

7. Potential Environmental Effects and Mitigation

This section describes the potential environmental and socio-economic effects associated with the development of the Project, and provides measures that will be incorporated to reduce and/ or eliminate potential adverse effects. A description of the facility is presented in **Section 6** and forms the basis for the identification of the potential environmental effects.

The potential effects resulting from the construction and operation of the Project are similar to many other projects undertaken by Hydro One and are well understood. There are approximately 300 transmission stations in Ontario. Hydro One has a strong track record of environmental compliance and stewardship and is committed to the completion of a comprehensive environmental analysis and mitigation of potential environmental effects. The Hydro One (2009) “Environmental Guidelines for Construction and Maintenance of Transmission Facilities” documents potential environmental effects and shows Hydro One’s commitment to mitigation of these effects.

The following sections describe potential environmental effects and corresponding mitigation measures. **Table 7-1** provides a summary of potential effects, their mitigation and residual (net) effects for the Project. Both short-term construction and long-term operations residual effects are discussed.

7.1 Releases to the Environment

The following section describes the potential atmospheric emissions, liquid discharges and solid wastes from station construction and operations activities.

7.1.1 *Atmospheric Emissions*

Construction

Construction activities can be the source of noise and dust emissions. There will also be emissions from construction vehicles and equipment. These emissions will be of relatively short in duration, intermittent and unlikely to have any effect on the surrounding air shed.

Mitigation measures used to minimize potential air quality effects include maintenance of construction equipment in good working condition to minimize combustion emissions to the extent practicable and use of dust suppression techniques, such as on-site watering and road cleaning or dirt and mud. Dirt and mud will also be reduced to the surrounding road system through the implementation of vehicle cleaning prior to leaving the site.

Construction may also be a source of short-term, intermittent noise. The noises will be common to those found at other construction sites and associated with activities, such as site grading, foundation work, building and tower erection, and construction traffic. The use of implosive connectors is also planned to connect the new conductors. Construction will take place over a period of approximately 27 months. It will require the use of heavy equipment, (e.g., dozers, front-end loaders, small trucks, backhoes, bobcats, dump trucks, compactors, cement trucks and/or cranes).

Sound emission standards for construction equipment will be used. Sound levels will be monitored. Efforts will be made to conform to the MOE (1978) Model Municipal Noise Control By-Law and noise by-law for the Corporation of the Municipality of Clarington.

Sound levels will attenuate with distance and more information on acoustics can be found in **Appendix D**.

Operation

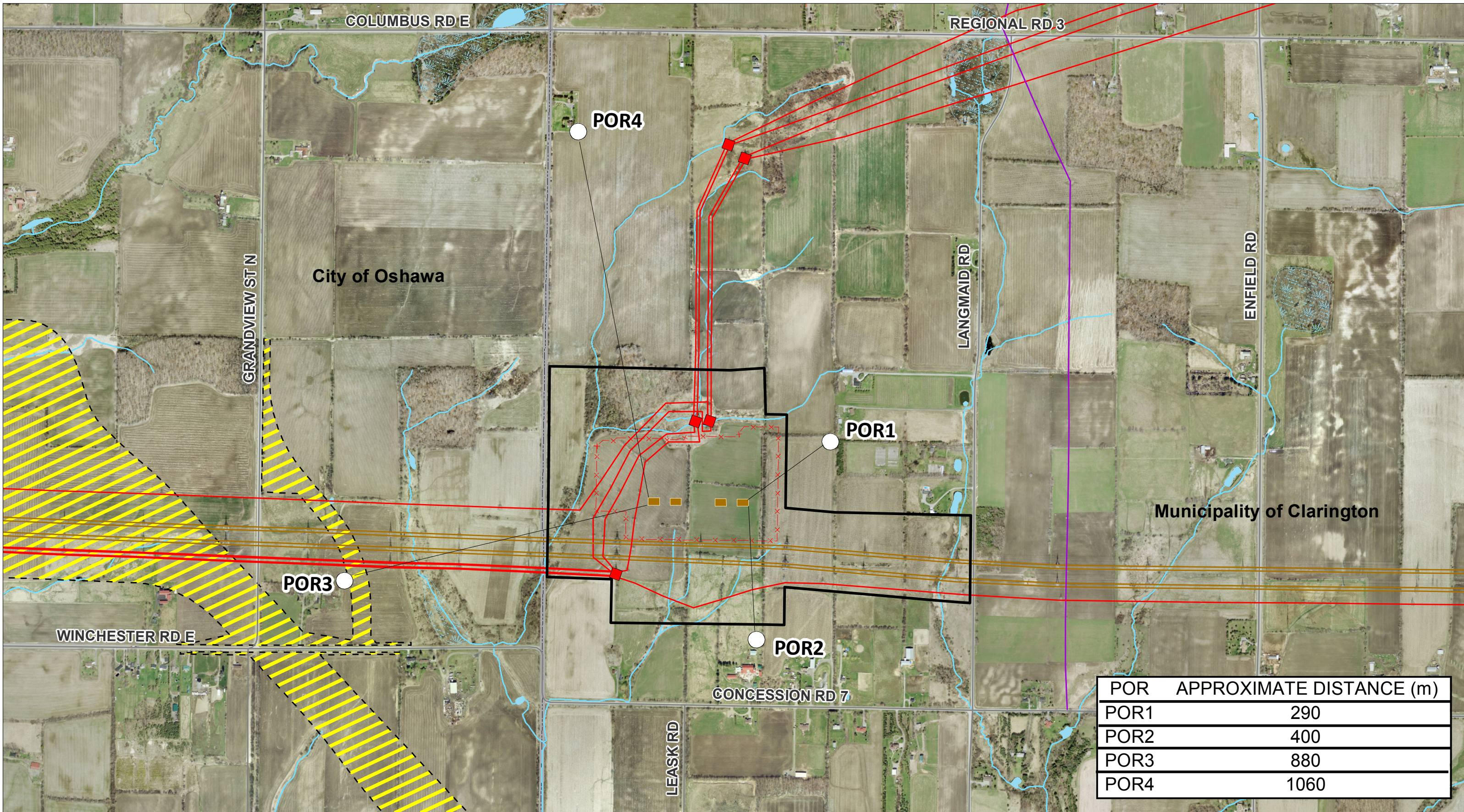
Transformers will produce a humming sound when energized and are usually equipped with cooling fans which contribute sound when operated occasionally. Noise can be readily mitigated with conventional technology (e.g., transformer selection, noise enclosures, noise barriers, etc.). As indicated in **Section 1.5.2**, as sound sources, power transformers are subject to approval by the Ministry of the Environment, under Section 9 of the *Environmental Protection Act* (i.e., Environmental Compliance Approval).



In order to minimize the sound from the transformers, a maximum sound level of 74 dBA is specified in Hydro One procurement specifications (including operating cooling fans) for transformers of the size/rating needed. This number represents the maximum sound pressure level measured in accordance with standard IEEE C57.12.90-2006 (or equivalent CSA or ANSI standard). It is a theoretical limit and includes the sound from the transformer itself and associated cooling fans. The actual operating conditions of the installed transformer(s) are generally quieter than the specified value(s).

The four nearest representative sensitive noise receptors to the transformers are shown in **Figure 7-1**. These points of reception (POR) are residences and are approximately 290 to 1060 metres away from the station.

Since one or more of the receptors are less than 500 metres away from the site, a detailed acoustic assessment will be performed to predict potential sound levels at the receptors and included in the ECA application. If the assessment should identify levels above the MOE limits at the receptor, noise control measures will be necessary. Hydro One has successfully used noise barriers and specialized transformers and cooling fans to control sound at several stations, and will apply similar sound control measures if necessary at the station. Consequently, Hydro One is confident that there will be no long term residual effects.

See **Appendix D** for the preliminary noise evaluation has been carried out for the station location.





