

**ANNEX II-B**

**CONNECTION LINE SUMMARY**



**Distribution Line Summary for  
the Wanatango Falls  
Hydroelectric Project  
(FrederickHouse River)**

**A Summary Report for:**



Original Report - based on analysis up to March 3, 2011  
Updated Report - based on further analysis and  
revisions up to August 3, 2011

**August 3, 2011**



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## Route Investigation, Analysis and Verification:

KBM Resources Group was retained by Xeneca Power Development Inc. to undertake a route investigation of proposed distribution lines routes for 18 proposed hydroelectric projects. After initial routing, a more advanced analysis was completed including digital aerial photography and a ground truthing exercise.

The 18 proposed Xeneca projects have been awarded conditional approval by the Ontario Power Authority under the Feed in Tariff (FIT) program. For each project, the site of the generator, point of common coupling (PCC) and point of connection (PC) are identified in the conditionally approved FIT application. Based on these approved points of connection, this exercise was undertaken to determine potential alternatives for distribution line routes for each project.

KBM was provided with preliminary distribution line routings developed by Xeneca staff and mapped by Natural Resource Solutions Inc. These preliminary routes were created, based on data found on publicly available mapping websites such as Google maps, Google Earth and Land Information Ontario (LIO) data sets (water, roads, streams, etc). Detailed information about values and land tenure affected by the proposed distribution line was not available during this first phase of the planning process.

KBM extended the scope of this review to further optimize the routes by maximizing the use of existing resources (roads), minimizing the number of water crossings, and avoiding wetlands where possible. Future studies will include a Rapid Assessment Technique to determine if adjacent wetlands are likely to be scored as a Provincially Significant Wetland (PSW) and an Ecological Land Classification using the MNR Crosswalk Exercise (where ecosite information is available) to identify potentially significant wildlife habitat along line and road corridors.

In addition, a leaf-off aerial photography program was undertaken for all routes (20 cm resolution (ground sample distance) digital true color RGB ortho-photography) to aid in habitat characterization and the identification of important environmental values.

Ground truthing of the route alternatives has been completed for segments running along existing roads. The remaining segments will be ground truthed after the routes are finalized through the Environmental Assessment (EA) process and potentially significant wildlife habitat has been identified (using Ecological Land Classification data where available).

All remaining assessment activities will be conducted following the completion of the EA (2011 and early 2012), prior to the construction of the distribution lines, which is expected to commence in the winter of 2013.

A draft report summarizing proposed distribution lines was completed by KBM on March 3<sup>rd</sup>, 2011. This report was distributed by Xeneca/KBM to all of the involved government agencies with the primary purpose of identifying and quantifying the proposed distribution lines and soliciting feedback to determine if sensitive values were missed during the preliminary analysis. Many of the proposed distribution lines described in the draft report have undergone changes primarily to mitigate impacts on identified values, wetlands, water crossings and patent lands.

This revised report describes the refined distribution line route for Wanatango Falls as a project-specific report.

## Methodology:

### *Draft Report (March 3<sup>rd</sup>):*

KBM began by assembling a database of pertinent values information and land tenure designations for the proposed distribution lines routes. The proposed line locations were then overlain with assembled values layers and a summary of the potentially impacted values was compiled and summarized. Data layers used for this exercise included:

- Land Information Ontario dataset
- NRCan Topographic data
- 2008 Forest Resource Inventory data
- Medium resolution SPOT panchromatic orthoimagery from Natural Resources Canada
- NRVIS Data Layers (circa Feb 2011)

A linear breakdown of proposed lines following existing roads, new access roads and new line corridors was also compiled and summarized. In order to minimize potential impacts to the environment, minor amendments were made, where possible, to the proposed routes by aligning them with existing roads and by avoiding water crossings and other sensitive areas. During the draft version of this exercise KBM did not have access to the most current forestry road layers.

Where appropriate, additional line routes were proposed. These were presented and explained in the draft report as alternatives with a primary goal of following existing roads and reducing impact to sensitive areas and identified values.

It should be noted that the desktop review was based solely on the information available to KBM. There is the potential that other unidentified values may be impacted by the proposed distribution lines such as unmapped water crossings or sensitive habitat areas. Further review of the proposed distribution line routes may be needed as per the requirement of the Class EA for each hydroelectric project.

Following the completion of the desktop review, further activities were planned to aid in the refinement of the proposed distribution line route:

- Digital aerial photography of the revised distribution line and road access routes.
- Ground truthing of the revised distribution line and road access routes
- Consultation and information sharing with each of the forest management companies which hold crown Sustainable Forest Licenses (SFL) in the areas that each project located.

Further review of the confirmed distribution line route will be undertaken as part of the regulatory permitting requirements for each project.

*Revised Report (August 3<sup>rd</sup>):*

Following the completion of the March 3<sup>rd</sup> draft report, KBM undertook extensive consultation with the SFL holders linked to the 18 projects. The consultation was constructive and most of the SFL holders provided GIS datasets including all road networks, planned harvest block locations and aggregate pit locations;. Many of the managing foresters were able to provide location specific information based on their extensive knowledge of the land base. This information was used to complete revisions to the distribution line routes. The distribution line maps prepared for the revised report will include any roads layers provided by the SFL holders.

The line routes presented in the draft report were reviewed using all available information and revised where appropriate in an effort to:

- reduce environmental impact (i.e. streams & wetland crossings);
- minimize landscape footprint and fragmentation;
- dovetail with existing road corridors; and
- reduce total line length.

The updated distribution line routes are described in this revised report (June 21<sup>st</sup>) and, where possible, compared to the linear breakdown of the lines described in the draft report.

*Ground Truthing:*

Ground truthing of the proposed line and road access routes was completed subsequent to the post processing of digital aerial photography in June 2011. Existing roads and water crossings were assessed so as to determine their current condition, structural integrity and upgrade requirements.

