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July 12th, 2017

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Dear Ms. Goodman:

I feel honoured and privileged to have successfully completed all my required co-op work terms as stipulated by the faculty and to hereby present a report portraying the experience gained as well as giving a glimpse into the workings of the company.

The title of my report is *“Class Environmental Assessment for Minor Transmission Facilities Through the Looking Glass of Hydro One”*. I just completed my third work term with Hydro One Networks Inc. (Hydro One) located at 483 Bay Street, Toronto, Ontario, Canada. M5G 2P5. My job was designated “Environmental Planner (Co-op)” and I worked under the supervision of Farah El Ayoubi. While at Hydro One, my department was initially called “Environmental Engineering & Project Support” and later changed to “Environmental Services”.

The purpose of this report is to talk about how the Environmental Services department in Hydro One conducts its Environmental Assessment (EA) processes, which reflects the company’s value for the environment, its work ethic and obligation to fulfilling proper due diligence.

As explicit as this report shall be, I am under obligation to adhere to a confidentiality code agreed with Hydro One to not disclose confidential information which can be specifically defined as information that reveals Hydro One project sites, facilities and all other project paraphernalia that relates. I will also reserve the right to withhold any information I deem confidential according to my rational judgement.

Finally, I will love to acknowledge the Almighty God; Jesus Christ for His help throughout the journey, for keeping me through, as well as granting me strength, wisdom and knowledge throughout my co-op year, and for even making this day of writing this report possible, and giving me words even as I type. To Him be Praise, Glory and Adoration forever. I will also love to thank my beloved parents; Francis & Nonso Bisong for their assistance throughout my education which has also resulted in the putting together of this report. I will also like to acknowledge my supervisor; Farah El Ayoubi who has been a tremendous individual, highly supportive and motivative. Finally, I will like to acknowledge and thank my co-op coordinator; Leslie Goodman for her gentle and patient support portrayed in guidance and counselling, I only pray that you remain blessed.

Sincerely,

A handwritten signature in black ink, appearing to read 'Bisong', with a horizontal line underneath.

Chidera Osere-Osowo Bisong

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UNIVERSITY OF MANITOBA

**Class Environmental Assessment for Minor Transmission Facilities Through
the Looking Glass of Hydro One**

Work Term completed at Hydro One Networks Inc.

By

Chidera Osere-Osowo Bisong

In partial fulfilment of the requirements of the Faculty of Environment Co-
operative Education Option, ENVR 3910 & ENVR 3920

Presented to Leslie Goodman, Faculty of Environment

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UNIVERSITY
OF MANITOBA



ABSTRACT

Hydro One, which is responsible for primarily transmission, and secondarily distribution of electricity throughout Ontario, owns 29,000 circuit kilometres of transmission lines and transmits only in voltages of 500,000 volts, 230,000 volts and 115,000 volts. The company is involved in the construction, refurbishment, maintenance, or decommissioning of transmission lines or transformer stations in the province of Ontario. To carry out these activities, environmental assessment must be done to make sure the activities:

- i) do not have a deleterious effect on the environment encompassing all of biological, physical and even social
- ii) to fulfil all due diligence
- iii) to make sure the activities comply with all environmental laws and regulations on all levels including all municipal, provincial, national and even international as the case dictates.

This report is tailored primarily at explaining how Hydro One carries out a specific kind of EA called “*Class Environmental Assessment*”, the report will portray in brief details:

- i) the processes involved in carrying out such EA,
- ii) the dynamics involved
- iii) the various regulations and government agencies the company is obligated to when conducting such an EA and,
- iv) all other dynamics including various stakeholders and studies carried out in the process.

Hydro One also carries out other types of EA which is dependent on the nature of the project being conducted, the nature of the project triggers the kind of EA to be conducted and even though this report focuses on the most common type which is the “Category B Project” which triggers a “Class EA”, the other kinds of EA will be very briefly highlighted. At the end, a proper understanding of Hydro One’s environmental commitments and how it is performed will be attained.

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Table 1 – Projects Categories

LIST OF ACRONYMS

Class EA – Class Environmental Assessment

DS - Distribution Station(s)

EA – Environmental Assessment

EA Act - Environmental Assessment Act

ESR – Environmental Study Report

FN – First Nation(s)

GS – Generation Station(s)

HEPC - Hydro-Electric Power Commission of Ontario

Hydro One – Hydro One Networks Inc.

