification will include:

- Description of the nature of the complaint;
- Time and date of the incident related to the complaint;
- A description of the measures taken to address the cause of the incident and to prevent a similar occurrence in the future;
- Specifically for noise related issues, on-site noise analysis may be conducted. If the tests confirm an exceedance of the critical noise value, appropriate mitigation measures will be implemented.

All inquiries will be directed to Nanticoke Solar who will respond to the inquiry accordingly. All inquiries will be logged electronically with the following information: date of question, inquiry or complaint, name, phone number, email address of the individual, response, date of response, and any follow-up issues. Nanticoke Solar will acknowledge the complaint with a response to the complainant. Every attempt is made to resolve complaints received within a reasonable amount of time. For complaints received that cannot be resolved quickly the complainant is informed that the issue will take time to resolve and they will be kept updated on the status of the issue.

Should such conditions arise that the general public requires notification (such as Project changes requiring notifications) the public will be notified as per the *Technical Guide for REA Approvals*, if required. Should agencies such as the local municipality or the Ministry of the Environment require notification, they will be sent the information directly by email, mail and/or telephone conversation. All communications will be documented and kept on file by Nanticoke Solar.

4.2 External Communications

The results of the project monitoring will be shared with the appropriate regulatory agencies and may be shared with the public. In the rare instance that The Project exceeds operational parameters (e.g., noise levels) or there is an emergency, the appropriate agency will be notified using the following approach. Remedies will be put in place to ensure that any regulatory requirements are adhered to.

If, through the Environmental Effects Monitoring Program, exceedances of the operational parameters are discovered, the appropriate regulatory agencies will be notified via e-mail followed by a hard copy report noting:

- The parameter exceeded;
- Magnitude of the exceedance; and
- Mitigation measures to be implemented.

4.3 Emergency Response

Copies of a detailed emergency response plan, developed in conjunction with the local emergency services, will be distributed to the local municipality prior to the commencement of operations. A plan specific to The Project will be developed during the construction phase of this project. This plan will include information on the following:

- Designation of Facility Emergency Coordinators;
- Process Description;
- Objectives;
- Local emergency response contact phone numbers;
- Administration;
- Regulatory References;
- Training;
- Facility Location Information;
- Facility Emergency Procedure;
- Immediate Site Evacuation Procedures and Routes;
- Delayed Site Evacuation Procedure;
- Personnel Injuries/Serious Health Conditions;
- Fire Response Plan;
- Chemical/Oil Spills and Releases;
- MSDS sheets for all chemicals used in construction and maintenance;
- Weather-Related Emergencies.