 Produced By: Inergi LP, GIS Services
 Date: July 25, 2013
 Fig7-1_Map12-02_ClaringtonTS_Noise_POR
 (C) Copyright Hydro One Networks Inc. All rights reserved. No part of this drawing may be redistributed or reproduced in any form by any photographic, electronic, mechanical or any other means, or used in any information storage or retrieval system. Neither Hydro One Networks Inc. nor any of its affiliates assumes liability for any errors or omissions.
 Source for Future Highway 407 - Municipality of Clarington, 2012
 Produced by Hydro One under Licence with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2009
 NOT TO BE REPRODUCED OR REDISTRIBUTED CONFIDENTIAL TO HYDRO ONE NETWORKS INC.

- 230 kV Junctions
- Transmission Lines**
- 44 kV
- 230 kV
- 500 kV
- Roads
- Future Highway 407
- Project Area
- Watercourses
- Water
- Wetlands
- Municipal Boundary
- Points of Reception (POR) (1-4)
- Station Fence Line
- 500kV Transformers

Clarington TS - Noise Points of Reception (POR)
Figure 7-1
 1:10,000 0 0.25 0.5 km

7.1.2 *Liquid Discharges*

Construction

During construction, there is limited need to take or use water. As previously noted, dust suppression techniques will be applied. The primary challenges will be to manage precipitation and run-off and to minimize the likelihood of spills.

Groundwater and stormwater collected from excavated areas will not be directly discharged to the ground surface. The liquids will be transferred to onsite containment (i.e., a plastic storage tank or open evaporation pit lined with an impermeable membrane) and tested to determine the appropriate type and location of disposal.

If laboratory testing confirms that the water is not contaminated (i.e., above legislated levels), they may then be discharged onto the adjacent ground surface according to the following requirements:

- Pump-out/vacuumed waters/slurries will be discharged in such a manner that the force of discharge does not cause erosion (e.g., using dewatering filter bags, fibre mats, sediment settling ponds, rock pads, etc.);
- Pump-out/vacuumed waters/slurries shall not be discharged directly into or near any form of natural or man-made water body or drainage (e.g., storm sewers, creeks, ponds, etc.);
- Release will be compliant with relevant sections of OPSS 518 - Control of Water from Dewatering Operations or specific municipal requirements to protect the environment;
- Temporary perimeter ditches will be installed around the construction site until the installation of permanent ditches to control stormwater and limited erosion and sedimentation; and
- If required, a Permit-To-Take-Water (PTTW) will be obtained prior to dewatering excavations if the volume exceeds 50,000 L/day..

A project environmental specification will set out erosion, sediment control and storm water management requirements. These specifications will conform to the Greater Golden

Horseshoe Area Conservation Authorities Erosion and Sedimentation Control Guideline for Urban Construction (2006).

It is unlikely that there will be significant spills of oils and fuels from construction vehicles. However, refuelling of construction vehicles will be carried out in a designated area and spill kits will be on hand. All refuelling or lubrication of equipment will be carried out at least 120 metres away from waterbodies.

Operation

The station will be fully equipped with spill containment for each transformer and an oil/water separation facility. These facilities, in conjunction with the site drainage are subject to ECA under the *Environmental Protection Act* along with the station drainage facilities. Spill controls are proven to be highly effective means of managing discharge quality. An ERP and spill cleanup equipment will be located on site. Hydro One is confident that, in the event of equipment failure, mineral oil will not escape from the site. In addition, the transformers are designed to withstand the internal forces without tank rupture, under the specified Hydro One internal fault conditions.

In the event of a spill within containment, the event will be reported, managed and cleaned up in accordance with all relevant legislation.

7.1.3 Solid Wastes

Construction

Solid waste generated at the site during construction will be collected, tested as required and disposed in accordance with environmental legislation.

Operation

The site will not be manned and will not generate significant quantities of waste materials. Wastes will be collected and directed to a regulated management site. The wastes will be recorded, tested and disposed in accordance with a Corporate Waste Management Certificate of Approval.

7.2 Key Natural Heritage Features

Based on field investigations, it has been determined that there is no specialized habitat, amphibian breeding habitat, rare breeding birds or significant mammal habitat located within the project area.

Significant Woodlands

A woodland of approximately 4.7 ha within the project area (as discussed in **Section 3**) is designated in the Municipality of Clarington Official Plan (2012) as “significant”. Within the ORMCP (OMMAH 2002) and the Greenbelt Plan (OMMAH 2005), this woodland is deemed a Key Natural Heritage Feature. In all cases, development associated with infrastructure is allowed under the condition that the need for the Project has been demonstrated and there is no reasonable alternative.

Approximately 1.5 ha in the southwest corner of the woodland will be subject to vegetation removal, as a result of the 230 kV line work, which will be located within the minimum vegetation protection zone for the woodland. This is also the location associated with two branches of the Harmony Creek. Through the use of taller towers and shorter spans (distance between towers) the loss of tree cover vegetation (1.5 ha) has been reduced by approximately 35% over standard transmission designs. Other measures that will be undertaken to reduce adverse effects resulting from the reconfiguration of transmission lines include:

- Restricting access along the ROW and minimizing the travel/work areas to maximize retention of compatible vegetation;
- Undertaking sediment and erosion controls as per CLOCA guidelines;
- Selective cutting and retaining all compatible vegetation to promote quicker regeneration;
- Using geotextile and gravel for all access to reduce compaction which will be removed after construction;
- Restore any compacted areas and plant compatible native species;
- Obtain necessary permits and approvals for the removal of retainable Butternut trees;
- Erection of barriers to ensure protection of creek(s);
- No refuelling of vehicles and/or equipment will occur within 100m of a watercourse;

- Seed agricultural areas between the station fence and the existing natural areas (woodlands and valleylands) with native species;
- Install taller towers which allow for greater variety of shrub heights; and
- Undertake area replacement planting at a 2:1 ratio.

The northern portion of the station is located within the vegetation protection zone for the significant woodland and valleyland. However, the station is located primarily within agricultural land and will not require the removal of any vegetation other than the removal of approximately 1 ha of hedgerows. The agricultural land between the station and the vegetation protection zone will be re-vegetated to increase the buffer to the woodland, valleyland, and associated creeks.

Removal of vegetation has the potential to disturb nesting migratory birds. The *Migratory Birds Convention Act (MBCA)* prohibits the disturbance, destruction or removal of a nest, egg or nest shelter of a migratory bird. In order to avoid contravention of the *MBCA*, vegetation clearing should not be conducted during the bird breeding season (May 1st to July 31st). If this is not possible, a breeding bird survey will be undertaken by a qualified avian biologist and any nests found must not be disturbed by the clearing activity until the young have fledged. Where active nests are found, a buffer zone reflective of the species will be established to restrict construction activities.

Construction of Clarington TS (including the associated transmission line realignment) will require the loss and/or conversion of approximately 3.2 ha of existing vegetation communities. While some of this habitat will be lost (hedgerows within the fence line of Clarington TS), other habitats, such as existing deciduous forest within the new 230 kV transmission line corridor, will be converted to compatible communities of low-growing native plant species. 2.8 ha of existing low-growing vegetation communities within the existing 230 kV transmission corridor will be subject to temporary disturbance during construction. No long-term adverse effects are expected to occur to these vegetation communities.

Hydro One has committed to a habitat creation to habitat loss ratio of 2:1 in the vicinity of the Project. In order to offset the 3.2 ha of affected habitat, Hydro One plans to create at least 6.4 ha of new habitat to ensure that the Project results in a gain in habitat. Hydro One has created a draft Habitat Creation and Enhancement Plan (see **Figure 7-2**) which outlines the portions of the Hydro One property which will be used to create habitat, increase linkages among the adjacent natural communities and provide visual screening for nearby residences. The draft Habitat Creation and Enhancement Plan also provides information on the measures that Hydro One will undertake to minimize the temporary disturbance to compatible vegetation communities which currently exist below overhead transmission facilities. Hydro One has submitted the draft Habitat Creation and Enhancement Plan to CLOCA for comment and will continue to consult with CLOCA and other interested parties in order to finalize the plan.

