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**Joanne Richardson**

Director – Major Projects and Partnerships  
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BY EMAIL AND RESS

March 1, 2021

Ms. Christine E. Long  
Registrar  
Ontario Energy Board  
Suite 2700, 2300 Yonge Street  
P.O. Box 2319  
Toronto, ON M4P 1E4

Dear Ms. Long:

**EB-2020-0265 – Hydro One Networks Inc. Leave to Construct Application – Hawthorne to Merivale Reconductoring Project – Final CIA**

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Hydro One Networks Inc. (“Hydro One”) is submitting its final Customer Impact Assessment (CIA) for its Hawthorne to Merivale Reconductoring Project.

Hydro One has completed its final CIA in accordance with its customer connection procedures, and the results confirm that there are no adverse impacts on transmission customers as a result of this Project. This is consistent with the results of the draft CIA previously submitted in its prefiled evidence Exhibit G, Tab 1 Schedule 1, Attachment A.

An electronic copy of the interrogatory responses has been submitted using the Board’s Regulatory Electronic Submission System.

Sincerely,

A handwritten signature in dark ink, appearing to read "Joanne Richardson", written in a cursive style.

Joanne Richardson

c/ EB-2020-0265 Intervenor (Electronic only)



Hydro One Networks Inc.  
483 Bay Street  
Toronto, Ontario  
M5G 2P5

Updated: 2021-03-01  
EB-2020-0265  
Exhibit G-1-1  
Attachment 1  
Page 1 of 8

**CUSTOMER IMPACT ASSESSMENT**  
**M30A/M31A CONDUCTOR UPGRADE**

Revision: **Final**

Date: 26 February 2021

Issued by: System Planning – Central & East  
System Planning Division  
Hydro One Networks Inc.

Prepared by:

A handwritten signature in black ink, appearing to read "Jean Morneau".

Jean Morneau  
Sr. Network Management Engineer  
System Planning Division  
Hydro One Networks Inc.

Approved by:

A handwritten signature in black ink, appearing to read "Ajay Garg".

Ajay Garg  
Manager Transmission Planning –East  
System Planning Division  
Hydro One Networks Inc.

### **Disclaimer**

This Customer Impact Assessment was prepared based on preliminary information available about the new M30A/M31A conductor. It is intended to highlight significant impacts, if any, to affected transmission customers early in the project development process and thus allow an opportunity for these parties to bring forward any concerns that they may have, including those needed for the review of the connection and for any possible application for Leave to Construct. Subsequent changes to the required modifications or the implementation plan may affect the impacts of the proposed connection identified in this Customer Impact Assessment. The results of this Customer Impact Assessment and the estimate of the outage requirements are subject to change to accommodate the requirements of the IESO and other regulatory or municipal authority requirements. The fault levels computed as part of this Customer Impact Assessment are meant to assess current conditions in the study horizon and are not intended to be for the purposes of sizing equipment or making other project design decisions. Many other factors beyond the existing fault levels go into project design decisions.

Hydro One Networks Inc. shall not be liable, whether in contract, tort or any other theory of liability, to any person who uses the results of the Customer Impact Assessment under any circumstances whatsoever for any damages arising out of such use unless such liability is created under some other contractual obligation between Hydro One Networks Inc. and such person.

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## **CUSTOMER IMPACT ASSESSMENT**

### **PROPOSED M30A/M31A CONDUCTOR UPGRADE**

#### **1.0 INTRODUCTION**

##### **1.1 Purpose**

This Customer Impact Assessment (CIA) study assesses the potential impact of the proposed Hawthorne TS x Merivale TS 230kV circuits M30A/M31A conductor upgrade on the transmission customers of the Ottawa area. This study is intended to supplement the System Impact Assessment (SIA) CAA ID 2016-572 issued by the IESO. In this report, the IESO concluded that there is no adverse impact of this project on the transmission system.

This is the final Customer Impact Assessment for the M30A/M31A conductor upgrade. A draft CIA was issued for comments on December 2<sup>nd</sup>, 2020. There were no comments on the report.

