

7.0 Potential Environmental Effects and Mitigation

This section describes the potential environmental effects that may occur due to construction, operation and maintenance associated with the proposed Duart Road TS and the recommended mitigation measures that would be applied to minimize these effects and address public concerns. These are described in terms of short-term or long-term potential effects in **Tables 7-1 and 7-2**. The mitigation measures are consistent with the requirements of Hydro One's *Environmental Guidelines for the Construction and Maintenance of Transmission Facilities* (Hydro One 2009).

7.1 Biological and Natural Environment

7.1.1 Environmentally Significant Areas

A number of environmentally significant areas (ESAs) have been identified in close proximity to the study area including Taylor Pond Wetland Complex, Taylor Pond, South Rodney Woods, Highgate Rail Road Prairie West and the Highgate Rolling Sandland (See **Section 3.2.1**). As none of these ESAs is in the study area or in close proximity to the proposed Duart TS site, no potential effects are predicted on ESAs.

7.1.2 Species at Risk

Based on information from the MNR NHIC (2008a) database, no species at risk (neither vegetation nor wildlife) occur on or adjacent to the proposed Duart TS site. Thus, no potential effects are predicted to any species at risk.

7.1.3 Terrestrial Features

The proposed Duart TS would be constructed on agricultural land now in use as a corn system. Thus no potential effects are predicted on natural vegetation species or wildlife habitat.

7.1.4. Aquatic Features

The nearest watercourse to the proposed Duart TS is located approximately 170 m away, and thus no potential effects are predicted.

The site for the proposed Duart TS would have a Drainage Plan and a spill containment system which require approval from MOE. Hydro One also would consult with the municipality and the MTO on this in developing the final plans. Post-construction activities will also involve the restoration of surface drainage ditches at the site to their original grade and condition, as required.

7.2 Socio-Economic Environment

The majority of the potential social effects are expected to be encountered during the construction phase of the project. During operation and maintenance phases of the project, the potential effects are expected to be much less significant.

7.2.1 Local Resident/Property Owner Concerns

During construction of the proposed Duart TS project, adjacent property owners and passing vehicles could be affected by noise, dust, traffic disruptions, lane closures and other construction related nuisances. Construction activities are expected to begin in April 2010 and are expected to continue over approximately a 15 month period, with the finish and in service date to be June 30, 2011. At the operational and maintenance phases for the proposed project, potential affects are less significant and could be associated with visual interference posed by the Duart TS or the presence of occasional maintenance vehicles.

Noise and dust related effects during construction are expected to occur. They will be mitigated by use of water sprays to suppress dust and the construction equipment used will be properly maintained to minimize noise and other (e.g. exhaust) emissions. After construction, the proposed Duart TS will be remotely operated, so routine vehicle traffic will be minimal.

Local roads will be used during construction. If there is demonstrated deterioration of local roads due to Hydro One vehicles then Hydro One will undertake the necessary repairs. Hydro One will conduct a condition assessment up front, and will ensure that the post-development conditions are equal to or better than pre-development.

The proposed Duart TS will be located approximately 280 m from the nearest home. A 10-15 m landscaping buffer will be provided to reduce the visual obstruction created by the proposed Duart TS to local residents and passing vehicles on Highway 401. The landscape treatment will reflect the existing character of this rural setting through the use of predominantly coniferous hedgerows and shelterbelts.

The Duart TS spill containment and drainage systems will include an oil/water separator to ensure that there is no loss of insulating oil to the surrounding environment. The TS does not use or release process waters. Runoff drainage from the construction site will be controlled to minimize release of high turbidity waters.

The proposed Duart TS is not expected to alter local property values. The primary use of the land surrounding the transformer station would still remain agricultural. The station would not be staffed as a work station, and would result in minimal traffic and disruption to area residents. Hydro One will undertake landscaping at selected locations to mitigate the potential visual impact to area residents.

In Hydro One's experience, transformer stations do not affect property value. Typically impacts are during the construction phase of the TS. Once this phase is complete, there is no evidence of decrease in property value.

There will be no increases in EMF exposure to area residents associated with the operation of Duart TS. Hydro One looks to Health Canada for information for guidelines on Electric and Magnetic Fields (EMF). Research shows that the strongest EMF around a TS comes from the lines (within the ROW), not the TS itself. This strength decreases rapidly with distance. At > 100m away from the station, EMF levels are undistinguishable from

background levels in a normal home: Please refer to our website: <http://www.hydroonenetworks.com/en/environment/emf> for links to Health Canada, the World Health Organization, and other sources of information on this subject.

