



## 7. PROJECT ACTIVITIES

All construction activities that have the ability to impact wildlife and the natural environment will be undertaken at appropriate time periods to minimize these impacts. Site preparation in significant bird breeding habitat will occur outside of the breeding bird season, May 1, to July 15. Site preparation and construction works within significant amphibian breeding habitat will be undertaken outside of the amphibian breeding season, April 15 to June 15. Table 2 presents the proposed construction schedule.

Table 2: Project Construction Schedule

| CONSTRUCTION ACTIVITY                        | Date of Commencement                      | Schedule                              |
|--|---|---------------------------------------|
| <b>Site Preparation</b>                      |   |                                       |
| Surveying and Geotechnical Activities        | Preliminary surveying in Spring 2012      | 8 weeks for preliminary surveys       |
|  | Pre-construction surveying in Summer 2012 | 12 weeks for pre-construction surveys |
| Clearing                                     | Spring 2013 (March-April 15)              | 1-2 months                            |
| Soil Stripping, Grubbing and Grading         | Spring 2013                               | 1-2 months                            |
| Development of Access Roads                  | Spring 2013                               | 1-2 months                            |
| Temporary Storage / Laydown Area             | Spring 2013                               | 1-2 months                            |
| Turbine Construction areas and Crane Pad     | Spring 2013                               | 1-2 months                            |
| <b>Component Installation and Connection</b> |   |                                       |
| Turbine Foundations                          | Summer 2013                               | 2 months                              |
| Wind Turbine Assembly and Installation       | Fall 2013                                 | 2-3 months                            |
| Electrical Collector Line Installation       | Summer 2013                               | 2-3 months                            |
| Horizontal Directional Drilling              | Summer 2013                               | 2 months                              |
| Transformer Substation                       | Spring 2013                               | 3 months                              |
| Power Line Installation – 230 kV Line        | Summer 2013                               | 3 months                              |
| Power Line Installation – Dual 69 kV Line    | Summer 2013                               | 2 months                              |
| Operations Building                          | Fall 2013                                 | 2 months                              |
| Meteorological Towers                        | Spring 2013                               | 1 week                                |
| <b>Post-Installation Activities</b>          |   |                                       |
| Clean up and Reclamation                     | Spring 2014                               | 1 month                               |
| Turbine Commissioning                        | Spring 2014                               | 1-2 months                            |



## 7.1 Construction

The following activities associated with construction of the wind facility will take between 6-9 months and are scheduled to begin in the summer of 2012. They will occur in the relative order in which they are presented in Table 3 below. Pre-construction activities that are currently underway include: topographic surveys, geotechnical studies and stormwater studies.

Table 3: Construction Activities

| Activity   | Description   |
|--|---|
| <p>Surveying and Geotechnical Investigations</p> | <p>Surveying all locations within the project location where construction activities are to occur began in fall 2011. At that time registered land surveyors staked all:</p> <ul style="list-style-type: none"> <li>• Construction zones around wind turbines (local laydown areas) – 200 metre x 200 metre boxes around turbines;</li> <li>• Access roads, hammerheads and bump out areas as well as turning radius for truck delivery that may infringe on private land;</li> <li>• Land for the substation;</li> <li>• Temporary laydown areas;</li> <li>• Operations and Maintenance Building location;</li> <li>• Crane paths and crane pads;</li> <li>• Power Line routes within the project location;</li> <li>• Collector systems routes.</li> </ul> <p>These areas were all surveyed and staked and Stage 1 and 2 Archaeological Assessments were undertaken in all construction areas. Project components were shifted to avoid Archaeological features wherever possible.</p> <p>Private utility locators were brought on site to determine the location of any underground utilities for the collection system road crossings and routes along the existing road allowances. The collector system was altered as necessary to avoid existing utilities.</p> <p>Geotechnical work began in November 2011 and involved bore samples being taken in proposed turbine locations. Bore samples were taken from a truck mounted drill rig that drilled boreholes at predetermined sampling locations, which included all turbine locations. This work established baseline soil and hydro-geological conditions for soil management activities during excavation and backfilling. Preliminary borehole data needs to be obtained to</p> |



