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Joanne Richardson
Director – Major Projects and Partnerships
Regulatory Affairs

BY EMAIL AND RESS

July 16, 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-2021-0136 – Hydro One Networks Inc. Leave to Construct Application – Richview TS by Trafalgar TS Reconductoring Project – Application and Evidence

Pursuant to Section 92 of the *Ontario Energy Board Act, 1998*, Hydro One Networks Inc. seeks the Ontario Enery Board's ("OEB") approval for an Order or Orders granting leave to reconductor existing transmission line circuits along the route between Richview Transformer Station and Trafalgar Transformer Station (the "Richview TS by Trafalgar TS Reconductoring Project", or "RTR Project", or the "Project") located in the municipalities of Toronto and Mississauga.

Additionally, pursuant to s. 97 of the *Ontario Energy Board Act*, *1998*, Hydro One Networks Inc. seeks for an Order granting approval of the forms of the agreement offered or to be offered to affected landowners.

An electronic copy of this Application has been filed through the OEB's Regulatory Electronic Submission System.

Sincerely,

Joanne Richardson

EXHIBIT LIST

Exh	Tab	Schedule	Attachment	Contents
A				
	1	1		Exhibit List
B				
	1	1		Application
	2	1		Project Overview
	3	1		Evidence In Support of Need
	3	1	1	IESO Transmission Project Hand-off Letter to Hydro One
	3	1	2	Hydro One Cost Estimate Summary – Richview x Trafalgar 230kV Circuit Conductor Upgrade
	3	1	3	IESO Report: Trafalgar TS x Richview TS 230 kV Line Upgrade: Need and Selection of the Preferred Plan
	4	1		Project Classification and Categorization
	5	1		Cost/Benefit Analysis and Options
	6	1		Quantitative and Qualitative Benefits
	7	1		Apportioning Project Costs and Risks
	8	1		Network Reinforcement
	9	1		Transmission Rate Impact

Exh	Tab	Schedule	Attachment	Contents
	10	1		Deferral Account
	11	1		Project Schedule
C				
	1	1		Physical Design
	1	1	1	Detailed Tower Design – R14T-R17T Semi-Anchor Structure Reinforcements
	1	1	2	Detailed Tower Design – R14T-R17T - Suspension Structure Reinforcements
	1	1	3	Detailed Tower Design – R19TH-R21TH - Canadian Bridge Semi-Anchor Structure Reinforcements
	1	1	4	Detailed Tower Design – R19TH–R21TH - Suspension Structure Reinforcements
	2	1		Maps
	2	1	1	Map of Geographic Location – Notice Map
D				
	1	1		Operational Details
E				
	1	1		Land Matters
	1	1	1	Project Route Map
	1	1	2	Form Agreement – Temporary Land Rights Agreement
	1	1	3	Damage Claim Agreement

ONTARIO ENERGY BOARD

IN THE MATTER OF the *Ontario Energy Board Act, 1998*;

AND IN THE MATTER OF an Application by Hydro One Networks Inc. pursuant to s. 92 of the *Act* for an Order or Orders granting leave to reconductor existing transmission line circuits along the route between Richview Transformer Station and Trafalgar Transformer Station (the "Richview TS by Trafalgar TS Reconductoring Project", or "RTR Project", or the "Project") located in the municipalities of Toronto and Mississauga.

And in the matter of an Application by Hydro One Networks Inc. pursuant to s. 97 of the *Act* for an Order granting approval of the forms of the `agreement offered or to be offered to affected landowners

APPLICATION

1. The Applicant is Hydro One Networks Inc. ("Hydro One"), a subsidiary of Hydro One Inc., herein referred to as "the Applicant". Hydro One is an Ontario corporation with its head office in Toronto and is licensed under Ontario Energy Board ("OEB" or the "Board") Electricity Transmitter Licence No. ET-2003-0035. Hydro One carries on the business, among other things, of owning and operating transmission facilities within Ontario.
2. Hydro One hereby applies to the Ontario Energy Board (the "Board") pursuant to s. 92 of the *Ontario Energy Board Act, 1998* (the "Act") for an Order or Orders granting leave to reconductor four existing 230 kV circuits between Richview Transformer Station ("TS") and Trafalgar TS. The RTR Project will facilitate increased transfer capability on the *Flow East Towards Toronto* ("FETT")

interface[1] by approximately 2,000 MW. The IESO has identified a need for additional capacity east of the FETT interface by 2026. Please refer to the Project Area Map for an illustration of the existing transmission line routes and the existing station locations filed at **Exhibit C, Tab 2, Schedule 1, Attachment 1**.

3. The RTR Project will involve the reconductoring of four existing 230 kV transmission circuits, described as:
    - Circuits known as R14T and R17T between Trafalgar TS and Richview TS, a distance of approximately 21.7 km; and
    - Circuits known as R19TH and R21TH - between Trafalgar TS and Tomken Junction (“JCT”), a distance of approximately 13.7 km.

4. A Single Line Diagram of the 230 kV Transmission Corridor between Richview TS and Trafalgar TS, provided at **Exhibit B, Tab 2, Schedule 1, Figure 2**, provides a visual representation of the individual sections of the four circuits that will be reconductored as part of this Project.

5. A *Project Area Map* illustration of the existing transmission circuit routes and the existing station locations is filed at **Exhibit C, Tab 2, Schedule 1, Attachment 1** and is also provided for the OEB to use this as the *Notice Map*.

6. Each individual 230 kV circuit currently consists of three phases, with each phase consisting of a single conductor. The RTR Project will reconductor each circuit with the same ‘one conductor per phase’ circuit configuration. Each reconductored circuit will continue to operate at 230 kV line voltage. Each circuit will continue to be carried on the same tower series between Richview TS and Trafalgar TS, and these towers will continue to remain on the current transmission right-of-way, with the same centre line. In addition to the

[1] The FETT interface is defined by four 500kV circuits into Claireville TS, two 230 kV circuits out of Orangeville TS (measured east of Everett TS) and four 230kV circuits out of Trafalgar TS. This transfer stresses the FETT interface of the power system by transferring power from the Southwest, Bruce, Niagara and West Zones to the Toronto Zone. A schematic diagram of the FETT interface can be found at Exhibit B, Tab 2, Schedule 1, Figure 1.

reconductoring, the following related work will be undertaken as part of the RTR Project:

- Replace insulators on the circuit sections that will be reconductored;
- Replace the existing skywire carried on one of the tower series, specifically the tower series that carries circuits R14T and R17T, with optical ground wire ("OPGW") between Richview TS and Trafalgar TS;
- Reinforce existing tower structures, as appropriate, to meet Hydro One's current standards for these reconductored circuits to withstand applicable wind and ice loads for the circuit's design;
- Replace six existing towers to meet the standard required for the reconductored circuits; and
- Performing necessary protection and control work to facilitate the connection and effective operation of the reconductored circuits.

7. The need for the Project has been established by the Independent Electricity System Operator ("IESO"), via their hand-off letter (the "Letter") dated December 10, 2020, and further substantiated in the IESO's Need Report titled, *Trafalgar TS x Richview TS 230 kV Line Upgrade: Need and Selection of the Preferred Plan*, both provided at **Exhibit B, Tab 3, Schedule 1, Attachment 1 and Attachment 3** respectively, and together with both **Exhibit B, Tab 3, Schedule 1, and Attachment 2** (cost related evidence), are referred to as the "**Need Evidence**".
8. The proposed in-service date for the Project is April 2026, assuming construction commencement in February 2022. The RTR Project's Schedule is provided at **Exhibit B, Tab 11, Schedule 1**.
9. Hydro One will rely predominantly on the statutory easement rights it enjoys on Infrastructure Ontario Bill 58 lands and on other land rights it currently has for the existing RTR Project circuits (R14T, R17T, R19TH and R21TH) right-of-way to

construct, operate and maintain the proposed new transmission facilities. Further information on land related matters is found at **Exhibit E, Tab 1, Schedule 1**.

10. This Application is also for approval of the forms of the agreement offered or to be offered to affected landowners, pursuant to s. 97 of the Act. The agreements are in the same form as previously approved in prior Hydro One leave to construct proceedings. The agreements can be found as attachments to **Exhibit E, Tab 1, Schedule 1**.

11. The IESO has provided a final System Impact Assessment ("**SIA**") which concludes that the RTR Project is expected to have no adverse impact on the reliability of the integrated power system. The final SIA is provided as **Exhibit F, Tab 1, Schedule 1, Attachment 1**.

12. Hydro One has completed the final Customer Impact Assessment ("**CIA**") in accordance with Hydro One's connection procedures. The CIA results confirm that the RTR Project will not have any adverse effects on the transmission-connected customers of the area. A copy of the final CIA is provided as **Exhibit G, Tab 1, Schedule 1, Attachment 1**.

13. The cost of the transmission line and related facilities for which Hydro One is seeking approval is approximately $60.9 million, of which $56.3 million is capital and will be added to rate base, and $4.6 million is removals. The details pertaining to these costs are provided at **Exhibit B, Tab 7, Schedule 1**.

14. Project economics, as filed in **Exhibit B, Tab 9, Schedule 1**, estimate there will be a minimal increase in transmission rates to Ontario's transmission ratepayers. The line connection pool rate of Ontario's Uniform Transmission Rates ("UTRs") will remain unchanged, whereas the network connection pool rate is forecast to increase the 2020 OEB-approved rates by a 0.51%, or from the current rate of $3.92/kW/month to $3.94/kW/month. For a typical residential customer who is under the Regulated Price Plan, there will be minimal impact on rates.

15. The Application is supported by written evidence which includes details of Hydro One's proposal for the transmission circuit work. The written evidence is prefiled and may be amended from time to time prior to the Board's final decision on this Application.

16. Given the information provided in the prefiled evidence, Hydro One submits that the RTR Project is in the public interest. The Project will facilitate increased east-directional transfers across the FETT via bulk transfers from western Ontario, including supply from western Ontario generation, while improving the quality of service and reliability.

17. Hydro One requests that a copy of all documents filed with the Board be served on the Applicant and the Applicant's counsel, as follows:

a) The Applicant:

Eryn MacKinnon
Sr. Regulatory Coordinator
Hydro One Networks Inc.

Mailing Address:

7th Floor, South Tower
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Telephone: (416) 345-4479
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b) The Applicant's counsel:

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PROJECT OVERVIEW DOCUMENTS

This Application is seeking OEB approval for Hydro One to construct transmission facilities between Richview TS and Trafalgar TS. The Project will reconductor Hydro One's existing 230 kV transmission circuits, whose nomenclatures are R14T, R17T, R19TH and R21TH, that connect two major stations, Richview TS and Trafalgar TS, in the Cities of Toronto and Mississauga, respectively.

These four circuits are paired as follows: circuits R14T and R17T are carried together on one set of towers (a configuration often referred to as 'double circuit'), and circuits R19TH and R21TH are carried together on a separate set of towers. Both tower spans are situated adjacent to each other and run parallel on the same right-of-way corridor between Richview TS and Trafalgar TS. The distance between Richview TS and Trafalgar TS is approximately 21.7km, and in total Hydro One is proposing to reconductor approximately 70km of circuits. Further detail on the specific lengths of each circuit that will be reconductored in the RTR Project is provided below, and a visual supporting schematic diagram is provided in **Figure 2** below.

The IESO has identified the need for an increased power transfer limit across the FETT transmission interface[1]. The FETT interface delivers electricity from western Ontario towards the GTA. Supply capacity east of the GTA is expected to decline[2] over the next decade due to the retirement of Pickering Generating Station ("GS") and the ongoing nuclear refurbishment outages. The IESO[3] has determined that the generation shortfall will be met by energy supplied from western Ontario and as such will require increased capacity flow on the FETT interface. The IESO has confirmed that the FETT interface capability will need to be increased by 2000 MW, which will be achieved by

[1] Exhibit B. Tab 3, Schedule 1, Attachment 1 and Attachment 3.
[2] Ibid
[3] Ibid

reconductoring the four 230 kV transmission circuits, identified above, between Trafalgar TS and Richview TS.

The 230 kV circuits R14T, R17T, R19TH, and R21TH will be reconductored as follows:

i) circuits R14T and R17T, which are carried on one tower span will be reconductored between Trafalgar TS and Richview TS, a length of approximately 21.7km; and
ii) circuits R19TH and R21TH, which are carried on one tower span, will be reconductored between Trafalgar TS and Tomken Jct, a length of approximately 13.7km.

There is no requirement to reconductor two sections of 230 kV circuits, that of R19TH and R21TH between Richview TS and Tomken Jct. These two sections currently have a conductor installed with an adequate ampacity rating to meet the increased FETT flow required, once the two above-described sections have been reconductored.

Additionally, at the same time, Hydro One will replace the existing skywire atop the tower series that carries circuits R14T/R17T with an optical ground wire (“OPGW”) between Richview TS and Trafalgar TS. The existing skywire was installed in 1985. The combination of new conductor characteristics, generation and transmission upgrades in the area, e.g. Hurontario SS, Halton Hills GS, Goreway GS, has resulted in short circuit fault levels reaching the current skywire’s carrying capability. The new OPGW skywire will have higher short circuit capability and will provide path diversity for the existing protection and control signals that currently use the OPGW skywire installed on the tower line span carrying circuits R19TH and R21TH.

Bundling the OPGW skywire replacement with the RTR Project reconductoring work is economically more efficient than if Hydro One were to perform the scopes of work separately. The combined scope will also minimizes outages to these critically important

Bulk Electric System ("BES") classified transmission circuits, on which it has been historically difficult to obtain outages.

Figure 1, below, shows the geographic location of the RTR Project and the FETT Interface boundaries.

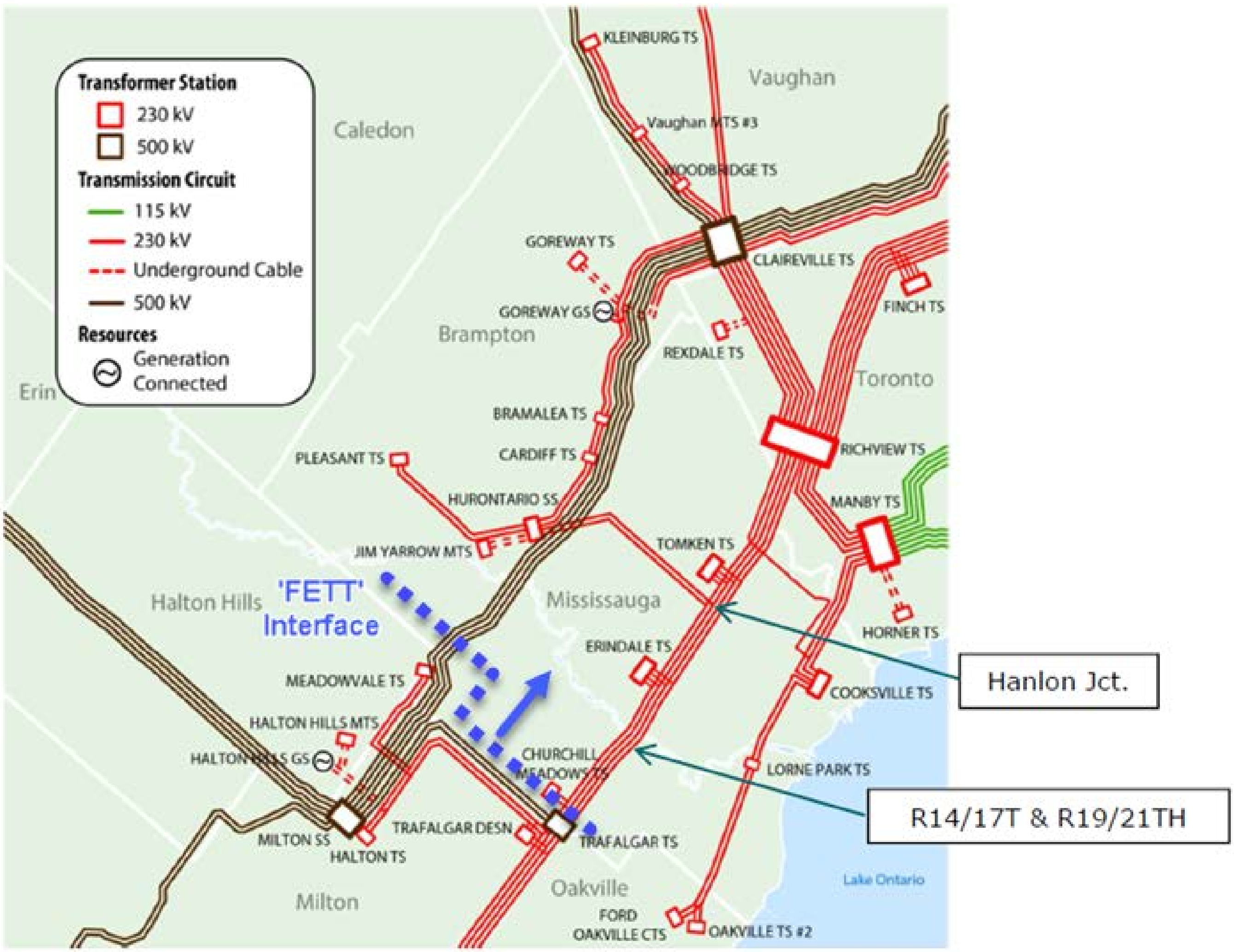

Figure 1: Map of the Richview TS by Trafalgar TS Reconductoring Project Area

Figure 2, below, schematically identifies the spans of circuit that will be reconductored. Also identified are the locations of the connecting transmission stations and junctions between Richview TS and Trafalgar TS. Circuit sections highlighted in red on **Figure 2** indicate circuits that will be reconductored during the RTR Project.

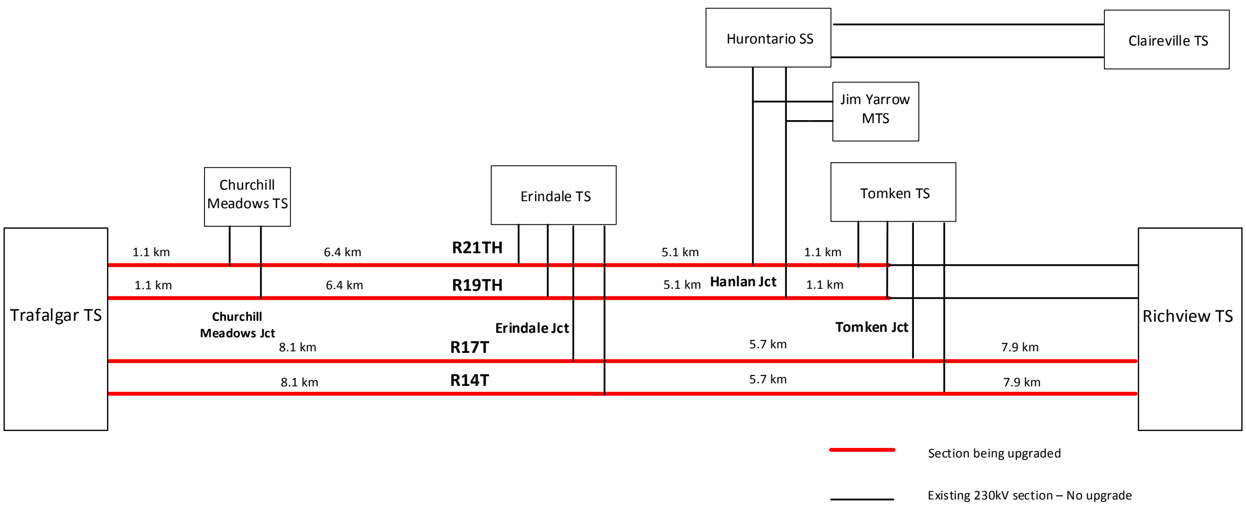

Figure 2: Single Line Diagram – 230 kV Transmission Corridor between Richview TS and Trafalgar TS.

EVIDENCE IN SUPPORT OF NEED

On December 10, 2020, the IESO provided a letter (the **"Letter"**) to Hydro One, requesting Hydro One to proceed with reconductoring the Richview TS by Trafalgar TS 230 kV transmission circuits R14T, R17T, R19TH and R21TH with 1433 kcmil aluminium conductor steel-supported ("ACSS") conductor aimed to address an emerging supply capacity need from the decline in generation in eastern Ontario. The Letter confirms the need for the RTR Project, stating;

> *"Supply capacity in eastern Ontario is expected to decline over the next decade, which contributes to a provincial need for capacity and, because of limits on the transfer capability of the FETT interface, ~4,000 MW of that capacity will have to be sited east of the FETT interface by 2026. To reduce the amount of capacity that must be sited in eastern Ontario, the IESO is recommending this Project, which is expected to be completed by 2026 and will increase the transfer capability of the interface by ~2,000 MW. This Project would reduce the risk to reliability in having to acquire a large amount of capacity in eastern Ontario and would enable more resources to compete to meet provincial needs."*

The Letter confirms that the RTR Project will facilitate increased transfers from western Ontario supply resources thereby increasing the efficiency and effectivity of the Ontario grid. The IESO's Letter provides specific direction regarding the RTR Project scope to Hydro One:

> *"The IESO is recommending Hydro One to proceed with conductor upgrades of the Richview TS x Trafalgar TS 230 kV transmission lines with 1433 kcmil ACSS conductor (the "Project")."*

and additionally,

> *"It was concluded that the use of 1433 kcmil ACSS would provide the required planning summer long term emergency (LTE) rating of 2000 A."*

Further information regarding the need for the Project is provided in the Letter, which is filed at **Exhibit B, Tab 3, Schedule 1 Attachment 1.**

Filed at **Exhibit B, Tab 3, Schedule 1 Attachment 2** is a cost estimate that Hydro One provided to the IESO in September 2020, regarding the reconductoring of specific sections of four 230 kV circuits between Richview TS and Trafalgar TS, later to be known as the RTR Project. This cost estimate informed the decision and direction that the IESO provided to Hydro One in its Letter.

Additionally, the IESO have provided Hydro One with the Report, '*Trafalgar TS x Richview TS 230 kV Line Upgrade: Need and Selection of the Preferred Plan*', dated June 12, 2021, that further outlines the IESO's position regarding the need and subsequent direction provided to Hydro One in its Letter. This report is also considered part of the Need Evidence, all of which clearly identifies the Project's need, its scope, and the date by which it should be completed and placed in-serviced. The IESO's report, as described above, is filed at **Exhibit B, Tab 3, Schedule 1, Attachment 3**.

Accordingly, Hydro One is seeking approval from the OEB to undertake this reconductoring project that will result in increased power flow requirements on R14T, R17T, R19TH and R21TH 230 kV transmission circuits. The proposed RTR Project will provide the necessary IESO-identified electricity capacity and reliability needs and will facilitate additional system flows, including those from western Ontario generation. Qualitative benefits of the recommended alternative are discussed in **Exhibit B, Tab 6, Schedule 1**.

Connecting Today.
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December 10, 2020

Mr. Robert Reinmuller
Director, Transmission Planning
Hydro One Inc.
483 Bay St., 13th Floor, North Tower
Toronto, Ontario M5G 2P5

Dear Robert,

**Re: Flow East Towards Toronto (FETT) Interface:
Recommendation to Proceed with Conductor Upgrades on the Trafalgar TS x Richview TS 230 kV Lines**

With the letter dated June 18, 2019, the IESO requested Hydro One to carry out studies to confirm the feasibility of, and provide cost estimates for, various upgrade options for the Richview TS x Trafalgar TS 230 kV transmission lines (attached). Thank you for confirming the feasibility of upgrading the line and providing the high quality cost estimates and the project schedule in the memorandum dated September 9, 2020 (attached).

The IESO is recommending Hydro One to proceed with conductor upgrades of the Richview TS x Trafalgar TS 230 kV transmission lines with 1433 kcmil ACSS conductor (the “Project”).

Need

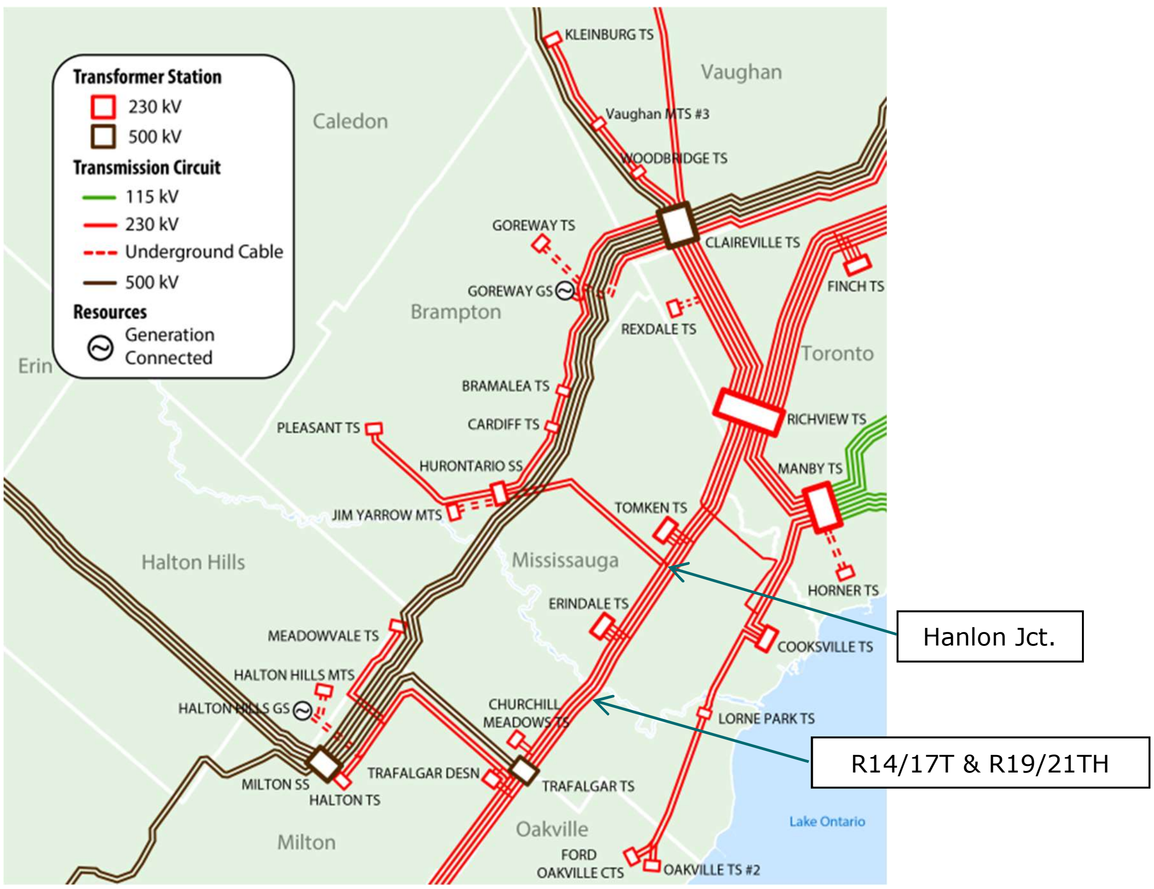
FETT is a transmission interface that delivers electricity from western to eastern part of Ontario and it consists of three paths: (a) four 500 kV circuits into Claireville TS from the west, (b) four 230 kV circuits between Trafalgar TS and Richview TS, and (c) two 230 kV circuits between Orangeville TS and Essa TS. Typically, the power transfers on this interface are in the west to east direction and are limited by summer ampacity ratings of the transmission circuits.

