NOVA SCOTIA
Communities, Culture and Heritage
Culture and Heritage Development

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Halifax, NS B3J 2R5
902-424-8443

November 23, 2022

Emily Redden
Cultural Resource Management Group Limited
Ten Mile House
1519 Bedford Highway
Bedford, Nova Scotia
B4A 1E3

Dear Emily Redden,

RE: Heritage Research Permit Report
A2022NS119 – Benjamin Mills Wind Energy Project ARIA

We have received and reviewed the revised final report on work conducted under the terms of Heritage Research Permit A2022NS119 for archaeological resource impact assessment of the Benjamin Mills Wind Energy Project ARIA Project in Hants County, Nova Scotia.

Natural Forces is planning a Wind Energy Project in Benjamin Mills, West Hants, Nova Scotia. In 2021, under Heritage Research Permit A2021NS150, CRM Group conducted a desktop study to screen for areas of archaeological potential within the proposed development area. It consists of the proposed impact areas for 28 turbines (each measuring 100 metres by 100 metres), access road improvements (with a 40-metre-wide assessment corridor), collector circuits, and a substation. The study area occupies an approximate area of 70.8 hectares. This 2022 ARIA involved Mi'kmaq engagement, potential modeling, previous work searches, historic background study and field reconnaissance.

The Proposed Development Area (PDA) is situated within the greater Mi'kmaq territory of Sipikne'katik and the background study indicated occupation of the area surrounding the by Mi'kmaq peoples going back many thousands of years prior to the arrival of Europeans. Europeans – Acadians - first arrived in the area in the 1680's. They were later deported by the British and their lands were re-occupied by New England Planters during the 1760's.
Field reconnaissance showed the area to be largely low potential. One area of archaeological potential was identified in the vicinity of Turbine 7, a rock overhang beneath a large, perched, granite boulder that may indicate a possible rock shelter.

Based on these results, CRM Group offered the following management recommendations for the study area:

1. It is recommended that any ground disturbance within 20 metres of the footprint of the potential rock-shelter be preceded by a program of strategic subsurface excavation within that footprint. Due to the presumed thinness of the soil and the restrictive size of the workspace, the test units would be excavated by trowel.

2. It is recommended that the remainder of the PDA as described and depicted in this report, be cleared of requirement for further archaeological investigation.

3. It is recommended that any proposed expansion of the Benjamins Mill Wind Project PDA avoid the modelled areas of elevated (moderate and high) archaeological resource potential be addressed by archaeological reconnaissance prior to any ground impact.

4. If archaeological deposits or human remains are encountered during construction activity within the study area, all work in the associated area(s) should be halted and immediate contact made with the Special Places Program (John Cormier: 902-424-4542).

CCH Staff have reviewed the report and find it acceptable as submitted. Please do not hesitate to contact me with any questions or concerns. Please do not hesitate to contact me with any questions or concerns.

Sincerely,

John Cormier
Coordinator, Special Places

BENJAMINS MILL WIND PROJECT
ARCHAEOLOGICAL RESOURCE IMPACT ASSESSMENT
ARCHAEOLOGICAL RECONNAISSANCE 2022
BENJAMINS MILL, NOVA SCOTIA

FINAL REPORT

Submitted to:
Dillon Consulting Limited
and the
Special Places Program of the
Nova Scotia Department of Communities, Culture, Tourism and Heritage

Prepared by:
Cultural Resource Management Group Limited
Ten Mile House
1519 Bedford Highway
Bedford, Nova Scotia
B4A 1E3

Heritage Research Permit Holder: Emily Redden
Author: Emily Redden

Heritage Research Permit Number: A2022NS119
CRM Group Project Number: 22-0034-01

NOVEMBER 2022

The following report may contain sensitive archaeological site data. Consequently, the report must not be published or made public without the written consent of Nova Scotia's Coordinator of Special Places, Department of Communities, Culture, Tourism and Heritage

EXECUTIVE SUMMARY

Natural Forces is proposing to develop a wind energy project south of Benjamins Mills, Hants County. In 2021, Cultural Resource Management Group Limited (CRM Group) was retained by Dillon Consulting Limited (Dillon) on behalf of Natural Forces to undertake the desktop study phase (Archaeological Screening) of an Archaeological Resource Impact Assessment (ARIA) for the entire expanse of the potential project area (General Project Area). Involving Mi'kmaw engagement, background research, and archaeological potential modelling, the project was designed to model the distribution of archaeological resource potential prior to implementation of planning for infrastructure. This approach provided an opportunity for Natural Forces to avoid areas of archaeological concern during the planning stage of the wind energy project. The screening, completed under Heritage Research Permit (HRP) A2021NS150, resulted in the identification and delineation of areas of moderate and high archaeological resource potential at various locations within the General Project Area. It was recommended that a program of archaeological field reconnaissance be undertaken within any proposed infrastructure impact areas prior to any ground disturbance activity.