| Activity      | Description  |
|---------------|--|
|               | <p>determine the requirement for dewatering activities during excavation.</p> <p>A legal boundary and topographical survey by an Ontario Land Surveyor (OLS) has been conducted to identify the boundaries of the project location. Before the construction process, an OLS will also stake the exact location of the perimeters for fencing, access roads, all foundations and the substation. In addition, the OLS will also identify the location of any underground utilities and/or infrastructure and the extent of any easements they may be contained within. Any designated archaeological and environmental features and their applicable setbacks (e.g. significant wildlife habitat, etc.) will also be clearly demarcated to prevent unnecessary encroachment.</p> <p>The drilling rig used for geotechnical investigations will transport minor amounts of lubricants for operation of the unit but these are contained on the rig. Waste generated by these activities is limited and will be removed from site routinely during the activity for disposal in an approved manner.</p> |
| Land Clearing | <p>The project is located on agricultural land and is currently under agricultural production. Most land is already cleared of natural vegetation. Bush, trees, and other vegetation will be cleared from some construction areas as required. The project was designed to minimize the amount of land clearing required to support a large scale wind farm. Land clearing within or directly adjacent to any significant natural features has been minimized.</p> <p>Clearing may also be required for portions of the site access roads, crane paths, collector lines and power line right-of-way. Temporary bridges will be installed to cross watercourses and drains where required. These temporary structures will be removed from the site after water crossing culverts/structures are installed. Please refer to the Water Assessment Report for more information regarding water crossings.</p>   |



| Activity                             | Description  |
|--------------------------------------|--|
| Soil Stripping, Grubbing and Grading | <p>On all construction sites the topsoil will be removed and temporarily stockpiled to avoid damage or contamination to these soils. Following soil stripping, grubbing will be carried out in cleared areas to remove roots and slash generated during site clearing. Roots and slash may be chipped with landowner approval.</p> <p>Soils that are unsuitable for road or turbine pad construction will be stockpiled for re-use during decommissioning or graded into adjacent areas. Excess soil will be stockpiled away from drains and watercourses and stabilized to prevent erosion. Grading will be done in such a manner so as to not alter existing drainage patterns in the area. Grading will be undertaken to smooth irregular ground surfaces and to ensure road grades are suitable for trucks delivering turbine components. The turbine locations will be graded to ensure a safe working area for cranes.</p>   |
| Development of Access Roads          | <p>Access roads will be about 6.0 m wide and constructed with a granular 'B' base and a finished surface of granular 'A' material. The total recommended thickness would be 500 to 600 mm. The use of gravel will reduce water use for dust control during construction. The subgrade is intended to be free of depressions and sloped (at a minimum grade of 2%) to provide effective drainage. During construction of the road, the topsoil will be stripped and spread on-site and some cut and fill is expected prior to the placement of the granular base. Access road subgrades are expected to consist of the existing native granular deposits. The subgrade will be cut as cleanly as possible to minimize disturbance and be proofrolled with heavy rollers to locate any loose or disturbed areas. Should weak areas or other incompatible material be detected during proofrolling, further excavation and subsequent backfill with approved native deposits (moisture content within 3 percent of optimum moisture content) or imported granular materials may be required. The replacement granular materials should be compacted to at least 95 percent SPMDD. The depth of the roadbed will be constructed as required to transport loads associated with construction and maintenance of the wind farm. No materials will be removed from the site.</p> <p>Because road construction will involve the use of machinery, it will take place during normal working hours in accordance with the Town's noise by-law, if applicable. The access roads will be constructed prior to the balance of the construction activities.</p> <p>Culverts will be installed for any watercourse crossings constructed at</p> |