Hydro One will continue to make information available about the project throughout the construction phase. This information will include:

- A schedule that includes a description of construction activities;
- Identifying periods of traffic disruptions;
- EMF updates from Health Canada (when available).
- A listing of potential effects and nuisance control measures to be used; and
- A Hydro One contact number for use by residents if questions or issues arise.

7.2.2 Air Quality and Noise

The construction of the proposed Duart TS has the potential to affect the air quality in the vicinity of the site. Emissions which are associated with construction activities are primarily dust and typical combustion emissions from construction equipment. As with any construction site, these emissions will be of relatively short duration and unlikely to have any effect on the surrounding airshed.

To reduce particulate emissions, effective dust suppression techniques, such as on-site watering and road cleaning, will be used. During construction the practices and procedures outlined in the Cheminfo (2005) document “Best Practices for the Reduction of Air Emissions from Construction and Demolition Activities”, prepared in conjunction with the Construction and Demolition Multi-Stakeholder Working Group for Environment Canada, will be followed. It is anticipated that the net effects on the local air quality during construction would be negligible and thus no other mitigative measures are required.

There will be no atmospheric emissions from the proposed Duart TS during the operation phase.

The proposed Duart TS will be a potential source of local noise during its construction phase. All work is expected to be completed using conventional construction methods. The noise associated with the construction of the proposed TS would most likely be a result of activities such as general site grading, foundation work and construction traffic. All of these activities, which are expected to take approximately 15 months, will require the use of various pieces of heavy equipment (e.g., dozers, front-end loaders, small trucks, backhoes, bobcats, dump trucks, compactors, cement trucks and/or cranes). Other construction activities, such as those related to the placement of the facility components (e.g., transformer), are expected to generate less noise. The movement of delivery and worker vehicles will also add to the sound levels during the equipment delivery and the construction period. During construction, Hydro One will try to locate access routes and lay down areas away from the residences to the extent possible. Note that background noise levels in the area are high because of the proximity to the 401 Highway.

Sound emission standards for construction equipment are set according to the date of manufacture of the equipment as defined by the MOE in the NPC-115 publication, listed in the MOE (1978) Model Municipal Noise Control By-Law. This document stipulates specific sound emission standards for various pieces of construction equipment. This Model By-Law includes a restriction on the operation of any equipment in connection with construction from 19:00 h one day to 07:00 h the next day, and all day Sunday and statutory holidays. Construction activities will adhere to this standard By Law as well as to the Corporation of the Municipality of Chatham- Kent By Law Number 41-2004.

Although Hydro One will confine construction activities to these time periods, there is a possibility that activities may be extended to facilitate their completion. Hydro One will inform local residents prior to such an occurrence.

The transformers will produce a humming sound during operation. Given the proximity to the 401 Highway, distance to nearby receptors and available technology, background noise levels in the vicinity of area homes will not change.

The four nearest representative sensitive noise receptors to the proposed transformers are shown in Figure 5/10 in Appendix F. These points of reception (POR) are residences and the closest one is approximately 350 metres away from the site.

Since some of the receptors are less than 500 metres away from the proposed site, a detailed acoustic assessment will be performed to predict potential sound levels at the receptors and included in the C of A application. If the assessment should identify levels above the MOE limits at the receptor, noise control levels will be necessary. Whether or not noise measures will be necessary will be determined by the Acoustic Assessment Report (AAR). 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 proposed site.

The Preliminary Noise Evaluation for the proposed Duart TS is provided in **Appendix F**.

7.2.3 Public Safety

Any construction site poses a potential safety hazard if not properly controlled. The public could be potentially exposed to hazards in the vicinity of construction areas. To minimize the effect of construction on public safety, the location of the construction lay-down and access areas will be carefully selected.

The effects on public safety services such as police, fire and ambulance should be minimal. No significant disruption to traffic is predicted except during transformer delivery. The proposed TS area will be fully secured to protect the public from hazards associated with construction and operation. Station fencing and security systems will be installed and maintained. Warning signs will also be posted.

The construction schedule will be discussed with Chatham-Kent planning staff and provided to local emergency services.

The TS design will minimize the potential for fires and ensure that any fires will be contained on site.

