








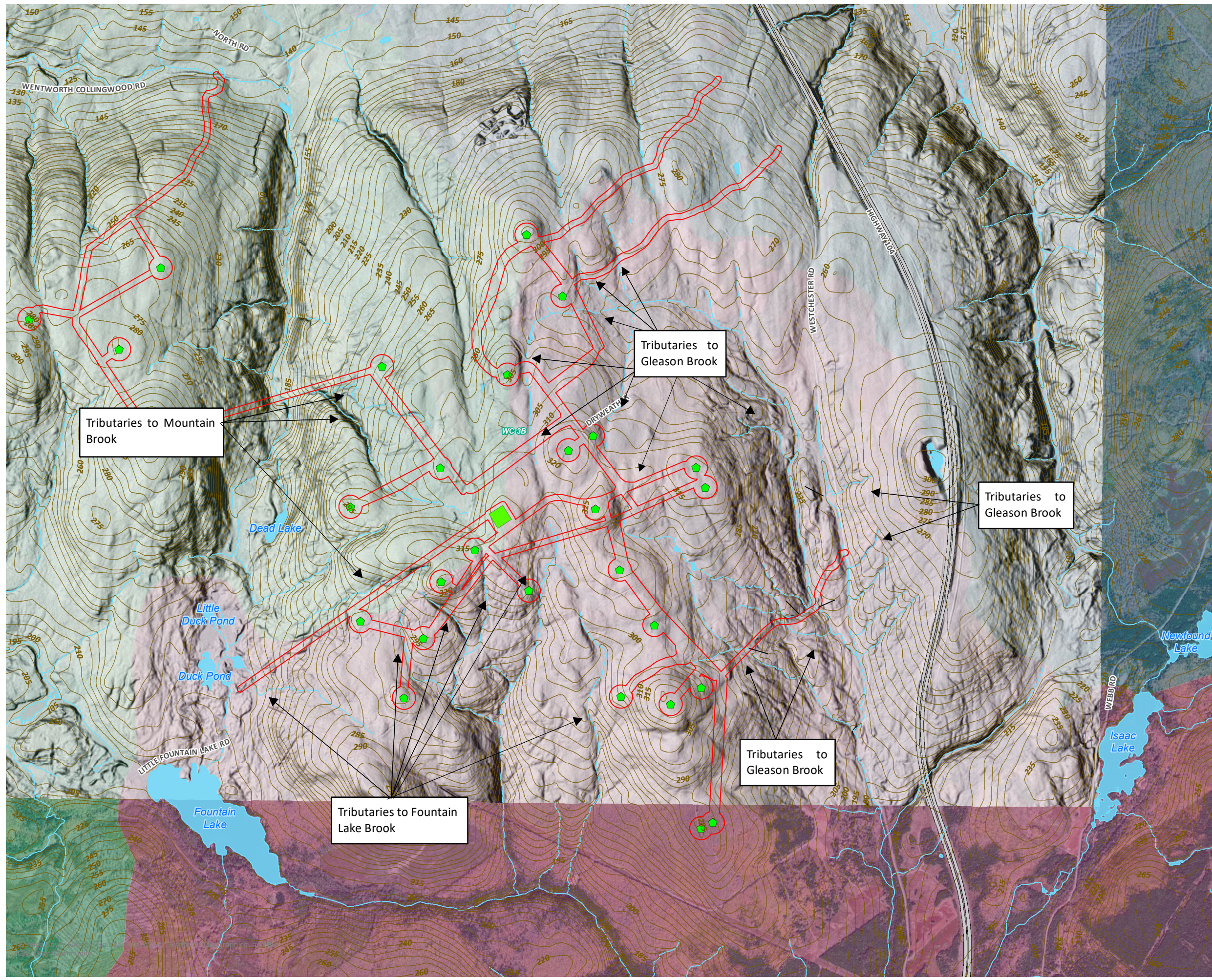


**LOCAL ASSESSMENT AREA,
SECONDARY WATERSHEDS AND
WATERCOURSES**

FIGURE 10

-  Proposed Turbine Location
-  Proposed Substation Location
-  Potential Development Area (PDA)
-  Contour
-  Watercourse
-  Waterbody
-  Portapique River Secondary Watershed
-  River Philip Secondary Watershed
-  Wallace River Secondary Watershed