IESO – Independent Electricity System Operator

kV – Kilovolt

LDCs – Local Distribution Companies

MMAH – Ministry of Municipal Affairs and Housing

MNRF – Ministry of Natural resources and Forestry

MOECC – Ministry of Environment and Climate Change

MTCS – Ministry of Tourism, Culture and Sports

MTO – Ministry of Transport Ontario

OPA – Ontario Power Authority

OPG – Ontario Power Generation

PICs – Public Information Centers

ToR – Terms of Reference

TS – Transformer Station(s)

1.0 INTRODUCTION

1.1 Brief History of Hydro One

Hydro One dates to 1906 when the Legislature of the province of Ontario passed the *Power Commission Act* establishing the then Hydro-Electric Power Commission of Ontario (HEPC), it was renamed from HEPC to Ontario Hydro in 1974 and finally to Hydro One Networks Inc. (Hydro One) in 1999. When the Ontario provincial government passed the *Energy Competition Act* restructuring Ontario Hydro into separate entities and giving birth to the now present \$9 billion company (History of Ontario Hydro, 2015). Hydro One is responsible for the transmission and distribution of electricity throughout Ontario and is thus responsible for every other activity associated with that responsibility (Solarbonds, 2015). The company owns 29,000 circuit kilometres of transmission lines and serves 1.3 million distribution customers. The company is the largest licensed electricity transmitter in Ontario and accounts for approximately 97% of the province's transmission capacity (Hydro One, 2016).

Hydro One's line of business portrays a classic example of a public service and thus the company used to be a Crown Corporation, however, in recent times there has been a transition as more than half of the company is now owned by other private entities. The privatization of Hydro One is still a hot debate topic today.

1.2 Categories of Hydro One's EA

Most of the work that Hydro One is involved in is either the construction, renovation, and maintenance, of transmission facilities. Work of this nature is obviously done in the environment and will thus have environmental effects, hence Hydro One must adhere to the *Environmental Assessment Act* of Ontario. This Act regulates the assessments that infrastructure projects must

complete to understand and mitigate their impacts on the environment. The **Guide to Environmental Assessment Requirements for Electricity Projects (2011)** is a regulation under the *EA Act (O.Reg.116/01)* that deals with both public and private sector electricity projects and classifies the transmission projects based on **voltage** and **length of transmission lines**. The regulation breaks it down into three categories with different requirements. We have **Category A, B and C projects** briefly explained in the table below;

Table 1: Project Categories.

PROJECT CATEGORIES		
Category A	Category B	Category C
<ul style="list-style-type: none"> - Expected to have minimal effects on the environment. - Don't require EA Act approval but required to adhere other applicable legislative requirements. - Such requirements differ and could include for e.g. Species at Risk Act (SARA) if the project 	<ul style="list-style-type: none"> - Expected to have potential effects on the environment that can likely be mitigated. - Projects subject to EA Act but proponents are not required to prepare an Individual EA. - Proponents required to prepare a Class EA which is equivalent to what O. Reg.116/01 refers to as the 	<ul style="list-style-type: none"> - Expected to have a significant effect on the environment. - They are major projects and require an Individual EA to be prepared. - For projects with nominal voltage of 500 kV.

<p>affects SAR in any way.</p> <p>- If there are any significant environmental effects associated with the project, the MOECC could designate it to a Category C.</p>	<p>Environmental Screening Process.</p> <p>- Class EA's are done for Category B projects.</p>	
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The Class EA which is the focus of this report is related to the Category B transmission projects and this is what we will build on in more detail.

1.3 The Class Environmental Assessment

The goal of the Class EA is to provide ample information that will aid the Minister of Environment and Climate Change to approve a project commencement following review. It is usually a small-scale project with predictable environmental effects that can be mitigated. In a project, the party responsible for ensuring that all EA Act requirements are fulfilled is known as the Proponent, so when carrying out this Class EA process, Hydro One is the proponent who applies for approval. During my time at Hydro we were single proponents for all the projects done during that period except for one where we were co-proponents with another Local Distribution Company (LDC).

As I stated previously, the Class EA is done to only Category B transmission projects and applies to some power supply infrastructure projects. The projects subject to this Class EA process must

be minor transmission lines or stations; telecommunication stations included and the subsequent operation, maintenance and decommissioning of such facilities. Transmission line projects involving greater than 2 km line and operating at a nominal voltage of 115 kV pass as minor transmission line projects. It also passes as a minor transmission project if it is operating at a nominal voltage higher than 115 kV and less than 500 kV and involve less than 50 km of line (Class EA for Minor Transmissions Facilities, 2016).

