

Appendix D

Summary of Potential Environmental Effects, Mitigation Strategies and Monitoring Plans

Potential Environmental Effects and the Environmental Effects Monitoring Plan during Construction					
Environmental Feature	Potential Effect	Performance Objective	Mitigation Strategy	Monitoring Plan and Contingency Measures	Net Effects
Heritage and Archaeological Resources¹					
Protected Properties	<ul style="list-style-type: none"> 12 features were identified in the Protected Properties Assessment. Construction will affect the property on which the Comfort Barn (Figure 2.16) is located through the installation of collector lines, access roads and two wind turbines. No potential for alteration to the Comfort Barn itself. Township of West Lincoln Heritage Committee reviewed the proposal and determined that the cultural heritage values of the Comfort Barn would not be negatively affected (See Consultation Report). 	<ul style="list-style-type: none"> Avoid alteration to the Comfort Barn structure. 	<ul style="list-style-type: none"> Closest turbines to the Comfort Barn are at a distance of 665m and 1000m. Closest access roads and collector lines are 150m from the Comfort Barn. 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> With mitigation measures, no direct or indirect impacts are anticipated.
Heritage Resources	<ul style="list-style-type: none"> Although 119 cultural heritage resources were identified within the Project Study Area in the Heritage Impact Assessment, the only potential direct construction-related impact was the damage or removal of heritage attributes along cultural heritage landscapes (i.e. fencing, trees, etc.) Potential indirect construction-related negative impacts were identified for 52 cultural heritage resources, including: <ul style="list-style-type: none"> Construction vibrations have potential to indirectly impact structural integrity of the built heritage resources. Transportation of over-sized loads has potential to cause accidental or indirect damage to high concentration of narrowly setback cultural heritage resources and landscapes in Smithville, St. Ann's, Bismark, Elcho, Wellandport and Stromness. 	<ul style="list-style-type: none"> Minimize removal of heritage attributes along cultural heritage landscapes. Reduce vibrations at built heritage resources. Minimize impacts to built heritage resources and cultural heritage landscapes. 	<ul style="list-style-type: none"> Avoid, where possible, removal or damage to identified heritage attributes (i.e., fencing, trees, etc). A 50 m no-construction buffer is recommended around the 52 identified heritage resources or else monitoring/contingency measures must be enforced. Avoid, where possible, transportation of over-sized equipment from the listed areas. Where avoidance is not possible, ensure that transportation through these areas avoids any removal or damage to identified heritage attributes (i.e., root systems and above ground vegetation of cultivated plants, canal infrastructure, landscape features, and built components of rail landscapes). Junction box at the intersection of Hutchinson Road and Highway 3 will be located on the northwest corner of the intersection to minimize visual impacts on the Mount Carmel Cemetery. Install transmission line poles on east side of Port Davidson Road (opposite side of road from the West Lincoln McCaffrey Cemetery). 	<ul style="list-style-type: none"> If construction will be within 50 m of the 52 built heritage resources, the maximum acceptable vibration or peak particle velocity levels will be monitored by a qualified engineer with experience with built heritage resources in a similar circumstance to ensure that maximum levels are not exceeded as coordinated by the Construction Contractor. Where damage to heritage attributes is unavoidable, plantings and built features should be restored to their pre-construction state immediately following construction. A construction monitor will confirm whether any removal or damage of character-defining attributes occurs along Hutchinson Road. 	<ul style="list-style-type: none"> Indirect effects to cultural heritage landscapes will be spatially and temporally limited. No significant effects are anticipated to built heritage resources.
Archaeological Resources	<ul style="list-style-type: none"> Encounter non-documented archaeological resources. 	<ul style="list-style-type: none"> Document and/or remove (as appropriate) archaeological resources from the Project Location prior to construction. 	<ul style="list-style-type: none"> If a new archaeological resource was discovered, work within the vicinity of the archaeological find would be suspended and a Ministry of Tourism, Culture and Sport archaeologist and aboriginal communities would be contacted. For construction works within 50 m from an identified resource that has not completed a Stage 3 AA, an archaeological monitor will be on site to supervise construction works. No construction works permitted within 20 m of an identified archaeological resource that has not completed a Stage 3 AA. 	<ul style="list-style-type: none"> In the event that human remains are encountered or suspected of being encountered before or during construction, all work would stop immediately. Notification would then be made to the Ontario Provincial Police or local police. 	<ul style="list-style-type: none"> No anticipated significant effects to known archaeological resources during the construction.

¹ Niagara Region Wind Farm – Stage 1 and 2 Archaeological Assessments, Protected Properties Assessment Report and Heritage Assessment Report (Stantec, 2013)

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Environmental Feature	Potential Effect	Performance Objective	Mitigation Strategy	Monitoring Plan and Contingency Measures	Net Effects
Natural Heritage Resources²					
Wetlands	<ul style="list-style-type: none"> Degradation of wetland through changes in water flow, surface water contamination or sedimentation. Wetland desiccation or drying from removal of riparian or buffering vegetation. Contamination through accidental spills. 	<ul style="list-style-type: none"> Prevent contamination through surface flow during construction and spills. Maintain existing surface water flow patterns. Minimize removal of riparian and buffering vegetation. Prevent contamination by sediment and erosion. 	<ul style="list-style-type: none"> No project development within significant wetlands. Boundaries of wetlands within 30m of the proposed construction area will be flagged/staked by a qualified ecologist. Silt barriers will be erected along the edge of all wetland boundaries within 30m of construction areas. All refueling activities or fuel storage will occur greater than 30m from all wetlands. Maintain surface flow patterns to wetlands by installing properly designed and sited culverts under access roads including at swales. Stake limits of vegetation clearing. All disturbed areas will be re-vegetated as soon as possible. Construction contractor to ensure no work occurs outside of the limits of construction envelope. Minimal alteration to surface water drainage patterns and installation of culverts as required to maintain flows. Stockpiling of materials will not occur within 30m of wetland boundary. Stockpiles left for longer than 30 days will be covered or stabilized by seeding, sodding, mulching or equivalent. Horizontal directional drill (HDD) under the wetland boundaries for installation of collector lines. Erosion control devices will be installed at the HDD location and drill cuttings will be collected and removed from the site for disposal in an approved and appropriate manner No clearing of trees in or near any of wetlands that could result in wetland desiccation or drying. 	<ul style="list-style-type: none"> Inspectors will ensure construction vehicles and personnel stay within the construction envelope, thereby limiting the disturbance of wetlands. Inspection of the erosion and sediment controls. Inspection of culvert installations to ensure flow conveyance with no restrictions or ponding. See "Spills" Ensure that seed establishes in areas of disturbance within one growing season (once after seeding and once in late spring the year after seeding). Reseed if seed does not stabilize. Inspect all erosion and sedimentation control measures regularly and after extreme weather events. If siltation of surface water is identified, the source of siltation will be isolated, contained, and controlled and sediment control measures increased as required to prevent additional sedimentation. Stockpile covers to be regularly monitored and if covers are found not to be effectively preventing sediment transport, additional E&S control measures employed as necessary. Disturbance monitoring will be conducted weekly in and adjacent to work areas to visually assess hydrological conditions. Hydrological conditions will be monitored once seasonally in each of spring and summer during the first year of post-construction. 	<ul style="list-style-type: none"> No direct loss of wetland habitat. No anticipated disruption of wetland function.
Areas of Natural and Scientific Interest (ANSI's)	<ul style="list-style-type: none"> No impacts to Life Science ANSIs (St. Ann's Slough Forest) as no components are located in the feature. Potential erosion, alteration, destruction or loss of part of an Earth Science ANSI. 2.43 ha of the Winger Earth Science ANSI will be disrupted by construction. No loss of the feature or loss of function of the feature are expected. 	<ul style="list-style-type: none"> Minimize impacts to the Earth Science ANSI. 	<ul style="list-style-type: none"> No significant grading, cutting or filling will occur within the ANSI. The width of the access road and limits of construction in proximity to the sand dune formations within the Earth Science ANSI will be minimized beyond the typical 20 m constructible area. The limit of construction within the ANSI will be staked or fenced (i.e. silt fence) prior to 	<ul style="list-style-type: none"> A topographic survey of existing elevations within the ANSI will be completed prior to construction activities to document the shape of the sand dunes. The project components within the ANSI will be identified on the topographic plan and provided to the MNR prior to construction: 	<ul style="list-style-type: none"> The significant features for which the Winger Earth Science ANSI has been identified are being protected. While disturbance to existing conditions will occur during

² A more detailed assessment of potential effects, mitigation and monitoring is provided in "Niagara Region Wind Farm – Natural Heritage Assessment / Environmental Impact Study" (Stantec, 2013).

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			<p>construction to assist with the demarcation of the construction area, to ensure construction activities minimize disturbance to the ANSI and to assist with the proper field installation of erosion and sediment control measures.</p> <ul style="list-style-type: none"> Any material excavated during the construction of the turbine will be disposed of off-site, while topsoil removed to accommodate the construction of the access road will be stabilized and stored on-site until the site is restored following completion of construction; Prior to construction of the access road, the existing topsoil will be removed and a layer of geotextile fabric installed beneath the access road to assist in removal of the access roads during decommissioning. Topsoil will be replaced at grade for all access roads and constructible areas No blasting will occur within the ANSI. Standard mitigation measures for vegetation removal, sedimentation and erosion control and dewatering will be applied. 	<ul style="list-style-type: none"> Photographs taken during construction of the access road, buried collector lines, fibre optic lines and temporary construction area associated with Turbine 89 will be submitted to the MNR following construction to illustrate compliance with the proposed mitigation measures and pre-construction survey information. Upon completion of construction, the topographic survey will be used to assist in restoring any disturbed areas to restore existing topography. 	<p>construction, appropriate mitigation measures have been employed to protect existing topography and soil conditions, limit the extent of disturbance within the ANSI boundaries and to avoid the more pronounced sand dune formations on site.</p> <ul style="list-style-type: none"> As a result, the significant features and provincially significant earth science values associated with the Winger Earth Science ANSI would be protected.
Significant Woodlands	<ul style="list-style-type: none"> Potential damage to root zones and limbs during construction or loss of trees to accommodate delivery of project components. Contamination through accidental spills. 	<ul style="list-style-type: none"> Prevent damage to critical root zones and prevent accidental loss of trees or limbs. Minimize accidental spills. 	<ul style="list-style-type: none"> No project development within significant woodlands. Clearly delineate work area using a barrier such as a silt fence to avoid accidental encroachment on the feature that would lead to damage of trees or root zones. Workers will be advised not to trespass beyond the boundary of the marked area. Erect silt fencing to prevent sedimentation within critical root zones. Fencing should be located no closer than the drip-line. Implement standard erosion and control measures. Stockpile materials greater than 30m from woodland edge. Stockpiles left for longer than 30 days will be covered or stabilized by seeding, sodding, mulching or equivalent. Re-vegetate disturbed areas with fast growing native species as soon as construction activity is complete. All maintenance activities, vehicle refueling or washing and chemical storage will be located more than 30m from significant woodlands. See "Spills" 	<ul style="list-style-type: none"> Inspectors will ensure construction vehicles and personnel stay within the construction envelope, thereby limiting the disturbance of woodland vegetation. Inspection of the erosion and sediment controls, including silt fencing regularly and daily during inclement weather. Any build up of sediment beyond the silt fence will be cleaned up and removed to avoid risk of further spread of sediment. Disturbance monitoring of woodlands will be conducted weekly in and adjacent to work areas to visually assess hydrological conditions All covers on stockpiles to be put in place and inspected when inclement weather is anticipated. Any tree limbs or root zones that are accidentally damaged will be pruned using proper arboricultural techniques. Inspection of reseeded areas within one growing season to confirm that seed is growing. Replant areas where seed has not grown. Accidental damage to trees, or unexpected tree removal, may require replanting of similar native species. A Certified Arborist will undertake an evaluation of health of pruned trees 	<ul style="list-style-type: none"> No direct loss of woodlands. Minimal if any anticipated negative impacts to woodlands.