*Rapid Assessment of potential PSWs:*

Where line or new road corridors could impact adjacent wetlands, a Rapid Assessment Technique will be used to determine if the wetland is likely to be scored as a Provincially Significant Wetland (PSW).

Northern Bioscience will complete this modeling exercise based on methods outlined in NEST Technical Report TR-025, Wetlands Evaluation in Ontario: Models for Predicting Wetland Score (OMNR, 1995). Where potential PSWs are identified in proximity to the route, the corridor will be realigned with sufficient setback to avoid impacts to these features.

*Ecological Land Classification using Ecosite Crosswalk:*

Where ecosite information is available, an Ecological Land Classification mapping exercise will be used to assist in identifying potentially significant wildlife habitat along line and road corridors.

Xeneca consultants will use high resolution aerial photography and Forest Resource Inventory (FRI) data to identify potentially significant wildlife habitat along the distribution line and road

corridors. Where ecosite information is available or can be derived, it will be used with the Northeastern Ontario Ecosite Crosswalk Exercise (MNR 2011) to identify the Ecological Land Classification (ECL) of habitat along the corridors. ECL information can then be used to assist in identifying potentially significant wildlife habitat using methods prescribed in the Significant Wildlife Habitat Technical Guide (OMNR, 2000).

*Field Verification of Potentially Significant Wildlife Habitat (Endangered Species Act):*

Twenty cm resolution digital true color ortho-photography and Ecological Land Classification data for the distribution line and road corridors will be used to identify potentially significant wildlife habitat along all potential corridors. Field investigations will be scheduled for the summer and fall of 2011 and spring of 2012, where needed.

Interim Report For Access Routes:

In general, the Xeneca waterpower sites will be accessed using existing forestry access roads, with some sections of new road required between the existing road and the generating station (GS) locations. Road maintenance and potential upgrades to existing roads and water crossings will be discussed with the SFL holder for the project area. Responsibility for road and water crossing upgrades will be confirmed during further discussion with the forestry companies later in 2011.

Desktop Exercise Report For: Wanatango Falls Project #2124716

The Wanatango Falls hydroelectric project consists of a proposed 4.7 MW generator on the Frederick House River approximately 21 km south west of the town of Cochrane.

*Line Summary Wanatango Falls:*

The proposed transmission line runs south from the GS to the PC at Hwy 101, approximately 4 km east of the town of Hoyle. Several line location options are being proposed to avoid patent land. Most of the line detour options are fairly minor with the most significant one being Line Options 1 & 2. Line option 1 crosses the Frederick House River at an Ontario Power Generation water control structure and then follows an existing secondary road on the south side of the river. Line option 2 crosses the Frederick House River approximately 3 km north of the water control structure and requires approximately 3.1 km of new corridor south of the river before joining an existing secondary road.

The total line distance utilizing the main Frederick House line and Option 1 would be 41.3 km, of which 81% would utilize existing roads with the remainder (19%) requiring new line corridor. This line option crosses a total of 8.9 km of patent land (21% of the total line). Eighteen pre-existing water crossings have been identified along this line route with three new crossings

required on new line corridor sections. These are discussed in further detail in the Roads & Ground Truthing Summary. A single wetland was skirted by the proposed line.

Line Options 2, 3, 4, & 5 are located entirely on Crown land. No water or wetland crossings are required with these options.

An unknown raptors nest was identified approximately 550 m west of the PCC south of the town of Dagwai. Zones of high potential for cultural heritage values were noted at the generator site based on available Forest Management Plan operations maps. Given that the model used in the determination of these areas generally buffers most major rivers, further consultation with the Ontario Ministry of Tourism and Culture and/or a licensed archaeologist will be required to determine necessary steps for project progression.

#### *Roads and Ground Truthing Summary:*

The Wanatango Falls site is accessed either via a northwest or eastern road option. The east side of the Frederick House River is accessed via the Newmarket Concession Road 5 & 6 located 29 km south of the town of Cochrane, off highway 17. The Newmarket Concession Road is classified as a secondary road consisting of an adequate clay/aggregate base with drainage ditching in low-lying wet sections. The road does require maintenance and upgrades throughout, particularly where water crossings and drainage culverts have failed and portions of the roads have washed out (see Figure 1).



**Figure 1.** Various areas requiring repair along the Newmarket Concession Road.

Road access to the west side of the Frederick House River is possible via the Dunn Road located approximately 10 km west of the town of Cochrane off of hwy 11. The current condition of this road is good consisting of a solid base with no identified issues with current drainage and or water crossing structures. Furthermore, a private aggregate pit is located near the beginning of the Dunn Road providing a potential source of material for future road upgrades and project construction.



A permanent bridge structure spans the Frederick House River roughly 500m north of the proposed dam site (see Figure 2). The bridge spans 40m (131.2 ft) and has a width of 3.35m (11 ft.). The current condition of the bridge decking was good and the bridge is rated to a maximum weight capacity of 35 tons.



**Figure 2.** Bridge crossing the Frederick House River.

Access to the west side of the GS along an old logging road was investigated. This old road (~25+yrs) was severely overcome with competing vegetation and a beaver dam was found midway along the route. Currently this route cannot be traveled via an all terrain vehicle. This route would require significant upgrading including the installation/upgrade of two water crossings to facilitate access to the dam site during the construction phase.



**Figure 3.** Access route to the west side of the proposed generator site.



**Figure 4.** Imagery showing access to the East and West side of the generator

The proposed power line route along an existing tertiary road on the east side of the Frederick House River was assessed for current condition and required upgrades. The logging road was found to be in poor condition and required access via an all-terrain vehicle. All of the water crossings and drainage culverts were either missing or had failed. A significant amount of competing vegetation has overtaken several sections of the road. The old logging road ends roughly 950 m north of the Frederick House River. Fine textures soils (particularly clays) are found throughout this section of the access road. This road would require a significant amount of upgrading in terms of both new road aggregate and water crossing.