Supply capacity in eastern Ontario is expected to decline over the next decade, which contributes to a provincial need for capacity and, because of limits on the transfer capability of the FETT interface, ~4,000 MW of that capacity will have to be sited east of the FETT interface by 2026. To reduce the amount of capacity that must be sited in eastern Ontario, the IESO is recommending this Project, which is expected to be completed by 2026 and will increase the transfer capability of the interface by ~2,000 MW. This Project would reduce the risk to reliability in having to acquire a large amount of capacity in eastern Ontario and would enable more resources to compete to meet provincial needs.

Increasing the FETT Transfer Capability

The FETT transfer capability can vary depending on how the power flows are distributed among the three paths that make up the interface. Under the typical flow distribution, the capacity of the Trafalgar TS x Richview TS path limits the amount of power that can be transferred across the FETT interface. Therefore, increasing the ampacity of the 230 kV circuits (R14/17T and R19/21TH) on the two double circuit lines between Trafalgar TS and Richview TS (please refer to Figure 1) path would increase the FETT transfer capability. IESO has considered a number of potential options to increase the FETT transfer capability and has concluded that the line upgrade is the preferred option as a first stage to increase the FETT transfer capability.

Figure 1: Trafalgar TS x Richview TS 230 kV Transmission Circuits R14/17T and R19/21TH



Page 2 of 3

Upgrading Trafalgar x Richview 230 kV Transmission Line (R14/17T and R19/21TH)

Working with Hydro One, the scope of the line upgrade work has been optimized as follows:

Table 1: Required Ampacity

Circuit	From	To	Distance [km]	Required Planning Summer LTE [A]
R14/17T	Richview TS	Tomken JCT	7.9	2000
R14/17T	Tomken JCT	Erindale JCT	5.7	2000
R14/17T	Erindale JCT	Trafalgar TS	8.1	2000
R19/21TH	Richview TS	Tomken JCT	8.0	An upgrade is not required
R19/21TH	Tomken JCT	Hanlan JCT	1.1	2000
R19/21TH	Hanlan JCT	Erindale JCT	5.1	2000
R19/21TH	Erindale JCT	Churchill Meadows JCT	6.4	2000
R19/21TH	Churchill Meadows JCT	Trafalgar TS	1.1	2000

It was concluded that the use of 1433 kcmil ACSS would provide the required planning summer long term emergency (LTE) rating of 2000 A.

Next Steps

The IESO will support Hydro One in obtaining Ontario Energy Board and Environmental Assessment approvals for this project, as required.

Kind regards,

Ahmed Maria,
Director, Transmission Planning,
Independent Electricity System Operator (IESO)

c.c. Bruno Jesus, Hydro One
Leonard Kula, IESO
Terry Young, IESO
Chuck Farmer, IESO
Christopher Reali, IESO
Jim Lee, IESO

483 Bay Street, Toronto, M5G 2P5

MEMORANDUM

September 9th 2020

**Richview x Trafalgar 230kV Circuits –
R14T/R17T, R19TH/R21TH Conductor Upgrade**

Cost Estimate Summary

A INTRODUCTION

A.1 Background

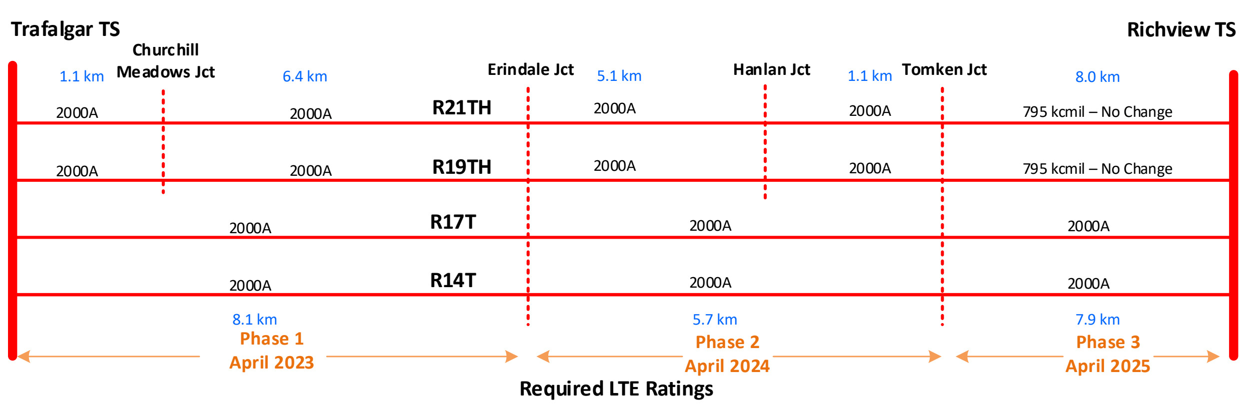
The IESO has indicated that there could be several changes to the generation availability in the area east of the FETT (Flow East Towards Toronto) interface. Two Pickering A units would be retired, Darlington units would be under refurbishment process and the current Lennox GS contract would have expired by then. Continuation of Lennox GS operation is a possibility, but it is uncertain. There will likely be a need to improve the FETT interface capability for 2023 summer.

The IESO requested Hydro One to provide a cost estimate for upgrading the R14T/R17T, and R19TH/R21TH circuits to a larger conductor.

A.2 Purpose

A.2.1 Conductor Upgrade

The scope of work is to upgrade the following sections of R14T/17T and R19TH/21TH circuits:



Phase	Circuits	From	To	Existing Conductor Size	Existing LTE Rating 127°C	Required LTE Rating (min)	Length (km)	In Service Date
1	R19TH / R21TH R14T / R17T	Trafalgar TS	Erindale Jct	1307.4 kcmil	1460 A	**2000 A**	7.5 & 8.1	April 2023
2	R19TH / R21TH R14T / R17T	Erindale Jct	Tomken Jct	795 kcmil	1090 A	**2000 A**	6.2 & 5.7	April 2024
3	R14T / R17T	Tomken Jct	Richview TS	795 kcmil	1090 A	**2000 A**	7.9	April 2025

Upgrade line sections that currently have a 795 kcmil ACSR conductor or 1307 kcmil ACSR to a minimum 2000A conductor (1433kcmil ACSS).

B SCHEDULE

Decision (IESO/H1) to Proceed with Project	October 1st 2020
Partial Release of Funds – Kick off Project	October 21st 2020
Detail Engineering to produce RFC all 3 phases	October 2020 – June 2021
Section 92	October 2020 – June 2021
Full Project Release – Business Case Approval	May 2021
Procurement	April 2021 – March 2022
Permits - NAV Canada, MTO, Train Tracks, Parks and City Approvals	June 2021 – December 2021
Lines Civil & Electrical - Phase 1	March 2022 – April 2023
Lines Civil & Electrical - Phase 2	October 2022 – April 2024
Lines Civil & Electrical - Phase 3	October 2023 – April 2025

C COST

The estimated cost to have all 3 phases completed by April 2025 is $47.7M (30%/-20%).

Prepared by:

Gene Ng, P.Eng
Sr. Network Management Engineer
Transmission Planning
Transmission System Development Division

Farooq Qureshy, P.Eng
Manager - Transmission Planning
Transmission Planning
Transmission System Development Division

Trafalgar TS x Richview TS 230 kV line upgrade: Need and Selection of the Preferred Plan

July 12, 2021

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Table of Contents

1. Flow East Towards Toronto (FETT) Interface

The Flow East Towards Toronto (FETT) interface is a transmission interface that delivers power from western Ontario to central and eastern Ontario. It consists of three paths:

- Four 500 kV circuits into Claireville TS from the west
- Four 230 kV circuits between Trafalgar TS and Richview TS
- Two 230 kV circuits between Orangeville TS and Essa TS

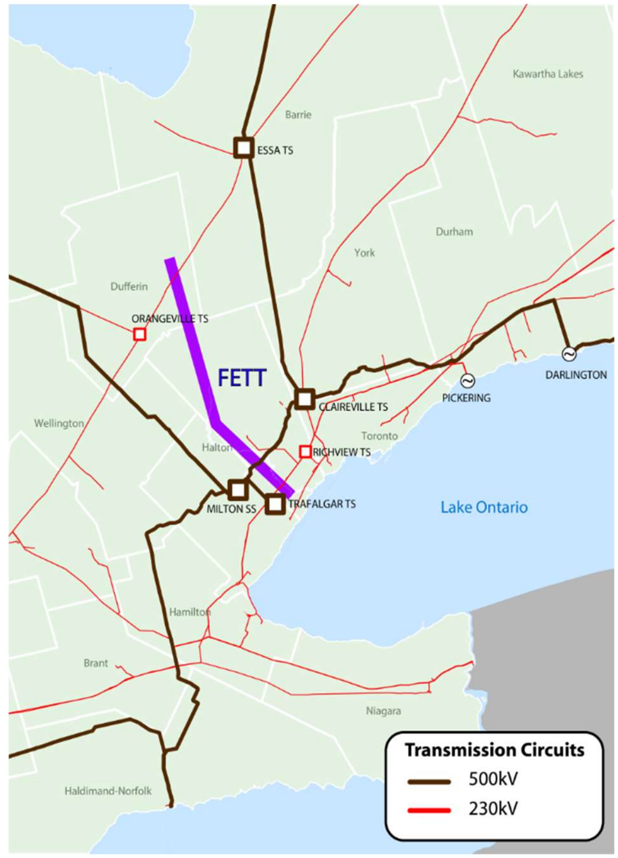

Figure 1: FETT Interface

Over the next few years, supply capacity east of the FETT interface is expected to decline due to nuclear retirements and nuclear refurbishments, and could potentially decline towards the end of this decade due to contracts for generation facilities reaching the end of their terms.

This decline in supply contributes to an overall provincial need for capacity (see the 2020 Annual Planning Outlook), where due to limitations on the transfer capability of the FETT interface 1850 MW to 2250 MW of that capacity must be acquired east of the interface by 2026. More specifically, with the decline in supply capacity east of the FETT interface, studies show that the transfer capability of the FETT interface will not be sufficient to meet NERC and NPCC reliability requirements by 2026 requiring, approximately 2,000 MW of supply to be specifically acquired east of FETT.

This reliability concern occurs during the summer peak demand periods, when the transmission line ratings are low and demands are high, both as result of high ambient temperatures. At summer peak, the demand east of FETT is about 65% of the total Ontario demand. Under these conditions, the 230 kV Trafalgar TS x Richview TS path reaches its capacity before the other two paths of the FETT interface, thus setting the transfer capability for the whole FETT interface.

As will be described further in this submission, given information available to the IESO, relying on successfully acquiring approximately 2,000 MW of capacity east of FETT by 2026 represents an unacceptable risk in IESO's ability to meet reliability standard requirements. Given the level of certainty in the ability to deploy a transmission enhancement to address the reliability need, and given the lead-time associated with transmission upgrades, the IESO finds it prudent to recommend that transmission enhancements to increase the FETT transfer capability are pursued at this time.

In addition to addressing the reliability concern of acquiring that much generation east of the interface, an ancillary benefit (i.e. not the driving reason for enhancements) of increasing the transfer capability of the FETT interface is that it enables greater competition in meeting the provincial need for capacity by removing the restriction that 2,000 MW must be acquired east of FETT. Greater competition can lead to lower costs for Ontario rate payers.

2. Supply Reliability East of the FETT Interface

2.1 North American and Ontario Reliability Criteria

Reliability standards are specified continent-wide by the North American Electric Reliability Corporation (NERC), for the northeastern region of North America by the Northeast Power Coordination Council (NPCC), and for the IESO-controlled Grid (ICG) in Ontario by the IESO.

These standards encompass both resource adequacy and transmission security[1]. Adequacy is the ability of the electric system to supply the aggregate electric power and energy requirements of the electricity consumers at all times, taking into account scheduled and reasonably expected unscheduled outages of system components. Security[2] is the ability of the electric system to withstand sudden disturbances such as electric short circuits or loss of system components.

The relevant reliability standard requirements for the planning timeframe are primarily outlined in NERC TPL-001 – Transmission System Planning Performance Requirements ("TPL-001"), NPCC Regional Reliability Directory #1 – Design and Operation of the Bulk Power System ("D1"), and IESO Ontario Resource and Transmission Assessment Criteria ("ORTAC").

Resource Adequacy requirements are found in R4 of NPCC D1 and section 8 of ORTAC, and require the IESO to plan its resources such that there is not more than 1 day in 10 years of Loss of Load Expectation ("LOLE"). Assessments are probabilistic, modeling outage rates of generator and demand uncertainty. The transfer capabilities between zones are set at a fixed value that represents the level at which the system can withstand a single contingency with all transmission elements initially in-service.

Transmission security requirements are found in NERC TPL-001, R7-R10 of NPCC D1, and in all but section 8 of the ORTAC. Assessments are deterministic, based on the system's ability to meet performance requirements for the specified disturbances, or "planning events", defined in the standards, while considering scheduled outages and unscheduled outages of critical system elements.

2.2 Reliability East of the FETT Interface

Over the next few years, supply capacity east of the FETT interface is expected to decline due to nuclear retirements and nuclear refurbishments, and could potentially decline further towards the end of this decade due to contracts for generation facilities reaching the end of their terms.

[1] Definitions for adequacy and security can be found here, North American Electric Reliability Corporation: Definition of "Adequacy Level of Reliability"

[2] North American Electric Reliability Corporation (NERC) replaced the use of term "Security" in 2001 with "Operating Reliability", but to not confuse the term with operational requirements, IESO continues to use the term security.

Given this reduction in supply east of the interface, studies indicate that starting in 2026 the transmission security and resource adequacy reliability criteria described in the previous section would not be met due to insufficient transfer capability across the FETT interface. The transmission security criteria was found to be more limiting and, hence, meeting those criteria, would also meet resource planning criteria. Therefore, the focus of this report will be on meeting transmission security criteria.

Table 1 shows the transfer capability of the FETT interface as determined in accordance with the transmissions security standards outlined previously. Table 2 shows by how much the forecasted demand east of FETT exceed the sum of the dependable resources east of FETT plus the transfer capability of the FETT interface. The two load forecast scenarios described in the 2020 Annual Planning Outlook were used in this need assessment.

The results of the assessment show an emerging need for supply capacity east of the FETT interface in the summer of 2023 when the Lennox GS contract expires in 2022 and further significant needs starting in 2026 after Pickering GS retires. Generating stations located east of FETT with expiring contracts around 2030 further adds to this need (Portland GS, Goreway GS, Halton Hills GS and York Energy Centre GS).

Table 1 | FETT Transfer Capability (2020 Annual Planning Outlook)

Scenario	Capability (MW)	Limiting Phenomenon	Limiting Contingency	Limiting Element	Note
All-In-Service	4,250 - 5,200	Thermal	Hurontario L21L30 (L19L29)	R19TH (R21H)	Summer capability; dependent on generation pattern
M570V initially Out-of-Service	2580 - 3350	Thermal	B560V + M571V	R21TH / R19TH	

Table 2 | Capacity needs east of FETT to meet transmission security

Demand Forecast	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Scenario 1	450	700	1550	4250	3550	3650	4400	5500	5200	5300	5350	5600
Scenario 2	0	0	950	3800	3000	3250	4000	5000	4650	4700	4750	4950

The IESO will be negotiating an extension of the Lennox GS contract as a transition measure to reduce this need. The capacity of Lennox GS is 2,000 MW and, as such, this need would be addressed until 2026 and the need for capacity east of FETT in 2026 would reduce to 2,250 MW under Scenario 1 and 1,800 MW under Scenario 2.

The next section describes the options available to meet this need.

3. Alternative Solution Options Considered

As mentioned in the previous section, to meet reliability criteria, 1850 MW to 2250 MW of supply is required to maintain security east of the FETT interface by 2026.

As indicated in the 2020 Annual Planning Outlook, in addition to this specific need for capacity east of the FETT interface, there is an overall need for capacity in Ontario due to increasing demand for electricity and the retirement of Pickering GS combined with nuclear unit outages for refurbishment. For the year 2026, that amount was determined to be about 5,200 MW after re-acquiring Lennox GS and 3,400 MW assuming all other resources with expiring contracts in the province are re-acquired.

To address the limitations of the FETT interface and the resulting supply concern east of the interface, some of the supply that is needed provincially, could be acquired east of the interface. This supply could be provided by:

1. Additional conservation programs targeted to areas east of FETT, beyond those already accounted for in IESO's demand forecasts
2. New domestic supply resources needed for the province in the areas east of FETT
3. Imports

After considering these supply options, as will be described in more detail below, relying on acquiring 1850 MW to 2250 MW of capacity east of the FETT interface by 2026 to meet reliability standards is an unacceptable reliability risk.

3.1 Additional Conservation Programs

The demand forecast used in the determination of the supply need in Table 2 contains the effect of codes and standards, previous conservation program savings, committed conservation programs under the 2021-2024 Conservation and Demand Management Framework and the continuation of such programs beyond 2024. There is potential for additional conservation programs, over and above those already considered, to help meet the supply need east of FETT.

A study carried out in 2019 looked at the achievable conservation potential for Ontario. Based on that study, it can be concluded that additional conservation programs alone would not meet the capacity needs east of FETT which is in the 2,000 MW range by 2026. The study indicates a possibility of obtaining about 200 MW of additional savings by 2026, which are cost effective based on their contributions to meeting the system's capacity and energy needs. Analysis of additional potential for conservation savings beyond that level has not been explored at this time.

3.2 New Supply Resources and/or Imports East of FETT

When acquiring new supply to meet the provincial need for capacity, it may be possible to run the capacity auction and resource procurements with a requirement to locate approximately 2,000 MW east of the FETT interface by 2026. The IESO is aware of some interest in developing new supply east of the interface and imports from Quebec and New York could provide some of that supply; however, the amount we're aware of isn't enough to meet the approximately 2,000 MW need and/or it is unclear whether or not it can be developed/acquired by 2026. Hence, there is significant uncertainty and risk in being able to obtain a sufficient amount of new supply resources east of FETT by 2026. As IESO develops and executes its resource acquisition mechanisms, more information will become available on how to meet the need east of FETT beyond 2027. Depending on the outcomes of those future provincial resource acquisitions, additional incremental increase in FETT transfer capability may be recommended as a second stage.

3.3 Summary

Although a combination of the above options can be considered to meet the capacity need east of FETT there are significant risks and unknowns in being able to acquire 2,000 MW of supply capacity east of the interface by 2026:

- The conservation level assumed in the Scenario 1 and Scenario 2 in APO 2020 represents the committed or expected level of conservation savings. Additional conservation in the near term beyond what has been committed as part of the 2021-2024 CDM Framework is not significant compared to the magnitude of the need.
- There are uncertainties on the capacity level that can be obtained east of FETT through the targeted capacity auction process and other resource acquisition mechanisms under development.

Not being successful in acquiring the needed resources east of the interface would result in the IESO-controlled grid being non-compliant with NERC and NPCC reliability standard requirements.

Hence, the IESO is recommending enhancing the FETT transfer capability. Enhancing the transfer capability of the interface, would lessen the restriction that 2,000 MW of the new supply resources needed in Ontario be acquired specifically east of the FETT interface by 2026 and provide flexibility to acquire these resources west of the FETT interface. As an ancillary benefit, greater flexibility in where supply resources are located is expected to provide greater competition amongst those supply resources and ultimately lead to ratepayer savings.

As will be described in the next section, there are low cost options for enhancing the transfer capability on this interface that could be implemented by 2026.

4. Improving FETT Interface Transfer Capability

Several transmission alternatives were considered that can provide increases in the FETT capacity. Those options were narrowed down to two options that meet the following two criteria:

- Can be in-service before the summer 2026.
- Provide an increase in transfer capability of at least 2,250 MW in 2026 assuming all transmission elements in service.

4.1 Description of Transmission Alternatives

The following are the alternatives that meet the above screening criteria.

<u>Alternative 1: Upgrade Trafalgar TS x Richview TS 230 kV lines</u>

This will increase the ability of Trafalgar TS x Richview TS path (230 kV circuits: R14/17T and R19/21TH) to accommodate higher transfers thereby increasing the overall FETT transfer capability. This involves replacing conductors on the existing two double circuit 230 kV lines with compact high-temperature conductors.

At the development phase of the project, numerous conductors were considered for upgrading the Trafalgar TS x Richview TS lines. It was concluded that the use of 1433 kcmil ACSS would provide the required planning summer long term emergency (LTE) rating of 2000 A. It is a high-temperature compact conductor that allows the required rating without involving significant tower modifications. The existing line includes 795 kcmil ACSR and 1307 kcmil ACSR conductors. The reduction in the resistance, hence reduction in line losses, will be about 44% for the sections with 795 kcmil ACSR and about 8% for the sections with 1307 kcmil ACSR.

Further details of the project are included in the IESO letter to Hydro One dated December 18, 2020.

<u>Alternative 2: Build a new double-circuit 230 kV line connecting Trafalgar TS and Oakville TS with new switching facilities at Trafalgar TS</u>

This would provide another transmission path into the area east of FETT from the west and reduce the transfers on the critical Trafalgar TS x Richview TS circuits. There is an idle corridor with no transmission assets between Trafalgar TS and Oakville TS. The line involved would be about 8 km in distance, but there would be a significant cost associated with adding switching facilities at Trafalgar TS which is a gas-insulated station.

Development work for this option has not been carried out due to the high cost. Since the corridor designation is dated, a new approval under the Environmental Approval process is expected.

4.2 Comparison of Transmission Alternatives

4.2.1 Reliability Performance Comparison

The FETT transfer capability depends on generation dispatch and, so, two scenarios are considered that reflect different availability of generating units at Bruce GS. Table 3 below shows a comparison of the two alternatives during the period after Pickering GS retires and two Bruce units are unavailable due to refurbishment work (mid-term), and after Bruce refurbishment outages are completed (long-term). The table provides a comparison under two system considerations:

1. With all transmission elements in-service
2. With a critical transmission element out-of-service

Both options meet the needs under both situations.

Both alternatives provide similar FETT capacity improvements in the mid-term but Alternative 1 provides better performance than Alternative 2 in the long-term for both all in-service and one element out-of-service conditions. Alternative 1 has overall better performance than Alternative 2.

Table 3 | Performance Comparison of Alternatives

Description of Option	Time period	Bruce GS units in-service	Pickering GS units in-service	All in-service (MW)	One element out-of-service (MW)	Increase in all in-service (MW)	Increase in element out-of-service (MW)
Existing System	Mid-term	6	0	4250	2600	0	0
	Long-term	8	0	5200	3350	0	0
Alternative 1: Upgrade Trafalgar TS x Richview TS 230 kV line	Mid-term	6	0	6950	4600	2700	2000
	Long-term	8	0	7350	4900	2150	1550
Alternative 2: Connecting Trafalgar TS and Oakville TS with new 230 kV line (8 km) with new switching facilities at Trafalgar TS	Mid-term	6	0	6900	4700	2650	2100
	Long-term	8	0	6900	4600	1700	1250

4.2.1 Economic Performance Comparison

At the time the IESO recommended Hydro One to proceed with Alternative 1 in the IESO letter to Hydro One dated December 18, 2020, the cost estimate for Alternative 1 was $48M. Subsequently, Hydro One has indicated the cost estimate now stands at $61M after further reviews. The estimated cost for Alternative 2 is $88 M, but it provides the added benefit of meeting the need for additional supply capacity to the Richview South area of Toronto (i.e., the area supplied by the Richview TS x Manby TS corridor). Thus, Alternative 2 would displace the need for transmission enhancements that increase the supply to Richview South area of Toronto, providing a benefit of about $23M. Even with this credit and now with the higher cost of Alternative 1, the cost of Alternative 2 is still expected to be higher than Alternative 1.

Therefore, overall Alternative 1 is preferred over Alternative 2 from a cost perspective.

4.2.2 Environmental Consideration

Upgrading the existing line between Trafalgar TS and Richview TS (Alternative 1) and rebuilding an idle 115 kV line to a new 230 KV Richview TS x Manby TS line (Toronto IRRP plan) is expected to have less environmental disturbance than building a new line on an idle corridor that currently has no assets (Alternative 2).

It also conforms with Provincial Policy Statement, 2020.

1.6.3 Before consideration is given to developing new infrastructure and public service facilities:

a) the use of existing infrastructure and public service facilities should be optimized; and

b) opportunities for adaptive re-use should be considered, wherever feasible.

4.3 Preferred Transmission Plan

In summary, Alternative 1 is the preferred plan for the following reasons compared to Alternative 2:

1. Cost advantage
2. Performance advantage
3. Lower environmental impact and conforms with Provincial Policy Statement, 2020
4. Lower implementation risk (i.e., if Alternative 2 is selected, there would be a higher risk of potential delay in obtaining EA approvals and not meeting the required summer 2026 in-service date)

5. Conclusion

The transmission project to upgrade the capacity of Trafalgar TS x Richview TS 230 kV lines is recommended as the preferred plan to meet the transmission security needs east of the FETT interface for the following reasons:

- It would provide the best path in meeting the capacity need east of the FETT interface where there is a significant risk of not being able to acquire sufficient new resources east of FETT to meet the need. The increase in FETT capability provided by the line upgrade would sufficiently increase the ability of resources west of FETT to contribute towards meeting the capacity need east of FETT.
- It can be implemented before summer 2026 when the need is expected to emerge.
- It is the most cost effective transmission alternative with least environmental impact and conforms with Provincial Policy Statement, 2020.
- It provides sufficient increase in FETT capability to meet both transmission security need and the resource adequacy need east of FETT.

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PROJECT CLASSIFICATION AND CATEGORIZATION

Project Classification

Per the Board's filing guidelines, rate regulated projects are classified into three groups based on their purpose.

- Development projects are those which:
  - (i) provide an adequate supply capacity and/or maintain an acceptable or prescribed level of customer or system reliability for load growth or for meeting increased stresses on the system; or
  - (ii) enhance system efficiency such as minimizing congestion on the transmission system and reducing system losses.
- Connection projects are those which provide connection of a load or generation customer or group of customers to the transmission system.
- Sustainment projects are those which maintain the performance of the transmission network at its current standard or replace end-of-life facilities on a "like for like" basis.