##### **1.2 Background**

Hydro One's M30A and M31A are 230kV circuits connecting Hawthorne TS and Merivale TS in Ottawa. The circuits have a long term emergency rating of 1800A. The IESO has identified the need for an increased power transfer limit across the two M30A and M31A circuits to address the need to facilitate bulk power flows from Eastern Ontario, including eastern Ontario generation, towards the GTA. Currently both M30A and M31A circuits can experience overloading under peak loading conditions, combined with high power transfers flowing west from Eastern Ontario into the GTA.

This project proposed to replace the existing 1843kcmil conductor of M30A/M31A with a twin-bundle 1443kcmil conductor. This project will increase the long-term emergency rating of the circuits from 1800A to 3000A.

Hydro One filed a "Leave to Construct" application under Section 92 of the Ontario Energy Board Act on December 2<sup>nd</sup>, 2020 to seek the Ontario Energy Board approval for the project. The project is expected to be completed by December 2023.

##### **1.3 Connected Customers**

The focus of this study is on transmission customers fed by circuits M30A/M31A. The affected customers are shown below.

Station	Customer
Albion TS	Hydro Ottawa
Ellwood MTS	Hydro Ottawa
Hawthorne TS	Hydro One Distribution Hydro Ottawa
Merivale MTS	Hydro Ottawa

## **2.0 LOAD FLOW**

The SIA completed by IESO found that the conductor upgrade of M30A/M31A has no negative impact on the transmission system. The area voltage is kept within limits and the line loading is within circuit ratings. Please refer to IESO document CAA ID 2016-572.

The CIA also assessed the area voltage after the conductor replacement for M30A/M31A for the base case (with all facilities in service) and for either line out of service. All bus voltages are within criteria and no voltage violations were found for these conditions.

## **3.0 SHORT- CIRCUIT STUDY**

The reconductoring of M30A/M31A has resulted in a small increase in station short circuit levels in the area. The short circuit levels before and after the conductor replacement are given in Appendix B. Hydro One has reviewed the fault level at its stations. Customers are requested to review the results and determine if the new fault levels are within their equipment ratings and whether their station grounding system is adequate.

## **4.0 CUSTOMER RELIABILITY**

This project will improve supply reliability to customers in the Merivale area and those supplied from by Ellwood MTS and Albion TS. The project will eliminate line overloading following contingences under summer peak load conditions and with heavy power transfers from Eastern Ontario to the GTA.

### **4.1 Preliminary Outage Impact Assessment**

Exact outage schedule will be made available during the execution phase of the project and will be established in consultation with load customers in the area. The outage duration, if any, will be minimized and risk managed with proper outage planning and co-ordination.

## **5.0 CONCLUSION**

This report concludes that the conductor replacement of M30A/M31A will not have any adverse effects on the transmission connected customers.

