



German Solar Corporation

Stafford Line Solar Project -
Project Description Report

H353010-00000-121-066-0025

Rev. 1

October 26, 2017

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Report**Stafford Line Solar Project - Project Description Report****H353010-00000-121-066-0025**

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1. Introduction

German Solar Corporation (GSC) on behalf of MNO Solar FIT 4 LP (hereinafter referred to as the “Proponent”) is proposing to construct, install and operate a ≤500 kilowatt (kW) solar photovoltaic (PV) renewable energy solar facility¹ in the County of Elgin, Township of Southwold, titled the “Stafford Line Solar Project”, hereinafter referred to as the “Project.” The Project has been awarded an Independent Electricity System Operator (IESO) contract under the Feed-in Tariff (FIT) Program. The commissioning date for the Project is expected to be achieved in the fall of 2019.

The Project will require a Renewable Energy Approval (REA) under Ontario Regulation (O. Reg.) 359/09 (as amended in May 2016) – *Renewable Energy Approvals under Part V.0.1 of the Environmental Protection Act* (EPA).

O. Reg. 359/09 prescribes the requirements for renewable energy projects based on the Class of solar facility. As set out in the Table of Section 4 of O. Reg. 359/09, the Project meets the requirements of a Class 3 solar facility (i.e., >10 kW) with a nameplate capacity of ≤500 kW.

Maps showing the location of the Project are provided in Appendix A. A representative photograph showing the existing conditions at the Project Location is shown below (Figure 1-1).



Figure 1-1: View of the Eastern Boundary of the Project from Stafford Line, Facing West. Google Street View Image Taken in August 2016

¹ “Solar Facility” is defined in O. Reg. 359/09 as “a renewable energy generation facility at which one or more solar photovoltaic collector panels or devices use light to generate electricity.”

1.1 Project Description Report Requirements

The Project Description Report (PDR) is a component of the consultation requirements of Sections 14 through 18 of O. Reg. 359/09. The Ministry of Environment and Climate Change (MOECC) receives a draft PDR prior to consultation activities and a final version with the complete REA application. This PDR represents the draft version that will evolve as the Project progresses through consultation activities, environmental, social and cultural considerations/assessments and final Project design.

This draft PDR has been prepared in accordance with Item 10, Table 1 of O. Reg. 359/09 (as reproduced in Table 1-1 below) and the *Technical Guide to Renewable Energy Approvals*² (MOECC, 2013).

Table 1-1: Project Description Report Requirements (Table 1 of O. Reg. 359/09)

Project Description Report Requirements	PDR Section
1. Any energy sources to be used to generate electricity at the renewable energy generation facility ³ .	Section 2.2
2. The facilities, equipment or technology that will be used to convert the renewable energy source or any other energy source to electricity.	Section 3.1
3. If applicable, the class of the renewable energy generation facility.	Section 2.4
4. The activities that will be engaged in as part of the renewable energy Project.	Section 3.2
5. The nameplate capacity of the renewable energy generation facility.	Section 2.3
6. The ownership of the land on which the Project Location is to be situated.	Section 2.1.2
7. If the person proposing to engage in the Project does not own the land on which the Project Location is to be situated, a description of the permissions that are required to access the land and whether they have been obtained.	Section 2.1.2
8. Any negative environmental effects that may result from engaging in the Project.	Section 4
9. If the Project is in respect of a Class 2 wind facility and it is determined that the Project Location is not on a property described in Column 1 of the Table to Section 19, a summary of the matters addressed in making the determination.	N/A
10. If the Project is in respect of a Class 2 wind facility in respect of which Section 20 applies and it is determined that the Project Location does not meet one of the descriptions set out in subsection 20 (2) or that the Project Location is not in an area described in subsection 20 (3), a summary of the matters addressed in making the determination.	N/A
11. An unbound, well-marked, legible and reproducible map that is an appropriate size to fit on a 215 mm by 280 mm page, showing the Project Location and the land within 300 m of the Project Location.	Appendix A

² The Technical Guide to Renewable Energy Approvals is currently under review. The proposed changes for the PDR section (Chapter 4) has been reviewed and incorporated; there were no major changes.

³ "Renewable Energy Generation Facility" is defined in the *Electricity Act, 1998* as "a generation facility that generates electricity from a renewable energy source and that meets such criteria as may be prescribed by regulation and includes associated or ancillary equipment, systems and technologies as may be prescribed by regulation, but does not include an associated waste disposal site, unless the site is prescribed by regulation for the purposes of this definition."