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Based on a review of the AC CDC records, brook trout, American eel and Atlantic salmon from the Inner Bay of Fundy and the Gaspé-Southern Gulf of St. Lawrence populations were observed within 20 km from the centre of the PDA (AC CDC 2022). Further descriptions of these species are presented in the dedicated SAR/SoCC Section (**Section 3.1.7.3**).

3.1.4.1.2 Field Assessment Approach and Methodologies

Fish habitat suitability assessments were conducted for watercourses that have crossings within 30 m of the PDA to evaluate the potential for each watercourse to support fish and fish habitat. The assessments were completed from October 5 to 13, 2021 and July 26 to 29, 2022. Fish habitat suitability assessments included the collection of physical characteristics of each watercourse. This included an assessment conducted at four locations within each assessed watercourses: at 50 m upstream of the PDA, where the watercourse intersects the PDA, and downstream 50 and 100 m from the PDA crossing location. The following assessment criteria were recorded at each assessed location:

- **Dominant substrate type:** Dominant substrate types (e.g., gravel or silt) were described and documented. Substrate type is especially important for fish spawning habitat;
- **Stream channel characteristics:** Stream channel characteristics including average wet width, approximate bankfull width, average wetted depth and maximum wetted depth were recorded in the field;
- ***In-situ* water quality parameters:** Water quality parameters (i.e., temperature, pH, dissolved oxygen (DO), specific conductivity) were measured in the field with a calibrated YSI professional plus multi meter; and,
- In-stream cover and bank vegetation.

Representative photos and GPS points (using a handheld GPS unit and ArcGIS applications) were collected for each watercourse during the field assessments. The presence and/or potential presence of fish in each aquatic feature was evaluated based on visual confirmation of fish during field surveys, watercourse characterizations conducted during low and mid-stage flow conditions, and the desktop evaluation for fish species potentially present within the study area. Biophysical characteristics of each watercourse were evaluated for fish habitat potential based on the habitat requirements for brook trout, which were identified within several watercourses in the study area.

Suitable habitat characteristics, along with water quality to support aquatic species and direct observations of fish were the basis of considerations on the likelihood of watercourses to support fish habitat. Watercourses were classed as either ‘unlikely to provide direct fish habitat’, ‘may provide seasonally accessible fish habitat’, ‘likely provides direct fish habitat’ or ‘fish habitat’. An explanation was also provided where fish habitat is possible but unconfirmed. Ephemeral streams and watercourses with barriers to fish passage were typically given a low rating, whereas permanent watercourses with direct observations of fish were given a higher rating for presence of fish habitat. Permanent or intermittent

watercourses where fish were not observed that were deemed likely to provide fish habitat, and/or contained seasonally accessible fish habitat are also identified as such.

In terms of water quality, dissolved oxygen (DO) and pH were used as indicators of suitability for aquatic life. The Canadian Council of Ministers of the Environment (CCME) publishes guidelines for these parameters. Watercourses with pH and DO within the recommended range from the CCME for the protection of aquatic wildlife were considered to have a higher likelihood to provide suitable fish habitat. The CCME freshwater aquatic life (FWAL) range for pH is 5-9, and a minimum DO concentration of 6.5 mg/L is recommended for a watercourse to support cold water biota life stages (excluding early life stages) (CCME 1999).

Results

Throughout the field assessments, watercourses were identified and assessed within the study area. Six watercourse crossings were assessed in the River Phillip Secondary Watershed (IDN-1) and seven locations were identified in the Portapique River secondary watershed (IDJ-7) (**Figure 10**). Although no watercourses within the Wallace River secondary watershed were identified within the PDA, the watershed is included in the discussion.