In 2022, CRM Group was retained to undertake the Screening and Reconnaissance phase of an Archaeological Resource Impact Assessment (ARIA) of the Potential Development Area (PDA), consisting of the impact footprints for 28 turbines, access road improvements, collector circuits, and a substation. Involving Mi'kmaw engagement, background research, and fieldwork, the project was designed to identify, document, interpret and make management recommendations for any zones of cultural resource potential within the study area. Although the field component of the 2022 ARIA only assessed the PDA, the archaeological screening component applied updated archaeological potential modelling to the General Project Area subjected to archaeological screening in 2021

The 2022 Archaeological Screening and Reconnaissance was conducted by CRM Group Archaeologist Emily Redden, according to the terms of HRP A2022NS119 (Category 'C'), issued to Redden through the Special Places Program of the Nova Scotia Department of Communities, Culture, Tourism and Heritage (Special Places). This report describes the ARIA of the study area, presents the results of these efforts, and offers cultural resource management recommendations.

The single area of elevated archaeological resource potential identified within the PDA is a possible rock-shelter – the space beneath a large, perched granite boulder located within the PDA for Turbine #7. Representing a dry and protective natural cavity in an elevated position within a generally rugged landscape, the open space beneath the boulder is ascribed high archaeological resource potential. Specifically, the concern is for archaeological resources to exist within the thin accumulation of vegetation and soil that overlies granite bedrock in the shelter of the large boulder.

It is recommended that any ground disturbance within the footprint of the potential rock-shelter (***Figures 13 & 14***) be preceded by a program of strategic subsurface excavation. Due to the presumed thinness of the soil and the restrictive size of the workspace, the test units would be excavated by trowel. It is recommended that the remainder of the study area as described and depicted in this report (***Figure 2***), be cleared of requirement for further archaeological investigation.

PROJECT PERSONNEL

Permit Holder:	Emily Redden, BA, RA
Assistant Archaeologists:	Mike Sanders, BA Kyle Cigolotti, BA Robert H. J. Shears, MA, RPA Logan Robertson, BA
Archaeological Field Technicians:	Shawn MacSween, BA Roderick Peterson Stewart MacPherson, BSc
Report Preparation:	Emily Redden, BA, RA *Author* Mike Sanders, BA *Technical Review* Shawn MacSween, BA *GIS/Drafting* Shannon Stevenson *Office Manager*

ACKNOWLEDGEMENTS

Special Places Program of the Nova Scotia Department of Communities, Culture, and Heritage	John Cormier, BA *Special Places Coordinator*
Nova Scotia Museum	Catherine Cottreau-Robins, PhD *Senior Curator of Archaeology*
	Vanessa Smith, MA *Assistant Curator of Archaeology*
Kwilmu'kw Maw-klusuaqn Archaeological Research Division	Heather McLeod-Leslie, PhD, PMP *Senior Archaeologist*
	Talva Jacobson, PhD *Staff Archaeologist*
Dillon Consulting Limited	Kelly Regan *Associate*
Natural Forces	Megan MacIsaac *Project Developer*
Crown Land Information Management Centre Land Services Branch	Deborah A. Anderson *Records Analyst*
Nova Scotia Department of Lands & Forestry Natural Sciences Library	Janelle Brenton *Library Assistant*
West Hants Historical Society	William Fry *Operations Staff, Research Team*