| Activity                                     | Description  |
|--|--|
|  | <p>this location in order to accommodate vehicular access and construction traffic across the watercourse while maintaining unimpeded flow within the watercourse. The type of crossing and mitigation measures will be developed in consultation with the MNR.</p>  |
| Transportation of Project Components to Site | <p>It is the responsibility of the turbine supplier, General Electric (GE), to determine the best route to the project location for the delivery of wind turbines. GE will be responsible for any road improvements that are necessary until the delivery trucks reach the project location. Once at the project location it is the responsibility of the proponent to ensure that the required upgrades, including road widening, strengthening and turning radii, are undertaken. Additional stone base may be added for strengthening, as required. The width may be increased to 6 metres in some places and up to 8 metres in other places. Widening of the turning radii would involve the placement of granular material to create a widened roadbed.</p> <p>A Transportation Plan for the project was completed. Please find the Transportation Plan for turbine component delivery in the Construction Plan Report. The following improvements will be necessary to improve the local infrastructure prior to turbine delivery. The necessary transportation and safety permits will be secured prior to delivery of project components to site. The proponent will obtain the necessary approvals from the County of Dufferin and the Township of Melancthon for any temporary or permanent road widening activities.</p> <p>The wind turbine blades will be delivered on an oversize vehicle roughly 54-56 m long, the nacelle on an oversized vehicle approximately 35 m long, and the towers on an oversized vehicle of sufficient capacity to carry the respective sections.</p> |



| Activity                           | Description   |
|------------------------------------|---|
| Temporary Storage and Laydown      | <p>Each component of the wind turbine will be stored at its respective erection site lay down area (200 m by 200 m located around turbine foundation). There will be a central laydown and construction area, located on Lot 26, Concession 2, Township of Melancthon. This laydown area will be the centralized workspace area for field offices, temporary storage as well as storage of equipment and materials. This construction area will be fenced and locked during non-working hours. The footprint of the laydown area is expected to be 6 hectares and have 2 access points from the 3<sup>rd</sup> line.</p> <p>There will be designated fueling areas for all equipment that will meet safety and regulatory requirements may be established. Please refer to the Environmental Effects Monitoring Plan and the Emergency Response and Communications Plan, part of the <i>Design and Operations Report</i> for further details regarding standards and protocols regarding Best Management Practices.</p>   |
| Turbine Staging Area and Crane Pad | <p>An area of approximately 200 m by 200 m (4 hectares) will be cleared principally in agricultural field areas and levelled at each turbine location. Such a large area was determined to be necessary in the event that construction issues were encountered at a turbine site so the turbine could be easily relocated within the existing cleared area with little consequence to the project schedule. All specialist studies included this area as part of the REA submission.</p> <p>The turbine staging area at each turbine site is comprised of:</p> <ul style="list-style-type: none"><li>• A staging and equipment storage area for the erection of the towers and the left and securing of the nacelle and blades;</li><li>• A crane pad, with dimensions up to 20 m, to support the crane used for construction.</li></ul> <p>The crane pad will be levelled to grade with a maximum slope of 1% of the total length of the entire area. A 2 m wide gravel path will be constructed around the crane pad to and around the turbine foundation.</p> <p>A total levelled and compacted staging area with a radius of at least 20 metres is required. Fifty (50) m levelled areas free from obstacles are also required on either side of the staging area as well as three 50 m levelled areas free from obstacles to laydown the wind turbine blades for assembly.</p> |