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

7.2.4 Aesthetic Effects

The proposed Duart TS will be visible to local residents in the community and for a brief time to passengers in vehicles travelling along Highway 401. The proposed TS location is partially blocked by the overpass bridge for vehicles travelling west bound, and by a woodlot for vehicles travelling eastbound on the 401. Additional visual screening of the proposed Duart TS will be provided by Hydro One. During construction, temporary office and storage facilities will be necessary. Any alteration to the landscape associated with temporary storage facilities and construction offices will be restored. As well, any private lands near the TS property that are damaged during construction will be restored after construction is complete.

A Landscape Plan will be developed in cooperation with municipal staff and the MTO during the design phase of the project. A 10-15 m landscaping buffer will be installed around the proposed Duart TS to minimize the visibility of the proposed TS to local residents. The landscape treatment will reflect the existing character of this rural setting through the use of predominantly coniferous hedgerows and shelterbelts. Landscape plans are a component of the municipal site plan development process.

7.2.5 Agriculture and Soils

The proposed Duart TS site is located on land that has been cleared for agricultural purposes. The site has been actively cultivated for many years and now is used as a corn system.

To the extent possible, construction areas will be designed to minimize long-term loss of crop producing areas. The total area of cultivated land affected by the proposed Duart TS

and permanent access road will be approximately 3.5 ha. If interest is expressed, Hydro One will lease the surplus portion of the land for agricultural purposes after construction is complete and the station is in service. A portion of the land would be used for implementing a visual screening system to be developed in cooperation with municipal officials and MTO. Any private lands near the Duart TS property that are damaged during construction will be restored after construction is complete. Restoration techniques will be based on the Hydro One (2009) *Environmental Guidelines for the Construction and Maintenance of Transmission Facilities*.

The mitigation measures that will be put in place to minimize potential effects on agriculture and soils on the Duart TS property and nearby lands are as follows:

- Restoration of access roads to stable conditions;
- Restoration of any soil compaction on arable land by tillage and/or crop treatment depending upon the wishes of the owner;
- Construction of farm gates and maintaining integrity of fence enclosures;
- Regular clean-up of construction material and debris;
- Temporary fencing of excavations;
- Use of fences and barriers to exclude livestock from certain locations;
- Ensure that all excavations are properly filled in at completion of the work; and
- Compensation for any damage to farm equipment and livestock injury.

7.2.6 Forest Resources

The proposed Duart TS will be located on previously cleared land now in agricultural production and will not result in any effects on local area forest resources.

7.2.7 Mineral Resources

The proposed Duart TS will not be located on a mineral resource site. No effects on area mineral resources are predicted and no mitigation is proposed.

7.2.8 Heritage Resources

There are no buildings (cultural heritage resources) located on the Duart TS property site.

A Stage 1 Archaeological Assessment was commissioned by Hydro One. The assessment indicated that the study area has a high archaeological potential and a Stage 2 survey will be required prior to construction of the proposed Duart Rd site.

Hydro One will undertake a Stage 2 archaeological survey to confirm the presence or absence of significant archaeological resources within the preferred Duart Rd. site. This work will be carried out by licensed archaeologists in compliance with Ministry of Culture guidelines to ensure recovery, protection and documentation of any heritage resources that may be present on the project site. If potentially significant resources are found during the Stage 2 field survey, then a Stage 3 assessment will be required to determine their extent and significance. If significance is found to be high following the Stage 3 work, then mitigative measures (either site avoidance and preservation or excavation) will be taken up in consultation with the Ministry of Culture. First Nations will be notified if Aboriginal burial sites are encountered.

7.2.9 Planning Policies

Discussions with the planning departments of the Municipalities of Chatham-Kent and West Elgin have indicated that there are no planned developments within the study area. Thus, no effects due to potential interactions between such developments and the proposed TS are expected to occur.

7.2.10 Recreational Resources

The proposed Duart TS will not be located near recreational resources. No effects on recreational resources are predicted and no mitigation is required.

7.2.11 Electric Magnetic Fields (EMFs)

Questions have been raised about the potential health effects from the exposure to electric and magnetic fields (EMF) after the proposed Duart TS is placed in service.

For those concerned about potential EMF effects from existing or future facilities, the Health Canada website should be reviewed as it provides important information on the matter: http://www.hc-sc.gc.ca/iyh-vsv/environ/magnet_e.html.

It is Health Canada's conclusion that for exposures found in Canadian homes there is no risk of health effects. For example, Health Canada has stated:

- “typical exposures present no health effects”
- “At present, there are no Canadian government guidelines for exposures to EMF at extremely low frequencies. Health Canada does not consider guidelines necessary because the scientific evidence is not strong enough to conclude that typical exposures cause health problems”.

