

- Mainland Moose Concentration Areas were created by the Nova Scotia Department of Natural Resources in 2012 using maps of preferred habitat, occupied range, and observational data to pinpoint areas of potential occupancy (NSDNR 2012a; NSDNRR 2021). One of these patches determined to be Mainland Moose Concentration Areas is located in the PDA.
- Crown Land Segments, which are directly adjacent to the west of the study area, approximately 500 metres to the east, 900 metres to the south, and 2.3 kilometres to the north of the study area

6.3 Socioeconomic VECs

The Project is located on a mixture of blueberry fields, previously forested land and undeveloped forested land in Cumberland County near the communities of Westchester Station, Rose, and Londonderry, and adjacent to Highway 104. Because potential exists for the Project to interact with many communities, the Cumberland Municipal District, shown on Figure 24, was considered as the LAA. The latest Statistics Canada data was reviewed to obtain information on the population and local economy of the Cumberland Municipal District, as well as an overview of the tourism/recreation industry within the area. This allows the Proponent to evaluate how the Project may affect the community and local economy. Background on the area and populations of the municipal district and nearby centres are summarized below.

Demographic Overview

In 2016, the population of the Cumberland Municipal District Census Subdivision (CS) was 4,115 (Statistics Canada 2017). Statistics on the population and demographics of the Cumberland Municipal District and Nova Scotia are presented in Table 24.



WESTCHESTER WIND PROJECT

LOCAL ASSESSMENT AREA FOR THE SOCIOECONOMIC ENVIRONMENT

- ◆ Proposed Turbine Location
- Substation
- Existing Site Road
- New Site Road
- - - Proposed Collector Network
- - - Interconnection Line
- Site Parcel
- Highway
- Public Road
- Watercourse
- Mapped Waterbodies
- Municipal Boundary



SCALE 1:55,000

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

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



PROJECT: 21-1329
STATUS: DRAFT
DATE: 2022-02-03

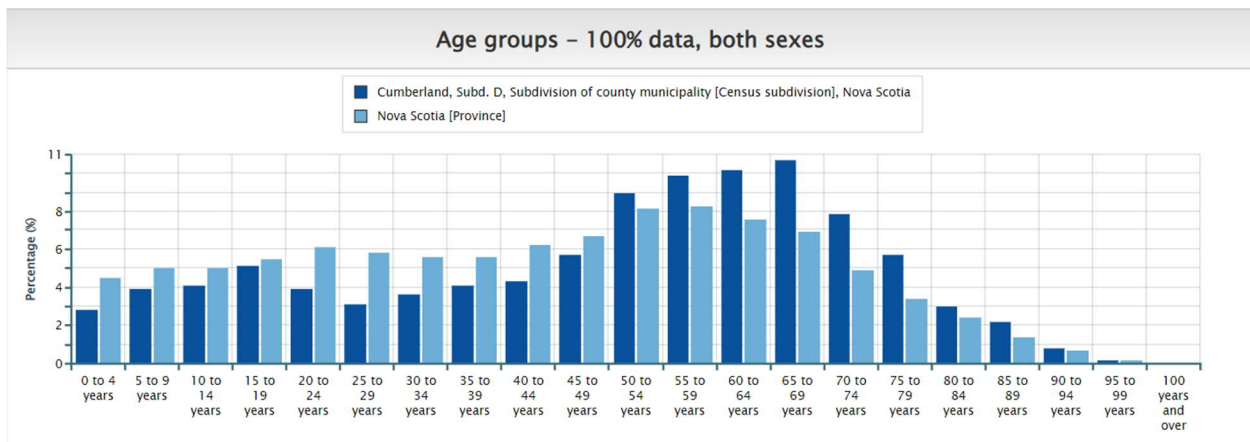
Base Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNR/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

TABLE 24: POPULATION AND DEMOGRAPHICS FOR CUMBERLAND CS AND NOVA SCOTIA

	Cumberland Municipal District Census Subdivision	Nova Scotia
Population in 2016	4,155	923,598
Population in 2011	4,266	921,727
2011-2016 Population Change (%)	-2.6	0.2
Total private dwellings (2016)	3,380	458,568
Total number of households (2016)	1,861	401,990
Population density per square km (2016)	3.9	17.4
Land area (square km) 2016	1,054.30	52,942.27
Median Age of the Population (2016)	55.4	45.5