| Activity                               | Description   |
|--|---|
| Turbine Foundations                    | <p>Depending on soil conditions, the size of the excavation for the turbine tower will be approximately 2.5 metres to 3 metres deep and about 20 metres wide. A tracked excavator will be used for excavate the foundation. Depending on weather conditions the excavation will take approximately two to three days. Soil not required or unsuitable for backfill will be stockpiled on site or re-used during decommissioning or graded into adjacent areas.</p> <p>If excavations extend below the groundwater table, dewatering will occur and water will be pumped out to an acceptable receiving areas. It is predicted that the daily volume would not exceed 50,000 L per day based on the geotechnical studies undertaken.</p> <p>It is anticipated that concrete can be supplied by a local supplier(s). The amount of concrete required will depend on ground/soil characteristics. Selection of the final foundation design will be determined based upon the site-specific geotechnical assessment. A typical spread footing foundation will be octagonal in shape with a diameter of approximately 15-17 m. The foundation is anticipated to be about two metres thick. The turbine tower pedestal is approximately four metres in diameter and is anchored to the concrete foundation using 140 large diameter anchor bolts.</p> <p>Ready mix trucks will be used to transport the concrete to the site. Approximately 40 truck trips will be required per foundation and pedestal. Construction of each foundation (e.g., formwork, rebar placement, and concrete pour) will be completed within about a week. The foundation and pedestal then need to cure for 14-21 days prior to erection of the turbine.</p> <p>The forms for the foundations will be removed and the excavated area back-filled compressed such that only the tower base portion of the foundation will be above ground.</p> <p>If the required amount of concrete cannot be sourced from an existing licensed local facility in the area, a project-specific batch plant will be required during the construction period. If a new batch plant is needed, it would be operated by a contractor and would require approximately 2 hectares of land.</p> |
| Wind Turbine Assembly and Installation | <p>The track propelled construction cranes used to erect the tower and blades weigh approximately 450 t and are about 11 m wide and roughly 15 m long (not accounting for the boom and counter weights). Given the crane size, key roads within the project area may have to be</p>   |



| Activity                                      | Description  |
|---|--|
|   | <p>widened and structurally enhanced, as discussed above, or a temporary bridging structure employed. Since a conventional track crane has a dispersed ground loading, depending on the soil conditions, the crane may be able to 'walk' on the existing soil.</p> <p>The turbines typically come in three sections that are assembled by crane at the site one section at a time. The nacelle, which houses the generator, is lifted by a crane and attached to the top of the top tower section. The rotor blades are assembled on the ground and, lifted by crane and attached to the nacelle. Turbine construction generally takes three to five days depending on weather conditions.</p>   |
| <p>Electrical Collector Line Installation</p> | <p>The collection system ("feeder lines") will be composed of 34.5 kV underground lines all connecting the turbines to the transformer sub-station. The feeder lines will generally follow the turbine access roads, although in some cases, to reduce the distance of the lines, the lines may divert from the roads and cross agricultural fields.</p> <p>The buried lines will be constructed on leased lands and be buried to a minimum depth of 1 m. The lines will be installed using an excavator to create a trench or hand dug where necessary. The cable will then be dropped into the trench from a spool pulled by a truck. The material removed from the trench will be used as backfill in the trench. Topsoil and subsoil will be excavated, stored and replaced separately on agricultural lands.</p>  |
| <p>Horizontal Directional Drilling</p>        | <p>Directional drilling will be used to install cables underneath watercourses, wetland features and roads, where required. For the collector lines there will be approximately 30 locations for 8" directional drilling to both cross under roadways and wetland features. The total length of directional drilling required is approximately 2.97 km.</p> <p>Work will be done to ensure that the riparian area where the drilling is to occur is disturbed to the minimum extent possible, at an appropriate depth below watercourses to avoid frac-out, and with appropriate concern given to minimize sediment and erosion control.</p> <p>A directional boring machine (Vermeer machine) will be used and will require the use of drilling fluid or 'mud' consisting of silica and bentonite. HDD required the excavation of pits at the ends of each site. The machine may or may not be located in the pit. Once bored a HDPE casing is then advanced and then the three conductors (one per phase), fiber optic duct and separate ground cable (if used) are pulled</p> |