The Class EA process has been in use for more than 25 years and has proven track record of efficiency and effectivity, at this point, it only gets better at each practice.

2.0 THE CLASS ENVIRONMENTAL ASSESSMENT PROCESSES

The Class Environmental Assessment Process outlines the steps that must be followed before Hydro One can embark on the construction of any of its electrical utility structures in Ontario.

2.1 Process Overview

The normal Class EA process begins with establishing the project need and ends with understanding and mitigating all the effects of the project. A project cannot commence until the EA has been accepted and approved by the Minister of the MOECC. Consultation is a big part of the process and is discussed later in the report (please refer to Section 5.0). Projects have different timelines; project timelines can vary depending on the complication of the process. Some projects are challenged by the public opposing the project after the draft ESR is released leading to a Part II Order Report which will be briefly explained later.

During my time at Hydro I realized that most of the projects that experienced such complications were projects that cut across highly populated residential areas. Another was areas around National and Provincial Parks or other environmental preserved areas. Areas in Northern Ontario didn't

experience much opposition except in the case where the project bordered around First Nations lands which is quite a common occurrence up north.

3.0 PROJECT IDENTIFICATION AND STUDIES PHASE

This is the first step in the process where the project and its need are identified, all alternatives to the project are carefully considered and analyzed, and then environmental studies to identify the effects of the project on the environment as a whole is commenced.

3.1 Step 1: Need Identified

This is the first step which involves the establishment or identification of the project need (why do we need to undertake the project?) We need to know if the need is reasonable. The Independent Electricity System Operator (IESO) which is the provincial agency tasked with planning and operating the power system in Ontario is responsible for ensuring the province has a reliable and sustainable supply of electricity. The IESO will identify different areas in the province where transmission facilities are required (either brand new or upgrade) to meet increasing demand or to help connect new GS. They will issue recommendations to the proponent (in this case Hydro One) to carry out the work (Class EA for Minor Transmission Facilities, 2016).

The need for a project can also be established by the proponent or proponents' joint studies (i.e. Hydro one and LDCs) - this is called co-proponent. In such a case either Hydro One or an LDC can carry out local area studies to appraise the performance of facilities and thus identify the need for improvement or development if need be to address growth of local demand or improve reliability. During my time at Hydro, I worked on two co-proponent projects where Hydro One had to work with an LDC. These projects posed different challenges; often the partners had limited

experience in undertaking environmental assessments and no appreciation to the depth of analysis required.

3.2 Step 2: Consider Alternatives

When the project need has been established, alternatives to the proposed project must be considered before moving forward. The alternatives must be reasonable from a technical, economic and environmental perspective and must also fall within the mandate/licensed rights of the proponent. In addition to considering all reasonable alternatives, the proponent must consider the Do Nothing Alternative.

3.3 Step 3: Environmental Studies and Analysis

This is a very major stage in the Environmental Assessment process, an area for study is carved out to surround the potential areas of impact of the project including potential locations of proposed alternative sites. The boundaries of the selected area will be based on environmental and technical constraints; environmental includes: ecological sensitive areas (e.g. lakes, wetlands), significant man-made constraints (e.g. cultural heritage resources, buildings), proximity to FN reserves etc. Some technical constraints may include; things that can affect construction and maintenance such as flood plains, soil conditions, existing land ownership, zoning etc. (Class EA for Minor Transmission Facilities, 2016)

When the above has been fulfilled and project maps created, Hydro One then sends out **Initial Notification** letters to all required stakeholders. Stakeholders include: the various affected ministries – most of the time includes; MOECC, MNRF, MMAH, MTCS (see list of acronyms) (Class EA for Minor Transmission Facilities, 2016). Other stakeholders include: the public; commissions or planning agencies where study area includes any lands under their jurisdiction,

conservation authorities which have jurisdiction over project area; FN and Métis communities in or around the area; and any property owners that may be potentially affected by the project or potentially interested in the project (Class EA for Minor Transmission Facilities, 2016).

After initial notifications are sent out, a couple of environmental screening processes and criteria are carried out. An **Environmental Inventory** is prepared, this includes collected and mapped data of; agricultural resources, cultural heritage resources, recreational resources, mineral resources, forestry resources, natural environment resources, human settlement, and visual/aesthetic resources (Class EA for Minor Transmission Facilities, 2016). Finally, the preferred alternative is selected after these.