Significant Valleylands

Valleylands were identified in the Municipality of Clarington Official Plan (2012) and pertain to the Farewell and Harmony Creek tributaries. The Project does not affect the Farewell Creek and will potentially affect the Harmony Creek where the 230 kV reconfiguration spans the creek and the installation of one (1) permanent creek crossing (see **Section 3.1.4**). In order to ensure that the integrity of these systems is maintained, an erosion and sediment control plan will be developed in conformance with CLOCA and their guidelines. Construction and grading plans will also be developed and subject to review by CLOCA. A 30 metre setback from the Harmony Creek tributaries will be established with protective fencing where feasible. Protective measures to reduce adverse effects will be undertaken in a manner similar to that outlined in significant woodlands.

Significant Wildlife Habitat

There was no Significant Wildlife Habitat in the project area that was found to have a) seasonal concentration areas, b) rare or specialized habitat c) habitat of Species of Conservation Concern. Although no animal movement corridors were observed during field investigations, Hydro One acknowledges that animal movement corridors may be present as identified by CLOCA in their Black/Harmonty/Farewell Existibg Conditions report.

As discussed under Significant Woodlands, approximately 1.5 ha of forest will be removed with a 2:1 ratio offset. The Habitat Creation and Enhancement Plan discussed above will develop habitat and natural linkages within the project area and adjacent natural systems.

Species at Risk Habitat

A search of the NHIC (2010a) database indicated that no SAR have been recorded recently (post-1989) within the project area. The MNR indicated that Butternut, Bobolink and Eastern Meadowlark may be found in the project area given that the Project is within their natural range.

The presence of butternut trees was confirmed during field surveys. Three (3) retainable (Category 2) butternut trees will be removed during construction to accommodate the transmission line reconfiguration required to access and egress the station. To mitigate any loss of retainable butternut trees, Hydro One will consult with the MNR to acquire the necessary approval to fulfill the required replacement planting. The intent of replanting is to provide a net increase in seed production when the new trees are mature. This will benefit butternut in Ontario by increasing genetic diversity and reproductive potential. Tending and monitoring of the Butternut seedlings will take place over a five year period to ensure that target survival rates are met. Butternut planting will be undertaken as part of the Habitat Creation and Enhancement Plan (see **Figure 7-2**).

As noted earlier in **Section 3**, two federally (COSEWIC, 2012) threatened species, Bobolink and Eastern Meadowlark, have natural ranges that coincide with the project area. Field surveys determined that the habitat within the project area was unsuitable for both species because of the presence of agricultural row crops throughout the site. In the past (pre-1989), Loggerhead Shrike, another provincially and federally threatened species, was observed in this area. Field surveys did not observe this species and determined that the habitat provided by row crops is unsuitable for Loggerhead Shrike.

Although not listed as SAR, a number of avian species noted in the area were considered as Species of Conservation Concern. However, an assessment of the habitat requirements for

these avian species for nesting was not supported by the habitat on or adjacent to the project area. Consequently these species were not considered further for any form of protection.

Hydrology

Construction and maintenance of the Project will require two (2) permanent crossings of tributaries of Harmony Creek and one (1) temporary crossing of a tributary of Farewell Creek. These watercourse crossings are subject to approval by CLOCA and are not anticipated to have any negative effects on these creeks. Any in-water works will conform to the MNR fisheries timing window.

Station drainage will be subject to an Industrial Sewage ECA under the *EPA*. The station drainage design will ensure that the pre and post construction area drainage is not significantly altered. The ultimate location of discharge will be determined at the design stage and will be subject to MOE approval. However, as suggested by CLOCA the drainage design will consider the direction of all discharge to the wetland/tributary system north of the station for continued sustainment of these features.

The station has no emissions and the transformers are within containment with an oil/ water separator designed to capture any oil that may be released. The transformers themselves have design rupture points which allow the system to prevent releases to the environment should there be a transformer failure event. In addition, the station will be situated on land with a deep overburden of glacial till which has very low permeability. In the rare event that oil does escape the containment system, the response time by Hydro One will allow for cleanup of the oil in advance of any movement. Consequently, no effects to the groundwater or hydrology are anticipated. Further, the monitoring wells installed at the site will be maintained and monitored regularly for groundwater level and quality. Hydro One intends to retain a minimum of four (4) intermediate depth monitoring wells (approximately 10 – 15 m in depth) paired with four (4) shallow groundwater monitoring wells (approximately 1 – 3 m in depth) at appropriate locations in the project area. The paired wells will allow for testing of hydraulic conductivity. A monitoring program will be conducted pre, during and post construction for a minimum two year period both within the project area and adjacent drinking water wells of participating residents. In addition, drive point piezometers will be

installed in the wetland (north) , creek (west) and drainage swale (south) to monitor surface water and shallow groundwater. This monitoring will allow for the provision of data to confirm if shallow discharge conditions are occurring and the potential for impacts to the sustainability of these features.

Fish and Aquatic Wildlife Habitat

There are no fish or amphibian SAR species identified in the Harmony Creek and Farewell Creek tributaries associated with the Clarington TS project area; however, these tributaries likely contribute to seasonal fish habitat (Stantec, 2012). As water levels appear to be limited during summer months, fish may be limited to utilizing reaches downstream of the property. The potential changes to tributaries in the project area (i.e., installation of watercourse crossings) is not anticipated to affect fish communities downstream as flow through the culverts will be maintained in a similar pattern to the existing channel. Hydro One will consult with CLOCA when determining the size, type and location of any watercourse crossings required for the proposed project. Any watercourse crossing permit requirements and construction timing windows for coldwater streams will be determined in consultation with CLOCA.

Sediment introductions into the watercourses from work being completed in and adjacent to the watercourse can also cause potential impacts to fish habitat. Erosion and sedimentation will be prevented by installing appropriate erosion and sediment control measures prior to the start of construction as per the Hydro One (2009) “Environmental Guidelines for Construction and Maintenance of Transmission Facilities” and the Erosion and Sedimentation Control Guideline for Urban Construction (Greater Golden Horseshoe Area Conservation Authorities, 2006). Additional measures that will be implemented include:

- In-water work will comply with the MNR timing window (July 1 to September 15). Any works done within this timeframe which may cause adverse effects will be mitigated in discussion with CLOCA; Erosion and sediment controls will be erected;
- No laydown area, storage areas or refuelling will occur within 100 metres of any watercourse;
- Spill response plans will be in place during the construction and operation phases of the station;

- Construction ditching will be in place prior to site preparation;
- Stockpiles will be located away from watercourses and will contain their own erosion and sediment controls;
- Work areas will be restricted in size to retain compatible vegetation;
- Access mats will be used to eliminate soil exposure and potential erosion; and
- Restoration plantings will occur on affected areas.

Wetlands

No Provincially Significant Wetlands occur either within or adjacent to the project area. No non-designated wetlands were identified within the project area that warrant a significant wetland designation. Regulations of the PPS do not apply to these wetlands; however, the wetlands are protected by the policies of the ORMCP (2002), Greenbelt Plan (2005) and Municipality of Clarington Official Plan (2012).