2. Project Overview

Details about the Project Location and land ownership are provided in the following sections.

2.1 Project Location and Ownership

Project Location is defined in O. Reg. 359/09 as “a part of land and all or part of any building or structure in, on or over which a person is engaging in or proposes to engage in the Project and any air space in which a person is engaging in or proposes to engage in the Project.”

The area of the Project Location (including the Connection Line) is approximately 1.1 ha.

2.1.1 Project Location Map

In accordance with Table 1 of O. Reg. 359/09, a Project Location map has been prepared per the following requirements: an unbound, well-marked, legible and reproducible map that is an appropriate size to fit on a 215 mm by 280 mm page, showing the Project Location and land within 300 m of the Project Location.

An (unbound) overview map of the Project is provided in Appendix A.

2.1.2 Land Ownership

The Project is located in the County of Elgin, Township of Southwold, Ontario on private land owned by GSC. The Project is situated on an abandoned and discontinued rail line.

On October 13, 2015, Proponent has entered into an Option to Lease Agreement with GSC for an exclusive, irrevocable option to lease the lands for the purposes of building, operating and maintaining the Project. The Proponent may exercise the Option at a time during the Option Period (50 months from the date of the Option to Lease Agreements) to enter into a ground lease for a solar power development. The term of the Lease shall be for 20 years from the Commercial Operation Date as defined in the Feed-In Tariff 4.0.1 Appendix 1-Standard Definitions with one option to review the Lease for an additional 5-year period.

The legal description of the property is provided in Table 2-1, below.

Table 2-1: Legal Description of the Property of the Stafford Line Solar Project

Solar Facility	PIN	Legal Description
Stafford Line Solar Project	35145-0170	PT LT 6 CON 5 OR GORE SOUTHWOLD AS IN SW4212; S/T INTEREST IN SW4212; SOUTHWOLD

2.2 Energy Sources to Generate Electricity

In accordance with Table 1 of O. Reg. 359/09, the energy sources to generate electricity will be solar energy.

2.3 Nameplate Capacity

In accordance with Table 1 of O. Reg. 359/09, the nameplate capacity of the Project will be ≤500kW.

2.4 Class of the Renewable Energy Facility

In accordance with Table 1 of O. Reg. 359/09, the Project will be a Class 3 solar facility. That is, the Project is ground mounted and greater than 10 kW.

2.5 Contact Information

Contact information for the Proponent is as follows:

Name: **Dennis German, President, German Solar Corporation**

Address: 15835 Robins Hill Road, London, Ontario, N5V 0A5

Office Telephone: 519-457-7373

Email: dgerman@germansolarcorp.ca

The Proponent has retained Hatch Ltd. (Hatch) to assist in meeting the REA requirements. Contact information for Hatch is as follows:

Name: **Kathleen Vukovics, REA Coordinator**

Address: 4342 Queen Street, Suite 500, Niagara Falls, ON L2E 7J7

Office Telephone: 905-374-0701, Ext. 5343

Fax: 905-374-1157

Email: Kathleen.vukovics@hatch.com

The Project website is located at: <http://www.pv-rail.com/>

2.6 Other Approvals Required

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

- Local Municipality – Building Permit – The local municipality will likely require a building permit to undertake construction.
- Ministry of Natural Resources and Forestry (MNRF) Approvals and Permitting Requirements Document (APRD) to address relevant permits, licenses, authorizations or approvals governed by MNRF. This may include, but not limited to:
 - ◆ Work Permit and/or Lakes and Rivers Improvement Act Approval – MNRF approval will be required should a water crossing be required for the Project.
 - ◆ Overall Benefit Permit for species at risk protected under the ESA, 2007.
- Lower Thames Conservation Authority (LTCA) – Development, Interference with Wetlands, and Alterations to Shorelines and Watercourses Permit.

2.7 Federal Involvement

No Federal lands or resources will be utilized for the Project and issues under Federal jurisdiction, such as permitting and approval requirements, are not anticipated. Therefore, no Federal involvement is anticipated to be required.

3. Project Information

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

3.1 Facilities, Equipment and Technology

In accordance with Table 1 of O. Reg. 359/09, the following details are related to facilities, equipment and technology that will be used to convert the renewable energy source or any other energy source to electricity.