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				<ul style="list-style-type: none"> within one year of pruning. Hydrological conditions will be monitored once seasonally in each of spring and summer during the first year of post-construction. See "Spills" 	
Provincial Parks and Conservation Reserves	<ul style="list-style-type: none"> As no Provincial Parks and Conservation Reserves were identified, there are no anticipated impacts. 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> None
Significant Wildlife and Wildlife Habitat (includes birds, bats, amphibians and other wildlife)	<ul style="list-style-type: none"> Disturbance to species during construction from traffic, noise and dust. Habitat removal (0.33 ha of grassland temporarily removed and 0.18 ha of grassland permanently removed). Degradation of habitat through erosion and sedimentation. Contamination through accidental spills. Shifts in species abundance, avoidance and behavior during construction. Degradation of habitat through changes in water flow, surface water drainage patterns or surface flow contamination. Direct mortality of snakes from construction vehicles. 	<ul style="list-style-type: none"> Avoid and minimize removal of habitat. Prevent contamination. Prevent habitat avoidance and disturbance. Prevent vehicle strikes. Maintain existing surface water flow patterns. 	<ul style="list-style-type: none"> Only scattered trees and grassland habitat are to be removed for the Project. Minimize construction disturbance during sensitive migratory periods (April/May and Sept/Oct). Implement standard vegetation removal measures. Implement standard sedimentation and erosion control measures. Implement a Replanting and Restoration Plan as per NH/VEIS. Construction activities within 120m of any Raptor Wintering Areas will be avoided during Dec, Jan and Feb. No development is permitted within identified significant turtle overwintering habitat, turtle nesting habitat, snake hibernacula and amphibian breeding habitat. Avoid construction within 120m of turtle overwintering habitat and snake hibernacula during sensitive periods for turtles (April/May and Late September to early October). Barrier fencing will be installed around all construction zones within 120m of turtle nesting habitat. Construction works will be made aware of potential occurrence of turtles and will avoid interactions with turtles. If turtles are found within the construction area, the use of standard care protocols for the removal of the species will be used. Silt barriers will be erected along the edge of amphibian breeding habitat. Construction vehicles and personnel will stay within the construction envelope. Horizontal direction drill entry/exit pits will be located at least 30m from any significant natural feature and a frac-out plan will be in place prior to directional drilling. All refueling activities should occur more than 30m from any identified habitats. Install properly designed and sited culverts in water crossings. 	<ul style="list-style-type: none"> Environmental Effects Monitoring Plan outlines disturbance and mortality monitoring requirements and adaptive management plan for birds, bats, wintering raptors and migratory birds. If clearing of vegetation occurs beyond defined limits, the area should be rehabilitated to pre-disturbance conditions. Any build-up of sediment beyond the erosion and sedimentation control points will be cleaned up and removed. See "Spills" Construction Supervisor to regularly visually monitor culvert installations to ensure flow conveyance, with no restrictions or ponding. Should a turtle nest be encountered during construction, a buffer will be established and the nest will be protected from construction activities (i.e. via a wire cage or similar). The nest will be monitored until the nest is no longer active. Silt barriers will be monitored, especially after a rain event and until vegetation has become re-established. Water levels within significant amphibian habitat will be monitored during active dewatering to ensure there are no decreases or temporary loss of habitat. 	<ul style="list-style-type: none"> No significant effects are anticipated. No loss of habitat or alteration of groundwater or surface water flow is anticipated from the Project. No fragmentation of habitat is anticipated.

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			<ul style="list-style-type: none"> Any vegetation clearing to occur outside breeding bird window, if possible, otherwise a bird nest survey to be completed immediately prior to vegetation clearing. See "Wetlands", "Woodlands" and "Spills". 		
Other Wildlife and Wildlife Habitat	<ul style="list-style-type: none"> Degradation of habitat through erosion and sedimentation. Contamination through accidental spills. Shifts in species abundance, avoidance and behavior during construction. Degradation of habitat through changes in water flow, surface water drainage patterns or surface flow contamination. 	<ul style="list-style-type: none"> Avoid and minimize removal of habitat. Prevent contamination. Prevent habitat avoidance and disturbance. Prevent vehicle strikes. Maintain existing surface water flow patterns. 	<ul style="list-style-type: none"> All new access road in previously cleared agricultural lands. Minimal alteration to surface water drainage patterns and installation of culverts as required to maintain flows. Restriction of construction activities primarily to daytime hours when breeding amphibian movement is less likely. Vehicle speeds should be restricted to 30 km/h or less on access roads. Any vegetation clearing to occur outside breeding bird window, if possible, otherwise a bird nest survey to be completed immediately prior to vegetation clearing. 	<ul style="list-style-type: none"> See 'Local Traffic'. See 'Environmental Noise'. 	<ul style="list-style-type: none"> No significant net effects are anticipated.
Significant Flora and Vegetation Communities	<ul style="list-style-type: none"> Degradation of habitat through erosion and sedimentation. Accidental damage to vegetation. Contamination through accidental spills. Changes in soil moisture and compaction. 	<ul style="list-style-type: none"> Prevent contamination from erosion, sedimentation or accidental spills. Prevent accidental damage to vegetation. 	<ul style="list-style-type: none"> No development will occur within rare vegetation communities. Construction vehicles and personnel will stay within the construction envelope. Refueling activities will occur far from woodland features. See "Spills". Tree pruning will be minimized to the greatest extent possible and any tree limbs or roots that are accidentally damaged will be pruned using proper arboricultural techniques. Accidental damage to trees, or unexpected vegetation removal, may require replanting of similar native species. Pruning will be avoided during leaf fall (approx. September to November). As appropriate, the limits of tree pruning will be marked in the field prior to construction. Horizontal direction drill entry/exit pits will be located at least 30m from any significant natural feature and a frac-out plan will be in place prior to directional drilling. Clearly delineate the work area using silt fencing to avoid accidental damage to vegetation. Implement standard erosion and control measures (see "Wetland", "Woodland" and "Surface Water, Fish and Fish Habitat"). Stockpile material greater than 30 m from the edge of rare vegetation communities or, where not possible, cover the piles when not in use. 	<ul style="list-style-type: none"> See "Spills" Daily monitoring of erosion and sedimentation control measures during when inclement weather is anticipated. All covers on stockpiles to be put in place and checked when inclement weather is anticipated. Inspection of reseeded areas within one growing season to confirm that seed is growing. Replant areas where seed has not grown. Any tree limbs or root zones that are accidentally damaged by construction activities will be pruned using proper arboricultural techniques. A Certified Arborist will undertake an evaluation of the health of the pruned trees within one year after pruning. Trees that die or are in poor health as a result of tree pruning will be replaced and the survivability of the trees monitored for a minimum of one year after planting. 	<ul style="list-style-type: none"> No significant net effects are anticipated.

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			<ul style="list-style-type: none"> Stockpiles left for longer than 30 days will be covered or stabilized by seeding, sodding, mulching or equivalent. Re-vegetate disturbed areas with fast growing native species as soon as construction activity within the disturbed area is complete. Any vegetation clearing to occur outside migratory breeding bird window (May 1 to July 31), to the extent practical, otherwise a bird nest survey to be completed immediately prior to vegetation clearing. If a nest is located, a designated buffer will be marked off within which no construction activity will be allowed while the nest is active. 		
Other Flora and Vegetation Communities	<ul style="list-style-type: none"> Indirect effect from dust emissions. 	<ul style="list-style-type: none"> Minimize dust emissions. 	<ul style="list-style-type: none"> See "Dust and Odour Emissions" 	<ul style="list-style-type: none"> See "Dust and Odour Emissions" 	<ul style="list-style-type: none"> No net effects are anticipated.
Water Bodies and Aquatic Resources					
Groundwater	<ul style="list-style-type: none"> Encounter groundwater during excavations. Potential groundwater seepage. Potential for accidental spills infiltrating groundwater supplies. Based on MOE water well data, there are 24 domestic and livestock water wells within 500m of a turbine. The closest well is approximately 92 m (from T01) (See Figure 2.1 to 2.58). Based on MOE water well data, there are 56 domestic and livestock water wells within 120m of the preferred transmission line route at both underground and overhead sections. The closest well is approximately 9m from the preferred transmission line route (see Figure 2.1 to 2.58). 	<ul style="list-style-type: none"> No impacts to private residential wells. No effects on groundwater quality. 	<ul style="list-style-type: none"> Site-specific geotechnical investigations will be completed prior to construction. Seepage is anticipated to be nominal and controllable with standard sump pumps. Any water pumped from excavated areas will be directed away from natural features, including wetlands. Withdrawal amounts are anticipated to be below the threshold of 50,000 L/day. If groundwater is encountered during excavations, good construction practices will be used such as minimizing the length of time that the excavation is open and monitoring seepage into the excavation. Discharge piping will be free of leaks and will be properly anchored. The area to be used for dewatering will be clearly marked with flagging, snow fencing or equivalent. 	<ul style="list-style-type: none"> Adherence to Complaint Response Protocol. All dewatering sediment control structures will be inspected immediately prior to and following commencement of pumping activities. NRWC will undertake a pre- and post-groundwater monitoring program at any residential well within 120m of a buried transmission line and any residential well of a home within 500m of a wind turbine (with landowner permission). Additional monitoring may be required if complaints are received from surrounding landowners regarding water well quality during construction. In the event of a well interference complaint, NRWC will: <ul style="list-style-type: none"> resample groundwater quality and document groundwater levels at monitoring well; collect a water quality sample from private well(s), as applicable; and Retain a third party consultant to review available data and determine if adverse effects have occurred as a result of construction activity. If Private water quality or quantity is disturbed as result of construction, NRWC will provide a temporary potable water supply until corrective measures are taken and will comply with MOE Guideline B-9: Resolution of Groundwater Interference Problems. 	<ul style="list-style-type: none"> It is anticipated any potential effects would be short term in nature and have little to no effect on groundwater quality and adjacent private water wells.