Data collected on physical fish habitat characteristics of each watercourse assessment location are summarized in **Appendix E**. Where it was practical to do so, data was collected from watercourses within 30 m of the PDA at a minimum of four locations (e.g., 50 m upstream, within the PDA and 50 and 100 m downstream). In-situ water quality results recorded during the 2021-2022 watercourse assessments are summarized in **Appendix E** and discussed in the sections below.

Watercourses of the River Phillip Secondary Watershed (IDN-1)

Two brooks were identified within the River Phillip Secondary Watershed that receive input waters from tributaries and streams that cross the PDA: Mountain Brook and Sugarloaf Brook. Sugarloaf Brook is located southwest of the PDA within the River Phillip secondary watershed. Available mapping and wet areas mapping (WAM) modeling was accessed via the Nova Scotia Provincial Landscape Viewer (NSDNRR 2022). The model predicted one potential tributary to Sugarloaf Brook crossing within the PDA; however, no watercourses were observed within the PDA at the location where it was predicted to be. Although no watercourses within the PDA are known to directly contribute input to Sugarloaf Brook, some overland flow and seepage from the PDA may eventually drain towards Sugarloaf Brook. Mountain Brook crosses the PDA between the proposed locations of T20 and T21. Additionally, the PDA includes watercourse crossings with several tributaries to Mountain Brook, as summarized below in **Table 14**.

An assessment of fish habitat suitability for the watercourse locations within the River Phillip secondary watershed is also presented in **Table 14** and **Figure 11**, which includes colour coded rankings of fish habitat suitability. The following assessment took into consideration information obtained through the desktop screening assessment as well as *in situ* water quality measurements (presented in **Appendix E**) and the physical habitat characteristics recorded during assessment of watercourse crossing locations throughout 2021 and 2022.

In general, Mountain Brook and the tributaries located immediately upstream from the brook have suitable habitat for brook trout and salmonids based on observations of neutral to slightly acidic pH, and cobble substrate. Minnows were observed within both forks of WC16 and WC1a-2022, which both flow directly to Mountain Brook; as a result, fish presence is considered to be confirmed for both Mountain Brook and tributaries WC1a-2022 and WC16.

Watercourses of the Wallace River secondary watershed (IDN-3)

The West Branch of the Wallace River is located east of the PDA within the Wallace River secondary watershed. Available mapping and WAM modeling identified one potential tributary to the West Branch of the Wallace River with crossings within the PDA. During the field investigations, an ephemeral drainage channel associated with drainage from an existing access road was identified at the predicted location. Although no watercourses within the PDA are known to directly contribute input to the West Branch of the Wallace River, some overland flow and seepage from the PDA may eventually drain towards the West Branch of the Wallace River (**Figure 12**).

Watercourses of the Portapique River secondary watershed (IDJ-7)

Watercourses that intersect with the PDA within the Portapique River secondary watershed include Gleason Brook, tributaries to Gleason Brook, tributaries to Fountain Lake/Fountain Lake Brook and tributaries to Duck Pond. The majority of the watercourses flow in a south/south-easterly direction with the exception of the headwaters and a headwater tributary to Gleason Brook which flows to the north. Watercourses within the Portapique River secondary watershed are considered critical habitat for the Inner Bay of Fundy population of Atlantic salmon. This is discussed further in **Section 3.1.7.3**.

Gleason Brook is a permanent watercourse and generally flows south and parallel to Westchester Road in the vicinity of the PDA. Gleason brook is fed from numerous tributaries that have crossings with the PDA and flows to the Portapique River. Fountain Lake is located southwest of the PDA and is fed by tributaries to the north and inputs from Duck Pond and Little Duck Pond. Fountain Lake Brook is a major outlet for Fountain Lake and flows east. Additional input from tributaries further east of Fountain Lake enter Fountain Lake Brook downstream from the PDA before this Brook flows into Gleason Brook.