Based on the above criteria, the Project is a development project to help increase supply capacity from western Ontario towards the east, including towards the GTA.

Project Categorization

The Board's filing guidelines require that projects be categorized to distinguish between a project that is a "must-do", which is beyond the control of the applicant ("non-discretionary"), from a project that is at the discretion of the applicant ("discretionary").

Non-discretionary projects may be triggered or determined by such things as:

a) mandatory requirement to satisfy obligations specified by regulatory organizations including NPCC/NERC or by the Independent Electricity System Operator (IESO);
b) a need to connect new load (of a distributor or large user) or new generation connection;
c) a need to address equipment loading or voltage/short circuit stresses when their rated capacities are exceeded;
d) projects identified in a provincial government approved plan;
e) projects that are required to achieve provincial government objectives that are prescribed in governmental directives or regulations; and
f) a need to comply with direction from the Ontario Energy Board if it is determined that the transmission system's reliability is at risk.

Based upon the above criteria, the Project is considered non-discretionary. The Project is being undertaken at the request of the IESO. It will increase power transfer capability from western Ontario towards the east, including into the GTA, across the FETT interface, and it will support the transmission system during periods of high output from generation sources in western Ontario.

Categorization and Classification

		Project Need	
		Non-discretionary	Discretionary
Project Class	Development	**X**	

COST BENEFIT ANALYSIS AND OPTIONS

TRANSMISSION ALTERNATIVES

There are no practical alternatives to the scope of work for which Hydro One is seeking the Board’s approval. The Hand-off Letter provided to Hydro One by the IESO, included in the Need Evidence per **Exhibit B, Tab 3, Schedule 1,** is very specific, and, as such, no other alternatives were considered.

QUANTITATIVE BENEFITS OF THE PROJECT

The RTR Project encompasses the following quantitative benefit:

Increase Thermal Rating of ~36 km of double circuit line

This investment will increase the thermal limits of the 230 kV circuits R14T and R17T, between Trafalgar TS and Richview TS, and the 230 kV circuits R19TH and R21TH between Trafalgar TS and Tomken JCT, to provide a minimum summer continuous rating of 2000A. This is consistent with the IESO's request[1].

QUALITATIVE BENEFITS OF THE PROJECT

The RTR Project encompasses the following qualitative benefits that cannot be specifically quantified:

Avoiding Future Refurbishment and Maintenance Activities

Some transmission circuit refurbishment work such as protection coating on the tower lines between Richview TS and Trafalgar TS was planned for 2021. Hydro One will now use this opportunity to perform the work during the Project's construction schedule to maximize the use of the crews on site. Regular maintenance and brush clearing along the Richview to Trafalgar right-of-way route was also scheduled for 2024 but will now be scheduled to occur during the RTR Project's execution phase to take advantage of the circuit outage opportunities.

[1] Exhibit B, Tab 3, Schedule 1, Attachment 1 and Attachment 3.

APPORTIONING PROJECT COSTS & RISKS

The estimated capital cost of the RTR Project, including overheads and capitalized interest, is shown below:

Table 1 - Project Cost

	Estimated Cost ($000's)
Materials	13,616
Labour	17,014
Equipment Rental & Contractor Costs	13,865
Sundry	1,921
Contingencies	2,710
OverHead [1]	4,617
Capitalized Interest [2]	2,331
Real Estate [3]	184
TOTAL PROJECT WORK	**$ 56,258**

The cost of the work provided above allows for the schedule of approval, design and construction activities provided in **Exhibit B, Tab 11, Schedule 1**.

1.0 RISKS AND CONTINGENCIES

As with most projects, there are risks associated with estimating costs. Hydro One's cost estimate includes an allowance for contingencies, in recognition of these risks.

[1] Overhead Costs allocated to the project are for corporate services costs. These costs are charged to capital projects through a standard overhead capitalization rate. As such they are considered "Indirect Overheads".
[2] Capitalized Interest is calculated using the Board's approved interest rate methodology (EB-2016-0160) to the Project's forecast monthly cash flow and carrying forward closing balances from the preceding month.
[3] Real Estate costs for the RTR Project is to acquire crossing permits to string conductors over railways, roads and waterways, as appropriate.

The top Project risks, outlined below, are the major contributors to the total contingency suggested for this Project.

- **Outage constraints –** There circuits deliver electricity from western Ontario towards the GTA. There is a risk of obtaining outages on these critical Bulk Energy System circuits to complete the project work. This may result in schedule delays and increase in project costs if timely outages cannot be obtained. Other on-going work in 2022 at Trafalgar TS and Claireville TS that is not related to the RTR Project scope may impact outage availability for the Project.
- **Permit and approval requirements** – the RTR Project requires a substantial number of permits and approvals, including those from oil pipeline owners, Navigation Canada, Ministry of Transportation, railway companies, the City of Toronto. Environmental Screen Out/Class EA is also required from the Ministry of Environment, Conservation and Parks. There is a risk that an approval may not be granted in a timely manner, which may result in schedule delays and additional costs.
- **Material delivery timelines** - The conductors and hardware required for the project have lead times of up to one year. There is a risk that vendors may not meet material requirement dates, which would result in schedule delays and standby costs.
- **Subsurface conditions** – the geotechnical investigations have not yet been completed for this Project. Poor soil conditions could increase the extent of the foundation reinforcement required for the existing towers, as well as the requirements for the foundation design of the six new towers, all of which would result in additional costs to the Project.

Cost contingencies that have not been included, due to the unlikelihood or uncertainty of occurrence, include:

- Labour disputes;
- Safety and environmental incidents;

- Significant changes in costs of materials since the estimate preparation; and
- Any other unforeseen and potentially significant event/occurrence.

2.0 COSTS OF COMPARABLE PROJECTS

The OEB Filing Requirements for Electricity Transmission and Distribution Applications, Chapter 4, requires the Applicant to provide information about a cost comparable project constructed by the Applicant.

The Project consists of reconductoring four circuits: two 230 kV circuits, known as R14T and R17T, from Trafalgar TS to Richview TS, and two circuits, known as R19TH and R21TH, from Trafalgar TS to Tomken JCT. Each replacement conductor on the four circuits will be 1433 kcmil ACSS/TW, with compact-type ACSS. The reconductoring will increase the conductor rating to a 2000 Ampacity Long Term Emergency ("LTE") rating. Additionally, some structural tower modifications/reinforcement will be required to accommodate the increased loading conditions due to the larger conductor size. The existing skywire on the tower series that carry two circuits, R14T and R17T, will be replaced with OPGW from Trafalgar TS to Richview TS.

Project cost comparisons for the RTR Project line scope of work to other similar transmission line projects completed by Hydro One are provided below. Hydro One has provided three line comparison projects, one at 230 kV operating voltage, and two at 115 kV operating voltage. These are considered to be the most appropriate project scope comparators to the RTR Project proposed in this Application.

2.1 LINES PROJECTS

The three comparable line projects are: Circuits K1W, K3W, K11W and K12W of the West Toronto Transmission Enhancement ("WTTE") Project; Circuits D6V and D7V Transmission Line Refurbishment ("D6V/D7V") Project; and the Decew TS to Glendale TS Transmission Line Refurbishment ("DxS") Project. The DxS Project involved the circuits known as D9HS and D10HS. These three comparator projects involve reconductoring existing 115 kV or 230 kV circuits. The WTTE and D6V/D7V Projects, both involved capacity increases, whereas the DxS Project was a refurbishment project that involved replacing existing end-of-life conductors with the same-sized conductor. As a result, there was no increase in capacity on this DxS Project.

The RTR Project scope differs from the comparator reconductoring projects outlined in this Application, as undertaken by Hydro One, due largely to the following two reasons:

- The scope of work on the RTR Project involves four 230 kV circuits carried on two separate, and adjacent sets of towers, compared to the comparator projects where reconductoring was carried out on only a single set of towers; and
- Tower reinforcement and some tower replacements are required for the RTR Project such that the towers carrying the heavier conductors will meet Hydro One's security class requirements, compared to the three comparator projects, which did not require tower reinforcement.

The additional work scope for the RTR Project mentioned above, compared to the comparative projects which did not contain those scope elements, contributes to a comparatively higher complexity and higher cost per circuit km for the RTR Project. These additional complexities require comparatively more planning, execution time and resources to undertake. This is due primarily to the increased amount of 230 kV circuits in proximity to each other and the dual sets of towers adjacent to each other, carrying the four circuits. Additionally this requires comparatively more safety requirements from the more complex scope of work, adding a level of cost above the comparator projects that have a smaller, less complex scope of work. Apart from the dual tower span with four circuits, these projects are nevertheless still an appropriate comparators, due to the scopes similar to that of the RTR Project. As mentioned, a four-circuit reconductoring project is unique, and as such the two-circuit project reconductoring projects of the D6V/D7V and DxS projects are as similar in scope as Hydro One has undertaken recently.

Hydro One has provided a side-by-side comparison of the projects described above to the RTR Project in **Table 2**, below. Table 2 illustrates that the RTR Project cost per circuit km is approximately $0.8M per km, which is comparable, and slightly higher, to the WTTE Project cost. Table 2 also indicates that the RTR Project’s costs per km is expected to be slightly higher compared to the D6V/D7V Project and the DxS Project on a per km basis, however this is a result of the increased cost drivers on the RTR Project, as outlined above.

Table 2 - Costs of Comparable Line Projects

Project	RTR Project	WTTE Project	D6V/D7V Project	DxS Project
Scope	Reconductor four 230 kV lines	Reconductor four 115 kV lines	Reconductor two 230 kV lines	Reconductor two 115 kV lines
Length (km)	21.7	10.0	9.4	9.0
Circuit Length (km)[4]	70.8[5]	40.0	18.8	18.0
Project Surroundings	Urban	Urban	Mostly Rural	Mostly Urban
In-Service Date	Apr-2026	Nov-18	Dec-20	Dec-15
Years for escalation	-	7 yrs, 5 months	5 yrs, 4 months	10 yrs, 4 months
Total Project Cost (SM)[6]	**56.3**	**21.4**	**8.6**	**6.3**
Less: By-Pass ($M)	0.4	-	-	0.2
Less: OPGW Costs ($M)[7]	1.2	0.3	0.3	0.8
Total Project Costs Before Escalation ($M)	**54.7**	**21.1**	**8.3**	**5.3**
Add: Escalation Adjustment (2%/year)	-	3.3	0.9	1.2
Total Comparable Project Costs ($M)	**54.7**	**24.5**	**9.2**	**6.6**
Total Cost/Circuit km ($M)	**0.8**	**0.6**	**0.5**	**0.4**

[4] Circuit km length is the sum of the length of all circuits in the project.
[5] The circuit length for the RTR Project is calculated by adding: the two circuits R14T and R17T of 21.7 km each, and, the two circuits R19TH and R21TH of 13.7 km each, for a total length of 70.8 km.
[6] The RTR Project costs provided are forecasts. The D6V/D7V, WTTE and DxS project costs represent actual costs.
[7] Installing OPGW costs are higher than the non-OPGW skywire alternative. The construction methodology and skywire material alternative has a cost impact. For the RTR Project, the replacement of strain plates on dead-end towers and reinforcement of tower peaks as well as splicing of the towers also impacts costs.

A description of each comparable project is provided below, with commentary highlighting any applicable similarities and/or differences to the RTR Project which drive costs for each.

a) The WTTE Project includes reconductoring of four 115 kV circuits (K1W, K3W, K11W and K12W), approximately 10 km long, between Manby TS and Wiltshire TS. K1W/k3W and K11W/K12W are each strung on a 2-Circuit 115 kV tower, spanning from Manby TS to tower structure 'Structure 4'. From the "Structure 4" tower to Wiltshire TS, the four circuits are then strung on a four-Circuit 115 kV Kipling St. Clair Type towers, with the exception being a small line section spanning between Runnymede TS and St. Clair JCT, (between Structures 34 and 35) which consists of two wood pole structures. The wood poles were replaced as part of a prior project with two 'G4L' design type steel towers. The WTTE Project went in-service in November 2018. Both the RTR Project and WTTE Project are situated in almost identical urban locations west of Toronto. Both projects involve multiple road crossings and involve increasing the rating of the existing circuits. The total costs per circuit km are relatively similar for both projects, with the RTR being slightly higher due to the differences between the two projects. The similarities and differences between the two projects are described below.

The WTTE line reconductor project was part of a larger overall project that included an expansion to the 115/27.6 kV Runnymede TS work that consisted of two new 50/83 MVA transformers. The scope of the RTR Project includes only line upgrade, with no station upgrade work. Both projects include upgrades to the existing shieldwire and replacement of existing insulators and associated hardware. The projects were also very similar in scope and included structural reinforcement and replacement of existing steel towers. The RTR Project requires 230 kV hardware, e.g. larger structural reinforcements, insulators and connectors, given the RTR Project is designed to be operated at a higher voltage class than the 115 kV WTTE Project.

The WTTE Project also carries the four circuits for the majority of the distance between the two terminal stations by the same tower span. The RTR Project circuits R14T/R17T and R19TH/R21TH are instead carried on two separate spans of towers for the entire route, adding to construction costs, as there is more scope associated with tower reinforcement work, access roads and craning requirements. By reconductoring only one circuit at a time, there are also comparatively increased time and resources for the efforts of setup and mobilization. Work teams complete one tower span and then return to the starting point each time to begin the reconductoring of the next span. Thus the mobilization and demobilization for each tower span adds more time and cost.

b) The D6V/D7V Project consists of refurbishing approximately 9.4km of double circuit 230 kV line between Guelph North JCT and Fergus JCT. The D6V/D7V Project is located mostly in a rural geographical area and was placed in service in December 2020.

Scope differences between the two projects that drive cost differences are the fact that the span length of the RTR Project is more than double the D6V/D7V Project, and the scope of the RTR Project includes four circuits compared to the D6V/D7V Project’s two circuits. The RTR Project will undertake 70.8 km of circuit reconductoring versus the D6V/D7V Project’s shorter 18.8 km length. Although a longer line enables the project fixed costs to be spread out on a cost per km basis, the RTR Project’s increased scope of work complexity requires a longer overall construction schedule, which drives increased project cost, including higher interest cost.

Additionally, the D6V/D7V Project is located primarily in a rural area with minimal road crossings, compared to the highly urbanized RTR Project setting, with multiple road, provincial highway, waterways, railways and pipeline crossings which drive additional project cost. Both circuits D6V and D7V are carried on a single set of towers with no other circuits on that tower, effectively reducing the level of complexity of this undertaking when compared to the RTR Project, which has two adjacent tower spans. No structural reinforcement of the tower or tower replacements were required for the D6V/D7V Project, and all of the foregoing result in comparatively lower project costs and a shorter construction schedule.

c) The DxS Project was a like-for-like (end-of-life) conductor replacement for a distance of approximately 9km for two 115 kV circuits, namely D9HS and D10S. Both circuits are carried on the same tower span, and the project was completed in December 2015. Both the RTR and DxS Projects are situated in urban locations, but they vary in length, with the RTR Project measuring approximately double the length of the DxS Project. A longer line enables the project fixed costs to be spread out on a cost per km basis.

The DxS project involved reconductoring circuits on the same single span of towers, resulting in a shorter overall construction schedule compared to that of the RTR Project scope of work (the RTR Project consists of two adjacent, but separate, tower spans). For the RTR Project, there are comparatively longer construction time and higher cost resulting from the proximity of the towers/circuits. Additionally, considering the criticality of these circuits to the Bulk Energy System, no two circuits can be taken out of service at any one time; and as such the sequential nature of the work results in a longer project construction schedule (this is true for not only the DxS project but also the other comparator projects selected in this exhibit). Furthermore, additional precautions, safety measures and equipment are required to work on the RTR Project, which consists of a 230 kV circuit instead of 115 kV for the DxS project.

In comparison to all the projects used for comparative purposes, the RTR Project requires tower modifications to accommodate the new heavier conductor. This is expected to include tower reinforcement, including localized steel member replacement and foundational upgrades for increased loading conditions. Additionally, six towers along the route have been identified as needing full replacement. The tower reinforcement and replacement scope of work result in an overall higher cost, on a per km basis, for the RTR Project, when compared to the three comparative projects, on a per circuit km basis.

CONNECTION PROJECTS REQUIRING NETWORK REINFORCEMENT

This is not a connection project. Network facilities being upgraded as a result of this Project are limited to those discussed in the details of the work being undertaken. See **Exhibit C, Tab 1, Schedule 1.**

TRANSMISSION RATE IMPACT

1.0 ECONOMIC FEASIBILITY

The RTR Project costs will be included in the network connection pool for cost classification purposes and not allocated to any individual customer. See **Exhibit B, Tab 1, Schedule 1**, for information on the proposed work. No customer contribution is required for this project.

Once the Project is in service, there will be no incremental operating and maintenance costs since activities such as vegetation management and inspection would not be materially impacted by the change in the increased conductor size on the existing four 230 kV circuits. The RTR Project will also have no impact on provincial peak load, resulting in zero incremental network revenue over the 25-year evaluation period.

A 25-year discounted cash flow analysis of the network pool work was conducted. The results show that based on the estimated initial cost of $60.9[1] million, plus the assumed impact on the future capital cost allowance and Hydro One corporate income tax, this capacity enhancement project will have a negative net present value of $52.7 million as shown in Table 1. This amount will be fully recovered via the network pool rates.

2.0 COST RESPONSIBILITY

Network Pool

The RTR Project will address an emerging supply capacity need from the decline in generation in eastern Ontario[2]. The Hydro One R14T, R17T, R19TH, and R21TH circuits

[1] Initial costs of $60.9 million include $56.3 million of up front capital costs plus $4.6 million cost of removals.
[2] Exhibit B, Tab 3, Schedule 1

are 230 kV network transmission lines in the GTA; and at completion of the RTR Project, these lines will facilitate the above described IESO-identified need.

This network pooled Project is not tied to any specific load increase or customer load application but is intended to accommodate increased system flows on the four 230 kV circuits. As such, the proposed circuit upgrades are included in the network pool, and no customer capital contribution is required, consistent with the provisions of Section 6.3.5 of the Transmission System Code.

3.0 RATE IMPACT ASSESSMENT

The analysis of the network pool rate impacts has been carried out on the basis of Hydro One's transmission revenue requirement for the year 2020, and the 2020 approved Ontario Transmission Rate Schedules. The network pool revenue requirements would be affected by the line upgrade based on the project cost allocation.

The 2020 OEB-approved rates have been used to measure the Project's customer impacts on rates. 2020 rates were used because, unlike 2021 OEB-approved rates, they do not include any foregone revenue that Hydro One is currently recovering in the 2021 rates.

Network Pool

Based on the total Project's initial cost of $60.9 million and the associated network pool incremental cash flows, there will be a change in the network pool revenue requirement once the project's impacts are reflected in the transmission rate base at the projected in-service date of April 1, 2026. Over a 25-year time horizon, this change in the network pool revenue requirement has a 0.51% incremental impact, increasing the 2020 OEB approved rate of $3.92 kW/month to $3.94 kW/month. If the 2021 OEB approved rates were used, there would be a 0.41% incremental impact, increasing the 2021 OEB approved rate of $4.90 kW/month to $4.92 kW/month. The maximum revenue shortfall related to the proposed facilities will be $4.2 million in the year 2034. The detailed analysis illustrating the calculation of the incremental network revenue shortfall and rate impact is provided in Table 3 and 4 below.

Impact on Typical Residential Customer

Based on the load forecast, initial capital costs and ongoing maintenance costs, adding the costs of the replacement of the required facilities to the network pool will cause a $0.03 per month increase in a typical residential customer's rates under the Regulated Price Plan ("RPP"). The table below shows this result for a typical residential customer who is under the RPP, utilizing the maximum impact by rate pool, regardless of year.

A. Typical monthly bill (Residential R1 at 700 kWh consumption per month)	$148.68 per month
B. Transmission component of monthly bill	$11.65 per month
C. Line Connection Pool share of Transmission component	$1.61 per month
D. Transformation Connection Pool share of Transmission component	$3.86 per month
E. Network Connection Pool share of Transmission component	$6.19 per month
F. Impact on Network Connection Pool Provincial Uniform Rates	0.51%
G. Net impact on typical residential bill (E x F)	$0.03 per month or $0.38 per year
H. Net increase on typical residential customer bill (G / A)	0.02%

Note: If 2021 OEB approved rates were used, the net impact on the typical residential customer bill would be the same with an increase of $0.03 per month or $0.38 per year, resulting in 0.02% net increase.

Table 1 - Net Present Value, page 1

			In-Service Date	<-------	Project year ended - annualized from In-Service Date					------->					
		Month	Apr-1	Apr-1	Apr-1	Apr-1	Apr-1	Apr-1	Apr-1	Apr-1	Apr-1	Apr-1	Apr-1	Apr-1	Apr-1
		Year	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038
			0	1	2	3	4	5	6	7	8	9	10	11	12
Revenue & Expense Forecast															
Load Forecast (MW)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Load adjustments (MW)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tariff Applied ($/kW/Month)				3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92
Incremental Revenue - $M				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Removal Costs - $M			(4.6)												
On-going OM&A Costs - $M			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Municipal Tax - $M				(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)
Net Revenue/(Costs) before taxes - $M			(4.6)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)
Income Taxes			1.2	0.6	1.2	1.1	1.0	0.9	0.9	0.8	0.7	0.7	0.6	0.6	0.5
Operating Cash Flow (after taxes) - $M			(3.4)	0.5	1.0	0.9	0.8	0.7	0.7	0.6	0.6	0.5	0.4	0.4	0.4
		Cumulative PV @ 5.31%													
PV Operating Cash Flow (after taxes) - $M	(A)	3.2	(3.4)	0.4	0.9	0.8	0.7	0.6	0.5	0.4	0.4	0.3	0.3	0.2	0.2
Capital Expenditures - $M															
Upfront - capital cost before overheads & AFUDC			(49.3)												
- Overheads			(4.6)												
- AFUDC			(2.3)												
Total upfront capital expenditures			(56.3)												
On-going capital expenditures				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PV On-going capital expenditures			0.0												
Total capital expenditures - $M			(56.3)												
Capital Expenditures - $M															
PV CCA Residual Tax Shield - $M			0.3												
PV Working Capital - $M			0.0												
PV Capital (after taxes) - $M	(B)	(55.9)	(55.9)												
Cumulative PV Cash Flow (after taxes) - $M	(A) + (B)	(52.7)	(59.4)	(58.9)	(58.0)	(57.2)	(56.5)	(55.9)	(55.4)	(55.0)	(54.6)	(54.3)	(54.0)	(53.8)	(53.6)

Discounted Cash Flow Summary

Economic Study Horizon - Years:		**25**
Discount Rate - %		**5.31%**
		Before Cont $M
PV Incremental Revenue		0.0
PV OM&A Costs		(4.6)
PV Municipal Tax		(2.7)
PV Income Taxes		1.9
PV CCA Tax Shield		8.9
PV Capital - Upfront	(56.3)	
Add: PV **Capital Contribution**	**0.0**	(56.3)
PV Capital - On-going		0.0
PV Working Capital		0.0
PV Surplus / (Shortfall)		(52.7)
Profitability Index*		**0.1**

Notes:
*PV of total cash flow, excluding net capital expenditure & on-going capital & proceeds on disposal / PV of net capital expenditure & on-going capital & proceeds on disposal

Other Assumptions

In-Service Date:	01-Apr-26
Payback Year:	2051
No. of years required for payback:	25

Table 2 - Net Present Value, page 2

		<------- Project year ended - annualized from In-Service Date -------->												
	Month	Apr-1	Apr-1	Apr-1	Apr-1	Apr-1	Apr-1	Apr-1	Apr-1	Apr-1	Apr-1	Apr-1	Apr-1	Apr-1
	Year	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051
		13	14	15	16	17	18	19	20	21	22	23	24	25
Revenue & Expense Forecast														
Load Forecast (MW)		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Load adjustments (MW)		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tariff Applied ($/kW/Month)		3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92
Incremental Revenue - $M		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Removal Costs - $M														
On-going OM&A Costs - $M		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Municipal Tax - $M		(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)
Net Revenue/(Costs) before taxes - $M		(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)
Income Taxes		0.5	0.5	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.2	0.2	0.2
Operating Cash Flow (after taxes) - $M		0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0
PV Operating Cash Flow (after taxes) - $M	**(A)**	**0.2**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Capital Expenditures - $M														
Upfront - capital cost before overheads & AFUDC														
- Overheads														
- AFUDC														
Total upfront capital expenditures														
On-going capital expenditures		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PV On-going capital expenditures														
Total capital expenditures - $M														
Capital Expenditures - $M														
PV CCA Residual Tax Shield - $M														
PV Working Capital - $M														
PV Capital (after taxes) - $M	**(B)**													
Cumulative PV Cash Flow (after taxes) - $M	**(A) + (B)**	**(53.4)**	**(53.3)**	**(53.1)**	**(53.0)**	**(53.0)**	**(52.9)**	**(52.8)**	**(52.8)**	**(52.8)**	**(52.7)**	**(52.7)**	**(52.7)**	**(52.7)**

Table 3 - Revenue Requirement and Network Pool Rate Impact, page 1

Revenue Requirement and Network Pool Rate Impact

Richview TS by Trafalgar TS Reconductoring Project		Project YE 01-Apr 2027	01-Apr 2028	01-Apr 2029	01-Apr 2030	01-Apr 2031	01-Apr 2032	01-Apr 2033	01-Apr 2034	01-Apr 2035	01-Apr 2036	01-Apr 2037	01-Apr 2038
Calculation of Incremental Revenue Requirement ($000)		1	2	3	4	5	6	7	8	9	10	11	12
In-service date	01-Apr-26												
Capital Cost	56,258												
Less: Capital Contribution Required	-												
Net Project Capital Cost	56,258												
Average Rate Base		27,568	54,576	53,454	52,333	51,211	50,090	48,968	47,847	46,725	45,604	44,482	43,361
Incremental OM&A Costs		0	0	0	0	0	0	0	0	0	0	0	0
Grants in Lieu of Municipal tax		191	191	191	191	191	191	191	191	191	191	191	191
Depreciation		1,121	1,121	1,121	1,121	1,121	1,121	1,121	1,121	1,121	1,121	1,121	1,121
Interest and Return on Rate Base		1,652	3,271	3,204	3,136	3,069	3,002	2,935	2,868	2,800	2,733	2,666	2,599
Income Tax Provision		-66	-478	-367	-267	-175	-93	-17	51	112	168	218	263
REVENUE REQUIREMENT PRE-TAX		**2,899**	**4,105**	**4,149**	**4,182**	**4,206**	**4,222**	**4,230**	**4,231**	**4,225**	**4,213**	**4,196**	**4,174**
Incremental Revenue		0	0	0	0	0	0	0	0	0	0	0	0
SUFFICIENCY/(DEFICIENCY)		**-2,899**	**-4,105**	**-4,149**	**-4,182**	**-4,206**	**-4,222**	**-4,230**	**-4,231**	**-4,225**	**-4,213**	**-4,196**	**-4,174**
	Base Year												
Network Pool Revenue Requirement including sufficiency/(deficiency)	977,674	980,573	981,779	981,822	981,856	981,880	981,895	981,903	981,904	981,899	981,887	981,870	981,847
Network MW	249,176	249,176	249,176	249,176	249,176	249,176	249,176	249,176	249,176	249,176	249,176	249,176	249,176
Network Pool Rate ($/kw/month)	3.92	3.94	3.94	3.94	3.94	3.94	3.94	3.94	3.94	3.94	3.94	3.94	3.94
Increase/(Decrease) in Network Pool Rate ($/kw/month), relative to base year		0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
RATE IMPACT relative to base year		**0.51%**	**0.51%**	**0.51%**	**0.51%**	**0.51%**	**0.51%**	**0.51%**	**0.51%**	**0.51%**	**0.51%**	**0.51%**	**0.51%**