Trends for population growth as well as the median age for Cumberland County CS are contrary to those experienced overall by the province of Nova Scotia based on the 2016 census. The population of Cumberland County had decreased at a rate of -2.6% per year over 15 years of census data (from 2001 to 2016). In comparison, the province of Nova Scotia had grown at a modest rate (0.2 %) over the same period. The median age of the population of the Cumberland Municipal District was 55.4 in 2016 which is greater than the provincial median age of 45.5. This data is in line with the Province of Nova Scotia's trends of urbanizing and aging populations. The population by age cohort in Cumberland Country is presented in Figure 25.

Police and hospital services are available in Cumberland and Springhill to service the needs of the community. The Cumberland County Detachment of the RCMP is located in Oxford, Nova Scotia. The nearest hospital with emergency services to the Project site is the All Saints Springhill Hospital, located in Springhill, NS. Fire services are also provided by that Municipality of Cumberland County and the closest fire station to the PDA is the Westchester Volunteer Fire Department, located in Westchester Station, NS.



Source: Statistics Canada 2016 Census of Population Community Profiles

FIGURE 25: POPULATION BY AGE COHORT, CUMBERLAND CENSUS SUBDIVISION D

6.3.1 Economy

The Project is located within the Province’s Cumberland Economic Region. Statistics Canada identified that there are approximately 12,100 residents actively employed, representing a participation (employment) rate of 54% (Statistics Canada 2017). This participation rate is lower than the provincial average of 61.3%.

The Cumberland County employment profile is dominated by work in health care and social assistance, manufacturing and retail trades. These industries account for more than 40% of the total employment in the economic region. The percentage of the labour force employed by each industry category within the Cumberland County Municipal District is provided in **Table 26**.

TABLE 25: LABOUR FORCE BY INDUSTRY, CUMBERLAND COUNTY MUNICIPAL DISTRICT

Industry	Total (%)
Health care and social assistance	16.0
Manufacturing	13.6
Retail trade	12.5
Public administration	7.6
Construction	7.2
Agriculture, forestry, fishing and hunting	6.7
Accommodation and food services	6.3
Educational services	5.7
Administrative and support, waste management and remediation services	4
Other services (except public administration)	3.2
Transportation and warehousing	2.8
Professional, scientific and technical services	2.7
Wholesale trade	2.5

Industry	Total (%)
Arts, entertainment and recreation	1.9
Finance and insurance	1.7
Mining, quarrying, and oil and gas extraction	1.6
Information and cultural industries	1
Real estate and rental leasing	1
Utilities	0.1
Management of companies and enterprises	0.07

Source: Statistics Canada 2016 Census

The Proponent remains committed to engaging local service providers where possible during each phase of the Project. The Project has the potential to stabilize costs for Nova Scotia Power customers and increase property tax revenues for the Cumberland Regional Municipality.

6.3.2 Land Use and Value

The Project area is proposed on privately-owned land parcels. The privately owned site lands have been recently used for commercial blueberry farming, forestry, maple syrup harvesting, and recreation. Adjacent lands are largely used for similar activities, with the addition of industrial activities related to the adjacent quarry and telecommunication towers. Existing development in the area is largely tied to residential and agricultural properties along roadways with concentrated development generally limited to the small communities in the areas of Millvale (northwest of the Project area) and Westchester Station (northeast of the Project area). Natural Forces remains committed to working with land owners and users to maintain safe use and enjoyment of these lands. Further details on the public consultation completed is detailed in Section 4.0.

The center of the Project area is approximately 3.5 and 12 km from the communities of Rose and Londonderry, respectively. These communities are composed of various residential, agricultural, industrial and commercial properties. The nearest structure to the site is a single-detached residential dwelling located approximately 1 km from the nearest proposed turbine location.

The primary building type in the Cumberland County Municipal District is residential dwellings. There are 18,445 private dwellings in the district, of which 10,340 are single-detached homes. According to Statistics Canada (2017), the average value of a property within the Cumberland Census Subdivision in 2016 was \$145,838, which is lower than the provincial average of \$230,441. The majority of residential properties are single detached houses within Cumberland County Municipal.

