



Construction Plan Report Silvercreek Solar Park

Submission to: Ministry of the Environment
Renewable Energy Approval Unit
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- Appendix A Checklist for Requirements under O.Reg 359/09
- Appendix B Natural Heritage Mitigation Commitments

SUMMARY OF CHANGES – Construction Plan Report

The following changes have been made to this report to update it from the report released in August of 2012.

1. The proponent has opted to remove the provision for a tracking installation at the solar array due to requirements to meet domestic content provisions. As a result the layout of the solar array and the inverter locations has been altered slightly. The text has been revised to state that a fixed installation will be utilized, and maps of the array location have been updated to reflect the fixed tilt installation
2. As a result of consultations with the Township of Malahide minor changes to access roads on the Solar Array site were changed to allow for better emergency access in case of fire. This is reflected in the updated site layout.
3. As a result of stakeholder consultations the site map was updated to clarify the area between the Solar Array fence and the roadway will continue to be farmed as part of an agricultural operation
4. The side of the road on which the distribution line construction will occur has been clarified in this report
5. Some minor typographical errors were corrected throughout the report, as a result some page numbers and section headings have changed
6. The onsite laydown area has been removed due to archaeological considerations and all storage will occur offsite in a storage area such as a barn or multipurpose storage facility. The report has been updated to reflect this change
7. Section 2.1.7 has been updated to reflect comments obtained from Catfish Creek Conservation Authority regarding the requirement to obtain a permit for distribution line watercrossings
8. Section 2.1.8 has been updated to reflect comments obtained from CCCA regarding the desire to maintain the integrity of the white pine plantation at the substation area
9. Table 3, section 3.2 Surface, Storm Water & Waterbodies has been updated to include additional mitigation of adding a conduit pipe for watercrossings as requested by CCCA.

1. INTRODUCTION

1.1 General Information

Silvercreek Solar Park Inc. (Silvercreek) is proposing to develop a new 10 MW ground-mounted solar photovoltaic (PV) facility located in Elgin County within the Township of Malahide, 9 km south of the town of Aylmer (Figure 1). This project will be located primarily on privately owned lands, with the exception of the distribution line which will be located on municipally controlled lands.

The Project requires construction of on-site roads to access the modules and sub-station. In order to connect the Project to the sub-station and consequently to the Hydro One Networks Inc. (HONI) system, construction of a new 34.5 kV underground electrical distribution line will occur within the Municipal Right of Way (Figure 2). An additional 115 kV cable will run less than 500 m to connect the substation to the adjacent Hydro One system as shown in Figure 3.

On July 1, 2012 amendments to Ontario Regulation 359/09 (O.Reg 359/09), the Renewable Energy Approvals Regulation came into force. This amendment allowed for projects which were significantly advanced to continue under the previous regulation. Given that Proponent has completed a significant amount of progress towards completion of the REA, they have opted to continue under the January 2011 requirements.

1.2 General Timing of Principal Construction Activities

The Silvercreek Solar Park is subject to Ontario Regulation 359/09 under the Environmental Protection Act, and requires a Renewable Energy Approval (REA), as a Class 3 Solar Facility. The project was awarded a Feed-in Tariff (FIT) contract in July 2011. Construction activities are planned to begin in May 2013. All required permits will be obtained prior to commencing construction.

Table 1: Proposed Development Timeline

REA Technical Studies	Ongoing through to early 2012
Public Open House #1	December 2009
Draft REA Reports to Public	July 2012
Public Open House #2	October 2012
REA Approval	April 2013
Start of Construction	May 2013
Planned In Service Date	October 2013
Contract Date for Commercial Operation (COD)	July 2014
Repowering/Decommissioning	2032 (approximately 20.5 years after COD)

