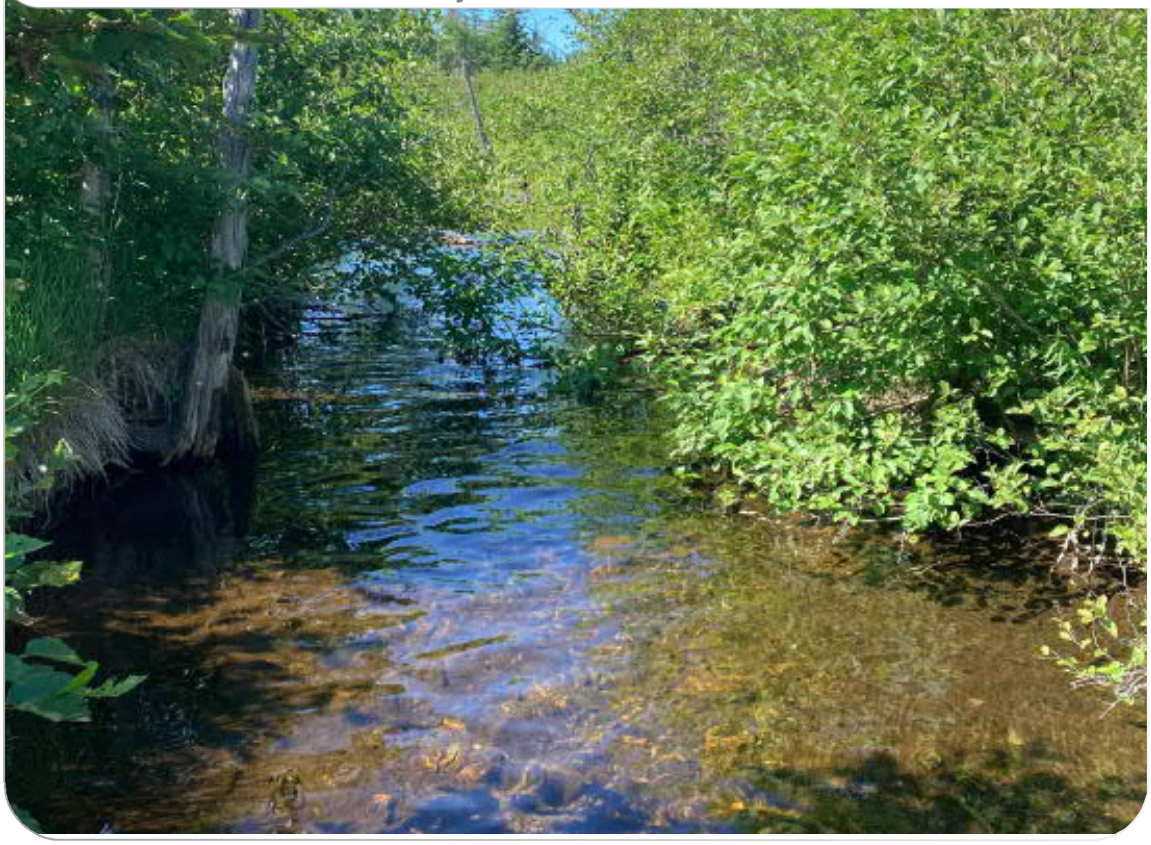
DILLON CONSULTING

NATURAL FORCES DEVELOPMENTS LP

Watercourse and Fish Habitat Appendix 2021-2022

Westchester Wind Project



December 2022 – 22-4065

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December 13, 2022

Natural Forces Developments LP
Westchester Wind Project
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Attention: Megan MacIsaac

Watercourse and Fish Habitat Appendix: 2021-2022 Assessment for the Westchester Wind Project

Dillon Consulting Limited (Dillon) is pleased to provide you with the final report for the watercourse and fish habitat assessment conducted as part of the environmental assessment for the Westchester Wind Project.

We trust the following meets your present needs. If you have any questions or comments, please contact the undersigned at (902)-450-4000 ext. 5052 at your convenience.

Sincerely,

DILLON CONSULTING LIMITED

Kelly Regan, M.Sc.
Project Manager, Associate

KSR:jb
Enclosure

Our file: 22-4065

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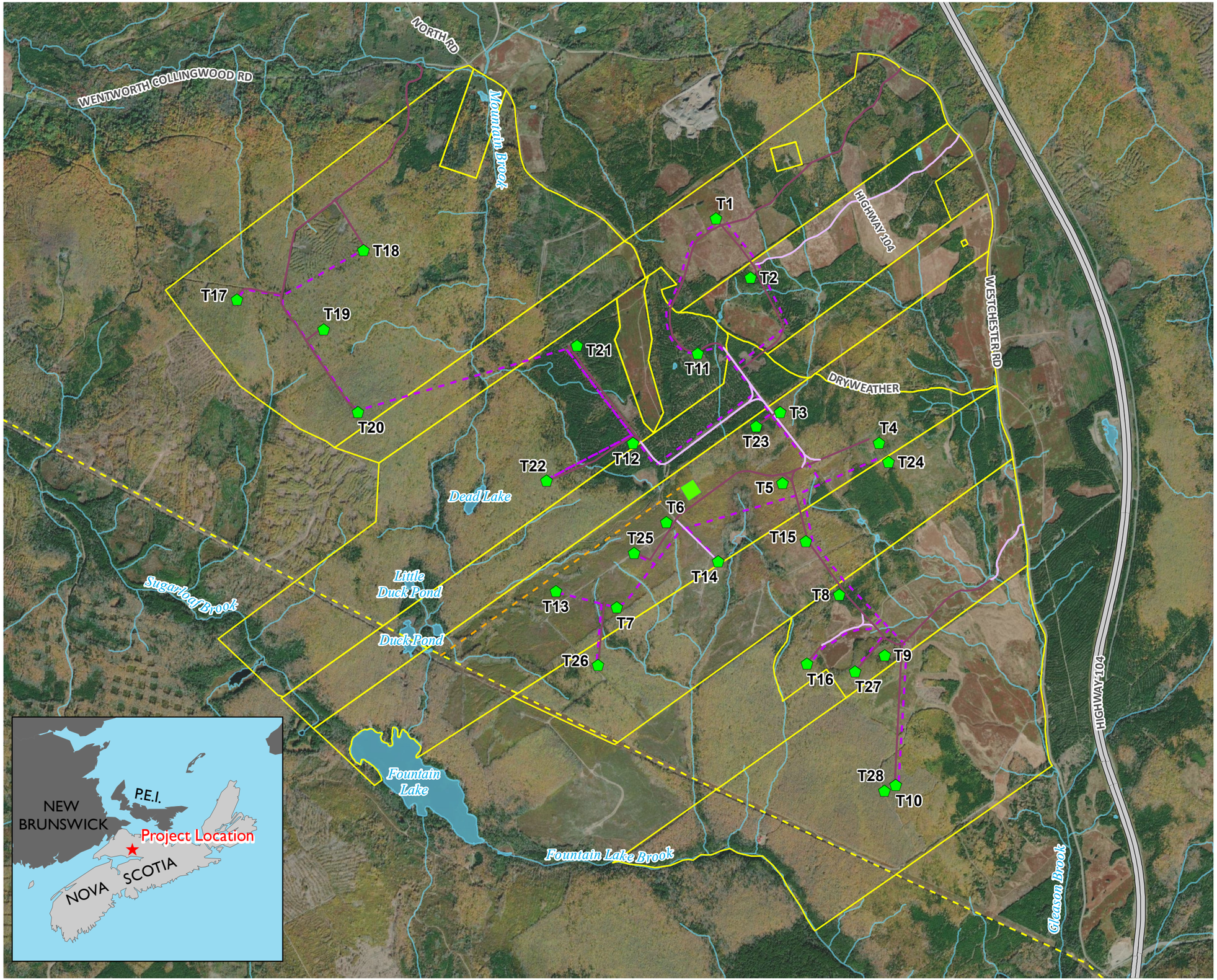
1.0 Introduction

Dillon Consulting (Dillon) was retained by Natural Forces Developments Limited Partnership (the Proponent) on behalf of the Westchester Wind Limited Partnership to complete natural environment surveys in support of the development of a Nova Scotia Environmental Assessment Registration Document (EARD) and associated Addendum for the Westchester Wind Project (the Project). The Project is being developed and will be owned and operated by the Westchester Wind Limited Partnership, a partnership between Natural Forces Developments Limited Partnership (referred to herein as the Proponent or Natural Forces) and Wskijnu'k Mtmo'taqnuow Agency Limited (the Agency), a corporate body wholly owned by the 13 Mi'kmaw bands in Nova Scotia. Natural Forces acts on behalf of the Westchester Wind Limited Partnership for many aspects of Project development.

The Project consists of up to 12 wind turbine generators (WTGs) capable of producing up to 50 MW of renewable energy that will be connected to the existing Nova Scotia Power transmission grid via an overhead transmission line, as well as a substation (Figure 1). The Project is located on a mixture of privately owned blueberry fields, previously forested land and undeveloped forested land in Cumberland County near the communities of Westchester Station, Rose, and Londonderry.

The proposed project is located in an area where watercourses and fish habitat are present. Watercourses and fish habitat are considered important features and valued environmental components (VECs) because they are valued in their relationship with other wildlife and wildlife habitat, including other biological and physical components addressed as VECs in this environmental assessment (EA). Natural environment surveys for the Project were conducted for VECs that were identified based on an understanding of the environmental features of the proposed project area, the nature of the Project, and the potential interactions that may occur between the proposed project and the environment/VECs.

Taking into consideration the objectives of the EARD, this report provides an effects assessment on watercourses and fish habitat, and includes: a brief overview of the proposed Project; a description of the scope and methodology used for the watercourse and fish habitat surveys; a summary of the survey results; and, an assessment of residual effects (including potential interactions and mitigation) of the proposed Project on watercourses and fish habitat.



Natural Forces

WESTCHESTER WIND PROJECT

PROJECT LOCATION AND SITE LAYOUT

FIGURE 1

- Proposed Turbine Location
- Proposed Substation Location
- Property Lines
- Roads to be Upgraded
- Proposed Access Roads
- Proposed Collector Network
- Proposed Interconnection Line
- Transmission Line
- Highway
- Watercourse
- Waterbody

SCALE 1:24,994

0 0.25 0.5 1 km

N W E S

MAP DRAWING INFORMATION:
DATA PROVIDED BY DILLON CONSULTING, GEONB, NATURAL FORCES

MAP CREATED BY: DU
MAP CHECKED BY: KB
MAP PROJECTION: NAD 1983 UTM ZONE 20N

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PROJECT: 21-1329
STATUS: DRAFT
DATE: 2022-12-09

FILE LOCATION: K:\2021\211329\Product\Internal\Westchester_Figures_2022\WC_ProjectLocation_2022.mxd

1.1 Background

The Project is situated within three secondary watersheds: The River Philip (1DN-1), the Wallace River (1DN-3) and the Portapique River (1DJ-7) secondary watersheds. The mapped watercourses that within the general vicinity include Mountain Brook and Fountain Lake Brook; and several unmapped watercourses are also present. Lakes in the general vicinity of the Project (Figure 1) include; Duck Pond, Little Duck Pond, Fountain Lake.

Fish and fish habitat are protected through the federal *Fisheries Act* as well as the Nova Scotia *Fisheries and Coastal Resources Act*. The federal *Fisheries Act* provides protection for all fish and fish habitat (DFO 2019). Section 35(1) of the *Fisheries Act* prohibits the harmful alteration, disruption or destruction (HADD) of fish habitat; Section 34.4(1) prohibits the death of fish by means other than fishing; and Section 36(3) prohibits the release of a deleterious substance into waters frequented by fish. Additionally, aquatic species at risk (SAR) are protected under both the federal *Species at Risk Act* (SARA) and Nova Scotia *Endangered Species Act* (NS ESA). Although the Canadian Council of Ministers of Environment's (CCME) Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (CWQG FWAL; CCME 1999) do not have force of law on their own, they provide environmental quality objectives for protecting fish from lethal and sub-lethal effects.

1.2 Purpose and Objectives of the Report

This report provides a summary of the watercourse and fish habitat assessments that were conducted as part of the biophysical surveys undertaken in support of the Project EA registration. The report includes:

- Brief description of the proposed project;
- Description of the scope and methods used for the surveys;
- The results of the desktop and field assessment; and
- An assessment of residual effects (including potential interactions and mitigation) of the proposed Project on watercourse and fish habitat.

2.0 Project Description

The following is a high-level summary of the Project. Please refer to the Westchester Wind Project Environmental Assessment Registration Document Addendum (the Addendum) dated December 2022 for further information.

The Project is located on Westchester Mountain in Cumberland County, Nova Scotia. The Project is proposed to have an installed capacity of up to 50 MW, amounting to up to 12 wind turbine generators and associated infrastructure, including an electrical substation, collector lines, and overhead transmission line (Figure 1).

The Project will be located predominantly on privately-owned lands used for blueberry farming, forestry, maple groves, and recreation (i.e., snowmobile trails). An easement will be required over a 300 m stretch of Crown land along an existing access road. The forestry activities include previously forested land at varying stages of regeneration, as well as undeveloped forested lands owned by forestry companies. In addition, the Project site met crucial factors that determined suitability, which included features such as the strength and consistency of the wind resources and its proximity to existing electrical and civil infrastructure. The Project site was selected due to the existing mixed anthropogenic land uses and historical anthropogenic impacts in these areas, in order to minimize impacts to undeveloped lands to the extent feasible.

The purpose of the Project is to contribute to Nova Scotia achieving their renewable electricity targets through the generation of clean and renewable energy. Not only will this have environmental benefits, but will also reduce Nova Scotia's reliance on imported energy sources through the development of a localized renewable energy generation (*Renewable Electricity Regulations* 2021).

3.0 Scope of Work

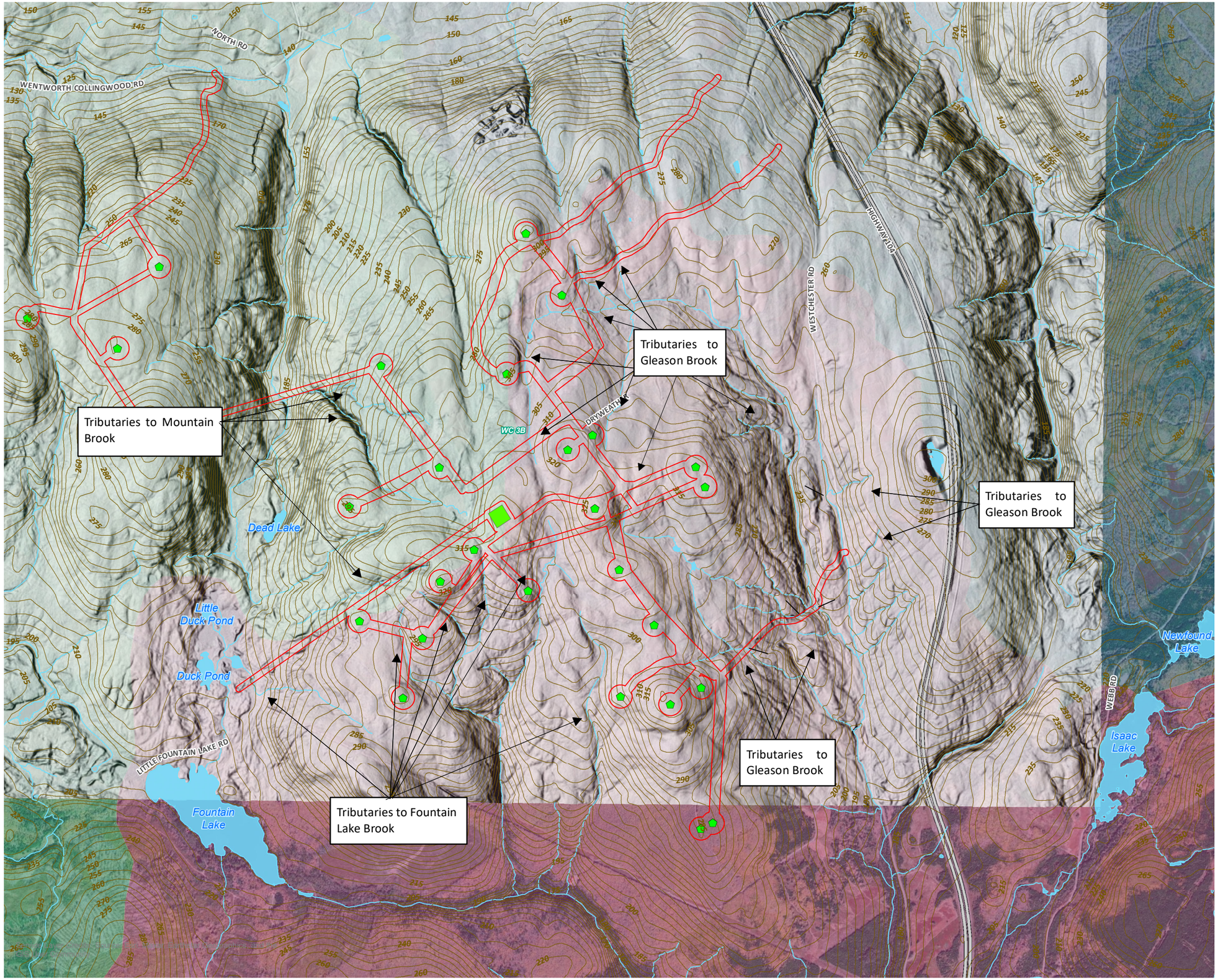
The scope of work for the watercourse and fish habitat assessments is based on the recommended approach outlined in the Guide to Preparing an EA Registration Document for Wind Power Projects in Nova Scotia (NSECC 2021). Additionally, the information obtained from the watercourse and fish habitat surveys will be available for inclusion in a NSECC Watercourse Alteration Permit, a DFO Request for Review and, if required, a *Fisheries Act* Authorization. For the purpose of this assessment, watercourses are defined as, "*the bed and shore of every river, stream, lake, creek, pond, spring, lagoon, or other natural body of water, whether it contains water or not, and the water therein, within the jurisdiction of the province*" (Nova Scotia Environmental Assessment Branch (NSEAB) 2021).

