

RUTLEY SOLAR

SunE Rutley Solar Farm

Design and Operations Report



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1. Site Plans and Facility Design Plan

1.1 Overview

SunEdison is proposing a single Class 3 Solar Facility with a nameplate capacity of 10 MW (AC) in the area of Ingleside, Ontario. If approved, this facility will convert solar energy into electricity to be fed into the Hydro One distribution grid. The defined project area, presented as Figure 1 (Appendix A), covers approximately 85 hectares (ha).

The major components of the projects are as follows:

- approximately 40,000 x MEMC solar panels (270-watt typical generation capacity)
- 320 Disconnect combiners
- 44 kV Substation including pole-top motor-operated disconnect; 44 kV switchgear; revenue grade PT's, CT's and metering; 10 MVA oil filled pad-mount transformer; interrupter switches, communication equipment, etc.
- 20 x 500-kW inverters (two inverters and one corresponding 1000-kVA transformer for each 1-MW block)
- Access driveways
- Temporary staging areas for the installation of the solar panels
- A 30-m tall communications tower (to be confirmed with Hydro One)

Site plans showing the location of the project components, adjacent buildings, roads, elevation contours, surface water drainage and the location of the solar array in relation to the Natural Heritage Features, Heritage or Archaeological resources and water bodies are detailed in Figure 2 (Appendix A).

1.2 Project Components

1.2.1 Solar Photovoltaic Modules

The solar PV technology to be used on this project will be MEMC modules 270-Watt modules. There will be a total of approximately 40,000 modules, each approximately 2 m long x 1 m wide. The modules will be held by a single-axis tracking system which is supported off the ground by vertical posts. Racks will be arranged into north-south rows each approximately 111 m long and 3 m wide.

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

1.2.2 Electrical System

The solar farm will connect to the Hydro One 44-kV distribution line (the M26 Feeder) north of the CN rail line, which abuts the north side of the site.

DC power collected from modules will be directed to approximately 20 inverter/step-up transformer units placed on concrete pads (2 inverters per pad). The AC power from the step-up transformers will be collected via 12.47-kV buried lines and connected to the main substation. This substation will include a transformer (12.47 kV to 44 kV) and associated switchgear and will be on a concrete pad. Hydro One will construct and own the tap line running from the substation to the M26 Feeder.

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

1.2.3 Access Driveways

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

1.2.4 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, substation and weather conditions to be recorded and displayed at a control station, and also provides warnings if there are abnormal conditions. If required by Hydro One, a single 30-m tall communications tower will be constructed to facilitate communications with Hydro One's system.

1.2.5 Construction Laydown Area

Two areas will be used for construction material storage; one will be located north of the Trans-Northern pipeline right-of-way (ROW), which runs east-west through the middle of the site, and the other south of the ROW. The areas of these sites are 1.0 and 1.8 hectares, respectively. Details on the construction and potential environmental effects of these temporary features can be found in the Construction Plan Report.

1.3 Consideration of Natural Features and Watercourses

The layout of the solar farm took many factors into consideration including: environmental features in the project area, water bodies, noise, and archaeological resources. 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.

1.3.1 Natural Heritage and Water Features

A desktop review and field inspection of natural features has been completed and the site has several potential natural and water features in the vicinity. Details of the study are presented in Appendix B. These include a residual woodlot on the western portion of the study area, and a woodlot to the north of the site and the CN rail line. Hoople Creek and its associated wetland complex are situated to the west and south of the site. The Hoople Creek wetland complex has been designated a Life Science Area of Natural and Scientific Interest (ANSI).

Mapping data obtained from the Land Information Office of the MNR indicates that there are two watercourses running approximately north-south across the site. A field inspection of the site did not reveal any evidence of the existence of these features. As these no longer exist, or perhaps never existed, the project will not impact any water features.

The Hoople Creek Wetland complex is a regionally significant wetland and the north side of Hoople Bay is a provincial wildlife area. There are historic records of four (4) Species at Risk (SAR) associated with this wetland complex and include one turtle species (Northern Map Turtle – 1990), one fish species (Greater Redhorse – 1938), one vascular plant species (Slender Bullrush – 1954) and one moss species (*Astomum muehlenbergianum* – 1969). All of these species are associated with the wetland complex.

The project has been designed to be at least 220 m from Hoople Creek and its associated wetland complex (310 m) and it is not anticipated that project will impact these features. As added measures to ensure the protection of Hoople Creek and its associated wetlands, mitigation measures which will be implemented include:

- Maintenance of the hydrological regime of the site during and after construction; and

- Installation of sedimentation control devices during construction and stabilization of any disturbed areas with vegetation post construction.