Figure 1: Site Plan – Solar Array & Connection Route

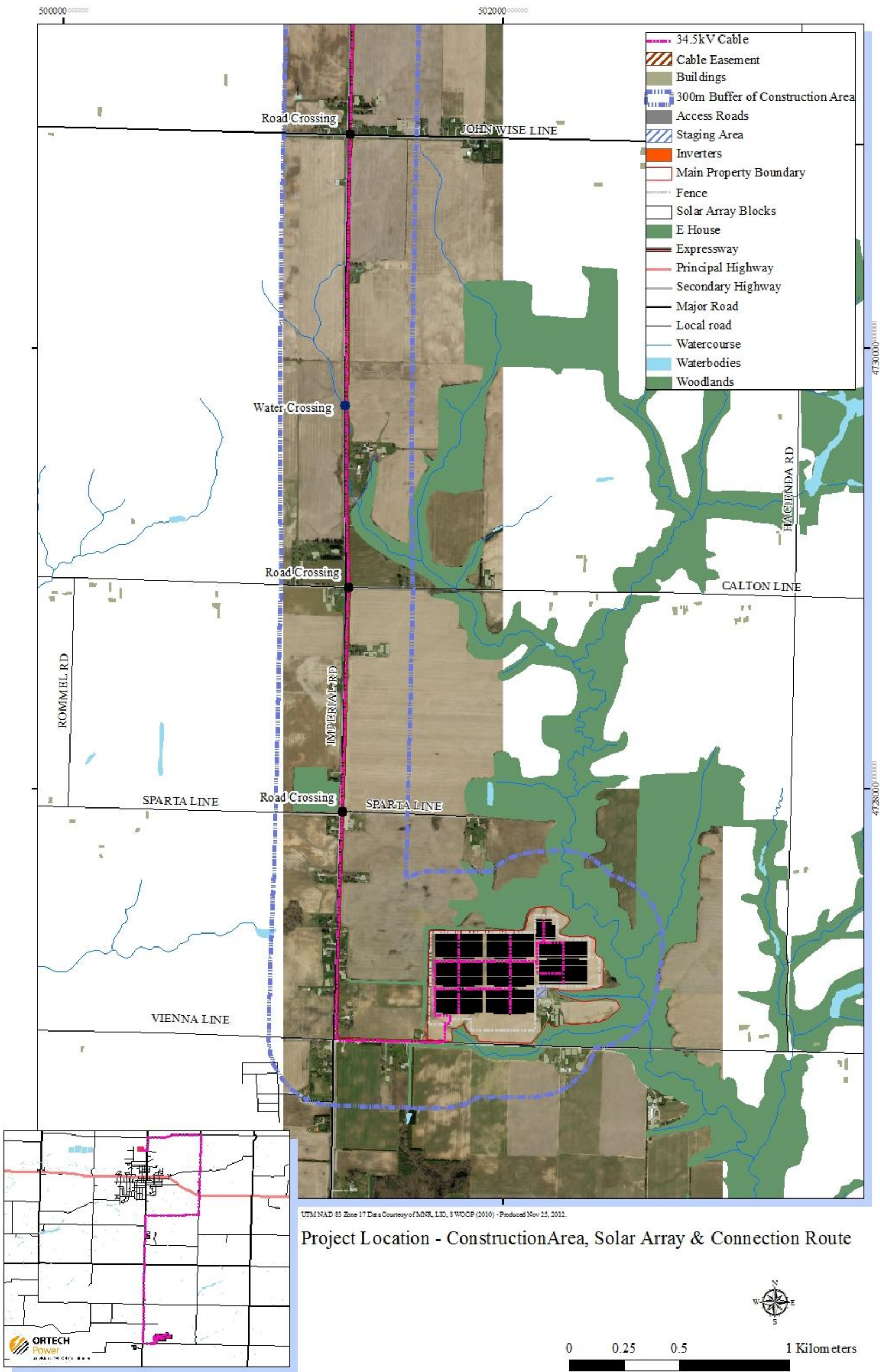


Figure 2: Site Plan –Connection Route Continued

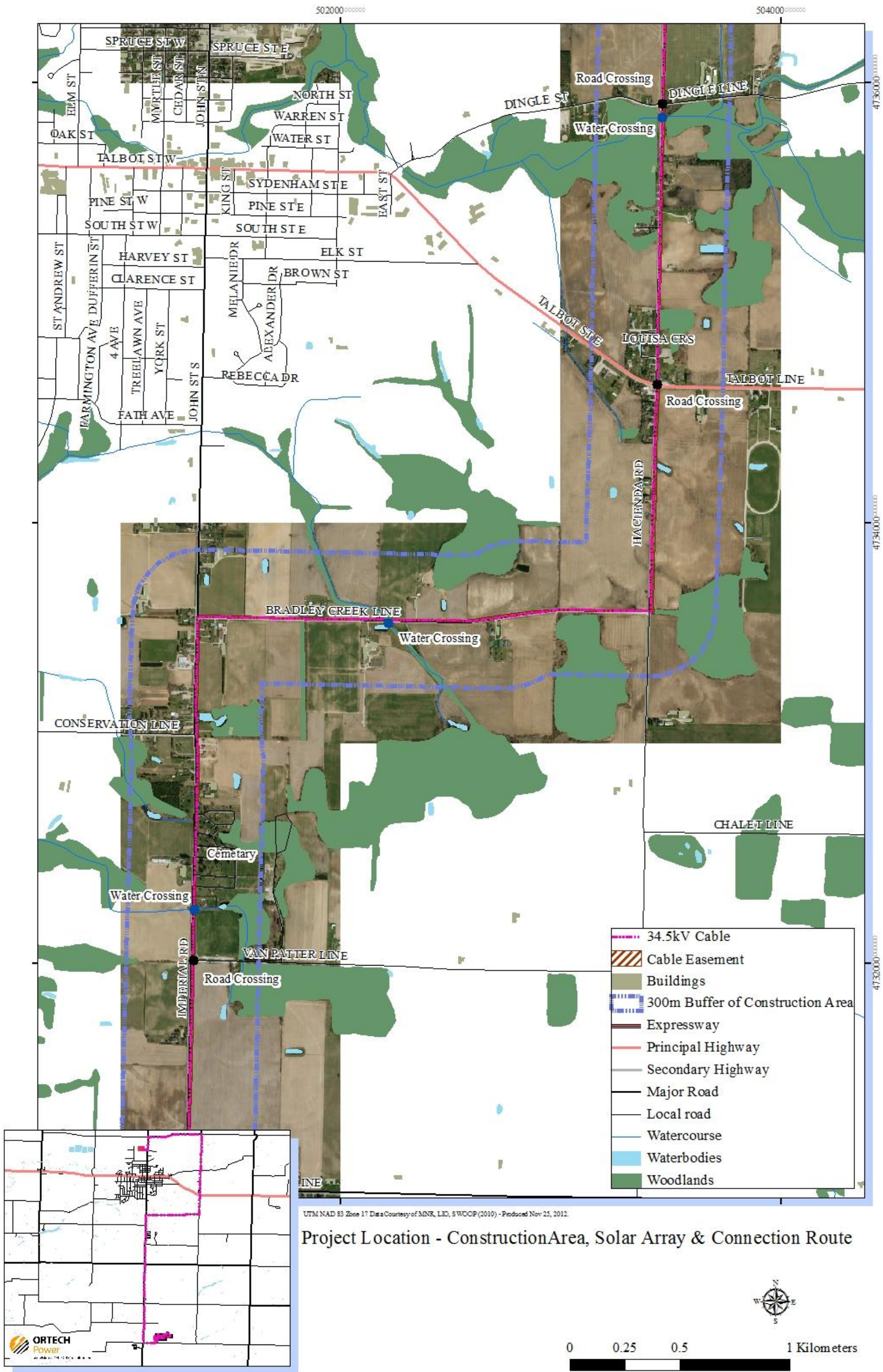
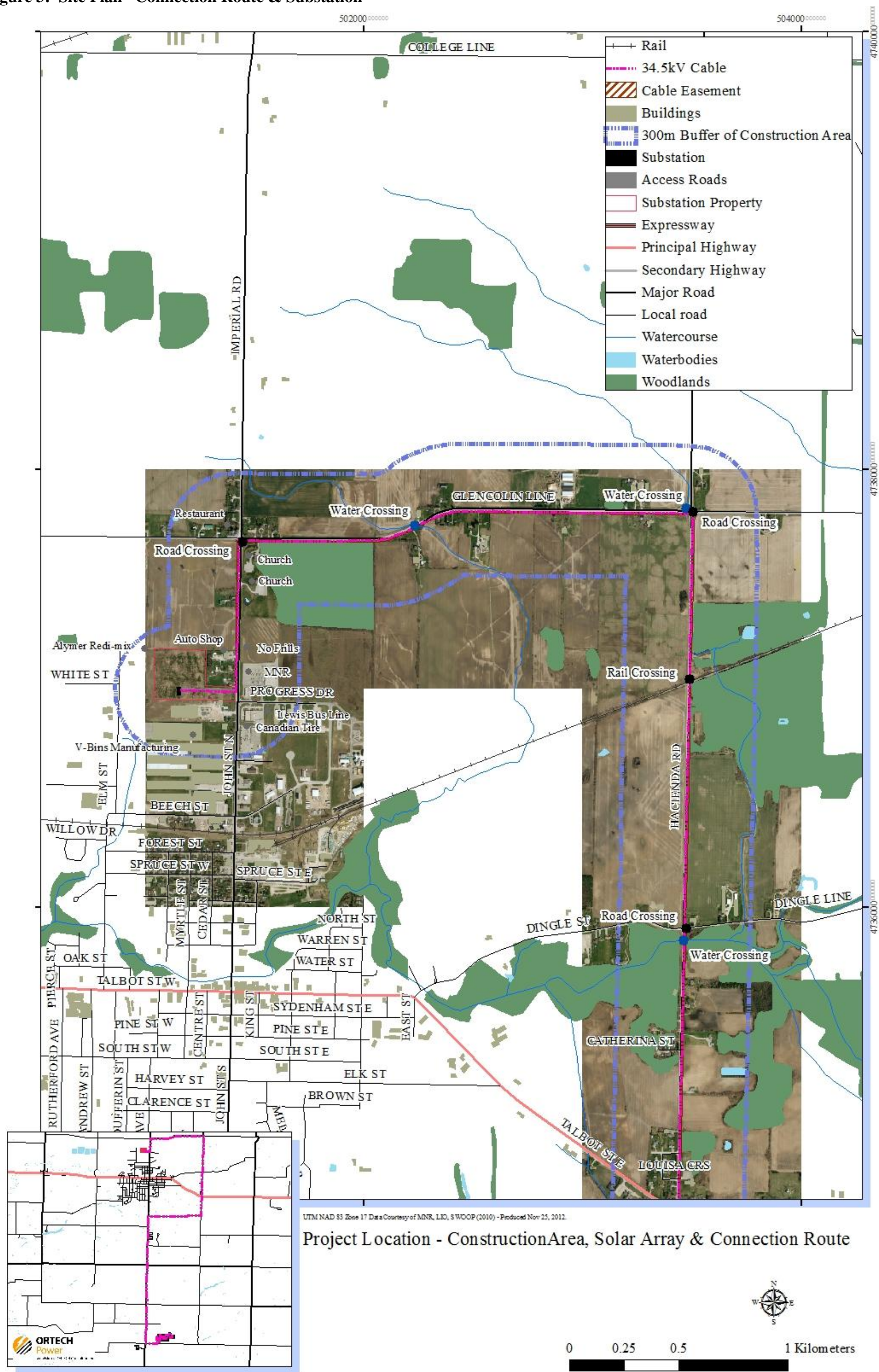


Figure 3: Site Plan –Connection Route & Substation



2. CONSTRUCTION AND INSTALLATION ACTIVITIES

The Project involves construction, operation and decommissioning of a 10 MW ground mounted photovoltaic solar park consisting of approximately 46,000 290 watt polycrystalline solar panels mounted on approximately 2000 racking tables each table will hold 24 modules, and will be fixed at a 30 degree tilted angle on horizontal single-axis trackers. Eight inverter and transformer stations will be required to convert direct current (DC) power generated by the panels to alternating current (AC) at a stepped up distribution line voltage of 34.5 kV. The project will require an on-site electrical house (e-house), 15 km of underground 34.5 kV distribution line, and an off-site substation to connect to the Hydro One 115 kV Transmission Station located north of the town of Aylmer. Additionally, an existing culvert which currently facilitates access to the substation property may need to be upgraded to support construction vehicles. This upgrade will be done in accordance and approval by the Township of Malahide and Elgin County.