The scope of work for the fish and fish habitat surveys included:

- An initial desktop assessment of watercourses and waterbodies within the secondary watersheds of the Potential Development Area (PDA);
- A desktop assessment of fish species and risk (SAR) and species of conservation concern (SoCC) with the potential to occur within the PDA; and
- Field surveys of watercourses within the PDA to collect information on water quality and their potential for aquatic habitat.

3.1 Spatial Boundaries

For the purpose of the watercourse and fish habitat surveys conducted as part of the biophysical baseline assessment for the Project, the spatial boundaries include the Potential Development Area (PDA), the Local Assessment Area (LAA), and the Study Area. For the watercourse and fish habitat VEC, the LAA includes watercourses that have the potential for direct and indirect impacts (i.e., watercourses with crossing within 30 m of the PDA) and the watercourses downstream of those crossings. A buffer of 30 m was selected to include watercourses that are adjacent to the PDA and could be impacted by Project activities within their riparian zone. The extent of each spatial boundary and purpose for the assessment of fish and fish habitat is summarized in Table 1 and shown on Figure 2).



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WESTCHESTER WIND PROJECT

LOCAL ASSESSMENT AREA, SECONDARY WATERSHEDS AND WATERCOURSES

FIGURE 2

- 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

0 0.25 0.5 1 km

N W E S

SCALE 1:24,000

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Table 1: Spatial Boundaries for the Assessment of Watercourses and Fish Habitat

Assessment Area	Definition	Purpose of Boundary
Potential Development Area	Area encompasses the Project footprint and a buffer of 15 m on either side of shoulders of the roadways (either existing or new) and collector lines and transmission line, a 75 m buffer around the base of each turbine location, and a 25 m buffer around the substation.	Represents the extent of anticipated areas that could undergo physical disturbance associated with the Project. This area encompasses all of the proposed 28 turbines locations and their associated infrastructure. The Project would consist of up to 12 of those locations and their associated infrastructure.
Study Area	Watercourse crossings within 30 m of the PDA were assessed in the field from 50 m upstream to 100 m downstream from the PDA.	The area covered on foot during surveys. Observations in the study area are applied to understand potential effects of the Project on the LAA
Local Assessment Area	Watercourse crossings within 30 m of the PDA and their associated tributaries or distributaries.	The maximum area where Project-specific environmental interactions can be predicted and measured with a reasonable degree of accuracy and confidence (i.e. the zone of influence of the Project phases on each VEC).

4.0 Methods

4.1 Desktop Assessment

4.1.1 Desktop Watercourse Assessment

A desktop assessment of watercourses and potential aquatic habitat was carried out prior to the onset of the field survey. While reviewing the resources for the wetland and watercourse surveys the information was also reviewed to evaluate the potential for aquatic species of conservation concern (SoCC) and/or aquatic species at risk (SAR) within the general area of the proposed project and to assist in scoping the field programs. The following sources were reviewed:

- Site-specific Atlantic Canada Conservation Data Centre reports (AC CDC 2021, AC CDC 2022);
- The Committee on the Status of Endangered Wildlife in Canada (COSEWIC);
- Fisheries and Oceans Canada (DFO) Species at Risk Mapping;
- Nova Scotia Natural Resources and Renewables Provincial Landscape Viewer (NSDNRR 2022); and
- Google Earth satellite imagery.

4.1.2 Fish Priority Species Assessment

For the watercourse and fish habitat assessment, as with the other biophysical surveys conducted for the Project environmental assessment (EA), the following definitions of SAR and SoCC apply:

- Species at Risk (SAR): A species that is determined to be Endangered, Threatened, or Vulnerable/Special Concern by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), Nova Scotia Endangered Species Act (NSESA), or the federal Species at Risk Act (SARA); and
- Species of Conservation Concern (SoCC): those species that are not SAR but are identified as regionally vulnerable or imperilled by the Atlantic Canada Conservation Data Centre (AC CDC) (i.e., those species with AC CDC S-ranks of S1: Critically imperiled in province; S2: Imperiled in province; and S3: Vulnerable in province of Nova Scotia.

Site-specific AC CDC reports were generated on May 7, 2021 and September 20, 2022, and included historical observations of SAR and SoCC reported within 5 km of the PDA. Due to the size of the PDA, a search of the AC CDC database was requested to include results from a radius of 10 km from the PDA Centre in 2022. For information purposes, the AC CDC report included SAR and SoCC observations from 100 km from the PDA centre, therefore it is important to note that some of fish species observed further from the PDA may not have suitable habitat present within the LAA.

An evaluation of the potential habitat for SAR and SoCC fish species included an assessment of the AC CDC screening and the results of the field surveys conducted throughout 2021 and 2022. The results of the fish priority species assessment include a description of suitable habitat for SAR and SoCC fish with the potential to occur within the LAA, as well as a summary identified potential habitat within watercourses of the PDA for those species.

4.2 Field Assessments

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 provide 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 measured 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 and bank vegetation.

Representative photos and GPS points (using a handheld GPS unit and Arc Geographic Information Systems (ArcGIS) applications) were collected for each watercourse during the field assessments.

The presence and/or the potential presence of fish in each aquatic feature has been 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. The 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 'does not provide direct fish habitat', 'may provide seasonally accessible fish habitat', 'likely provides direct fish habitat', or 'fish observed'. An explanation was 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).

5.0 Results

5.1 Desktop Assessment

5.1.1 Desktop Watercourse Assessment

Surface water flow across the PDA is expected to be guided by topography. The PDA is situated on ridges that are broken up by steep valleys and surface water flow is directed towards watercourses which are contained within their watersheds by the surrounding topography. Based on topographical mapping, the elevation within the PDA ranges from 130 m above sea level in the vicinity of Mountain Brook in the northwestern portion of the PDA to maximum peaks approximately 330 m above sea level towards the center of the PDA.

The PDA is located within the Economy (1DJ) and Phillip/Wallace (1DN) primary watersheds. The LAA for the physical environment includes the three secondary watersheds that the PDA is located within: The River Philip (1DN-1), the Wallace River (1DN-3) and the Portapique River (1DJ-7) secondary watersheds. The largest portion of the PDA falls within the Economy watershed, specifically, the Portapique River secondary watershed (IDJ-7) which flows south towards Minas Basin. Some areas of the PDA to the west and north are located within the River Philip (1DN-1) and Wallace River (1DN-3) secondary watersheds, respectively, which both flow north and eventually to the Northumberland Strait.

The following watercourses and water bodies located the LAA and shown on Figure 2 by their secondary watersheds:

- River Phillip Secondary Watershed (1DN-1):
  - Mountain Brook
  - Tributaries to Mountain Brook
- Wallace River Secondary Watershed (1DN-3):
  - Tributaries to West Branch Wallace River
- Portapique River Secondary Watershed (IDJ-7):
  - Duck Pond
  - Little Duck Pond
  - Tributaries to Fountain Lake
  - Fountain Lake
  - Tributaries to Fountain Lake Brook
  - Fountain Lake Brook
  - Gleason Brook
  - Tributaries to Gleason Brook

5.1.2 Fish Priority Species Assessment

Based on a review of the AC CDC records, brook trout, American eel and Atlantic salmon from the Inner Bay of Fundy and the Gaspe-Southern Gulf of St. Lawrence populations were observed within 20 km from the centre of the PDA (AC CDC 2022).

No fish were reported within 10 km from the PDA centre in the ACCDC (2021) report; however, based on the results of the later ACCDC (2022) report (which superseded the report received in May 2021), brook trout, American eel and Atlantic salmon from the Inner Bay of Fundy and the Gaspe-Southern Gulf of St. Lawrence populations were reported with historical observations between 10 and 20 km of the centre of the PDA (ACCDC 2022). Table 2 summarizes the historical observations of fish SAR and SOCC within 20 km of the PDA reported by the ACCDC.

Table 2: Fish SAR and SoCC within 20 km from the PDA Centre (AC CDC 2022)

Common Name	Scientific Name	S-rank and Conservation Status	No. of Historical Observations	Distance from PDA Centre (km)
Brook Trout	*Salvelinus fontinalis*	AC CDC: S3	65	15.6 ± 0.0
Atlantic Salmon - Inner Bay of Fundy population	*Salmo salar pop. 1*	AC CDC: S1 SARA: E COSEWIC: E	60	13.5 ± 1.0
Atlantic Salmon - Gaspe - Southern Gulf of St. Lawrence population	*Salmo salar pop. 12*	AC CDC: S1 COSEWIC: SC	31	16.3 ± 50.0
American Eel	*Anguilla rostrata*	AC CDC: S3N COSEWIC: T	73	12.2 ± 1.0

Notes:
S-rank refers to the Sub-national (Provincial) rank provided by the ACCDC and includes the following: S1 Critically Imperiled, S2 Imperiled, S3 Vulnerable, S4 Apparently Secure, S5 Secure and SU Unrankable. Rankings are frequently paired with the following breeding status qualifiers: B Breeding, N Non-breeding and M Migrant
Conservation Status Categories: E Endangered, T Threatened, V Vulnerable, SC Special Concern

Based on a review of the AC CDC records, brook trout, American eel and Atlantic salmon from the Inner Bay of Fundy and the Gaspe-Southern Gulf of St. Lawrence populations were observed within 20 km from the centre of the PDA (AC CDC 2022).

Brook trout are considered by AC CDC to be vulnerable in Nova Scotia (Ranked S3), but are not currently protected under SARA or NSESA. Brook trout are freshwater fish with a preference for cool, freshwater environments but spend parts of their life cycle in a variety of habitats from small headwater streams to large lakes (Nova Scotia Department of Agriculture and Fisheries [NSDFA] 2005).

American eel is a species of conservation concern that is presently listed as Threatened by COSEWIC and their non-breeding population is considered by AC CDC to be vulnerable in Nova Scotia (Ranked S3N). American eel are habitat generalists that can be found in freshwater, estuaries and coastal marine waters that are accessible to the Atlantic Ocean (COSEWIC 2012). American eel are catadromous species spend most of their life cycle in freshwater, returning to the Sargasso Sea to spawn (COSEWIC 2012).

Atlantic salmon are anadromous species with adults migrating from the ocean to spawn in freshwater rivers, generally in the same river where they were born. Salmon rivers or streams are generally large, clear, and cool, with riverbeds composed of gravel, cobble and boulder substrates (DFO 2010). Atlantic salmon are divided into unique populations based on genetic distinction and range. The Gaspe-Southern Gulf of St. Lawrence population of Atlantic salmon has been assessed as Special Concern by COSEWIC (2010) and is considered imperiled provincially by the AC CDC (ranked S1); this population is not currently protected under SARA or NSESA. The Inner Bay of Fundy population of both Atlantic salmon populations are considered imperiled provincially by the AC CDC (ranked S1). The Gaspe-Southern Gulf of St. Lawrence population was observed within the Wallace River (AC CDC 2022). Though part of the PDA does cross through the Wallace River secondary watershed, the West Branch Wallace River connection to the Wallace River is located 18 km from the PDA and it is not anticipated to be affected by the Project.

The Inner Bay of Fundy population of Atlantic salmon have been identified throughout the Portapique River watershed (DFO 2022), which has been identified as critical habitat for this species. DFO records provided through the AC CDC database (AC CDC 2022) indicated that this population of Atlantic salmon has been identified in the Bass River, the Portapique River and Great Village River (Amiro 1998). Inner Bay of Fundy Atlantic salmon are not expected to inhabit watercourses evaluated within the study area based on the absence of suitable aquatic habitat with the exception of Gleason Brook, where access to the site is provided by an existing access road and bridge. No instream work is anticipated within the Gleason Brook and instream work within tributaries of Gleason brook is not anticipated within 100 m upstream of suitable Atlantic salmon habitat.

The effects of past development activities (e.g. layout of access roads and installation of the culverts) may presently be limiting the productivity of fish and fish habitat.

5.2 Field Assessments

Throughout the field assessments, watercourses were identified and assessed within the study area and their locations are shown on Figure 2. 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). Although no watercourses within the Wallace River secondary watershed were identified within the PDA, the watershed is included in the discussion below.

Data collected on physical fish habitat characteristics of each watercourse assessment location are summarized in Appendix A. 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 A and discussed in the sections below.

5.2.1 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 Philip 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 other tributaries to Mountain Brook, as summarized below in Table 3.

Table 3: PDA Crossings of Watercourses within the River Phillip Secondary Watershed

Water course ID	Description	Proposed Potential Alterations
MB-01	Mountain Brook: small permanent watercourse.	None – The proposed collector line will span Mountain Brook.
WC1a-2022	Small permanent tributary flowing north. Flow into a larger tributary (WC1b-2022) before flow enters Mountain Brook.	A new proposed access road and adjacent collector line to T22.
WC1b-2022	Small permanent tributary flowing east to west and parallel to the PDA. Tributary receives flow from WC-1a-2022 and WC-07-2022 and flows directly into Mountain Brook.	None – This watercourse runs parallel to existing access road to be upgraded.