3.1.1 Photovoltaic Panels

The Project is a renewable energy project that will use solar PV technology.

At this time the PV panel information, including make, model, size, dimensions, number of panels, etc. has not been finalized and is subject to change. The Proponent is considering using 325 W to 425 W panels manufactured by Hanwah Solar. It is estimated that between 1550 to 1880 PV panels will be installed, and approximately 5 to 25 inverters will be required.

There will be 20 to 25 polycrystalline PV panels mounted on structural aluminum or galvanized steel racking tables in single, double or triple rows. Each rack is in a fixed tilt-adjustable position, facing south and angled between 15° and 55° to the horizon. The rows of racking tables are supported by vertical structural steel posts that are founded in either concrete slab on grade, driven piles or buried foundations in the ground to a depth below the frost line, at least 1.2 m.

3.1.2 Electrical Interconnection

Electricity generated by the PV panels will be converted from DC to AC by an inverter, and subsequently stepped up (via a transformer) in order to connect to the existing HONI distribution system. The step-up transformer will be located within the proposed panel location on a concrete transformer vault.

3.2 Project Activities

In accordance with Table 1 of O. Reg. 359/09, the Project activities involved in the construction, operation and decommissioning phases of the Project are outlined in the following sections.

3.2.1 Construction

It is anticipated that construction of the Project will take three to six months, depending on time of year and various other factors. Prior to construction, the area will be surveyed and any buried infrastructure will be located before commencing with site preparation.

3.2.1.1 *Site Preparation*

Site preparation consists of removal of scrub trees and brush. Minor grading of the railway bed may be required in some cases.

Construction laydown will occur on the property, immediately adjacent to where the PV arrays are proposed.

The existing lane from the former railway bed will be used as the access road for the Project. New access lanes may be required where the existing railway bed is not sufficient for access lane use.

Where the existing rail bed is less than 5 m wide or is insufficient for an access lane, it will be widened to allow for transport using gravel sufficient for lane underlayment. The minimum thickness of the access road granular base and top course material will be at least 30 cm. Ditches and culverts will be constructed, if necessary, to maintain site drainage. Erosion and sedimentation control measures (e.g., silt fence barriers, etc.) will be installed, where needed.

A 2-m high chain link fence which may have barbed wire will be installed around the perimeter of the Project to prevent unauthorized access.

3.2.1.2 *Construction and Installation*

Foundations and/or support structures will be required beneath transformers, inverters and PV panels. Detailed engineering for the design of the foundations and support structures are yet to be completed. However, it is expected that the pads for the racking tables, transformers and inverters will be concrete slab-on-grade. The PV panels will be installed on fixed racking structures. Foundation construction and the installation of support structures will be subject to inspection prior to the installation of PV panels, and wiring.

A network of underground DC cabling will be required from the termination point of the PV array to the inverters which will then convert the DC electricity to AC.

A network of underground AC cabling may be required from the inverters, to connect the PV array to the HONI distribution system.

In all cases, a simple trenching device will be used to install the underground cables.

3.2.1.3 *Testing and Commissioning*

Testing and commissioning will be performed on the installation prior to start up and connection to the power grid. Solar modules, inverters, cabling, will be checked for system continuity, reliability, and performance standards. If problems or issues are identified, modifications will be made prior to start up.

3.2.1.4 *Site Restoration*

Site restoration will occur during the final stages of Project construction and installation activities. The main objective will be to re-instate the area to the original pre-construction condition, such as the ecosystem, vegetation, and drainage, where possible. All construction

material, equipment and waste will be removed from the site. Site restoration will be undertaken, as required.

3.2.2 Operation

The Project will operate year-round and generate electricity during daylight hours. The amount of power generated will depend on daily weather conditions and sufficient solar irradiation. The Project will be operated remotely and accordingly, no employees will be on site with the exception of maintenance and inspection personnel, as needed.

3.2.2.1 Electrical System

Electrical cables will convey the electricity from the inverters to a transformer rated for the Project generation size. One transformer is required for the Project and will be located within the PV array. The transformer will step-up the voltage to 27.6 kV as required for connection to the HONI distribution system.

3.2.2.2 Site Security

The Project will be gated, fenced and contain security cameras as deemed necessary for site security.

3.2.2.3 Maintenance and Inspection

The Project will typically be scheduled for maintenance twice per year. Typically, maintenance includes checking the structures, interconnections, adjusting the tilt for seasonal conditions and cleaning the PV panels. It is anticipated that the panels may be washed twice a year using water with no cleaning solutions added.