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ARCHAEOLOGICAL RECONNAISSANCE 2022
BENJAMINS MILL, NOVA SCOTIA

1.0 INTRODUCTION

Natural Forces is proposing to develop a wind energy project south of Benjamins Mills, Hants County. In 2021, Cultural Resource Management Group Limited (CRM Group) was retained by Dillon Consulting Limited (Dillon) on behalf of Natural Forces to undertake the desktop study phase (Archaeological Screening) of an Archaeological Resource Impact Assessment (ARIA) for the entire expanse of the potential project area (General Project Area). Involving Mi'kmaw engagement, background research, and archaeological potential modelling, the project was designed to model the distribution of archaeological resource potential prior to implementation of planning for infrastructure. This approach provided an opportunity for Natural Forces to avoid areas of archaeological concern during the planning stage of the wind energy project. The screening, completed under Heritage Research Permit (HRP) A2021NS150, resulted in the identification and delineation of areas of moderate and high archaeological resource potential at various locations within the General Project Area. It was recommended that a program of archaeological field reconnaissance be undertaken within any proposed infrastructure impact areas prior to any ground disturbance activity.

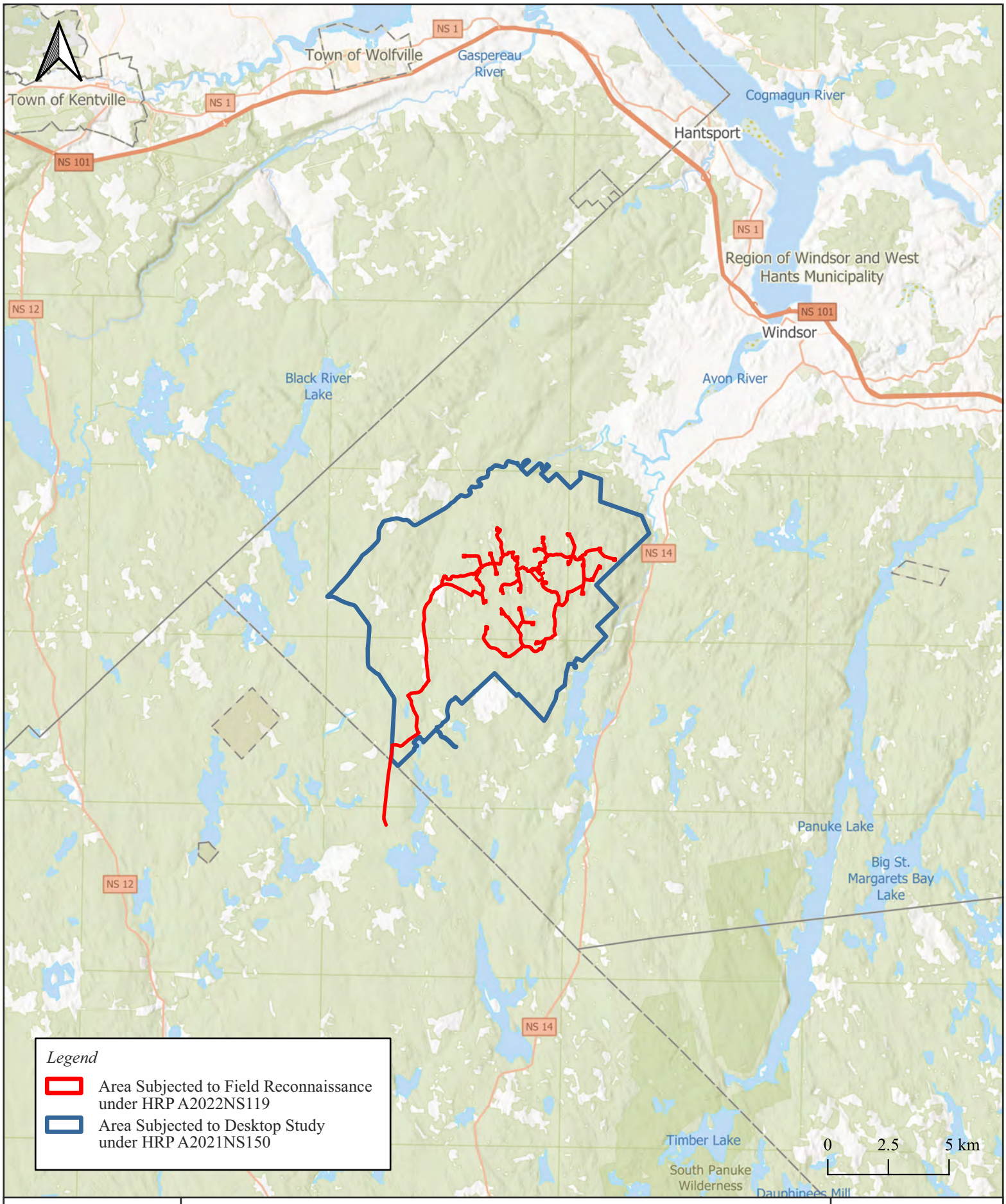
In 2022, CRM Group was retained to undertake the Screening and Reconnaissance phase of an Archaeological Resource Impact Assessment (ARIA) of the Potential Development Area (PDA), consisting of the impact footprints for 28 turbines, access road improvements, collector circuits, and a substation. Involving Mi'kmaw engagement, background research, and fieldwork, the project was designed to identify, document, interpret and make management recommendations for any zones of cultural resource potential within the PDA. Although the field component of the 2022 ARIA only assessed the PDA, the archaeological screening component applied updated archaeological potential modelling to the General Project Area subjected to archaeological screening in 2021.