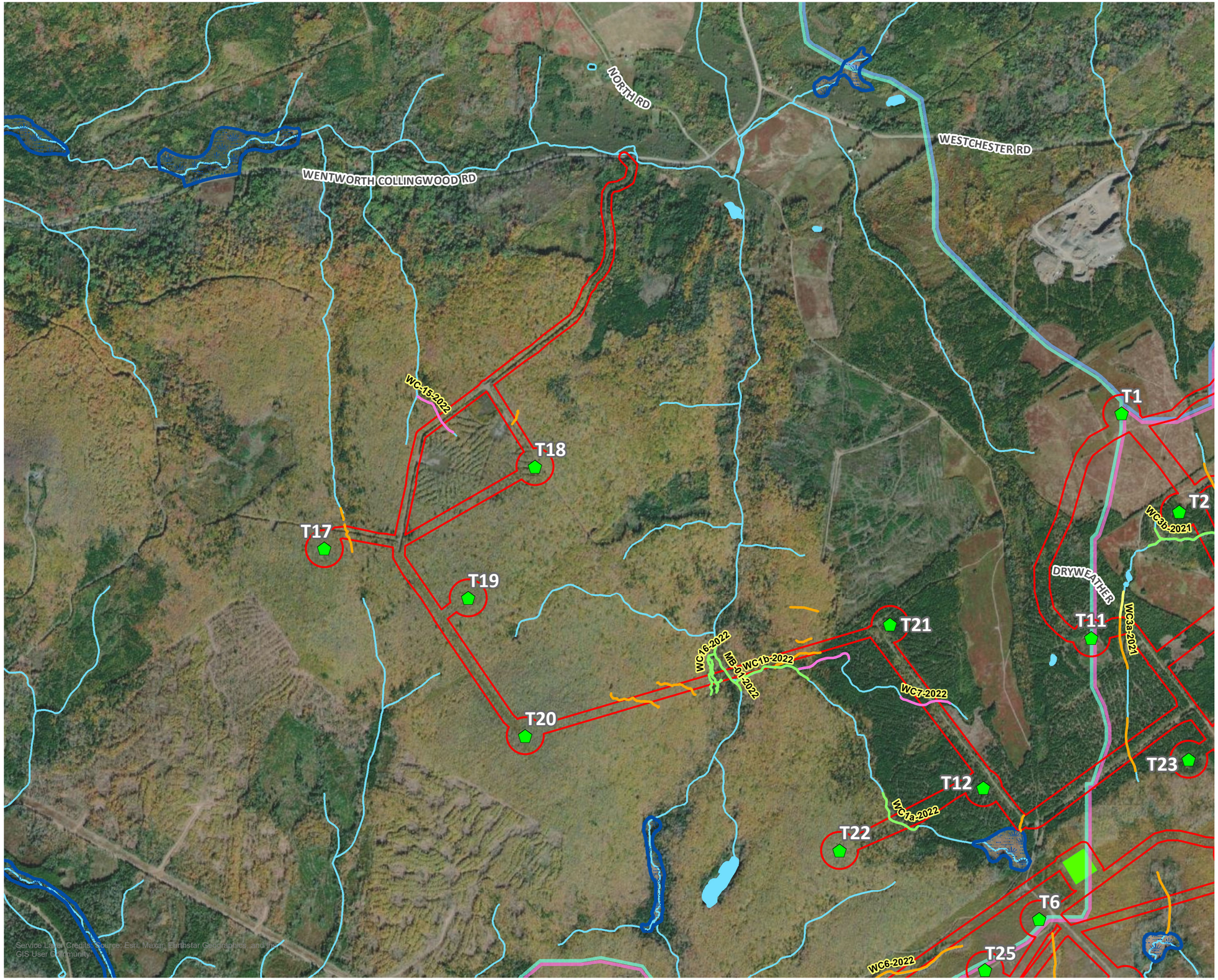
Water course ID	Description	Proposed Potential Alterations
WC7-2022	Ephemeral tributary to Mountain Brook. Watercourse flows through a metal culvert at the PDA crossing. Downstream of the culvert appears to be washed out from previous high flows.	An existing access road with metal culvert may require upgrades.
WC15-2022	Forked intermittent tributary to Mountain Brook.	Potential within the eastern fork (T2) where an existing access road and culvert may require upgrades.
WC16-2022	Small permanent forked tributary to Mountain Brook.	None – The collector line proposed will span both forks of this tributary and Mountain Brook.

Notes:

1. As previously described, the PDA encompasses all of the proposed 28 turbines locations and their associated infrastructure. The Project would consist of up to 12 of those locations and their associated infrastructure. As such, this list encompasses all potential watercourse crossings in this secondary watershed within 30m of the PDA.

An assessment of fish habitat suitability for the watercourse locations within the River Philip secondary watershed is presented in Table 4 below and presented on Figure 3, 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 A) 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 WC1-2022 and WC16.



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WESTCHESTER WIND PROJECT

WATERCOURSE AND FISH HABITAT SUITABILITY FOR ASSESSED WATERCOURSES WITHIN THE RIVER PHILIP SECONDARY WATERSHED
FIGURE 3

- 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

0 0.25 0.5 km

N W E S

SCALE 1:15,000

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FILE LOCATION: K:\2021\211329\Product\Internal\Westchester_Figures_2022\Watercourse Figures 2022\WC_F03to5B_Watercourse_FishHabitatSuitabilityAssessment_2022.mxd

Table 4: Fish Habitat Suitability of Watercourses within the River Phillip Secondary Watershed in the PDA

Water Course ID	Water Quality	Existing Potential Barriers	Suitability as Fish Habitat
MB-01	pH: 6.3-6.5 DO: 8.2-9.2 mg/L	Slightly acidic water	Yes. Cobble substrate, neutral to slightly acidic pH and available cover.
WC1a-2022	pH: 7.5-8.4 DO: 8.2-9.2 mg/L	None identified	Yes. 5cm brook trout observed July 27, 2022.Cobble substrate, suitable water quality and available cover.
WC1b-2022	pH: 6.4-6.7 DO: 7.7-8.6 mg/L	Slightly acidic water	Yes, brook trout observed upstream (WC1a-2022). Cobble substrate, neutral to slightly acidic pH and available cover.
WC7-2022	pH: 6.1 DO: 5.0 mg/L	Insufficient water/flow and soft substrate in some areas. Moderate to low pH and DO observed on July 28, 2022.	Unlikely with potential for tolerant species when water is at a high stage.
WC15-2022	pH: 6.5-6.7	Slightly acidic and insufficient water in areas. A raised culvert in the east form prevents fish passage upstream of the existing access road.	Potential for some tolerant fish species to be present seasonally. Watercourse is very steep with sections with cobble and gravel substrate. Culvert under an existing access road may block upstream access for fish.
WC16-2022	pH: 7.0	None identified	Yes, small minnows observed 70-900 m downstream of the PDA July 27, 2022.

Notes:

1. As previously described, the PDA encompasses all of the proposed 28 turbines locations and their associated infrastructure. The Project would consist of up to 12 of those locations and their associated infrastructure. As such, this list encompasses all watercourse in this secondary watershed within 30m of the PDA.

5.2.2 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, shown on Figure 4. 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 4).

5.2.3 Watercourses of the Portapique River Secondary Watershed (IDJ-**7**)

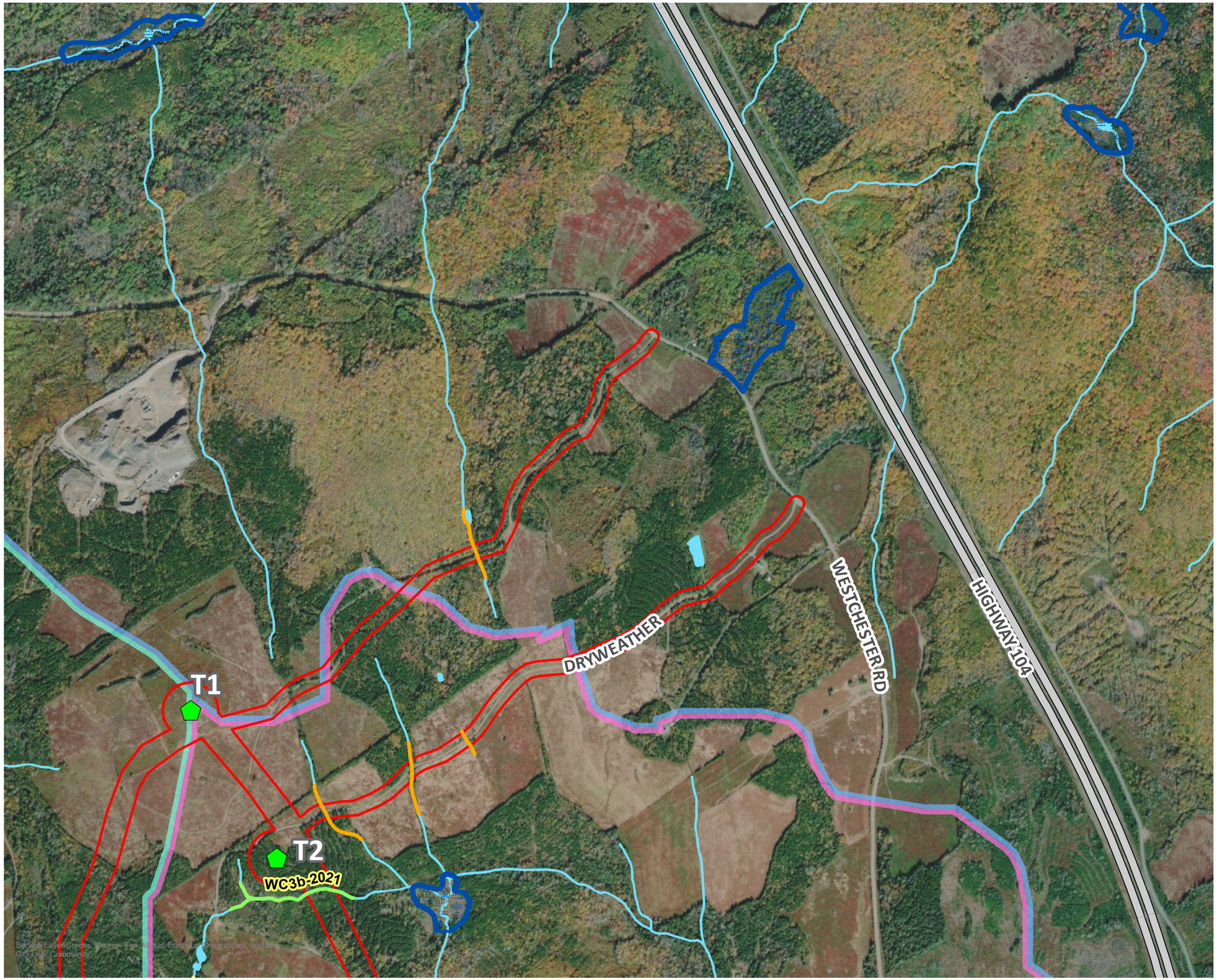
Watercourses that intersect with the PDA within the Portapique River secondary watershed include Gleason Brook, tributaries to Gleason Brook, tributaries to Fountain Lake/Fountain Lake Brook and tributaries to Duck Pond. The majority of the watercourses flow in a south/south-easterly direction with the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

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 south west 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 (see Figure 5B), 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 Figures 5A and 5B and summarized in Table 5, below.



Natural Forces

WESTCHESTER WIND PROJECT

WATERCOURSE AND FISH HABITAT SUITABILITY FOR ASSESSED WATERCOURSES WITHIN THE WALLACE RIVER SECONDARY WATERSHED
FIGURE 4

- 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

0 0.175 0.35 km

N W E S

SCALE 1:10,000

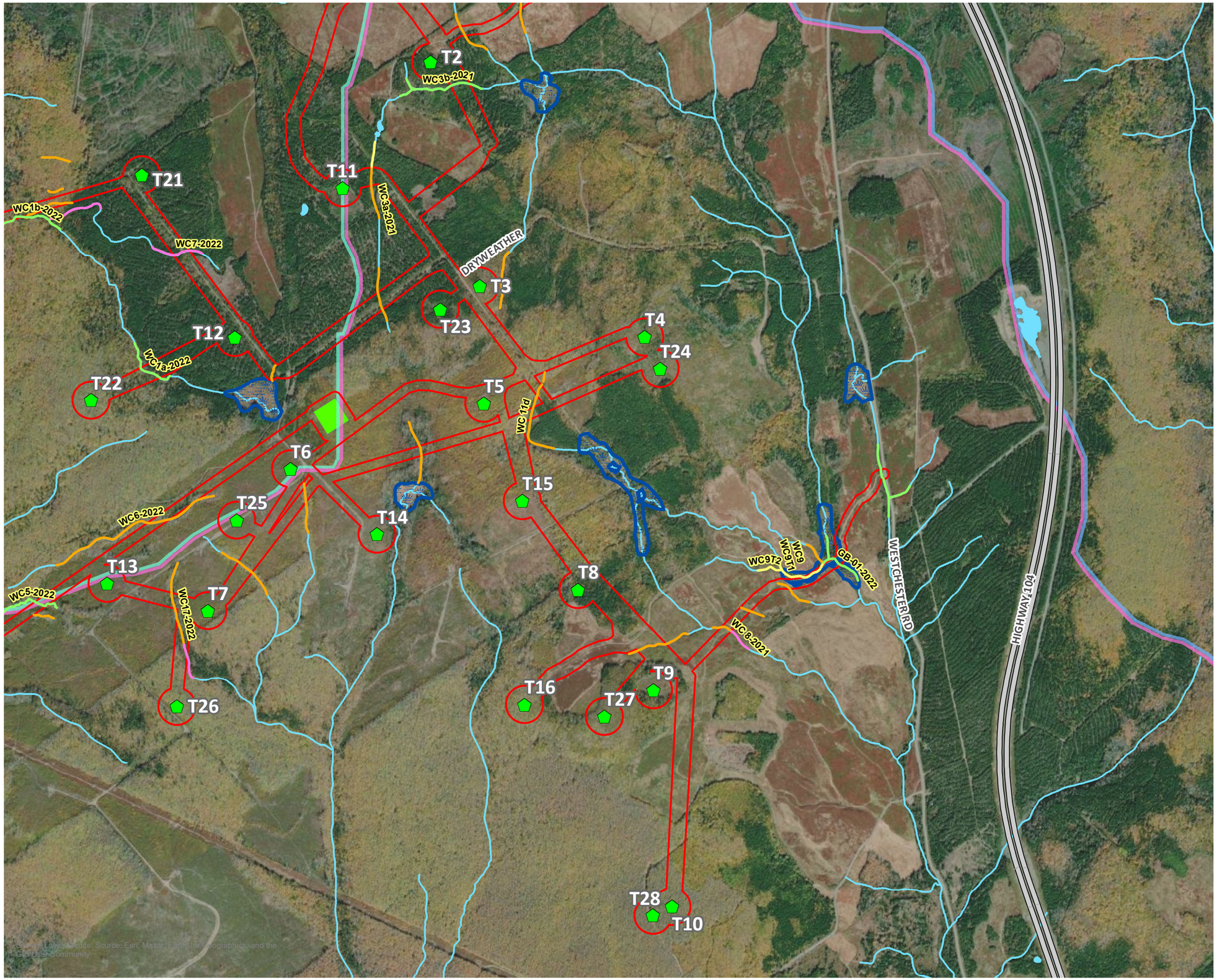
MAP DRAWING INFORMATION:
DATA PROVIDED BY DILLON CONSULTING, GEONB, NATURAL FORCES

MAP CREATED BY: DU
MAP CHECKED BY: KB
MAP PROJECTION: NAD 1983 UTM ZONE 20N

DILLON CONSULTING

PROJECT: 21-1329
STATUS: DRAFT
DATE: 2022-12-09

FILE LOCATION: K:\2021\211329\Product\Internal\Westchester_Figures_2022\Watercourse Figures 2022\WC_F03to5B_Watercourse_FishHabitatSuitabilityAssessment_2022.mxd



Natural Forces

WESTCHESTER WIND PROJECT

WATERCOURSE AND FISH HABITAT SUITABILITY FOR ASSESSED WATERCOURSES WITHIN THE PORTAPIQUE RIVER SECONDARY WATERSHED
FIGURE 5A