All the required maintenance materials (e.g., hydraulic fluids) will be brought to the site as required so no on-site storage of this material will be necessary. The Project will be inspected whenever the power output is lower than anticipated as this would be indicative of a mechanical or electrical problem.

3.2.3 Decommissioning

A 20 to 25 yr. lifespan is typically anticipated for the Project. At that time (if the power purchase agreement is not extended), the Project will be decommissioned or refurbished depending on market conditions and/or technological changes.

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

- Removal of the scrap metal and cabling. Where possible, these materials will be recycled, with non-recyclables taken to an approved disposal site.
- Removal of support structures and foundations; these materials will be recycled where possible.
- Site cleanup and any necessary re-grading.

- Conveyance of the unused lands to interested parties, including farmers, adjacent land owners, the Municipality or community groups is a consideration during and post contract period of the Project.
- Removal of panels, inverters, transformers and associated wiring end electrical units. These materials will be recycled where possible.

4. Potential Negative Environmental Effects

The potential negative environmental effects that may occur during construction, operation and decommissioning phases of the Project are described in Table 4-1.

The categories for the potential negative environmental effects were selected following the *Technical Guide to Renewable Energy Approvals* (MOECC, 2013) and include:

- Cultural Heritage – includes protected properties, archaeological resources, and heritage resources
- Natural Heritage – includes provincial parks or conservation reserves, Areas of Natural and Scientific Interest (ANSIs) (earth science and life science), southern wetlands, wildlife habitats, and woodlands
- Water – includes water bodies, such as lakes, permanent streams, intermittent streams and seepage areas
- Air, Odor and Dust
- Noise
- Local Interests, Land Use and Infrastructure
- Public Health and Safety
- Areas Protected under Provincial Plans and Policies
- Other Resources.

Based on the current knowledge of the Project and standard/regulated environmental protection practices, proposed mitigation measures have been provided. Further details are provided in subsequent reports (e.g., Construction Plan Report, Design and Operations Report and Environmental Impact Studies (EIS)).

As part of the REA process for the Project, if environmental features (e.g., natural features, water bodies) are determined to be significant and within required setbacks from the Project, an EIS has been prepared. Any potential impacts identified in the EIS will have appropriate mitigation measures to minimize or eliminate negative effects.

Table 4-1: Potential Negative Environmental Effects

Category	Environmental and Social Component	Potential Environmental Effects (Construction, Operation and Decommissioning)	Proposed Mitigation
Water	Surface Water	Surface water quality of the various water bodies in proximity to the Project Location could be impaired due to contamination from accidental spills or increased turbidity due to site erosion as well as potential effects due to contamination identified at	A 30-m setback for electrical equipment will be put in place from all waterbodies in accordance with provincial requirements and regulations. As well, erosion and sediment control measures and spill