**Figure 5.** Proposed line route along old logging road on east side of the Frederick House River.

The remainder of the proposed power line route south of the Frederick House River was accessed via the Ice Chest Road off of hwy 101 approximately 4 km east of the town of Hoyle. The first 13 km of the Ice Chest Road are classified as a primary road with the remainder consisting of well maintained secondary roads (see Figure 5).



**Figure 6.** Primary and Secondary roads sections along the Ice Chest Road.

Line options 1 travels along an exiting road toward the OPG water control structure. A locked gate has been put in place approximately 1 km south of the dam to limit access to the site (see Figure 6).



**Figure 7.** Gate south of the OPG water control dam.

# Appendix

Revised Line Route Summary Statistics for Wanatango Falls:

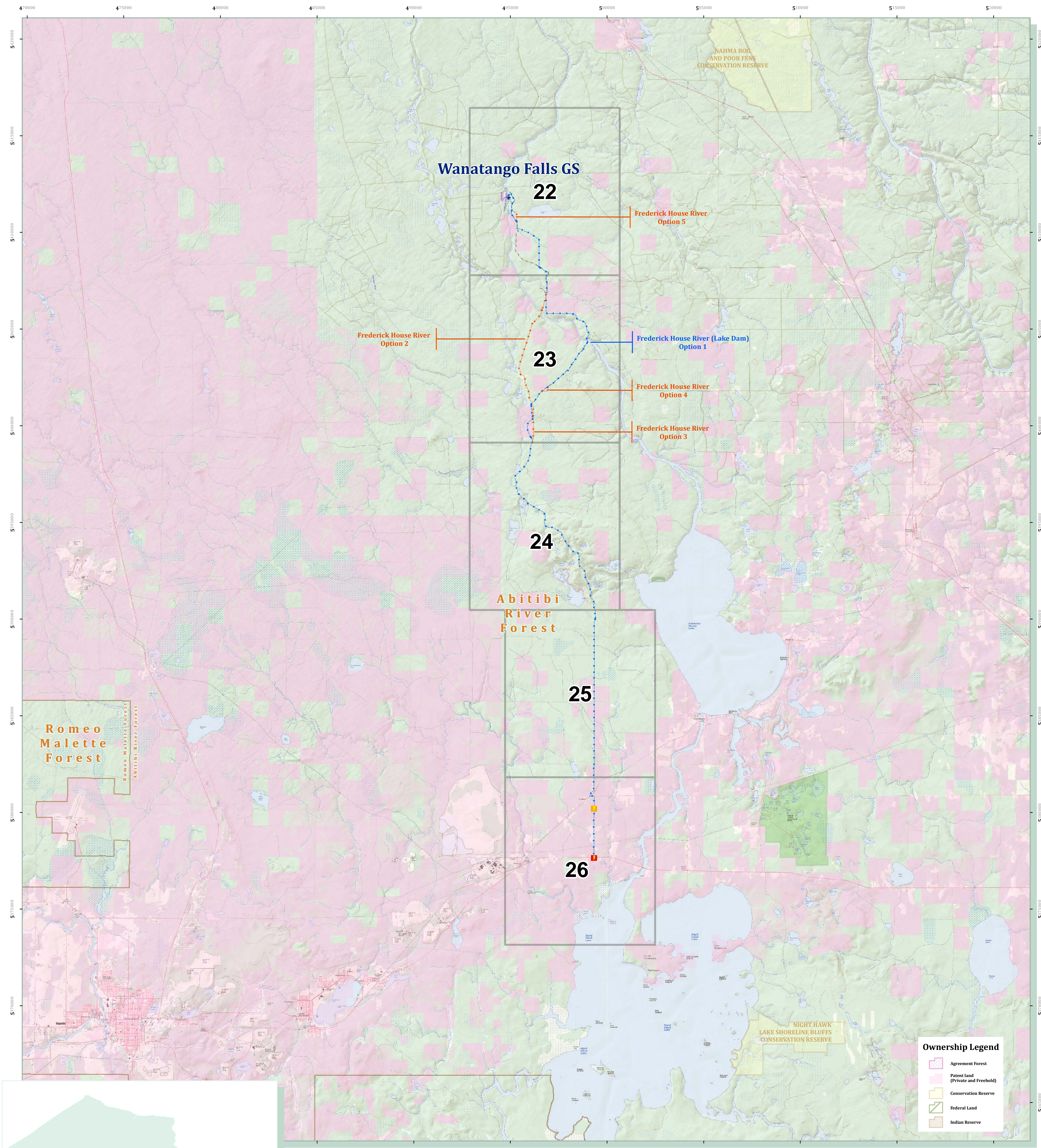
Site	Owner Type <sup>1</sup>	RoadType	Summary Statistics					
			Length <sup>2</sup> (m)	Water Crossing			Wetlands	
				Highway	Existing	New	Edge	Crossing
Frederick House (Lake Dam) Option 1	Crown	Existing Access	4,093	-	-	-	-	-
Frederick House (Lake Dam) Option 1	Crown	New Corridor	4,250	-	1	-	-	-
Frederick House (Lake Dam) Option 1	Private	Existing Access	320	-	-	-	-	-
Frederick House (Lake Dam) Option 4	Crown	New Corridor	526	-	-	-	-	-
Frederick House (Wanatango)	Crown	Existing Road	20,486	-	16	-	1	-
Frederick House (Wanatango)	Crown	New Corridor	3,540	-	-	3	-	-
Frederick House (Wanatango)	Private	Existing Road	9,034	-	1	-	-	-
Frederick House (Wanatango) Option 2	Crown	Existing Road	2,099	-	-	-	-	-
Frederick House (Wanatango) Option 2	Crown	New Corridor	4,077	-	-	1	-	-
Frederick House (Wanatango) Option 3	Crown	New Corridor	2,022	-	-	1	-	-
Frederick House (Wanatango) Option 5	Crown	New Corridor	670	-	-	-	-	-

Revised maps for the Wanatango Falls site are located at:

[http://www.kbmr.com/upload/documents/atlas\\_aug\\_19\\_11\\_tile-set-c-\(frederick-house-river\).pdf](http://www.kbmr.com/upload/documents/atlas_aug_19_11_tile-set-c-(frederick-house-river).pdf)

<sup>1</sup> The vast majority of the land identified as ‘crossing patent land’ is actually line routing which will be constructed inside an existing public road allowance and is adjacent to patent land

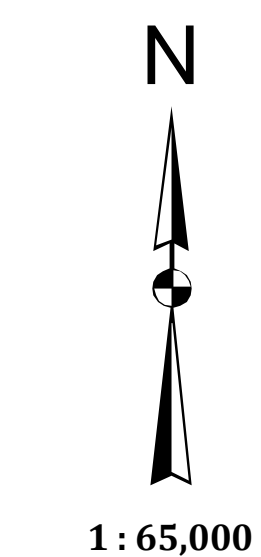
<sup>2</sup> For conservative purposes, the line length tabulated in this report includes all line constructed from the Generation Station (GS) to the Point of Connection (PC), which includes a section of line expansion, which will be owned, operated and maintained by Hydro One Networks Inc. This HONI grid expansion is defined as the line section between the Point of Common Coupling (PCC) and the Point of Connection (PC). This section is always built inside an existing public road allowance



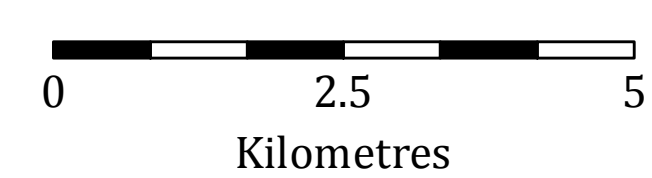
Reference data based on the Toporama 1:50,000 scale topographic reference product developed by Natural Resources Canada (NRCan) and the Land Information Ontario data warehouse, Ontario Ministry of Natural Resources.

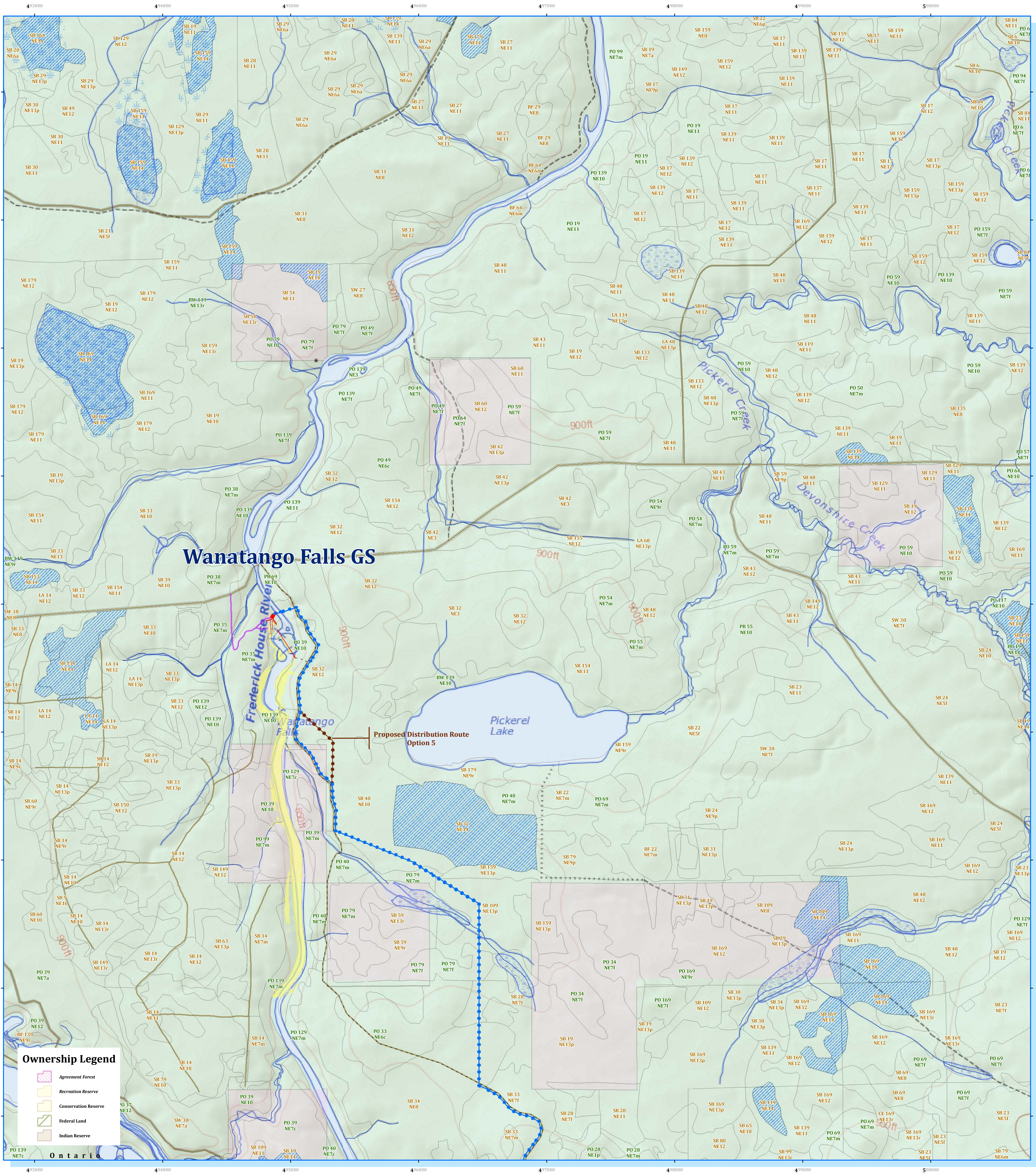
## Tile Set C (Frederick House River)