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Surface Water, Fish, and Fish Habitat ³	<p>General construction-related potential impacts:</p> <ul style="list-style-type: none"> Short-term increase in turbidity from run-off and soil erosion. Loss of shade. Reduced bank stability. Reduced allochthonous inputs. Water quality and habitat disturbance to aquatic habitat. <p>Culvert and access road potential construction-related impacts:</p> <ul style="list-style-type: none"> Disturbance to aquatic biota and habitat during installation. Permanent enclosure of portions of a watercourse. Changes to riparian vegetation within road allowance. Barrier to fish passage to upstream. Erosion at inlets and outlets. Overhead lines potential construction-related impacts: Loss of riparian vegetation and resulting increased turbidity Removal of shade, cover and food production. <p>Underground collector lines potential construction-related impacts:</p> <ul style="list-style-type: none"> Erosion and sedimentation from site disturbance and dewatering. Collapse of the punch or bore hole under the stream. Disturbing riparian vegetation and reducing shoreline cover, shade and food production areas. Disturbance to bottom of bank substrates, sensitive fish stages and introduction of deleterious substances. Transformer substation construction-related potential impacts: Soil erosion resulting from removal of stabilizing vegetation cover which can cause sediment transport, increase in turbidity. Release of fuel, lubricating oils and other fluids associated with electrical equipment. 	<ul style="list-style-type: none"> No impediment. No spills. No erosion, sediment transport or surface water turbidity. Vegetation removal on the slopes of watercourses to be minimized to the extent possible. Minimize the risk of slope failure and siltation. Minimize impacts to fish and fish habitat. Minimize amount of in-water work. 	<ul style="list-style-type: none"> No wind turbines have been located within 30 m of the average annual high water mark of a lake or a permanent or intermittent watercourse All in-water work would be completed within MNR timing windows. All materials and equipment used shall be operated and stored in a manner that prevents any deleterious substance (e.g., petroleum products, silt, etc.) from entering the water: Any stockpiled materials should be stored and stabilized away from the water; Stockpiles left for longer than 30 days will be covered or stabilized by seeding, sodding, mulching or equivalent; Refuelling and maintenance of construction equipment should occur a minimum of 100 m from a water body; As appropriate, spills should be reported to the MOE Spills Action Centre; Any part of equipment entering the water should be free of fluid leaks and externally cleaned/degreased to prevent any deleterious substance from entering the water; Only clean material, free of fine particulate matter should be placed in the water. Sediment and erosion control measures should be implemented prior to construction and maintained during the construction phase to prevent entry of sediment into the water: Silt fencing and/or barriers should be used along all construction areas adjacent to natural areas; No equipment should be permitted to enter any natural areas beyond the silt fencing during construction; No more than 50,000 L/day will be extracted from surface water resources. See 'Spills'. 	<ul style="list-style-type: none"> All sediment and erosion control measures should be inspected at least weekly and during and immediately following rainfall events to ensure that they are functioning properly and are maintained. If the sediment and erosion control measures are not functioning properly, no further work should occur until the sediment and/or erosion problem is addressed; Sediment and erosion control measures should be left in place until all areas of the construction site have been stabilized. Develop a response plan that is to be implemented immediately in the event of a sediment release or spill of a deleterious substance. The Construction Contractor will: Perform routine checks of all erosion and sediment control measures Monitor flow conveyance during in-water works where culvert replacements are required Visually inspect access/exit pits and directional drill line for frac-outs Inspect drilling equipment and materials for spills/leaks Ensure that bank, bed and floodplain conditions are restored to pre-construction conditions after construction. Additional monitoring requirements as may be identified in Conservation Authority permits. Compensation strategies and/or permits from Fisheries and Oceans Canada and/or conservation authorities, as applicable, would likely include conditions of approval such as construction and post-construction monitoring. 	<ul style="list-style-type: none"> Effects to surface water and water bodies would be both spatially and temporally limited. No significant negative construction effects are anticipated to surface water, water bodies and fish and fish habitat.

³ A more detailed assessment of potential effects, mitigation and monitoring is provided in "Niagara Region Wind Farm – Water Assessment and Water Body Report" (Stantec, 2013).

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Air Quality and Environmental Noise					
Dust & Odour Emissions	<ul style="list-style-type: none"> Emissions from construction equipment. Short-term nuisance dust effects 	<ul style="list-style-type: none"> Minimize duration and magnitude of emissions. 	<ul style="list-style-type: none"> Operate vehicles in a manner that reduces air emissions to the extent practical, including: <ul style="list-style-type: none"> Using multi-passenger vehicles as possible; and Avoid idling vehicles. Equipment and vehicles would be maintained in a manner that reduces air emissions. Protect stockpiles of friable material with a barrier or windscreen and in the event of dry conditions and excessive dust. Dust suppression (e.g. water). 	<ul style="list-style-type: none"> Adherence to Complaint Response Protocol. All vehicles identified through the monitoring program that fail to meet the minimum emission standards would be repaired immediately or replaced as soon as practical. 	<ul style="list-style-type: none"> Any net effects are expected to be short-term in duration and highly localized.
Environmental Noise	<ul style="list-style-type: none"> There are 2,667 receptors within 1.5 km of any turbine. Noise emitted from construction equipment. 	<ul style="list-style-type: none"> Minimize noise emissions to a reasonable extent Noise levels arising from equipment to be compliant with sound levels established by the MOE and County/Township guidelines (if applicable). 	<ul style="list-style-type: none"> All engines associated with maintenance equipment would be equipped with mufflers and/or silencers in accordance with MOE and/or MTO guidelines and regulations. Routine maintenance to ensure equipment is operating properly and efficiently. To the greatest extent possible, activities that could create excessive noise would be restricted to normal construction hours, when residents are less sensitive to noise, and adhere to any local noise by-laws. 	<ul style="list-style-type: none"> Adherence to Complaint Response Protocol. If construction activities that cause excessive noise must be completed outside of normal time frames, adjacent residents will be notified in advance and by-law conformity will occur, as required. 	<ul style="list-style-type: none"> Any net effects are expected to be limited to short-term, intermittent noise increases during daylight hours at the work areas and/or along the haul routes.
Land Use and Socio-Economic Resources					
Agricultural Lands	<ul style="list-style-type: none"> Change in use from agricultural to renewable energy development on lands used during construction. Adverse effects to artificial drainage. Soil erosion or crop loss on adjacent lands due to flooding as a result of temporary or permanent disruption to water flow. Encounter and disruption of contaminated soils. 	<ul style="list-style-type: none"> Minimize disturbance to agricultural lands and operations. Minimize land required for the Project. Avoid impacting artificial tile drains. Minimize disturbance to drainage patterns. Properly manage contaminated soils if encountered. 	<ul style="list-style-type: none"> Landowners are being financially compensated for the lease of the private lands and thus offset the effect of removing the land from agricultural production. Efforts have been made to site the turbines, access roads and collector lines in such a way as to minimize disturbances to existing agricultural lands and operations. The location of artificial tile drainage and associated drains would be confirmed with each landowner on a site-specific basis prior to construction activities. Should tile drains be damaged, locations should be recorded and flagged and repaired. If a main drain, header tile, or large diameter tile is severed, a temporary repair should be made to maintain field drainage and prevent flooding of the work area and adjacent lands. If contaminated soil is encountered, the contaminated material will be disposed of in accordance with the current appropriate provincial legislation, such as Ontario Regulation 347, the General – Waste Management Regulation. 	<ul style="list-style-type: none"> Following the completion of construction, as appropriate, temporary workspaces would be graded and de-compacted (if required), the topsoil replaced, and the area left as close to pre-existing condition as possible.. An agricultural tile drainage contractor would carry out any re-alignment works as well as repair tiles and/or drains that may experience construction related damage. 	<ul style="list-style-type: none"> No anticipated significant net effects. Any net effects are expected to be short-term until mitigation and corrective actions are completed. The Project provides positive income to participating landowners through land lease agreements for agricultural lands.
Mineral, Aggregate, and Petroleum Resources	<ul style="list-style-type: none"> Impacts to petroleum resources operations. 	<ul style="list-style-type: none"> Project construction does not require the 	<ul style="list-style-type: none"> The source of the required aggregate will be determined prior to construction, however it 	<ul style="list-style-type: none"> An Engineer's Report will be prepared for all petroleum resources operations 	<ul style="list-style-type: none"> No anticipated significant net

Potential Environmental Effects and the Environmental Effects Monitoring Plan during Construction					
Environmental Feature	Potential Effect	Performance Objective	Mitigation Strategy	Monitoring Plan and Contingency Measures	Net Effects
	<ul style="list-style-type: none"> The transmission line crosses three different pipelines owned by Enbridge and TransCanada. Collector lines and fibre optic lines cross three different pipelines. Nearest transmission pipeline to a turbine is 654m. 	<ul style="list-style-type: none"> creation of a new pit or quarry to provide the required aggregate materials for construction. No impacts to petroleum resources operations. 	<ul style="list-style-type: none"> is planned that local sources will be used to the greatest extent possible. On-site surveying will take place prior to construction to identify petroleum resources operations within 75 m of the Project Location. MNR will be consulted through the Approvals and Permitting Requirements Document (APRD) to confirm if any permits are required relating to petroleum resources. Locate all pipelines prior to construction. Consult with Enbridge and TransCanada prior to construction of transmission line and collector line at pipeline crossings. 	<ul style="list-style-type: none"> within 75 m of the Project Location. The purpose of the Engineer's Report will be to demonstrate that there are no effects to the petroleum resources operations as a result of the construction of the Project. If a potential effect to the petroleum resources operations is identified, construction methods may be altered (staying within the Project Location) to minimize or eliminate any potential effects. 	<ul style="list-style-type: none"> effects. Project will not require the creation of a new pit or quarry to provide the required aggregate materials and as such a licence of permit under the <i>Aggregate Resources Act</i> will not be sought for the Project.
Game And Fishery Resources	<ul style="list-style-type: none"> Disturbance to game species from construction activities. Limiting access to lands for hunting and fishing. Individuals who previously used the lands for hunting and fishing purposes are likely to relocate to a new area during construction. 	<ul style="list-style-type: none"> Minimize disturbance to game and fishery resources. Minimize length of time that lands are inaccessible. 	<ul style="list-style-type: none"> Routine maintenance to ensure equipment is operating properly and efficiently, thus limiting noise and potential disturbance to game resources. Hunting and other recreational uses will not be permitted on lands required during construction (unless permitted by NRWC and/or the construction contractor) as it would be unsafe due to the large construction equipment on-site. 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> The net effect of limiting access to land due to safety concerns and potential disturbance to game resources will be temporary.
Areas Protected Under Provincial Plans and Policies	<ul style="list-style-type: none"> No project components within the Oak Ridges Moraine Conservation Plan or the Lake Simcoe watershed. 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A
	<ul style="list-style-type: none"> A portion of the transmission line is located within existing road rights-of-way within the Protected Countryside of the Greenbelt Area Plan Long term tree trimming and vegetation removal adjacent to the transmission line for lifetime of the project. 	<ul style="list-style-type: none"> Avoid and/or minimize negative impacts to key natural heritage features and key hydrologic features. Optimize coordination with different infrastructure services. 	<ul style="list-style-type: none"> Transmission line is located outside of all natural features and habitats. Design the transmission line with monopole structures, minimize pole structure height and maximize pole structure spacing. Follow existing municipal road right of way to avoid cross-country routes and minimize disturbance to natural features. Route alignment through Greenbelt Area minimizes length traversed by the transmission line. 	<ul style="list-style-type: none"> See 'Natural Heritage Resources' 	<ul style="list-style-type: none"> No anticipated significant net effects.
	<ul style="list-style-type: none"> A portion of the transmission line is located within the Niagara Escarpment Plan Area within existing road rights-of-way. Underground transmission line construction has potential to: <ul style="list-style-type: none"> Impact contours or create steep grades. Negatively impact water quality from erosion and sedimentation. Some tree and vegetation removal during construction and site clearing. Negatively impact quality or quantity of top 	<ul style="list-style-type: none"> Minimize impacts on natural heritage features. Minimize visual impacts. Ensure no impacts to contours or creation of steep grades. Minimize impacts to water quality. Minimize vegetation 	<ul style="list-style-type: none"> Compliance with Development Permit (N/S/2012-2013/191) obtained from the NEC prior to REA submission to the MOE. Transmission line is located outside of all natural features and habitats. Follow existing municipal road right of way to avoid cross-country routes and minimize disturbance to natural features The transmission line within the Niagara Escarpment Plan Area will be installed underground within an existing right of way. 	<ul style="list-style-type: none"> Adherence to Complaints Monitoring Protocol. Continued consultation with the Niagara Escarpment Commission and neighbouring landowners. Pre- and post-construction monitoring of the water quality and availability in existing residential wells within 120 m of the proposed transmission line will be completed (where access is permitted by landowners) 	<ul style="list-style-type: none"> No anticipated significant net effects.