During the assessments, a network of ditches, ruts and ephemeral drainage was identified within the PDA in the vicinity of the mapped watershed divide between the Portapique River and River Philip Secondary Watershed boundary. Several discrepancies between map sources and conditions in the field were evident, due in part to the altered landscape. At the time of the 2022 assessments, water was at a low water stage and dry in some locations; however, based on field observations, the watercourses are expected to contribute tributary water into Duck Pond. With the exception of WC5 (**Figure 13**), these drainages were considered to not provide suitable fish habitat based on the presence of damaged culverts, soft substrates, inconsistent channel definition and periods of no flow. In July 2022, small minnows were observed in isolated ponds within this watercourse.

The assessment locations of watercourses within the Portapique River secondary watershed are shown on **Figure 13** and summarized in **Table 14**. An assessment of fish habitat

suitability for the watercourse locations in the Portapique Secondary Watershed is also presented in















Figure 13a-b: Watercourse and Fish Habitat Suitability for Assessed Watercourses within the Portapique River Secondary Watershed

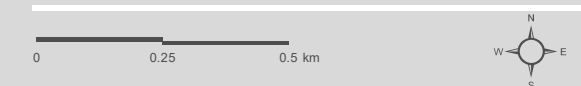
Table 14 and **Figure 13**, which includes colour coded rankings of fish habitat suitability. The following assessment took into consideration information obtained through the desktop screening assessment as well as *in-situ* water quality measurements (presented in **Appendix E**) and the physical habitat characteristics recorded during assessment of watercourse crossing locations throughout 2021 and 2022.

In general, Gleason Brook and the tributaries located immediately upstream from the brook have suitable habitat for brook trout and salmonids based on observations of neutral to slightly acidic pH, and cobble substrate. Minnows were observed within Gleason Brook and tributaries WC3 (to Gleason Brook) and WC5 (an intermittent tributary to Duck Pond). The minnows observed in Gleason Brook and WC3 were confirmed by a biologist (Dillon) to be brook trout.

WESTCHESTER WIND PROJECT

WATERCOURSE AND FISH HABITAT SUITABILITY FOR ASSESSED WATERCOURSES WITHIN THE RIVER PHILIP SECONDARY WATERSHED
FIGURE 11

-  Proposed Turbine Location
-  Proposed Substation Location
-  Potential Development Area (PDA)
-  Highway
-  Watercourse
-  Waterbody
-  Wetland (Province of Nova Scotia, 2021)
- Secondary Watershed (Local Assessment Area)**
 -  Portapique River Secondary Watershed
 -  River Philip Secondary Watershed
 -  Wallace River Secondary Watershed
- Fish Habitat**
 -  Confirmed Fish Habitat
 -  Likely Provides Fish Habitat
 -  May Provide Seasonal Fish Habitat
 -  Unlikely to Provide Suitable Fish Habitat