| Activity  | Description   |
|---|---|
|   | <p>through the casing.</p> <p>Where the underground line will cross a watercourse, the appropriate Department of Fisheries and Oceans (DFO) Operational Statements will be followed or a letter of authorization will be obtained. Please refer to the <i>Water Assessment Report</i> for more information on water crossings.</p>  |
| <p>Transformer Substation and Point of Interconnect – 69kV Power Line Option</p>  | <p>A project sub-station/transformer (located on Lot 26, Concession 2, Township of Melancthon) will be required within the project limits to increase the voltage of the electricity from collection system voltage, 34.5kV to 69 kV for transport via the 35.6 km power line for connection to the provincial grid. A second sub-station/transformer will be required at the point of connection with the provincial grid, located in the Town of Mono. The second transformer will step-up the voltage from 69 kV to 230 kV to facilitate connection with the provincial grid. While the final design of the sub-stations are to be confirmed, they would consist of an open-air designed facility with one transformer unit. Each sub-station would be surrounded by a security fence and would have security lighting. The project substation would require a footprint of 1 hectare and the point of interconnect substation would require a footprint of 1 hectare.</p> <p>Single-walled transformers are to be used. As such, the transformer(s) would sit in a concrete containment system to capture any oil leaks from the transformer. The containment system would be sized so that it would contain all of the oil in the transformer should there be a complete failure (a rare and unexpected event). Water captured by the containment system (from a rain event) would be pumped out for ground discharge if no oil is mixed with the water. If oil is found to be mixed with the water, then the water/oil mix would be pumped to a tanker truck and then take off-site for disposal at a licensed facility.</p> <p>Both the project substation and the point of interconnect substation have intentionally been located in non-significant woodlots to reduce noise emission and the visual impact of each facility on neighbouring receptors. As both substation are to be located in woodlots clearing of trees will be required and well as levelling and grading the footprint and access roads each substation.</p> |
| <p>Transformer Substation and Point of Interconnect – 230kV Power Line Option</p> | <p>A project sub-station/transformer (located on Lot 26, Concession 2, Township of Melancthon) will be required within the project limits to increase the voltage of the electricity from collection system voltage, 34.5kV to 230 kV for transport via the 46 km power line for connection</p>   |



| Activity                                   | Description  |
|--|--|
|  | <p>to the provincial grid. A switching station will be required to interconnect the power line with the provincial grid, at the Orangeville Transformer Station, located on Part Lot 2, Concession 2, Township of Amaranth. While the final design of the switching station is yet to be confirmed, it would have an approximate footprint of 30 m<sup>2</sup> and consist of an open-air designed facility with one transformer unit. The sub-station would be surrounded by a security fence and would have security lighting.</p> <p>Single-walled transformers are to be used. As such, the transformer(s) would sit in a concrete containment system to capture any oil leaks from the transformer. The containment system would be sized so that it would contain all of the oil in the transformer should there be a complete failure (a rare and unexpected event). Water captured by the containment system (from a rain event) would be pumped out for ground discharge if no oil is mixed with the water. If oil is found to be mixed with the water, then the water/oil mix would be pumped to a tanker truck and then take off-site for disposal at a licensed facility.</p> <p>The project substation has been intentionally been located in a non-significant woodland to reduce noise emission and the visual impact from the facility on neighbouring receptors. As the substation is to be located in a woodlot, clearing of trees will be required and well as levelling and grading the footprint and access road.</p> |
| Power Line Installation – Dual 69kV Option | <p>A three phase dual 69 kV power line of approximately 35.6 km in length will be constructed to connect the wind farm to the provincial power grid located to the southeast of the project in the Town of Mono. The line has been routed to minimize its length and to avoid sensitive environmental features. In addition to the consideration of the environmental features, consultation with the public and Hydro One helped decide between various routes. The route selected is 35.6 km in length. Hydro One has approximately 501 existing hydro poles along 32.88 km of the route and there are no poles along 2.72 km of the route. DWP will be responsible for constructing approximately 54 new wooden poles along this 2.72 km route to complete the route. DWP is responsible for constructing poles and stringing the line along new pole sections. Horizontal directional drilling will be used along the 69 kV power line to avoid Provincially Significant Wetlands and assumed Provincially Significant Wetlands. Hydro One will be responsible for replacing the existing hydro poles with taller towers to accommodate the existing lines and the new dual 69 kV lines and</p>  |