Assumptions

Incremental OM&A		N.A.
Grants in Lieu of Municipal tax	0.34%	Transmission system average
Depreciation	2.00%	Reflects 50 year average service life for towers, conductors and station equipment, excluding land
Interest and Return on Rate Base	5.99%	Includes OEB-approved ROE of 8.52%, 2.75% on ST debt, and 4.42% on LT debt. 40/4/56 equity/ST debt/ LT debt split
Income Tax Provision	26.50%	2020 federal and provincial corporate income tax rate
Capital Cost Allowance	8.00%	100% Class 47 assets except for Land

Table 4 - Revenue Requirement and Network Pool Rate Impact, page 2

Revenue Requirement and Network Pool Rate Impact

Richview TS by Trafalgar TS Reconductoring Project		01-Apr	01-Apr	01-Apr	01-Apr	01-Apr	01-Apr	01-Apr	01-Apr	01-Apr	01-Apr	01-Apr	01-Apr	01-Apr
		2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051
Calculation of Incremental Revenue Requirement ($000)		13	14	15	16	17	18	19	20	21	22	23	24	25
In-service date	01-Apr-26													
Capital Cost	56,258													
Less: Capital Contribution Required	-													
Net Project Capital Cost	56,258													
Average Rate Base		42,240	41,118	39,997	38,875	37,754	36,632	35,511	34,389	33,268	32,146	31,025	29,903	28,782
Incremental OM&A Costs		0	0	0	0	0	0	0	0	0	0	0	0	0
Grants in Lieu of Municipal tax		191	191	191	191	191	191	191	191	191	191	191	191	191
Depreciation		1,121	1,121	1,121	1,121	1,121	1,121	1,121	1,121	1,121	1,121	1,121	1,121	1,121
Interest and Return on Rate Base		2,531	2,464	2,397	2,330	2,263	2,195	2,128	2,061	1,994	1,927	1,859	1,792	1,725
Income Tax Provision		303	339	371	399	424	445	464	481	495	506	516	524	530
REVENUE REQUIREMENT PRE-TAX		**4,147**	**4,115**	**4,080**	**4,041**	**3,999**	**3,953**	**3,905**	**3,854**	**3,801**	**3,745**	**3,688**	**3,628**	**3,567**
Incremental Revenue		0	0	0	0	0	0	0	0	0	0	0	0	0
SUFFICIENCY/(DEFICIENCY)		**-4,147**	**-4,115**	**-4,080**	**-4,041**	**-3,999**	**-3,953**	**-3,905**	**-3,854**	**-3,801**	**-3,745**	**-3,688**	**-3,628**	**-3,567**
	Base Year													
Network Pool Revenue Requirement including sufficiency/(deficiency)	977,674	981,820	981,789	981,754	981,715	981,672	981,627	981,579	981,528	981,474	981,419	981,361	981,302	981,241
Network MW	249,176	249,176	249,176	249,176	249,176	249,176	249,176	249,176	249,176	249,176	249,176	249,176	249,176	249,176
Network Pool Rate ($/kw/month)	3.92	3.94	3.94	3.94	3.94	3.94	3.94	3.94	3.94	3.94	3.94	3.94	3.94	3.94
Increase/(Decrease) in Network Pool Rate ($/kw/month), relative to base year		0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
RATE IMPACT relative to base year		**0.51%**	**0.51%**	**0.51%**	**0.51%**	**0.51%**	**0.51%**	**0.51%**	**0.51%**	**0.51%**	**0.51%**	**0.51%**	**0.51%**	**0.51%**

1 **Table 5 - DCF Assumptions**

Hydro One Networks -- Transmission Connection Economic Evaluation Model
2020 Parameters and Assumptions

Transmission rates are based on 2020 OEB-approved uniform provincial transmission rates.

Monthly Rate ($ per kW)	
Network	**3.92**
Transformation	**2.33**
Line	**0.97**

Grants in lieu of Municipal tax (% of up-front capital expenditure, a proxy for property value):		**0.34%**	Based on Transmission system average
Income taxes:			
Basic Federal Tax Rate - % of taxable income:	2020	**15.00%**	Current rate
Ontario corporation income tax - % of taxable income:	2020	**11.50%**	Current rate
Capital Cost Allowance Rate: Class 47 costs	2020	**8%**	Current rate
After-tax Discount rate:		**5.31%**	Based on OEB-approved ROE of 8.52% on common equity and 2.75% on short-term debt, 4.42% forecast cost of long-term debt and 40/60 equity/debt split, and current enacted income tax rate of 26.5%

2

DEFERRAL ACCOUNT REQUESTS

There are no new deferral account requests being made as part of this Application.

PROJECT SCHEDULE

TASK	**START**	**FINISH**
Submit Section 92		July 16, 2021
Projected Section 92 Approval		January , 2022
LINES		
Detailed Engineering	March 2021	December 2021
Procurement	April 2021	September 2022
Receive Material	January 2022	April 2025
Construction	February 2022	March 2026
IN SERVICE		**April, 2026**

PHYSICAL DESIGN

1.0 LINE FACILITIES

The current 230 kV circuits, known as R14T, R17T, R19TH and R21TH, located on the same right-of-way between Trafalgar TS and Richview TS, measure a distance of approximately 21.7 km, and each currently consist of three phases of single conductor. The RTR Project will replace the single 230 kV conductor on each phase of each circuit with a single 230 kV conductor on each phase of the three-phase circuits. Each circuit will continue to operate at 230 kV. The R14T, R17T, R19TH and R21TH reconductored circuits will remain in their current location, with their current tower centre-line and tower heights as situated on the current right-of-way corridor that is not expected to change. The planned scope of work includes replacing six current towers with new towers along the existing right-of-way. In addition, some structural steel tower member reinforcement/replacement is required to enable the current towers to adequately meet the design standards (in regards to wind and ice load) to carry the new 230 kV conductors to be strung on circuits R14T, R17T, R19TH and R21TH. In all, six existing towers on the right-of-way require replacement, 43 tower structures will require foundation refurbishment, and 116 towers will require some type of supporting steel arm reinforcement/modification.

Towers carrying both circuits require reinforcement due to increased tower loads from the proposed larger conductors and increased design loads using modern Hydro One structure load criteria. Additionally, some towers along the path have corrosion and the Project Plan is to address this. Examples of the structural reinforcement drawings for these structures are attached to this Exhibit in **Attachment 1** through **Attachment 4**.

Proposed reinforcement of the *1940 Type Semi Anchor Structure* on the R14T and R17T circuits is illustrated in **Attachment 1**[1]. There are two *1940 Type Semi Anchor Towers* on the R14T and R17T circuits which require reinforcement. Reinforcement is generally limited to the tower arms, where the arm hangers and cross-braces require larger steel members due to the proposed larger conductor.

Attachment 2[2] illustrates the typical reinforcement and modification of the cross-arms of the *1940 Type Suspension Structures* on the R14T and R17T circuits. Reinforcement includes replacing the cross-arm hangers and addition of Z-brace to the top face of the middle-arms. The cross-bracing at the shieldwire peak requires reinforcement due to the larger OPGW cable. In addition, there are seven *1940 Type Suspension Towers* that require new middle-arms to accommodate moving the bottom phase up in order to increase electrical clearances. A total of 65 suspension structures for R14T and R17T circuits are proposed to be reinforced.

Attachment 3[3] provides the reinforcement strategy for the *1948 Canadian Bridge Type Semi-Anchor Structures* of the R19TH and R19TH circuits. There are a total of three *1948 Canadian Bridge Type Semi Anchor Towers* that require reinforcement. The tower arm-hangers and cross-braces require larger steel members due to the proposed larger conductor. Some diagonal members on the tower body of these structures will also require larger steel member reinforcement.

In **Attachment 4**[4], reinforcement of the *Revised 1940 Type Suspension Towers* for the R19TH and R21TH circuits is shown. These towers are similar to the *1940 Type Suspension Structures* but were redesigned in the past with a double-shieldwire peak. Reinforcement includes replacing the cross-arm hangers, addition of Z-brace to the top

[1] The structure members that will be replaced are marked in red on the attachment drawings.
[2] Ebit.
[3] Ebit.
[4] Ebit.

face of the middle-arms, and replacing the knee-brace of the shieldwire peak. There are a total of 33 *Revised 1940 Type Suspension Towers* for circuits R19TH and R17TH and two *Revised 1940 Type Suspension Towers* for circuits R14T/R17T which will be modified.

Other tower types on the R14T/R17T and R19TH/R21TH tower lines that require reinforcement include.

- *X10S Suspension Structure* (2 structures) – requires Z-brace added to middle arm hangers
- *1940 Type Transposition Structure* (6 structures) – similar reinforcement as the *1940 Type Suspension structure.*
- *1951 Type Semi-Anchor Structure* (1 structure) – similar reinforcement as the *1948 Canadian Bridge Type Semi Anchor Tower*
- *X1M Type Semi-Anchor Structure* (1 structure) – similar reinforcement as the *1948 Canadian Bridge Type Semi Anchor Tower*

Figure A below illustrates the existing steel suspension towers on the current Right-of-way carrying the four 230 kV circuits, R14T, R17T, R19TH, and R21TH.

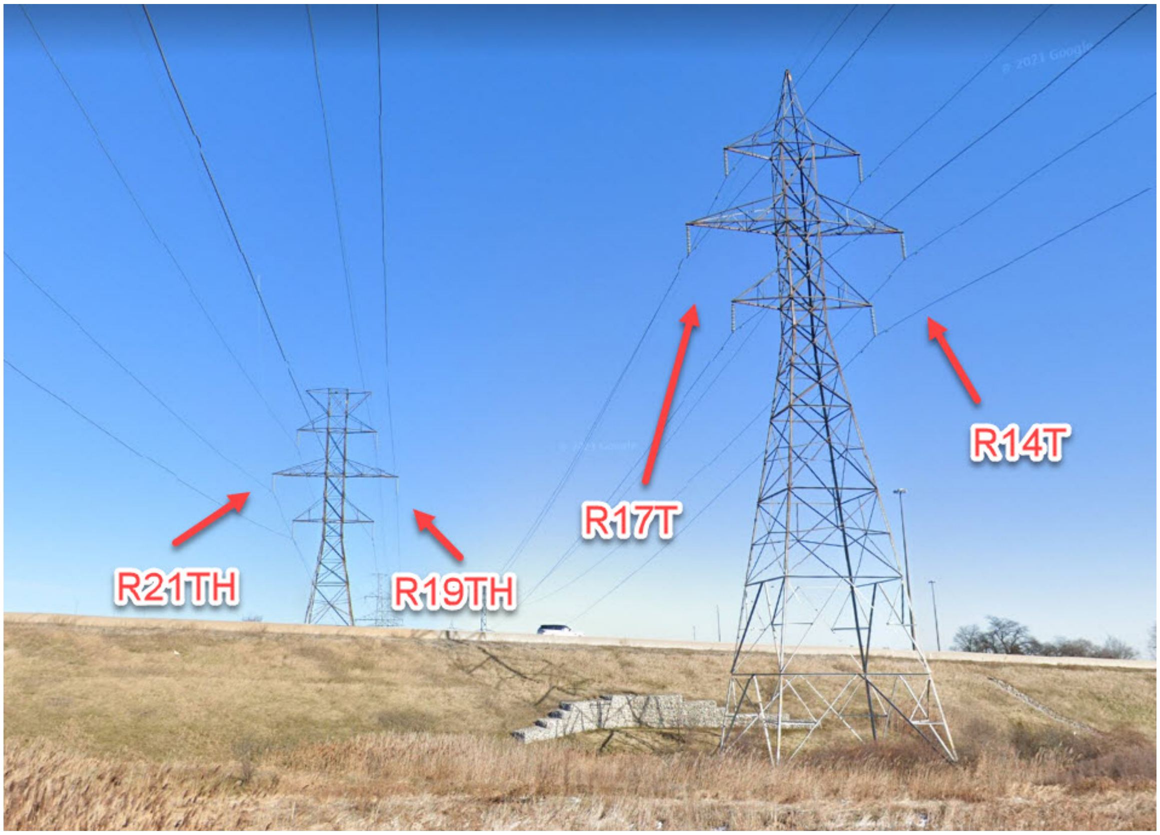

Figure A: Existing Tower and Circuit Facilities

(Photograph taken face east towards Toronto)

Figure A above illustrates the existing single-conductor circuits consisting of three phases (i.e. one conductor on each phase, and three conductors in total that constitute one 'circuit'). Additionally, Figure A shows two sets of adjacent parallel towers, with each tower carrying two circuits, situated on the same right-of-way. The RTR Project will replace conductor sections that currently have either 795 or 1307 kcmil ACSR conductor, with a 1433 kcmil ACSS conductor.

As mentioned, all four circuits' routes will continue to span along the current right-of-way, the width of which will not change. The locations of the currently situated towers carrying the four circuits will also not change as a result of this Project. Further details regarding land matters can be found at **Exhibit E, Tab 1, Schedule 1**.

Maps indicating the geographic location of both existing circuits' route are provided at **Exhibit C, Tab 2, Schedule 1, Attachment 1**. A schematic diagram of the proposed line facilities is provided in **Exhibit B, Tab 2, Schedule 1, Figure 1**.

2.0 STATION FACILITIES

In conjunction with the line facilities work described above, the RTR Project will also require the following minor station-related work:

- *Trafalgar TS*
  Project work at this station will consist of modifying the protection relays settings to accommodate for the circuit impedance. In addition, the OPGW skywire will be terminated at the station.
- *Richview TS*
  Project work at this station will consist of modifying the protection relays settings to accommodate for the circuit impedance. In addition, the OPGW skywire will be terminated at the station.

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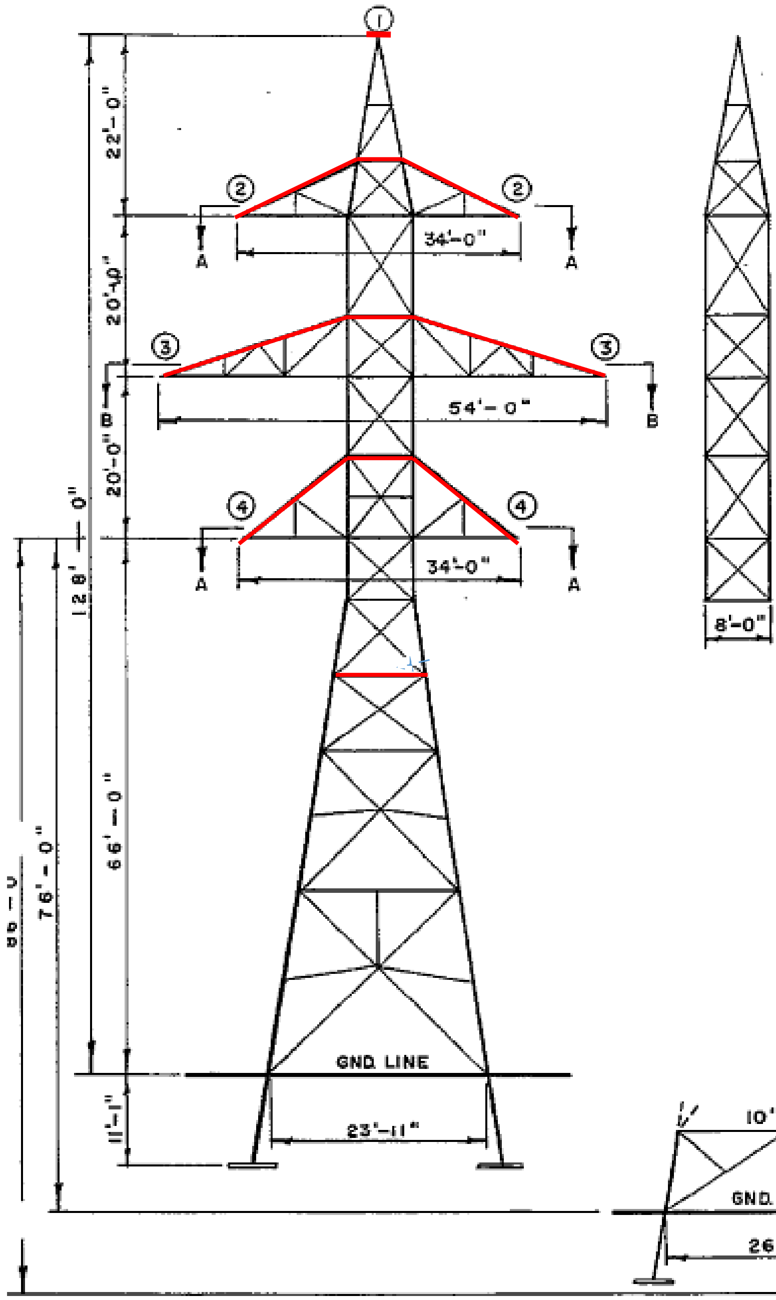
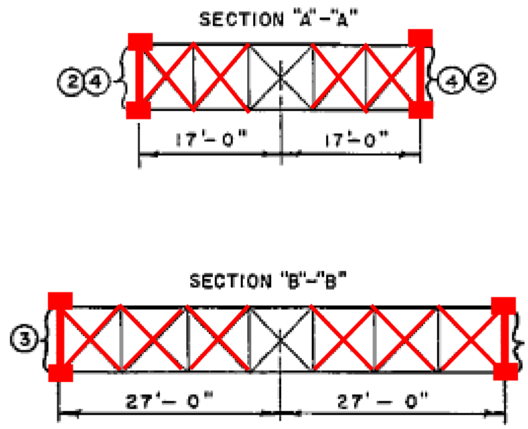
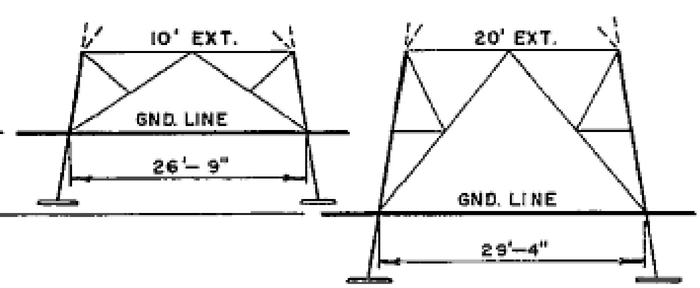
EB-2021-0136
Exhibit C-1-1
Attachment 1
Page 1 of 1







230 kv
DOUBLE CIRCUIT
1940 TYPE
SEMI-ANCHOR TOWER

Attachment 1 - EXHIBIT C, TAB 1, SCHEDULE 1

Richview x Trafalgar Reconductoring Project

Structure Reinforcement
Circuit R14T/R17T

ST 7 - 23

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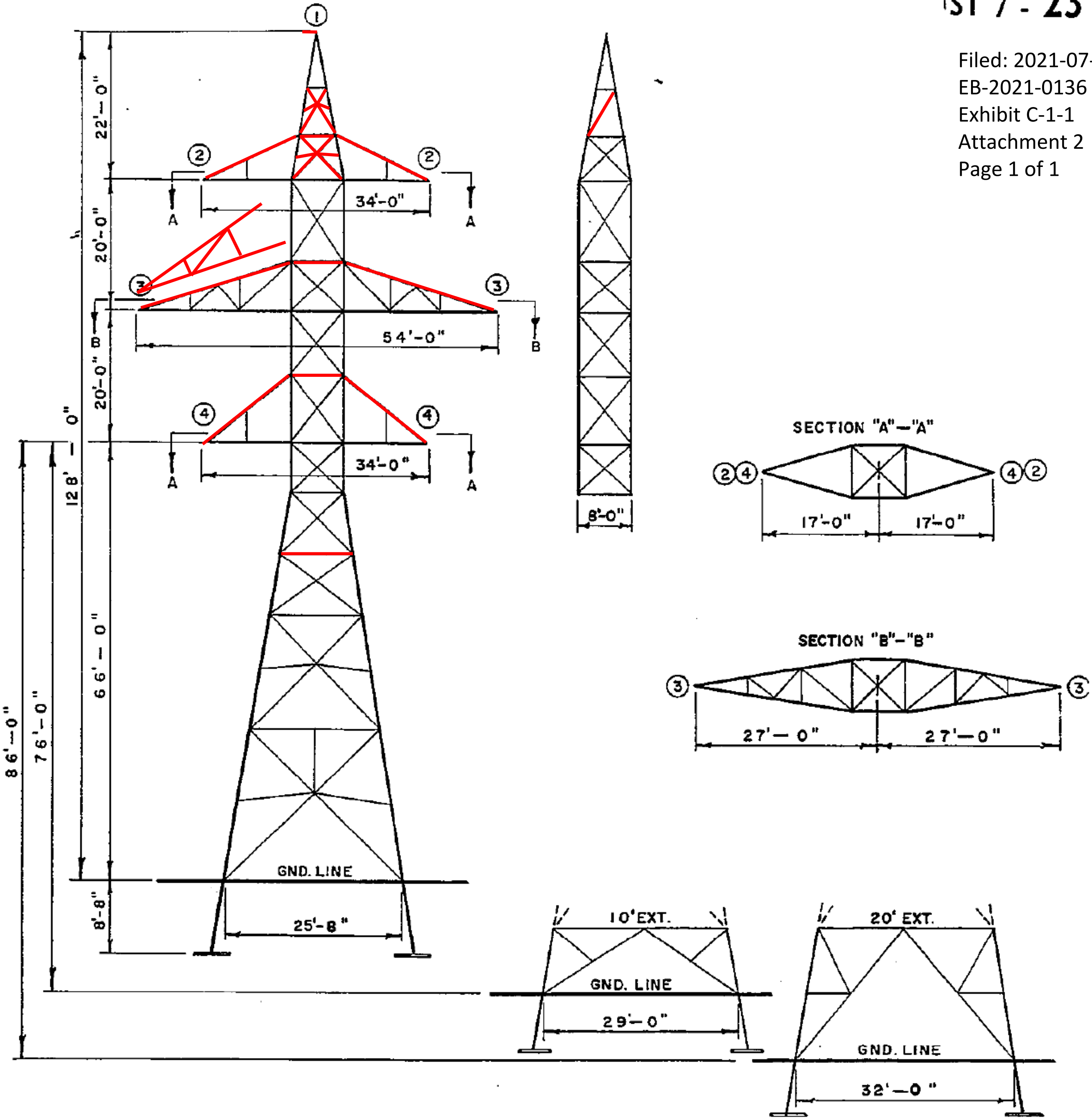
EB-2021-0136
Exhibit C-1-1
Attachment 2
Page 1 of 1



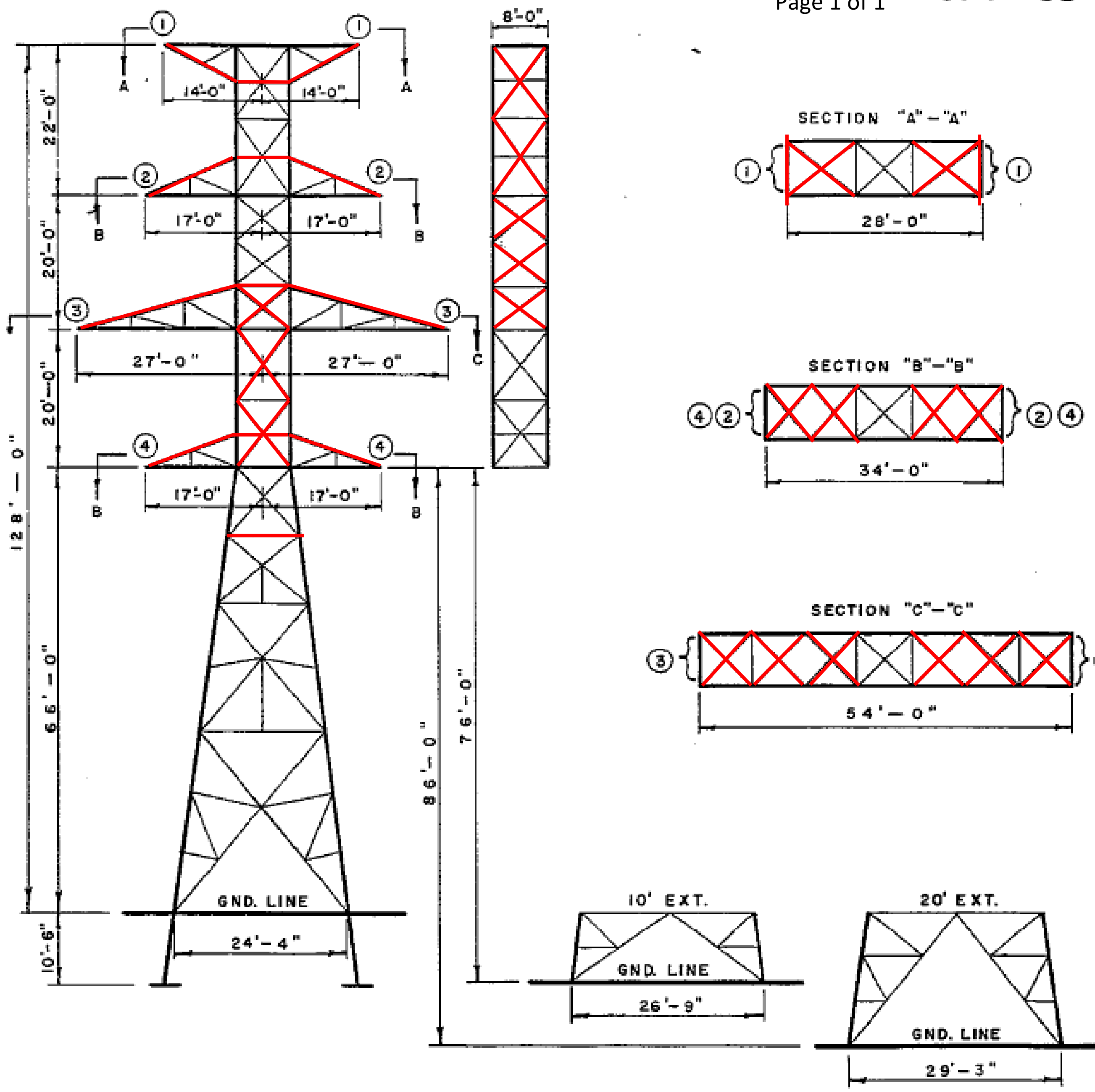
230 kv DOUBLE CIRCUIT 1940 TYPE SUSPENSION TOWER