Potential Environmental Effects and the Environmental Effects Monitoring Plan during Construction					
Environmental Feature	Potential Effect	Performance Objective	Mitigation Strategy	Monitoring Plan and Contingency Measures	Net Effects
	<ul style="list-style-type: none"> soils. o Disturb wildlife. o Disruption to public enjoyment of the Mountainview Conservation Area and Bruce Trail. o Temporary lane closures and traffic slowdowns during construction. o Dust generation and noise emissions during construction. 	<ul style="list-style-type: none"> removal. • Minimize disturbance to wildlife. • Minimize disruption to recreational areas. • Minimize dust generation. 	<ul style="list-style-type: none"> • The transmission line trench will be located within the travelled portion of Mountainview Road, or as close as possible to the pavement or roadside to minimize vegetation removal. • No blasting during installation will ensure grades are maintained. • Erosion and sedimentation controls to be installed and maintained during construction and disturbed areas to be stabilized and revegetated immediately after construction. • Design transmission line to minimize tree and vegetation removal (avoid new crossings through woodlands and maintain line entirely within the road right of way). • Tree trimming will be undertaken at the direction of a qualified arborist, using tree-cutting methods that minimize environmental impacts, protects tree health and minimizes disruption to plant and animal species. • Construction timing planned to minimize impact on local wineries. • See 'Other Wildlife and Wildlife Habitat'. • See 'Natural Heritage Features'. • See 'Dust & Odour Emissions'. • See 'Surface Water, Fish and Fish Habitat'. • See 'Other Flora and Vegetation Communities'. • See 'Agricultural Lands'. • See 'Recreation Areas and Features'. • See 'Local Traffic'. • See 'Spills'. 	<ul style="list-style-type: none"> • See 'Groundwater'. • See 'Other Wildlife and Wildlife Habitat'. • See 'Natural Heritage Features'. • See 'Dust & Odour Emissions'. • See 'Surface Water, Fish and Fish Habitat'. • See 'Other Flora and Vegetation Communities'. • See 'Agricultural Lands'. • See 'Recreation Areas and Features'. • See 'Local Traffic'. 	
Recreation Areas and Features	<ul style="list-style-type: none"> • Land within 120 m of the Project Location is used for recreation purposes such as hunting, fishing, hiking and off-roading including the Mountainview Conservation Area, Wainfleet Rail Trail (Gord Harry Trail) and Bruce Trail. Consultation with the NPCA confirmed that the portion of the Wainfleet Rail Trail which is proposed to host access roads is not currently maintained as part of the active trail, but that future expansion of the trail is possible. • Potential disruption to visitors to the Mountainview Conservation Area. • Construction works along the Wainfleet Rail Trail will require temporary closure of the west end of the trail from Elgin Road to Townline Road due to the presence of construction equipment, vehicles and disturbed land. Potential impacts to the trail east of Elgin Road are disturbance from dust and noise. • Disruption to Bruce Trail access points due to visual and physical obstacles. 	<ul style="list-style-type: none"> • Minimize impacts to access and enjoyment of Bruce Trail, Wainfleet Rail Trail and Mountainview Conservation Area. 	<ul style="list-style-type: none"> • Notify the Bruce Trail Conservancy in advance of any construction within 300 m of the Bruce Trail. • Notify the Niagara Peninsula Conservation Authority in advance of any construction within 300 m of the Mountainview Conservation Area and Wainfleet Rail Trail. • Ensure that access to the Bruce Trail is not obstructed by construction equipment or works, where possible – in extreme cases, provide signage for hikers to access the trail via safe alternate route. • Coordinate with NPCA to identify preferred dates/times for Wainfleet Rail Trail closure. • Minimize time of Wainfleet Rail Trail closure by focusing construction resources within the area and completing all works before moving resources to the next site. • Ensure that walking and car entry into the Mountainview Conservation Area is not 	<ul style="list-style-type: none"> • Follow-up with Bruce Trail Conservancy and Niagara Peninsula Conservation Authority of any project changes, schedule changes and recommendations for minimizing impacts. 	<ul style="list-style-type: none"> • Net effects are short term and spatially limited.

Potential Environmental Effects and the Environmental Effects Monitoring Plan during Construction					
Environmental Feature	Potential Effect	Performance Objective	Mitigation Strategy	Monitoring Plan and Contingency Measures	Net Effects
			<p>obstructed by any construction equipment or works. Provide traffic control guidance so access is never limited.</p> <ul style="list-style-type: none"> See "Dust & Odour Emissions" and "Environmental Noise" 		
Local Traffic	<ul style="list-style-type: none"> Increase in traffic. Temporary road/lane closures. 	<ul style="list-style-type: none"> Minimize disturbance to local traffic. 	<ul style="list-style-type: none"> There may be instances where excess loads (e.g. turbine components) will require special traffic planning. Construction Contractor will implement a Transportation and Traffic Management Plan. Understanding local school bus routes and timing to avoid traffic congestion. 	<ul style="list-style-type: none"> Permits will be obtained from the County/Township and/or MTO to implement road work activities once final transportation routes and requirements have been finalized. Community Liaison Committee will have ability to comment on the Transportation and Traffic Management Plan. 	<ul style="list-style-type: none"> A limited, short term effect on local traffic, but will be managed through the implementation of a Transportation and Traffic Management Plan.
Local Economy	<ul style="list-style-type: none"> Increase in direct, indirect and induced employment. Local economic benefits from land lease payments, local expenditures, municipal taxes, etc. Disruptions to local businesses. 	<ul style="list-style-type: none"> Create positive effects on local economy. Minimize disruptions to local businesses. 	<ul style="list-style-type: none"> To the extent possible, NRWC would source required goods and services from qualified local suppliers. ENERCON has announced that it will build two new manufacturing facilities in the region to support the Project including a tower manufacturing facility and a converter and control panel manufacturing facility. One facility is already operational. NRWC will be contributing over \$20million to local communities through community vibrancy funds. Disruptions in the vicinity of local businesses would be largely due to an increase in traffic, and would be short term and are not expected to affect use of these businesses. 	<ul style="list-style-type: none"> None required. 	<ul style="list-style-type: none"> A positive net effect is anticipated on the local economy during construction of the Project. The new ENERCON Facilities are expected to create over 50 new jobs. Community vibrancy fund will support local projects and will be managed by local citizens. Construction and planning phases of the Project are expected to create 770 jobs annually over the four years of development and construction. A Niagara Community employment and contractors seminar is being discussed for Spring 2013. NRWC has engaged several Aboriginal communities to identify employment opportunities.

Potential Environmental Effects and the Environmental Effects Monitoring Plan during Construction					
Environmental Feature	Potential Effect	Performance Objective	Mitigation Strategy	Monitoring Plan and Contingency Measures	Net Effects
Viewscape	<ul style="list-style-type: none"> Viewscape from areas surrounding the Project Location will be altered due to the presence of construction equipment and personnel along with changes to the physical landscape. 	<ul style="list-style-type: none"> Minimize potential for visual disturbance. 	<ul style="list-style-type: none"> Minimal mitigation measures are available to address concerns related to visual changes to the area during the construction of the Project. 	<ul style="list-style-type: none"> Adherence to Complaint Response Protocol. 	<ul style="list-style-type: none"> Will be a net effect (either positive or negative based on perceptions) due to the change in viewscape of the surrounding area.
Existing Infrastructure					
Provincial, municipal, and other major infrastructure	<ul style="list-style-type: none"> The proposed transmission line crosses several HONI transmission line corridors and will be installed either underground or overhead as determined during detailed design. Transmission line and collector line infrastructure cross three railways (CP and CN owned) and will be installed either underground or overhead as determined through detailed design. Abnormal wear and/or road upgrades on local roads. Damage to municipal drains. Temporary impacts to existing utilities. 	<ul style="list-style-type: none"> Minimize impacts to local roads. Minimize impacts to municipal drains. Minimize disruptions/impacts to other existing utilities. 	<ul style="list-style-type: none"> Consultation with MTO regarding any necessary agreements related to use of roads for transportation of Project materials in addition to obtaining the required permits for use of provincial highways. Detailed plans or agreements regarding maintenance and/or repairs of the local roads and road rights-of-way damaged during construction will be developed with the County/Township. Agreements would be developed for use of the municipal road allowance for routing of the collector lines. Where there are existing distribution lines within the municipal road allowance, NRWC will work with the Local Distribution Company to develop shared pole user agreements (if reasonable to do so). Drains superintendents from the County/Township will be requested to attend site visits and be part of the discussions with the Conservation Authorities during the <i>Fisheries Act</i> permitting process for the Project. Locate all utilities within municipal road allowances prior to construction Pre and post construction photos will be completed prior to any works starting. Consultation with HONI during construction of transmission line crossings. Consultation with CP Rail and CN Rail during construction of transmission line and collector line crossings. 	<ul style="list-style-type: none"> Pre and post construction road surveys will be conducted and NRWC will be responsible for any required upgrades/repairs directly associated with Project construction as per agreements with the Township/County. Local roads would be restored to their pre-construction conditions to the satisfaction of local authorities as applicable to the agreements with County/Township. Some municipal roads requiring structural enhancement/upgrades may be left in their upgraded form if requested. Permits and approvals will be obtained from the County/Township and/or MTO to implement road work activities once final transportation routes and requirements have been finalized. Approvals will be obtained from HONI, CN Rail and CP Rail for installation of transmission line and collector line crossings. In the event that utilities within municipal road allowances are damaged as a result of the construction of the Project, NRWC would rectify damages. Affected roadside ditches and drains would be repaired if required and monitored to ensure that they are functioning properly. 	<ul style="list-style-type: none"> Abnormal wear on local roads may be unavoidable. However, the effect of constructing the various Project components is anticipated to have a limited, short term effect on local roads given NRWC's commitment to developing maintenance and/or repair plans or agreements with the County/Township. No effects on railway or HONI transmission lines are expected.
Navigable Waters	<ul style="list-style-type: none"> Temporary barrier due to crossings. 	<ul style="list-style-type: none"> Avoid navigable waterways. Minimize length of disturbance to navigable waterways. 	<ul style="list-style-type: none"> Confirmation of the presence of these waters will be obtained from Transport Canada and permits (if required) will be obtained prior to construction. 	<ul style="list-style-type: none"> To be identified as part of any permits (if required). 	<ul style="list-style-type: none"> None
Telecommunication and Radar Systems	<ul style="list-style-type: none"> Potential to interfere with telecommunication and radar systems 	<ul style="list-style-type: none"> Minimize interference with telecommunication and radar systems 	<ul style="list-style-type: none"> NRWC has consulted with relevant agencies and licensed providers to identify any likely effects to telecommunication and radar systems. In the unlikely event that signal disruption is 	<ul style="list-style-type: none"> Adherence to Complaint Response Protocol. NRWC would review potential incidents of telecommunications interference on a case by case basis. 	<ul style="list-style-type: none"> No anticipated significant effects to telecommunication / radar systems.