In 2010 a study in the Municipality of Chatham-Kent, Ontario was prepared to assess the effects of wind energy on real estate values in accordance with the Canadian Uniform Standards of Professional Appraisal Practice for the Appraisal Institute of Canada (Canning et al. 2010). The study found that it was highly unlikely that a relationship exists between wind farms and the market values of rural residential real estate. Additionally, a study analyzing more than 7,000 home and farm sales from 2002 to 2010 in the Melancthon Township and 10 surrounding counties found that Ontario's first and largest wind farm

(133 turbines) had “no statistically significant effect” on property values (Vyn and McCullough 2014). Further, the study found a lack of significant effect is similar across both rural residential properties and agricultural properties (Vyn and McCullough 2014).

There are existing radiocommunication systems near the Project lands. Of the various types of radiocommunication towers, the following are near the Project: fixed (point-to-point), broadcast, land mobile, and cellular towers. There are four point-to-point (PTP) links that cross or come near to the proposed turbine locations. These towers, and the PTP links, are illustrated on the maps included in the Radiocommunication System Impact Study included in Appendix M.

6.3.3 Transportation

Delivery of materials and equipment will be phased throughout the construction period depending upon the specific construction activity. The vehicles likely to be involved include:

- Large trucks with trailers for delivery of materials, earth-moving equipment and cargo containers for storage of tools and parts;
- Dump trucks to deliver and/or move stone for constructing the internal site roads;
- Concrete trucks for constructing WTG foundations;
- One 600 tonne main lift crane;
- One 500 tonne base and mid install crane;
- One 60 tonne pre-assembly crane;
- WTG component delivery vehicles; and
- Miscellaneous light vehicles including cars and pickup trucks.

Of these predicted vehicle movements, some will be oversized loads associated with the delivery of the WTG component parts (towers, blades, nacelles) and the cranes required for erection. These deliveries will be subject to movement orders and permits as agreed upon with governing authorities.

In addition to private roads on private land, publicly managed roads will be used for transportation to the Project site and any potential modifications to intersections for access to the Project Area will follow appropriate traffic controls and permitting. The site is currently accessed via Westchester Road, a gravel road that branches out into a network of other moderately maintained roads throughout the Project area. Access to Westchester Road is located on the north side of Wentworth Collingwood road via Highway 104, approximately 2 km southwest of the site and shown on Figure 24. Existing access roads that will be used for the Project will need to be widened to support heavy equipment and material movements and turning radii.

The construction delivery route will be decided after a review of the local road network and through consultation with local authorities in each jurisdiction. Roads used for the construction phase of the Project will comply with intermediate and maximum weight road restriction lists (provided online on the Nova Scotia *Roads Designation* website). If required, a Transportation Plan will be provided to the Nova Scotia Department of Public Works.

Wind turbines are required to be setback from public highways, roads, and streets, which includes roads and streets within boundaries of a city, designated highways, and areas designated for those purposes in a community plan. The Project layout does not infringe on the minimum setbacks from public roads or transportation routes.

6.3.4 Recreation and Tourism

Nova Scotia markets itself as a tourism destination, with a tourism industry that generated an estimated \$2.64 billion in tourism revenues in 2019 based on preliminary estimates. The province also contributed more than \$936 million to tourism-related GDP, and generated 19,300 direct and spinoff jobs in 2017 (NSFTB 2021). In 2019, tourism revenues were an estimated \$2.64 billion for the province as a whole (Tourism Nova Scotia 2022). Cumberland County Municipal District falls into the Fundy Shore and Annapolis Valley tourist region, which accounts for approximately 15% of the province’s tourism revenues (Tourism Nova Scotia 2022).

Popular recreational activities within Cumberland County include skiing, camping, hunting, snowmobiling, and all-terrain vehicle (ATV) use. Mapping of local ATV and hiking trails were reviewed, as well as all federal, provincial, and local recreation sites, tourism features, and parks within a 5 km radius of the Project footprint. Recreation features within the 5 km radius and notable features outside of this boundary is provided below in Table 26.