Attachment 2 - EXHIBIT C, TAB 1, SCHEDULE 1

Richview x Trafalgar Reconductoring Project

Structure Reinforcement
Circuit R14T/R17T

ST 7 - 35



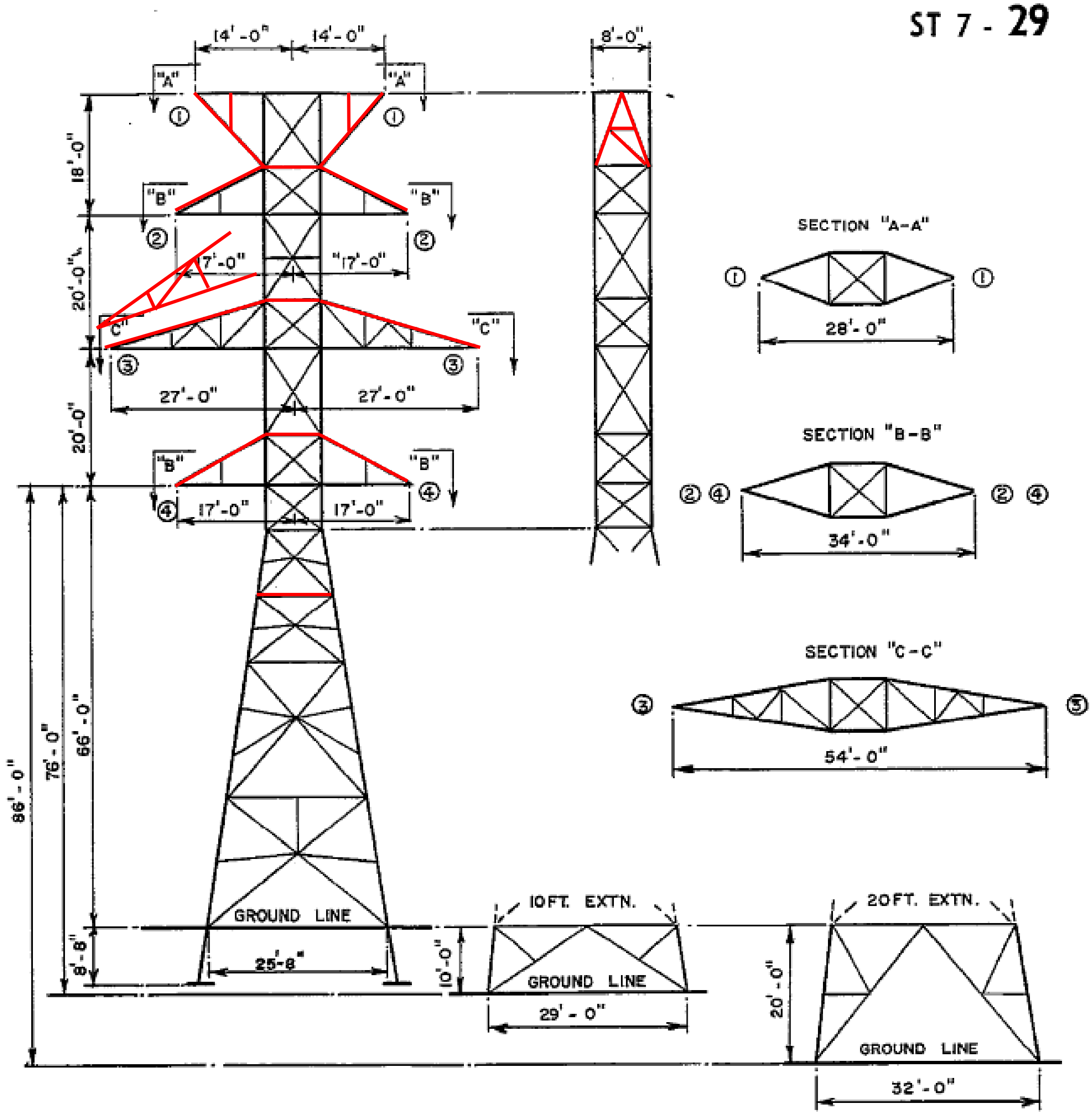
230 kv
DOUBLE CIRCUIT
1948 C.B. TYPE
SEMI-ANCHOR TOWER

Attachment 3 - EXHIBIT C, TAB 1, SCHEDULE 1

Richview x Trafalgar Reconductoring Project

Structure Reinforcement
Circuit R19TH/R21TH

ST 7 - 29



230 kv **DOUBLE CIRCUIT** **REVISED 1940 TYPE** **SUSPENSION TOWER**
Attachment 4 - EXHIBIT C, TAB 1, SCHEDULE 1
Richview x Trafalgar Reconductoring Project Structure Reinforcement Circuit R19TH/R21TH

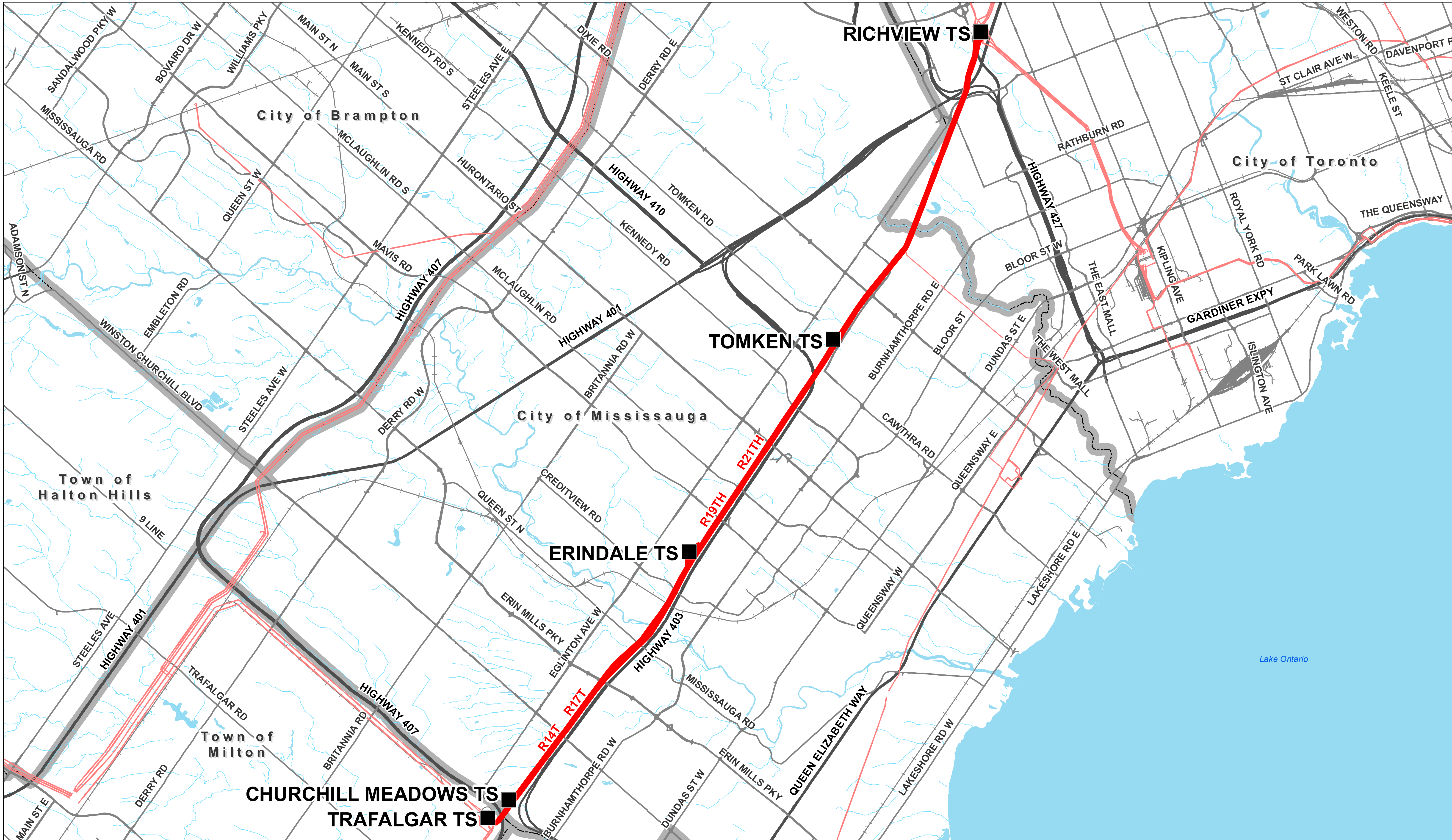
MAPS

A map showing the geographic location of the RTR Project is provided at **Exhibit C, Tab 2, Schedule 1, Attachment 1**. This map is for the OEB to use as the Project's Notice Map.

An illustrative aerial view map showing more detail of the footprint for the Project's line and station work is provided at **Exhibit E, Tab 1, Schedule 1, Attachment 1.**

Further details on land matters for this Project are available at **Exhibit E, Tab 1, Schedule 1.**

Map of Geographic Location – Notice Map



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Map21-038_TrafalgarTS_RichviewTS_Section92_application

Station / Junction

Transmission Line

R14T/R17T and R19TH/R21TH

Others

Highway

Major Road

Railway

Watercourse

Waterbody

Municipal Boundaries

Trafalgar TS to Richview TS
R14T/R17T and R19TH/R21TH

1:80,000

0 1 2 km

OPERATIONAL DETAILS

The RTR Project includes the replacement of the current conductors on circuits R14T, R17T, R19TH and R21TH. As discussed, each circuit currently consists of one conductor per phase (known as single phase), and each circuit has three phases, for a total of three conductors for each circuit. The RTR Project will replace all conductors on the four prior mentioned circuits along the Trafalgar TS to Richview TS route. Additionally, the RTR Project will replace the skywire atop the tower span carrying circuits R14T and R17T with OPGW between Trafalgar TS to Richview TS.

The four 230 kV circuits are located on towers situated on the same right-of-way, consisting of two adjacent sets of tower spans, each tower carrying two circuits. One tower span carries the R14T and R17T 230 kV circuits, and the second tower span carries the R19TH and R21TH 230 kV circuits.

No portion of any circuit on either of the two tower spans will be relocated or reconfigured, and as such, there will be no change to the operation of the circuits. The R14T, R17T, R19TH and R21TH circuits will continue to be operated at 230 kV. The existing stations in the Project vicinity, Churchill Meadows TS, Erindale TS and Tomken TS, will continue to be supplied by the same RTR Project circuits. The terminal stations connecting the circuits along the span of line being reconductored will also remain the same, those being Trafalgar TS and Richview TS.

After project completion, Hydro One Protection, Control and Telecom (“PC&T”) facilities at Trafalgar TS and Richview TS will continue to protect the reconductored circuits by detecting faults and isolating faulted elements. Line protection for circuits R14T, R17T, R19TH and R21TH will be modified and coordinated for operation with the new conductor (for the reduction of the impedance of each circuit). Operation of the proposed facilities will continue to be in accordance with the procedures administered by Hydro One's Ontario Grid Control Centre ("OGCC") and the IESO.

Hydro One PC&T facilities will continue to protect all elements in those stations and protect the 230 kV transmission lines by detecting faults and isolating faulted elements. Operation of the proposed facilities will continue to be in accordance with the procedures of the OGCC and the IESO.

This section of the transmission system is part of the eastern Ontario Bulk Electric System and is a critical circuit section of the electrical system that allows management of easterly flows towards the GTA.

LAND MATTERS

1.0 DESCRIPTION OF LAND RIGHTS

The proposed line upgrade of the R19TH and R21TH circuits from Richview TS x Trafalgar TS and R14T and R17T circuits from Tomken Jct x Trafalgar TS will be completed within the existing transmission right-of-way ("ROW"). The existing ROW can be broken into five sections:

1. Richview TS x Tomken Jct,
2. Tomken Jct x Hanlan Jct,
3. Hanlan Jct x Erindale Jct,
4. Erindale Jct x Churchill Meadows Jct, and
5. Churchill Meadows Jct x Trafalgar TS.

For each of the sections identified above, there is variation in width and there is also variation in the number of additional transmission lines that are also situated on each ROW section identified. All five ROW sections identified carry at least one additional circuit's towers on that ROW.

A detailed description of each of the individual five ROW sections, including the circuits and towers each ROW accommodates in addition to the RTR Project's circuits, is outlined below:

1. Richview TS x Tomken Jct – This ROW section accommodates the R19TH and R21TH circuits and the tower span carrying them, the R14T and the R17T circuits and the tower span carrying them. The ROW carries the R24C circuit and the tower span carrying that circuit. The corridor width is approximately 105m and comprises Bill 58 lands and an MTO crossing of the Highway 401/427 junction.
2. Tomken Jct x Hanlan Jct – This ROW section accommodates the R19TH and R21TH circuits and the tower span carrying them and also the R14T and the R17T

circuits and the tower span carrying them. The corridor width is approximately 81m and comprises Bill 58 lands and an MTO crossing of Highway 403.

3. Hanlan Jct x Erindale Jct - This ROW section accommodates the R19TH and R21TH circuits and the tower span carrying them, and also the R14T and the R17T circuits and the tower span carrying them. The corridor width varies from approximately 81m up to a width of 100m wide east of Hurontario Street, and a width of approximately 90m approaching Erindale Jct. This section of the ROW comprises predominantly Bill 58 lands. In addition, there is an easement over the City of Mississauga's property within this section measuring approximately 405m long.
4. Erindale Jct x Churchill Meadows Jct – This ROW section accommodates the R19TH and R21TH circuits and the tower span carrying them, and also the R14T and the R17T circuits and the tower span carrying them. The corridor width varies from approximately 81m to 125m and comprises Bill 58 lands.
5. Churchill Meadows Jct x Trafalgar TS – This ROW section accommodates the R19TH and R21TH circuits and the tower span carrying them, and also the R14T and the R17T circuits and the tower span carrying them. The corridor width is approximately 81m and is comprises Bill 58 lands with a crossing of the MTO Highway 403/407 junction.

The RTR Project will rely on the existing ROW's that are expected to accommodate the occupation rights required for the Project. Renewal of MTO crossing permits may be required for the 400 series Highway crossings, Highway 407/403 junction between Trafalgar TS x Churchill Meadows Jct, Highway 403 at Tomken Jct x Hanlan Jct, and Highway 427/401 junction outside Richview TS. Hydro One will coordinate all necessary permits with the MTO.

Temporary land rights may be required for the Project at specific locations along the circuits' existing ROW. It is expected that construction of the Project will not require extensive temporary land rights, given the ability to utilize the already existing ROW and Hydro One-owned land surrounding the stations along the route. Any temporary land rights required have not yet been identified but will be determined in advance of the Project's construction start date. Hydro One will undertake their acquisition at the appropriate time. Temporary land rights required may include, but are not limited to, temporary access roads, temporary laydown areas and material storage areas.

2.0 DESCRIPTION OF NEW LAND RIGHTS REQUIRED

Hydro One will rely predominantly on statutory easement rights it enjoys on Infrastructure Ontario Bill 58 lands and one City of Mississauga property to construct, operate and maintain the proposed reconductored circuit transmission facilities. It is not expected that additional land rights will be required for this Project.

3.0 EARLY ACCESS TO LAND

Hydro One will be relying on existing land rights to conduct various activities and studies associated with required environment approvals, engineering and design for this Project. Hydro One does not expect to require any early access agreements and does not anticipate the need to apply to the Board under section 98 of the *Ontario Energy Board Act, 1998* for early access in advance of leave to construct approval.

4.0 LAND ACQUISITION PROCESS

No new land rights are expected to be required for this Project. In the event any additional rights requirements are identified, Hydro One will follow its typical land acquisition process in a manner similar to that which has been employed in the recent past, which allowed Hydro One to acquire the necessary land rights from the property owner in a mutually agreeable and timely manner.

Acquisition of Land Rights on Public Roads and Highways

As required, Hydro One intends to locate on public roads and highways. Given its legislated occupation rights under section 41 of the *Electricity Act*, *1998*, Hydro One does not require consent of the owner or any other person having an interest in public streets or highways to locate its proposed project corridor ROW. Hydro One will, however, engage with representatives from the appropriate municipalities having jurisdiction over these public roads and highways to ensure compliance with section 41(9) of the *Electricity Act, 1998*. If necessary, Hydro One will obtain the requisite encroachment and occupancy permits within roadways under the jurisdiction of the MTO.

5.0 LAND-RELATED FORMS

Attachments 2 and 3 to this Exhibit contain the agreements that Hydro One intends to use to obtain land rights for the Project, should they be required. Listed below are the Hydro One form agreements included in the Application and a statement that indicates whether the individual form agreements have been previously approved by the Board in prior Hydro One leave to construct applications.

- Temporary Land Rights Agreement (**Attachment 2**). This form agreement was included and approved by the OEB in previous leave to construct applications.[1]
- Damage Claim Agreement (**Attachment 3**). This form agreement was included and approved by the OEB in previous leave to construct applications.[2]

Where Hydro One requires encroachment or occupancy permits from MTO over 400-series highways, the form agreement will be provided by MTO as the landowner.

[1] This form agreement was included in and approved by the OEB in EB-2019-0077 Decision and Order dated October 17, 2019, and EB-2018-0117 Decision and Order dated April 23, 2020.
[2] Ibid.

Project Route Map

CHURCHILL MEADOWS TS
TRAFALGAR TS
HIGHWAY 407
HIGHWAY 403
LOWER BASE LINE E
SLADEVIEW CRES
9 LINE
City of Mississauga
Town of Milton
Town of Oakville
R21TH
R17T
69
69A
B
C
79
70
80
71
81
Key Map
Tile 1 of 19
Existing Structure
Junction
Transformer Station
230 kV Transmission Line
Hydro One Land Ownership
Hydro One Land Easement
Railway
Road
Highway
Watercourse
Waterbody
Municipal Boundary
Trafalgar TS to Richview TS -
Section 92 OEB Application
1:5,000
0
100
200
m
Produced By: Inergi LP, GIS Services
Date: Apr 19, 2021
Map21-041_RichviewTS_TrafalgarTS_S92_OEB
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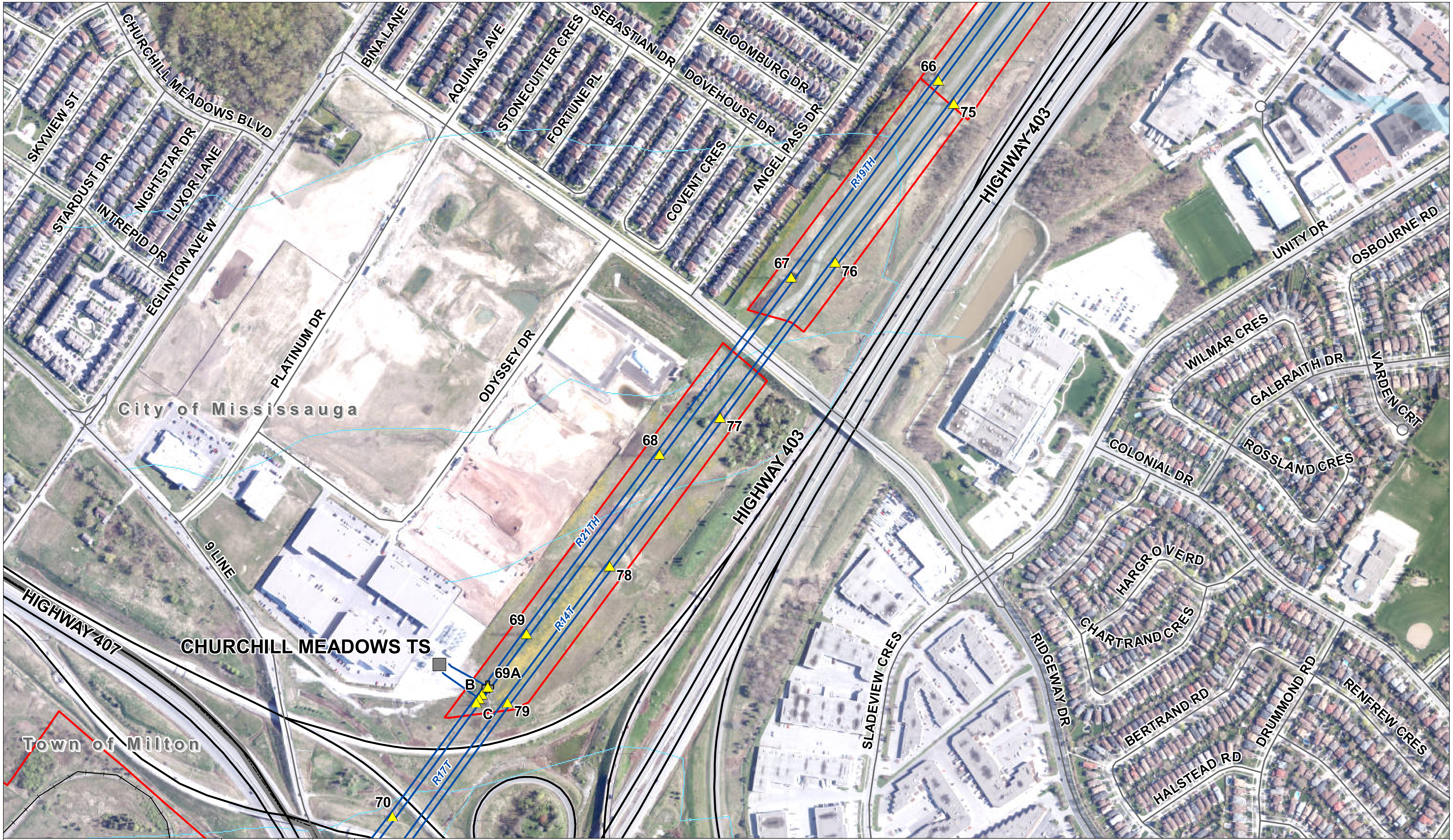

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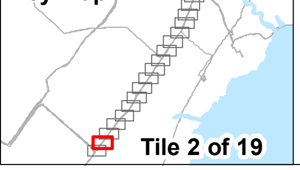

Tile 2 of 19

Existing Structure
Junction
Transformer Station
230 kV Transmission Line
Hydro One Land Ownership
Hydro One Land Easement
Railway
Road
Highway
Watercourse
Waterbody
Municipal Boundary

Trafalgar TS to Richview TS - Section 92 OEB Application

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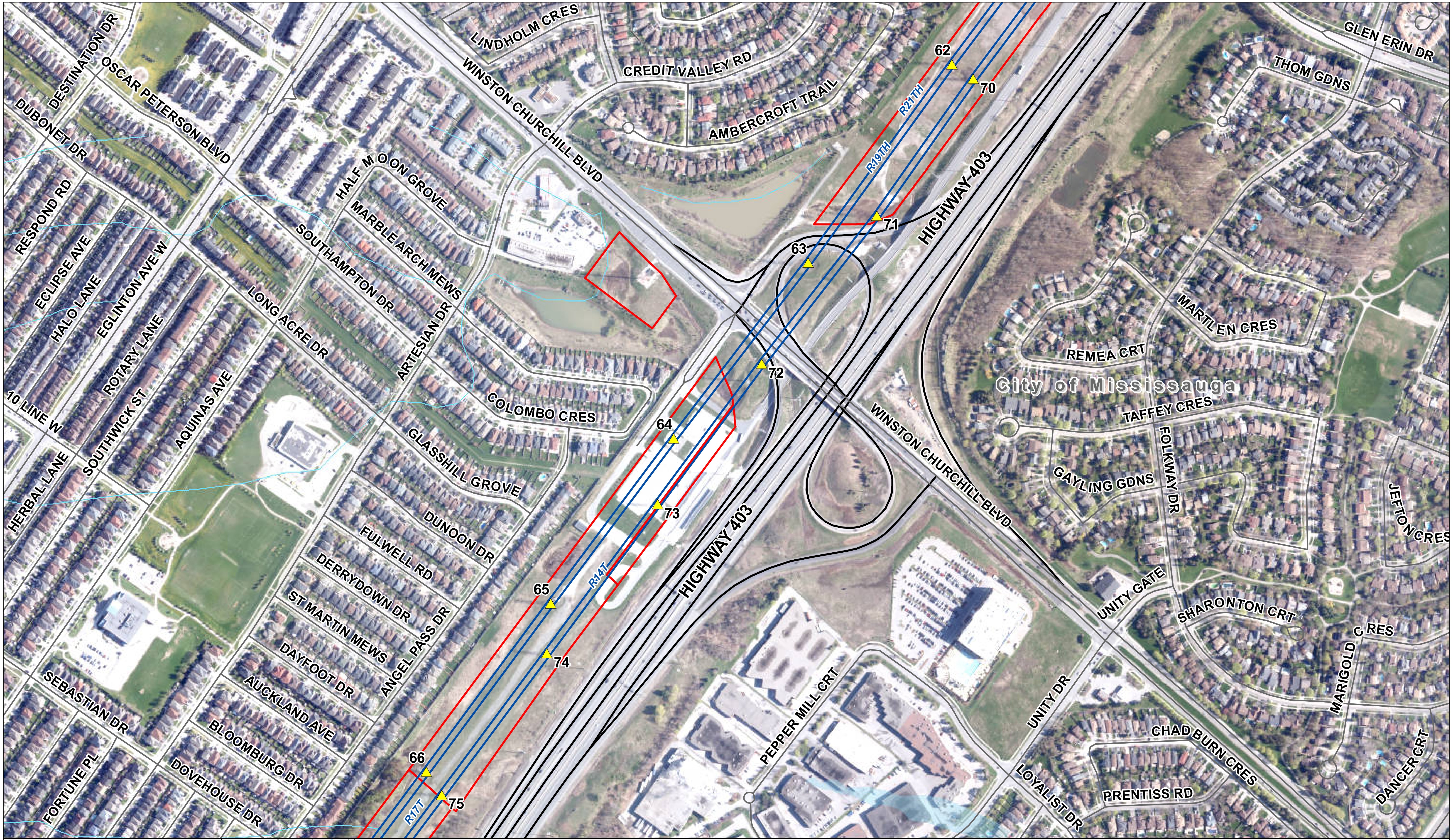