| Activity                                | Description   |
|---|---|
|   | <p>stringing the line along these sections.</p> <p>The power line will be an overhead line and require 8–10 m of space within the municipal road right-of-way. Some sections of the right-of-way may require clearing. The tower structures of the power line would be composed of single poles and be spaced about 50–55 metres apart and installed to a typical depth of 2.5 m. New poles will range from 15 m to 24 m<sup>1</sup> high and require a top space of 5.8 m for the 15 m pole and 4.0 m for the 21 m, 23 m, and 24 m poles. Please refer back to Figure 3b for an illustration of the locations where DWP would have to construct new poles and where there are existing Hydro One poles.</p>  |
| Power Line Installation<br>230kV Option | <p>The detailed design for the 230 kV power line installation has not been finalized. This power line will principally be an overhead line. The power line will commence at the project substation and extend west along a private easement to just west of Hwy 10 where it will meet a rail right-of-way. The power will then divert south within the rail right-of-way and be setback a minimum of 4 m from the rail bed. Horizontal directional drilling will be used along the 230 kV power line to avoid Provincially Significant Wetlands and treated as Provincially Significant Wetlands.</p>   |
| Operations and<br>Maintenance Building  | <p>A 200m<sup>2</sup> operations and maintenance (O&amp;M) building will be constructed on site on the same land parcel as the project substation, Lot 26, Concession 2, Township of Melancthon. The footprint of the O&amp;M building will be approximately 1.2 hectares and would include the building, parking and a small laydown area. It will provide office and storage space and a workspace for maintenance of equipment. The building will also have a small kitchen and washroom facilities. A well will be required to provide a potable source of water for the O&amp;M building. Domestic waste water will be managed by the construction of a small septic tank and field bed. Access to the building will be from County Road 21.</p> |

All construction activities will be conducted by licensed contractors in accordance with required standards and codes and all activities will abide by local laws and requirements. All construction-related activities will be conducted within the project location boundary outlined in Figure 2a-d. Testing and commissioning of the facility will occur over the last few weeks of construction. During construction, no hazardous materials, including fuel, oils or grease will be stored on site, although equipment may require their use. Disposal of hazardous wastes will only be required in the case of accidental spills and

<sup>1</sup> Heights are approximate. The range of pole heights under consideration are 50, 70, 75, and 80 feet.



will follow the procedures outlined in the Spills Response Plan. Decisions on waste disposal or recycling during, and immediately after, construction will be made by the on-site contractor who will refer to the *Environmental Protection Act*.

## 7.2 Operations and Maintenance

The following activities are associated with the operation and maintenance of the wind facility. These activities will take place over the lifetime of the facility.

Table 4: Operations and Maintenance Activities

| Activity   | Description   |
|--|---|
| Wind turbine operations  | Facility operations will be monitored remotely from an Operations and Maintenance Building. Controls will be implemented for fail safe action in the event of electrical or instrument losses. The wind turbine system will be integrated with the electric interconnection Supervisory Control and Data Acquisition (SCADA) to ensure that the project critical controls, alarms and functions are properly coordinated for safe, secure and reliable operation. Meteorological data will be monitored from the Operations and Maintenance Building.   |
| Transformer substations and electrical transmission operations | Transformer substations will step up voltage for connection to the provincial grid. Substations will sit in a concrete containment system to capture any oil leaks from the transformer. The containment system will be sized such that it will contain all of the oil in the transformer should there be a complete failure (a rare and unexpected event). Water captured by the containment system (from a rain event) will be pumped out for ground discharge if no oil is mixed with the water. In the event that oil is found mixed with the water, the mixture would be pumped to a tanker truck and taken off-site for disposal at a licensed facility. Each sub-station will be surrounded by a security fence and will have security lighting. |
| Periodic maintenance and inspection of project components      | Operations staff will periodically inspect components to ensure continued safe operation. Routine maintenance, security visits and other measures will be conducted as needed. Normal maintenance on the individual wind turbines occurs twice per year, and will include complete checks of structural soundness, electronics systems and changing of hydraulic and lubricating fluids. Maintenance activities will follow a checklist provided by General Electric, the turbine manufacturer. Substations will undergo regular checks and maintenance to ensure safe and reliable operation.  |
| Cleaning of Turbines   | Turbines will be cleaned as required to prevent accumulation of dirt and other debris that may restrict normal operation.   |
| Routine to major maintenance                                   | Unexpected maintenance occurs infrequently and typically involves   |