- 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

0 0.25 0.5 km

N W E S

SCALE 1:15,000

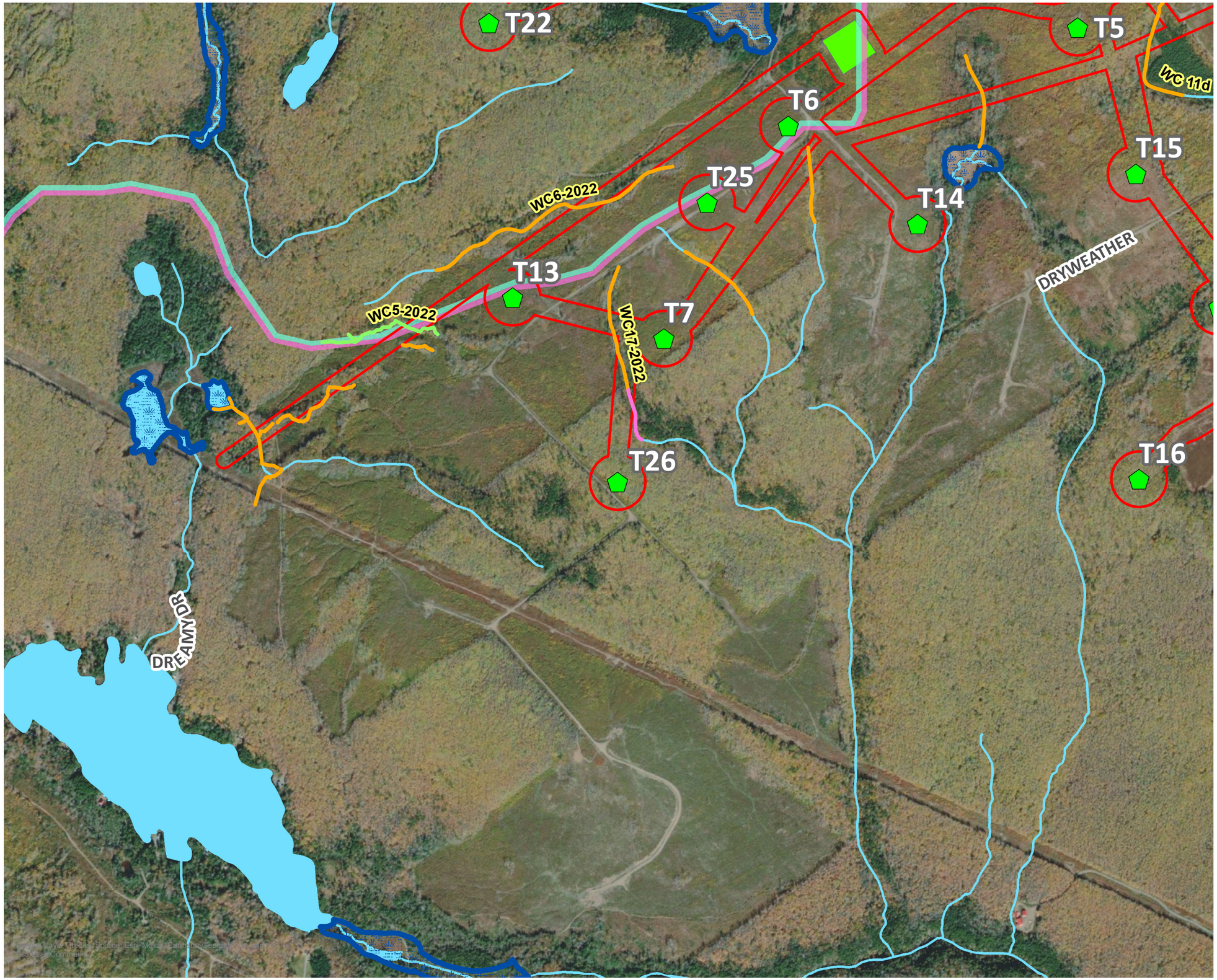
MAP DRAWING INFORMATION:
DATA PROVIDED BY DILLON CONSULTING, GEONB, NATURAL FORCES

MAP CREATED BY: DU
MAP CHECKED BY: KB
MAP PROJECTION: NAD 1983 UTM ZONE 20N

DILLON CONSULTING

PROJECT: 21-1329
STATUS: DRAFT
DATE: 2022-12-09

FILE LOCATION: K:\2021\211329\Product\Internal\Westchester_Figures_2022\Watercourse Figures 2022\WC_F03to5B_Watercourse_FishHabitatSuitabilityAssessment_2022.mxd



Natural Forces

WESTCHESTER WIND PROJECT

WATERCOURSE AND FISH HABITAT SUITABILITY FOR ASSESSED WATERCOURSES WITHIN THE PORTAPIQUE RIVER SECONDARY WATERSHED
FIGURE 5B

- 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

0 0.175 0.35 km

N W E S

SCALE 1:10,000

MAP DRAWING INFORMATION:
DATA PROVIDED BY DILLON CONSULTING, GEONB, NATURAL FORCES

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MAP PROJECTION: NAD 1983 UTM ZONE 20N

DILLON CONSULTING

PROJECT: 21-1329
STATUS: DRAFT
DATE: 2022-12-09

FILE LOCATION: K:\2021\211329\Product\Internal\Westchester_Figures_2022\Watercourse Figures 2022\WC_F03to5B_Watercourse_FishHabitatSuitabilityAssessment_2022.mxd

Table 5: PDA Crossings of Watercourses within the Portapique River Secondary Watershed

Water Course ID	Description	Proposed Potential Alterations
GB-01	Gleason Brook: Small permanent watercourse that collects waters from tributaries from the north and west of the proposed crossing. Water flow is south to the Portapique River. A rare lichen was identified 600 m upstream from this crossing in 2021. [2]	None – An existing access road and bridge will be upgraded. No instream work will be required within Gleason Brook.
WC8-2021	Intermittent Tributary to Gleason Brook. Watercourse is deeply incised and overtops existing roadbed The watercourse flows overtop of an existing access road at the PDA crossing location.	Upgrades will be required to the existing access road including the installation of a culvert or bridge.
WC9-2021	Tributary to Gleason Brook that runs parallel to an existing access road. This location collects flows from several south-flowing tributaries (including from WC3) and then flows east into Gleason Brook.	None – This watercourse runs parallel to existing access road to be upgraded.
WC3-2021 (WC3a and WC3b)	Tributary to Gleason Brook that the PDA crosses in two locations. The watercourse is intermittent to ephemeral at WC-3a and forms a small permanent stream further downstream before WC3b. This watercourse runs through a conifer plantation at WC3b.	Upgrades will be required to the existing access roads and for collector lines at two locations (i.e., WC3a and WC3b).
WC17	Ephemeral tributary to Fountain Lake Brook	An access road and two collector lines are proposed to cross this watercourse. The access road is proposed for an area with limited flow and two collector lines are not anticipated to require instream work and can span the crossing locations.
WC5	Ephemeral tributary to Duck Pond.	Potential for an access road to cross this watercourse to support the interconnection to the transmission line.
WC6	Ephemeral tributary to Duck Pond.	None – This watercourse runs parallel to existing access road to be upgraded.

Notes:

1. As previously described, the PDA encompasses all of the proposed 28 turbines locations and their associated infrastructure. The Project would consist of up to 12 of those locations and their associated infrastructure. As such, this list encompasses all watercourse in this secondary watershed within 30m of the PDA.
2. Eastern waterfan (*Peltigera hydrothyria*) was identified 600m upstream from the proposed GB-01 crossing in 2021. Further details and proposed mitigation measures are found in the Vegetation and Lichen Survey Report prepared by Dillon in 2022.

An assessment of fish habitat suitability for the watercourse locations in the Portapique Secondary Watershed is presented in Table 6 below and in Figures 5 and 6, which also include colour coded rankings of fish habitat suitability for the assessed locations of watercourses. The following assessment took into consideration information obtained through the desktop screening assessment as well as *in-situ* water quality measurements (presented in Appendix A) 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.

Table 6: Fish Habitat Suitability of Watercourses within the Portapique River Secondary Watershed in the PDA

Water Course ID	Water Quality	Existing Potential Barriers	Suitability as Fish Habitat
GB1-2021	pH: 6.4-6.7 DO: 6.5-7.3 mg/L	None observed	Yes, small Brook trout were observed near T1 and T4 on July 27, 2022.
WC8-2021	pH: 7.4 DO: 10 mg/L	Insufficient water in the upstream reaches.	Potential for some tolerant fish species to be present downstream of the PDA crossing location based on suitable pH, DO and substrate conditions.
WC9-2021	pH: 7.2 DO: 11.7 mg/L	A raised culvert near the confluence with Gleason Brook is a barrier to fish passage.	Likely/Yes. Cobble substrate and available cover.
WC3-2021 (WC3a and WC3b)	pH: 5.8-6.9 DO: 6.1-10.5 mg/L	Soft substrate (fines), low to no flow, acidic pH and low DO in the upstream reach (WC3a). A culvert beneath an access road at WC3a further restricts fish passage upstream.	Yes, minnows were observed at WC3b (July 29, 2022). At WC3b, gravel substrate with fines, pH is neutral to slightly acidic and watercourse has available cover and suitable DO. Upstream crossing (WC3a) is unlikely fish habitat due to insufficient flow and poor water quality.
WC17-2022	pH: 5.7 DO: 3.4 mg/L	Soft substrate (fines), low to no flow, low pH and DO and insufficient flow.	Unlikely

Water Course ID	Water Quality	Existing Potential Barriers	Suitability as Fish Habitat
WC5-2022	pH: 4.7-5.4 DO: 6 mg/L	Low flow, acidic pH and low DO	Yes – minnows observed in small isolated pools within this watercourse.
WC6-2022	pH: 5.8-6.9 DO: 5.4-5.7 mg/L	Insufficient water, low DO and acidic pH recorded July 28, 2022.	Unlikely

Notes:

1. As previously described, the PDA encompasses all of the proposed 28 turbines locations and their associated infrastructure. The Project would consist of up to 12 of those locations and their associated infrastructure. As such, this list encompasses all watercourse in this secondary watershed within 30m of the PDA.

5.3 Assessment Conclusions

Based on a review of the AC CDC records, American eel and Atlantic salmon from the Inner Bay of Fundy and the Gaspe-Southern Gulf of St. Lawrence populations were observed within 12, 14 and 16 km from the PDA, respectively (AC CDC 2022). The Gaspe-Southern Gulf of St. Lawrence population was observed within the Wallace River (AC CDC 2022). Though part of the PDA does cross through the Wallace River secondary watershed, the West Branch Wallace River connection to the Wallace River is located 18 km from the PDA and it is not anticipated to be affected by the Project. The Inner Bay of Fundy population of Atlantic salmon, however, have been identified throughout the Portapique River watershed (DFO, 2022), which has been identified as critical habitat for this species. Suitable Atlantic salmon habitat was identified during initial field studies.

The results of the field surveys confirm that fish occupancy and suitable habitats are present within the study area. With the exception of several small brook trout minnows observed in Gleason Brook and a tributary of Mountain Brook, no additional fish SAR/SoCC were observed during the field surveys. The results of the *in-situ* surface water quality measurements indicate that watercourses are present within the PDA that have physical and chemical characteristic to support salmonids and other fish species.

The proposed WTG locations were selected as they do not impact watercourses, nor are they within 30 meters of a watercourse. However, watercourse crossing with linear features of the PDA were identified in seven locations (Figure 2). These crossings are all associated with existing or proposed roads and/or collector lines. During the field assessments, three watercourse crossings with existing access roads were identified that have ineffective or raised culverts. The proposed road upgrades at these locations will enhance potential fish habitat by restoring flow and reducing barriers to fish passages at these locations.

The information obtained from the watercourse assessment will be taken under consideration by the proponent when finalizing the project footprint and selecting the final 12 turbine layout. Where feasible, the design of the project will be finalized in a way to interact with as few watercourses as possible.

6.0 Effects Assessment and Mitigation Recommendations

6.1 Identification of Project Interactions

The PDA was selected to minimize interactions with watercourse crossings by avoiding development in locations with watercourses to the extent possible. The proposed layout utilizes existing road infrastructure where possible to minimize disturbance of the local environment and the proposed WTG locations were carefully selected in locations more than 30 m from watercourses.

6.1.1 Approach to Project Components

The Project has three main distinct phases during each of which the potential interactions with the surrounding environment are considered distinct. Unplanned events are considered separately from the phases.

The phases of the Project include:

1. *Planning, Site Preparation and Construction Phase;*
2. *Operation Phase; and*
3. *Decommissioning Phase*.

The project interaction matrix in Table 7 is used as an initial screening to assist in determining if an interaction is possible between the activities being carried out in each phase of the Project and watercourses and fish habitat.

Table 7: Project Interactions with Environmental Components

Valued Environmental Component	Project Phases			
	Planning, Site Preparation and Construction Phase	Operation Phase	Decommissioning Phase	Unplanned Events
Fish and Fish Habitat	✓	✓	✓	✓

Legend: ✓ = Potential interaction identified

Those Project phases for which a checkmark is provided indicates that the project may interact with watercourses and fish habitat, and thus an environmental effects assessment is warranted. In this case, it is possible that interactions could occur during each phase of the Project, as well as unplanned events (including but not limited to accidents, malfunctions and severe weather events), which are all discussed below.

6.1.2 Identification of Potential Environmental Effects

Without mitigation, watercourses with crossings within the PDA have the potential to be impacted during the construction and decommissioning phases of the proposed Project. Interaction may primarily occur during clearing and grubbing and access road widening, as well as during eventual infrastructure removal and site reclamation activities in the decommissioning phase. Potential interactions include increasing sediment load during earth works from altering surface water drainage patterns.

While the construction and decommissioning phases present potential for negative impacts to watercourses within 30 m of Project-related activities, impacts are reversible once the decommissioning phase has started and land reclamation activities restore the Project site to its previous state.

Though some studies exist (DFO 1998; DFO 2018), potential effects of sounds and vibrations associated with the construction (e.g. blasting) and daily operation of the proposed project to fishes occurring within the LAA and the impacts of seismic vibrations and anthropogenic sounds on the behavior and health of fishes (and other wildlife) are not entirely clear. Best Management Practises for Pile Driving and Related Operations (DFO 2018) state that peak underwater pressures in excess of 30 kilopascals (kPa) are likely to adversely affect fish. Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters (DFO 1998) state that the detonation of explosives in or near water produces post-detonation compressive shock waves that can damage the swimbladders of fish and may kill or damage fish eggs and larvae when pressures exceed of 100 kPa (DFO 1998). The construction and decommissioning phases of the project are expected to temporarily increase noise and vibration due to potential blasting and an increase in heavy vehicle traffic on the Project site.

Studies on offshore wind energy turbines have indicated that underwater sound can be generated at levels that are detectable by fish (Mooney 2020). It remains unclear whether onshore WTGs generate underwater noise that has the potential to affect fish health and behaviours. Although not included as a study for the proposed Project, ambient underwater noise in the watercourses located near the project area is expected to be present as a result of pre-existing site activity and the turbulent nature of the watercourses caused by the steep terrain. None of the proposed WTG locations have been sited within 250 m of watercourses with a high potential for fish to be present.

6.1.3 Standard Mitigation of Potential Environmental Effects

Standard mitigation has been identified for the anticipated interaction and/or effect in relation to watercourse and fish habitat in an attempt to prevent the interaction from occurring if possible, or to reduce the magnitude, geographic extent, frequency, duration, reversibility, or ecological/socioeconomic context of the interaction. Best management practices (based on industry guidelines and regulatory guidance documents) have been proposed as mitigation measures. In addition, several acts, codes, regulations and guidelines may require appropriate actions be conducted to mitigate impacts prior to or during the interaction.

The federal and provincial legislation and codes that could apply to the Project include (but may not be limited to):

- *Fisheries Act* (FA 1985);
- *Canadian Environmental Protection Act* and regulations (ECCC 1999);
- *Species at Risk Act* (ECCC 2002);
- *Transportation of Dangerous Goods Act*, and regulations (TC 1992);
- Nova Scotia *Environment Act* and regulations (NSG 1994-95);
- Nova Scotia *Water Resources Protection Act*, and regulations(NSG 2000);
- Nova Scotia *Fisheries and Costal Resources Act* (NSG 1996);
- Nova Scotia *Endangered Species Act*, and regulations (NSG 1998a);
- Nova Scotia *Wilderness Areas Protection Act* (NSG 1998b), and regulations; and
- Contingency Planning Guidelines (NSECC 2021).

The potential interactions of the Project on watercourses and fish habitat and the proposed mitigation measures are summarized in Table 8.