- |                                       |   |                            |
|---------------------------------------|---|----------------------------|
| <b>Dam Site</b>                       | <b>Proposed Powerline</b>   | <b>Primary Haul Road</b>   |
| <b>Point of Connection (PC)</b>       | <b>Proposed Alternate Powerline</b>                                     | <b>Secondary Haul Road</b> |
| <b>Point of Common Coupling (PCC)</b> | <b>Resource / Recreation Access Route (requires field verification)</b> | <b>Winter Haul Road</b>    |
| <b>Forest Management Unit</b>         | <b>New Access Road</b>  | <b>Tertiary Haul Road</b>  |
|                                       | <b>Potential New Access Road</b>  |                            |

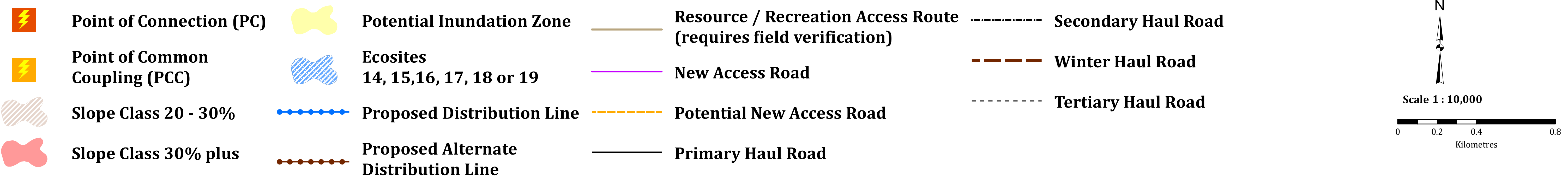


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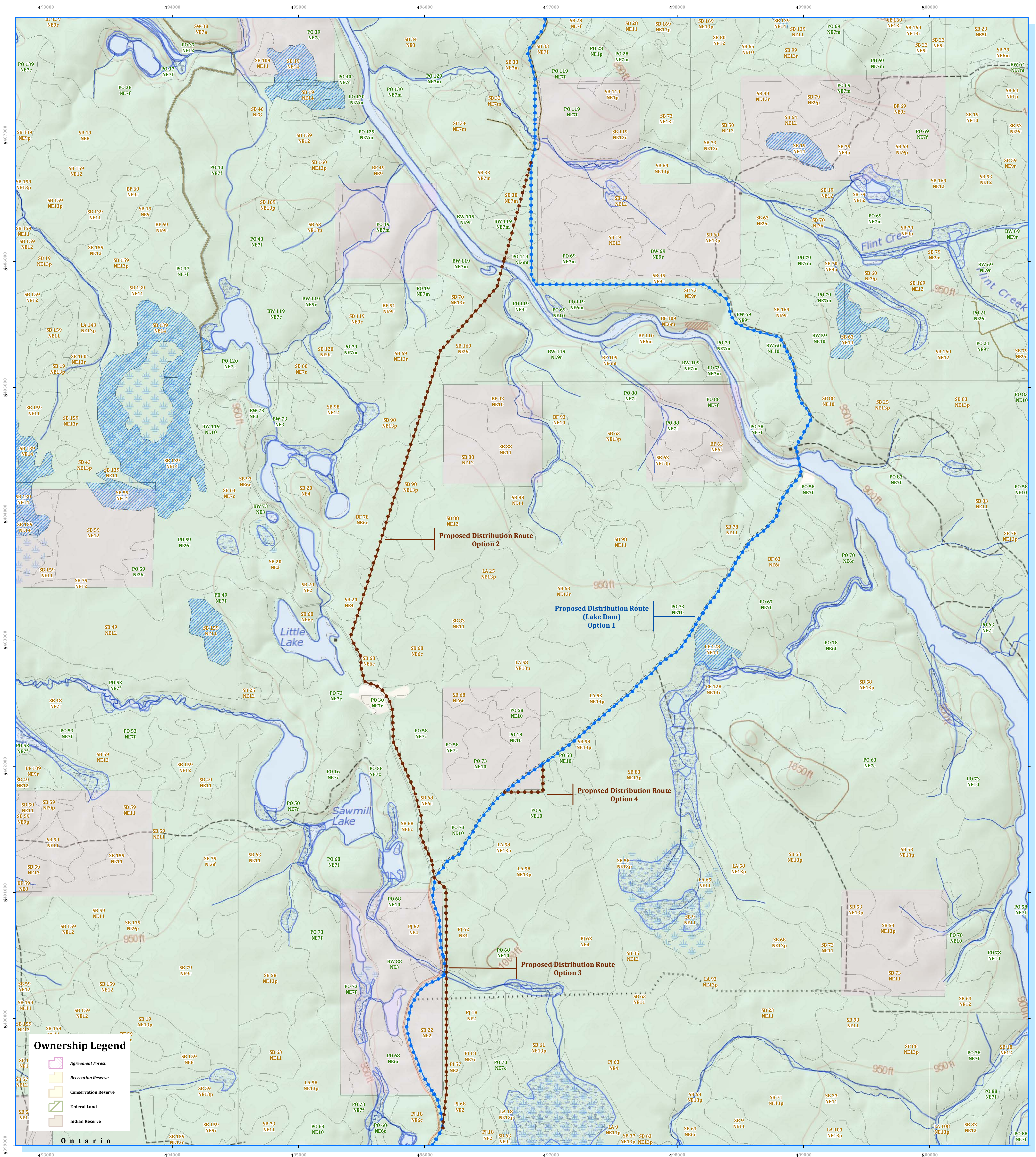




## Tile\_C\_22 Frederick House River (Wanatango)




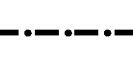

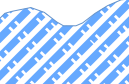





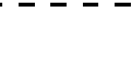

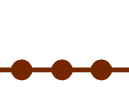
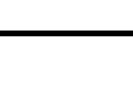