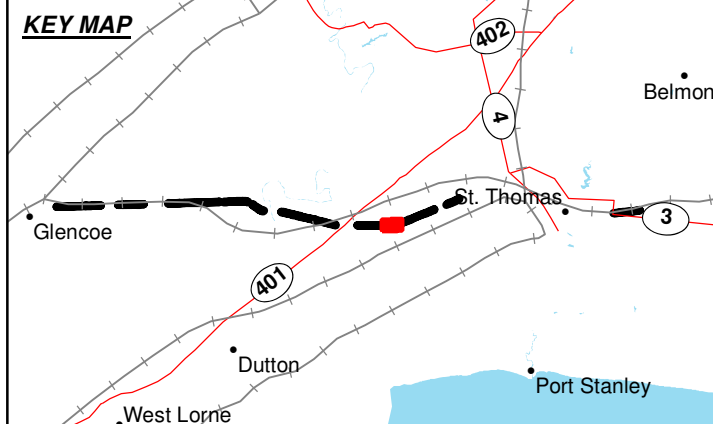
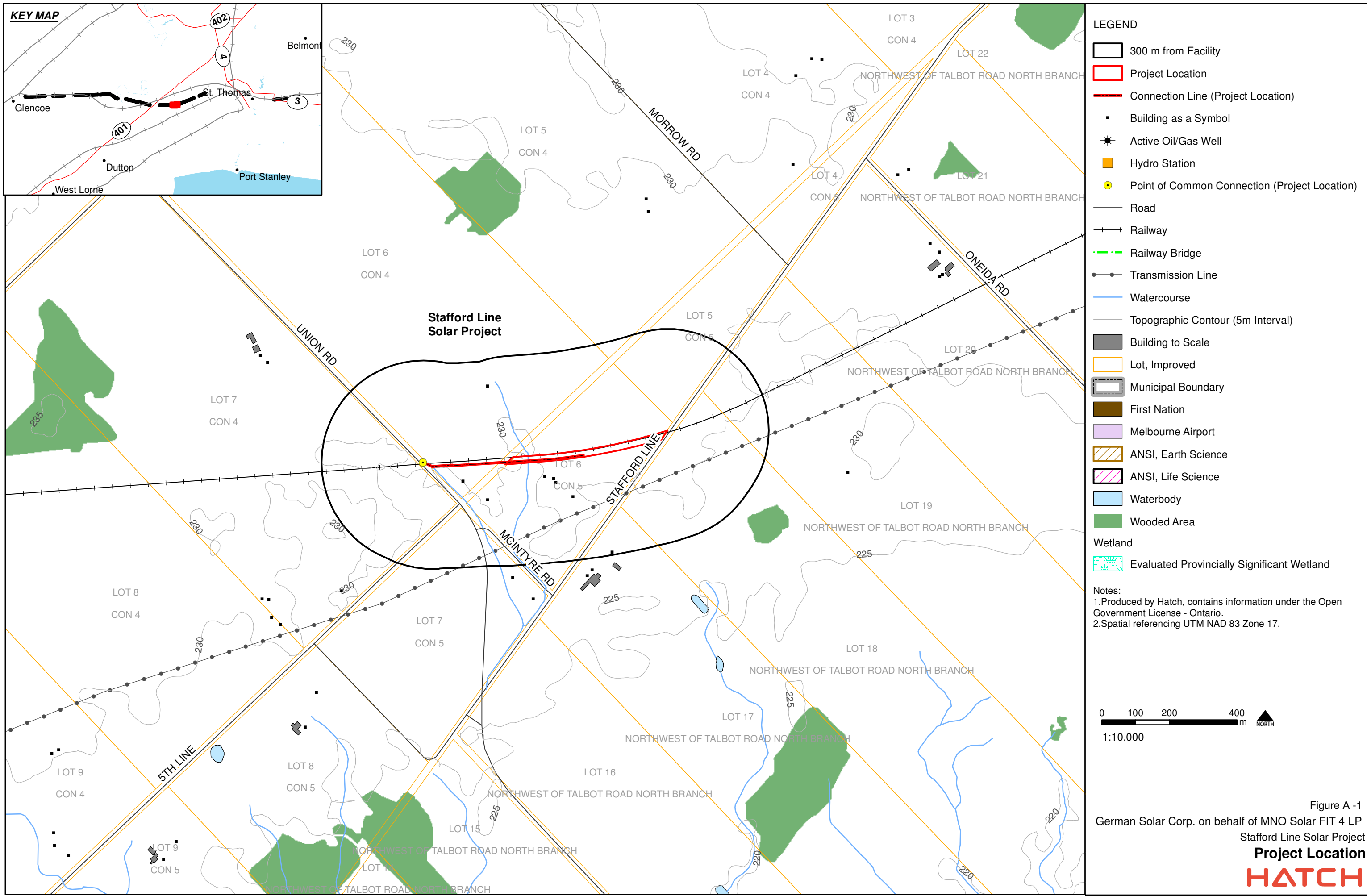
Category	Environmental and Social Component	Potential Environmental Effects (Construction, Operation and Decommissioning)	Proposed Mitigation
		<p>the Project Location.</p> <p>There are water bodies identified (based on LIO data) on and within 300 m of the Project. Of these, there was one permanent and/or intermittent stream located on or within 120 m of the Project.</p>	<p>prevention and response measures will be implemented to minimize any potential impacts to surface water. Where required, water crossings will be constructed in accordance with best management practices.</p> <p>A Storm Water Management Plan may be developed, as required to ensure pre-construction flows are maintained through all Project phases. Mitigation measures will include best management practices, including, but not limited to, erosion and sediment control measures and maintenance of existing drainage conveyance (quality, quantity, surface water volumes/flow rates).</p>
	Groundwater	Groundwater may be impaired by contamination due to accidental spills, or changes in groundwater recharge.	Spill response measures will be in place to prevent and minimize any accidental spills.
	Aquatic Habitats/Biota	<p>The Project is currently situated on an abandoned and discontinued rail line. The lands are currently idle.</p> <p>The installation of the Project may result in negative impacts to fish and fish habitat if water bodies are present.</p> <p>There are water bodies identified (based on LIO data) on and within 300 m of the Project. Of these, there was one permanent and/or intermittent stream located on or within 120 m of the Project.</p>	A 30-m setback for electrical equipment from all water courses will protect fish habitat in accordance with provincial requirements and regulations. Erosion and sedimentation controls and spill prevention and response measure will limit any potential impact
Natural Heritage	Areas of Natural and Scientific Interest (ANSI) (earth science and/or life science)	There are no ANSIs on or within 300 m of the Project.	Not applicable.
	Wetlands	The presence/absence of wetlands has been confirmed through field investigations and are discussed in the Natural Heritage Assessment Report.	If required, mitigation measures, including monitoring programs proposed in the EIS will occur, throughout the life of the Project to minimize any potential negative impacts on significant wetlands.
	Woodland/Vegetation	The Project is located on an abandoned and discontinued rail line. The presence/absence of woodlands has been confirmed through field investigations and are discussed in the Natural Heritage Assessment Report. Overall, vegetation clearing on the Project Location is expected to be minimal.	Work areas will be flagged to limit clearing, and ensure it will not extend into un-utilized areas. Re-vegetation of the Project, as required, will occur after decommissioning.
	Terrestrial Wildlife/Wildlife Habitat (including species at risk)	An assessment of wildlife habitat in and within 50 m of the Project Location has been completed and is described within the Natural Heritage Assessment Report.	Work areas will be clearly marked and will not infringe further than necessary. Mitigation measures will include, at a minimum, site preparation outside of the breeding bird season or other sensitive wildlife