| Activity                                | Description   |
|---|---|
|   | the replacement of a major component, such as a gearbox, transformer or blade. In the event of a major malfunction, a crane may be required to lift the affected component. Crane pads will be located in the same place as during the construction and installation phase, where possible, and mitigation and monitoring measures described in the <i>Construction Plan Report</i> will be followed. Delivery of replacement turbine components will follow measures outlined in the <i>Transportation Plan</i> , appended to the <i>Construction Plan Report</i> .  |
| Periodic landscape and road maintenance | Short native vegetation will be planted once construction activities are complete. Regular maintenance may include mowing grass and trimming. Grading, ditch maintenance, shouldering may also be required during the operations phase of the project. Snow removal and application of sand and/or de-icing agents (i.e., salt) may be required during the winter months to maintain safe conditions for maintenance activities. There will be infrequent, short-duration emissions from motorized vehicles during the operations phase. This will result from accessing the Operations and Maintenance Building or from transporting maintenance personnel on-site.  |
| Inspections and testing                 | Activities will be carried out as required by the local utility and other governing bodies.   |
| Water Taking                            | The Operations and Maintenance Building will contain a small washroom and kitchen facilities. A small water well will be required on-site.  |
| Sewage Disposal                         | A septic system, with a small field bed and two washrooms, will be constructed to service the Operations and Maintenance Building. The septic tank, typically constructed of concrete or fiberglass, will conform to industry standards and local building codes. The septic tank will be pumped regularly and it will be the project owner's responsibility to ensure proper maintenance of the system.  |
| Waste Management                        | Project operations will result in the generation of solid waste (office waste, materials packaging, used mechanical parts, etc.) and used turbine lubricant and oils. Waste will be stored in a secured area of the Operations and Maintenance Building. A Spills Response Plan, prepared as part of the <i>Design and Operations Report</i> , provides further details about handling potentially hazardous materials and procedures for reporting spills under the Environmental Protection Act. Non-hazardous waste will be collected and disposed at the Township of Melancthon and Township of Amaranth landfills. Hazardous waste, such as used transformer or turbine oil, will be disposed at the County of Dufferin Transfer and Recycling Facility. |



## 7.3 DECOMMISSIONING PLAN OVERVIEW

### 7.3.1 Procedures for Dismantling and Demolishing

The project components consist of numerous recyclable materials, including steel, copper and wiring. When the Project reaches the end of its operational life, the parts can be dismantled and recycled. All waste resulting from the decommissioning of the facility will be transported by a certified and licensed contractor and taken to a landfill/recycling facility in accordance with all Ministry regulations.

#### *7.3.1.1 Above-ground Structure Decommissioning*

In the event that the Project requires decommissioning, the following general sequence for the removal of the components will be used:

##### Transformer Substation and Switching Station:

- Disconnect and remove all electrical components as a whole or disassembled;
- Reclaim gravel around the yard and remove the security fence (unless the landowner wishes to keep the area as is);
- Remove sound attenuating berms and replant as required; and
- Remove and transport all waste and salvage or recycle components as appropriate.

##### Above-ground Transmission Lines

- Disconnect all electrical equipment;
- Remove all overhead transmission systems not shared with Hydro One, including conductors and poles; and
- Remove and transport all waste and salvage or recycle components as appropriate.