4.0 BUILD UP TO PROJECT ACCEPTANCE PHASE

This phase begins right after all environmental studies and analysis have been performed, then the findings, results and conclusions are prepared and submitted for a process of review and feedback to commence with both the ministry and the public. However, after collecting the inventory (which has been discussed in the previous section) there is work being done on effects prediction and developing mitigation measures.

4.1 Step 4: Preparation of ESR and Final Project Notification

The Class EA stipulates that a draft ESR be prepared which will include the following:

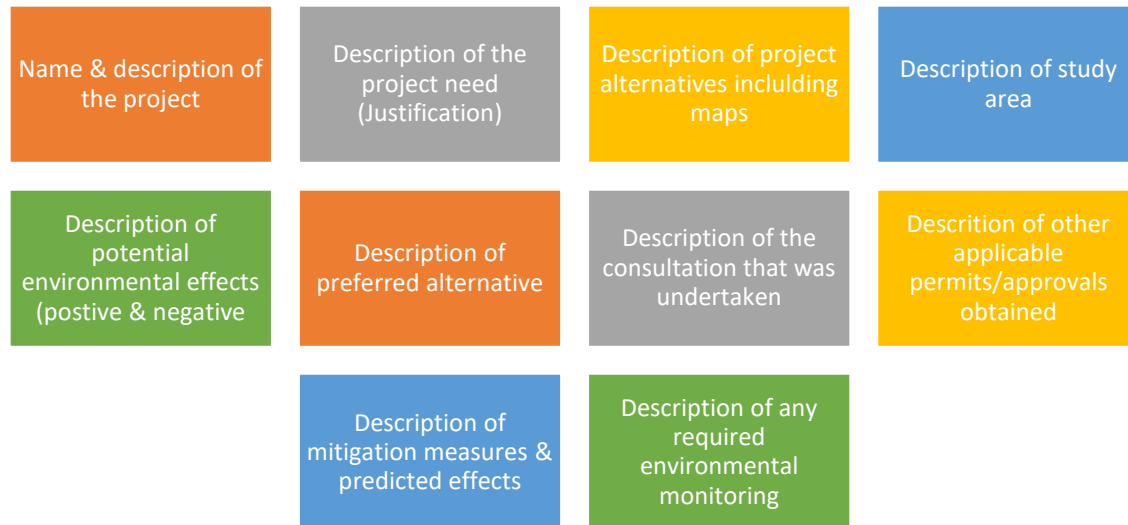


Fig. 1: Draft ESR contents.

After this is done, and the draft ESR is made available at a location that is a public facility like a Library, a **Final Project Notification** is done. The final notification will be issued to inform all stakeholders; municipal, provincial, and federal government agencies, FN and Métis communities, potentially affected and interested persons and interest groups telling them that the report is complete and review period is commencing.

4.2 Step 5: Examination of the Project Acceptability

If there is no expressed opposition to the project, it will be considered acceptable and the final ESR and Statement of Completion will then be filled with the MOECC and a copy will be sent to the Regional EA Coordinator at the appropriate Regional Office. On the other hand, if the project is opposed, the proponent which is Hydro One in this case will have to re-evaluate the rationale of the concerns raised and will attempt to resolve it, if the issue is resolved, the project is deemed

accepted but if not resolved, Hydro One (who is the proponent) will advise the MOECC of the issues raised during the review period, explain their action, explain why the concerns raised cannot be resolved and recommend next steps (Class EA for Minor Transmission Facilities, 2016).

If the concerns remain unresolved, the concerned party (requester) may advise Hydro One steps up the project to a higher level of assessment (i.e. Individual EA). If Hydro One refuses to do that, the requester can now request that the Minister grant a **Part II Order** and elevate the status of the project. This order request must be received by the ministry within the project review period. At this point, it is left for the minister to decide; he can either accept it, deny it with or without condition, refer it to mediation before deciding, or advise Hydro One to redo its project planning (Class EA for Minor Transmission Facilities, 2016).

4.3 Step 6: Statement of Completion

When the review period for the draft ESR is complete, all comments raised will be incorporated to finalize the ESR report. Hydro One will then complete and submit the Statement of Completion form to the MOECC along with the final copy of the ESR. At this stage, the project is considered acceptable.

4.4 Step 7: Continued Communication

The fact that the project has been accepted does not mean that communication with stakeholders ends. There must be a maintenance of consequent and continuous correspondence between Hydro One and stakeholders throughout the project's life span as need arises.

5.0 CONSULTATION

Consultation is one of the most important steps and practices when conducting an EA, and it is expected to be carried out throughout the life span of the project.