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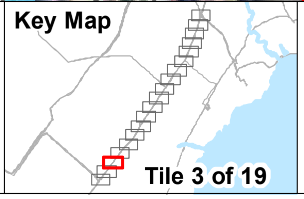

Tile 3 of 19

- Existing Structure
- Junction
- Transformer Station
- 230 kV Transmission Line
- Hydro One Land Ownership
- Hydro One Land Easement
- Railway
- Road
- Highway
- Watercourse
- Waterbody
- Municipal Boundary

Trafalgar TS to Richview TS - Section 92 OEB Application

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Map21-041_RichviewTS_TrafalgarTS_S92_OEB

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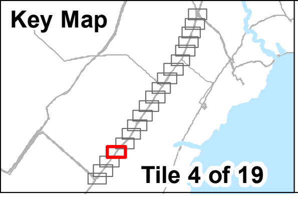

Tile 4 of 19

- Existing Structure
- Junction
- Transformer Station
- 230 kV Transmission Line
- Hydro One Land Ownership
- Hydro One Land Easement
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- Road
- Highway
- Watercourse
- Waterbody
- Municipal Boundary

Trafalgar TS to Richview TS - Section 92 OEB Application

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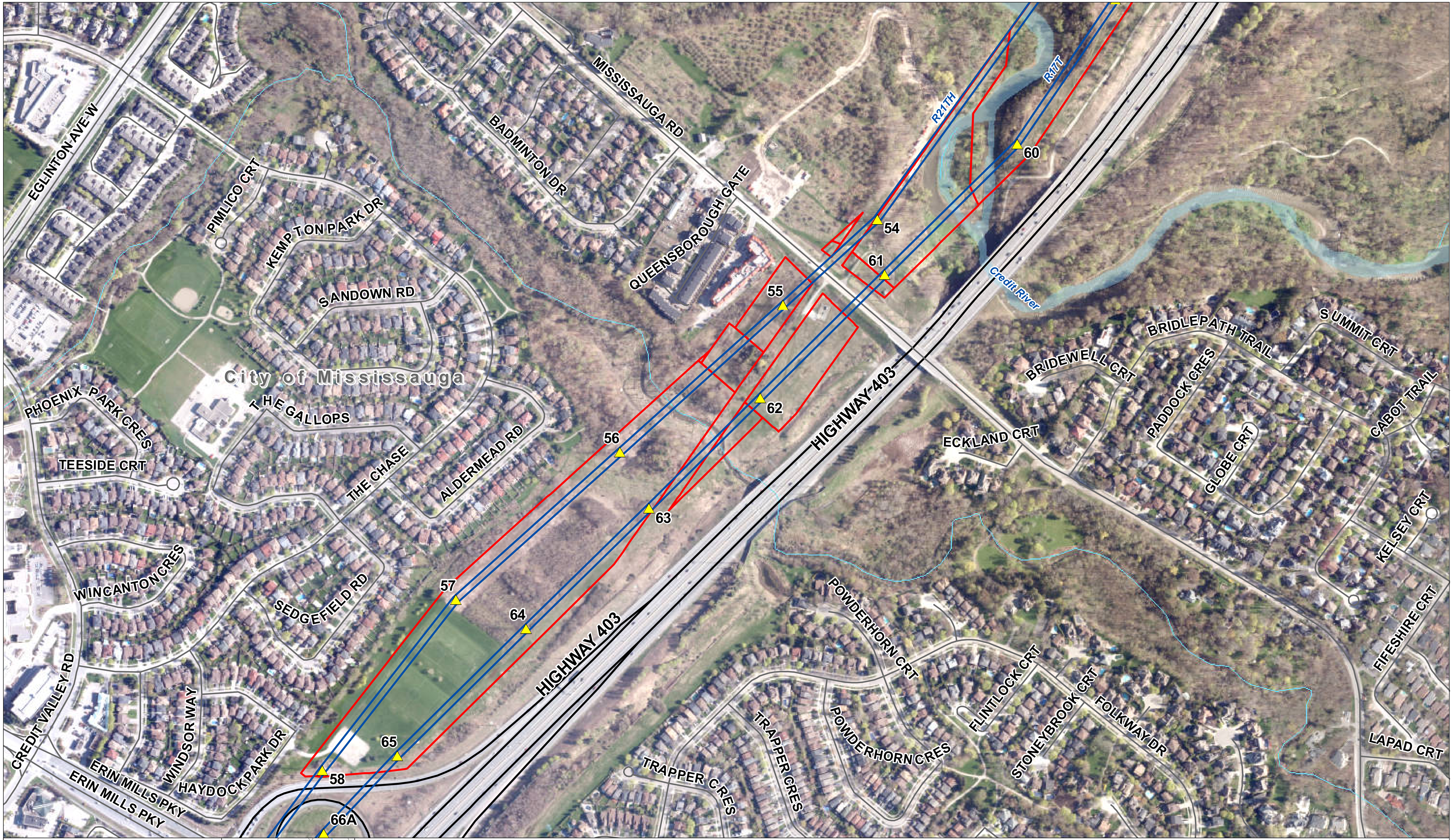

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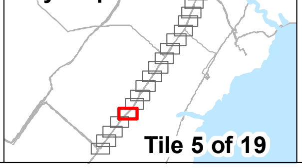

Tile 5 of 19

Existing Structure
Junction
Transformer Station
230 kV Transmission Line
Hydro One Land Ownership
Hydro One Land Easement
Railway
Road
Highway
Watercourse
Waterbody
Municipal Boundary

Trafalgar TS to Richview TS - Section 92 OEB Application

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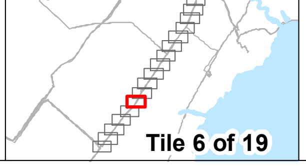
Map21-041_RichviewTS_TrafalgarTS_S92_OEB

Key Map



Tile 6 of 19

Existing Structure
Junction
Transformer Station
230 kV Transmission Line
Hydro One Land Ownership
Hydro One Land Easement
Railway
Road
Highway
Watercourse
Waterbody
Municipal Boundary

Trafalgar TS to Richview TS - Section 92 OEB Application

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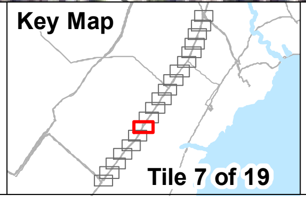
Map21-041_RichviewTS_TrafalgarTS_S92_OEB

Key Map



Tile 7 of 19

Existing Structure
Junction
Transformer Station
230 kV Transmission Line
Hydro One Land Ownership
Hydro One Land Easement
Railway
Road
Highway
Watercourse
Waterbody
Municipal Boundary

Trafalgar TS to Richview TS - Section 92 OEB Application

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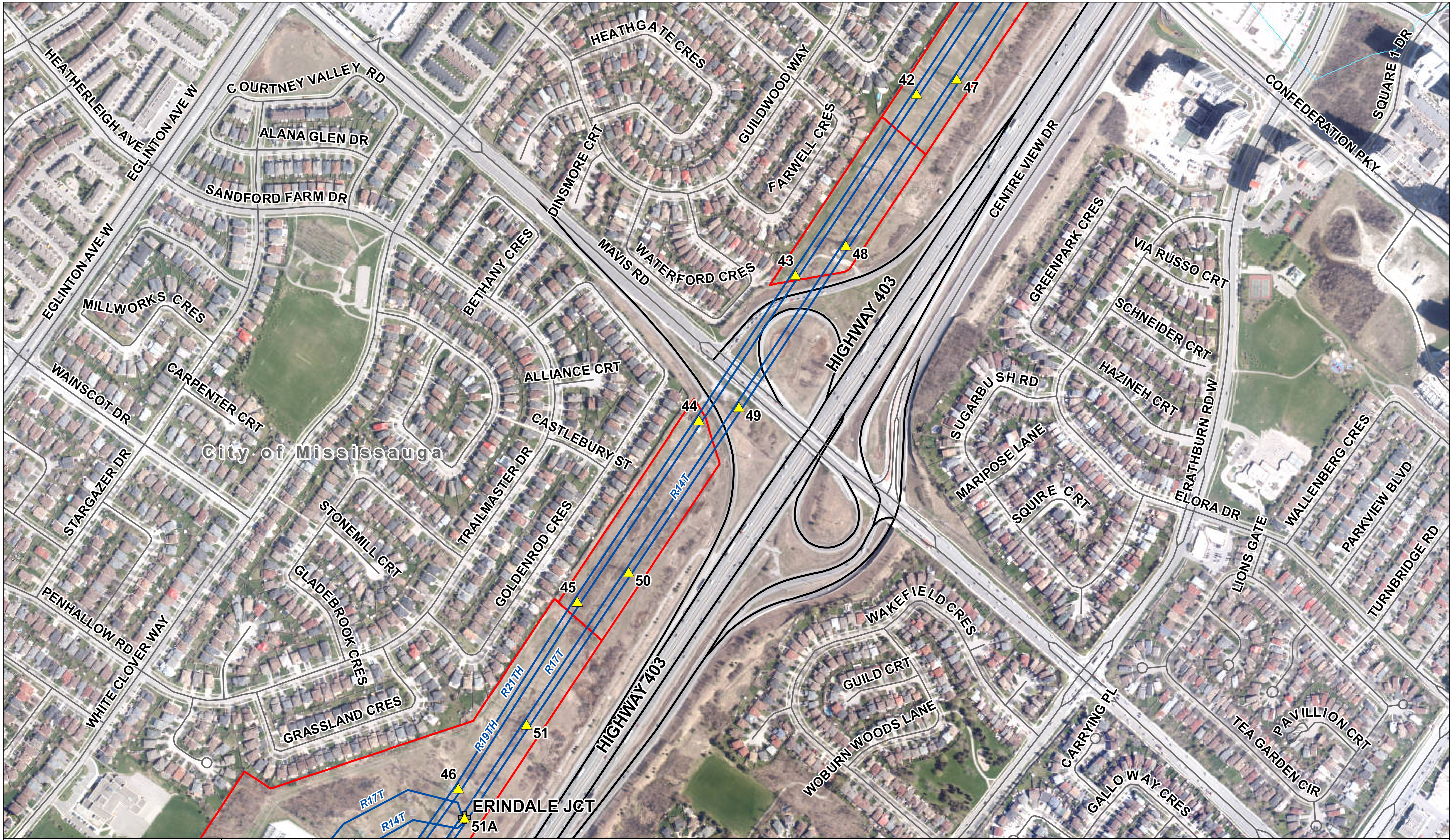

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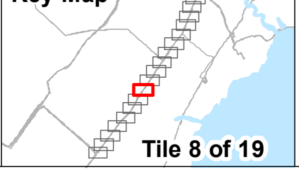


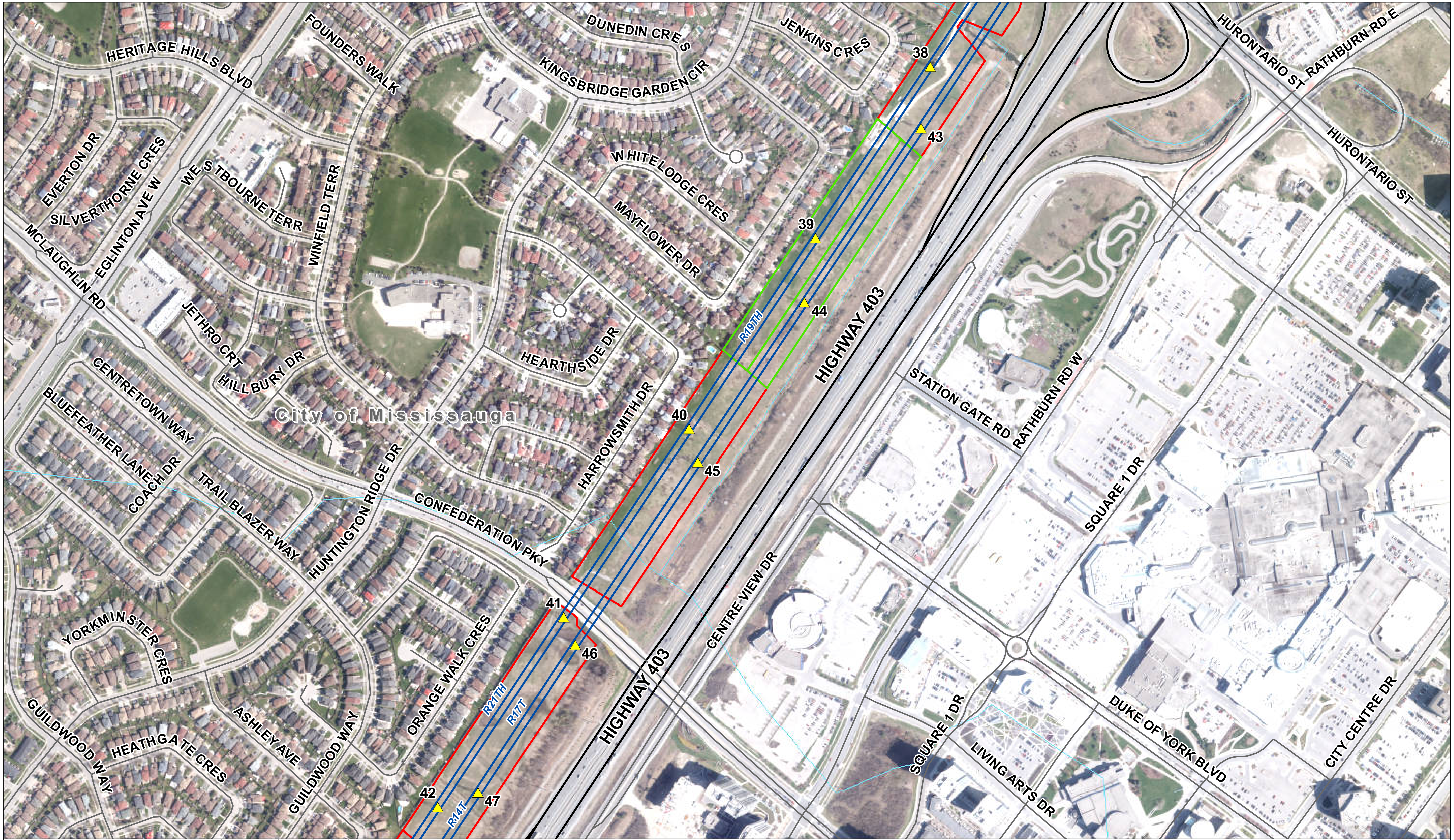
Tile 8 of 19

- Existing Structure
- Junction
- Transformer Station
- 230 kV Transmission Line
- Hydro One Land Ownership
- Hydro One Land Easement
- Railway
- Road
- Highway
- Watercourse
- Waterbody
- Municipal Boundary

Trafalgar TS to Richview TS - Section 92 OEB Application

1:5,000

0 100 200 m



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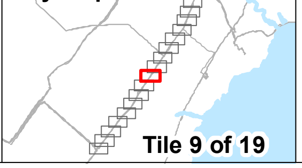
Key Map



Tile 9 of 19

- Existing Structure
- Junction
- Transformer Station
- 230 kV Transmission Line
- Hydro One Land Ownership
- Hydro One Land Easement
- Railway
- Road
- Highway
- Watercourse
- Waterbody
- Municipal Boundary

Trafalgar TS to Richview TS - Section 92 OEB Application

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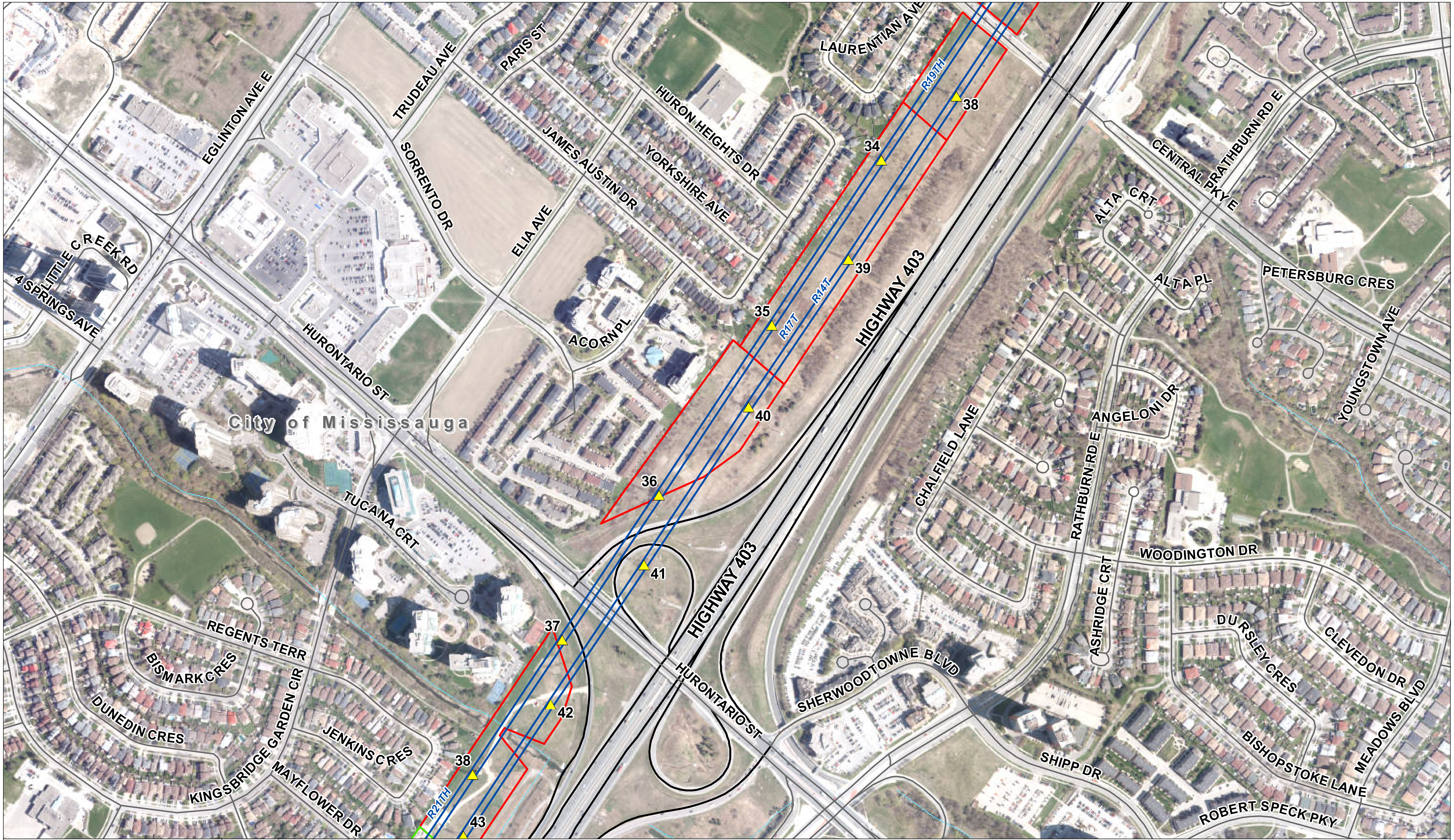

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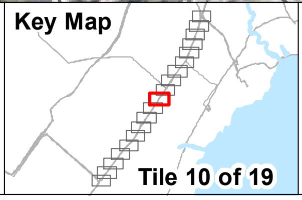

Existing Structure
Junction
Transformer Station
230 kV Transmission Line
Hydro One Land Ownership
Hydro One Land Easement
Railway
Road
Highway
Watercourse
Waterbody
Municipal Boundary

Trafalgar TS to Richview TS - Section 92 OEB Application

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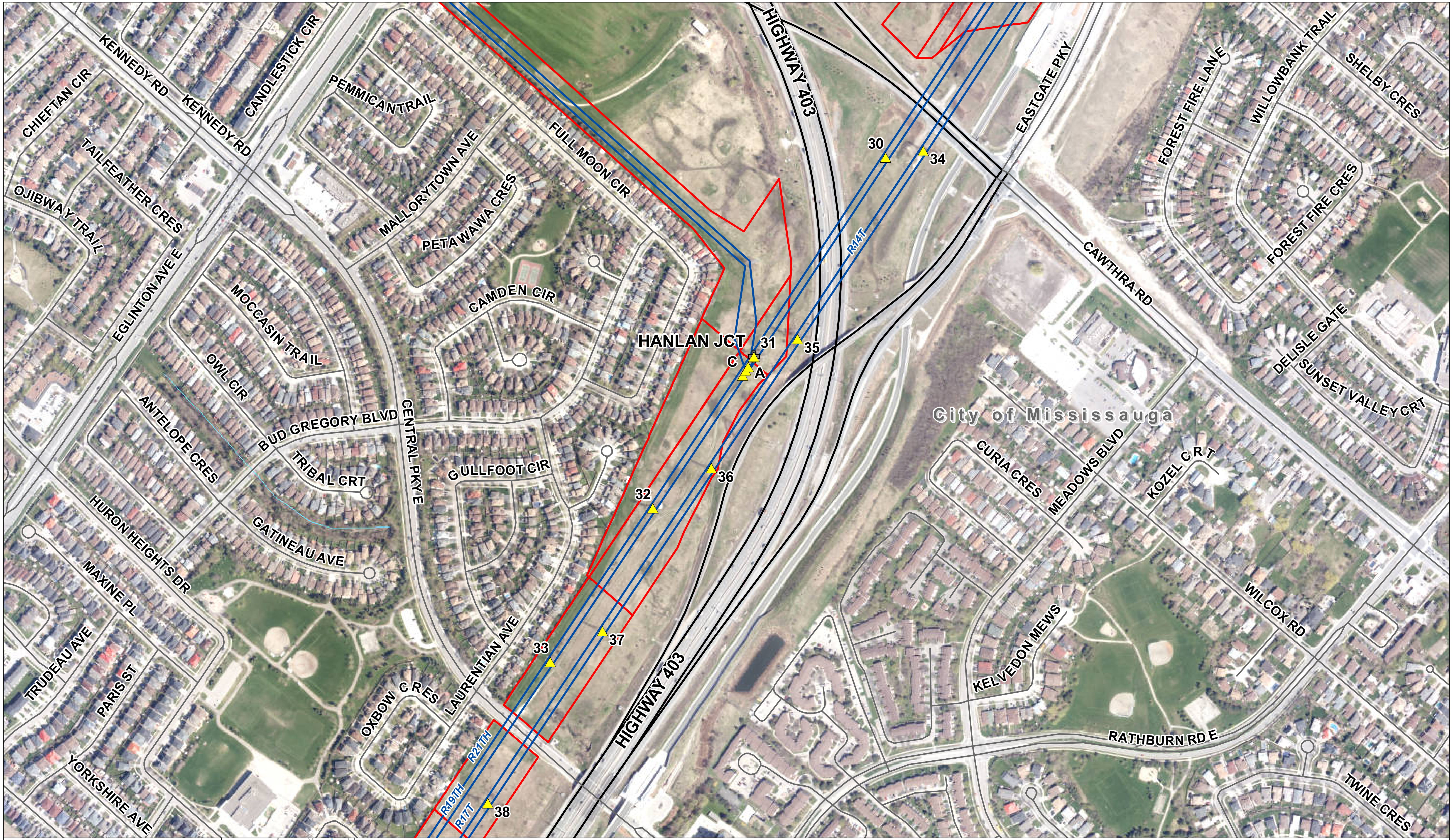

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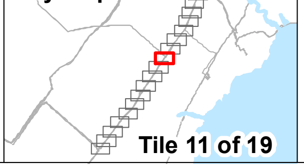
Date: Apr 19, 2021
Map21-041_RichviewTS_TrafalgarTS_S92_OEB

Key Map



Tile 11 of 19

- Existing Structure
- Junction
- Transformer Station
- 230 kV Transmission Line
- Hydro One Land Ownership
- Hydro One Land Easement
- Railway
- Road
- Highway
- Watercourse
- Waterbody
- Municipal Boundary

Trafalgar TS to Richview TS - Section 92 OEB Application

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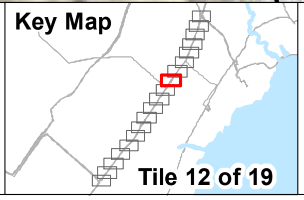

Tile 12 of 19

Existing Structure
Junction
Transformer Station
230 kV Transmission Line
Hydro One Land Ownership
Hydro One Land Easement
Railway
Road
Highway
Watercourse
Waterbody
Municipal Boundary

Trafalgar TS to Richview TS - Section 92 OEB Application

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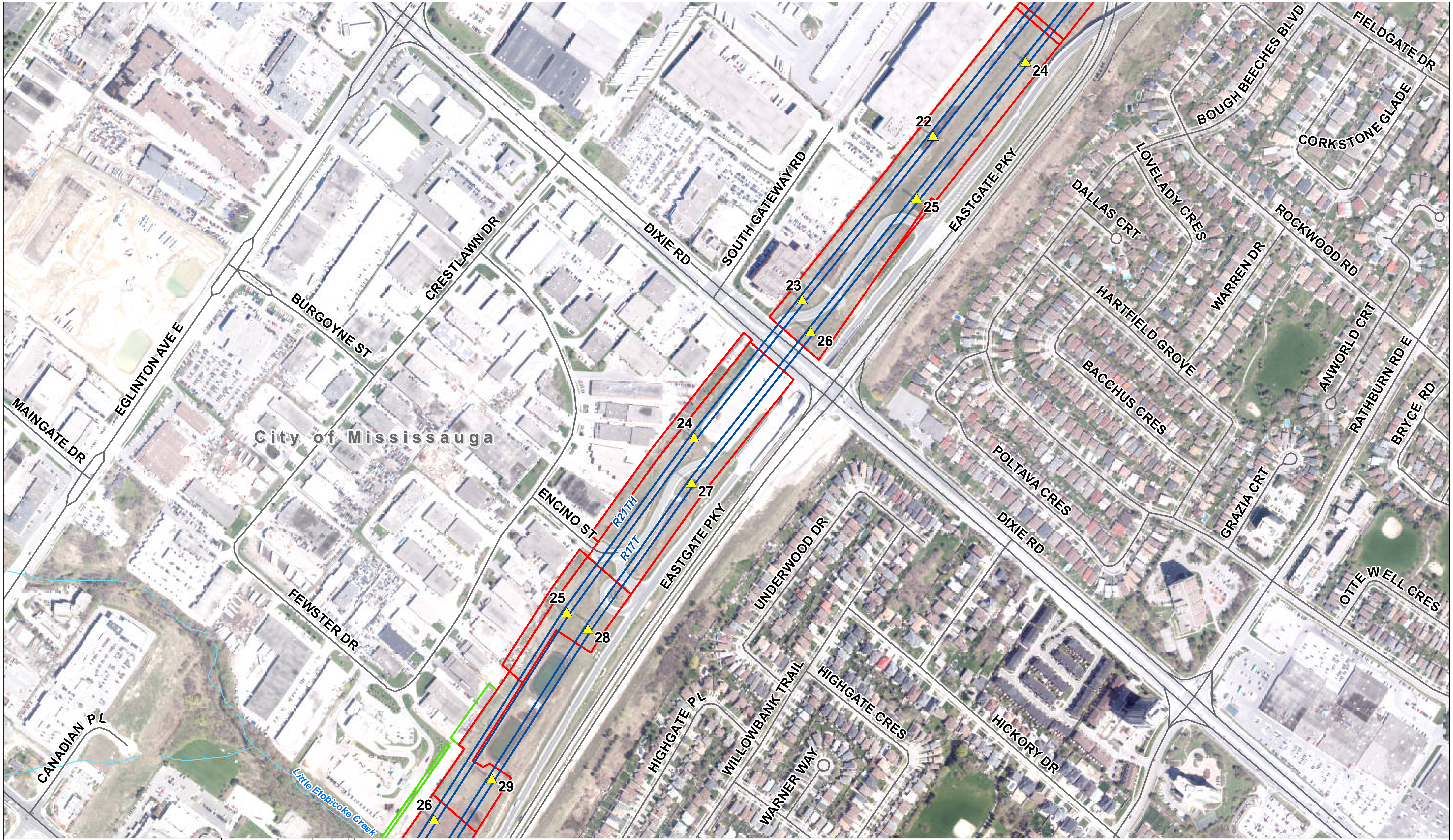