Potential Environmental Effects and the Environmental Effects Monitoring Plan during Construction					
Environmental Feature	Potential Effect	Performance Objective	Mitigation Strategy	Monitoring Plan and Contingency Measures	Net Effects
			experienced, NRWC will meet with owner of system to discuss potential options for mitigation.	•	
Aeronautical Systems	<ul style="list-style-type: none"> Aeronautical obstruction. 	<ul style="list-style-type: none"> Minimize potential hazard to low flying aircraft. 	<ul style="list-style-type: none"> Once the turbines are erected (and prior to operation), turbine lighting will conform to Transport Canada standards. Nav Canada would be responsible for updating all aeronautical charts with the turbine locations. Nav Canada will be informed of the start date for construction. 	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> No anticipated significant effects to aeronautical systems.
Public Health and Safety					
Public Health and Safety	<ul style="list-style-type: none"> Potential traffic safety hazards. Accidents and malfunctions. 	<ul style="list-style-type: none"> Minimize traffic safety hazards. Minimize potential for accidents or malfunctions. 	<ul style="list-style-type: none"> As appropriate, for public safety all non-conventional loads would have front and rear escort or "pilot" vehicles accompany the truck movement on public roads. May provide notification of non-conventional load movements. Implementation of a Transportation and Traffic Management Plan and a detailed Health and Safety/Emergency Response Plan. The Construction Contractor to employ good site safety practices. 	<ul style="list-style-type: none"> Design and approval of the Emergency Response Plan with local emergency services personnel. If required, NRWC would participate in a training session for these workers. 	<ul style="list-style-type: none"> With adherence to safety policies and procedures, there is minimal increased or new risk to public health and safety.
Waste Management and Contaminated Lands					
Waste Generation	<ul style="list-style-type: none"> Improper disposal of waste material may result in contamination to soil, groundwater, and/or surface water resources on and off the Project sites. Litter may become a nuisance to nearby residences if not appropriately contained and allowed to blow off the site. 	<ul style="list-style-type: none"> Ensure proper disposal of waste. 	<ul style="list-style-type: none"> Implementation of a site-specific waste collection and disposal management plan, which may include good site practices such as: <ul style="list-style-type: none"> Contractors will be required to remove all waste materials from the Project sites after construction; All waste materials and recycling would be transported off-site by private waste material collection contractors licensed with a Certificate of Approval – Waste Management System; and, Labeling and proper storage of liquid waste. As appropriate, spill kits will be provided on-site. Dumping or burying wastes within the Project sites will be prohibited. Disposal of non-hazardous waste at a registered waste disposal site(s). Implementation of an on-going waste management program consisting of reduction, reuse, and recycling of materials. See 'Spills' 	<ul style="list-style-type: none"> See 'Spills'. 	No anticipated significant effects.
Spills	<ul style="list-style-type: none"> Potential contamination from accidental spills. 	<ul style="list-style-type: none"> No spills. 	<ul style="list-style-type: none"> Refueling, equipment maintenance, and 	<ul style="list-style-type: none"> Monitoring would be required following 	No anticipated significant

Potential Environmental Effects and the Environmental Effects Monitoring Plan during Construction

Environmental Feature	Potential Effect	Performance Objective	Mitigation Strategy	Monitoring Plan and Contingency Measures	Net Effects
		<ul style="list-style-type: none"> Minimize impacts from accidental spills. 	<p>other potentially contaminating activities would occur in designated areas.</p> <ul style="list-style-type: none"> Spills will be reported immediately to the MOE Spills Action Centre, as applicable. Development of Emergency Response Plan. Construction Contractor will develop a Frac-Out Response Plan which outlines required actions in the case of inadvertent return of drilling lubricant (i.e., a "frac-out") during directional drilling. 	<p>the unlikely event of contamination from an accidental spill or leak (method for monitoring may be developed in consultation with the Spills Action Centre of the MOE).</p> <ul style="list-style-type: none"> Contaminated soils would be removed and replaced as appropriate. Emergency Response Plan will address procedures for response to spills including containment and clean-up materials and their storage locations. Internal audits will be completed to confirm compliance with Monitoring and Emergency Response Plans. 	<p>effects.</p>

Summary of the Potential Environmental Effects and the Environmental Effects Monitoring Plan during Operation					
Environmental Feature	Potential Effect	Performance Objective	Mitigation Strategy	Monitoring Plan and Contingency Measures	Net Effects
Heritage and Archaeological Resources					
Protected Properties	<ul style="list-style-type: none"> Although 12 protected properties were identified in the Protected Properties Assessment no direct or indirect operation-related impacts were identified. 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A. 	No net effects.
Heritage Resources	<ul style="list-style-type: none"> Although 119 cultural heritage resources were identified in the Project Study Area in the Heritage Impact Assessment, no direct operation-related impacts were identified. The assessment identified four heritage resources, the Elcho United Church Cemetery, Mount Carmel Cemetery, Mount Carmel United Brethren Church and West Lincoln McCaffrey Cemetery, which have potential for operation-related indirect effects from visual impacts. 	<ul style="list-style-type: none"> Minimize visual impacts 	<ul style="list-style-type: none"> Work directly with Elcho Cemetery Board to design and install an appropriate visual barrier around the cemetery to protect views. Install transmission line poles on east side of Port Davidson Road (opposite side of road from the West Lincoln McCaffrey Cemetery). Work directly with the municipality and cemetery board to design and erect appropriate visual barrier (i.e., tree plantings, fencing) on the northern, western and southern boundaries of the Mount Carmel cemetery. Junction box at the intersection of Hutchinson Road and Highway 3 should be located at the northwest corner of the intersection away from Mount Carmel United Brethren Church. 	<ul style="list-style-type: none"> N/A 	Minimal indirect visual impacts anticipated.
Archaeological Resources	<ul style="list-style-type: none"> There are no areas that would be excavated during the operation phase that would not have been previously assessed prior to construction; therefore no effects are anticipated to archaeological resources during operation. 	<ul style="list-style-type: none"> None required. 	<ul style="list-style-type: none"> In the event that archaeological resources are encountered during operations, all work within the vicinity of an archaeological find will be suspended; <ul style="list-style-type: none"> the Ministry of Tourism, Culture and Sport archaeologist would be contacted; and Aboriginal communities would be contacted. 	<ul style="list-style-type: none"> In the event that human remains are encountered or suspected of being encountered before or during construction, all work would stop immediately. Notification would then be made to the Ontario Provincial Police or local police. 	<ul style="list-style-type: none"> No net effects to archaeological resources during operations are anticipated.
Natural Heritage Resources					
Wetlands	<ul style="list-style-type: none"> Contamination through accidental spills. 	<ul style="list-style-type: none"> No spills. 	<ul style="list-style-type: none"> See 'Spills'. All maintenance activities, vehicle refueling or washing and chemical storage will be conducted at the operations and maintenance facility (off site) or, if necessary, located more than 30m from wetlands. 	<ul style="list-style-type: none"> Hydrological conditions will be monitored once in the spring and once in the summer during the first year of post-construction. 	None.
Areas of Natural and Scientific Interest (ANSI's)	<ul style="list-style-type: none"> No potential effects to Life Science ANSI (St. Ann's Slough Forest) as no components are located in the feature. No operation-related potential effects to the Winger Earth Science ANSI which hosts project components. Contamination through accidental spills. 	<ul style="list-style-type: none"> No spills. 	<ul style="list-style-type: none"> See 'Spills'. See 'Woodlands'. 	<ul style="list-style-type: none"> N/A 	None.
Valleylands and Hazard Lands	<ul style="list-style-type: none"> The Project Location encounters one valleyland, the Welland River. Collector lines and transmission lines are proposed to cross the Welland River. The option of overhead lines or underground lines will be confirmed during detailed design but both options have been assessed for potential impacts. Potential impacts to woodlands, wetlands, watercourses and fish habitat within the valleyland during regular maintenance. 	<ul style="list-style-type: none"> See "Wetlands", "Woodlands" and "Surface Water, Fish and Fish Habitat" 	<ul style="list-style-type: none"> See "Wetlands", "Woodlands" and "Surface Water, Fish and Fish Habitat" 	<ul style="list-style-type: none"> See "Wetlands", "Woodlands" and "Surface Water, Fish and Fish Habitat" 	See "Wetlands", "Woodlands" and "Surface Water, Fish and Fish Habitat"
Woodlands	<ul style="list-style-type: none"> Contamination through accidental spills. 	<ul style="list-style-type: none"> No spills. 	<ul style="list-style-type: none"> See 'Spills'. 	<ul style="list-style-type: none"> See "spills". 	None.