The 2022 Archaeological Screening and Reconnaissance was conducted by CRM Group Archaeologist Emily Redden, according to the terms of HRP A2022NS119 (Category 'C'), issued to Redden through the Special Places Program of the Nova Scotia Department of Communities, Culture, Tourism and Heritage (Special Places). This report describes the ARIA of the study area, presents the results of these efforts, and offers cultural resource management recommendations.

2.0 STUDY AREA

The proposed Benjamins Mill Wind Project area is located at Benjamins Mill, in West Hants, within the area subjected to Archaeological Screening by CRM Group under HRP A2021NS150. It consists of the proposed impact areas for 28 turbines (each measuring 100 metres by 100 metres), access road improvements (with a 40-metre-wide assessment corridor), collector circuits, and a substation (***Figures 1 & 2***). In total, the study area measures approximately 70.8 hectares.

Plate 1: View northwest from Turbine #17. October 14, 2022.



CRM Group
Cultural Resource Management Group Ltd.

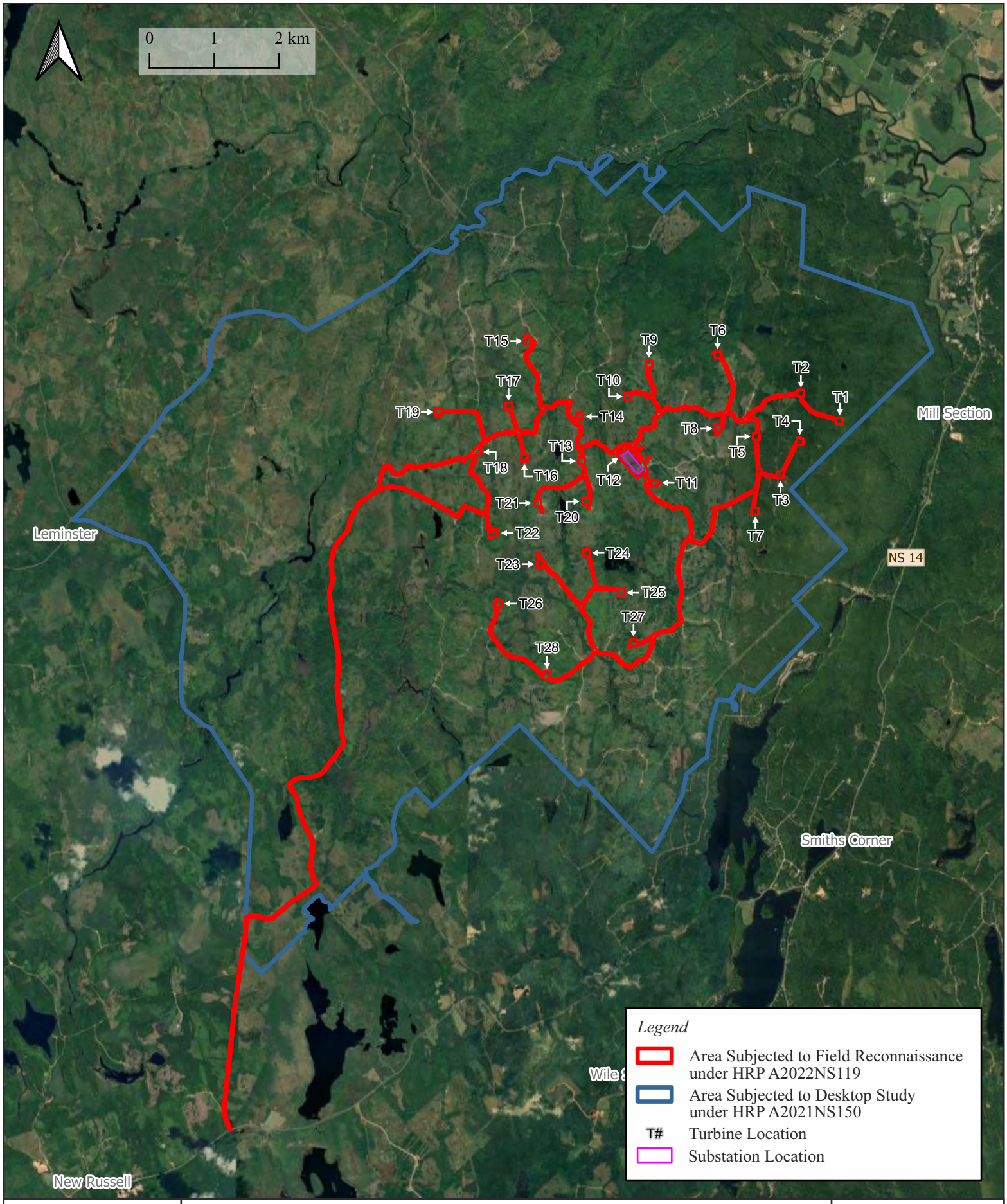
Approximate Study Area

BENJAMINS MILL WIND ENERGY PROJECT
ARCHAEOLOGICAL FIELD RECONNAISSANCE 2022
BENJAMINS MILL, NOVA SCOTIA

Figure 1

November 2022

Scale: 1:200,000



CRM Group Cultural Resource Management Group Ltd.	*Detailed Study Area*	*Figure 2*
	BENJAMINS MILL WIND ENERGY PROJECT ARCHAEOLOGICAL FIELD RECONNAISSANCE 2022 BENJAMINS MILL, NOVA SCOTIA	November 2022 Scale: 1:75,000

3.0 METHODOLOGY

In keeping with Nova Scotia's ***Special Places Protection Act Heritage Research Guidelines*** (the Guidelines) for Category 'C' Permits, the 2022 ARIA consisted of three components: Mi'kmaw engagement, background research, and archaeological fieldwork.

3.1 Mi'kmaw Engagement

CRM Group contacted the Kwilmu'kw Maw-klusuaqn Archaeological Research Division (KMK-ARD) to inform them of the various phases of the project and to request any information pertaining to traditional or historical Mi'kmaw use of the study area. The information provided by KMK-ARD assisted CRM Group in conducting background research with an approach that considered the diversity of views witnessed and experienced by a broad range of representative groups. The knowledge gained was used to broaden archival research to better understand the cultural and archaeological importance of the land upon which the study area is located and to formulate a relationship of information sharing.