TABLE 26: RECREATIONAL AND TOURISM FEATURES NEAR THE PROJECT SITE

Feature	Distance to nearest WTG
SANS Trails	Intersects the PDA
Portapique River Wilderness Area	1 km
Trans-Canada Highway (104)	1.7 km

Interactive mapping from the Snowmobile Association of Nova Scotia (SANS) was reviewed for recreational trails on and adjacent to the Project site. SANS is an incorporated non-for-profit association that represents approximately 4,500 snowmobiling families throughout Nova Scotia (SANS 2022) Trails 104, 212, and 215, as well as a SANS warming shelter intersect with the proposed PDA.

The Portapique River Wilderness Area is located to the South of the PDA approximately 1 km from the nearest proposed WTG location. Wilderness Areas are provincially-significant protected areas that represent (typical) examples of Nova Scotia's natural landscapes, native biological diversity, and outstanding natural features (NSE 2018). Wilderness areas are protected under the *Wilderness Areas Protection Act*.

The Trans-Canada Highway 104 crosses within 1.7 km from the nearest proposed WTG location. Highway 104 forms the main route of the Trans-Canada Highway across Nova Scotia. This highway is approximately 320 km long and runs from the Nova Scotia-New Brunswick boarder to River Tillard near St. Peter's.

6.3.5 Human Health and Safety

A review of possible health and safety concerns has been included in this assessment. Effects to human health associated with construction, operation, or decommissioning of wind turbines are considered minimal or non-existent due to the size and location of the Project, mitigation, and setback distances.

The wind turbine models under consideration have been selected in order to comply with international wind class standards, and to help reduce the risk of ice build-up, lightning strikes and general malfunctions. Natural Forces has an in-house construction manager who oversees construction activities and will encourage safe practices for worker safety. A copy of the Occupational Health and Safety (OHS) Act will also be located on site at all times.

Many of the mentioned assessments are conducted to ensure the construction and operation of the Project will occur in the safest manner possible and will often reduce many of the concerns and risks before construction begins such as possible noise and shadow flicker annoyance.

The public can be concerned about the potential for impacts to human health from wind turbines. Common concerns include:

- Risk of ice throw (addressed in **Section 8.3**);
- Sound (addressed in **Section 7.1.1.4**);
- Shadow flicker (addressed in **Section 7.1.3.1**);
- Infrasound (addressed below);
- Electromagnetic fields (EMF) (addressed below); and
- Effects to air quality from dust and air emissions (addressed in **Section 7.1.1.3**).

Low frequency sound is defined as sound with a frequency less than 200 Hertz (Hz) or cycles per second. Infrasound, also referred to as low-frequency sound, is sound that is not audible to humans, which is typically below a frequency of 20 Hz (Ontario Ministry of the Environment [OMOE] 2010).

Infrasound levels created by wind turbines are often comparable to the ambient levels prevalent in the natural environment, such as levels created by the wind itself. In terms of health, at sufficiently high levels, infrasound can be dangerous; however, it is inaccurate to conclude that infrasound from wind turbines causes health risks (OMOE 2010).

A recent study conducted by the Massachusetts Institute of Technology found that infrasound near wind turbines does not exceed audibility thresholds. Other studies specific to epidemiology have shown a relationship between living near turbines and annoyance. Annoyance appears to be strongly related to individual characteristics rather than noise from turbines. However, infrasound and low-frequency sound do not present unique health risks. (McCunney et al. 2014).

Electromagnetic fields (EMFs) are a type of energy that occurs naturally and is created through the use of electrical appliances and equipment (City of Toronto 2011). A guidebook to Wind Energy Development was produced in 2011 and identified transmission lines, wind turbine generators, generator transformers and underground cables as the four potential sources of EMFs as a result of wind farm operations (Canadian Wind Energy Association [CanWEA] 2011). The guidebook goes on to

suggest that EMF exposure is not significant due to low emission levels produced by wind farm operations. The guidebook indicates that, although still low, the generator transformers likely generate the highest levels of EMFs relative to all other wind farm components while in operation. Similar conclusions have been made by Health Canada and the World Health Organization (Chief Medical Officer of Health of Ontario 2010).

6.4 Cultural and Heritage VECs

Cultural and heritage resources, both naturally-occurring and human-made, are those resources related to the past that remain to inform present and future societies of that past. Heritage resources include archaeological resources (e.g. artifacts, features, structures), paleontological resources (e.g. fossils), and built heritage resources (e.g. historic buildings, complexes). These resources are highly delicate features of the environment and their integrity is susceptible to ground-disturbing activities. Project activities related to surface or sub-surface ground disturbance has the potential for interaction with heritage and cultural resources, where they are present.