Table 8: Potential Interactions & Proposed Mitigation for Watercourse and Fish Habitat

Potential Interactions with Watercourse and Fish Habitat	Proposed Mitigation Measures
Loss or damage to watercourses and fish habitat due to clearing, grubbing, and/or access road widening during construction and decommissioning. Loss or damage to watercourses and fish habitat due infrastructure removal during decommissioning and site reclamation activities.	1. Limit the removal of riparian zone vegetation; 2. Minimize the use of heavy equipment within 30 m of a watercourse to the extent possible; 3. Minimize the use of blasting within 30 m of a watercourse to the extent possible and blasting will adhere to the Guidelines for the Use of Explosives in or near Canadian Fisheries Waters (DFO, 1998); 4. Construction activities near watercourses will comply with the applicable regulations and guidelines such as the *Fisheries* Act and will be carried out strictly in accordance with NSECC and DFO Approvals, Terms and Conditions, and Letters of Advice; 5. Where possible, watercourse crossings will be located in areas that exhibit a stable soil type where grades approaching the crossings will not be too steep, and will span the watercourse where possible; 6. Proper erosion and sediment control measures will be installed and checked regularly during the construction phase and prior to, and after, storm events to ensure they are continuing to operate properly to minimize potential effects to adjacent habitat;

Potential Interactions with Watercourse and Fish Habitat	Proposed Mitigation Measures
	7. Sufficient staff and equipment to manage erosion and sediment control during storm events and other emergencies will be provided; 8. In stream work will be timed to occur in the dry season and not during significant rainfall. Culverts will be designed and installed to prevent the creation of barriers to fish movement and maintain bankfull channel functions and habitat functions to the extent possible; 9. Prior to in-stream work, fish-outs will be completed to ensure no harm to resident fish species. Captured fish will be released outside of the work area; 10. Runoff will be controlled, and sediment will be prevented from leaving the Site at all times; 11. Equipment shall be kept in good working order and maintained to avoid noise disturbances. and 12. All workers will be familiarized identified and potential aquatic SAR (i.e., Atlantic Salmon, Eastern waterfan and American eel) and will adhere to mitigation measures for the protection of aquatic SAR as outlined within the Adaptative Management Plan; and, 13. All workers will be familiarized and will adhere to the provincial Nova Scotia Endangered Species Act and federal Species at Risk Acts; <u>Mitigation Measures for Unplanned Events</u> 1. Equipment shall be kept in good working order and maintained so as to reduce risk of spills/leaks and to avoid water contamination; 2. Spill response kits must be readily available for each piece of equipment, on site workers are required be knowledgeable on emergency spill response protocols and initiate corrective measures immediately to minimize any impacts to the surrounding environment; 3. Where applicable, secondary containment and limited quantities of chemicals and fuels required to be store on site shall be in an area away from the surrounding terrestrial environment, or direct pathways (i.e., ditches) to the surrounding environment, all chemicals and fuels will be stored in appropriate containers designed for the reduction of potential spills or leaks;

Potential Interactions with Watercourse and Fish Habitat	Proposed Mitigation Measures
	4. Refueling, oiling, and maintenance of equipment will be completed in specifically designated areas located at least 30 m away from any watercourse, wetland, or well to minimize potential effects that could arise in the event of a spill; 5. If contaminated soil or water is encountered, it will be reported to NSE and managed utilizing the Nova Scotia Contaminated Site Regulations; 6. Visual monitoring of silt or sedimentation within watercourses will occur during construction after heavy weather events; and 7. Chemicals and petroleum products will be managed in accordance to manufacturer specifications and stored more than 30 m from a watercourse or wetland.

Consultation with NSDNRR and NSECC regarding the development of a post-construction monitoring program for selected watercourses will be conducted prior to development as part of the watercourse alteration permit process.

6.2 Residual Environmental Effects

A residual environmental effect is an environmental effect of a project that remains, or is predicted to remain, after mitigation measures have been implemented (GOC 2022). The Project will be developed in such a way as to avoid disturbance to watercourses where avoidance is not possible, and minimize the area of disturbance within the Project site. Avoidance through site design has been completed to the extent possible (i.e., avoiding watercourses where possible, spanning watercourses using overhead collection lines, and use of existing roads). In addition, following the construction and decommissioning phases of the Project, natural revegetation with native species will be promoted in consultation with the landowners to minimize the potential for habitat loss and invasive species spread.

Short-term, reversible disturbance to watercourses and fish habitat due to clearing, grubbing, and/or access road widening during construction and decommissioning were assessed above as a potential intersection between the Project and the watercourse and fish habitat VEC. After employing the proposed mitigation strategies in Table 8 (above), these potential effects are anticipated to be temporary, of small magnitude and contained.

During construction and decommissioning, a direct release of a contaminating substance (e.g., fuel or sediment) into environment could result in a negative effect of the Project on the watercourse and fish habitat VEC. The mitigation measures for unplanned events listed above in Table 8 are anticipated to limit the potential effect as a result of an unplanned event, such as a spill, to be of a small magnitude, of short duration and localized.

In consideration of the above and planned mitigation, the residual environmental effects of the Project on watercourses and fish habitat during all phases including unplanned events are rated not significant. No follow-up or monitoring is proposed to monitor environmental interactions with the watercourses and fish habitat, unless required under permit from NSECC.

6.3 Cumulative Environmental Effects

Cumulative effects are changes to the environment that are caused by an action in combination with other past, present and future human actions (GoC 2022). Specific to the nature of the undertaking, cumulative effects are combined impacts that may occur when wind power projects or other types of projects are located in the same region (NSECC 2021). The nearest wind farm to the proposed Project location is the Higgins Mountain Project. The distance between the proposed Project to the nearest existing wind farm is approximately 9 km. The Higgins Mountain Project lies within a different secondary watershed (Great Village River, 1DJ-8), and thus does not spatially overlap with the LAA for the Westchester Wind Project watercourses and fish habitat. As a result, the potential for interaction between the residual effects of the projects is considered to be unlikely.

Without the above proposed mitigation measures, cumulative impacts to watercourses and fish could result from the increased number of vehicles and use of site access roads in addition to the existing site uses. The above mitigation measures were carefully developed to prevent residual impacts to watercourse and fish habitat as a result of the Project.

7.0 Summary and Conclusions

The information provided in this document is based on the currently available design/planning information and existing environment information obtained during focused field surveys conducted throughout 2021 and 2022. As previously discussed, the Project layout was designed to attempt to minimize interactions with wetlands. Care will be taken to avoid wetlands, and all attempts will be made to span wetlands with poles; however, pursuant to the *Nova Scotia Wetland Conservation Policy*, for any Projects that negatively affect wetland areas or function, NSECC will require the adherence to the mitigation sequence to prevent the net loss of wetland area and function (NSE 2019).

The Project has been sited to minimize the potential impact of the Project on natural landscapes and undisturbed natural habitat by selecting lands previously impacted by anthropogenic activities. In order to mitigate risk to watercourses, fish, and fish habitat, all WTGs were set back at least 30m from watercourses. During construction of the collector network, care will be taken to avoid watercourses, and all attempts will be made to span watercourses with poles. Best management practices for erosion and sediment control will be implemented to monitor potential impacts to watercourses. Overall, transitioning to renewable energy will help reduce the effects of climate change. This may have a positive impact on the long term population growth and viability of fish populations in Nova Scotia.

This report has been prepared for the Environmental Assessment of the Westchester Wind Project. The Project is expected to provide renewable electricity to Nova Scotia and support Nova Scotia Power in attaining their future renewable energy targets. The information provided in this document is based on the current available design/planning information and existing environment information obtained during focused field surveys conducted throughout 2021 and 2022. The proposed WTG locations are not predicted to directly interact with identified watercourses as none were delineated within the proposed footprint of these structures; however, as currently designed, up to seven watercourses will be directly impacted by proposed access road construction.

8.0 Closure

This report was prepared by Dillon Consulting Limited (Dillon) for Natural Forces Developments Limited Partnership (the Proponent) on behalf of the Westchester Wind Limited Partnership, in support of the Westchester Wind Project Addendum (2022). Dillon has used the degree of care and skill ordinarily exercised under similar circumstances at the time the work was performed by reputable members of the environmental consulting profession practicing in Canada. Dillon assumes no responsibility for conditions which were beyond its scope of work. There is no warranty expressed or implied by Dillon.

The material in the report reflects Dillon's best judgment in light of the information available to Dillon at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions made based on it, are the responsibilities of such third parties. Dillon accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

9.0 References

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Appendix A

Fish Habitat Suitability Assessment Data

Table A-1: Fish Habitat Characteristics and Observations of River Phillip Watershed Watercourses within the PDA

Watercourse	Crossing Assessment ID	Physical Observations		Channel Morphology		Substrate		In-stream Cover		Riparian Conditions	
Mountain Brook	MB01 – T1	Flow Regime	Small Perm	Morphology	Riffle	Bedrock	0	Overhanging Veg	Trace	Crown Closure (%)	51-75
		stage	Mid	Channel	N/A	Boulder	10	LWD	Moderate	Bank Texture	Cobble
		Bankful Width (m)	2.72	Islands	None	Cobble	20	Undercut	Abundant	Left Bank Shape	Sloped
		Water Depth (cm)	7	Bars	Mid	Large Gravel	25	Deep Pool	Trace	Right Bank Shape	Undercut
		Velocity (m/sec)	0.1	Pattern	Sinuous	Small Gravel	25	SWD	Moderate	Veg Stage	Mature Forest
				Confinement	F Confined	Fines	20	Instream Veg	Trace		
	MB01 – T2	Flow Regime	Small Perm	Morphplogy	Riffle	Bedrock	0	Overhanging Veg	Trace	Crown Closure (%)	76-100
		stage	Mid	Channel	N/A	Boulder	10	LWD	Moderate	Bank Texture	Cobble
		Bankful Width (m)	4.88	Islands	None	Cobble	50	Undercut	Abundant	Left Bank Shape	Sloped
		Water Depth (cm)	8.75	Bars	Mid	Large Gravel	15	Deep Pool	Trace	Right Bank Shape	Undercut
		Velocity (m/sec)	0.3	Pattern	Sinuous	Small Gravel	20	SWD	Moderate	Veg Stage	Mature Forest
				Confinement	Entrenched	Fines	5	Instream Veg	Trace		
	MB01 – T3	Flow Regime	Small Perm	Morphplogy	Riffle	Bedrock	0	Overhanging Veg	Trace	Crown Closure (%)	76-100
		stage	Mid	Channel	N/A	Boulder	5	LWD	Moderate	Bank Texture	Gravel
		Bankful Width (m)	3.86	Islands	None	Cobble	30	Undercut	Abundant	Left Bank Shape	Sloped
		Water Depth (cm)	1.2	Bars	Mid	Large Gravel	25	Deep Pool	Trace	Right Bank Shape	Overhanging
		Velocity (m/sec)	0.3	Pattern	Straight	Small Gravel	20	SWD	Moderate	Veg Stage	Mature Forest
				Confinement	F Confined	Fines	20	Instream Veg	Trace		
	MB01 – T4	Flow Regime	Small Perm	Morphplogy	Flat	Bedrock	0	Overhanging Veg	Trace	Crown Closure (%)	51-75
		stage	Mid	Channel	N/A	Boulder	0	LWD	Trace	Bank Texture	Cobble
		Bankful Width (m)	5.2	Islands	None	Cobble	60	Undercut	Moderate	Left Bank Shape	Overhanging
		Water Depth (cm)	11	Bars	Side	Large Gravel	20	Deep Pool	Trace	Right Bank Shape	Sloped
		Velocity (m/sec)	0.1	Pattern	Straight	Small Gravel	15	SWD	Trace	Veg Stage	Young Forest
				Confinement	O Confined	Fines	5	Instream Veg	Trace		
Tributary to Mountain Brook	WC1a-2022 - T1	Flow Regime	Intermittent	Morphology	Rifle	Bedrock	0	Overhanging Veg	Trace	Crown Closure (%)	76-100
		stage	Mid	Channel	N/A	Boulder	0	LWD	Trace	Bank Texture	Fines
		Bankful Width (m)	1.86	Islands	None	Cobble	10	Undercut	Trace	Left Bank Shape	Sloped
		Water Depth (cm)	6	Bars	None	Large Gravel	50	Deep Pool	Trace	Right Bank Shape	Undercut
		Velocity (m/sec)	0.5	Pattern	Sinuous	Small Gravel	30	SWD	Trace	Veg Stage	Young Forest
				Confinement	F Confined	Fines	10	Instream Veg	Trace		
	WC1a-2022 - T2	Flow Regime	Intermittent	Morphology	Rifle	Bedrock	0	Overhanging Veg	Trace	Crown Closure (%)	76-100
		stage	Mid	Channel	N/A	Boulder	0	LWD	Moderate	Bank Texture	Fines
		Bankful Width (m)	4	Islands	Occasional	Cobble	5	Undercut	Abundant	Left Bank Shape	Undercut
		Water Depth (cm)	1	Bars	Mid	Large Gravel	25	Deep Pool	Trace	Right Bank Shape	Sloped
		Velocity (m/sec)	0.5	Pattern	Sinuous	Small Gravel	50	SWD	Moderate	Veg Stage	Young Forest
				Confinement	O Confined	Fines	20	Instream Veg	None		
	WC1a-2022 - T3	Flow Regime	Intermittent	Morphology	Rifle	Bedrock	0	Overhanging Veg	Trace	Crown Closure (%)	76-100
		stage	Mid	Channel	N/A	Boulder	20	LWD	Trace	Bank Texture	Fines
		Bankful Width (m)	2.71	Islands	None	Cobble	10	Undercut	Moderate	Left Bank Shape	Undercut
		Water Depth (cm)	1	Bars	Side	Large Gravel	40	Deep Pool	Trace	Right Bank Shape	Undercut
		Velocity (m/sec)	0.7	Pattern	Straight	Small Gravel	20	SWD	Trace	Veg Stage	Young Forest
				Confinement	Confined	Fines	10	Instream Veg	Trace		Trace
	WC1a-2022 - T4	Flow Regime	Intermittent	Morphology	Rifle	Bedrock	0	Overhanging Veg	Trace	Crown Closure (%)	51-75
		stage	Mid	Channel	N/A	Boulder	5	LWD	None	Bank Texture	Boulder
		Bankful Width (m)	2.55	Islands	None	Cobble	10	Undercut	Trace	Left Bank Shape	Sloped
		Water Depth (cm)	5	Bars	None	Large Gravel	60	Deep Pool	Trace	Right Bank Shape	Sloped
		Velocity (m/sec)	0.3	Pattern	Straight	Small Gravel	20	SWD	Trace	Veg Stage	Young Forest
				Confinement	Confined	Fines	5	Instream Veg	Trace		
Tributary to Mountain Brook	WC1b-2022 - T1	Flow Regime	Small Perm	Morphology	Rapid	Bedrock	0	Overhanging Veg	Trace	Crown Closure (%)	76-100
		stage	Mid	Channel	N/A	Boulder	40	LWD	Moderate	Bank Texture	Bedrock
		Bankful Width (m)	4.9	Islands	None	Cobble	30	Undercut	Moderate	Left Bank Shape	Vertical
		Water Depth (cm)	8	Bars	None	Large Gravel	20	Deep Pool	Moderate	Right Bank Shape	Sloped
		Velocity (m/sec)	0.3	Pattern	Sinuous	Small Gravel	18	SWD	Moderate	Veg Stage	Mature Forest
				Confinement	Entrenched	Fines	2	Instream Veg	Trace		
	WC1b-2022 - T2	Flow Regime	Small Perm	Morphology	Rapid	Bedrock	0	Overhanging Veg	Trace	Crown Closure (%)	76-100
		stage	Mid	Channel	N/A	Boulder	30	LWD	Moderate	Bank Texture	Bedrock
		Bankful Width (m)	2.32	Islands	None	Cobble	40	Undercut	Moderate	Left Bank Shape	Undercut
		Water Depth (cm)	7	Bars	Side	Large Gravel	15	Deep Pool	Moderate	Right Bank Shape	Undercut
		Velocity (m/sec)	0.1	Pattern	Sinuous	Small Gravel	10	SWD	Trace	Veg Stage	Mature Forest
				Confinement	Entrenched	Fines	5	Instream Veg	Trace		
	WC1b-2022 - T3	Flow Regime	Small Perm	Morphology	Rifle	Bedrock	0	Overhanging Veg	Trace	Crown Closure (%)	76-100
		stage	Mid	Channel	N/A	Boulder	20	LWD	Trace	Bank Texture	Cobble
		Bankful Width (m)	3.95	Islands	None	Cobble	40	Undercut	Moderate	Left Bank Shape	Sloped
		Water Depth (cm)	9	Bars	Side	Large Gravel	20	Deep Pool	Trace	Right Bank Shape	Undercut
		Velocity (m/sec)	0.2	Pattern	Sinuous	Small Gravel	15	SWD	Moderate	Veg Stage	Mature Forest
				Confinement	F Confined	Fines	5	Instream Veg	Trace		
	WC1b-2022 - T4	Flow Regime	Small Perm	Morphology	Rifle	Bedrock	0	Overhanging Veg	Trace	Crown Closure (%)	76-100
		stage	Mid	Channel	N/A	Boulder	15	LWD	Moderate	Bank Texture	Cobble
		Bankful Width (m)	3.95	Islands	None	Cobble	40	Undercut	Moderate	Left Bank Shape	Sloped
		Water Depth (cm)	6.8	Bars	Side	Large Gravel	25	Deep Pool	Moderate	Right Bank Shape	Undercut
		Velocity (m/sec)	0.2	Pattern	I Wandering	Small Gravel	15	SWD	Trace	Veg Stage	Pole-Sapling
				Confinement	F Confined	Fines	5	Instream Veg	Trace		
Tributary to Mountain Brook	WC7-2022 - T1	Flow Regime	Ephemeral	Morphology	Rifle	Bedrock	0	Overhanging Veg	Moderate	Crown Closure (%)	26-50
		stage	Dry	Channel	N/A	Boulder	0	LWD	Trace	Bank Texture	Boulder
		Bankful Width (m)	0.45	Islands	None	Cobble	30	Undercut	Trace	Left Bank Shape	Sloped
		Water Depth (cm)	3	Bars	None	Large Gravel	5	Deep Pool	None	Right Bank Shape	Undercut
		Velocity (m/sec)	0	Pattern	Straight	Small Gravel	0	SWD	Trace	Veg Stage	Young Forest
				Confinement	F Confined	Fines	65	Instream Veg	Moderate		
	WC7-2022 - T2	Flow Regime	Ephemeral	Morphology	Rapid	Bedrock	0	Overhanging Veg	Trace	Crown Closure (%)	26-50
		stage	Dry	Channel	N/A	Boulder	20	LWD	Trace	Bank Texture	Boulder
		Bankful Width (m)	1.1	Islands	None	Cobble	25	Undercut	Trace	Left Bank Shape	Sloped
		Water Depth (cm)	4	Bars	None	Large Gravel	5	Deep Pool	None	Right Bank Shape	Sloped
		Velocity (m/sec)	0	Pattern	Straight	Small Gravel	0	SWD	Moderate	Veg Stage	Young Forest
				Confinement	O Confined	Fines	50	Instream Veg	None		
	WC7-2022 - T3	Flow Regime	Ephemeral	Morphology	Rapid	Bedrock	0	Overhanging Veg	None	Crown Closure (%)	51-75
		stage	Low	Channel	N/A	Boulder	15	LWD	None	Bank Texture	Boulder
		Bankful Width (m)	1.25	Islands	None	Cobble	30	Undercut	Trace	Left Bank Shape	Sloped
		Water Depth (cm)	5	Bars	None	Large Gravel	30	Deep Pool	None	Right Bank Shape	Undercut
		Velocity (m/sec)	0	Pattern	Straight	Small Gravel	20	SWD	Moderate	Veg Stage	Young Forest
				Confinement	O Confined	Fines	5	Instream Veg	None		
	WC7-2022 - T4	Flow Regime	Ephemeral	Morphology	Rapid	Bedrock	0	Overhanging Veg	None	Crown Closure (%)	51-75
		stage	Low	Channel	N/A	Boulder	5	LWD	None	Bank Texture	Boulder
		Bankful Width (m)	2.7	Islands	None	Cobble	30	Undercut	Trace	Left Bank Shape	Sloped
		Water Depth (cm)	2	Bars	None	Large Gravel	45	Deep Pool	None	Right Bank Shape	Sloped
		Velocity (m/sec)	0	Pattern	Straight	Small Gravel	15	SWD	Moderate	Veg Stage	Young Forest
				Confinement	O Confined	Fines	5	Instream Veg	None		