The construction of the SunE Rutley Solar Farm will be limited to areas of previously cleared land and will not impinge on any identified significant natural feature. With the mitigation measures described above, the project is not anticipated to have any negative effects on the Natural Heritage or Water Features. SunEdison will also examine options to improve wildlife habitat, where possible.

1.3.2 Noise Study

Noise caused by inverters and transformers are cited as potential concerns by local residents. In order to determine the potential impacts of these effects on the study area, modelling studies were completed in accordance with the MOE guidelines. Prior to commencement of these studies a field visit was conducted to map all potential receptors including: residences, campgrounds, schools, hospitals and long-term care facilities within 1.5 km of the site.

The noise study was conducted in accordance with the Ministry of Environment (MOE) “Basic Comprehensive Certificates of Approval (Air) – User Guide”, dated April 2004. The results of this study show that noise levels are below the 40 dBA standards specified by the Renewable Energy Approval regulation for all receptors. In fact, noise levels off of the site are not elevated above background levels. Details of the study are presented in Appendix D.

Furthermore, it is noted that the site is directly south of and abutting CN's Kingston Subdivision, one of Canada's busiest rail lines, as well as Highway 401 approximately 400 m to the north. Noise emanating from these facilities far exceeds any noise that would be generated from the solar farm.

1.4 Consideration of Archaeological Resources, Heritage Resources and Protected Properties

Consideration must be given to the potential impact which the project may have on Archaeological and Heritage resources as well as Protected Properties. The following sub-sections detail the examination of the potential for impacts on these resources. Details of the studies completed are presented in Appendix C.

1.4.1 Consideration of Protected Properties and Heritage Resources

The Stage 1 archaeology investigation concluded that there are no protected properties or heritage resources on or in the vicinity of the site.

1.4.2 Consideration of Archaeological Resources

The Stage 1 archaeology investigation concluded the following about the archaeological resources related to the site:

- There are no recorded archaeological sites in the subject area; and
- The study area was previously reported to contain numerous watercourses, however none were observed during natural heritage field surveys, and has a history of extensive agricultural use; therefore a Stage 2 field survey was recommended.

As a result, a field (Stage 2) archaeological survey was completed with the results presented in Appendix C. The major findings included:

- Two artifact scatters contained early historic material (locus 1 and locus 5) were determined to be of significance; and
- One c1870 foundation and artifact scatter (locus 6) was also found.

A further Stage 3 assessment was recommended and subsequently completed. The artifact scatter near locus 5 was determined to be minor and did not require additional work or avoidance. The artifact scatters near locus 1 and 6 were fully defined and a 10 m buffer will be implemented during construction, operation and decommissioning in order to avoid these areas. When locus 1 and 6 were delineated, a 5 m buffer was included in the mapping and as such, only an additional 5 m buffer was applied to meet the required set-back.

Ministry of Tourism and Culture correspondence and confirmation of these findings are included in Appendix C.

1.5 Design Constraints and Setbacks

The results of the background studies were used to aid in the layout of the solar array, driveways and electrical collector systems. The Renewable Energy Approvals Regulation (O.Reg. 359/09) provided setback distances which are summarized in the table below.

| Setback | Distance (m) | Notes |
|--|--------------|--|
| Natural Heritage Setbacks (Significant woodlots, wetlands, valleylands and ANSIs) | 120 m | From the nearest edge of the construction area (fence line) to the nearest point of the natural feature. |
| Water Features | 120 m | From the nearest edge of the construction area (fence line) to the nearest point of the water feature. |

The setback distances to the nearest feature are illustrated in Figure 2. The solar array is located more than 120 m from the nearest significant wetland or ANSI. One woodland to the north of the project and north of the CN Rail line was determined to be significant, however it was determined that the project would have no impact on this feature due to the distance (119 m) and the presence of the CN rail line between this feature and the site.

1.5.1 Provincial Policy Plans

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

1.5.2 Adherence to Setbacks

The design of the SunE Rutley Solar Farm adheres to the requirements of Ontario Regulation 359/09.

Noise Setbacks: The predicted maximum noise values for all non-participating noise receptors are all below 40 dBA, as noted in the Noise Study Report (Appendix C).

Setbacks from Oil and Gas Resources: A review of the Ontario Oil, Gas & Salt Resources Library found at <http://www.ogslibrary.com/> did not find evidence of any active, dry or decommissioned oil or gas wells within the study area.