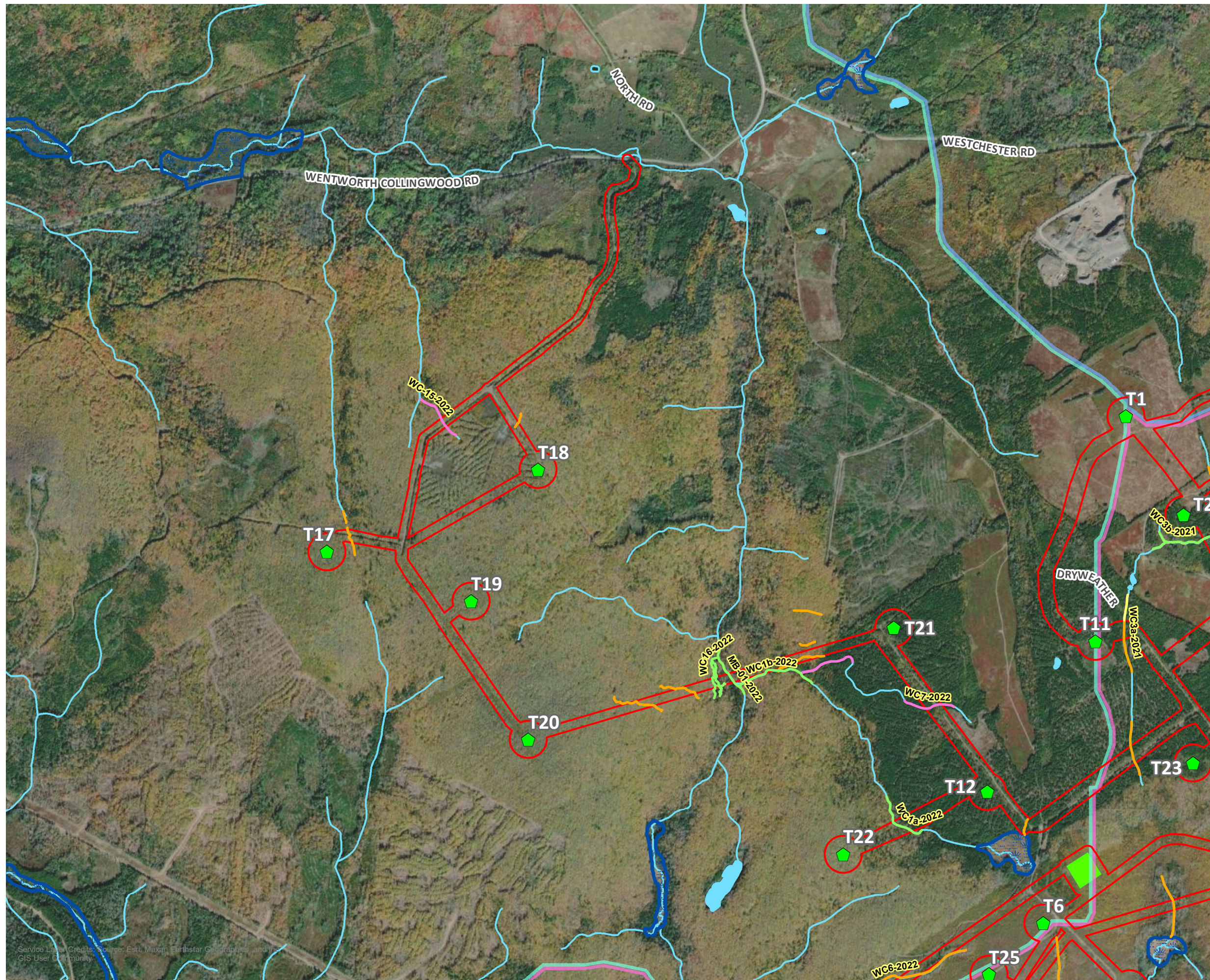
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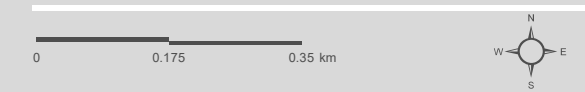
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WATERCOURSE AND FISH HABITAT SUITABILITY FOR ASSESSED WATERCOURSES WITHIN THE WALLACE RIVER SECONDARY WATERSHED
FIGURE 12

-  Proposed Turbine Location
-  Proposed Substation Location
-  Potential Development Area (PDA)
-  Highway
-  Watercourse
-  Waterbody
-  Wetland (Province of Nova Scotia, 2021)
- Secondary Watershed (Local Assessment Area)**
 -  Portapique River Secondary Watershed
 -  River Philip Secondary Watershed
 -  Wallace River Secondary Watershed
- Fish Habitat**
 -  Confirmed Fish Habitat
 -  Likely Provides Fish Habitat
 -  May Provide Seasonal Fish Habitat
 -  Unlikely to Provide Suitable Fish Habitat



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