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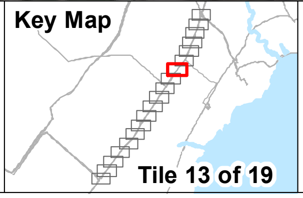

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Junction
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Road
Highway
Watercourse
Waterbody
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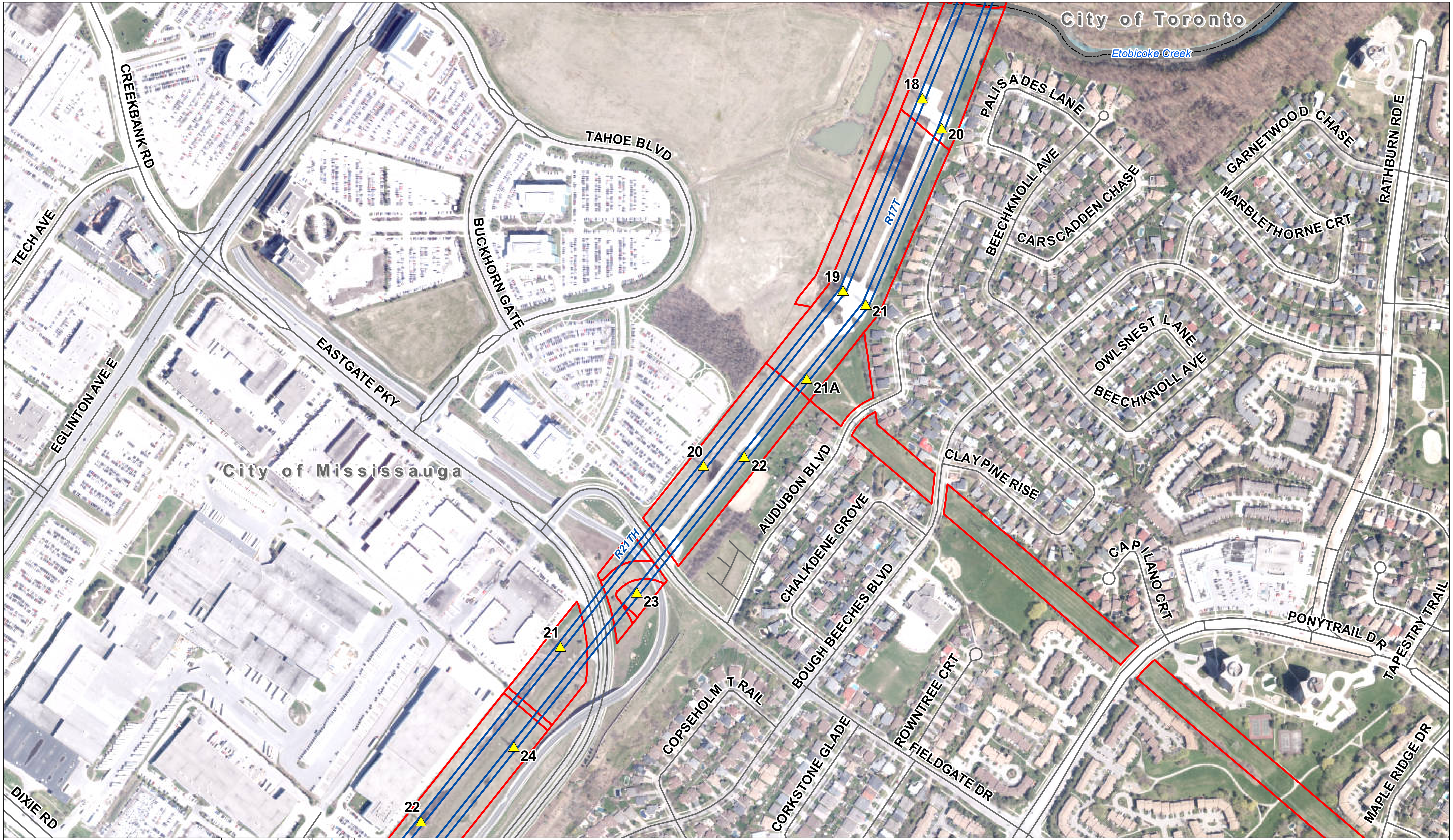

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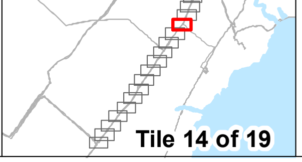

Tile 14 of 19

- Existing Structure
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- Transformer Station
- 230 kV Transmission Line
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- Road
- Highway
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- Waterbody
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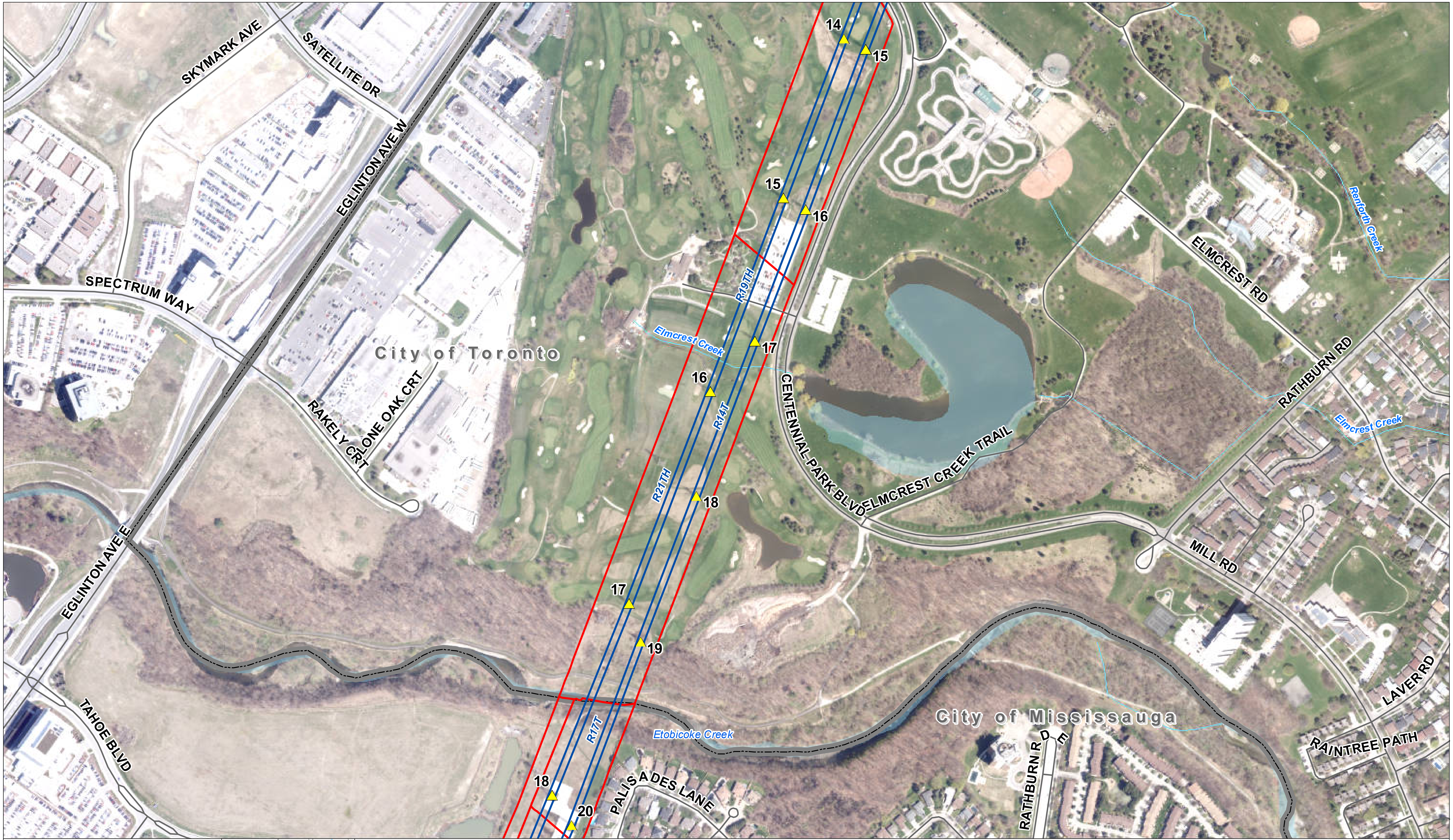

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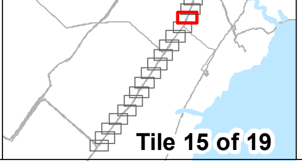

Tile 15 of 19

Existing Structure
Junction
Transformer Station
230 kV Transmission Line
Hydro One Land Ownership
Hydro One Land Easement
Railway
Road
Highway
Watercourse
Waterbody
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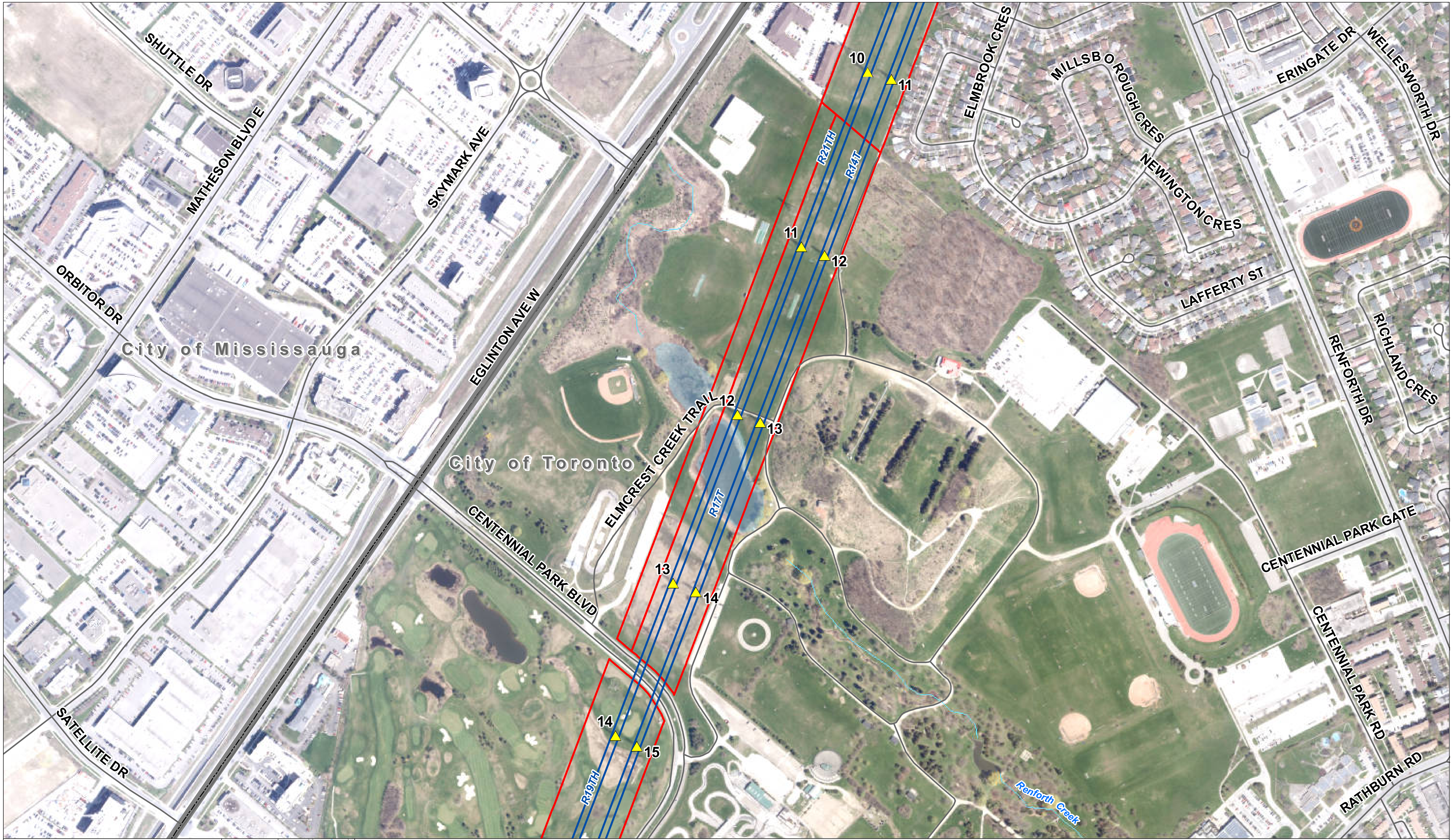

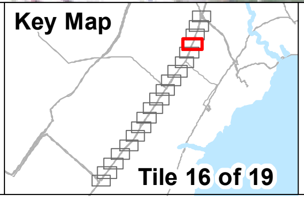

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Transformer Station
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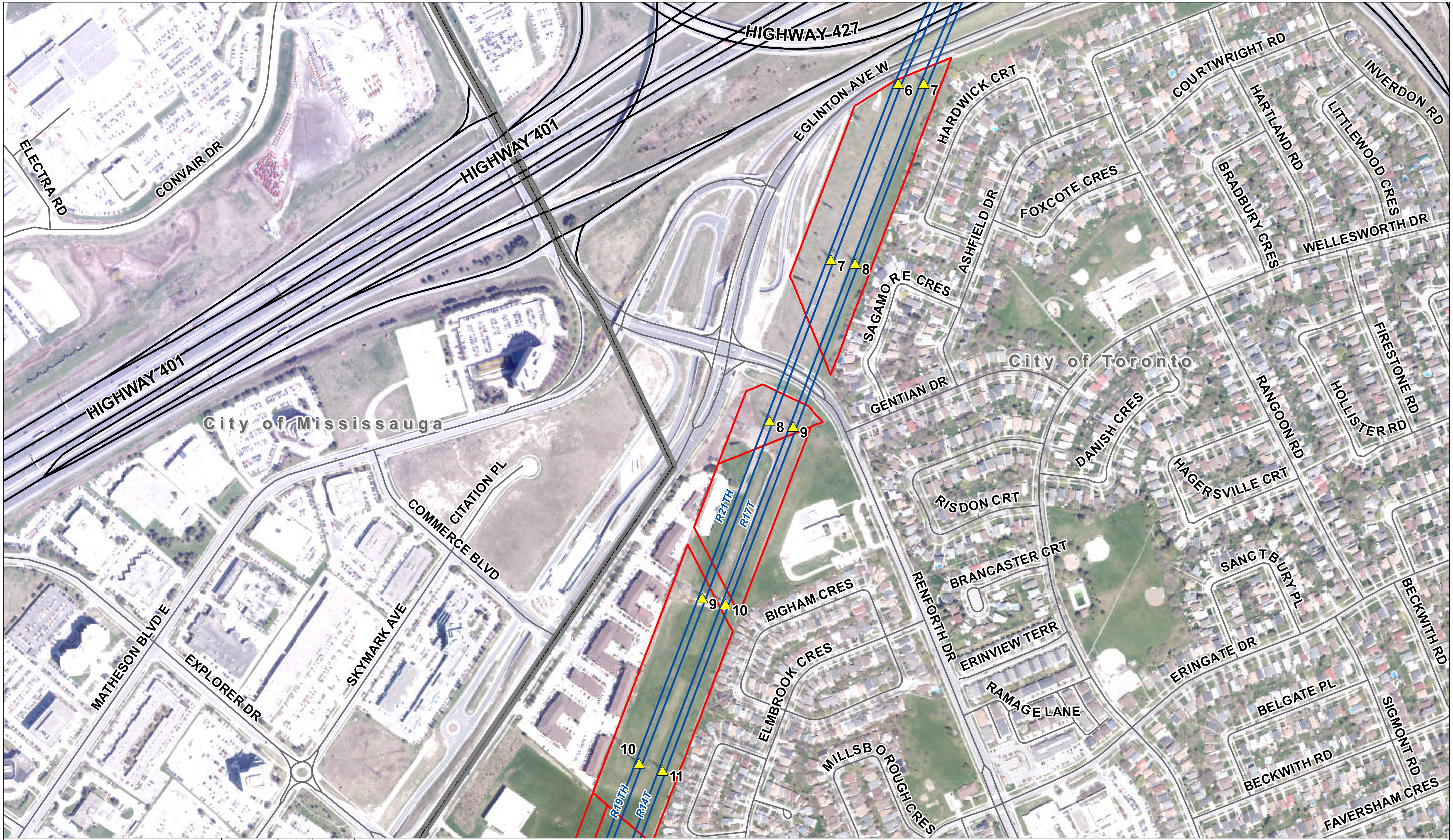

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Key Map

Tile 17 of 19

Existing Structure
Junction
Transformer Station
230 kV Transmission Line
Hydro One Land Ownership
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Railway
Road
Highway
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Waterbody
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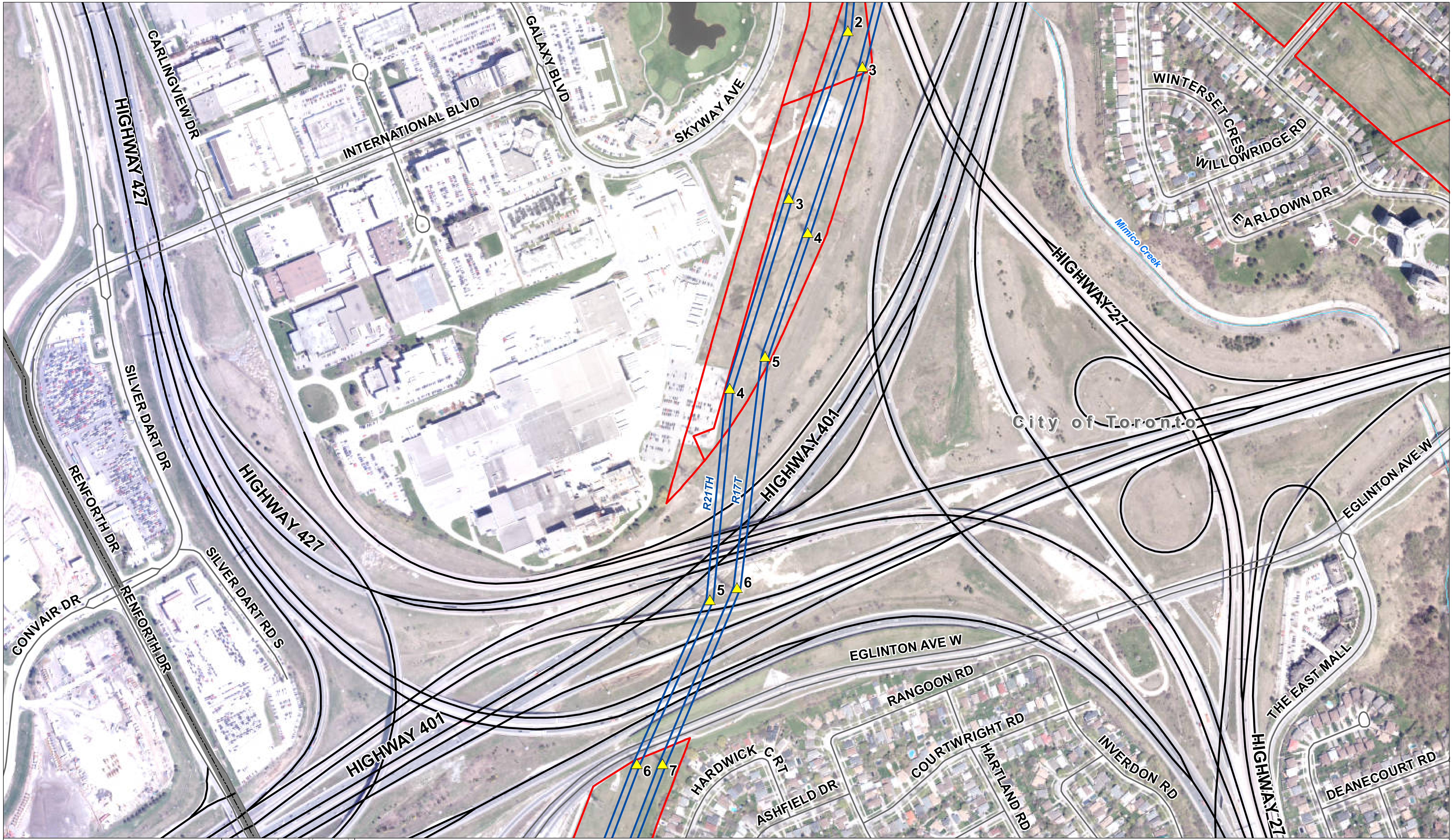

hydro one

inergi

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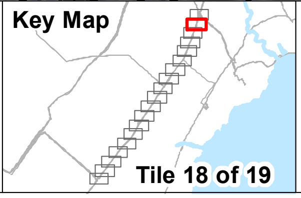

Tile 18 of 19

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Railway
Road
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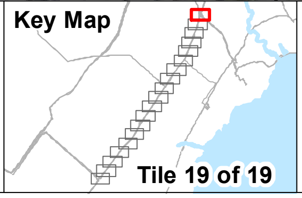

Tile 19 of 19

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Railway
Road
Highway
Watercourse
Waterbody
Municipal Boundary

Trafalgar TS to Richview TS - Section 92 OEB Application

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File: EB-2018-0117

THIS AGREEMENT made in duplicate the XXXXX day of XXXXXX 202X.

BETWEEN:

(INSERT NAME)

[NTD – ENSURE FULL LEGAL NAMES OF ALL OWNERS INSERTED]
[NTD – IF MORE THAN 1 OWNER THEN AMEND TO “(collectively the “**Owner**”)”

(the **"Owner"**)
OF THE FIRST PART

AND:

HYDRO ONE NETWORKS INC.

(**"HONI"**)
OF THE SECOND PART

WHEREAS:

1. The Owner is the registered owner of lands legally described as ***(INSERT LEGAL DESCRIPTION)*** (the “Lands”)

2. The Owner is agreeable in allowing HONI to enter onto a portion of the Lands highlighted in yellow as shown on the sketch attached hereto as Schedule “A” (the “Strip”), for the purposes of certain construction activities in conjunction with the XXXXXX (the “Project”), which shall include but are not limited to a temporary material storage yard for the purposes of storage of materials and equipment, including but not limited to construction equipment and machinery, requisite to the construction on the Strip subject to the terms and conditions contained herein (collectively the “Activities”).

NOW THEREFORE THIS AGREEMENT WITNESSES THAT in consideration of Two Dollars ($2.00) now paid by HONI to the Owner, and the respective covenants and agreements of the parties hereinafter contained and other valuable consideration, the receipt and sufficiency of which are hereby acknowledged by the parties hereto, the parties hereto agree as follows:

1. The Owner hereby grants to HONI and its respective officers, employees, workers, permittees, servants, agents, contractors and subcontractors, with or without vehicles, supplies, machinery, plant, material and equipment, as of the date this Agreement, (i) the right to commence the Activities on the Strip; and (ii) the right to enter upon and exit from, and to pass and repass at any and all times in, over, along, upon, across, and through the Strip and so much of the Lands as may be reasonably necessary.

2. The permission granted herein shall commence as of the date this Agreement (the “Commencement Date”) and shall terminate three (3) years from the Commencement Date (the “Initial Term”).

3. The Initial Term may be extended upon 60 days prior written notice from HONI to the Owner for an additional two (2) years on the same terms and conditions contained herein save for this right to extend (the “Extended Term”).

4. All agents, representatives, officers, directors, employees and contractors and property of HONI located at any time on the Lands shall be at the sole risk of HONI and the Owner shall not be liable for any loss or damage or injury (including loss of life) to them or it however occurring except and to the extent to which such loss, damage or injury is caused by the negligence or willful misconduct of the Owner.

5. Upon execution of this Agreement by all parties, HONI shall pay to the Owner the amount of XXXXX Dollars ($XXXX), which is compensation for the permission granted herein.

6. HONI shall repair any physical damage to the Lands resulting from the Activities and, shall restore the Lands to its original condition so far as possible and practicable to the satisfaction of the Owner, acting reasonably.

7. HONI agrees that it shall indemnify and save harmless the Owner from and against all claims, demands, costs, damages, expenses and liabilities (collectively the “Costs”) whatsoever arising out of HONI’s presence on the Lands or of its activities on or in connection with the Lands arising out of the

permission granted herein except to the extent any of such Costs arise out of the negligence or willful misconduct of the Owner.

8. This Agreement does not commit the Owner to enter into any further agreements with HONI in conjunction with the Project.

9. This Agreement shall be governed by and construed in accordance with the laws of the Province of Ontario and the laws of Canada applicable herein. The parties hereto submit themselves to the exclusive jurisdiction of the Courts of the Province of Ontario.

IN WITNESS WHEREOF the Parties have hereunto set their respective hands and seals to this Agreement of Purchase and Sale.

SIGNED, SEALED AND DELIVERED
In the presence of)
)
)
)
)
______________________________) ______________________________ (seal)
Print Name of Witness *(INSERT NAME)*

)
)
)
)
)
______________________) ______________________________ (seal)
Print Name of Witness *(INSERT NAME)*

IF OWNER IS CORPORATION – USE THE FOLLOWING

[INSERT FULL LEGAL NAME]

Per: ______________________________
Print Name:
Print Title:

Per: ______________________________
Print Name:
Print Title:

We/I have authority to bind the Corporation

HYDRO ONE NETWORKS INC.