##### Removal and Dismantling of Turbines

- Disconnect the tower from the collection system and disconnect the wiring between turbine sections;
- Remove, using a crane, the blades, rotor, nacelle and towers section by section;
- Drain lubricating oil from the generator once it has been placed on the ground, and dispose oil in accordance with Ministry regulations;
- Sort and store turbine components on temporary lay-down areas; and
- Remove and transport all waste and salvage or recycle components as appropriate.



### Access Roads

- Consult with the landowner to determine if access roads and culverts should be left in place for their continued use; and,
- If access road is deemed unnecessary, remove access road and restore access road location as near as practical to its original condition with native soils and seeding.
- If necessary, remove culverts and re-contour and re-vegetate land to maintain drainage patterns; and
- Remove and transport all waste and salvage or recycle components as appropriate.

### Operations and Maintenance Building

- Demolish in accordance with provincial regulatory requirements; and
- Remove and transport all waste and salvage or recycle components as appropriate.

### Meteorological Towers

- Demolish in accordance with provincial regulatory requirements; and
- Remove all waste and salvage or recycle components as appropriate.

#### *7.3.1.2 Below-ground Structure Decommissioning*

In the event that the Project requires decommissioning, the following general sequence for the removal of the components will be used:

### Wind Turbine Foundations

- Remove the top 1 metre of overburden around the foundation and stockpile excavated soil;
- Demolish the top 1 metre of concrete and rebar; and
- Transport off-site and dispose at a licensed facility.

### Transformer Substation and Switching Station Foundations

- Refer to the activities described above for 'Wind Turbine Foundations'.

### Crane Pads

- Consult with landowner to determine if crane pad aggregate should be left in place or removed; and
- If the aggregate is not to remain, remove it and salvage as appropriate.



### Meteorological Tower Foundations

- Refer to the activities described above for 'Wind Turbine Foundations'.

### Underground Collection System

- Leave the underground cables in place;
- Cut cables at connection points greater than 1m below grade.

This decommissioning plan is based on current procedures and experience. These procedures may be subject to revision based on new experiences and requirements over time.

### 7.3.2 Site Restoration

Once all of the turbines and ancillary facilities are removed, remaining work will consist of restoring lands to pre-disturbance conditions where possible and according to landowner preference and industry standards. Lands will be restored to bring the site into a condition consistent with agricultural use. The decommissioning process will affect agricultural practices directly surrounding the access roads, substation and turbine locations, but only during their removal.

Site restoration activities will include:

- Removal of non-native materials and in-filling using stockpiled soils or imported soils;
- Seeding and vegetation to mitigate soil erosion;
- Measures to restore soil nutrient content; and
- Erosion and sediment control.

Site restoration activities will occur immediately following the removal of site components, where possible. Other than concrete turbine foundations, which will remain 1 metre below the soil, no residual effects are foreseen from decommissioning. Subsoil and top soil will be replaced where previously removed for construction of access roads, crane pads, lay-down areas and foundations. Imported (non-native) fill, if necessary, will match the existing soil type as closely as possible. Re-vegetation will occur in areas disrupted by construction and operation activities, where necessary and according to industry standards and best practices.



### 7.3.3 Managing Excess Materials and Waste

Dismantled wind turbines have a high salvage value due to the steel and copper components. These components are easily recyclable and there is a ready market for scrap metals. Transformers and transmission lines are designed for a 50-year lifespan so these items could be refurbished and sold for reuse.

Anticipated yields for salvage or recycling include:

- 80% –turbine tower and nacelle;
- 100% –salvageable metallic materials from the hub;
- 5% –percentage of total tower and nacelle weight that consists of salvageable copper bearing materials;
- 0% –blades and rotor. These are fiberglass epoxy and carbon fiber; and
- 75% –overall re-use of aggregate base course from the crane pads, including 50% re-use as base course and 25% to be used as general fill or non-structural fill.

Components to be recycled or reused will be temporarily stored on-site, and then transported off-site. Components requiring disposal, including toxic or hazardous materials such as oils, fuels or lubricants, will be disposed of through conventional waste streams applicable at the time of decommissioning.