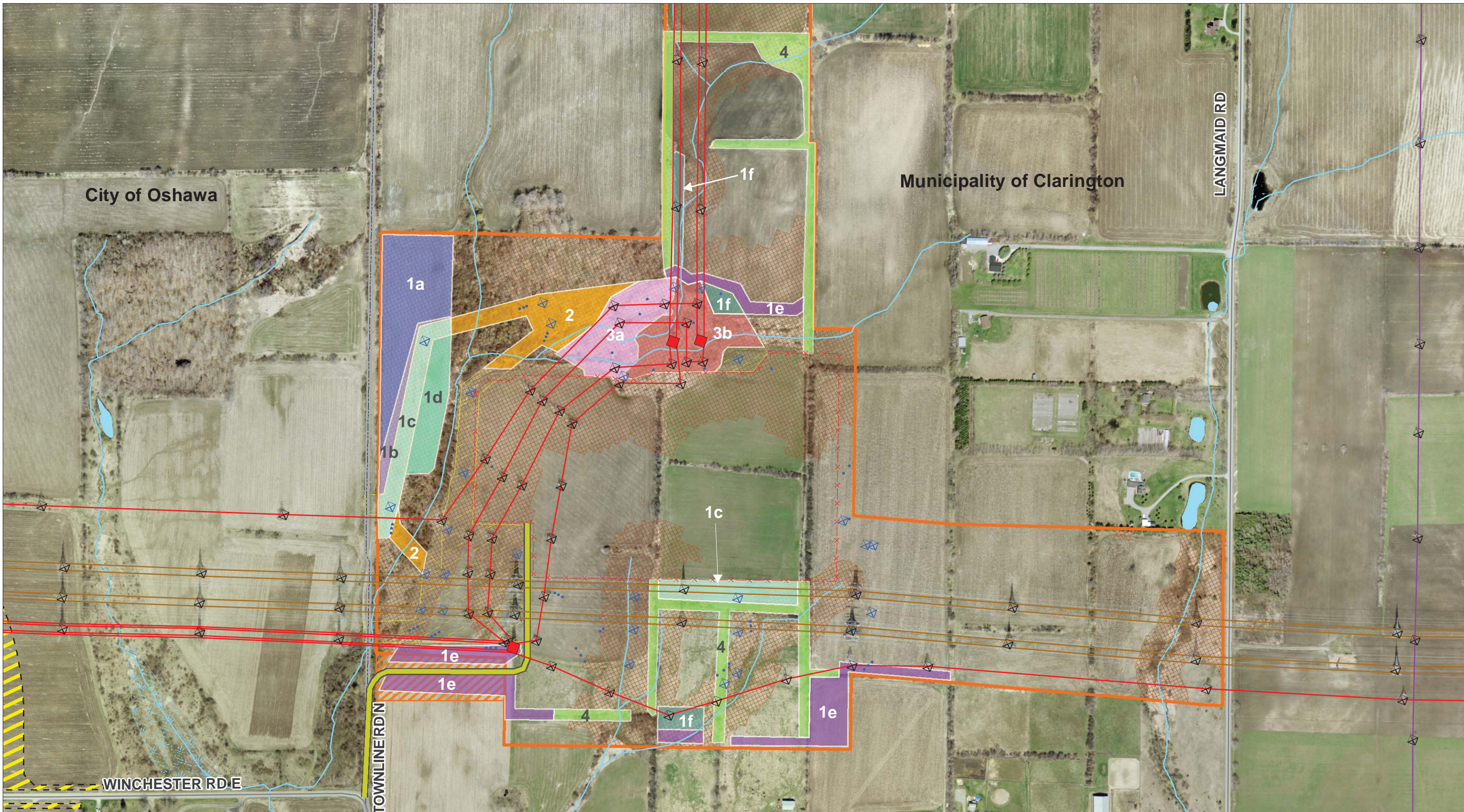


Figure 7-2

hydro one inergi

Produced By: Inergi LP, GIS Services
 Date: July 25, 2013
 Fig7-2_Map12-02_ClaringtonTS_HabitatCreation_VisualScreeningPlan
 (C) Copyright Hydro One Networks Inc. All rights reserved. No part of this drawing may be redistributed or reproduced in any form by any photographic, electronic, mechanical or any other means, or used in any information storage or retrieval system. Neither Hydro One Networks Inc. nor any of its affiliates assumes liability for any errors or omissions.
 Source for Future Highway 407 - Municipality of Clarington, 2012
 Produced by Hydro One under Licence with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2009
 NOT TO BE REPRODUCED OR REDISTRIBUTED CONFIDENTIAL TO HYDRO ONE NETWORKS INC.

Existing Structures	Roads	New Tower Structures	Station Fence Line	New 230 kV ROW
230 kV Junctions	Access Road (Approximate Location)	Watercourses	CLOCA Natural Heritage System Opportunity Area	Habitat Creation Area (1)
Transmission Lines	Future Highway 407	Water	Temporary Disturbance Mitigation (3)	Construction Activity Area (2)
44 kV	Hydro One Property	Wetlands	Hedgerow Enhancement (4)	
230 kV	Future Land Purchase (Optional)	Municipal Boundary		
500 kV				

Clarington TS - Habitat Creation and Visual Screening Plan

1:5,000

0 0.1 0.2 km

7.3 Socio-Economic Environment

7.3.1 Land Use Planning Conformance

Hydro One projects are designed to respect the natural environment while still ensuring the safe and reliable delivery of electricity in Ontario. The Clarington TS is required to conform with the Durham Regional Official Plan (2008), Municipality of Clarington Official Plan 1996 (April 2012 Office Consolidation), Oak Ridges Moraine Conservation Plan (ORMCP) (2002), and the Greenbelt Plan (2005).

The site for Clarington TS is zoned as Agriculture and designated as Utility within the Municipality of Clarington Official Plan 1996 (April 2012 Office Consolidation). This allows for the development of transmission facilities providing the need is demonstrated and all reasonable alternatives have been explored. Similarly, the Oak Ridges Moraine Conservation Plan (ORMCP) (2002), and the Greenbelt Plan (2005) also allow for utility infrastructure in all land use designations provided that the need is demonstrated and all reasonable alternatives have been addressed. Where the Project is situated on the Oak Ridges Moraine, Hydro One is required to conform to Section 41 of the ORMCP.

Durham Regional Official Plan Conformance

Electric power facilities are permitted in all Durham Regional land use designations. The project area is designated Prime Agricultural Areas and Oak Ridges Moraine Areas in the Durham Regional Official Plan. Existing transmission lines are also shown on Schedule “A” – Map “A5” of the Regional Structure land use schedule. Key natural and hydrologic features are identified on the subject property and are shown on Schedule “B” – Map “B1E” Greenbelt Natural Heritage System & Key Natural Heritage and Hydrologic Features schedule in the Durham Regional Official Plan.

Policies 5.2.5 through to 5.2.8 of the Regional Official Plan address the requirements for new utility facilities.

Policy 5.2.5

Hydro One has taken into consideration the location, design and construction of utilities and that negative impacts and constraints on the natural built and cultural environments will be minimized. This is further detailed when discussing ORMCP requirements. The Clarington Transformer Station (TS) is located adjacent to existing transmission infrastructure, thereby addressing a primary consideration of this policy section. As described in **Section 3.2.1** of the ESR (ESR), Ontario Hydro installed the first 230 kV circuit in the project area in 1928, with three additional circuits installed in 1929, and the fifth 230 kV circuit installed in 1932. The property was expropriated in 1978 for the purpose of installation of the now existing two double 500 kV circuits rights-of-way (ROW) and a future transmission station.

Policy 5.2.6

To meet the requirements of the *Environmental Assessment Act (EA Act)*, Hydro One followed the Ontario Hydro (1992) Class Environmental Assessment for Minor Transmission Facilities (Class EA) process, which is approved under the *EA Act*. The Project falls within the definition of the project covered under this Class EA.

Policy 5.2.7

Hydro One has prepared their draft ESR in accordance with the requirements of the Class EA process. Hydro One has carried out the Class EA in conformance with all other applicable land use plans and regulatory requirements.

Policy 5.2.8

Hydro One has consulted the Regional Municipality of Durham since the onset of the project and will do so until the project has been completed.