3.2 Background Research

In preparation for fieldwork, CRM Group undertook a review of background information compiled during the initial ARIA conducted under HRP A2021NS150. Supplemental focused research was also undertaken as needed to better understand the study area's archaeological potential. During this investigation, CRM Group utilized the resources of various institutions including documentation available through the Nova Scotia Archives, the Nova Scotia Crown Land Information Management Centre, the Department of Natural Resources, the Nova Scotia Registry of Deeds, Nova Scotia Property Online, and the Nova Scotia Museum.

The research included a review of relevant historic documentation incorporating land grant records, legal survey and historic maps, local and regional histories, and previous archaeological reports. Topographic maps and aerial photographs, both current and historic, were also used to evaluate the General Project Area. Satellite and LiDAR DEM data were reviewed to delineate historic infrastructure and evaluate topography. This data facilitated the identification of environmental and topographic features that may have influenced human settlement and resource exploitation patterns. The historical and cultural information was integrated with the environmental and topographic data to identify potential areas of archaeological sensitivity. In-house GIS potential modelling was utilized to inspect the Genreal Project Area's physical relationship to existing registered archaeological sites, locations of cultural or heritage significance, and navigable water bodies.

The information obtained from this suite of research materials enabled a preliminary evaluation of archaeological potential and ensured readiness for swift interpretation of any archaeological features encountered during reconnaissance.