Setbacks from Significant Woodlots: The solar array is located within the 120 m setback from a significant woodlot however no impacts are anticipated.

Setbacks from Water Features: The solar array is located outside of the 120 m setback from water features.

Setbacks from Significant Wetlands: The solar array is located outside of the 120 m setback from wetland features.

Setbacks from ANSIs: The solar array is located outside of the 120 m setback from life science ANSIs. There are no earth science ANSIs within 300 m of the project boundary.

Setbacks from Valleylands and Provincial Parks: There are no Significant Valleylands or Provincial Parks within 300 m of the project boundary.

Details of these setbacks are included in the Natural Heritage Report (Appendix B). Ministry of Natural Resources confirmation of these finding is included in Appendix B.

2. Operations

2.1.1 General

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

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

2.1.2 Routine Farm Maintenance

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

2.1.3 Unplanned Farm Maintenance

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

2.1.4 Electrical System

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

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 | Solar Farm 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 | Siting of the array away from residents reduces the visual impact. Visual barriers such as fence slats or berms using excess site grading material will be installed during construction where required to reduce the potential visual impact. |
| Residual Impacts | No to minimal residual impacts are anticipated. However, 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 | Solar Farm operation |
| Environmental Component Affected | Noise Levels – Local Residents |
| Potential Impacts | Noise modelling (Appendix C) has shown that some noise will occur from the inverters and transformers. No noise above background levels is expected at any receptor. |
| Mitigation Measures | None required. |
| Residual Impacts | No residual impacts are anticipated. |

2.2.1.3 Wildlife Disturbances

| | |
|----------------------------------|--|
| Activities | Solar Farm operation |
| Environmental Component Affected | Wildlife and Birds |
| Potential Impacts | <p>Since the Project has largely been sited outside of vegetated areas, potential effects to bird and bat species, wildlife, and their habitats will be temporary until the solar arrays become part of the environmental “background”.</p> <p>For most breeding species, habitat loss or disruption during construction was more of a potential concern than disturbance or direct mortality as a result of operation. In fact, based on experience at other operating solar farms, bird and bat species tend to be present throughout solar farms during operations.</p> |

| | |
|---------------------|---|
| Mitigation Measures | None required. |
| 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 solar array will be visited by maintenance staff for routine inspections monthly after commissioning. |
| Environmental Component Affected | Wildlife and Birds |
| Potential Impacts | <p>Routine maintenance visits will be less of a disturbance than the regularly occurring farming activities now taking place on farmlands surrounding the site.</p> <p>Maintenance activities include regular lubrication of the tracking units which generates some waste material.</p> |
| Mitigation Measures | <p>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.</p> <p>Any waste material from the maintenance activities will be properly disposed of by authorized and approved offsite vendors.</p> |
| Residual Impacts | Infrequent visits by maintenance staff will have little residual impacts. |

3. Environmental Effects Monitoring Plan

Monitoring is fundamental to confirming key net effects from the project. The intent of monitoring will be to verify compliance with federal and/or provincial 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., Environment Canada, Ministry of Natural Resources, and Ministry of Environment) and in accordance with any conditions attached to the Renewable Energy Approval.

3.1 Construction Staging

The timing and execution of construction activities will be scheduled to minimize the potential impacts on the natural environment. The staging aspects which will be incorporated will include:

Schedule construction and reclamation activities to be conducted as close to each other as feasible so as to minimize the time any 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. Measures will be implemented so that sediment is prevented from entering any water body. In order for these measures to be effective, it is imperative they are installed correctly in the proper location, inspected, and repaired when necessary. This outcome is achieved through proper coordination by individuals involved in the planning and implementation of these mitigations.

The following is a typical list of measures to be implemented for controlling the release of sediments during construction:

- Areas where erosion potential is high will be identified prior to the start of construction activities;
- Sedimentation control measures will be installed prior to and clearing or construction activities;
- Stripped material will be stockpiled for future use and these stockpiles will be located away from watercourses or drainage features;
- Stockpiled material will be sloped to a maximum of 2:1 to minimize run-off;
- Light duty sediment fencing will be placed along any unconsolidated slope to prevent sediments from reaching any water feature. Filter fabric is the only acceptable fencing material to be used (i.e., no plastic-braided fencing). Fencing shall be secured along the base by digging in the filter fabric and backfilling with earth to grade, to prevent runoff from flowing underneath the bottom edge. In the area where the work area drains overland flow towards the watercourse, the fencing will be doubled with a row of hay bales installed between the fencing and on the upstream side. The hay bales will be installed in a shallow (~5 cm) trench packed tightly together and staked into position;
- Sediment fencing shall be placed along the base of all spoil piles to prevent sediment-laden runoff from entering ditches or watercourses;
- Rock check dams and/or hay bales shall be installed in project-affected drainage ditches to entrap sediments and reduce water velocities to facilitate sediment deposition. Rock check dams will be installed via a standard sediment fence installed perpendicular to the flow and then filled with fine gravel or filter sand on either side. Alternatively, double sediment fencing and the associated hay bales may be installed to achieve the same result, however additional staking may be required to prevent hay bales from floating in the associated deeper waters;
- All disturbed areas will be stabilized and re-vegetated as soon as feasible; and
- Sedimentation control measures will be left in place until all disturbed areas have been stabilized.