Greenbelt Plan

As indicated in the letter received from the Regional Municipality of Durham Planning and Economic Development Department received December 19, 2012:

The Greenbelt Plan recognizes that “Infrastructure is important to the economic well-being, human health and quality of life in southern Ontario and the Greenbelt.” The Plan also states that “Existing

infrastructure must be maintained and new infrastructure will be needed to continue serving existing and permitted land uses within the Greenbelt.” The Plan further recognizes that “major infrastructure servicing national, provincial and inter-regional needs traverses the Greenbelt” and that “new and or expanded facilities will be needed in the future to serve the substantial growth projected in Southern Ontario.”

Hydro One is required to serve existing and future needs of the transmission infrastructure through the operation of the station.

Hydro One understands that Policy 4.2.1.2d of the Greenbelt Plan requires that “new or expanding infrastructure shall avoid key natural heritage features or key hydrologic features unless need has been demonstrated and it has been established that there is no reasonable alternative.” Hydro One describes in the “Oak Ridges Moraine Conservation Plan” section below the need for the Project, why there is no other reasonable alternative for the station and how Hydro One has minimized the effects on key natural heritage and hydrologic features.

Under Policy 4.2.1.2e it mentions that “where infrastructure does cross the Natural Heritage System or intrudes into or results in the loss of a key natural heritage feature or key hydrologic features, including related land-form features, planning, design and construction practices shall minimize negative impacts and disturbance on the features or their related functions, and where reasonable, maintain or improve connectively”. Clarington TS will be constructed and operated to minimize any negative impacts on sensitive environmental features and functions in the area, including the key natural heritage and hydrologic features. With respect to the effects on key natural heritage features, Hydro One continues to work with CLOCA, the Municipality of Clarington and MNR to develop a Habitat Creation and Enhancement Plan. Regarding hydrologic features, Hydro One does not consider that either the hydrogeologic or hydrologic functions will be affected in any negative manner. However, Hydro One will be undertaking groundwater and well monitoring pre, during and post construction for a period of two years.

Oak Ridges Moraine Conservation Plan

Within the project area, the agricultural land within the ORMCP is designated as Countryside Area, while the natural features are designated as Natural Linkage Areas. The portions of the project area which are outside the ORMCP are governed by the Greenbelt Plan and are designated as Protected Countryside. The Project, as defined under the ORMCP, is not development or site alteration but is an infrastructure/utility use. To conform to the requirements of the ORMCP under Section 41, Hydro One must demonstrate the need for the project and that there is no other reasonable alternative to the station.

The Need

As described within **Section 1.1**, the OPA has recommended that Hydro One develop an implementation plan to transmit a corresponding amount of power lost in the East Greater Toronto Area when the Pickering NGS is retired.

Reasonable Alternatives

As described in **Sections 1.3** and **4.6.2**, during the course of the Class EA process, no other alternative was considered technically or economically reasonable. The *EA Act* requires consideration of reasonable alternatives.

Additional ORMCP Requirements – Minimize and Mitigate Adverse Effects

Hydro One has also demonstrated within the ESR that it will undertake the requirements as outlined in Section 41 of the ORMCP. These requirements and the corresponding sections of the ESR are as follows:

1. The area of construction disturbance will be kept to a minimum – refer to **Sections 6.2, 7.2 and 7.3.3** and **Table 7-1**.
2. Right of way widths will be kept to the minimum that is consistent with meeting other objectives, such as stormwater management, and with locating as many infrastructure and utility uses within a single corridor as possible – refer to **Section 7.2**.

Through the use of taller towers and shorter spans (distance between towers) the loss of tree cover vegetation (1.5 ha) has been reduced by approximately 35% over standard transmission designs. Other measures that will be undertaken to reduce adverse effects resulting from the reconfiguration of transmission lines include:

- Restricting construction equipment access along the ROW within the woodlot and minimizing the travel/work areas to maximize retention of compatible vegetation.
 - Installing taller towers to allow for greater shrub heights
3. The project will allow for wildlife movement. Restoration planting to offset the woodland area loss will be primarily located adjacent to the significant woodland to the west. The planting area will provide an east-west linkage from the significant woodland to the forested areas west of Townline Road North – refer to **Section 7.2**.
 4. Lighting will be focused downward and away from Natural Core Areas. There will be minimal lighting on site during the evening hours. This lighting is for emergency measures and will be directed away from natural core areas – refer to **Table 7-1**.
 5. The planning, design and construction practices adopted will keep any adverse effects on the ecological integrity of the ORMCP Area to a minimum – refer to **Sections 7.1.2, 7.2 and Table 7-1**.
 6. The design practices will maintain, and where possible improve or restore, key ecological and recreational linkages. The Habitat Creation and Enhancement Plan considers key ecological and recreation linkages and will be developed in concert with CLOCA, the MNR and other interested parties – refer to **Section 7.2 and Table 7-1**.
 7. The landscape design will be adapted to the circumstances of the site and use native plant species as much as possible, especially along rights of way – refer to **Section 7.3.4 and Table 7-1**.

8. The long-term landscape management approaches adopted will maintain, and where possible improve or restore, the health, diversity, size and connectivity of the hydrologically sensitive features – refer to **Section 7.2** and **7.3.4**, and **Table 7-1**.

Hydro One will continue to consult with key agencies and stakeholders regarding commitments and conformities with land use plans and regulatory requirements, including, but not limited to the Regional Municipality of Durham, Municipality of Clarington, City of Oshawa, MNR, and CLOCA.

7.3.2 Public Safety and Traffic Control

Any construction poses a potential safety hazard if not properly controlled. The operation of heavy construction equipment represents a potential hazard to the public. Hydro One's Corporate policy states that "everyone will make safety a primary consideration in every decision that is made and every action taken." Hydro One mitigates safety issues by implementing safety measures during construction.

Hydro One is committed to ensuring the public's safety. Corporate policy states that "we will promote public awareness and education of safety issues related to our electrical facilities and we will comply with all legal requirements and follow good utility work practices to protect the public." To minimize the effect of construction on public safety, the location of the construction lay-down and access will be carefully selected. Construction areas will be signed and fenced, where appropriate.

Regional Works, Durham Regional Police Services and the Durham Emergency Measures Office, and the Municipality of Clarington Fire Services will be consulted on the following types of activities:

- equipment transportation routing
- traffic
- access
- emergency response
- security
- other site planning activities

All work will be governed by the Hydro One Health, Safety and Environmental System policies and procedures. An ERP will govern work during station construction and operation.

Perimeter fencing will enclose the station and will be maintained to prevent public access.

Hydro One will continue to make available information about the project through notification and a pre-construction PIC. This will include, but not be restricted to:

- a description of construction activities and schedule;
- construction routes;
- road closures, as required; and
- Hydro One contact numbers.

Traffic disruptions at the construction entry/exit location may occur during construction. Hydro One will develop a traffic management plan with the Municipality of Clarington and the City of Oshawa, as well as monitor and respond to any resident and motorist complaints. To minimize disruption and/or delays to local traffic and emergency public safety services, advance notice will be provided to municipal emergency response units. Where appropriate, traffic control officers will be assigned to assist construction vehicle entry and exit. Hydro One will make best efforts to schedule construction activities in order to minimize adverse effects on local traffic.

7.3.3 Agricultural Resources

The station site is located on land that has been cleared for agricultural purposes. The site has been actively cultivated for many years. As indicated in **Section 3.1.1**, the soils in the project area are 80% Class 1 with no significant limitations for agricultural production and 20% Class 4 with severe limitations due to adverse topography.

To the extent possible, construction areas will be selected to minimize long-term loss of crop producing areas. The total area of cultivated land affected by the proposed TS project including the permanent access road will be about 16.4 ha. Agricultural land that is cleared or

damaged during construction, including temporary warehousing areas, will be restored after construction is complete. Approximately 4 additional hectares of existing agricultural land will be converted as part of the Habitat Creation and Enhancement Plan. Restoration techniques will be based on the Hydro One (2008) Environmental Guidelines for the Construction and Maintenance of Transmission Facilities, and any habitat creation work will be maintained and preserved as part of Hydro One's restoration compensation commitments. Hydro One will continue to contract the land outside the station fence to local farmers or agricultural interests for continued production (with the exception of habitat creation areas).