The Health Canada's Fact Sheet that addresses issues related to EMFs can be found in **Appendix J**.

Health Canada and the Federal Provincial Territorial Radiation Protection Committee (FPTRPC) have also examined this issue and have produced several documents on subject. Quotes from recent documents indicate: “the Federal Provincial Territorial Radiation Protection Committee (FPTRPC) concludes that adverse health effects from exposure to power-frequency EMFs, at levels normally encountered in homes, schools and offices, have not been established.”¹ And “it is the opinion of the Federal-Provincial-Territorial Radiation Protection Committee that there is insufficient scientific evidence showing exposure to EMFs from power lines can cause adverse health effects such as cancer. Therefore, a warning to the public to avoid living near or spending time in proximity to power lines is not required.”²

¹ The Canadian Federal-Provincial-Territorial Radiation Protection Committee, “Position Statement for the General Public on the Health Effects of Power-Frequency (60 Hz) Electric and Magnetic Fields,” January 20, 2005
<http://www.bccdc.org/downloads/pdf/rps/reports/ELF%20position%20statement%20E-050120.pdf>.

² Response Statement to Public Concerns Regarding Electric and Magnetic Fields (EMFs) from Electrical Power Transmission and Distribution Lines " - Canadian Federal-Provincial-Territorial Radiation Protection Committee, November 2008.
[http://www.bccdc.org/downloads/pdf/rps/reports/FPTRPC%20Response%20statement%20power%20line%20EMF%20\(final\)%20%2008Nov08.pdf](http://www.bccdc.org/downloads/pdf/rps/reports/FPTRPC%20Response%20statement%20power%20line%20EMF%20(final)%20%2008Nov08.pdf)

It is acknowledged that research findings are both controversial and contradictory. However, a mechanism or explanation of possible health effect has not been established. This position is supported by several extensive reviews of over 30 years of research by several respected international organizations. Although a web search can identify individual studies, independent national and international bodies that have conducted reviews of the entire body of research, are consistent with and the basis for Health Canada's and the FPTRPC positions. Hydro One relies on the recommendations of national and international bodies and not the work or claims of individuals.

Table 7-1: Mitigation Measures for the Proposed Duart Transformer Station (short-term)

Criteria	Potential Effects	Proposed Mitigation	Residual (Net) Effects
Air quality and noise	<p>Fugitive dust and typical combustion emissions from construction equipment, and increased noise levels during daytime hours associated with heavy construction equipment and worker vehicles.</p> <p>Effects on air quality and noise will be temporary and limited to the site preparation and construction periods.</p>	<ul style="list-style-type: none"> • Use effective dust suppression techniques, such as on-site watering and street cleaning. • Adhere to Cheminfo (2005) best practices to minimized effects on air quality. • Locate access routes and lay down areas away from residences to the extent possible. • Noise levels will conform to municipal noise bylaws. • Use of well maintained equipment with suitable noise controls or silences, as required. • Limit construction activities between 7am and 7 pm on weekdays and Saturdays and no construction on Sundays and Statutory Holidays. (In adherence with the Corporation of the Municipality of Chatham- Kent By Law Number 41-2004). • If activities need to be extended to facilitate their completion, local residents will be informed. 	No significant residual (net) effects are predicted.

Traffic	Short-term disruption of traffic in site vicinity due to equipment and materials delivery and worker vehicular traffic.	<ul style="list-style-type: none"> • Develop a traffic plan with municipal officials. • Plan deliveries of equipment and materials to minimize delays. • Monitor and respond to complaints from neighbours. 	No significant residual (net) effect is 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 will be signed, fenced and locked where necessary. • The location of the construction lay-down and access areas will be carefully selected to minimize any potential effect on public safety. • The construction schedule will be discussed with the municipal planning staff and provided to the local emergency services. • The nearby residents will be informed prior to construction. 	No significant residual (net) effects are predicted.
Soils	Soil erosion during construction. Agricultural land will be used to locate the proposed Duart TS and cannot be avoided as the study area is predominantly agricultural.	<ul style="list-style-type: none"> • Adhere to erosion and sediment control plan. • Restoration of access roads, drainage courses and neighbouring areas where soils might have been compacted during construction. • Width of access roads and tower sites work areas will be kept to a minimum. • Restoration techniques will be based on the Hydro One 	No significant residual (net) effects are predicted.