Category	Environmental and Social Component	Potential Environmental Effects (Construction, Operation and Decommissioning)	Proposed Mitigation
			periods, as required.
	Physiography/ Topography	During construction, re-grading of excavated soils and some minor alterations to local topography may occur.	Decommissioning of the Project site will include re-grading to original conditions, to the extent possible.
	Soils	Potential reductions in soil quality/loss of soils as a result of accidental spills, erosion, soil compaction during construction.	Erosion and sediment control measures will be implemented prior to and during construction and will remain in place until vegetation and soils are stabilized on the Project Location. Mitigation measures will be implemented to protect soil quality and minimize compaction during construction.
Cultural Heritage	Tourism and Recreation	Any tourism or recreational resources existing within the immediate Project vicinity will be considered in determining potential impacts.	Visual screening as defined in the IESO rules, in those areas will be considered, if required.
	Archaeological and Cultural Heritage Resources	Archaeological assessments conducted in 2017 have not identified existing archaeological resources on the property. Excavations during Project construction may result in the discovery of archaeological resources. Potential heritage resources will be determined as per the requirements of the Ministry of Tourism, Culture and Sport.	During construction if an artifact is found, work will stop until a licensed archaeologist has cleared the area and approved that construction can recommence, in accordance with Ministry of Tourism, Culture and Sport requirements.
Air, Odor and Dust	Air Quality	Reductions in local air quality may occur during construction/decommissioning. Fugitive dust may occur as vegetation is removed and soils remain bare, as well as through the operation of equipment and vehicle traffic. There are no anticipated impacts identified during operations.	Mitigation measures will include standard best management practices. Dust will be suppressed to maintain good air quality during construction/decommissioning, in accordance with provincial requirements and regulations.
Noise	Noise	Temporary disturbance to neighbouring residents may occur during construction/decommissioning. The operation of inverters and transformers may result in increased ambient sound levels. However, noise studies in accordance with O. Reg. 359/09 are required to meet sound levels established by the MOECC.	Measures to meet MOECC sound levels for the closest receptor during operations will be implemented, as required.
Local Interests, Land Use and Infrastructure	Visual Landscape	Installation of the Project will result in a change to the local landscape. Although it should be noted that the Project will be developed on an abandoned/discontinued rail line.	Visual screening as defined in the IESO rules will be considered, as required.
	Land Use	The Project is currently situated on an abandoned and discontinued rail line. The lands are currently idle.	Not applicable.
	Local Traffic	Construction/decommissioning of the Project may result in slight increases in local area traffic and the potential for temporary disruption along routes used, however, no delays to the local community traffic are anticipated.	Transportation routes will be determined to minimize the impact on local traffic. Although not anticipated to be necessary, if required, a Traffic