The project area may require temporary off-site staging area for assembly of project components and storage of equipment, supplies, and materials during the construction period. In the event this is required storage and staging will occur in an existing barn located within reasonable proximity to the facility which is used for housing equipment, or in a multipurpose storage area located in the Town of Aylmer. Regardless of the option no construction or modification to these structures or areas will be required. The entire facility will be secured with a fence and a gate and locked; warning signs will be in place to protect people from electrical danger.

No municipal roadway upgrades are anticipated as a result of this project.

All component sizes and placement will be confirmed by the Construction Contractor prior to construction, and following a geotechnical assessment.

2.1 Materials Brought on Site & Construction Equipment

Construction of the Silvercreek Solar Park will utilize standard building practices and materials for the majority of the project. Materials such as gravel, sand, concrete, wood, electrical wiring and cables, and various metals will be brought onto the site for the purposes of construction. Construction vehicles such as vibratory pile drivers, light duty boom truck, wheel loaders, dump trucks and flatbed trailers will be required on site to facilitate the construction. It is anticipated that the construction process will generate noise and fugitive dust impacts. These impacts and mitigation strategies are discussed in Section 3.4.

2.1.1 Access Road Construction

An existing entranceway located on Vienna Line will be used to access the site from the south. This access point consists of a gravel swale approximately 10 m in width and is sufficient for the project requirements. No modifications or alternations to this access point will be required.

Access roads will be constructed with a gravel base to allow access to the electrical systems located alongside the roadway. Use of a geotextile may be required to prevent gravel from mixing with the topsoil layer.

Fencing will be erected around the perimeter of the project site and a controlled access gate will be provided and maintained at the Vienna Line entranceway. Additionally the project site will be set back from the roadway approximately 80m separated by active agricultural operations. Fencing and site security will provide a dual purpose of preventing public access to mechanical and electrical equipment and to deter vandalism.

Materials Brought onto Site:

2,000 m of fencing material (posts, chain link fencing, hand tools, service truck), 800 m³ gravel, 2,500 m² geotextile, equipment fuel.

Construction Equipment Used:

Wheel loader (1), dump truck (1), compactor (1), service vehicle (1) , small hand tools.

Timing:

Approximately 5 working days will be required to construct on-site access roads. A summer/fall construction period is projected.

Temporary Uses of Land:

A small portion of the staging area may be used for fencing materials, geotextile and gravel.

Materials Generated at, or Transported From, the Project Location:

Pruning of adjacent trees during installation of the perimeter fence line may generate minor quantities of woodwaste (up to 15 m³). Woodwaste will be sent off-site for composting.

Substation Access Road

A gravel road will be constructed to access the substation as depicted in Figure 3. This access road will require clearing of pine trees and substrate, and will utilize an existing entrance. It will be fenced at both the entrance and again at the substation.

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Materials Brought onto Site:

250 m of fencing material (posts, chain link fencing, hand tools, service truck),
200 m³ gravel, 700 m² geotextile, equipment fuel.

Construction Equipment Used:

Wheel loader (1), dump truck (1), compactor (1), service vehicle (1), small hand tools.

Timing:

Approximately 5 working days will be required to construct on-site access roads. A summer/fall construction period is projected.

Temporary Uses of Land:

Temporary storage of materials and equipment will occur within the area designed for access roads or substation.

Materials Generated at, or Transported From, the Project Location:

Removal of immature (less than 15 years old) pine trees covering 0.07 hectares to accommodate access road, substation and fence line will be required. Woodwaste will be sent off-site for composting or possible landscape mulch.

2.1.2 Upgrades to Municipal Infrastructure

Construction of the Silvercreek Solar Park will not require any upgrades to roadways. All municipal roadways are adequate to support construction and delivery of components.

Materials Brought onto Site:

None.

Construction Equipment Used:

None.

Timing:

Not Applicable.

Temporary Uses of Land:

None.

Materials Generated at, or Transported From, the Project Location:

None.

2.1.3 Support Racks for Solar Panels

Installation of the support structures for the solar arrays will require the placement of pile-driven support columns, installation of horizontal support beams, tracking mechanisms, and solar panel support racks.

A small, 20 tonne vibratory pile driver will place and drive 10 cm (4") round pipe or helical pile approximately 4 m into the ground along the path of each solar array. The depth of the pipe will be based upon the soil structure and the support requirements of the solar arrays to resist the bending moment of wind forces. The proposed construction method has the advantage of providing a fast and inexpensive installation.

Horizontal support beams will be affixed to the top of the support columns upon which racking supports for the solar panels will rest.

Materials Brought onto Site:

Steel support poles (12,540 required), horizontal support beams (3,500 m), electrical cable, metal fasteners, equipment fuel, lubricants.

Construction Equipment Used:

Vibratory pile driver, service truck, flatbed trailer / boom truck, small hand tools. Operation of the vibratory pile driver may have the potential for noise impacts. Operation of vehicles away from access roads may have the potential to generate fugitive dust emissions.

Timing:

Approximately 30 business days will be required to install the posts, and horizontal support beams.

Temporary Uses of Land:

None

Materials Generated at, or Transported From, the Project Location:

Excess steel and electrical wire will be removed from the site by the respective contractor and disposed of in accordance with MOE Regulations. Where possible, it will be sold as scrap for recycling. Small quantities of lubricants/grease may be left over from commissioning. Lubricants will be sent off-site for disposal. Confirmation of the small quantity generator provisions within Ontario Regulation 347 "General Waste Management" will be verified prior to construction.

2.1.4 Photovoltaic Solar Panels

The project requires up to 46,000 polycrystalline solar photovoltaic panels with the rated power output of 290 watts each fixed at a 30 degree angle. The panels will be grouped in separately controlled sections or arrays, each with its own power inverter and transformer. The solar panels are designed for modular installations and simple mechanical and electrical connections will be required. Delivery of the panels on-site will occur via transport truck and management of packaging materials will be the primary focus. Containers will be placed on-site for source separation of wood, paper and cardboard materials in order to minimize waste generation.

Materials Brought onto Site:

Solar panels, including cardboard boxes and wooden pallets.

Construction Equipment Used:

Service truck (1), boom truck (2), small hand tools, equipment fuel. Operation of vehicles away from access roads may have the potential to generate fugitive dust emissions.

Timing:

Approximately 30 business days will be required to install the solar panels.

Temporary Uses of Land:

None

Materials Generated at, or Transported From, the Project Location:

Designated recycling containers will be provided for packing materials consisting of wood and cardboard. Some refuse material may be generated, such as strapping and foam packaging, requiring landfill disposal.

2.1.5 On-Site Electrical Equipment

An individual solar panel will be capable of generating 290 watts of direct current (DC) electricity. These solar panels will be electrically connected both in parallel and series. The generated electricity will be transmitted via underground cables to one of eight combined inverter/transformer stations located alongside one of the main access roads. The inverter/transformer stations will convert DC to alternating current (AC) and the units will step-up the line voltage to 34.5 kV. The inverter/transformer stations will connect to an e-house containing electrical switch gears and metering devices prior to exiting the project site.