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:

- Clearly marked work areas with vehicle traffic being restricted to the work areas;
- It is not anticipated that any tree clearing will be required and every effort will be made to avoid the removal of trees. Should a tree be in direct conflict with a proposed access road or work area the tree will be removed and, if practical, replanted after construction has been completed;
- 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; and
- Vehicle traffic will be limited to 30 km/h or less on access driveways to reduce the potential for collisions with wildlife.

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
- Upon completion of the construction work, the work areas and access driveways will be reduced to the minimum size needed, de-compacted and the topsoil will be used to restore all non-used work areas to productive capacity.

3.5 Archaeological Resources

Construction activities have the potential to disturb undiscovered archaeological resources. Should any artifacts be discovered during construction, the SunEdison representative will be contacted and all work within the vicinity of the find site will be halted. A licensed archaeologist will be contacted and no further work near the find site will be completed until the site has been cleared by the MTC. In addition, aboriginal communities that have been identified as having an interest in the project will be notified of the find.

3.6 Waste Management

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

3.8 Inspections

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

- Daily log and weekly reports completed by the contractor's inspector;
- Prior to construction SunEdison and the inspector will jointly determine that all required permits, licenses and approvals are in place prior to the commencement of construction. The inspector will also review the permits on a weekly basis and report to SunEdison any which may be approaching the expiry date;
- The inspector 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 inspector will make a verbal report to the project manager and the SunEdison 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 Renewable Energy Approvals process is the means by which this is controlled under the EPA. Prior to construction, a Renewable Energy Approval (REA) will be obtained. Any conditions of approval and follow-up measures 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. This will include a 1-800 number as well as local contact personnel.

3.10 Potential Environmental Effects, Mitigation Measures and Monitoring

The potential environmental effects, mitigation measures, monitoring objectives and monitoring plan are presented in Table 1.

Table 1: 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 | No wildlife mortality | Adherence to woodlot and watercourse setbacks Minimal time required to complete activities | <ul style="list-style-type: none"> Construction inspection and surveying to maintain setbacks <u>Contingency Measures</u> <ul style="list-style-type: none"> Alter location of project components Suspend construction during breeding periods |
| | Clearing and grubbing and soil excavation | No loss of soil or soil fertility | Site clearing and grubbing will be kept to a minimum area on-site by staking and marking off the areas that define limits of the work to be done Excavated soil will be re-used on-site where feasible, or disposed of in a proper facility off-site. Sedimentation and erosion controls | <ul style="list-style-type: none"> Inspection of top soil separating Construction inspection and surveying <u>Contingency Measures</u> <ul style="list-style-type: none"> Importation of new topsoil |
| | Impacts to surface water features from construction | No increase in sedimentation in watercourses No changes in drainage / hydrological function | Adherence to setbacks Proper sizing and installation of culverts Stabilization of disturbed surfaces to prevent erosion Installation of light duty sedimentation fencing installed around work area during construction | <ul style="list-style-type: none"> Routine inspection of erosion control devices Inspection of final restored surfaces to ensure vegetation re-growth <u>Contingency Measures</u> <ul style="list-style-type: none"> Repair, replace or installation of additional erosion control measures |
| | A short-term increase in truck traffic during construction period. | Minimal delays | Delivery of equipment will be coordinated with local traffic patterns Traffic control plan will be developed | <ul style="list-style-type: none"> Complaint tracking <u>Contingency Measures</u> Establish alternate delivery routes |
| | Archaeological resources | No loss of archaeological resources | Establishment of buffers around archaeological sites If any archaeological resources are discovered, portions of the project may be redesigned to avoid them If practical, the resources will be removed and catalogued in accordance with Ontario Ministry of Culture guidelines | <ul style="list-style-type: none"> All archaeological sites will be staked off and all workers will be instructed to avoid these sites <u>Contingency Measures</u> <ul style="list-style-type: none"> During excavation activities if any archaeological resources are found to be in conflict with the proposed facilities, excavation activities will be halted within the vicinity of the find site and the issues assessed with consideration given to modifying the siting of equipment. |