7.3.4 Appearance of the Landscape

The proposed vegetation planting of the TS site will provide some screening of the station from the surrounding neighbouring properties and the public. The vegetation will consist of native coniferous and deciduous plantings of trees and shrubs along the station south, east and partially north property edges. Where existing hedgerows are remaining, they will be augmented to provide a better visual buffer of the station.

In consultation with CLOCA and the MNR, replacement plantings will be undertaken and existing natural linkages will be enhanced through the planting of native species found at the site. Butternut trees will also be planted on the west side of the site and may be used in the future for the Butternut Recovery Program.

The installation of the proposed station will change the current landscape character in some measure. However, given the presence of 230 kV and 500 kV transmission lines, over time the station will blend into the existing transmission infrastructure.

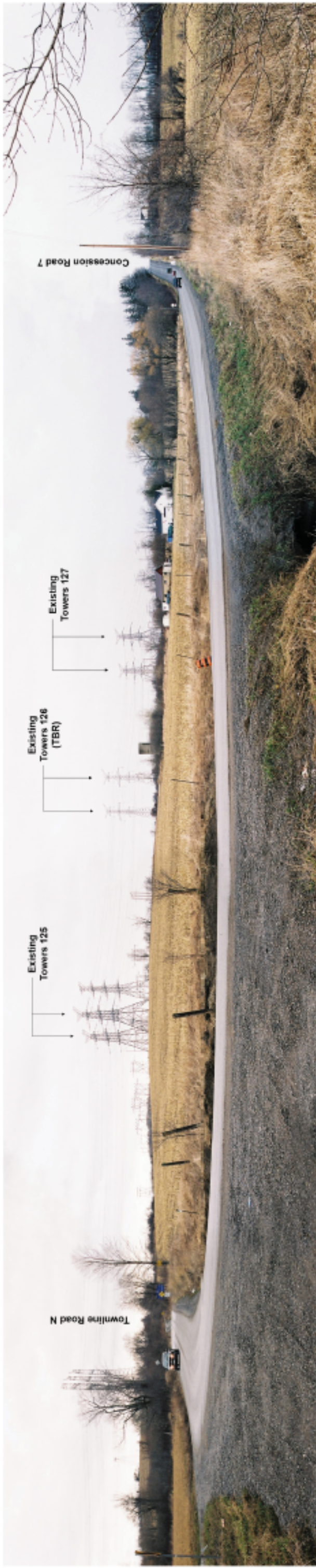
The proposed plantings will mostly surround the new transformer station with a ribbon of natural greenery. Public views of the proposed project will mostly been screened by this green ribbon and roadside vegetation. Views from neighbouring properties will also be screened however, the station is large and the equipment in the station yard may not be fully screened from certain vantage points. Where views will be affected are from those neighbouring properties that are located on a higher elevation and therefore may look 'down'

onto the station if viewed from a second storey. Given the presence of the existing 230 kV and 500 kV transmission lines the proposed project will blend into the existing infrastructure.

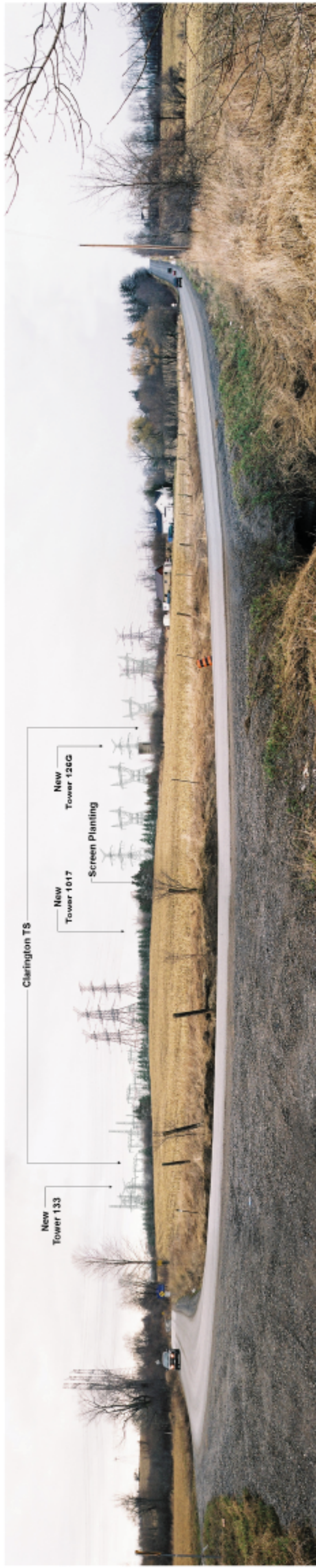
Please refer to **Figures 7-3 to 7-6** for comparisons of the existing condition and post-development simulation.

Figure 7-3: Photo Simulation – View looking Northeast from Townline Rd N and Concession Rd 7

EXISTING CONDITIONS



PROPOSED CONDITIONS



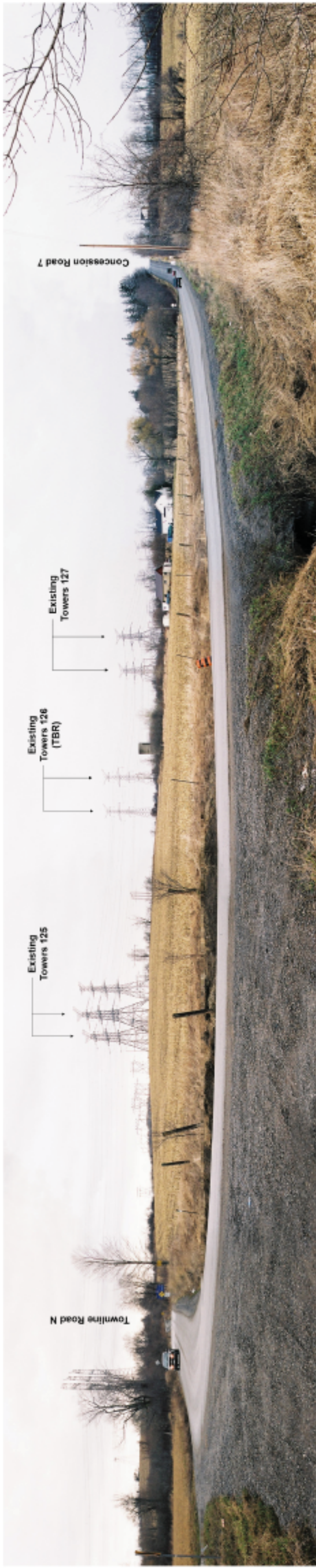
CLARINGTON TS CAMERA 01 PHOTO SIMULATION - VIEW LOOKING NORTHEAST FROM TOWNLINE ROAD N and CONCESSION ROAD 7