Installation of electrical cables will require some on-site trenching, both alongside the solar array systems and access roads. There will be no off-site

removal or disposal of soils required. As the site is an agricultural field no vegetation removal is expected.

The inverter/transformer units will be delivered on-site as one-piece, fully enclosed units and will be placed upon a slab-on-grade concrete foundation.

In order to maintain off site communications with the Project, a fibre optics communication line will be installed. This line will run underground and will connect to a Supervisory Control and Data Acquisition (SCADA) System located within the e-house. In order to provide an independent supply of power for operations and to meet standby power requirements, the facility will be connected to the existing 3-phase 4.8 kV line located on Vienna Line. The connection point with this line will be located at the entrance of the facility. The line will be installed at the same time as the underground collector lines, using the same equipment and techniques.

Materials Brought onto Site:

Inverter/Transformer housing (8), electrical cable, e-house building.

Construction Equipment Used:

Trenching equipment, service vehicle, boom truck, equipment fuel.

Timing:

Approximately 5 business days will be required to install the inverter/transformer units. A fall/winter installation period is proposed.

Temporary Uses of Land:

None

Materials Generated at, or Transported From, the Project Location:

A small quantity of electrical wire may be generated, which will be disposed of in accordance with MOE regulations and will be sold as scrap to be recycled where possible.

2.1.6 Distribution Line

After the required power metering at the e-house, the power from the project site will be distributed by a new 34.5 kV distribution line, which will run 15 km underground, from the site location to a new substation built adjacent to the Aylmer TS. Beginning at the substation property the path of the distribution line will travel north along the west side of Imperial Road, east along the south side of Glencolin Line, south along the east side of hacienda road, west along the north side of Bradley Creek Line (formerly Tobacco Line), south along the east side of Imperial Road and east along the north side of Vienna Line. The path of the distribution line can be seen in Figure 2

Construction of the distribution line will occur below ground. Installation of the underground cable will be completed using open trenching and plowing where possible, with directional drilling required when crossing obstructions such as waterbodies, road and railways. A construction plan will be prepared by the construction contractor which will provide additional detail on methods and types of construction. This plan will be provided to the Township of Malahide and County of Elgin for review and approval. Additionally the railway crossing of the distribution line will be reviewed and approved by Trillium Railway as required by the Canadian Transportation Act. Additionally a permit will be required from Catfish Creek Conservation Authority (CCCA) pursuant to the Conservation Authorities Act for all watercrossings.

Materials Brought onto Site:

Electrical cable, equipment fuel.

Construction Equipment Used:

Trenching and directional drill equipment. Installation of the distribution line will occur in close proximity to residential housing, contributing to the potential for noise impacts.

Timing:

Approximately 15 business days will be required to install the underground cable. Installation of the cable and trenching/directional drilling may occur during the summer, fall or winter time period.

Temporary Uses of Land:

None.

Materials Generated at, or Transported From, the Project Location:

Electrical wire will be sold as scrap for recycling. Electric cable spools will be returned to supplier for reuse.

2.1.7 Substation Construction

The location of the new substation is presently a white pine plantation. In order to facilitate the installation of the substation, removal and disposal of approximately 0.36 hectares of immature (less than 15 years old) white pine, stumps and substrate will be required. Woodwaste will be sent off site for compost or landscape mulch. The intent is to remove only the minimum white pine required to install the grounding grid and substation footprint. Excess substrate will be graded into the adjacent topography.

The substation will require the construction of concrete foundations, block walls and installation of electrical equipment. Materials will be delivered using the access road.

Materials Brought onto Site:

Gravel (1,000 m³), concrete (20 m³), concrete blocks, electrical cable, electrical equipment (transformer, switch gear, grounding grid), equipment fuel.

Construction Equipment Used:

Concrete truck (1), dump truck (1), wheel loader (1), boom truck (1), small hand tools.

Timing:

Approximately 30 business days will be required to construct and install the substation.

Temporary Uses of Land:

A staging area / parking lot adjacent to the substation building will be used to park construction equipment and store building materials prior to use.

Materials Generated at, or Transported From, the Project Location:

General building materials requiring disposal will be sent off-site for landfill. Construction and packaging materials such as wood, cardboard and steel will be recycled.

2.2 Component Transportation

Provincial highways and municipal roads will be used to deliver components to the site. Transportation will be in compliance with all weight and access restrictions; where required for component delivery, oversized permits will be obtained.

2.2.1 Traffic Management Plan

Delivery of components to the project site and work within the municipal easement will be coordinated with the municipality. Minor delays to residences along Vienna Line and the distribution line may occur during component delivery and installation of the distribution line. Notification to residences potentially impacted by these delays will be provided prior to commencement of the activity.

Development of a detailed traffic management plan will follow the guidelines contained within the most recent version of the Ontario Traffic Manual (Book 7 – Temporary Conditions). The plan will be developed prior to the commencement of construction activities and presented to both the municipality of Malahide and Elgin County. Section 2.1 “Materials Brought On Site and Construction

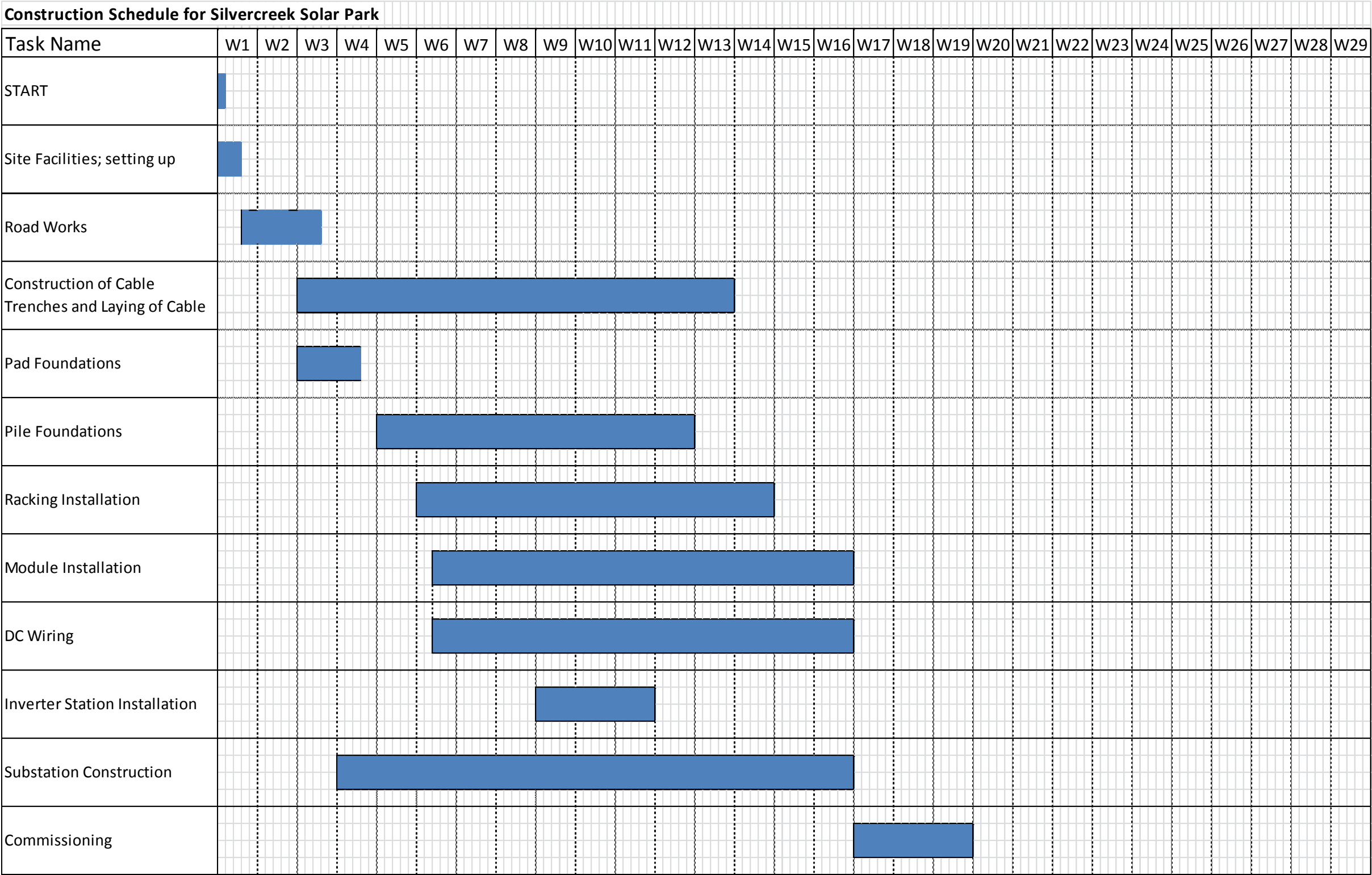
Equipment” provide some context regarding the scope of the Traffic Management Plan.