Table A-1: Fish Habitat Characteristics and Observations of River Phillip Watershed Watercourses within the PDA

Watercourse	Crossing Assessment ID	Physical Observations		Channel Morphology		Substrate		In-stream Cover		Riparian Conditions	
Tributary to Mountain Brook	WC15-2022 - T1	Flow Regime	Intermittent	Morphology	Rifle	Bedrock	0	Overhanging Veg	Abundant	Crown Closure (%)	51-75
	west fork	stage	Low	Channel	N/A	Boulder	0	LWD	Trace	Bank Texture	Fines
		Bankful Width (m)	5	Islands	None	Cobble	80	Undercut	None	Left Bank Shape	Sloped
		Water Depth (cm)	4	Bars	None	Large Gravel	10	Deep Pool	None	Right Bank Shape	Sloped
		Velocity (m/sec)	0.5	Pattern	Sinuous	Small Gravel	10	SWD	Moderate	Veg Stage	Mature Forest
				Confinement	Confined	Fines	0	Instream Veg	Moderate		
	WC15-2022 - T2	Flow Regime	Intermittent	Morphplogy	Rifle	Bedrock	0	Overhanging Veg	Abundant	Crown Closure (%)	51-75
	east fork	stage	Low	Channel	N/A	Boulder	0	LWD	Trace	Bank Texture	Fines
		Bankful Width (m)	2.5	Islands	None	Cobble	80	Undercut	None	Left Bank Shape	Sloped
		Water Depth (cm)	2	Bars	None	Large Gravel	10	Deep Pool	None	Right Bank Shape	Sloped
		Velocity (m/sec)	1	Pattern	Sinuous	Small Gravel	10	SWD	Moderate	Veg Stage	Mature Forest
				Confinement	Confined	Fines	0	Instream Veg	Moderate		
Tributary to Mountain Brook	WC16-2022 - T2	Flow Regime	Intermittent	Morphology	Run	Bedrock	0	Overhanging Veg	Abundant	Crown Closure (%)	26-50
	East fork (US)	stage	Low	Channel	N/A	Boulder	0	LWD	Trace	Bank Texture	Fines
		Bankful Width (m)	2	Islands	None	Cobble	0	Undercut	Abundant	Left Bank Shape	Sloped
		Water Depth (cm)	3	Bars	None	Large Gravel	0	Deep Pool	None	Right Bank Shape	Sloped
		Velocity (m/sec)	0.7	Pattern	I Wandering	Small Gravel	40	SWD	Moderate	Veg Stage	Young Forest
				Confinement	Confined	Fines	60	Instream Veg	Moderate		
	WC16-2022 - T3	Flow Regime	Intermittent	Morphology	Rifle	Bedrock	0	Overhanging Veg	Moderate	Crown Closure (%)	26-50
	West fork (DS)	stage	Low	Channel	N/A	Boulder	0	LWD	Trace	Bank Texture	Fines
		Bankful Width (m)	1.5	Islands	None	Cobble	0	Undercut	None	Left Bank Shape	Sloped
		Water Depth (cm)	15	Bars	None	Large Gravel	0	Deep Pool	None	Right Bank Shape	Sloped
		Velocity (m/sec)	0.5	Pattern	Sinuous	Small Gravel	25	SWD	Moderate	Veg Stage	Young Forest
				Confinement	Confined	Fines	75	Instream Veg	Abundant		
	WC16-2022 - T4	Flow Regime	Ephemeral	Morphology	Run	Bedrock	0	Overhanging Veg	Moderate	Crown Closure (%)	26-50
	Downstream	stage	Low	Channel	N/A	Boulder	0	LWD	Trace	Bank Texture	Fines
		Bankful Width (m)	5	Islands	Occasional	Cobble	0	Undercut	None	Left Bank Shape	Sloped
		Water Depth (cm)	2	Bars	Side	Large Gravel	0	Deep Pool	None	Right Bank Shape	Sloped
		Velocity (m/sec)	0.25	Pattern	Sinuous	Small Gravel	35	SWD	Moderate	Veg Stage	Young Forest
				Confinement	Entrenched	Fines	65	Instream Veg	Moderate		

Table A-2: Fish Habitat Characteristics and Observations of Portapique River Watershed Watercourses within the PDA

Watercourse	Crossing Assessment ID	Physical Observations		Channel Morphology		Substrate		In-stream Cover[2]		Riparian Conditions	
Gleason Brook	GB-2022 - T1	Flow Regime	Small Perm	Morphology	Run	Bedrock	0	Overhanging Veg	Moderate	Crown Closure (%)	0
	50 m up	stage	Mid	Channel	N/A	Boulder	0	LWD	Moderate	Bank Texture	Fines
		Bankful Width (m)	4.61	Islands	Frequent	Cobble	0	Undercut	Moderate	Left Bank Shape	Vertical
		Water Depth (cm)	20	Bars	Side	Large Gravel	10	Deep Pool	Moderate	Right Bank Shape	Sloped
		Velocity (m/sec)	0.1	Pattern	I Meandering	Small Gravel	10	SWD	Trace	Veg Stage	Shrub
				Confinement	Entrenched	Fines	80	Instream Veg	Moderate		
	GB-2022 - T2	Flow Regime	Small Perm	Morphology	Rifle	Bedrock	0	Overhanging Veg	Abundant	Crown Closure (%)	1-25
	PDA crossing	stage	Mid	Channel	N/A	Boulder	10	LWD	Moderate	Bank Texture	Boulder
		Bankful Width (m)	5.7	Islands	None	Cobble	40	Undercut	Moderate	Left Bank Shape	Vertical
		Water Depth (cm)	7	Bars	None	Large Gravel	20	Deep Pool	Moderate	Right Bank Shape	Undercut
		Velocity (m/sec)	0.6	Pattern	Straight	Small Gravel	15	SWD	Trace	Veg Stage	Shrub
				Confinement	Entrenched	Fines	15	Instream Veg	Trace		
	GB-2022 - T3	Flow Regime	Small Perm	Morphology	Rifle	Bedrock	0	Overhanging Veg	Moderate	Crown Closure (%)	51-75
	50 down	stage	Mid	Channel	>1m	Boulder	15	LWD	None	Bank Texture	Cobble
		Bankful Width (m)	3.61	Islands	None	Cobble	35	Undercut	Abundant	Left Bank Shape	Undercut
		Water Depth (cm)	13	Bars	None	Large Gravel	35	Deep Pool	Trace	Right Bank Shape	Sloped
		Velocity (m/sec)	1	Pattern	Straight	Small Gravel	10	SWD	Trace	Veg Stage	Shrub
				Confinement	Entrenched	Fines	5	Instream Veg	Trace		
	GB-2022 - T4	Flow Regime	Small Perm	Morphology	Run	Bedrock	0	Overhanging Veg	Moderate	Crown Closure (%)	0
	100 m down	stage	Mid	Channel	>1m	Boulder	10	LWD	None	Bank Texture	Cobble
		Bankful Width (m)	3.56	Islands	None	Cobble	25	Undercut	Abundant	Left Bank Shape	Undercut
		Water Depth (cm)	24	Bars	None	Large Gravel	25	Deep Pool	Moderate	Right Bank Shape	Vertical
		Velocity (m/sec)	0.1	Pattern	Straight	Small Gravel	25	SWD	Trace	Veg Stage	Shrub
				Confinement	Entrenched	Fines	15	Instream Veg	None		
Tributary to Gleason Brook	WC8 - T1	Flow Regime	Ephemeral	Morphology	Run	Bedrock		Overhanging Veg	Trace	Crown Closure (%)	0-25
	upstream N fork	stage	Mid	Channel		Boulder		LWD	None	Bank Texture	Fines
		Bankful Width (m)	0.3	Islands		Cobble		Undercut	None	Left Bank Shape	Sloped
		Water Depth (cm)	5	Bars		Large Gravel	10	Deep Pool	None	Right Bank Shape	Sloped
		Velocity (m/sec)	0.3	Pattern		Small Gravel	40	SWD	None	Veg Stage	herb
				Confinement	Confined	Fines	50	Instream Veg	Moderate		
	WC8 - T2	Flow Regime	Ephemeral	Morphology	Rifle	Bedrock		Overhanging Veg	Trace	Crown Closure (%)	0-25
	upstream W fork	stage	Mid	Channel		Boulder	30	LWD	None	Bank Texture	Fines
		Bankful Width (m)	0.3	Islands		Cobble	30	Undercut	None	Left Bank Shape	Sloped
		Water Depth (cm)	n/a	Bars		Large Gravel		Deep Pool	None	Right Bank Shape	Sloped
		Velocity (m/sec)	n/a	Pattern		Small Gravel	20	SWD	None	Veg Stage	herb
				Confinement	Confined	Fines	20	Instream Veg	Moderate		
	WC8 - T3	Flow Regime	Ephemeral	Morphology	Run	Bedrock		Overhanging Veg	Trace	Crown Closure (%)	0-25
		stage	Mid	Channel		Boulder		LWD	None	Bank Texture	Fines
		Bankful Width (m)	1	Islands		Cobble	10	Undercut	None	Left Bank Shape	Sloped
		Water Depth (cm)	3	Bars		Large Gravel	10	Deep Pool	None	Right Bank Shape	Sloped
		Velocity (m/sec)	0.2	Pattern		Small Gravel	50	SWD	None	Veg Stage	herb
				Confinement	Unconfined	Fines	30	Instream Veg	Moderate		
	WC8 - T4	Flow Regime	Intermittent	Morphology	Run	Bedrock		Overhanging Veg	Trace	Crown Closure (%)	0-25
	downstream	stage	Mid	Channel		Boulder		LWD	None	Bank Texture	Fines
		Bankful Width (m)	0.8	Islands		Cobble	10	Undercut	None	Left Bank Shape	Sloped
		Water Depth (cm)	6	Bars		Large Gravel	10	Deep Pool	None	Right Bank Shape	Sloped
		Velocity (m/sec)	0.5	Pattern	Sinuous	Small Gravel	50	SWD	None	Veg Stage	herb
				Confinement	O Confined	Fines	30	Instream Veg	Moderate		
Tributary to Gleason Brook	WC9 - T1	Flow Regime	Small Perm	Morphology	Rifle	Bedrock		Overhanging Veg	Abundant	Crown Closure (%)	76-100
		stage	Mid	Channel		Boulder	90	LWD	None	Bank Texture	Boulder
	upstream	Bankful Width (m)	1.1	Islands		Cobble	10	Undercut	None	Left Bank Shape	Sloped
		Water Depth (cm)	0.1 (0.3 pool)	Bars		Large Gravel		Deep Pool	Moderate	Right Bank Shape	Sloped
		Velocity (m/sec)	>1	Pattern		Small Gravel		SWD	Moderate	Veg Stage	Shrub
				Confinement	Confined	Fines		Instream Veg	Trace		
	WC9 - T2	Flow Regime	Small Perm	Morphology	Rifle	Bedrock		Overhanging Veg	Moderate	Crown Closure (%)	26-50
		stage	Mid	Channel		Boulder	80	LWD	None	Bank Texture	Boulder
	PDA-upstream	Bankful Width (m)	2.6	Islands		Cobble	10	Undercut	None	Left Bank Shape	Undercut
		Water Depth (cm)	0.15	Bars		Large Gravel	10	Deep Pool	None	Right Bank Shape	Sloped
		Velocity (m/sec)	>1	Pattern		Small Gravel		SWD	Moderate	Veg Stage	Shrub
				Confinement	Confined	Fines		Instream Veg	Trace		
	WC9 - T3	Flow Regime	Small Perm	Morphology	Rifle	Bedrock		Overhanging Veg	Moderate	Crown Closure (%)	26-50
		stage	Mid	Channel		Boulder	80	LWD	None	Bank Texture	Gravel
	PDA downstream	Bankful Width (m)	2.5	Islands		Cobble	10	Undercut	None	Left Bank Shape	Sloped
		Water Depth (cm)	0.2	Bars		Large Gravel	10	Deep Pool	None	Right Bank Shape	Sloped
		Velocity (m/sec)	>1	Pattern		Small Gravel		SWD	Moderate	Veg Stage	Shrub
				Confinement	Confined	Fines		Instream Veg	Trace		
Tributary to Gleason Brook	WC3a - T1	Flow Regime	Intermittent	Morphology	Rapid	Bedrock	0	Overhanging Veg	None	Crown Closure (%)	51-75
		stage	Low	Channel	N/A	Boulder	0	LWD	Moderate	Bank Texture	Boulder
		Bankful Width (m)	1.35	Islands	None	Cobble	0	Undercut	Moderate	Left Bank Shape	Sloped
		Water Depth (cm)	3	Bars	None	Large Gravel	0	Deep Pool	None	Right Bank Shape	Undercut
		Velocity (m/sec)	0	Pattern	Straight	Small Gravel	0	SWD	Abundant	Veg Stage	Young Forest
				Confinement	O Confined	Fines	100	Instream Veg	Trace		
	WC3a - T2	Flow Regime	Intermittent	Morphology	Rapid	Bedrock	0	Overhanging Veg	Trace	Crown Closure (%)	26-50
		stage	Low	Channel	N/A	Boulder	0	LWD	Moderate	Bank Texture	Boulder
		Bankful Width (m)	1.15	Islands	None	Cobble	10	Undercut	Trace	Left Bank Shape	Sloped
		Water Depth (cm)	5	Bars	None	Large Gravel	5	Deep Pool	None	Right Bank Shape	Undercut
		Velocity (m/sec)	0.05	Pattern	Straight	Small Gravel	20	SWD	Moderate	Veg Stage	Young Forest
				Confinement	O Confined	Fines	65	Instream Veg	Trace		
	WC3a - T3	Flow Regime	Intermittent	Morphology	Rapid	Bedrock	0	Overhanging Veg	Trace	Crown Closure (%)	26-50
		stage	Low	Channel	N/A	Boulder	20	LWD	Moderate	Bank Texture	Boulder
		Bankful Width (m)	1.9	Islands	None	Cobble	50	Undercut	Trace	Left Bank Shape	Sloped
		Water Depth (cm)	8	Bars	None	Large Gravel	15	Deep Pool	None	Right Bank Shape	Undercut
		Velocity (m/sec)	0.04	Pattern	Straight	Small Gravel	5	SWD	Moderate	Veg Stage	Young Forest
				Confinement	O Confined	Fines	10	Instream Veg	Trace		
	WC3a - T4	Flow Regime	Ephemeral	Morphology	Flat	Bedrock	0	Overhanging Veg	Moderate	Crown Closure (%)	1-25
		stage	Low	Channel	N/A	Boulder	0	LWD	None	Bank Texture	Fines
		Bankful Width (m)	0.5	Islands	None	Cobble	0	Undercut	Moderate	Left Bank Shape	Undercut
		Water Depth (cm)	5	Bars	None	Large Gravel	0	Deep Pool	None	Right Bank Shape	Undercut
		Velocity (m/sec)	0	Pattern	Straight	Small Gravel	0	SWD	Trace	Veg Stage	
				Confinement	Entrenched	Fines	100	Instream Veg	Moderate		