Summary of the Potential Environmental Effects and the Environmental Effects Monitoring Plan during Operation

Environmental Feature	Potential Effect	Performance Objective	Mitigation Strategy	Monitoring Plan and Contingency Measures	Net Effects
Provincial Parks and Conservation Reserves	<ul style="list-style-type: none"> As no Provincial Parks and Conservation Reserves were identified within the Project Location, there are no anticipated impacts. 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A 	N/A
Significant Wildlife and Wildlife Habitat	<ul style="list-style-type: none"> Shifts in species abundance, avoidance and behavior during operation. Direct mortality of birds and bats from collisions. Turbine lighting has potential to impact migratory birds and cause collisions. Disturbance to species during maintenance activities from traffic, noise and dust. Direct mortality of turtles, amphibians and snakes due to collision with maintenance vehicles. 	<ul style="list-style-type: none"> Minimize mortality of significant wildlife. Minimize disturbances to significant wildlife. 	<ul style="list-style-type: none"> Turbine lights with the shortest allowable flash durations and longest allowable pause between flashes are preferred. To the extent possible, no steady burning lights/floodlights will be used at the facility. Principles of avoidance and minimization, as discussed in section 5.1, were applied during layout design to mitigate potential effects during operation. Setbacks between project components and significant wildlife habitat were considered during layout design to mitigate potential effects during operation. Maintenance vehicle speeds will be limited to 30 km/h or less on access roads and traffic will be limited primarily to daytime hours. Signs will be erected to communicate the speed limit. No herbicide will be used within significant features or wildlife habitats. 	<ul style="list-style-type: none"> Mortality monitoring for birds will be conducted twice weekly (3-4 day intervals) at ten turbines from May 1 - October 31 for 3 years post construction (see NHA/EIS and EEMP in Appendix E). Raptor monitoring will be conducted monthly from May 1 – October 31 and weekly from November 1 – April 30 for 3 years post construction (see NHA/EIS and EEMP in Appendix E). Disturbance monitoring for wintering Short-eared Owls will occur for 3 years post-construction (see NHA/EIS and EEMP in Appendix E). Disturbance monitoring for migratory birds at significant migratory bird stopover areas will occur for 3 years post-construction (see NHA/EIS and EEMP in Appendix E). Disturbance monitoring will be conducted at all significant raptor wintering areas for 3 years post-construction (see NHA/EIS and EEMP in Appendix E). Post-construction mitigation, including operational controls, will be considered if annual mortality of birds exceeds the MNR thresholds (14 birds/turbine/year at individual turbine or turbine groups, 0.2 raptors/turbine/year, 0.1 raptors of provincial conservation concern/turbine/year OR 10 or more birds at any one turbine or 33 or more birds at multiple turbines). Mitigation includes: <ul style="list-style-type: none"> Consultation with MNR. Increased monitoring and analyses of monitoring. Periodic shut-down of selected turbines at specific times of year Blade feathering at specific times of year. (See EEMP in Appendix E) In the case of a mass bird mortality event (more than 10 bird fatalities at any one turbine or more than 33 bird fatalities at multiple turbines on a single survey) the following steps will be implemented: <ul style="list-style-type: none"> Notify MNR 	No significant net effects are anticipated given the required implementation of contingency measures and adaptive management plan associated with the EEMP (Appendix E).

Summary of the Potential Environmental Effects and the Environmental Effects Monitoring Plan during Operation

Environmental Feature	Potential Effect	Performance Objective	Mitigation Strategy	Monitoring Plan and Contingency Measures	Net Effects
				<ul style="list-style-type: none"> ○ Emergency carcass search of all turbines in the project. ○ Analysis of the results of the emergency carcass search. ○ Based on the risk factors identified, additional mitigation and scoped monitoring recommendations will be developed in conjunction with MNR with goal of avoiding future mortality events. (See EEMP in Appendix E) • Mortality Monitoring for bats will be conducted twice weekly (3 – 4 day intervals) at 30% of the wind turbines from May 1 to October 3 for 3 years. • Disturbance monitoring will be conducted at identified at significant bat maternity colonies within 120m of any turbine for 3 years including Exit Surveys in June. • In the event of significant bat mortality (more than 10 bats/turbine/year) increasing cut-in speed to 5.5 m/s or feathering wind turbine blades when wind speeds are below 5.5 m/s between sunset and sunrise from July 15 to September 30. (See EEMP in Appendix E) • In the event of continued significant bat mortality, MNR will be notified and consulted to determine additional mitigation and scoped monitoring requirements. (See EEMP in Appendix E) • Disturbance monitoring will be conducted for 1 year within significant turtle nesting features within 30m or proposed access roads (June and July). • Disturbance monitoring will be conducted for 1 year within significant amphibian breeding habitat within 30m of proposed access roads (April to June). • NRW and the MNR will review the post-construction monitoring results to determine if an ecologically significant effect on migratory birds, winter raptors, turtle nesting habitat, bat maternity colonies or breeding amphibians is occurring. Contingency measures identified in the EEMP in Appendix E may be implemented if performance objectives are not met. • A Vegetation Monitoring Plan will be developed to monitor the success of the Replanting and Restoration Plan. 	

Summary of the Potential Environmental Effects and the Environmental Effects Monitoring Plan during Operation					
Environmental Feature	Potential Effect	Performance Objective	Mitigation Strategy	Monitoring Plan and Contingency Measures	Net Effects
Other Wildlife and Wildlife Habitat	<ul style="list-style-type: none"> Increased noise and disruption from operations and maintenance activities. Limited mortality due to potential bird and bat collisions with turbines. Potential impacts to deer and mammal movements. 	<ul style="list-style-type: none"> Minimize disturbance to wildlife and wildlife habitat. 	<ul style="list-style-type: none"> See 'Local Traffic' See 'Environmental Noise' 	<ul style="list-style-type: none"> See 'Local Traffic'. See 'Environmental Noise'. See 'Significant Wildlife and Wildlife Habitat' NRWC committed to work with the Six Nations to develop and participate in a winter mammal movement study to track deer proximity to turbines post-construction. 	No significant net effects are anticipated given the required implementation of contingency measures associated with the EEMP (Appendix E). Adverse impacts are not expected on deer's land use in proximity to turbines.
Significant Flora and Vegetation Communities	<ul style="list-style-type: none"> Indirect effects to flora and vegetation from dust emissions. Contamination through accidental spills. 	<ul style="list-style-type: none"> Minimize disturbance to flora and vegetation communities. 	<ul style="list-style-type: none"> All maintenance activities, vehicle refueling or washing or chemical storage will be located at the operations and maintenance facility of site, or where necessary, more than 30m from features. See 'Dust and Odour Emissions'. Minimize required tree trimming and coordinate maintenance work with different infrastructure services. Where practical, locate pole line away from mature trees. 	<ul style="list-style-type: none"> See 'Dust and Odour Emissions' 	None.
Other Flora and Vegetation Communities	<ul style="list-style-type: none"> Indirect effects to other flora and vegetation from dust emissions. Long term tree trimming along aboveground collector lines and transmission lines. 	<ul style="list-style-type: none"> Minimize disturbance to other flora and vegetation communities. 	<ul style="list-style-type: none"> All maintenance activities, vehicle refueling or washing or chemical storage will be located at the operations and maintenance facility of site, or where necessary, more than 30m from features. See 'Dust and Odour Emissions'. Minimize required tree trimming and coordinate maintenance work with different infrastructure services. Where practical, locate pole line away from mature trees. 	<ul style="list-style-type: none"> See 'Dust and Odour Emissions'. 	None.
Water Bodies and Aquatic Resources					
Groundwater	<ul style="list-style-type: none"> Potential contamination from accidental spills. 	<ul style="list-style-type: none"> No spills. 	<ul style="list-style-type: none"> See 'Spills'. 	<ul style="list-style-type: none"> See 'Spills'. 	See 'Spills'.
Surface Water, Fish, and Fish Habitat	<p>No potential impacts are anticipated with the proper installation of Project components and appropriate use of maintenance equipment. There is potential for some impacts where improper installation of Project components or inappropriate use of maintenance equipment results in:</p> <ul style="list-style-type: none"> Impediment of fish movement or water passage due to inappropriate sizing or installation of culverts. Potential contamination from accidental spills. Erosion, sedimentation, and surface water turbidity during maintenance activities. 	<ul style="list-style-type: none"> No impediment. No spills. No erosion, sediment transport or surface water turbidity. 	<ul style="list-style-type: none"> No additional mitigation measures are required for correctly installed culverts. Culvert will be appropriately sized and field fit on site. See 'Spills'. Vegetation removal on the slopes of watercourses will be minimized to the extent possible Stream banks will not be disturbed until necessary for maintenance activities. Materials removed or stockpiled deposited and contained in a manner to ensure sediment does not enter a watercourse. Seeding completed where possible. If siltation to a watercourse occurs, activities will cease immediately until the situation is rectified. 	<ul style="list-style-type: none"> See 'Spills'. NRWC will ensure monitoring during the following spring run-off one year after construction to review effectiveness of the bank and slope re-vegetation, to check bank and bank stability and to ensure surface drainage has been maintained. 	None.
Air Quality and Environmental Noise					
Air Quality	<ul style="list-style-type: none"> Emissions from maintenance equipment and vehicles. 	<ul style="list-style-type: none"> Minimize duration and magnitude of emissions. 	<ul style="list-style-type: none"> Operation staff would operate vehicles in a manner that reduces air emissions to the extent practical, including: <ul style="list-style-type: none"> Using multi-passenger vehicles to the extent practical 	<ul style="list-style-type: none"> Adherence to Complaint Response Protocol All vehicles identified through the monitoring program that fail to meet the minimum emission standards will be 	<ul style="list-style-type: none"> Any net effects are expected to be short-term in duration and highly localized.