NOVEMBER 2012

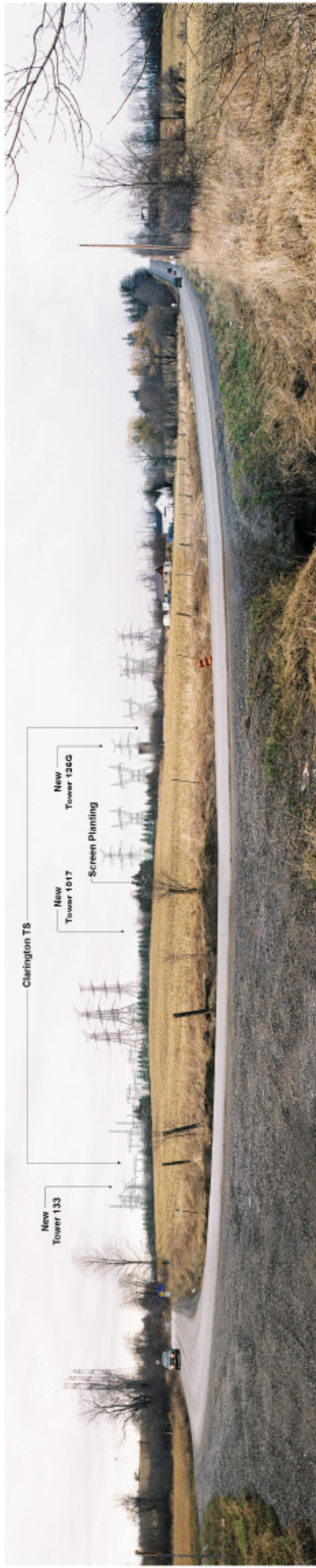


Figure 7-3: Photo Simulation – View looking Northeast from Townline Rd N and Concession Rd 7

EXISTING CONDITIONS



PROPOSED CONDITIONS



CLARINGTON TS CAMERA 01 PHOTO SIMULATION - VIEW LOOKING NORTHEAST FROM TOWNLINE ROAD N and CONCESSION ROAD 7

NOVEMBER 2012



Figure 7-4: Photo Simulation – View looking West from Langmaid Rd

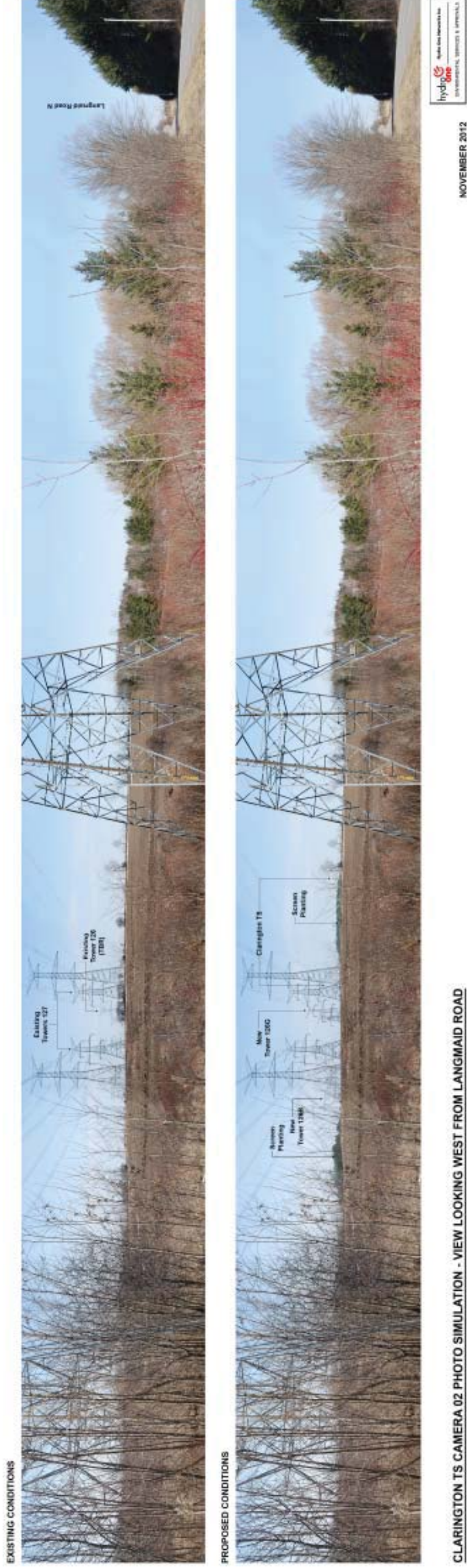


Figure 7-5: Photo Simulation – View looking South from Regional Rd 3



CLARRINGTON TS CAMERA 03 PHOTO SIMULATION - VIEW LOOKING SOUTH FROM REGIONAL ROAD 3

NOVEMBER 2012



7.3.5 Recreational, Mineral and Forestry Resources

There are no recreational, mineral and forestry resource impacts as a result of the proposed project.

7.3.6 Cultural Heritage Resources

The overall views of the project site from adjacent properties that are located at the edge of and outside the study area will be changed to some degree. By providing plantings that enhances the natural settings and reinforcing the edges of agricultural fields, the project site will have elements characteristic of the cultural heritage landscape that is found in the study area.

Using native species existing in the study area, the new plantings will have similar characteristics as the existing vegetation. Linkages will be created to connect the existing natural areas to the woodlands located within the project and study area. By providing this type of planting, the project area maintains and continues these natural settings. Planting vegetation along the edges to augment and enhance the existing hedgerows, the views will resemble the typical agricultural landscape as described in **Section 3.2.3** Appearance of the Landscape (Visual Appearance).

The above proposed vegetation and restoration works within the project area will mitigate views of the study area with minimal affect to the cultural heritage landscape. Views from surrounding properties will be similar to current views of agricultural fields with hedgerow edges. As discussed earlier, the station is large and views from certain vantage points of the station are unavoidable (i.e., from a higher elevation than the project site). However, the overall landscape views of the project and study area will be similar or closely resembling the current views of this landscape.

Details of the proposed vegetation and location of planting will be developed with consultation with the CLOCA, Municipality of Clarington and the City of Oshawa. Further field investigation and view assessments will be completed during construction and once the

station is constructed to identify any unwanted views and mitigation, where possible, is needed. A final vegetation mitigation plan will be completed.

Should any artifacts be uncovered during construction, a licensed archaeologist will be contracted to assess significance and if necessary develop an appropriate plan of action including notification of the MTCS, First Nations and Métis Communities.

Table 7-1: Summary of Potential Effects, Mitigation Measures and Residual Effects

Environmental Component	Potential Effects	Proposed Mitigation	Residual (Net) Effect
SHORT TERM EFFECTS			
Releases to the Environment			
Environmental noise	<p>There is potential for noise emissions from site preparation and construction activities.</p> <p>Effects on noise will be temporary and limited to the site preparation and construction periods.</p>	<ul style="list-style-type: none"> • Maintain equipment to ensure that operation conforms to normal air and noise parameters. • Noise and vibration are taken into account when deciding on equipment and work methods. • All work will conform with the municipal noise by-law (i.e., Municipality of Clarington by-law 2007-071). • Equipment will conform with NPC-115 publication from MOE • Inform local residents and businesses if activities need to be extended to facilitate their completion. 	No residual effects are predicted.
Air Quality	Exhaust emissions from vehicles	<ul style="list-style-type: none"> • Equipment is maintained to minimize exhaust • Hydro One Fleet Services has an Environmental Program which includes anti-idling and GPS installation in vehicles 	No residual effects are predicted
	Particulate Emissions (dust)	<ul style="list-style-type: none"> • Use effective dust suppression techniques, such as on-site watering and street cleaning. 	No residual effects are predicted.
Solid Waste	Solid waste will be generated during construction.	<ul style="list-style-type: none"> • Test all solid waste for proper waste classification. • Solid waste will either be recycled or disposed at a licensed landfill. 	No residual effects are predicted.
Mud	There is potential for mud from the	<ul style="list-style-type: none"> • Mud will be removed from roads, as required. 	No residual effects are