Cultural and heritage resources has been selected as a VEC because of their importance to the people of Nova Scotia and because these resources are recognized and managed by provincial and federal regulatory agencies. In addition, Indigenous peoples are very interested in the preservation and management of heritage resources, particularly those that relate to their individual identities, as well as their Nation's history, culture, or traditions. Importantly, the Project is located in part of the Mi'kmaw Cultural Landscape Area known as Sipikne'katik where previous archaeological investigation has revealed multiple pre-contact Mi'kmaw habitation sites, dating as far back as 13,500 years ago (CRM Group 2022, Appendix N).

Archaeological sites and heritage resources in Nova Scotia are protected under the *Nova Scotia Special Places Protection Act*, which is administered by the Department of Communities, Culture, Tourism, and Heritage (NSDCCTH 2022). Protected sites include public and private land ownership, and underwater sites. The Act also ensures that high-quality research is carried out on these sites through the province's Heritage Research Permit system (NSDCCTH 2022).

Based on the history in the area known from previous archaeological studies, there is potential for Indigenous cultural heritage resources (both pre-contact and historic), or Euro-Canadian resources to exist within the Project area.

6.4.1 Archaeological and Cultural Resources

An Archaeological Resource Impact Assessment has been undertaken under Heritage Research Permit A2021NS150. The final report is currently under review by the Special Places Program of CCTH and all results and recommendations are considered to be draft until the review is completed and accepted. The ARIA was conducted by Cultural Resource Management (CRM) Group Limited (Appendix N - Pending). The purpose of the assessment was to evaluate the potential for archaeological resources within the Project area and to provide recommendations for further mitigation if required.

As part of the ARIA conducted for the Project in 2021, CRM reviewed the Maritime Archaeological Resource Inventory (MARI). According to MARI, there are nine registered archaeological sites within the

LAA for the Cultural and Heritage VECs (CRM Group 2022); however, none of the currently registered sites are located within the PDA, as it is presently designed (CRM Group 2022). Background research of the Project Area yielded no evidence of National Historic Sites, Special Places, Protected Areas, National or Provincial Parks within the ARIA study area. One of the adjacent registered archaeological sites (20 metres east of the study area) includes a historic cemetery. Table 27 describes the archaeological sites location within the LAA, which is shown on Figure 26.

TABLE 27: REGISTERED ARCHAEOLOGICAL SITES WITHIN THE PROJECT AREA (CRM 2022).

Name	Description	Further Information
Westchester 3 (BjCw-03)	Historic, religious complex; cemetery and possible church foundation	Located adjacent to the LAA, the site represents an historic cemetery and possible church foundation along Westchester Road. The site is situated on two knolls with headstones and depressions.
Westchester 4 (BjCw-04)	Historic, domestic; small stone foundation	Ceramics and nails were found during exploratory shovel testing.
Westchester 5 (BjCw-05)	Historic, domestic; large dry-stone foundation	Three stone walls
Westchester 10 (BjCw-10)	Historic, domestic; foundation, infilled	Westchester 10 is a foundation is infilled with field stones and located in a cleared field. It is also associated with Westchester 11, 12, and 13.
Westchester 11 (BjCw-11)	Historic, domestic; foundation, infilled	
Westchester 12 (BjCw-12)	Historic, domestic; foundation, infilled	
Westchester 13 (BjCw-13)	Historic, domestic; cellar, overgrown	A cellar infilled with field stones within a current blueberry field. Possible that the infilling is due to artificial levelling of the blueberry field. Shovel testing uncovered shards of earthenware, brown transfer pint, annular ware, and a machine-cut nail, possibly establishing an approximate date within the late 19 th century.
Westchester 14 (BjCw-14)	Historic, domestic; cellar, infilled	
Westchester 15 (BjCw-15)	Historic, domestic; large dry-stone foundation, overgrown	A cellar infilled with field stones within a current blueberry field. Possible that the infilling is due to artificial levelling of the blueberry field. Shovel testing uncovered shards of earthenware, brown transfer pint, annular ware, and a machine-cut nail, possibly establishing an approximate date within the late 19 th century.