Summary of the Potential Environmental Effects and the Environmental Effects Monitoring Plan during Operation					
Environmental Feature	Potential Effect	Performance Objective	Mitigation Strategy	Monitoring Plan and Contingency Measures	Net Effects
			<ul style="list-style-type: none"> o Avoid idling vehicles o Equipment and vehicles would be maintained in a manner that reduces air emissions, including: o Using mufflers and emission control systems as available; o Using catalytic converters as required; and, o Monitor vehicles and ensure compliance with the emissions requirements of the MOE and/or MTO; • As appropriate, records of vehicle maintenance will be retained and made available for periodic review by NRW and/or the Operation and Maintenance Contractor. 	repaired immediately or replaced as soon as practicable.	
Dust & Odour Emissions	<ul style="list-style-type: none"> • Dust emissions from operation and maintenance vehicles. • No potential for odour emissions. 	<ul style="list-style-type: none"> • Minimize duration and magnitude of dust emissions. • Minimize disturbance to existing land uses. 	<ul style="list-style-type: none"> • Maintaining equipment in good running condition and in compliance with regulatory requirements. • Dust suppression (e.g. water and/or calcium chloride) of source areas as necessary. • Covering loads of friable materials during transport. 	<ul style="list-style-type: none"> • Adherence to Complaint Response Protocol. 	<ul style="list-style-type: none"> • Any net effects are expected to be short-term in duration and highly localized.
Environmental Noise	<ul style="list-style-type: none"> • There are 2667 receptors within 1.5km of any turbine including 2032 non-participating occupied receptors, 539 non-participating vacant lot receptors and 96 participating receptors. • All non-participating receptors are greater than 550m from the centre point of any turbine and show noise emissions less than 40 dBA in the Noise Assessment (Appendix C). • Noise emitted from a turbine and/or transformer substation during operation. • Noise emitted from maintenance equipment during operations and maintenance. 	<ul style="list-style-type: none"> • Ensure noise at all non-participating receptors meets MOE Guidelines. • Minimize duration and magnitude of noise emitted from maintenance equipment. 	<ul style="list-style-type: none"> • Adherence to all noise setback requirements for both 124m hub height and 135m hub height tower. • Transformer substations are equipped with a noise attenuating barriers (4-sided noise wall at north transformer substation and 2-sided noise wall at south transformer substation, as per Noise Assessment Report.) • All engines associated with maintenance equipment would be equipped with mufflers and/or silencers in accordance with MOE and/or MTO guidelines and regulations. • Noise levels arising from maintenance equipment would also be compliant with sound levels established by the MOE. • Routine Project maintenance to ensure infrastructure is operating properly and efficiently. • To the greatest extent possible, operation activities that could create excessive noise would be restricted to regular business hours, when residents are less sensitive to noise, and adhere to any local noise by-laws and any requirements of the Occupational Health and Safety Act. • If maintenance activities that cause excessive noise must be completed outside of normal time frames, adjacent residents will be notified in advance and by-law conformity will occur, as required. 	<ul style="list-style-type: none"> • Noise monitoring or acoustic auditing (if required) of all noise emissions, would be conducted in accordance with the REA for the Project including auditing of noise emissions at various times of year, wind speeds and locations in the Project Study Area. • Turbine shutdown in the event of a malfunctioning turbine or extreme weather event. • Turbine maintenance to ensure turbines are running properly and efficiently. • Adherence to Complaint Response Protocol. • In the event of a malfunctioning turbine which is resulting in noise emissions that are above MOE requirements, the problematic turbine(s) would be shut down until corrective measures are taken. 	<ul style="list-style-type: none"> • Net effects will be some noise emissions from the turbines and transformer but in compliance with the required MOE limits.
Land Use and Socio-Economic Resources					
Areas Protected Under Provincial Plans and Policies	<ul style="list-style-type: none"> • No project components within the Oak Ridges Moraine Conservation Plan or the Lake Simcoe watershed. • A portion of the transmission line is located within existing road rights-of-way in the Protected Countryside of the Greenbelt Area Plan • Long term tree trimming and vegetation 	<ul style="list-style-type: none"> • N/A • Avoid and/or minimize negative impacts to key natural heritage features and key hydrologic features. 	<ul style="list-style-type: none"> • N/A • Design the transmission line with monopole structures, minimize pole structure height and maximize pole structure spacing. • Design the transmission line to minimize vegetation removal. 	<ul style="list-style-type: none"> • N/A • See 'Significant Flora and Vegetation Communities' • See 'Other Flora and Vegetation Communities' 	<ul style="list-style-type: none"> • N/A • No anticipated significant net effects.

Summary of the Potential Environmental Effects and the Environmental Effects Monitoring Plan during Operation

Environmental Feature	Potential Effect	Performance Objective	Mitigation Strategy	Monitoring Plan and Contingency Measures	Net Effects
	removal adjacent to the transmission line for lifetime of the project.	<ul style="list-style-type: none"> Optimize coordination with different infrastructure services. 	<ul style="list-style-type: none"> Follow existing municipal road right of way to avoid cross-country routes and minimize disturbance to natural features. Route alignment through Greenbelt Area minimizes length traversed by the transmission line. 		
	<ul style="list-style-type: none"> A portion of the transmission line is located within the Niagara Escarpment Plan Area within existing road rights-of-way. The line will be installed underground through the NEP Area. No potential impacts during operation. 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Obtain a Development Permit from the NEC prior to receipt of REA. 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> No anticipated significant net effects.
Existing Land Uses	<ul style="list-style-type: none"> Temporary / minor increase in noise and dust levels during maintenance activities. Minor increase in traffic. 	<ul style="list-style-type: none"> Minimize disturbance to existing land uses, including local businesses. 	<ul style="list-style-type: none"> See 'Environmental Noise'. See 'Dust and Odour Emissions'. 	<ul style="list-style-type: none"> See 'Environmental Noise'. See 'Dust and Odour Emissions'. 	<ul style="list-style-type: none"> No anticipated significant net effects.
Recreation Areas and Features	<ul style="list-style-type: none"> Much of the land within 120 m of the Project Location is used for recreation purposes such as hunting, fishing, hiking and off-roading. Recreational areas include the Mountainview Conservation Area, Bruce Trail and Wainfleet Rail Trail (Gord Harry Trail). The Lake Erie waterfront is approximately 600 m from the nearest project components. There are no operation-related effects to the Bruce Trail and Mountainview Conservation Area recreation sites and the shores of Lake Erie. There will be occasional maintenance vehicle access of the Wainfleet Rail Trail along the approximately 500m stretch between Elgin Road and Townline Road. Access would not require trail closure but has potential to cause disturbance to hikers through the generation of noise and dust. Consultation with the NPCA confirmed that the potentially affected portion of the Wainfleet Rail Trail is not currently open or maintained for public use. However, NPCA is considering opening this portion of the trail in the near future. Temporary trail closure may be required in extreme cases where large equipment replacement is necessary. 	<ul style="list-style-type: none"> Minimize disturbances to public's use of recreation areas (i.e., hikers, bicyclists). 	<ul style="list-style-type: none"> Enforce maintenance vehicle speed limits of 30 km/hr when along the Wainfleet Rail Trail or any access roads which connect to the trail. Notify NPCA in advance of any maintenance in the area. Continue consultation with NPCA. See "Dust & Odour Emissions" and "Environmental Noise" 	<ul style="list-style-type: none"> Consult with NPCA to confirm whether additional mitigation measures are required based on hiker comments or feedback. Adherence to Complaint Response Protocol. 	<ul style="list-style-type: none"> No anticipated significant net effects.

Summary of the Potential Environmental Effects and the Environmental Effects Monitoring Plan during Operation

Environmental Feature	Potential Effect	Performance Objective	Mitigation Strategy	Monitoring Plan and Contingency Measures	Net Effects
Agricultural Lands and Operations	<ul style="list-style-type: none"> Change in land use from agriculture to renewable energy development. Noise and visual impacts to livestock. Dust emissions associated with vehicular traffic during regular maintenance. 	<ul style="list-style-type: none"> Minimize disturbance to agricultural lands and operations. 	<ul style="list-style-type: none"> Landowners are financially compensated for the lease of private lands. Change in land use is not permanent and will be returned to original land use at the end of the project life cycle. The condition of the land at the end of the project life cycle will be the same or better than original conditions. Consultation was conducted with landowners to help minimize land disturbance when siting wind turbines and associated infrastructure. Consultation with landowners will be continued during construction and post-construction to ensure that rehabilitation of temporary construction areas are adequately returned to their original land use to conditions that are the same or better than original conditions. Communication with livestock owners. Dust emissions are expected to be short-term in duration and highly localized; no mitigation measures required. 	<ul style="list-style-type: none"> Adherence to Complaint Response Protocol. 	<ul style="list-style-type: none"> No anticipated significant net effects.
Mineral, Aggregate, and Petroleum Resources	<ul style="list-style-type: none"> No potential operation-related effects to mineral, aggregate and petroleum resources. The nearest turbine to a pipeline is 654m. 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Landowners are financially compensated for the land that would be taken out of production during the lifetime of the Project. Additional studies to verify the location of known petroleum resources in proximity to Project components will be undertaken as part of the MNR's Approval, Permitting and Requirements Document (APRD) process. Companies operating oil and gas pipelines in the area have been consulted regarding the Project regarding location of infrastructure and will be continue to be consulted through the REA process and detailed design, as appropriate. Underground locates in the road allowance will be completed as needed prior to construction. 	<ul style="list-style-type: none"> None required. 	<ul style="list-style-type: none"> Primary and secondary aggregate deposits would be removed from future use where Project infrastructure overlays these deposits until the Project is decommissioned. However, wind turbines are not considered permanent structures on the landscape.
Game And Fishery Resources	<ul style="list-style-type: none"> Sensory disturbance to game species from noise. Impediment of fish movement or water passage due to improperly installed culverts. 	<ul style="list-style-type: none"> Minimize disturbance to game and fishery resources. 	<ul style="list-style-type: none"> See 'Environmental Noise'. Culverts installed such that there is no restriction of flows. 	<ul style="list-style-type: none"> See 'Environmental Noise'. None required. 	<ul style="list-style-type: none"> Temporary and intermittent net effects are anticipated.
Local Traffic	<ul style="list-style-type: none"> Short-term, localized disturbance to traffic patterns, increases in traffic volume, and/or creation of potential traffic safety hazards during regular maintenance. Traffic on previously unopened road allowances. 	<ul style="list-style-type: none"> Minimize disturbance to local traffic. 	<ul style="list-style-type: none"> There may be infrequent instances where excess loads (e.g. turbine and transformer components) would require special traffic planning, widening turning radiuses and road widths and the creation of new ingress/egress nodes. NRWC may provide notification of non-conventional load movements that may interfere with local traffic. NRWC to execute Road Use Agreement with affected municipalities including a definition of upgrades, maintenance and use of unopened road allowances and general liability. 	<ul style="list-style-type: none"> Adherence to Complaint Response Protocol. 	<ul style="list-style-type: none"> A limited short-term effect on traffic during regular maintenance.
Viewscape	<ul style="list-style-type: none"> Viewscape from areas surrounding the Project Location will be altered due to the presence of wind turbines, transformer substations, tap-in location and 	<ul style="list-style-type: none"> Minimize potential for visual disturbance. 	<ul style="list-style-type: none"> Minimal mitigation measures are available to address concerns related to visual changes in the area due to the physical size of the turbines and poles. 	<ul style="list-style-type: none"> None. 	<ul style="list-style-type: none"> Net effect, either positive or negative based on perceptions, due to the change in viewscape of

Summary of the Potential Environmental Effects and the Environmental Effects Monitoring Plan during Operation

Environmental Feature	Potential Effect	Performance Objective	Mitigation Strategy	Monitoring Plan and Contingency Measures	Net Effects
	aboveground collector and transmission pole lines.		<ul style="list-style-type: none"> • Turbines will be painted light grey and distributed over the Project Study Area. • Turbine lights with the shortest allowable flash durations and longest allowable pause between flashes are preferred. • To the extent possible, no steady burning lights/floodlights will be used at the facility, including at the transformer substations. • Where feasible, full cutoff fixtures (those that reduce up-lighting) will be used for outdoor lighting at the transformer substations to mitigate light trespass on neighbouring properties and potential impacts on the nighttime environment. • NRWC will consult with Transport Canada and Nav Canada to minimize the number of turbines which are lit, based on the relevant regulations at the time of construction. • Collector line poles and transmission line poles will be monopole structures and designed with maximum spacing and minimum height practical to minimize visual impacts • A Landscaping Plan developed by the Construction Contractor will include recommendations for natural landscaping around chainlink fences. • See 'Heritage Resources'. 		the surrounding area.
Local Economy	<ul style="list-style-type: none"> • Increase in employment over the operation period. • Local economic benefits from land lease payments, municipal taxes, etc. 	<ul style="list-style-type: none"> • Create positive effects on local economy. 	<ul style="list-style-type: none"> • To the extent possible local hiring will be maximized. • NRWC will be contributing over \$20 million to local communities through community vibrancy funds. 	<ul style="list-style-type: none"> • None required. 	<ul style="list-style-type: none"> • A positive net effect is anticipated on the local economy during the operation of the Project through the creation of jobs and use of local labour and suppliers. Approximately 12 full-time operation and maintenance staff would be employed during the operation phase. • Community vibrancy fund will support local projects and will be managed by local citizens. • A Niagara Community employment and contractors seminar is being planned for Spring 2013. • NRWC has engaged several Aboriginal communities to identify employment opportunities.
Existing Infrastructure					
Provincial, municipal, and other major infrastructure	<ul style="list-style-type: none"> • Excess loads during maintenance of large components would require special traffic planning. • Maintenance of transmission lines and collector lines could disrupt existing 	<ul style="list-style-type: none"> • Minimize disturbance to Provincial, municipal, and other major infrastructure. 	<ul style="list-style-type: none"> • Necessary permits would be obtained. • As appropriate, "pilot" vehicles will accompany non-conventional loads. • Public notification of unconventional load movements may occur. 	<ul style="list-style-type: none"> • See 'Local Traffic' 	<ul style="list-style-type: none"> • Net effect will be short-term and spatially limited.