## 6.0 APPENDIX A

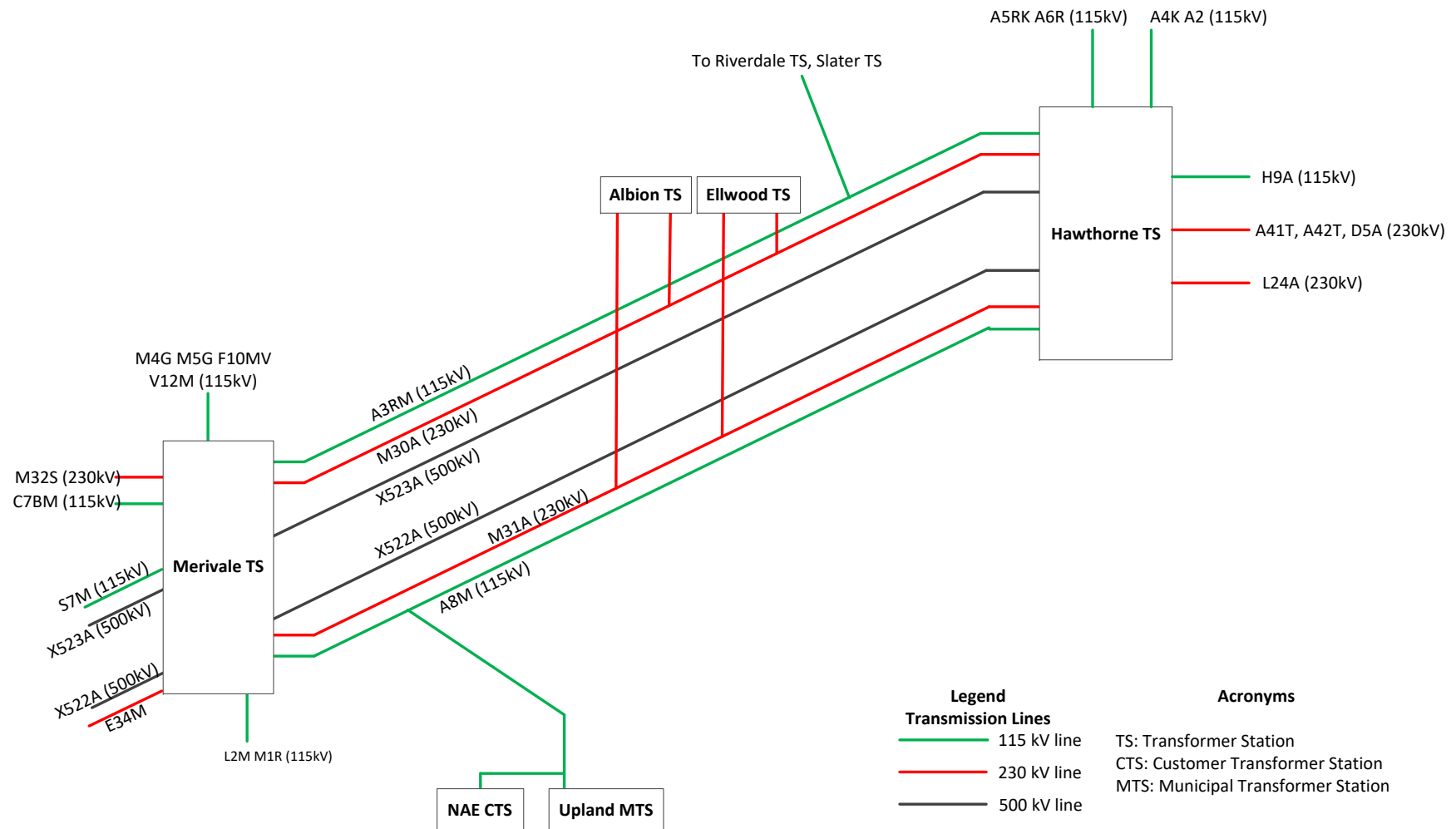


Figure 1. Single line diagram of transmission corridor between Hawthorne TS and Merivale TS.