3.3 Previous Archaeological Assessments

During the background study, CRM Group also reviewed reports for ARIAs previously undertaken near the General Project Area. The review heightened knowledge of the relevant archaeological data and served to ready field personnel for the task of identifying and interpreting any archaeological resources encountered during fieldwork. All results and recommendations from previous assessments have been accepted by Special Places and continue to be upheld.

3.4 Archaeological Potential Model

Archaeological resources are not randomly distributed across the landscape. Human land use and resource exploitation follow patterns of resource distribution and are influenced by a variety of specific cultural, environmental, and geomorphological factors. Consequently, specific areas within

a general landscape will have sustained differing degrees and types of utilization over time. Through preparation of an archaeological potential model, researchers attempt to identify the specific factors that may have contributed to the patterning of human land and resource exploitation.

Archaeological potential modelling can play a significant role in determining where archaeological assessments should be focused within our Maritime landscape. Potential modelling is an integrated approach to uncovering previously unknown archaeological sites and areas of elevated archaeological potential. This is accomplished by analyzing the geomorphology of the landscape through an examination of LiDAR DEM data, GIS-based data, projections of past Relative Sea Level (RSL) positions and applying the recorded history of the area. The goal is identifying the distribution of factors known to have governed past human land use, and thereby, to effectively model the distribution of zones of archaeological potential (low, moderate, or high) within the study area.

Advances in geospatial data processing and widespread production of LiDAR DEM, for Nova Scotia in particular, is enabling major improvements in development planning and operations, including the prediction and protection of archaeological and cultural sites. As part of this process, potential models are created for both Pre-contact and historic era sites, recognizing that the distribution of these types of sites vary.

The resulting archaeological potential model involves the integration of both inductive and deductive approaches to modelling cultural heritage resources. The inductive approach involves applying existing data regarding the established distribution of known archaeological resources, while the deductive approach involves applying extrapolations based on patterns observed in the existing data (Hamilton S. , 2000, p. 43). As an example, the inductive approach is used when noting the distribution of registered archaeological sites recorded in the Maritime Archaeological Resource Inventory (MARI), whereas the deductive approach is used when applying the site distribution patterning noted in the MARI data to then project the likely distribution of undocumented archaeological resources within a given study area. While archaeological potential modelling can run the risk of perpetuating the oversimplification of human land use, it remains a useful tool in identifying areas of elevated archaeological potential.

The primary data layers used in the determination of areas of moderate and high archaeological potential include:

- Proximity to burial sites (cemeteries, graveyards, and lone burials)
- Proximity to registered archaeological sites (inventoried in the MARI)
- Proximity to designated heritage properties and features
- Proximity to water (the margins of existing lakes and watercourses, but also Palaeoshorelines; the goal of which is to predict areas of Pre-contact archaeological resource potential, as well as unreported historic sites)
- Proximity to identified areas of concern identified through Mi'kmaw engagement
- Proximity to known areas of historic activity (involves undertaking archival research to gather historic documentation such as historic maps, written histories, and other documents that delineate areas of past human activity where it is reasonable to expect that associated archaeological resources might lie)
- Proximity to predictable Pre-contact portage routes
- Topographic highpoints or anomalies (as identified through LiDAR DEM)
- Strahler Stream Order (numerical measure of branching complexity of watercourses)

Factors used in the determination of areas of low archaeological potential would include:

- Zones of steep slope

- Wetlands
- Areas of comprehensive modern ground impact

When archaeological potential models are evaluated, the most common form of validation is through field testing under permitted assessment (Heritage Research Permit). This testing would be in the form of archaeological reconnaissance and, potentially, a program of strategic subsurface testing.

3.5 Archaeological Fieldwork

Fieldwork for the ARIA, conforming to Guidelines set by Special Places, consisted of archaeological reconnaissance, as described in ***Section 3.5.1***.