Environmental Component	Potential Effects	Proposed Mitigation	Residual (Net) Effect
	<p>site preparation and construction activities.</p> <p>Mud will be temporary and limited to the site preparation and construction periods.</p>	<ul style="list-style-type: none"> • Mud mats may be installed 	<p>predicted.</p>
Groundwater and Stormwater	<p>There is a potential to encounter groundwater during site preparation and stormwater will be encountered during construction.</p>	<ul style="list-style-type: none"> • Develop dewatering protection measures during the detailed engineering phase of the project. • Temporary perimeter ditches will encompass the construction site until the installation of permanent ditches to control stormwater and limited erosion and sedimentation. • Contain all collected water (i.e. pump-out water) until tested for disposal. • Conduct water testing during construction, as required prior to disposal. • Obtain Permit-To-Take-Water (PTTW) for dewatering greater than 50,000 L/day if required. 	<p>No residual effects are predicted.</p>
Spills	<p>Incidental spills of oil, gasoline and other liquids during construction.</p>	<ul style="list-style-type: none"> • Implement appropriate clean-up measures as per the ERP. • All refuelling or lubrication of equipment at least 120 metres away from waterbodies. • Refuelling to be undertaken in a designated location. • Locate spill kits in potential spill locations (i.e. refuelling locations). 	<p>No residual effects are predicted.</p>

Environmental Component	Potential Effects	Proposed Mitigation	Residual (Net) Effect
Erosion	Soil may be lost during site preparation owing to rainfall. This loss may result in the sedimentation of adjacent natural features	<ul style="list-style-type: none"> • Temporary perimeter ditches will encompass the construction site until the installation of permanent ditches. • A Sediment Control Plan will be implemented in conformance with Greater Golden Horseshoe Area Conservation Authorities Erosion and Sedimentation Control Guideline for Urban Construction (2006) 	No residual effects are predicted.

Environmental Component	Potential Effects	Proposed Mitigation	Residual (Net) Effect
Socio-Economic			
Traffic	Short-term disruption of traffic in project vicinity due to equipment and materials delivery and worker vehicular traffic.	<ul style="list-style-type: none"> • Provide advance notice to the Municipality of Clarington emergency response units. • Develop traffic control plan with approval from the Municipality of Clarington and the City of Oshawa. • Erect road signage and provide notification/pre-construction PIC to area residents on timelines and construction route. • Where appropriate, assign traffic control officers to assist construction truck entry and exit. • Provide proper training, safety attire and equipment to the traffic control officers. 	No residual effects are predicted.
Public safety	Public could be potentially exposed to typical construction hazards in the vicinity of the construction areas.	<ul style="list-style-type: none"> • Construction areas to be signed, fenced and locked where necessary. • The location of the construction lay-down and access areas to be carefully selected to minimize any potential effect on public safety. • The construction schedule to be discussed with the municipal planning staff and provided to the local emergency services. • Nearby residents to be informed prior to construction. 	No residual effects are predicted.
Archaeological and cultural heritage resources	Based on Stage 2 & 3 archaeological assessments (ASI, 2012) no effects are predicted.	<ul style="list-style-type: none"> • Should any artifacts be found during construction, all work will be halted and Hydro One will contact MTCS and the First Nation and Métis Communities. 	No residual effects are predicted.

Environmental Component	Potential Effects	Proposed Mitigation	Residual (Net) Effect
	No built heritage and cultural heritage landscapes are present and no effects are predicted.	<ul style="list-style-type: none"> Continued cooperation with the MTCS and the Municipality of Clarington Visual effects on neighbouring properties cannot be mitigated during construction. 	<p>No residual effects are predicted.</p> <p>No significant effects are predicted.</p>
Visual Aesthetics	Visual aesthetics during construction	<ul style="list-style-type: none"> Visual effects on neighbouring properties cannot be mitigated during construction. 	<p>No residual effects are predicted.</p> <p>No significant effects are predicted.</p>
LONG TERM EFFECTS			
Releases to the Environment			
Environmental Noise	Noise emitted by the transformers during operation	<ul style="list-style-type: none"> The station will be designed to comply with provincial regulations. The station will be approved under the Environmental Protection. Acoustic barriers will be installed as required to meet MOE requirements under the <i>EPA</i>. 	<p>No residual effects are predicted.</p>
Natural Environment Features			
SAR	Removal of retainable butternut trees.	<ul style="list-style-type: none"> Obtain approval for a Butternut Planting Plan under SAR legislation. 	<p>No residual effects are predicted.</p> <p>The Plan will provide a net benefit.</p>
Terrestrial features	Vegetation removal and displacement of nesting birds	<ul style="list-style-type: none"> Clearly demarcate limits of vegetation removal. 	<p>No residual effects are predicted.</p>

Environmental Component	Potential Effects	Proposed Mitigation	Residual (Net) Effect
		<ul style="list-style-type: none"> • Obtain tree cutting permits from the Region of Durham, Planning and Economic Development Department. • Fell all trees parallel with existing corridor. • Dispose of all woody material. • Vegetation clearing outside of migratory bird nesting season (May 1 to July31), if practicable. Otherwise, conduct a pre-construction survey to identify breeding bird nests and determine buffer requirements. • No disturbances of nests found until young have fledged. • Confine construction access to maximize retention of compatible vegetation. • Lighting will be focused downward and away from Core Natural Areas. • Restorative planting under transmission lines with compatible native species. • Restorative planting adjacent to the project area at a 2:1 ratio of area of trees removed to area planted. Efforts will be made to create/enhance natural linkages between forested areas, as determined through consultation with CLOCA and MNR. 	<p>Restorative planting would provide long-term net benefit regarding increased linkage and woodland size.</p>
Aquatic features	Watercourse crossings (temporary and permanent) will be required for construction and maintenance purposes.	<ul style="list-style-type: none"> • Installation of proper creek crossing devices (i.e., culverts) as determined through consultation with CLOCA. • Equalization culverts may be used in low-lying wet areas. 	No residual effects are predicted.

Environmental Component	Potential Effects	Proposed Mitigation	Residual (Net) Effect
		<ul style="list-style-type: none"> • All equipment and material is stored or stockpiled away from water. • To mitigate the impacts on fish and aquatic wildlife, in water work will comply with CLOCA's timing window, and will mitigate any impacts from work conducted outside of July 1 to September 15. 	
	Creek bank erosion and/or sedimentation of creek due to work near watercourses.	<ul style="list-style-type: none"> • Sediment control devices are to be installed to control sedimentation of watercourses in conformance with Greater Golden Horseshoe Area Conservation Authorities Erosion and Sedimentation Control Guideline for Urban Construction (2006). • Where possible, retain vegetative buffers and selective cutting of trees near watercourses. 	No residual effects are predicted.
	Vegetative removal adjacent to creek banks.	<ul style="list-style-type: none"> • Restorative planting along creek banks with compatible native species, as determined through consultation with CLOCA and MNR. • Restrict construction activity to creek banks and erect protective barriers. 	No residual effects are predicted.
	Creek bank erosion and/or sedimentation of creek due to station drainage outfall.	<ul style="list-style-type: none"> • Vegetation replacement with native species along watercourses. • Seed all areas between the station fence and watercourse to increase the vegetative buffer. • Station drainage outfall designed to dissipate energy of discharge and eliminate erosion of drainage channel. • Discharge flow designed to meet 	No effects are predicted.

Environmental Component	Potential Effects	Proposed Mitigation	Residual (Net) Effect
		preconstruction flows to watercourse.	
Socio-Economic			
Visual Aesthetics	Public views of the station from adjacent properties and roadways.	<ul style="list-style-type: none"> Existing hedgerows will be augmented to increase the screening of the station 	Low residual effects are predicted.
	Views of the proposed station from area residents.	<ul style="list-style-type: none"> Additional planting of native trees and shrubs will be located along the project area limits where possible to provide screening from adjacent landowners and the public. 	Diminishing effect as vegetation matures
Agriculture	Loss of agricultural land	<ul style="list-style-type: none"> Designate lands still suitable for agricultural use after construction Restore all designated lands as required for agricultural use Enter into contracts for agricultural use of lands with tenant farmers 	No residual effects are predicted.
Hydrology	Contamination of well/groundwater from spills	<ul style="list-style-type: none"> See Spills Installation of transformer containment and oil/water separator Drainage application to MOE, including containment subject to an ECA for Sewage Works Glacial till retards water penetration (low aquifer vulnerability area) Sample monitoring wells on a regular basis. 	No residual effects are predicted.