At the time of this report multiple access routes to the project location exist, although use of Imperial Road south of Aylmer and north of the project, as well as portions of Vienna Line, will most likely be involved.

2.3 Land Surveying and Geotechnical Surveys

Geotechnical and surveying work at the project site will be required for the project location prior to construction to determine foundation requirements and pile depths. The geotechnical investigation will require the use of a mobile drill rig to extract underlying soil samples for analysis.

Table 2 – Construction Schedule and Timing



3. DESCRIPTION OF ENVIRONMENTAL EFFECTS, MITIGATION & MONITORING**Table 3: Environmental Effects, Mitigation & Monitoring Table**

Section	Criterion	Potential Effect without Mitigation		Mitigation Measure	Monitoring Proposed	Net Impacts	Residual Significance
		Activity/Description	Significance				
3.1	Ground Water & Water Takings	Piles may impact ground water sources	IE	<ul style="list-style-type: none"> Site surveying will confirm location of tile drainage systems. Repair any damage to tile system. 	<ul style="list-style-type: none"> Monitor discharge of tile outflow after installation of piles. 	NE	None
3.2	Surface, Storm Water & Waterbodies	Alteration of local Drainage Patterns	IE	<ul style="list-style-type: none"> Design to maintain existing surface water drainage patterns and functions (including project layout, grading, storm water management facilities and structure designs) Utilize existing roads and road crossing structures where possible Newly impervious surfaces should consider use of permeable materials 	<ul style="list-style-type: none"> None required 	NE	None
		Fish Habitat Alteration Loss	SE	<ul style="list-style-type: none"> Consideration of design layout to minimize number of crossings Consider layout distances to water body features and sensitivity of those features Implement trenchless (i.e. directional drilling) technology at crossings where possible Any loss to the productive capacity of a watercourse must be compensated for under the <i>Fisheries Act</i> 	<ul style="list-style-type: none"> Conduct work in accordance with DFO Operational statements for working in and around water. 	IE	None

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		Erosion and Sedimentation	SE	<ul style="list-style-type: none"> • Implement trenchless (i.e. drilling) technology at crossings • Minimize potential for soil compaction (see Soil Compaction) • Controlled vehicle and machinery access routes, keep away from water bodies • Avoid clearing, grubbing and grading activities during seasonally wet periods (i.e. spring) • Avoid work if during high volume rain events (>20mm in 24hrs) or snow melts are observed, resuming once soils have stabilized • Stabilize exposed soils as soon as possible after construction disturbance (i.e. plantings, rock etc.). If insufficient time is available in the growing season to establish vegetative cover, an overwintering treatment such as erosion control blankets, fiber matting etc. should be applied to contain the site over the winter period • Minimize disturbance by keeping construction equipment outside and away from water bodies • Where construction activity and supporting infrastructure (i.e. underground cabling) exist less than 30m from a water body, work is recommended to occur during the low flow period of the year from late June through to the end of September, wherever possible, and appropriate sediment and control measures should be implemented. • If work within 30m of a water body cannot be completed during the recommended time period, work should be temporarily halted during major rain or surface runoff events to avoid the increased potential for sedimentation. • Implement Stormwater Management Plan • Install conduit pipe under watercrossings to facilitate future maintenance and minimize impacts to aquatic habitat 	<ul style="list-style-type: none"> • Contractor Monitoring 	<ul style="list-style-type: none"> • NE 	None
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	Water Quality Impairment	IE	<ul style="list-style-type: none"> Keep machinery clean and refuel a minimum of 30 m away from any water body Fuel and other construction-related chemical stored securely away from water bodies Any discharges to a water body must meet MOE Policy 2 standards (at or better water quality than of the receiving water body) Adequately treat any discharge water prior to discharge as to meet MOE policy 2 standards (i.e. filter bags) Implement Stormwater Management Plan 	<ul style="list-style-type: none"> Contractor Monitoring 	NE	None
	Water Level Alteration	SE	<ul style="list-style-type: none"> Implement Water Level Response Plan, trigger criteria to be determined in consultation with OMNR Maintain temporary by-pass channel (when required) during in-water work as to maintain flow and prevent back flooding and overtopping of water containment structure 	<ul style="list-style-type: none"> No water level alteration will occur 	NE	None
	Soil Compaction	IE	<ul style="list-style-type: none"> Controlled vehicle access routes Staging areas should be located a minimum of 30m from any water body 	<ul style="list-style-type: none"> Contractor Monitoring 	NE	None
	Debris entering a water body	IE	<ul style="list-style-type: none"> Construction debris should be stabilized (i.e. tarps) away from water bodies Refuse and other material should be appropriately disposed of off-site Staging areas should be located away from water bodies (i.e. 30m) Drilling shafts should be located away from water bodies (i.e. 30m) 	<ul style="list-style-type: none"> Contractor Monitoring 	NE	None
	Drilling Frac-out	SE	<ul style="list-style-type: none"> Conduct appropriate geotechnical studies as to ensure directional drilling is appropriate at that location and will not result in a 'frac-out' Develop emergency response plan in the unlikely event of a 'frac-out' when drilling below a water body, this plan will deal with issues associated with water level alteration, water quality and erosion & sedimentation 	<ul style="list-style-type: none"> A frac-out emergency response plan will be created by the construction contractor prior to construction and provided to the MNR, Township of Malahide and County of Elgin for Review 	NE	None

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Section	Criteria	Project Component	Project Activity	Potential Negative Effects	Mitigation Measures	Objectives, Monitoring, and Contingency Plans
3.3	Natural Heritage Features	Solar Panel Erection	Clearing, grubbing, grading, and topsoil removal	<ul style="list-style-type: none"> Increased erosion and sedimentation into woodlands, wetlands, and other natural features, Soil compaction 	<ul style="list-style-type: none"> Develop and implement an erosion and sediment control plan, Utilize erosion blankets, silt fencing, straw bales, etc. for construction activities within 30m of a wetland, woodland, or water body, Maintain erosion control measures for the duration of construction or decommissioning activities, Suspend work if high runoff volume is noted or excessive sediment discharge occurs, Any stockpiled material will be stored more than 30m from a wetland, woodland, or water body, No vehicle traffic on exposed soils and no heavy machinery traffic on sensitive slopes 	<p>Performance Objective: Minimize direct impacts on vegetation communities and protect rare/sensitive habitats, maintain vegetated buffers, particularly within riparian zones, and minimize the impacts of sedimentation on nearby natural features.</p> <p>No monitoring or contingency plan required.</p>
			Noise/human activity	<ul style="list-style-type: none"> Disturbance to local wildlife 	<ul style="list-style-type: none"> Clearly post construction speed limits 	<p>Performance Objective: Limit potential wildlife road mortalities.</p> <p>No monitoring or contingency plan required.</p>
			Accidental damage to vegetation	<ul style="list-style-type: none"> Damage or removal of vegetation adjacent to the project location 	<ul style="list-style-type: none"> Where construction activity occurs within 30m of a naturally vegetated feature (i.e. a significant woodland or wetland), the construction area should be clearly delineated with protective fencing, such as silt fencing, Damaged trees should be pruned through implementation of proper arboricultural techniques 	<p>Performance Objective: Minimize impacts to natural vegetation.</p> <p>No monitoring or contingency plan required.</p>
			Chemical spills or	<ul style="list-style-type: none"> Soil or water 	<ul style="list-style-type: none"> Develop a spill response plan and train 	<p>Performance Objective:</p>