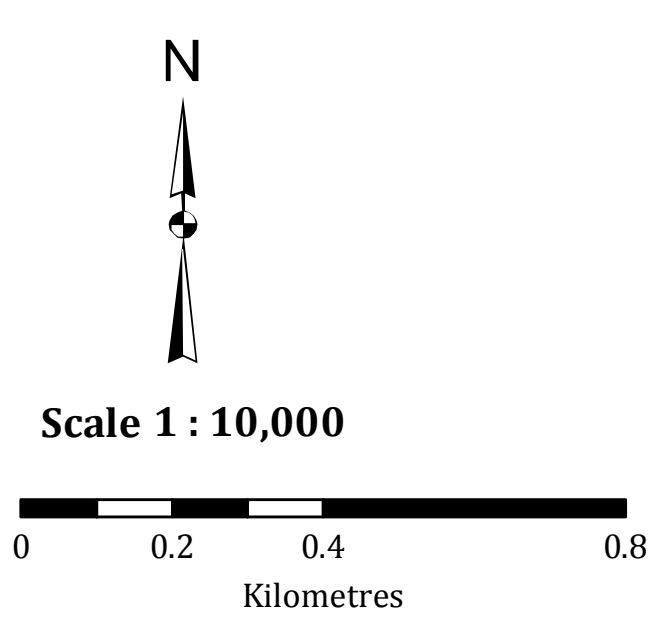


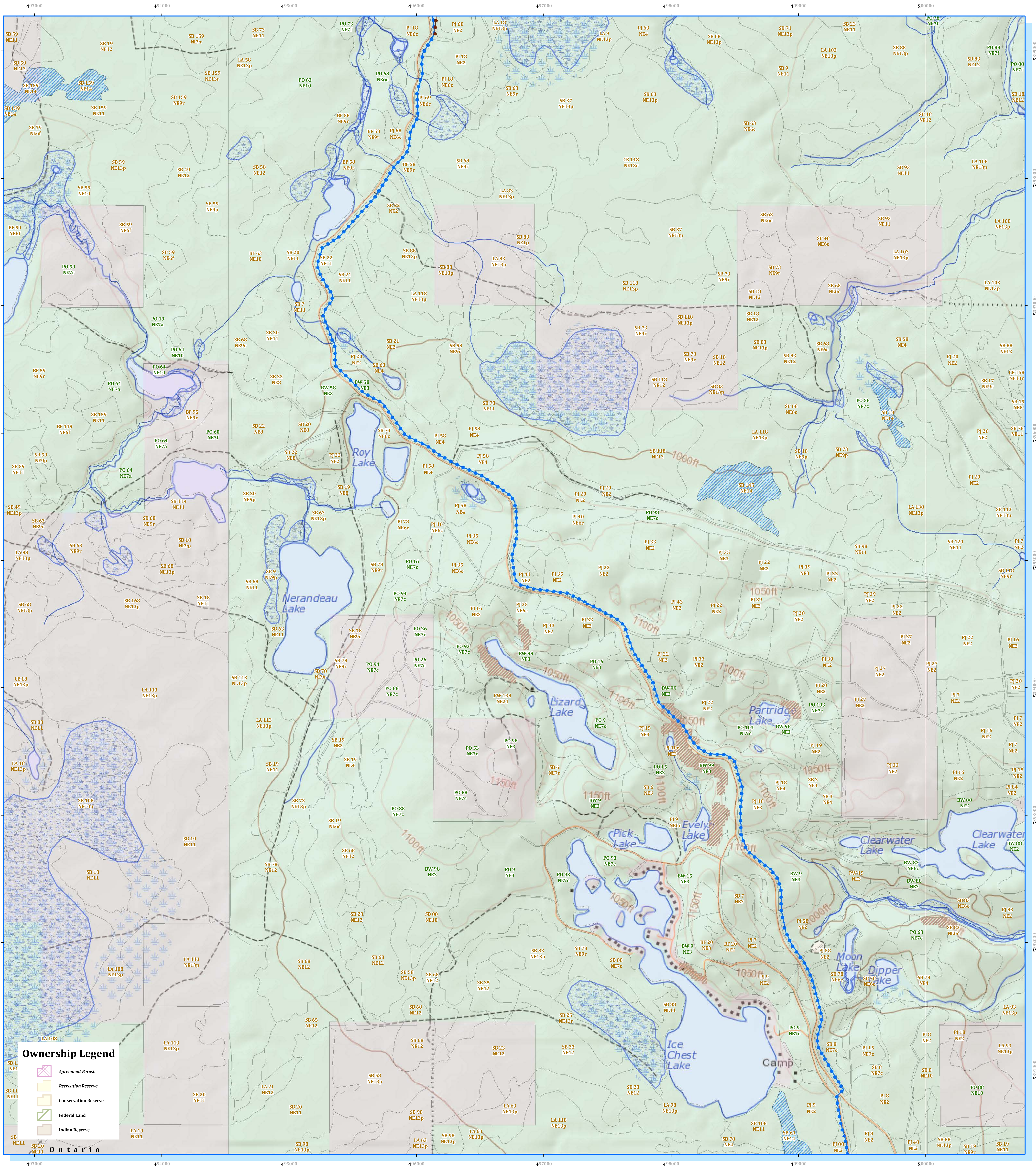


Reference data from the Land Information Ontario data warehouse, Ontario Ministry of Natural Resources. Toporama background from Natural Resources Canada (NRCan), Earth Sciences Sector, Mapping Information Branch, Centre for Topographic Information - Sherbrooke.