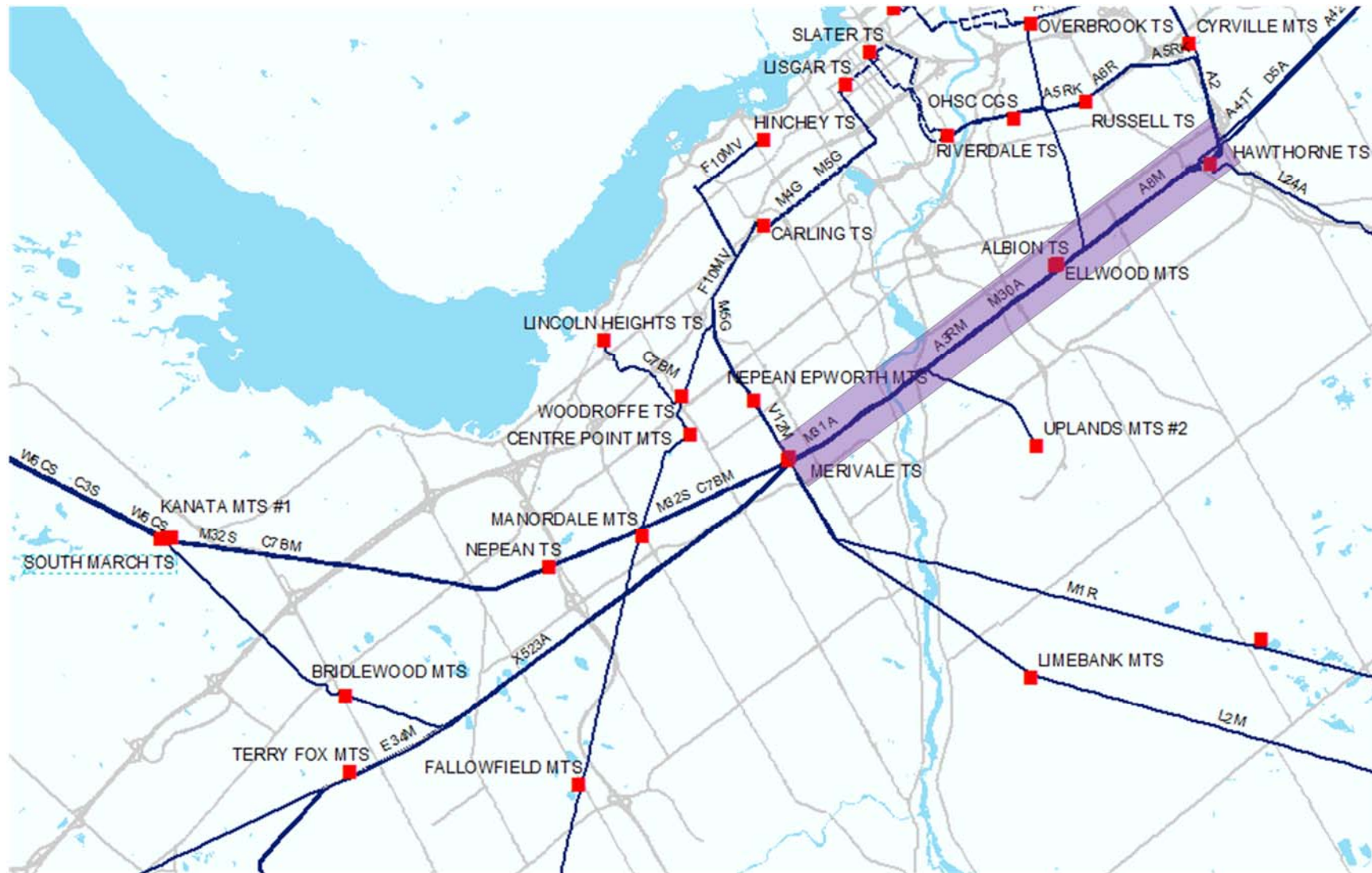


Figure 2. Map of area with transmission corridor between Hawthorne TS and Merivale TS highlighted.



## 7.0 APPENDIX B

Short circuit levels before (pre) and after (post) the M30A/M31A conductor replacement are shown in Table B1 below. Results provided are from base case with planned future projects over the next 5 years connected to the Ontario system.

Table B1. Short circuit levels before and after project in service.

Station	Voltage (kV) <sup>1</sup>	3 Phase sym. (kA)		LG sym. (kA)		Breaker rating (kA) <sup>3</sup>	
		PRE	POST	PRE	POST	3 phase (sym)	LG (sym)
ALBION M30A	250	19.3	20.2	20.9	22.2	n/a	n/a
ALBION M31A	250	19.2	20.1	20.8	22.0	n/a	n/a
ALBION TS BQ	13.2	16.4	16.4	8.0	8.0	20.0	20.0
ALBION TS JY	13.2	17.2	17.3	8.2	8.2	20.0	20.0
ELLWOOD M30A	250	19.2	20.1	20.9	22.2		
ELLWOOD M31A	250	19.3	20.2	21.0	22.2		
HAWTHORNE TS	46.0	13.8	13.8	6.7	6.7	17.0	17.0
HAWTHORNE TS	127	30.7	30.5	38.0	37.5	50.0	50.0
HAWTHORNE TS	250	23.4	23.5	29.1	29.3	50.0	50.0
MERIVALE AL	127	26.5	26.6	28.9	29.2	45.4 <sup>2</sup>	45.4 <sup>2</sup>
MERIVALE TS	250	19.0	19.9	20.0	21.1	63.0	63.0

Note:

1. Voltage shown is the maximum continuous voltage used for short circuit calculation.
2. Asymmetrical interrupting rating provided. Based on 10,000MVA asymmetrical interrupting capability breakers at 127kV.
3. Most limiting breaker rating listed.