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			accidental fluid release (i.e. oil, gasoline, grease, etc.)	contamination	staff on appropriate procedures, <ul style="list-style-type: none"> • Keep emergency spill kits on site, • Vehicle washing, refueling stations, and chemical storage will all be located more than 30m from natural features or water bodies, • Dispose of waste material by authorized and approved offsite vendors 	Minimize impacts to natural features and wildlife habitats and avoid contamination of water or wetland features. No monitoring or contingency plan required.
3.3 Cont.	Natural Heritage - Continued.		Dewatering activities (if necessary)	<ul style="list-style-type: none"> • Reduced stream flow rate, • Increased water temperature 	<ul style="list-style-type: none"> • Control rate and timing of water pumping, • Pump from deep wells to infiltration galleries adjacent to water bodies or wetlands or use off-site water, • Do not take water during periods of extreme low flow 	Performance Objective: Maintain ground and surface water conditions with those near pre-construction conditions. No monitoring or contingency plan required.
			Installation of impervious surfaces	<ul style="list-style-type: none"> • Increase surface run-off, • Changes in surface water drainage 	<ul style="list-style-type: none"> • Maintain vegetative buffers around water bodies, • Control quantity and quality of stormwater discharge by installing silt fencing as per the Construction Plan Report (ORTECH Environmental 2012), • Minimize grading activities to maintain existing drainage patterns as much as possible 	Performance Objective: Limit disturbances to surface water drainage patterns. No monitoring or contingency plan required.
		Laydown Area	Clearing, grubbing, grading, and topsoil removal	<ul style="list-style-type: none"> • Increased erosion and sedimentation into woodlands, wetlands, and other natural features, • Soil compaction 	<ul style="list-style-type: none"> • Develop and implement an erosion and sediment control plan, • Utilize, monitor and maintain erosion blankets, silt fencing, straw bales, etc. for construction activities within 30m of a significant wetland, woodland, or water body, • Maintain erosion control measures for the duration of construction or decommissioning activities, • Any stockpiled material will be stored more than 30m from a wetland, woodland, or water body, 	Performance Objective: Minimize direct impacts on vegetation communities and protect rare/sensitive habitats, maintain vegetated buffers, particularly within riparian zones, and minimize the impacts of sedimentation on nearby natural features. No monitoring or contingency plan required.

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					<ul style="list-style-type: none"> No vehicle traffic on exposed soils, or heavy machinery traffic on sensitive slopes, Re-vegetate temporary roads to pre-construction conditions as soon as possible after construction activities are complete 	
3.3 Cont.	Natural Heritage - Continued		Noise/human activity	<ul style="list-style-type: none"> Disturbance and/or mortality to local wildlife 	<ul style="list-style-type: none"> Avoid construction or decommissioning activities during sensitive time periods (i.e. breeding bird season), wherever possible, Conduct nest searches if vegetation removal will occur during the breeding bird season (May 1-July 31) Construction and decommissioning activities within 30m of woodlands or wetlands should occur during daylight hours, wherever possible, Clearly post construction speed limits 	<p>Performance Objective: Limit potential wildlife road mortalities.</p> <p>No monitoring or contingency plan required.</p>
			Accidental damage to vegetation	<ul style="list-style-type: none"> Damage or removal of vegetation adjacent to the project location 	<ul style="list-style-type: none"> Where construction activity occurs within 30m of a naturally vegetated feature (i.e. significant woodland or wetland), the construction area should be clearly delineated with protective fencing, such as silt fencing, Damaged trees should be pruned through implementation of proper arboricultural techniques 	<p>Performance Objective: Minimize impacts to natural vegetation.</p> <p>No monitoring or contingency plan required.</p>
			Chemical spills or accidental fluid release (i.e. oil, gasoline, diesel fuel, grease, etc.)	<ul style="list-style-type: none"> Soil or water contamination 	<ul style="list-style-type: none"> Develop a spill response plan and train staff on appropriate procedures, Keep emergency spill kits on site, Vehicle washing, refueling stations, and chemical storage will all be located more than 30m from natural features or water bodies, Dispose of waste material by authorized and approved offsite vendors 	<p>Performance Objective: Minimize impacts to natural features and wildlife habitats and avoid contamination of water or wetland features.</p> <p>No monitoring or contingency plan required.</p>

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3.3 Cont.	Natural Heritage - Continued	Permanent Access Roads	Installation of impervious surfaces	<ul style="list-style-type: none"> • Increase surface run-off, • Changes in surface water drainage 	<ul style="list-style-type: none"> • Maintain vegetative buffers around water bodies, • Control quantity and quality of stormwater discharge, • Minimize grading activities to maintain existing drainage patterns as much as possible 	<p>Performance Objective: Maintain ground and surface water conditions with those near pre-construction conditions.</p> <p>No monitoring or contingency plan required.</p>
			Clearing, grubbing, grading, and topsoil removal	<ul style="list-style-type: none"> • Increased erosion and sedimentation into woodlands, wetlands, and other natural features, • Soil compaction 	<ul style="list-style-type: none"> • Develop and implement an erosion and sediment control plan, • Utilize, monitor and maintain erosion blankets, silt fencing, straw bales, etc. for construction activities within 30m of a wetland, woodland, or water body, • Maintain erosion control measures for the duration of construction or decommissioning activities, • Any stockpiled material will be stored more than 30m from a wetland, woodland, or water body, • No vehicle traffic on exposed soils, and no heavy machinery traffic on sensitive slopes 	<p>Performance Objective: Minimize direct impacts on vegetation communities and protect rare/sensitive habitats, maintain vegetated buffers, particularly within riparian zones, and minimize the impacts of sedimentation on nearby natural features.</p> <p>No monitoring or contingency plan required.</p>
			Noise/human activity	<ul style="list-style-type: none"> • Disturbance and/or mortality to local wildlife 	<ul style="list-style-type: none"> • Avoid construction or decommissioning activities during sensitive time periods (i.e. breeding bird season), wherever possible, • Conduct nest searches if vegetation removal will occur during the breeding bird season (May 1-July 31) • Construction and decommissioning activities within 30m of woodlands or wetlands should occur during daylight hours, wherever possible, • Clearly post construction speed limits 	<p>Performance Objective: Limit potential wildlife road mortalities.</p> <p>No monitoring or contingency plan required.</p>