Table A-2: Fish Habitat Characteristics and Observations of Portapique River Watershed Watercourses within the PDA

Watercourse	Crossing Assessment ID	Physical Observations		Channel Morphology		Substrate		In-stream Cover[2]		Riparian Conditions	
Tributary to Gleason Brook	WC3b - T1	Flow Regime	Small Perm	Morphology	Run	Bedrock	0	Overhanging Veg	Moderate	Crown Closure (%)	0
		stage	Mid	Channel	N/A	Boulder	0	LWD	Trace	Bank Texture	Fines
		Bankful Width (m)	1.91	Islands	None	Cobble	0	Undercut	Moderate	Left Bank Shape	Sloped
		Water Depth (cm)	17	Bars	None	Large Gravel	30	Deep Pool	Moderate	Right Bank Shape	Sloped
		Velocity (m/sec)	0.01	Pattern	Sinuous	Small Gravel	30	SWD	Trace	Veg Stage	Shrub
				Confinement	Confined	Fines	40	Instream Veg	Trace		
	WC3b - T2	Flow Regime	Small Perm	Morphology	Rifle	Bedrock	0	Overhanging Veg	Trace	Crown Closure (%)	51-75
		stage	Mid	Channel	N/A	Boulder	10	LWD	Moderate	Bank Texture	Boulder
		Bankful Width (m)	1.81	Islands	None	Cobble	20	Undercut	Moderate	Left Bank Shape	Undercut
		Water Depth (cm)	5	Bars	None	Large Gravel	30	Deep Pool	Trace	Right Bank Shape	Sloped
		Velocity (m/sec)	0.6	Pattern	Straight	Small Gravel	20	SWD	Moderate	Veg Stage	Young Forest
				Confinement	F Confined	Fines	20	Instream Veg	None		
	WC3b - T3	Flow Regime	Small Perm	Morphology	Rifle	Bedrock	0	Overhanging Veg	Moderate	Crown Closure (%)	1-25
		stage	Mid	Channel	N/A	Boulder	0	LWD	None	Bank Texture	Fines
		Bankful Width (m)	1.8	Islands	Frequent	Cobble	10	Undercut	Moderate	Left Bank Shape	Undercut
		Water Depth (cm)	5	Bars	None	Large Gravel	80	Deep Pool	None	Right Bank Shape	Sloped
		Velocity (m/sec)	0.6	Pattern	I Wandering	Small Gravel	5	SWD	Moderate	Veg Stage	Young Forest
				Confinement	O Confined	Fines	5	Instream Veg	Trace		
	WC3b - T4	Flow Regime	Small Perm	Morphology	Rifle	Bedrock	0	Overhanging Veg	Abundant	Crown Closure (%)	0
		stage	Mid	Channel	N/A	Boulder	5	LWD	None	Bank Texture	Cobble
		Bankful Width (m)	1.17	Islands	Occasional	Cobble	80	Undercut	Moderate	Left Bank Shape	Sloped
		Water Depth (cm)	6	Bars	None	Large Gravel	10	Deep Pool	None	Right Bank Shape	Vertical
		Velocity (m/sec)	0.1	Pattern	Straight	Small Gravel	0	SWD	Moderate	Veg Stage	Young Forest
				Confinement	O Confined	Fines	5	Instream Veg	Moderate		
Tributary to Fountain Brook	WC17-2022 - T1	Flow Regime	Ephemeral	Morphology	Flat	Bedrock	0	Overhanging Veg	0	Crown Closure (%)	51-75
		stage	Dry	Channel	N/A	Boulder	10	LWD	10	Bank Texture	Fines
		Bankful Width (m)	1.4	Islands	None	Cobble	0	Undercut	0	Left Bank Shape	Sloped
		Water Depth (cm)	0	Bars	None	Large Gravel	0	Deep Pool	0	Right Bank Shape	Sloped
		Velocity (m/sec)	0	Pattern	Straight	Small Gravel	0	SWD	0	Veg Stage	Mature Forest
				Confinement	Unconfined	Fines	90	Instream Veg	90		
	WC17-2022 - T2	Flow Regime	Intermittent	Morphology	Flat	Bedrock	0	Overhanging Veg	0	Crown Closure (%)	51-75
		stage	Low	Channel	N/A	Boulder	0	LWD	0	Bank Texture	Fines
		Bankful Width (m)	1.1	Islands	None	Cobble	0	Undercut	0	Left Bank Shape	Sloped
		Water Depth (cm)	0.03	Bars	None	Large Gravel	0	Deep Pool	0	Right Bank Shape	Sloped
		Velocity (m/sec)	0	Pattern	Straight	Small Gravel	0	SWD	0	Veg Stage	Mature Forest
				Confinement	Unconfined	Fines	100	Instream Veg	100		
	WC17-2022 - T3	Flow Regime	Intermittent	Morphology	Flat	Bedrock	0	Overhanging Veg	0	Crown Closure (%)	76-100
		stage	Low	Channel	N/A	Boulder	25	LWD	25	Bank Texture	Boulder
		Bankful Width (m)	1.7	Islands	None	Cobble	15	Undercut	15	Left Bank Shape	Sloped
		Water Depth (cm)	10	Bars	Side	Large Gravel	0	Deep Pool	0	Right Bank Shape	Sloped
		Velocity (m/sec)	0	Pattern	Straight	Small Gravel	0	SWD	0	Veg Stage	Mature Forest
				Confinement	O Confined	Fines	60	Instream Veg	60		
	WC17-2022 - T4	Flow Regime	Intermittent	Morphology	Rapid	Bedrock	0	Overhanging Veg	0	Crown Closure (%)	76-100
		stage	Dry	Channel	N/A	Boulder	60	LWD	60	Bank Texture	Boulder
		Bankful Width (m)	1.55	Islands	None	Cobble	40	Undercut	40	Left Bank Shape	Sloped
		Water Depth (cm)	0	Bars	None	Large Gravel	0	Deep Pool	0	Right Bank Shape	Sloped
		Velocity (m/sec)	0	Pattern	Sinuous	Small Gravel	0	SWD	0	Veg Stage	Mature Forest
				Confinement	O Confined	Fines	0	Instream Veg	0		
Tributary to Duck Pond	WC5-2022 - T1	Flow Regime	Intermittent	Morphology	Rifle	Bedrock	0	Overhanging Veg	-	Crown Closure (%)	51-75
		stage	Low	Channel	N/A	Boulder	10	LWD	-	Bank Texture	Boulder
		Bankful Width (m)	1.26	Islands	None	Cobble	30	Undercut	-	Left Bank Shape	Sloped
		Water Depth (cm)	2	Bars	None	Large Gravel	40	Deep Pool	-	Right Bank Shape	Sloped
		Velocity (m/sec)	0	Pattern	Sinuous	Small Gravel	15	SWD	-	Veg Stage	Young Forest
				Confinement	Confined	Fines	5	Instream Veg	-		
	WC5-2022 - T2	Flow Regime		Morphology		Bedrock	0	Overhanging Veg	Moderate	Crown Closure (%)	51-75
		stage		Channel	N/A	Boulder	20	LWD	Moderate	Bank Texture	Boulder
		Bankful Width (m)	1.34	Islands		Cobble	40	Undercut	Moderate	Left Bank Shape	Sloped
		Water Depth (cm)	0	Bars		Large Gravel	20	Deep Pool	None	Right Bank Shape	Undercut
		Velocity (m/sec)	0	Pattern		Small Gravel	10	SWD	Moderate	Veg Stage	Young Forest
				Confinement		Fines	0	Instream Veg	None		
	WC5-2022 - T3	Flow Regime	Intermittent	Morphology	Rifle	Bedrock	0	Overhanging Veg	Moderate	Crown Closure (%)	76-100
		stage	Low	Channel	N/A	Boulder	20	LWD	Trace	Bank Texture	Boulder
		Bankful Width (m)	2.6	Islands	None	Cobble	40	Undercut	Trace	Left Bank Shape	Undercut
		Water Depth (cm)	5	Bars	None	Large Gravel	30	Deep Pool	None	Right Bank Shape	Sloped
		Velocity (m/sec)	0	Pattern	Sinuous	Small Gravel	10	SWD	Moderate	Veg Stage	Mature Forest
				Confinement	F Confined	Fines	0	Instream Veg	Moderate		

Table A-2: Fish Habitat Characteristics and Observations of Portapique River Watershed Watercourses within the PDA

Watercourse	Crossing Assessment ID	Physical Observations		Channel Morphology		Substrate		In-stream Cover[2]		Riparian Conditions	
Tributary to Duck Pond	WC6-2022 - T1	Flow Regime	Ephemeral	Morphology	Flat	Bedrock	0	Overhanging Veg	None	Crown Closure (%)	76-100
		stage	Dry	Channel	N/A	Boulder	10	LWD	None	Bank Texture	Fines
		Bankful Width (m)	0.64	Islands	None	Cobble	10	Undercut	None	Left Bank Shape	Sloped
		Water Depth (cm)	0	Bars	None	Large Gravel	0	Deep Pool	None	Right Bank Shape	Sloped
		Velocity (m/sec)	n/a	Pattern	Straight	Small Gravel	0	SWD	Moderate	Veg Stage	Young Forest
				Confinement	Confined	Fines	80	Instream Veg	None		
	WC6-2022 - T2	Flow Regime	Ephemeral	Morphology	Rifle	Bedrock	0	Overhanging Veg	Trace	Crown Closure (%)	76-100
		stage	Low	Channel	N/A	Boulder	5	LWD	Trace	Bank Texture	Fines
		Bankful Width (m)	0.92	Islands	None	Cobble	15	Undercut	None	Left Bank Shape	Sloped
		Water Depth (cm)	1	Bars	None	Large Gravel	0	Deep Pool	None	Right Bank Shape	Sloped
		Velocity (m/sec)	0	Pattern	Sinuous	Small Gravel	0	SWD	Moderate	Veg Stage	Young Forest
				Confinement	O Confined	Fines	80	Instream Veg	None		
	WC6-2022 - T3	Flow Regime	Ephemeral	Morphology	Rifle	Bedrock	0	Overhanging Veg	Abundant	Crown Closure (%)	51-75
		stage	Dry	Channel	N/A	Boulder	0	LWD	None	Bank Texture	Cobble
		Bankful Width (m)	0.68	Islands	Occasional	Cobble	50	Undercut	None	Left Bank Shape	Undercut
		Water Depth (cm)	0	Bars	None	Large Gravel	0	Deep Pool	None	Right Bank Shape	Sloped
		Velocity (m/sec)	0	Pattern	Sinuous	Small Gravel	0	SWD	Trace	Veg Stage	Young Forest
				Confinement	Unconfined	Fines	50	Instream Veg	Abundant		
	WC6-2022 - T4	Flow Regime	Ephemeral	Morphology	Rifle	Bedrock	0	Overhanging Veg	Moderate	Crown Closure (%)	51-75
		stage	Low	Channel	N/A	Boulder	20	LWD	Moderate	Bank Texture	Boulder
		Bankful Width (m)	3.17	Islands	Occasional	Cobble	40	Undercut	Trace	Left Bank Shape	Sloped
		Water Depth (cm)	3	Bars	None	Large Gravel	20	Deep Pool	None	Right Bank Shape	Sloped
		Velocity (m/sec)	0	Pattern	I Meandering	Small Gravel	10	SWD	Abundant	Veg Stage	Young Forest
				Confinement	Confined	Fines	10	Instream Veg	Moderate		

Table A-3: Watercourse Quality Parameters measured *in-situ* for the Westchester Wind Project