Per: ______________________________
Print Name:
Title:

I have authority to bind the Corporation

SCHEDULE "A"

SETTLEMENT AGREEMENT AND RELEASE

THIS AGEEMENT AND RELEASE IS made as of the _____________ day of ____________ ____________ , 202X

Between:

[INSERT FULL LEGAL NAME OF INDIVIDUAL(S)]

(the "Claimant")

- and-

HYDRO ONE NETWORKS INC.

("Hydro One")

WHEREAS the Claimant is the registered owner of the lands legally described as ____________ _______________________________being PIN • (LT) (the "**Claimant's Lands**").

AND WHEREAS the Claimant alleges that he/she/they suffered damages in the form of _______ ____ as a result of construction, maintenance or other work carried out by Hydro One on the Claimant's Lands in or around _____ ________________________ (the **"Work**").

AND WHEREAS Hydro One has agreed to pay to the Claimant the sum of • Dollars ($0.00) in settlement of all claims related, in any manner whatsoever, to the Work (the "**Settlement Amount**"), which settlement precludes any litigation between the parties in respect of any cause of action, of any nature or kind whatsoever, whether known or unknown, in connection with the Work.

AND WHEREAS the calculation of the Settlement Amount is detailed on Schedule "A" attached hereto.

NOW THEREFORE, IN CONSIDERATION of payment by Hydro One to the Claimant of the Settlement Amount, and for other good and valuable consideration the receipt and sufficiency of which is hereby acknowledged, the parties hereto hereby agree as follows:

THE Claimant, for his/her heirs, administrators, successors, assigns, agents, servants, and on behalf of any parties who claim a right or interest through them, does hereby irrevocable release and forever discharge Hydro One and its administrators, successors, assigns, agents, servants, officers, directors, employees, shareholders, associates, including its parent, affiliates and subsidiary corporations, of, from and against any and all manner of actions, causes of action, suits, proceedings, liabilities, debts, sums of money, claims, damages and demands which the Claimant ever had now has, can, shall or may hereafter have against Hydro One existing by any reason or by any act, cause, matter or thing whatsoever relating to, or connected with the Work.

AND FOR THE SAID CONSIDERATION, the Claimant further agrees not to make any claim or take any proceedings against any other person or corporation who might claim contribution or indemnity under the provisions of the *Negligence Act* and any amendments thereto from the persons or corporations discharged by this Agreement.

AND IT IS UNDERSTOOD AND AGREED that if any action is commenced in connection with any of the claims released herein and if Hydro One is added to such proceedings in any manner whatsoever, whether justified in law or not, the proceedings will immediately be discontinued and any legal costs incurred in any such proceedings shall be paid on a full indemnity basis to Hydro One.

AND IT IS FURTHER UNDERSTOOD AND AGREED that this Agreement is intended to cover and does cover not only all known injuries, losses and damages arising from the Work, but all future injuries, losses and damages arising from the Work, save and except any damages to drainage tiles, that are not now known or anticipated but which may later develop or be discovered, including all the effects and consequences thereof.

AND IT IS UNDERSTOOD AND AGREED that any claim for damages arising from the Work to drainage tiles on the Claimant's Land must be brought to Hydro One's attention within two (2) years from the date of this Agreement (the "Drainage Tile Damage"),

AND IT IS UNDERSTOOD AND AGREED the parties will negotiate a separate settlement agreement for any Drainage Tile Damage.

AND IT IS UNDERSTOOD AND AGREED that the fact and terms of this Agreement and the settlement underlying it will be held in confidence and will not be disclosed either orally or in writing, directly or indirectly, by any of the parties to this Agreement, unless in accordance with auditors' or accountants' written advice for financial statement or income tax purposes, or for the purpose of any judicial, legal or regulatory proceeding, process or requirement.

AND THE CLAIMANT hereby acknowledges, declares, and agrees that he/she understands the terms of this Agreement and voluntarily accepts the consideration referred to above, that he/she has had a full opportunity to obtain independent legal advice prior to execution of this Agreement, and that no party has been induced to enter into this Agreement by reason of any representation or warranty of any nature or kind whatsoever and that there is no condition, express or implied, or collateral agreement affecting this Agreement.

IT IS FURTHER UNDERSTOOD AND AGREED that the Settlement Amount shall be paid by Hydro One to the Claimant within 30 days from the date of this Agreement as written above.

IT IS UNDERSTOOD AND AGREED that the payment of the Settlement Amount is deemed to be no admission whatsoever of liability on the part of Hydro One.

IT IS FURTHER UNDERSTOOD AND AGREED that this Agreement may be transmitted by e-mail or facsimile, and that a copy so transmitted shall be valid and binding as if it were an original copy.

IT IS FURTHER UNDERSTOOD AND AGREED that this Agreement may be executed in any number of counterparts with the same effect as if the parties had signed the same Agreement. All counterparts shall constitute one and the same Agreement.

IN WITNESS WHEREOF, the parties have set their hands this ______________ day of ______ __________________, 20____.

WITNESS:	**CLAIMANT:**
_______________________	_______________________
Name:	Name:
_______________________	_______________________
Address:	Name:

HYDRO ONE NETWORKS INC.

Per:______________________________
Name:
Title:

I have authority to bind the corporation

SCHEDULE "A"

Settlement Amount Calculation

SYSTEM IMPACT ASSESSMENT

Under the Market Rules, any party planning to construct a new or modified connection to the Independent Electricity System Operator ("IESO")-controlled grid must request an IESO System Impact Assessment ("SIA") of these facilities. The IESO has completed a SIA of the proposed facilities under the IESO Connections Assessment and Approval process. Please refer to **Attachment 1** for the IESO's final SIA report.

The IESO assessment addresses the impact of the proposed facilities on system operating voltage, system operating flexibility, and on the ability of other connections to deliver or withdraw power supply from the IESO-controlled grid. The IESO's SIA confirms that Hydro One's proposed transmission facilities will not have a materially adverse impact on the reliability of the integrated power system. Furthermore, the Project will not cause any changes to the current classifications of North American Electric Reliability Corporation's Bulk Electric System elements and Northeast Power Coordinating Council's Bulk Power System elements in the Toronto to Mississauga transmission zone.

System Impact Assessment Report

Final Report - Public

CAA ID: 2020-679
Project: Richview x Trafalgar Conductor Upgrade
Connection Applicant: Hydro One Inc.

April 14, 2021

ieso
Connecting Today.
Powering Tomorrow.

Acknowledgement

The IESO wishes to acknowledge the assistance of Hydro One in completing this assessment.

Disclaimers

IESO

This report has been prepared solely for the purpose of assessing whether the connection applicant's proposed connection with the IESO-controlled grid would have an adverse impact on the reliability of the integrated power system and whether the IESO should issue a notice of conditional approval or disapproval of the proposed connection under Chapter 4, section 6 of the Market Rules.

Conditional approval of the project is based on information provided to the IESO by the connection applicant and Hydro One at the time the assessment was carried out. The IESO assumes no responsibility for the accuracy or completeness of such information, including the results of studies carried out by Hydro One at the request of the IESO. Furthermore, the conditional approval is subject to further consideration due to changes to this information, or to additional information that may become available after the conditional approval has been granted.

If the connection applicant has engaged a consultant to perform connection assessment studies, the connection applicant acknowledges that the IESO will be relying on such studies in conducting its assessment and that the IESO assumes no responsibility for the accuracy or completeness of such studies including, without limitation, any changes to IESO base case models made by the consultant. The IESO reserves the right to repeat any or all connection studies performed by the consultant if necessary to meet IESO requirements.

Conditional approval of the proposed connection means that there are no significant reliability issues or concerns that would prevent connection of the proposed project to the IESO-controlled grid. However, the conditional approval does not ensure that a project will meet all connection requirements. In addition, further issues or concerns may be identified by the transmitter(s) during the detailed design phase that may require changes to equipment characteristics and/or configuration to ensure compliance with physical or equipment limitations, or with the Transmission System Code, before connection can be made.

This report has not been prepared for any other purpose and should not be used or relied upon by any person for another purpose. This report has been prepared solely for use by the connection applicant and the IESO in accordance with Chapter 4, section 6 of the Market Rules. This report does not in any way constitute an endorsement of the proposed connection for the purposes of obtaining a contract with the IESO for the procurement of supply, generation, demand response, demand management or ancillary services.

The IESO assumes no responsibility to any third party for any use, which it makes of this report. Any liability which the IESO may have to the connection applicant in respect of this report is governed by Chapter 1, section 13 of the Market Rules. In the event that the IESO provides a draft of this report to the connection applicant, the connection applicant must be aware that the IESO may revise drafts of this report at any time in its sole discretion without notice to the connection applicant. Although the IESO will use its best efforts to advise you of any such changes, it is the responsibility of the connection applicant to ensure that the most recent version of this report is being used.

Hydro One

The results reported in this report are based on the information available to Hydro One, at the time of the study, suitable for a System Impact Assessment of this connection proposal.

The short circuit and thermal loading levels have been computed based on the information available at the time of the study. These levels may be higher or lower if the connection information changes as a result of, but not limited to, subsequent design modifications or when more accurate test measurement data is available.

This study does not assess the short circuit or thermal loading impact of the proposed facilities on load and generation customers.

In this report, short circuit adequacy is assessed only for Hydro One circuit breakers. The short circuit results are only for the purpose of assessing the capabilities of existing Hydro One circuit breakers and identifying upgrades required to incorporate the proposed facilities. These results should not be used in the design and engineering of any new or existing facilities. The necessary data will be provided by Hydro One and discussed with any connection applicant upon request.

The ampacity ratings of Hydro One facilities are established based on assumptions used in Hydro One for power system planning studies. The actual ampacity ratings during operations may be determined in real-time and are based on actual system conditions, including ambient temperature, wind speed and facility loading, and may be higher or lower than those stated in this study.

The additional facilities or upgrades which are required to incorporate the proposed facilities have been identified to the extent permitted by a System Impact Assessment under the current IESO Connection Assessment and Approval process. Additional facility studies may be necessary to confirm constructability and the time required for construction. Further studies at more advanced stages of the project development may identify additional facilities that need to be provided or that require upgrading.

Table of Contents

List of Figures

No table of figures entries found.

List of Tables

No table of figures entries found.

Project Description

Hydro One Networks Inc. (the "connection applicant" and "transmitter") is proposing to replace the 230 kV conductors of most sections of circuits R14T, R17T, R19TH and R21TH that are connected between Richview Transformer Station (TS) and Trafalgar TS (the "project"). The IESO recommended, in a letter that was sent to the connection applicant on December 18, 2020, to proceed with this project, that is expected to address the need for improved capability across the Flow East Towards Toronto (FETT) interface. The specifications of the proposed conductors are presented in Appendix B of this report.

The connection applicant will adjust the settings of the existing line protections for transmission circuits R14T, R17T, R19TH and R21TH to maintain the same protection zones and operating times while accounting for the impedances of the proposed conductors.

The proposed in service date is in December 2024.

Notice of Conditional Approval

This assessment concludes that the proposed connection of the project is expected to have no material adverse impact on the reliability of the integrated power system, provided that all requirements in this report are implemented. Therefore, the assessment supports the release of the Notification of Conditional Approval for connection of the project.

Assessment Findings

The studies performed determined that there is no adverse impact to the surrounding system caused by the project. In addition, the impedances and thermal ratings of the replacement conductors are similar or better than those of the existing conductors. The studied scenarios, main assumptions and results are available in Appendix C of this report.

IESO Requirements for Connection

Specific Requirement:

The connection applicant shall submit the outage plan for incorporating the project to the IESO and obtain its approval at least twenty four months before the date of the first outage.

General Requirements:

The connection applicant shall satisfy all applicable requirements specified in the Market Rules, the Transmission System Code (TSC) and reliability standards. Some of the general requirements that are applicable to this project are presented in detail in Appendix A of this report.

Appendix A: General Requirements

The connection applicant shall satisfy all applicable requirements specified in the Market Rules, the Transmission System Code and reliability standards. This Section highlights some of the general requirements that are applicable to the project.

1. The connection applicant shall notify the IESO at connection.assessments@ieso.ca as soon as it becomes aware of any changes to the project scope or project data used in this assessment. The IESO will determine whether these changes require a re-assessment.
2. The connection applicant must initiate the IESO's Market Registration process prior to the commencement of any project related outages. Once the IESO's Market Registration process has been successfully completed, the IESO will provide the connection applicant with a Registration Approval Notification (RAN) document, confirming that the project is fully authorized to connect to the IESO-controlled grid. For more details about this process, the connection applicant is encouraged to contact IESO's Market Registration at market.registration@ieso.ca.

   The connection applicant is required to provide "as-built" equipment data for the project during the IESO Market Registration process. If the "as-built" equipment data differs materially from the ones used in this assessment, then the IESO may decide that further analysis of the project is required.
3. The connection applicant shall ensure that the project's equipment meet the voltage requirements specified in section 4.2 and section 4.3 of the Ontario Resource and Transmission Assessment Criteria (ORTAC).
4. The connection applicant shall ensure that the connection equipment is designed to be fully operational in all reasonably foreseeable ambient conditions. Failures of the connection equipment must be contained within the project and have no adverse impact on the IESO-controlled grid.
5. As per Market Manual 1.4: Connection Assessment and Approval (formerly Market Manual 2.10), the connection applicant will be required to provide a status report of its proposed project with respect to its progress upon request of the IESO using the project status report form on the IESO website. Failure to comply with project status requirements listed in Market Manual 1.4: Connection Assessment and Approval (formerly Market Manual 2.10) will result in the project being withdrawn.

Appendix B: Data Verification (Confidential)

Appendix C: Technical Assessment (Confidential)

Independent Electricity System Operator
1600-120 Adelaide Street West
Toronto, Ontario M5H 1T1

Phone: 905.403.6900
Toll-free: 1.888.448.7777
E-mail: customer.relations@ieso.ca

ieso.ca

@IESO_Tweets
facebook.com/OntarioIESO
linkedin.com/company/IESO

Connecting Today.
Powering Tomorrow.

CUSTOMER IMPACT ASSESSMENT

Hydro One has completed a Customer Impact Assessment ("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. Please refer to **Attachment 1** for the final CIA report prepared by Hydro One.

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

Customer Impact Assessment

Richview TS x Trafalgar TS –Line Upgrade Project

CIA ID: 2021-03
Revision: Final
Date: May 31st 2021

Issued by: System Planning Division
Hydro One Networks Inc.

Prepared by:	Approved by:
Gene Ng P.Eng	Farooq Qureshy P.Eng
Senior Network Management Engineer	Manager, Transmission Planning (C&E)
System Planning Division	System Planning Division
Hydro One Networks Inc.	Hydro One Networks Inc.

Disclaimer

This Customer Impact Assessment was prepared based on information available about the proposed transmission line reconductoring, spanning the cities of Mississauga and Toronto. 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 also 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. j

Hydro One Networks shall not be liable to any third party which uses the results of the Customer Impact Assessment under any circumstances whatsoever, for any indirect or consequential damages, loss of profit or revenues, business interruption losses, loss of contract or loss of goodwill, special damages, punitive or exemplary damages, whether any of the said liability, loss or damages, arises in contract, tort or otherwise.

Table of Contents

Customer Impact Assessment
Richview TS x Trafalgar TS Line Upgrade Project

1.0 INTRODUCTION

This Customer Impact Assessment (CIA) study assesses the potential impact of the line conductor upgrades of the Richview TS x Trafalgar TS 230kV transmission circuits on the transmission customers in the South West GTA area.

This study is intended to supplement the IESO System Impact Assessment (SIA) report CAA ID 2020-679 dated April 14, 2021 for the proposed Richview TS to Trafalgar TS Conductor Upgrade project.

In accordance with section 6 of the Ontario Energy Board's Transmission System Code ("TSC"), Hydro One Networks Inc. (Hydro One) is to carry out a Customer Impact Assessment ("CIA") study to assess the impact of the proposed line upgrade on existing transmission customers in the affected area. This assessment does not evaluate the overall impact of the project on the bulk electricity system.

This Customer Impact Assessment (CIA) study report is being issued to all area transmission customers being affected by the proposed work for review and comments.

2.0 BACKGROUND

The Independent Electricity System Operator ("IESO") has identified the need for increased power transfer capability across the "Flow East towards Toronto" ("FETT") transmission interface that delivers electricity from South West Ontario ("SWO") to the Greater Toronto Area ("GTA").

As supply capacity east of the GTA is expected to decline over the next decade due to the retirement of Pickering Generating Station ("GS") and the ongoing nuclear refurbishment outages, the generation short fall will be met with energy supply from SWO and will result in an increase in flow on the FETT interface.

The IESO has advised that the FETT interface capability will need to be increased by 2000 MW and to achieve this the two 230kV double circuit lines R14T/R17T and R19TH /R21TH, between Richview TS and Trafalgar TS, need to be upgraded.

Hydro One's proposed Richview Trafalgar Reconductoring (RTR) Project covers reconductoring of about 22km of 230 kV double circuit line R14T/R17T between Trafalgar TS and Richview TS and about 14km of 230kV double circuit line R19TH/R21TH between Trafalgar TS and Tomken Junction.

Figure 1 shows the sections of circuits R14T/R17T and R19TH/R21TH being replaced.

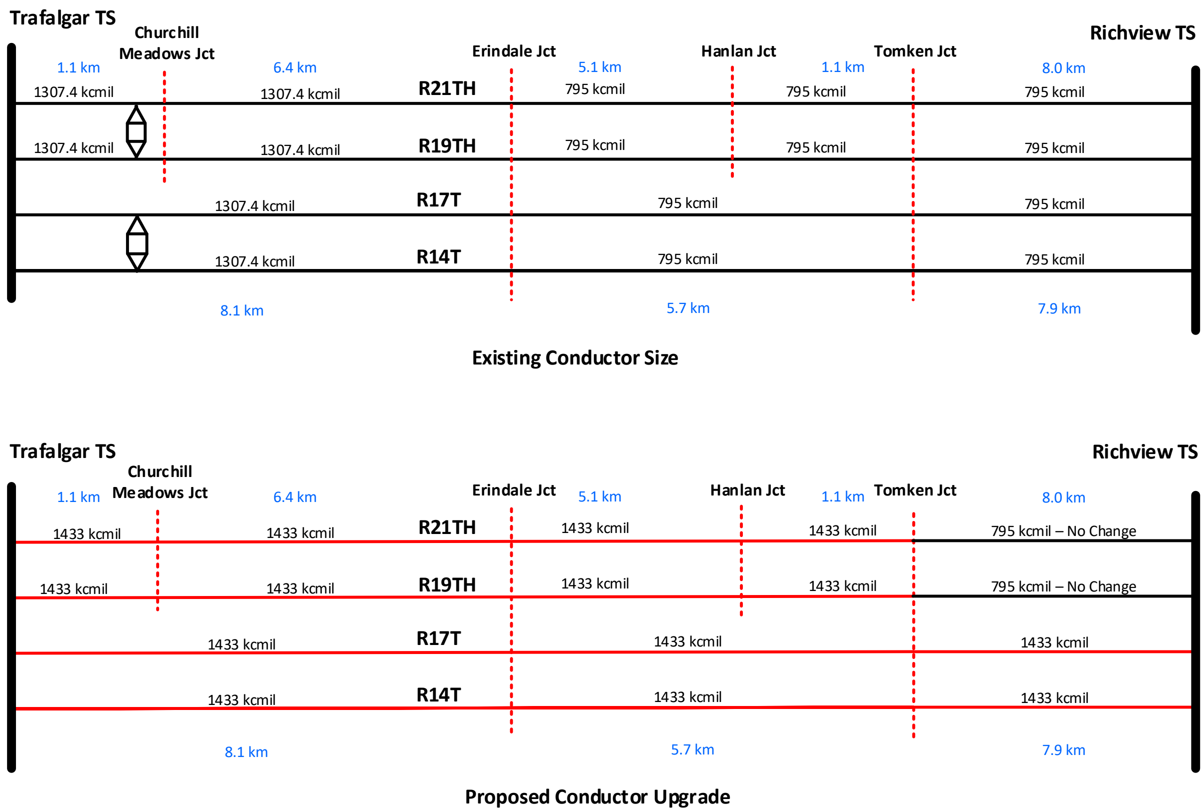

Figure 1 – Proposed Project

The conductor will be upgraded from either 795kcmil ACSR or 1307.4kcmil ACSR to 1433 kcmil ACSS. Table 1 shows the Long Term Emergency (LTE) ampacity ratings for each conductor. The LTE rating is applicable under contingency conditions.

Table 1: LTE Conductor Ratings

Conductor	LTE - Ampacity
795 kcmil ACSR	1090A
1307.4 kcmil ACSR	1460A
1433 kcmil ACSS	2000A

The proposed upgrade project is expected to be in-service by March 31, 2026.

3.0 CUSTOMER LIST

The purpose of the CIA is to assess the impact of the proposed line upgrade on existing transmission customers connected to Hydro One's transmission system on these circuits (R14T/R17T, R19TH/R21TH). The customers within the study scope are listed in Table 2.

Table 2: Connected Customers

Transformer Stations	Customer
Trafalgar TS	Oakville Hydro
Churchill Meadows TS	Alectra Utilities
Erindale TS	Alectra Utilities
Jim Yarrow MTS	Alectra Utilities
Tomken TS	Alectra Utilities
Richview TS	Toronto Hydro Alectra Utilities

4.0 CIA RESULTS

4.1 Load Flow and Short- Circuit Studies

There are no changes to the circuit configuration as a result of this reconductoring project.

The circuits' impedances with the replacement conductors are not materially different from the existing ones and, therefore, there are no significant changes to line flows and short circuit levels following the incorporation of the project.

The short circuit study results, with the new line conductors, are summarized in the Appendix A showing both symmetric and asymmetric (3-cycle) short circuit levels for the local busses. The study assumes maximum contribution from all the planned generation additions. Pre-fault voltage of 250.00 kV at 220 kV stations is assumed. There is minimal impact to the short circuit level in the area, and all HV breakers can withstand the change to the short circuit level.

All area customers are advised to review the short circuit results to ensure that their equipment ratings are adequate.

4.2 Customer Reliability

The proposed transmission reinforcement work will increase supply reliability and adequacy for all area customers connected as a result of the increased transmission capacity of the transmission circuits (R14T/R17T, R19TH/R21TH).

4.3 Preliminary Outage Impact Assessment

A preliminary outage plan associated with the project's construction work has been developed. The detailed outage plan will be identified when final engineering design is available and a detailed construction schedule is established. Whenever possible, the outage plan will include measures for maintaining local distribution load security in consultation with the area LDCs.

5.0 CONCLUSIONS AND RECOMMENDATIONS

This Customer Impact Assessment (CIA) study has reviewed the impact of the conductor upgrade project for the local customers connected to the 230kV circuits R14T/R17T and R19TH/R21TH.

The fault levels at all stations in the area experience no significant change as a result of the project. Customers are requested to review the fault levels provided in Appendix B to ensure to ensure that the capability of their equipment is not exceeded.

The study has confirmed that the proposed project can be incorporated without any adverse impact on Hydro One Transmission customers.

Appendix A: Short Circuit Levels

Bus Name	BASE KV	MAX V (pu)	Breaker Clearing Time	3 Phase Fault		Single Phase Fault		Breaker Rating Sym kA	Breaker Rating Asym kA
				SYM I	ASYM I	SYM I	ASYM I		
TRAFALGAR TS	220	1.136	0.025	65.5	85.9	63.5	85.5	80	96
TRAF DSN T39	220	1.136	0.025	59.7	77.1	56.4	73.3	-	-
TRAF DSN T38	220	1.136	0.025	59.7	77.1	56.5	73.4	-	-
TRAF DSN BY	27.6	1.051	0.067	16.7	18.3	11.7	14.2	31.5	37.8
CHURCH MDR19	220	1.136	0.025	54.7	69.4	48.5	61.1	-	-
CHURCH MDR21	220	1.136	0.025	54.7	69.4	48.5	60.9	-	-
CHURCH MEAD	44	1.045	0.067	15.3	16.9	6.9	8.5	31.5	37.8
ERINDALE R14	220	1.136	0.025	33.3	40.8	25.6	29.2	-	-
ERINDALE R17	220	1.136	0.025	33.3	40.8	25.9	29.4	-	-
ERINDALE R19	220	1.136	0.025	36.8	44.4	30.6	35.9	-	-
ERINDALE R21	220	1.136	0.025	36.7	44.3	30.5	35.2	-	-
ERINDALE E	27.6	1.051	0.067	13.7	15.0	10.9	13.0	31.5	37.8
ERINDALE Q	27.6	1.051	0.067	14.2	15.7	10.6	12.9	31.5	37.8
ERINDALE BJ	44	1.045	0.067	15.2	17.0	14.0	16.6	18.8	20.7
ERINDALE YZ	44	1.045	0.067	14.8	16.6	6.9	8.3	18.8	20.7
J YARROW R19	220	1.136	0.025	27.4	33.5	23.4	26.3	-	-
J YARROW R21	220	1.136	0.025	27.2	33.3	23.2	26.1	-	-
JIM YARROW A	27.6	1.051	0.067	13.7	15.0	10.5	12.7	(1)	
JIM YARROW B	27.6	1.051	0.067	13.8	15.1	10.6	12.8	(1)	
TOMKEN R14T	220	1.136	0.025	34.2	41.6	26.3	29.8	-	-
TOMKEN R17T	220	1.136	0.025	34.4	41.9	26.8	30.3	-	-
TOMKEN R19T	220	1.136	0.025	39.5	46.9	33.8	38.7	-	-
TOMKEN R21T	220	1.136	0.025	39.3	46.7	33.7	38.5	-	-
TOMKEN TS BY	44	1.045	0.067	15.3	16.7	7.0	8.5	18.8	20.7
TOMKEN TS EZ	44	1.045	0.067	14.9	16.6	6.9	8.5	23.0	27.6
RICHVIEW AH2	220	1.136	0.025	63.1	81.4	57.5	73.7	80	104
RICHVIEW AH1	220	1.136	0.025	62.2	79.9	55.5	70.7	80	104
RICHVIEW BY	27.6	1.051	0.067	16.5	18.5	11.7	14.3	18.1	19.2
RICHVIEW E	27.6	1.051	0.067	14.8	15.7	10.8	12.9	29.9	32.8
RICHVIEW J	27.6	1.051	0.067	14.9	15.7	10.9	12.9	29.9	32.8
RICHVIEW Q	27.6	1.051	0.067	13.7	15.6	10.5	12.8	30	33
RICHVIEW Z	27.6	1.051	0.067	13.8	15.7	10.5	12.8	30	33
HURONTARIO19	220	1.136	0.025	32.1	39.4	26.3	29.6	63	81.9
HURONTARIO21	220	1.136	0.025	31.9	39.1	26.0	29.4	63	81.9

Note. 1) LV Breakers owned by Alectra