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3.3 Cont.	Natural Heritage Continued		Accidental damage to vegetation	<ul style="list-style-type: none"> • Damage or removal of vegetation adjacent to the project location 	<ul style="list-style-type: none"> • Where construction activity occurs within 30m of a naturally vegetated feature (i.e. significant woodland or wetland), the construction area should be clearly delineated with protective fencing, such as silt fencing, • Damaged trees should be pruned through implementation of proper arboricultural techniques 	<p>Performance Objective: Minimize impacts to natural vegetation.</p> <p>No monitoring or contingency plan required.</p>
			Chemical spills or accidental fluid release (i.e. oil, gasoline, grease, etc.)	<ul style="list-style-type: none"> • Soil or water contamination 	<ul style="list-style-type: none"> • Develop a spill response plan and train staff on appropriate procedures, • Keep emergency spill kits on site, • Vehicle washing, refueling stations, and chemical storage will all be located more than 30m from natural features or water bodies, • Dispose of waste material by authorized and approved offsite vendors 	<p>Performance Objective: Minimize impacts to natural features and wildlife habitats and avoid contamination of water or wetland features.</p> <p>No monitoring or contingency plan required.</p>
			Installation of impervious surfaces	<ul style="list-style-type: none"> • Increase surface run-off, • Changes in surface water drainage 	<ul style="list-style-type: none"> • Maintain vegetative buffers around water bodies, • Control quantity and quality of stormwater discharge, • Minimize grading activities to maintain existing drainage patterns as much as possible 	<p>Performance Objective: Maintain ground and surface water conditions with those near pre-construction conditions.</p> <p>No monitoring or contingency plan required.</p>
		Underground Cabling	Clearing, grubbing, grading, and topsoil removal	<ul style="list-style-type: none"> • Increased erosion and sedimentation into woodlands, wetlands, and other natural features 	<ul style="list-style-type: none"> • Develop and implement an erosion and sediment control plan, • Utilize, monitor and maintain erosion blankets, silt fencing, straw bales, etc. for construction activities within 30m of a wetland, woodland, or water body, • Locate all entry and exit pits at least 30m from natural features (i.e. woodlands, wetlands) or water bodies, • Collect drill cuttings as they are generated and placed in a soil bin or bag for off-site 	<p>Performance Objective: Minimize direct impacts on vegetation communities and protect rare/sensitive habitats, maintain vegetated buffers, particularly within riparian zones, and minimize the impacts of sedimentation on nearby natural features.</p> <p>No monitoring or contingency plan required.</p>

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					<p>disposal,</p> <ul style="list-style-type: none"> Any stockpiled material will be stored more than 30m from a wetland, woodland, or water body Horizontal directional drill entry/exit pits should be located at least 30m from any significant natural feature Restore and re-vegetate entry/exit pits to pre-construction conditions as soon as possible after construction 	
3.3 Cont.	Natural Heritage Continued		Noise/human activity	<ul style="list-style-type: none"> Disturbance and/or mortality to local wildlife 	<ul style="list-style-type: none"> Avoid construction or decommissioning activities during sensitive time periods (i.e. breeding bird season), wherever possible, Construction and decommissioning activities within 30m of woodlands or wetlands should occur during daylight hours, wherever possible, Restore and re-vegetate entry and exit pits to pre-construction conditions as soon as possible after construction 	<p>Performance Objective: Limit potential wildlife road mortalities.</p> <p>No monitoring or contingency plan required.</p>
			Accidental damage to vegetation	<ul style="list-style-type: none"> Damage or removal of vegetation adjacent to the project location 	<ul style="list-style-type: none"> Where construction activity occurs within 30m of a naturally vegetated feature (i.e. significant woodland or wetland), the construction area should be clearly delineated with protective fencing, such as silt fencing, Damaged trees should be pruned through implementation of proper arboricultural techniques 	<p>Performance Objective: Minimize impacts to natural vegetation.</p> <p>No monitoring or contingency plan required.</p>
			Chemical spills or accidental fluid release (i.e. oil, gasoline, grease, etc.)	<ul style="list-style-type: none"> Soil or water contamination 	<ul style="list-style-type: none"> Develop a spill response plan and train staff on appropriate procedures, Keep emergency spill kits on site, Vehicle washing, refueling stations, and chemical storage will all be located more than 30m from natural features or water bodies, 	<p>Performance Objective: Minimize impacts to natural features and wildlife habitats and avoid contamination of water or wetland features.</p> <p>No monitoring or contingency plan required.</p>

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					<ul style="list-style-type: none"> • Develop and implement a plan to prevent and minimize potential effects which may be caused by 'frac-out' from directional drilling (found in the Construction Plan Report, ORTECH Environmental 2012), • Drill entry and exit pits should be at least 30m from natural features (i.e. significant woodland or wetland) or water bodies, • Dispose of waste material by authorized and approved offsite vendors • Collect horizontal directional drill cuttings as they are generated and placed in a soil bin or bag for off-site disposal 	
3.3 Cont.	Natural Heritage - Continued	Substation Construction	Clearing, grubbing, grading, and topsoil removal	<ul style="list-style-type: none"> • Increased erosion and sedimentation into woodlands, wetlands, and other natural features, • Soil compaction 	<ul style="list-style-type: none"> • Develop and implement an erosion and sediment control plan, • Utilize, monitor and maintain erosion blankets, silt fencing, straw bales, etc. for construction activities within 30m of a wetland, woodland, or water body, • Maintain erosion control measures for the duration of construction or decommissioning activities, • Suspend work if high runoff volume is noted or excessive sediment discharge occurs, • Any stockpiled material will be stored more than 30m from a wetland, woodland, or water body, • No vehicle traffic on exposed soils, and no heavy machinery traffic on sensitive slopes 	<p>Performance Objective: Minimize direct impacts on vegetation communities and protect rare/sensitive habitats, maintain vegetated buffers, particularly within riparian zones, and minimize the impacts of sedimentation on nearby natural features.</p> <p>No monitoring or contingency plan required.</p>
			Noise/human activity	<ul style="list-style-type: none"> • Disturbance and/or mortality to local wildlife 	<ul style="list-style-type: none"> • Avoid construction or decommissioning activities during sensitive time periods (i.e. breeding bird season), wherever possible, • Construction and decommissioning activities within 30m of woodlands or wetlands should occur during daylight 	<p>Performance Objective: Limit potential wildlife road mortalities.</p> <p>No monitoring or contingency plan required.</p>

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					hours, wherever possible, • Clearly post construction speed limits	
3.3 Cont.	Natural Heritage Continued		Accidental damage to vegetation	• Damage or removal of vegetation adjacent to the project location	<ul style="list-style-type: none"> • Where construction activity occurs within 30m of a naturally vegetated feature (i.e. significant woodland or wetland), the construction area should be clearly delineated with protective fencing, such as silt fencing, • Damaged trees should be pruned through implementation of proper arboricultural techniques 	<p>Performance Objective: Minimize impacts to natural vegetation.</p> <p>No monitoring or contingency plan required.</p>
			Chemical spills or accidental fluid release (i.e. oil, gasoline, grease, etc.)	• Soil or water contamination	<ul style="list-style-type: none"> • Develop a spill response plan and train staff on appropriate procedures, • Keep emergency spill kits on site, • Vehicle washing, refueling stations, and chemical storage will all be located more than 30m from natural features or water bodies, • Dispose of waste material by authorized and approved offsite vendors 	<p>Performance Objective: Minimize impacts to natural features and wildlife habitats and avoid contamination of water or wetland features.</p> <p>No monitoring or contingency plan required.</p>

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Section	Criterion	Potential Effect without Mitigation		Mitigation Measure	Monitoring Proposed	Net Impacts	Residual Significance
		Activity/Description	Significance				
3.4	Air Quality & Noise Emissions	Installation of piles may have significant noise impacts on the surrounding residences	IE	<ul style="list-style-type: none"> Neighbouring land owners will be notified in advance of pile driving Pile driving will occur during daytime periods 	<ul style="list-style-type: none"> A construction contact number will be provided to the public to address complaints 	IE	None
		Construction vehicles will result in onsite fugitive dust emissions	IE	<ul style="list-style-type: none"> Limit vehicle speeds and travel away from main access roads. 	<ul style="list-style-type: none"> None 	IE	None
3.5	Land Use & Resources	Removal of Tree Species from substation property results in decreased tree count in area	IE	<ul style="list-style-type: none"> Substation property is private and not used recreationally; additionally neighbouring property is a mixture of agricultural, industrial and residential. 	<ul style="list-style-type: none"> None 	NE	None
		Installation of solar array removes agricultural land from production	IE	<ul style="list-style-type: none"> Land will only be temporarily removed from production. Ability of land to lie fallow may create favourable soil conditions in the future 	<ul style="list-style-type: none"> None 	NE	None
3.6	Traffic Patterns & Flows	Construction of connection line and deliver of components will result in traffic delays and minor closures	IE	<ul style="list-style-type: none"> Local landowners will be provided notice of construction activities, signage will be used where required 	<ul style="list-style-type: none"> None 	IE	None