| Project Activity | Potential Effects | Performance Objective | Mitigation Strategy | Monitoring Plan and Contingency Measures |
|-------------------------------|--|--|---|--|
| | Fuel or transformer oil spill | No spills | Any leak or spills from trucks or machinery would be contained and site would be properly cleaned up and disposed of at registered disposal facilities Transformers used in the project are silicone based and do not contain hydrocarbons Refuelling of all vehicles and equipment will be done away from watercourses during construction and no re-fuelling on-site during the operation phase | <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 | No dust/noise reaching neighbouring residences | 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 |
| Operational Activities | | | | |
| Solar Farm Operation | Reduction in aesthetic quality of landscape | None Required | Complaints tracking Adherence to noise setbacks will site inverters away from residents | <ul style="list-style-type: none"> Recording and communication of complaints to MOE |
| | Noise impacts on receptors (residents located on non-lease properties) | <40 dBA at non-participating receptors | 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 <u>Contingency Measures</u> <ul style="list-style-type: none"> Repair damaged components |
| | Disturbance to wildlife & birds | None | Adherence to setbacks | None Needed |
| | Spill of transformer oil | No spills | Secondary containment systems Proper disposal of waste materials | <u>Contingency Measures</u> <ul style="list-style-type: none"> Notification of Spills Action Centre, if required Assess and remediate impact soils |

| Project Activity | Potential Effects | Performance Objective | Mitigation Strategy | Monitoring Plan and Contingency Measures |
|-----------------------------------|---|--|--|---|
| Decommissioning Activities | | | | |
| Removal of Equipment | Surficial disturbance | No increase in sedimentation in water bodies | Re-grading of site & land use restored after equipment disturbances complete Install erosion control measures | <ul style="list-style-type: none"> ○ Frequent inspection of erosion control devices ○ Inspection of final restored surfaces ○ On-going consultation with landowners <u>Contingency Measures</u> <ul style="list-style-type: none"> ○ Repair, replace or installation of additional erosion control measures |
| Removal Equipment | Sensory disturbance (sound and visual presence) | None | Complaints tracking Impacts from equipment usage & personnel present will be short term | <ul style="list-style-type: none"> ○ Recording and communication of complaints to MOE |
| | Dust | No offsite impacts | Watering of exposed soils Maximum speeds | <ul style="list-style-type: none"> ○ Recording and communication of complaints to local authorities |
| | Surficial disturbance | No increase in sedimentation in water bodies | Re-grading of site & land use restored after equipment disturbances complete Install erosion control measures | <ul style="list-style-type: none"> ○ Frequent inspection of erosion control devices ○ Inspection of final restored surfaces ○ On-going consultation with landowners <u>Contingency Measures</u> <ul style="list-style-type: none"> ○ Repair, replace or installation of additional erosion control measures |
| Removal of Transformer | Spill of transformer oil | No spills | An oil containment system will be maintained during decommissioning to prevent soil contamination in the event of a leak Proper disposal of waste materials | <u>Contingency Measures</u> <ul style="list-style-type: none"> ○ Notification of Spills Action Centre, if required ○ Assess and remediate impact soils |

| Project Activity | Potential Impacts | 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 | No spills | <p>Small quantities of lubricants present in the tracking system</p> <p>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</p> <p>Transformers used in the project are silicone based and do not contain hydrocarbons</p> <p>Refuelling of all vehicles and equipment will be done away from watercourses during construction and no re-fuelling on-site during operation phase</p> <p>Use of lightning protection equipment</p> | <u>Contingency Measures</u> <ul style="list-style-type: none"> Notification of Spills Action Centre, if required Assess and remediate impact soils |
| | Public safety | No Accidents | <p>Siting on private property which restricts public access to the array</p> <p>Equipment conforms to CSA standards</p> <p>Fencing of the substation for security based on standard utility practices</p> | <u>Contingency Measures</u> <ul style="list-style-type: none"> Activation of emergency response plan |

4. Response Plan

4.1 Public Complaints

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.

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 solar power facility exceeds operational parameters or there is an emergency, the appropriate agency will be notified using the following approach.

Exceedance of Operational Parameters

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. SunEdison has standard Emergency Action Plans for all of its operating facilities. A plan specific to the SunE Rutley Solar Farm 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