## Tile\_C\_23 Frederick House River (Wanatango)

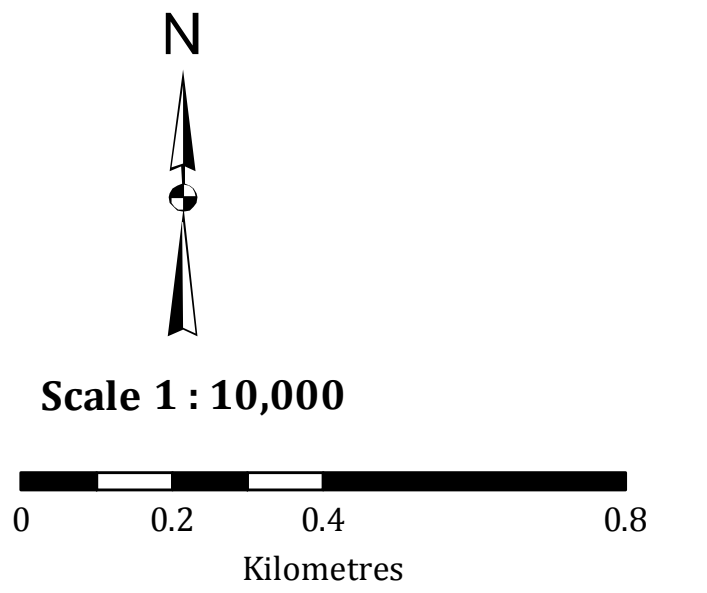
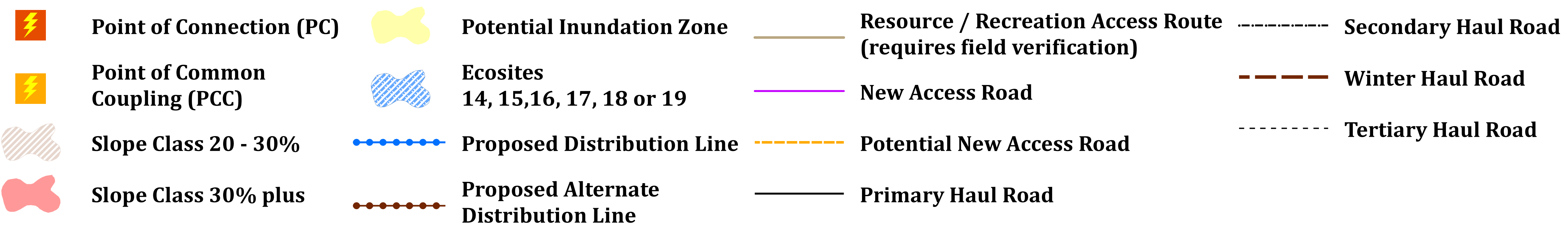
- |  |  |  |   |
|--|--|--|---|
|  Point of Connection (PC)       |  Potential Inundation Zone            |  Resource / Recreation Access Route (requires field verification) |  Secondary Haul Road |
|  Point of Common Coupling (PCC) |  Ecosites 14, 15, 16, 17, 18 or 19    |  New Access Road  |  Winter Haul Road    |
|  Slope Class 20 - 30%           |  Proposed Distribution Line           |  Potential New Access Road  |  Tertiary Haul Road  |
|  Slope Class 30% plus           |  Proposed Alternate Distribution Line |  Primary Haul Road  |   |

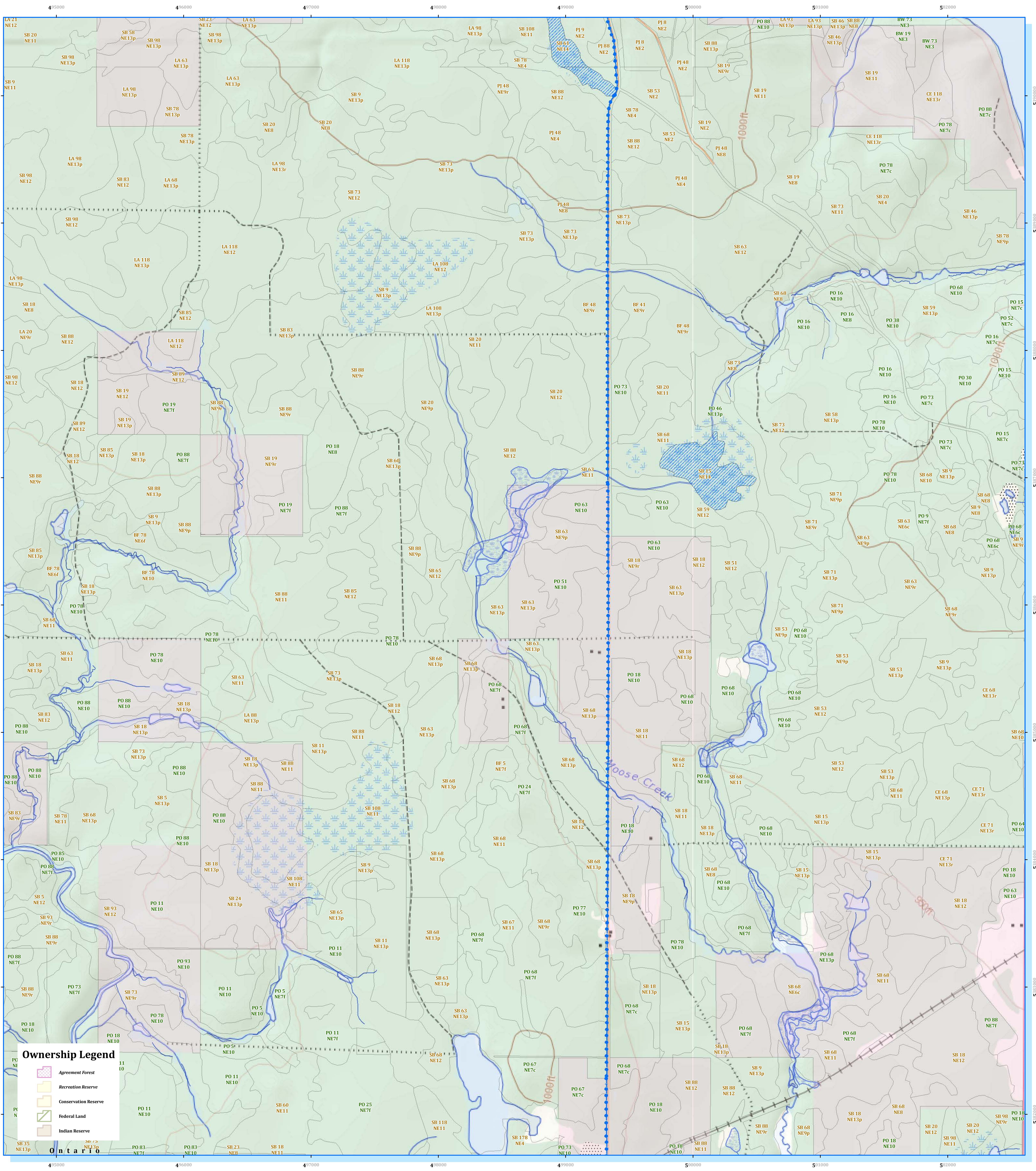




Reference data from the Land Information Ontario data warehouse, Ontario Ministry of Natural Resources. Toporama background from Natural Resources Canada (NRCan), Earth Sciences Sector, Mapping Information Branch, Centre for Topographic Information - Sherbrooke.