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Section	Criterion	Potential Effect without Mitigation		Mitigation Measure	Monitoring Proposed	Net Impacts	Residual Significance
		Activity/Description	Significance				
3.7	Public Safety	There is a possibility of unauthorized site access by members of the public	IE	<ul style="list-style-type: none"> Fencing and signage will be used to identify hazards and provide a contact in the event of an emergency 	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> NE 	None
		Installation of the connection line along the roadside may create hazardous conditions	IE	<ul style="list-style-type: none"> Fencing and signage will be used, as well a safety plan utilizing Highway Safety Act Book 7 for roadside construction will be drafted 	<ul style="list-style-type: none"> Construction contractor monitoring as outlined in the safety plan 	<ul style="list-style-type: none"> NE 	None
3.8	Waste Materials Disposal	Woodwaste generated from tree removal and pruning	IE	<ul style="list-style-type: none"> Woodwaste will be managed in effort to beneficially use the material for another purpose (compost, landscape mulch) 	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> NE 	None
		Landfilling of composite and foam packaging materials during solar panel installation	IE	<ul style="list-style-type: none"> Separate containers will be provided for wood, cardboard and metals to facilitate source separation of the recyclable portion of the waste stream 	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> NE 	None
3.9	Heritage & Archaeological Resources	There is the potential for items of archaeological significance to be uncovered during construction	SE	<ul style="list-style-type: none"> Fencing will delineate areas of avoidance Work will cease until an archaeologist has reviewed the site 	<ul style="list-style-type: none"> In the event artifacts are discovered further work will be monitored by an archaeologist 	<ul style="list-style-type: none"> IE 	None

Notes:

Negligible Effect (NE): A nearly zero or hardly discernible effect. A negligible effect would touch a population or specific group of individuals at a localized area and/or over a short period in such a way as to be similar in effect to random small changes in the population (or group) due to environmental irregularities, but would have no measurable effect on the population (or group) as a whole.

Insignificant Effect (IE): An effect that may exhibit one or more of the following characteristics: Not widespread. Recurring effect lasting for short periods of time during or after project implementation.

Significant Effect (SE): An effect that may exhibit one or more of the following characteristics: Widespread. Permanent reduction in species diversity or population of species. Permanent alterations to community characteristics or services, land use or established patterns.

4. CONCLUDING REMARKS

The Construction Plan Report is a mandatory component of an application for the Renewable Energy Approval for Class 3 Solar Facilities. This report has been prepared in accordance with the requirements of the Ontario Regulation 359/09 and Technical Guide to Renewable Energy Approvals (MOE 2011).

Under the REA requirements a construction plan report must contain the following:

- details of any construction or installation activities including their location and timing;
- any negative environmental impacts that may result from these activities within a 300 m radius of the project location; and
- mitigation measures in respect of any negative environmental effects due to project construction.

5. ACKNOWLEDGEMENTS & REFERENCES

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APPENDIX A

**Checklist for Requirements under O.Reg 359/09
(1 page)**

**Construction Plan Report
for Silvercreek Solar Park Inc.***Appendix A
Project No. 70287*

Table 4: Construction Plan Report Requirements (as per O.Reg. 359/09 – Table 1)

Requirements	Completed	Section Reference
Set out a description of the following in respect of the renewable energy project:		
1. Details of any construction or installation activities.	Yes	Section 2
2. The location and timing of any construction or installation activities for the duration of the construction or installation.	Yes	Section 1
3. Any negative environmental effects that may result from construction or installation activities within a 300 m radius of the activities.	Yes	Section 3
4. Mitigation measures proposed in respect of any potential negative environmental effects.	Yes	Section 3

APPENDIX B

**Natural Heritage Mitigation Commitments
(2 pages)**

Table 5 – Natural Heritage Mitigation Commitments

Mitigation Measure	Objective(s)	Location(s)
<ul style="list-style-type: none"> Any vegetation removal required within the road right-of-way should be kept to a minimum. 	<ul style="list-style-type: none"> Minimize vegetation removal and impacts on wildlife habitats 	Underground Collector Lines
<ul style="list-style-type: none"> Any accidentally damaged trees should be pruned through the implementation of proper arboricultural techniques 	<ul style="list-style-type: none"> Protect tree species from permanent damage 	Entire Project
<ul style="list-style-type: none"> Develop and implement an erosion and sedimentation control plan. 	<ul style="list-style-type: none"> Protect natural features and wildlife habitats, where appropriate 	Entire Project
<ul style="list-style-type: none"> Clearly delineate work area using silt fencing, erosion blankets, or similar barrier 	<ul style="list-style-type: none"> Minimize erosion impacts on features when construction activities are proposed within 30m of significant natural features 	Within 30m of any significant natural feature: WOD-001, WOD-004, WOD-005, WOD-009, WOD-011, WET-005, WET-006, VAL-001, VAL-002, CAAP-001*
<ul style="list-style-type: none"> Utilize, monitor and maintain erosion control measures for the duration of construction or decommissioning activities. 	<ul style="list-style-type: none"> Minimize erosion impacts on features when construction activities are proposed within 30m of significant natural features 	Within 30m of any significant natural feature: WOD-001, WOD-004, WOD-005, WOD-009, WOD-011, WET-005, WET-006, VAL-001, VAL-002, CAAP-001*
<ul style="list-style-type: none"> Suspend work if high runoff volume is noted or excessive sediment discharge occurs 	<ul style="list-style-type: none"> Minimize erosion impacts on features when construction activities are proposed within 30m of significant natural features 	Within 30m of any significant natural feature: WOD-001, WOD-004, WOD-005, WOD-009, WOD-011, WET-005, WET-006, VAL-001, VAL-002, CAAP-001*

• Maintain vegetation buffers around water bodies	• Minimize the potential for erosion, and protect wildlife habitat, within riparian areas	Entire Project
• Any stockpiled material will be stored more than 30m from a significant wetland, significant woodland, or water body	• Limit the potential for increased erosion within 30m of significance natural features	Entire Project
• All maintenance activities, vehicle refueling or washing, and chemical storage will be located more than 30m from any significant feature, significant habitat, or water body.	• Minimize the risk of contamination of chemical spill around significant natural features	Entire Project
• Develop a spill response plan, train staff on appropriate procedures, and keep emergency spill kits on site.	• Minimize potential long-term effects or significance contaminations in the event an accidental spill occurs	Entire Project
• Dispose of waste material by authorized and approved offsite vendors	• Limit the potential for contamination of significant natural features	Entire Project
• Implement infiltration techniques to the maximum extent possible.	• Minimize potential impacts to soil moisture regime and groundwater stores	Entire Project
• Design roads to promote infiltration.	• Minimize potential impacts to soil moisture regime and groundwater stores	Entire Project
• Minimize grading activities to maintain existing drainage patterns, to the fullest extent possible.	• Maintain existing surface water drainage patterns	Entire Project
• Horizontal directional drill entry/exit pits should be located at least 30m from any significant natural feature , significant wildlife habitat, or water body.	• Minimize impacts on significant natural features, water bodies, and wildlife habitat	Horizontal Directional Drilling
• Collect drill cuttings as they are generated and placed in a soil bin or bag for off-site disposal	• Limit the potential for soil or water contamination	Horizontal Directional Drilling
• Restore and re-vegetate entry/exit pits to pre-construction conditions as soon as possible after construction	• Minimize the presence of exposed soil to reduce the potential for erosion	Horizontal Directional Drilling