Summary of the Potential Environmental Effects and the Environmental Effects Monitoring Plan during Operation					
Environmental Feature	Potential Effect	Performance Objective	Mitigation Strategy	Monitoring Plan and Contingency Measures	Net Effects
	infrastructure at crossings of HONI transmission lines and railways.		<ul style="list-style-type: none"> Consultation with HONI and railway owners as appropriate. 		
Telecommunications Networks	<ul style="list-style-type: none"> Potential to interfere with radio, TV, or internet signals (static ghosting, signal blockage, dynamic interference/pulsing) (RABC, 2010). Potential to interfere with cellular telephone networks. 	<ul style="list-style-type: none"> Minimize interference with radio, TV, or internet signals. Minimize interference with cellular telephone networks. 	<ul style="list-style-type: none"> NRWC has consulted with relevant agencies and licensed providers to identify any likely effects to telecommunication and radar systems. 	<ul style="list-style-type: none"> Adherence to Complaint Response Protocol. NRWC would review potential incidents of telecommunications interference on a case by case basis. In the unlikely event that signal disruption is experienced, contingency measures (at the cost of NRWC) may include: <ul style="list-style-type: none"> Replacing the receiving antenna with one that has a better discrimination to the unwanted signals Relocating either the transmitter or receiver Switching to an alternate means of receiving the information. Cellular coverage could be restored by installation of an additional cell tower or of one or more additional antennae on the existing cell tower. 	<ul style="list-style-type: none"> No anticipated significant effects.
Aeronautical Systems	<ul style="list-style-type: none"> Aeronautical obstruction. Consultation with Nav Canada confirmed that the turbines will be visible to Hamilton and Toronto RADAR's at the Hamilton and Toronto with potential for the following impacts: <ul style="list-style-type: none"> A large number of nuisance (false) primary radar targets; A significant reduction in ability to identify and track primary surveillance targets; Inability to provide full traffic information to aviation customers; An increase in the controller's workload. A decrease in flight safety for aircraft operation; and, Increase to the Obstacle Clearance Circle (OCC) altitude at the Dunnville Airport. 	<ul style="list-style-type: none"> Minimize potential hazard to low flying aircraft. Minimize impacts to Nav Canada RADAR's. 	<ul style="list-style-type: none"> Turbine lighting will conform to Transport Canada standards. In order to reduce rural light pollution, lights would be selected with the minimal allowable flash duration, narrow beam, and would be synchronized. Consultation with Nav Canada and Transport Canada will confirm which turbines will require lighting – NRWC will aim to minimize the number of lit turbines. Nav Canada confirmed that the potential effects on the RADAR systems can be mitigated with specific technical adjustments on a cost-recovery basis. NRWC and Nav Canada will enter into an agreement to ensure that all necessary technical adjustments are made to mitigate impacts. Nav Canada would be responsible for updating all aeronautical charts with the turbine locations. Low-level aircraft such as ultra-lights and crop dusters are to be familiar with the area they are flying over and are prohibited from night-time flights. 	<ul style="list-style-type: none"> Routine maintenance of the turbines and replacement of safety lighting in the event of malfunction. Continued consultation with Nav Canada throughout the lifetime of the Project. 	<ul style="list-style-type: none"> No anticipated significant effects to aeronautical systems. Low-level aircrafts such as crop dusters may need to re-route their paths or consult with NRWC when spraying is to occur.
Waste Management and Contaminated Lands					
Waste Generation	<ul style="list-style-type: none"> Improper disposal of waste material may result in contamination to soil, groundwater, and/or surface water resources on and off the Project sites. Litter may become a nuisance to nearby residences if not appropriately contained and allowed to blow off the site. 	<ul style="list-style-type: none"> Ensure proper disposal of waste. 	<ul style="list-style-type: none"> Implementation of a site-specific waste collection and disposal management plan, which may include good site practices such as: <ul style="list-style-type: none"> Contractors will be required to remove all waste materials from the Project sites during maintenance activities; All waste materials and recycling would be transported off-site by private waste material collection contractors licensed with a Certificate of Approval – Waste Management System; and, Labeling and proper storage of liquid waste. As appropriate, spill kits will be provided on-site. Dumping or burying wastes within the Project sites 	<ul style="list-style-type: none"> See 'Spills'. 	No anticipated significant effects.

Summary of the Potential Environmental Effects and the Environmental Effects Monitoring Plan during Operation					
Environmental Feature	Potential Effect	Performance Objective	Mitigation Strategy	Monitoring Plan and Contingency Measures	Net Effects
			<ul style="list-style-type: none"> will be prohibited. Disposal of non-hazardous waste at a registered waste disposal site(s). If waste is classified as waste other than solid non-hazardous, a Generator Registration Number is required from the MOE and the generator will have obligations regarding manifesting of waste. Implementation of an on-going waste management program consisting of reduction, reuse, and recycling of materials. See 'Spills' 		
Spills	<ul style="list-style-type: none"> Potential contamination from accidental spills. 	<ul style="list-style-type: none"> No spills. 	<ul style="list-style-type: none"> Refueling, equipment maintenance, and other potentially contaminating activities would occur in designated areas. Spills will be reported immediately to the MOE Spills Action Centre, as applicable. The two transformers will be mounted on foundations that have a secondary liquid containment storage area designed to capture the insulating fluid in the unlikely event of a leak. The liquid containment system is designed to hold all of the liquid from the transformers as well as any precipitation that may accumulate. The TS will be operated in accordance with all applicable codes and standards including the Canadian Electrical Code and the Ontario Electrical Safety Code. Development of Emergency Response Plan. 	<ul style="list-style-type: none"> Monitoring would be required following the unlikely event of contamination from an accidental spill or leak (method for monitoring may be developed in consultation with the Spills Action Centre of the MOE). Contaminated soils would be removed and replaced as appropriate. Emergency Response Plan will address procedures for response to spills including containment and clean-up materials and their storage locations. Internal audits will be completed to confirm compliance with Monitoring and Emergency Response Plans. 	No anticipated significant effects.
Public Health and Safety					
Turbine Blade and Structural Failure	<ul style="list-style-type: none"> Potential risk to public health and safety from collision with failed components. 	<ul style="list-style-type: none"> No structural failure of the turbines or ancillary equipment. 	<ul style="list-style-type: none"> Adherence to required setbacks of turbines from homes, property lines and right of ways. Design, install, operate, and maintain turbines according to applicable industry standards/certifications. Use of lightning protection systems. Training and education of staff operating the control system. Familiarizing local municipal emergency response staff with Project facilities. ENERCON Storm Control system recognizes high winds and controls wind turbine appropriately to reduce risk of damage. 	<ul style="list-style-type: none"> Inspections of turbines would occur after extreme events and contingency measures such as turbine shutdown would be implemented in the event of structural damage. Turbine maintenance to ensure turbines are running properly and efficiently. NRWC and/or the Operation and Maintenance Contractor would maintain a master Incident Report. Incident reporting would follow the requirements of the Occupational Health and Safety Act. Emergency Response Plan will address procedures for response to incidents. Internal audits will be completed to confirm compliance with Monitoring and Emergency Response Plans. 	With adherence to safety policies and procedures, there is minimal increased or new risk to public health and safety.
Ice fall and shed	<ul style="list-style-type: none"> Public Health and Safety from collision with ice. 	<ul style="list-style-type: none"> Limit potential for ice throw/shed to impact pedestrians. 	<ul style="list-style-type: none"> Adherence to required setbacks of turbines from homes, property lines and right of ways. Design of turbine tower reduces ice accumulation (solid conical tower rather than latticed tower). ENERCON blade de-icing system reduces chance of ice accumulation via an electric fan heater which 	<ul style="list-style-type: none"> Inspections of turbines would occur after extreme events and contingency measures such as turbine shutdown would be implemented in the event of structural damage and/or icing to a turbine(s). 	With adherence to safety policies and procedures, there is minimal increased or new risk to public health and safety.

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Environmental Feature	Potential Effect	Performance Objective	Mitigation Strategy	Monitoring Plan and Contingency Measures	Net Effects
			<p>maintains the surface of the blade to above 4°C.</p> <ul style="list-style-type: none"> If weather conditions cause ice formation on blades and de-icing system is not effective at removing the ice, the turbine controls detect ice formation and shut down the turbine until ice has gone. 	<ul style="list-style-type: none"> Turbine maintenance to ensure turbines are running properly and efficiently. NRWC and/or the Operation and Maintenance Contractor would maintain a master Incident Report. Incident reporting would follow the requirements of the Occupational Health and Safety Act. Emergency Response Plan will address procedures for response to incidents. Internal audits will be completed to confirm compliance with Monitoring and Emergency Response Plans. 	
Extreme Weather Events	<ul style="list-style-type: none"> Potential damage to project infrastructure from extreme weather events. 	<ul style="list-style-type: none"> No structural failure of the turbines or Project equipment. 	<ul style="list-style-type: none"> Project components have been designed to withstand the effects from extreme events (turbine is designed for gusts up to 59.5 m/s or 214 km/h). Use of lightning protection systems. Design, install, operate, and maintain turbines according to applicable industry standards/certifications. Failsafe devices are capable of shutting down the turbine blades in the event of excessive wind conditions, imbalance, or malfunction of other turbine components. ENERCON Storm Control system recognizes high winds and controls wind turbine appropriately to reduce risk of damage. 	<ul style="list-style-type: none"> See 'Turbine Blade and Structural Failure'. 	With adherence to safety policies and procedures, there is minimal increased or new risk to public health and safety.
Third Party Damage	<ul style="list-style-type: none"> Potential damage to towers from accidental collision from off-road and maintenance vehicles. 	<ul style="list-style-type: none"> No structural failure of the turbines or Project equipment. 	<ul style="list-style-type: none"> Access to the towers will be restricted to avoid potential accidents to unqualified persons. 	<ul style="list-style-type: none"> See 'Turbine Blade and Structural Failure'. 	With adherence to safety policies and procedures, there is minimal increased or new risk to public health and safety.