Watercourse Name	Assessed Location	Date	Temp. °C	D.O. mg/L	pH	Cond. µS/cm	TDS mg/L	ORP mV
Mountain Brook	T1	07/27/2022	15	8.84	6.31	27.5	18.2	254
Mountain Brook	T2	07/26/2022	15.1	8.17	6.47	29.1	18.85	266
Mountain Brook	T3	07/27/2022	15	9.17	6.43	19.1	18.85	269
Mountain Brook	T4	07/27/2022	14.9	8.27	6.47	29.1	18.85	267
WC1a-2022	T1	26-07-2022	17.5	7.64	6.3	30.4	19.5	223
WC1a-2022	T2	26-07-2022	17.6	7.53	6.31	30	19.5	235
WC1a-2022	T3	26-07-2022	16.6	8.05	6.3	29.5	18.85	239
WC1a-2022	T4	26-07-2022	16.6	8.37	6.23	29	18.85	247
WC1b-2022	T1	07/27/2022	15.9	8.56	6.4	31	20.15	282
WC1b-2022	T2	07/27/2022	15.7	8.61	6.67	31.4	20.15	274
WC1b-2022	T3	07/27/2022	15.8	8.21	6.55	31.4	20.15	274
WC1b-2022	T4	07/27/2022	16	7.71	6.45	31.3	20.15	274
WC7-2022	T1	07/28/2022	Insufficient Water					
WC7-2022	T2	07/28/2022	15.8	5.03	6.1	41.3	26.65	296
WC7-2022	T3	07/28/2022	Insufficient Water					
WC7-2022	T4	07/28/2022	Insufficient Water					
WC15-2022	T1	07/13/2022	12.4	-	6.7	55		
WC15-2022	T2	07/13/2022	13.8	-	6.5	51		
WC16-2022	T3	07/13/2022	12.6	-	7.03	22		
Gleason Brook	T2	10/05/2021	7.4	11.9	7.27	31.3		
Gleason Brook	T1	26-07-2022	6.8	8.09	6.48	35.3	22.76	185
Gleason Brook	T2	26-07-2022	17.5	8.69	6.52	34.7	22.75	236
Gleason Brook	T3	26-07-2022	18	8.77	6.53	34.5	22.75	247
Gleason Brook	T4	26-07-2022	18	7.19	6.65	34.6	22.75	231
WC8-2021	T2	10/05/2021	8.3	9.96	7.35	27.7	-	
WC9-2021	T1	10/05/2021	8.1	11.66	7.22	26.5	-	
WC3a-2021	T1	07/28/2022	Dry	-	-	-	-	
WC3a-2021	T2	07/28/2022	Insufficient Water					
WC3a-2021	T3	07/28/2022	14.2	7.5	6.07	28.9	18.85	300
WC3a-2021	T4	07/28/2022	Insufficient Water					
WC3b-2021	T2	10/05/2021	6.5	10.53	6.9	28.7	-	
WC3b-2021	T1	07/29/2022	12.5	6.15	5.75	38.8	25.35	230
WC3b-2021	T2	07/29/2022	12.8	8.25	5.93	36.3	23.4	322
WC3b-2021	T3	07/29/2022	12.8	9.03	6.39	36.6	24.05	303

Watercourse Name	Assessed Location	Date	Temp. °C	D.O. mg/L	pH	Cond. µS/cm	TDS mg/L	ORP mV
WC3b-2021	T4	07/29/2022	13.8	7.45	6.45	38	24.7	293
WC3b-2021	T5	07/29/2022	13.2	9.24	6.36	36.5	23.4	295
WC17-2022	T1	07/27/2022	Dry	-	-	-	-	
WC17-2022	T2	07/27/2022	Insufficient Water					
WC17-2022	T3	07/27/2022	18.1	3.37	5.74	36.7	25.05	264
WC17-2022	T4	07/27/2022	Dry	-	-	-	-	
WC5-2022	T1	07/28/2022	17.2	4.73	5.94	24.9	16.25	278
WC5-2022	T2	07/28/2022	Dry	-	-	-	-	
WC5-2022	T3	07/28/2022	16.3	5.35	6	33.8	15.6	305
WC6-2022	T1	27-07-2022	Dry	-	-	-	-	
WC6-2022	T2	27-07-2022	20.9	4.07	5.73	31.3	20.15	319
WC6-2022	T3	27-07-2022	Dry	-	-	-	-	
WC6-2022	T4	07/27/2022	12.9	5.51	5.43	27.4	17.55	310

Notes:

Temp: Temperature; D.O.: Dissolved Oxygen, Cond.: Conductivity; TDS Total Dissolved Solids, and ORP: Oxidative Reduction Potential.

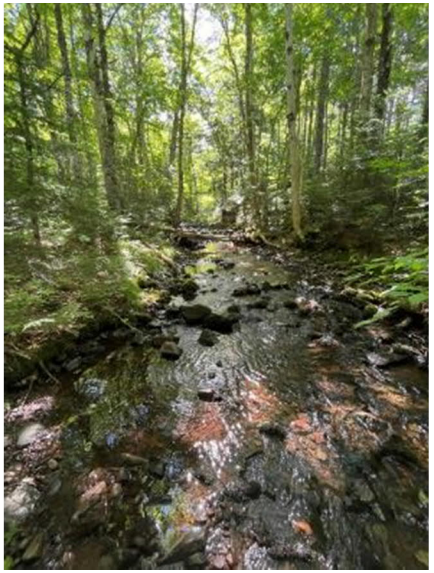
Appendix B

Photographs

Mountain Brook

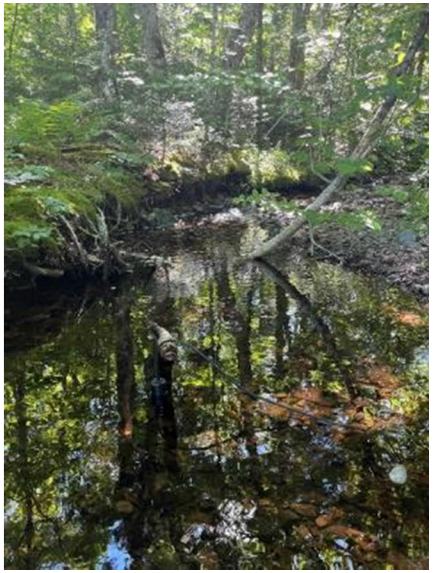
T1 July 27, 2022 50 m upstream from PDA Crossing

T2 – July 27, 2022 at PDA Crossing



T3 July 27, 2022 50 m downstream from PDA Crossing

T4 July 27, 2022 100 m downstream from PDA Crossing



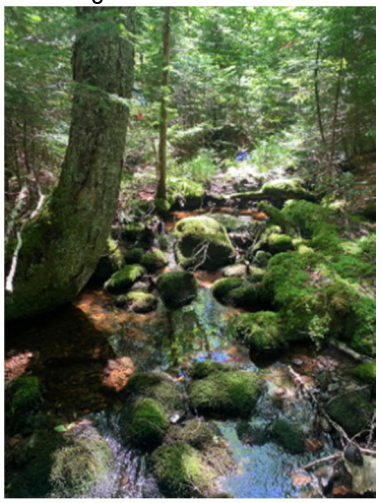
WC1a-2022

T1 July 26, 2022 50 m upstream from PDA Crossing

Brook Trout Observed in WC1-2022 July 26, 2022

T2 – July 26, 2022 at PDA Crossing

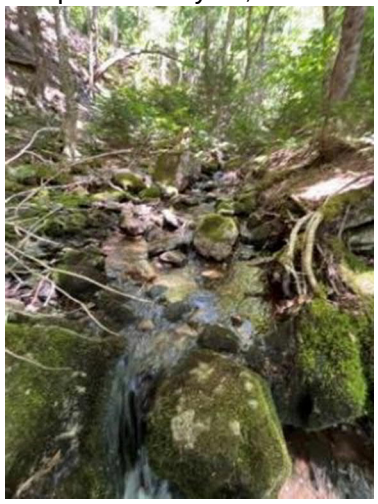
T3 July 26, 2022 50 m downstream from PDA Crossing



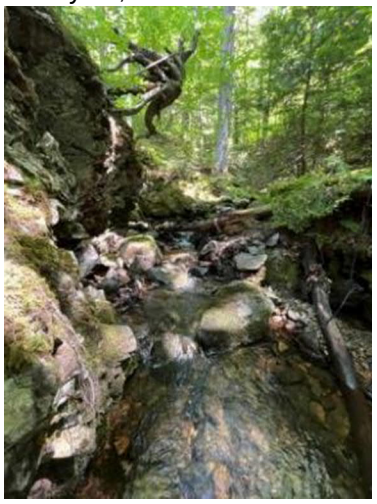
T4 July 26, 2022 100 m downstream from PDA Crossing

WC1b-2022

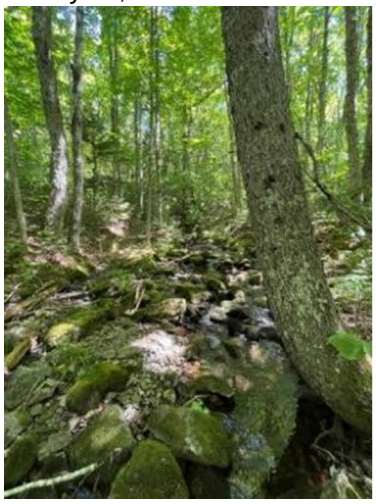
T1 Upstream July 27, 2022



T2 July 27, 2022



T3 July 27, 2022



T4 Downstream July 27, 2022

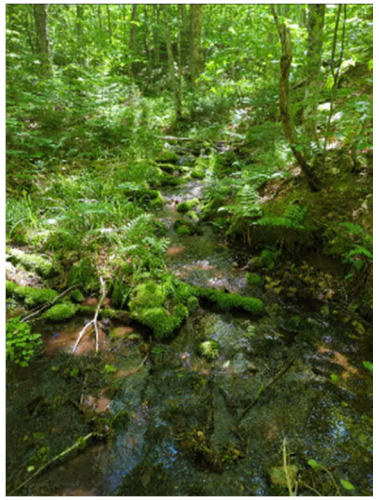
WC15-2022

July 13, 2022 – T1 (west fork)

July 13, 2022 – T1 (west fork)

July 13, 2022 – T2 (east fork)

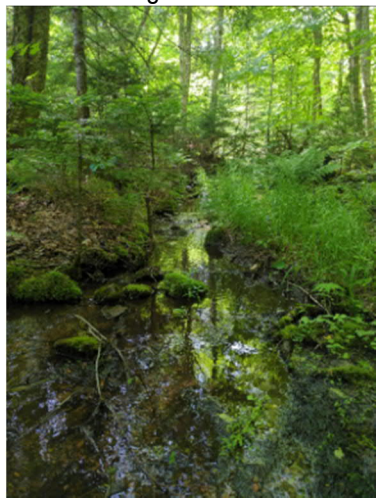
July 13, 2022 – T2 (east fork)



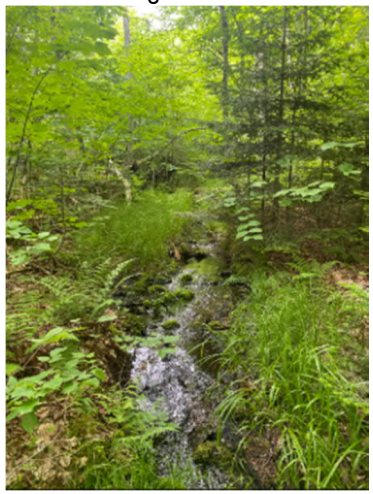
WC16-2022

T1 July 13, 2022 – East fork upstream

T2 July 13, 2022 – East fork at PDA crossing



T3 July 13, 2022 – West fork at PDA crossing



T4 July 13, 2022 – Small minnow observed Downstream

WC7-2022

T1 July 28, 2022 50 m upstream from PDA Crossing

T2 – July 28, 2022 at PDA Crossing (flows under an existing access road through a metal culvert)

T3 July 28, 2022 50 m downstream from PDA Crossing

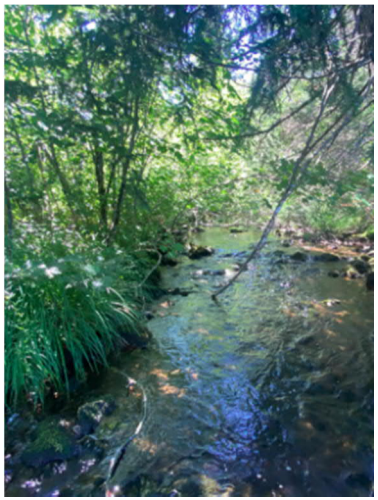
T4 July 28, 2022 100 m downstream from PDA Crossing

Gleason Brook

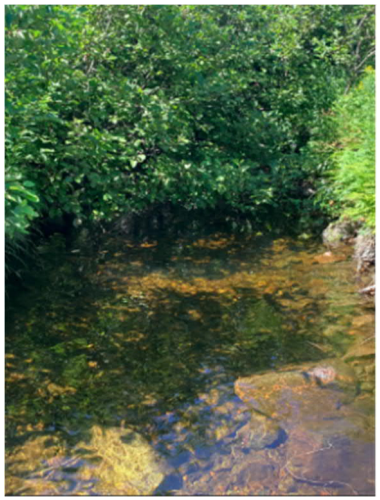
T1 July 26, 2022 50 m upstream

T2 July 26, 2022 PDA Crossing

T3 July 26, 2022 50 m downstream



T4 July 26, 2022 100 m downstream



WC8-2021

T1 October 5, 2021 upstream from the north fork

T2 October 8, 2021 upstream from the west fork

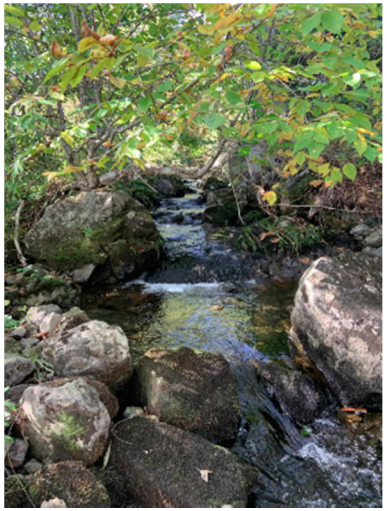
T3 October 5, 2021 –PDA Crossing

T4 October 5, 2021 downstream

WC9-2021

T1 October 5, 2021 Upstream

T2 October 5, 2021 Parallel to PDA (Upstream)



T3 October 5, 2021 Parallel to PDA (Downstream)

Flow towards Gleason via a hanging culvert.

WC3a-2021

T1 - July 28, 2022. Initiation of WC3A at the outflow of WL-6, ~30 m downstream of proposed crossing.

T2 - July 28, 2022. Crossing existing trail, ~40 m downstream of PDA crossing.

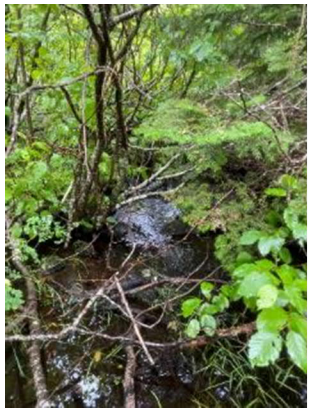
T3 July 28, 2022, 50 m downstream of PDA crossing.

T4 July 28, 2022, 100 m downstream of PDA crossing.

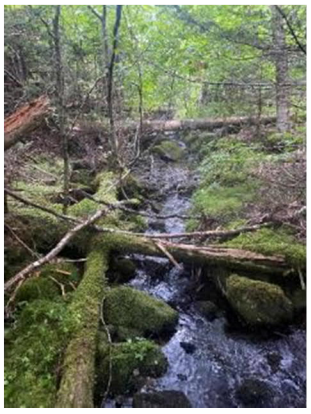



WC3b-2021

T1 July 29, 2022 50 m upstream from PDA Crossing



T2 – July 29, 2022 at PDA Crossing



T3 July 29, 2022 50 m downstream from PDA Crossing

July 29, 2022 ephemeral input to WC3b, 60 m downstream from PDA Crossing

T4 July 29, 2022 100 m downstream from PDA Crossing

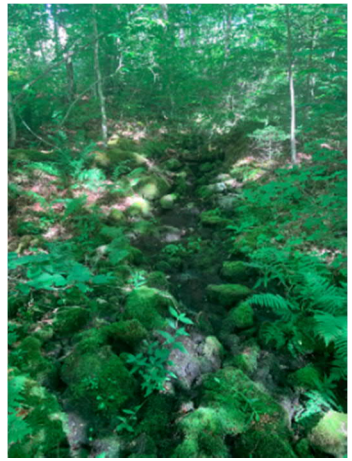
WC17-2022

T1 July 27, 2022 dry channel upstream from PDA Crossing

T2 – July 27, 2022 ~60 m downstream from PDA Crossing and ~60 m upstream from a proposed collector line crossing

T3 – July 27, 2022 ~230 m downstream from PDA road crossing and ~90 m downstream from a proposed collector line crossing

T4 – July 27, 2022 ~280 m downstream from PDA road crossing and ~140 m downstream from a proposed collector line crossing



WC5-2022

T1 July 28, 2022 50 m upstream from PDA Crossing

T2 – July 28, 2022 at PDA Crossing

Small fish in small isolated pools 30-60 m downstream of PDA crossing location.

T3 – July 27, 2022 at PDA Crossing

T3 July 28, 2022 50 m downstream from PDA Crossing

WC6-2022

T1 July 28, 2022 upstream

T2 – July 28, 2022

T3 – July 28, 2022

T4 – July 28, 2022 downstream