		(2009) Environmental Guidelines for the Construction and Maintenance of Transmission Facilities.	
Water	Stormwater discharge during construction.	<ul style="list-style-type: none"> • Implementation of the Stormwater Management Plan and adherence to MOE C-of-A for stormwater. 	No significant residual (net) effects are predicted.
Soil and water quality	Incidental spills of oil, gasoline and other liquids during construction.	<ul style="list-style-type: none"> • Adherence to Emergency Preparedness and Response Plan. • Area well monitoring before, during and after construction to confirm no effect on water quality or levels. 	No significant residual (net) effects are predicted.
Solid waste	Solid waste to be generated during construction.	<ul style="list-style-type: none"> • Use of appropriate waste collection procedures. • Waste disposal in accordance with regulatory requirements. 	No significant residual (net) effects are predicted.

<p>Aesthetics</p>	<p>Temporary lay-down areas and access routes will be visible on the landscape during the site preparation and construction periods.</p>	<ul style="list-style-type: none"> • Any alteration to the landscape associated with temporary storage facilities and construction offices will be restored. • Any private lands near the TS property that are damaged during construction will be restored after construction is complete. • Restoration techniques will be based on the Hydro One (2009) Environmental Guidelines for the Construction and Maintenance of Transmission Facilities. 	<p>No significant residual (net) effects are predicted.</p>
<p>Heritage resources</p>	<p>The proposed site is situated on agricultural land and used as a corn system.</p> <p>Hydro One will consult with Ministry of Culture (MOC), as appropriate, if any resources are found to avoid any damage to or destruction of heritage resources.</p>	<p>There are no buildings (cultural heritage resources) located on the station property.</p> <p>A Stage 2 Archaeological Assessment will be undertaken prior to construction to confirm the presence or absence of significant archaeological resources at the station site.</p> <p>If potentially significant sites are found during the Stage 2 field survey, Hydro One will complete a Stage 3 Archaeological Assessment to determine their extent and significance.</p> <p>If site significance is found to be high following the Stage 3 work, mitigative measures (either site avoidance and preservation or</p>	<p>No residual (net) effects are predicted on heritage resources.</p>

		excavation) will be taken up in consultation with the MOC.	
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Table 7-2: Mitigation Measures for Undertaking the Proposed Transformer Station (long-term)

Criteria	Potential Effects	Proposed Mitigation	Residual (Net) Effect
Agriculture	Loss of agricultural production.	<ul style="list-style-type: none"> The total area of cultivated land affected by the proposed TS and permanent access road will be about 3.5 ha. Adjacent Hydro One lands still available for agricultural production. 	No significant residual (net) effects are predicted.
Noise	The operation of the transformers will produce a humming sound and can be heard in close proximity to the transformers.	<ul style="list-style-type: none"> MOE C-of-A (noise) to be obtained. A noise study will be conducted to measure background levels and model future levels using noise simulations. Noise control will be implemented if required. 	No significant residual (net) effects are predicted.
Public safety	<p>Children or other persons could be at risk if they entered the station property.</p> <p>There is a risk of station fires.</p>	<ul style="list-style-type: none"> Station fencing and security systems will be installed and maintained. Station design will minimized the potential for fires and ensure that any fires would be contained onsite. 	No significant residual (net) effects are predicted.
Water	Stormwater discharge during operation and maintenance activities.	<ul style="list-style-type: none"> Implementation of the Stormwater Management Plan and adherence to MOE C-of-A (draining). 	No significant residual (net) effects are predicted.

Soil and water quality	Potential for release of oils or fuels during operation and maintenance activities.	<ul style="list-style-type: none"> • Adherence to Emergency Response Plan (ERP). • Implementation of appropriate clean-up measures as per the ERP. • Station will be fully equipped with spill containment and oil-water separation facilities. 	No significant residual (net) effects are predicted.
Aesthetics	The Duart TS will be visible to adjacent residents and, for a short time, to passengers driving along Highway 401.	<ul style="list-style-type: none"> • A Landscape Plan will be developed and implemented in consultation with municipal officials and the Ontario Ministry of Transportation (MTO has a road easement in the area). • A 10 to 15 m landscaping buffer surrounding the proposed TS will be installed to minimize the visibility of the station. 	No significant residual (net) effects are predicted on aesthetic values.
Wildlife	Displacement of local wildlife	<ul style="list-style-type: none"> • Any displaced wildlife will return after construction. • No species at risk present. 	No significant residual (net) effects are predicted.