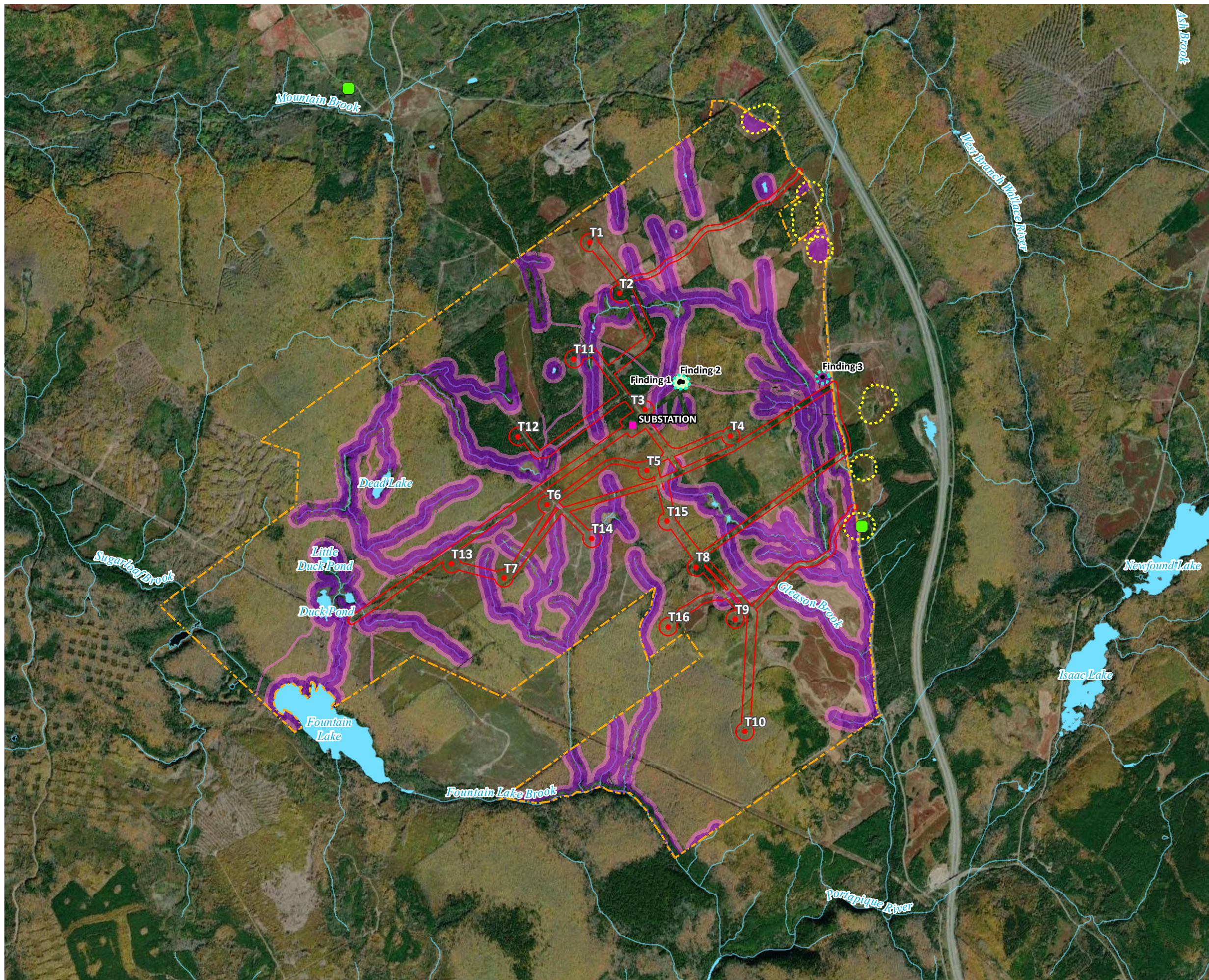
During archaeological field reconnaissance (May 11 and 13, 2021), the portion of the proposed PDA was assessed by teams of archaeologists. Details of the ARIA and field assessment, including photos of the site are located in Appendix N. Three potential unregistered archaeological findings were reported during the field assessment with locations shown on Figure 26, included the following:

Finding 1) A cellar depression (measuring approximately 5 m by 7 m and 1 m deep). No tiered stones were identified within the depression, but it is possible that the cellar was of wooden sill construction.