## Tile\_C\_24 Frederick House River (Wanatango)





Reference data from the Land Information Ontario data warehouse, Ontario Ministry of Natural Resources. Topographic background from Natural Resources Canada (NRCan), Earth Sciences Sector, Mapping Information Branch, Centre for Topographic Information - Sherbrooke.

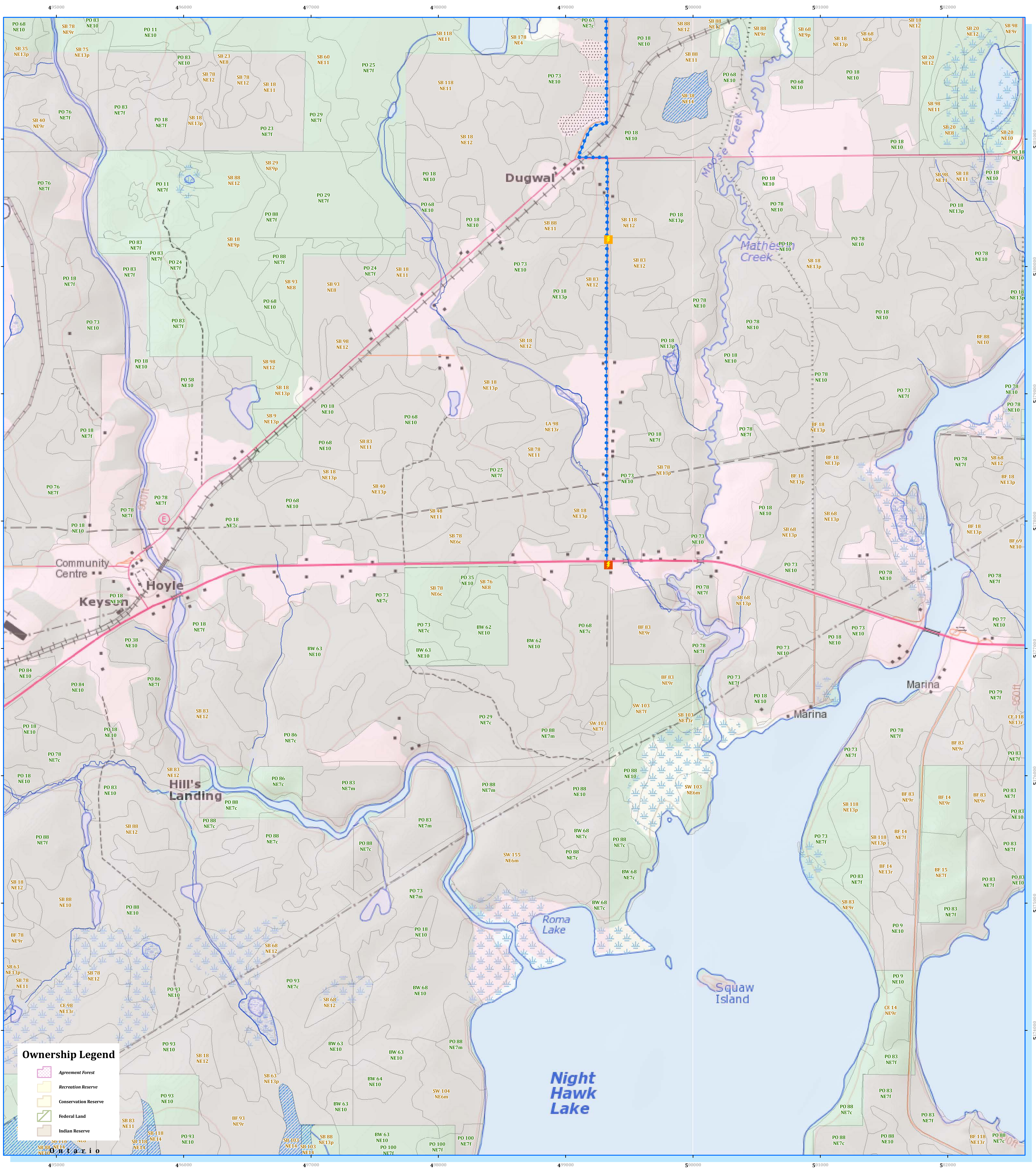
### Tile\_C\_25 Frederick House River (Wanatango)

Point of Connection (PC)	Potential Inundation Zone	Resource / Recreation Access Route (requires field verification)	Secondary Haul Road
Point of Common Coupling (PCC)	Ecosites 14, 15, 16, 17, 18 or 19	New Access Road	Winter Haul Road
Slope Class 20 - 30%	Proposed Distribution Line	Potential New Access Road	Tertiary Haul Road
Slope Class 30% plus	Proposed Alternate Distribution Line	Primary Haul Road	

N

Scale 1 : 10,000

0 0.2 0.4 0.8  
Kilometres



Reference data from the Land Information Ontario data warehouse, Ontario Ministry of Natural Resources. Toporama background from Natural Resources Canada (NRCan), Earth Sciences Sector, Mapping Information Branch, Centre for Topographic Information - Sherbrooke.

### Tile\_C\_26 Frederick House River (Wanatango)