Category	Environmental and Social Component	Potential Environmental Effects (Construction, Operation and Decommissioning)	Proposed Mitigation
			Management Plan will be developed to address and mitigate any potential effects associated with traffic and ensure compliance with municipal requirements. Mitigation would include, but not limited to, measures to control traffic and safety protocols.
Public Health and Safety	Community Safety	Construction/decommissioning of the Project will result in a risk to community and workforce safety. During operation, potential risks to public safety are limited.	Safety procedures will be followed to ensure both worker and public safety. The public will not be allowed access to the site during construction, operations or decommissioning.
Areas Protected under Provincial Plans and Policies	Protected Area	The Project is not within any provincial land use plan areas (i.e., Greenbelt Plan, Oak Ridges Moraine Conservation Plan, Niagara Escarpment Plan, Lake Simcoe Protection Plan).	Not applicable.
Other Resources	Aggregate Resources	Not applicable.	Not applicable.
	Waste Management and Disposal Sites	Construction/decommissioning of the Project will likely result in the generation of recyclable material, and municipal and sanitary waste.	The disposal and proper storage of wastes and recyclables will occur in accordance with municipal and provincial requirements and regulations.

Appendix A

Overview Map – Project Location



- LEGEND**
- 300 m from Facility
 - Project Location
 - Connection Line (Project Location)
 - Building as a Symbol
 - Active Oil/Gas Well
 - Hydro Station
 - Point of Common Connection (Project Location)
 - Road
 - Railway
 - Railway Bridge
 - Transmission Line
 - Watercourse
 - Topographic Contour (5m Interval)
 - Building to Scale
 - Lot, Improved
 - Municipal Boundary
 - First Nation
 - Melbourne Airport
 - ANSI, Earth Science
 - ANSI, Life Science
 - Waterbody
 - Wooded Area
- Wetland**
- Evaluated Provincially Significant Wetland

Notes:
 1. Produced by Hatch, contains information under the Open Government License - Ontario.
 2. Spatial referencing UTM NAD 83 Zone 17.

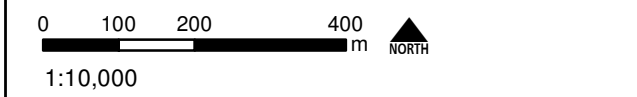
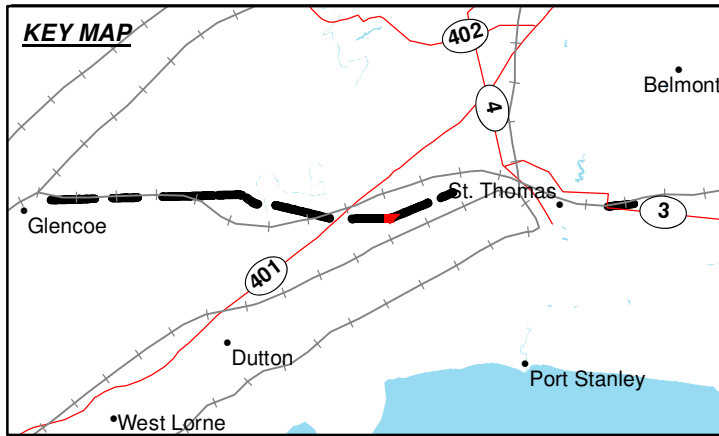


Figure A -1
 German Solar Corp. on behalf of MNO Solar FIT 4 LP
 Stafford Line Solar Project
Project Location
HATCH



LEGEND

- 300 m from Facility
- Solar Facility (Project Location)
- Connection Line (Project Location)
- Building as a Symbol
- Active Oil/Gas Well
- Hydro Station
- Point of Common Connection (Project Location)
- Road
- Railway
- Railway Bridge
- Transmission Line
- Watercourse
- Topographic Contour (5m Interval)
- Building to Scale
- Lot, Improved
- Municipal Boundary
- First Nation
- Melbourne Airport
- ANSI, Earth Science
- ANSI, Life Science
- Wooded Area
- Wetland**
- Evaluated Provincially Significant Wetland

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Figure A -2
 German Solar Corp. on behalf of MNO Solar FIT 4 LP
 Stafford Line Solar Project
Solar Facility Location
HATCH

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HATCH

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