5.1 Consultation & Notification Methodology

As already stated in this report, consultation is a very integral part and must be made with all interested parties and stakeholders involved one way or the other with the project. Consultations may include events such as setting up Public Information Centers (PICs) and workshops. PICs are frequently used consultation techniques that allows Hydro One's project team and members of the community to discuss one-on-one in an informal manner and receive feedback.

Notification methods may include; newspaper advertisements, unaddressed mail or flyers, direct mail or email, project website, and social media (Class EA for Minor Transmission Facilities, 2016).

6.0 RELATED CLASS EA ACTIVITIES

The related projects embarked on by Hydro One which can most likely trigger a Class EA includes: the construction of Transmission Lines, Transformer Stations and Telecommunication Stations.

6.1 Transmission Lines, Transformer Stations & Telecommunication Stations

Hydro One is occasionally involved with undertakings that could trigger a Class EA. This includes: transmission lines, transformer stations and telecommunication stations. Hydro One transmits energy through transmission lines, they could be either overhead or underground. The construction of these transmission lines usually require the creation of access roads to project site, the tower foundations, the conductor strings as well as other project requirements. After these lines are

erected and commissioned, they are subject to routine maintenance and management. These are activities that could trigger a Class EA. For a Transformer Station to be able to trigger a Class EA it must have four basic components namely:

- High voltage areas equal to or greater than 115 kV
- Transformer areas
- Low voltage areas less than 50 kV
- A control, meter and relay area (Class EA for Minor Transmission Facilities, 2016).

Energy enters transformer stations from the supply source through transmission lines which terminate in the high voltage areas where the voltage level is changed by the transformers from 115 kV, 230 kV or 500 kV to a lower voltage for distribution. The lower voltage is directed through electrical conductors to lower voltages less than 50 kV (Class EA for Minor Transmission Facilities, 2016). Sufficient land is needed for transformer stations of approximately 25 ha, and a lot of physical work which includes topsoil removal and fencing is performed on site during construction. Maintenance activities is also carried out even after station has been constructed. Telecommunication Stations consists of radio and fibre optic links which are used for the purposes of security, protection, control and monitoring of the transmission system (Class EA for Minor Transmission Facilities, 2016). Without this network, continuous surveillance over major transmission facilities cannot occur. This network also allows protective relay operation to automatically isolate a faulted system component in the event of a malfunction. The only other on site installation that is required in addition to the towers is a small specially designed building for the associated equipment (Class EA for Minor Transmission Facilities, 2016). Normal construction site operations are needed to be performed during construction which would cause a disturbance to both the physical and social environment, inviting an EA. Coupled with that, a series of

maintenance activities must be performed after construction and commissioning. The telecommunication facility will have to be decommissioned when transmission facilities become obsolete or goes out of service.

7.0 SUMMARY

The Environmental Assessment process must be undertaken for most infrastructure projects that will have an impact on the environment. Guidelines based off on stipulations set by the ministry must be followed to make sure that these projects do not have a deleterious effect on both the social and physical environment. Hydro One who is deeply involved with setting up electricity utility structures is not an exemption. Hydro One follows regulations and guidelines mainly set by the MOECC when embarking on project construction, maintenance or refurbishment. From the project need being identified, to the statement of completion, Hydro One is required to follow diligently all the processes while maintaining constant correspondence with all the stakeholders involved. Before Hydro One can embark on the construction of a project, the project need must first be identified, properly highlighting and justifying why the project is needed and how critical its existence is. After this, all alternatives must be carefully considered, and then an in-depth environmental studies and analysis must commence. When the former is fulfilled, a draft ESR is prepared and submitted for other stages of review. Finally, in the case where it is accepted as safe, a statement of completion of EA is issued by Hydro One, and then construction can commence.

8.0 REFERENCES

Hydro One website. Available from <https://www.hydroone.com/about> [accessed September 2017]

Class Environmental Assessment for Minor Transmission Facilities 2016. Available from https://www.hydroone.com/abouthydroone/CorporateInformation/majorprojects/classenvironmentalassessmentforminortransmissionfacilities/Documents/Class%20EA%20for%20Minor%20Transmission%20Facilities_Nov16%202016.pdf [accessed July 2017]

Guide to Environmental Assessment Requirements for Electricity Projects. Available from <https://www.hydroone.com/abouthydroone/CorporateInformation/majorprojects/classenvironmentalassessmentforminortransmissionfacilities/Documents/3-8a-4-ea-electricity-projects-en.pdf>

Code of Practice: Preparing, Reviewing and Using Class Environmental Assessment in Ontario.

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