Finding 2) A stone pile wall (about 24 m long) was discovered 13 m north of the cellar depression running parallel with the potential historic road alignment (of the Cobequid Road). This finding is located approximately 13 m north of the cellar depression (Finding 1) and is a loosely tiered, dry-laid, stone pile wall. The wall runs parallel with a potential historic road alignment that may represent the original alignment of the Cobequid Road.

Finding 3) A buried foundation in the immediate vicinity of where the school was located. The foundation has previously been infilled for the development of the blueberry field. In addition to the foundation, archaeologists found brick, shards of glass, wire, square cut iron nails, and shards of refined earthenware.

The findings deem the Project development area and the surrounding area as high archaeological potential to encounter historic cultural resources (CRM Group 2022).

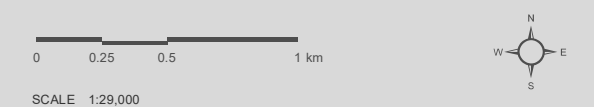


WESTCHESTER WIND PROJECT

FINDINGS WITHIN THE CULTURAL AND HERITAGE LOCAL ASSESSMENT AREA

FIGURE 26

- Proposed Turbine Location
 - Substation
 - Historic Cellar
 - Cemetery
 - Reconnaissance Location
 - ▭ Project Development Area
 - ▭ Local Assessment Area
 - ▭ 50m Buffer of a Registered Archaeological Site
 - ▭ 100m Buffer of a Register Archaeological Site
 - Watercourse
 - Waterbody
- Area of Archaeological Potential**
- Moderate
 - High



SCALE 1:29,000
 MAP DRAWING INFORMATION:
 DATA PROVIDED BY DILLON CONSULTING, GEONB, NATURAL FORCES

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



PROJECT: 21-1329
 STATUS: DRAFT
 DATE: 2022-02-11

6.4.2 Existing and Historic Land Uses

Mi'kmaw Land Use History

Recently, archaeological studies have shifted towards a more comprehensive overview of the ecological, socio-cultural, and economic values of traditional Mi'kmaw cultural landscapes, as opposed to studies based solely on material artifacts, as it is recognized that geological features hold high importance when considering cultural landscapes (Lewis 2018).

Archaeological records indicate that the proposed Project area and vicinity were utilized and occupied by the Mi'kmaq since at least the Kejikawe'k L'nuk (The Recent People) or the Late Woodland/Ceramic Period (1,000-400 BP [before present]) (CRM Group 2022). The earliest Mi'kmaw evidence on the landscape was found approximately 27 km from the Project site, near present-day Debert. Evidence suggests these sites were occupied approximately 11,500 to 8,000 BP. In addition, there is a registered archaeological site 1.8 km from the Project site (Site BjCw-18; Appendix N), where a pre-contact projectile point was found, which further illustrates the use of the area by pre-contact Mi'kmaq (CRM Group 2022). More recently, there are historical accounts of Mi'kmaw campsites in the Cobequid Hills in the mid-19th century (Hardy 1896).

Historic Land Use

A map from 1755 of Cumberland County and the Chignecto Isthmus shows the study area as unoccupied lands (Lewis 1755), which will be further investigated through the MEK study. Land grants in the study area were given to Loyalist settlers and many families settled on their homesteads on Westchester Mountain (CRM Group 2022). Many headstones located in the Westchester Pioneer Cemetery (located approximately 20 m east of the study area, on the other side of Westchester Road) as well as several foundations and cellars located within and adjacent to the study area along the Cobequid Road (Sites BjCw-01 to BjCw-17; Appendix N) are attributed to the settlers of these first homesteads (CRM Group 2022). The presumed location of the church associated with the settlement and cemetery was discovered during a previous archaeological assessment in the area (Nivan 1991). Other historical structures in the immediate area of the study area included a school and a post office.

More recently, 1933 aerial photographs show a post office and farmsteads along the Cobequid Road. In 1954 photography, a structure, possibly the schoolhouse, is still seen standing, and the current transmission line in the area had been developed. By 1995, aerial photographs show increased forestry and agriculture (blueberry farming) in the study area. Many forestry roads had been constructed in the area (CRM Group 2022).

Today, the study area mostly consists of forestry and agriculture activities.