3.5.1 Field Reconnaissance

The goals of the archaeological field reconnaissance were to conduct a visual inspection of the PDA to search for and document any exposed archaeological resources and to further delineate areas of archaeological potential (low, moderate, and high). The survey was guided by the results of engagement and background research and took care to note any cultural landscape indicators. Researchers were watchful for topographic or vegetative anomalies, searching the ground surface for signs of historic land use (e.g., levelled ground, anomalous mounds or depressions, structural features, vestige populations of domestic plants, and Culturally Modified Trees) that might indicate the presence of buried archaeological resources. Prominent stone faces, whether on bedrock outcrops or exposed boulders, were searched for petroglyphs. Soil exposures within road-cuts, in recently grubbed areas, and at the base of uprooted trees were searched for artifacts and evidence of archaeological features. The field team also remained watchful for the suite of environmental conditions recognized as being conducive to past settlement – relatively flat, dry land close to transportation routes such as waterways, portage routes, or early roads, or topographic high-points that would have offered strategic vistas. Field geomatic data was recorded with handheld Garmin GPS map 62s with +/- five-metre accuracy. Field observations were recorded through the combination of georeferenced photographs, field sketches, and field notes.

Field reconnaissance for the 2022 ARIA assessed areas within the proposed infrastructure footprints (***Figure 2***). The proposed turbine locations and sub-station footprints were transected at approximately 30 metre intervals, while previously undeveloped proposed access roads and collector line corridors assessed at approximately 15 metre intervals.

3.6 Artifact Analysis

Had any artifacts been recovered during the archaeological testing they would have been processed and recorded in accordance with standards set by Special Places.

4.0 RESULTS

The following are the results of the Screening and Reconnaissance Phase of the ARIA for HRP A2022NS119.

4.1 Mi'kmaw Engagement

In response to CRM Group's inquiry, KMK-ARD provided traditional Mi'kmaw land use information that was taken into consideration when preparing the archaeological assessment. Aside from information not disclosed out of respect for its sensitive or confidential nature, the contributed knowledge is presented below in ***Section 4.2***.

4.2 Background Research

The following overview describes the environmental and cultural setting of the General Project Area and its environs, summarizing and expanding upon the results of previous archaeological research and drawing upon the results of Mi'kmaw engagement. This background provides a framework for the evaluation of archaeological potential and interpretation of cultural resources in creation of the archaeological potential model.

4.2.1 Environmental Setting

Several environmental factors such as glacial history, topography, surficial geology, hydrology, and vegetation have influenced settlement patterns and contributed to the archaeological potential of the area.

Wisconsin Glaciation

The Laurentide Ice Sheet, which once covered much of northern North America, reached its most recent glacial maximum across the Atlantic region by approximately 18,000 radiocarbon years before present (BP). Following retreat of the ice sheet, by approximately 13,000 BP, crustal suppression, combined with sea level rise, resulted in marine inundation in parts of the Bay of Fundy reaching inland to a maximum elevation of approximately 41 metres above sea level (ASL) (Fader, 2005, p. 17).

Due to subsequent crustal rebound and glacial re-advance of the Younger Dryas Chronozone (ca. 15,000 to 13,500 BP), by approximately 10,000 BP, sea level had rapidly lowered to approximately 60 metres below modern ASL (Fader, 2005). This would have resulted in inner and northern portions of the Bay of Fundy being at least partially subaerially exposed. Shorelines within the Minas Basin would have been lower than modern levels, but their exact location would have depended on tidal amplitude and flow rates of a post-glacial rivers. If a linear progression of sea level regression is assumed over this three-thousand-year period, Palaeo sea level would have matched modern levels at approximately 11,700 BP, and by the time of first known human occupation in the region, at the Debert/Belmont sites, at approximately 10,600 BP, sea level would have been approximately 40 metres below modern levels. This eliminates the possibility of a Palaeo shoreline within the General Project Area during the period of first human occupation of the region.

Topography

The General Project Area is located in the greater ecological region known as the *Western– South Mountain* ecodistrict (Unit 720) (***Plate 2***) (Neily, Basquill, Quigley, & Keys, 2017, p. 186). The area also borders the southeast edge of the *Valley and Central Lowlands – Central Lowlands* ecodistrict (Unit 630) (Neily, Basquill, Quigley, & Keys, 2017, p. 174). The *South Mountain* ecodistrict extends 150 kilometres in a long arc from east of the Sissiboo River in the west, to Panuke Lake in the east, and measures 75 kilometres north to south. In general, the ecodistrict's hummocky, rocky landscape slopes towards the Atlantic Ocean, however the General Project Area is situated within the Avon

River watershed that flows into the Minas Basin (*Error! Reference source not found.)*. The area has the highest elevations in western Nova Scotia, at about 289 metres ASL, with a mean elevation of 175 metres ASL (Neily, Basquill, Quigley, & Keys, 2017, p. 186). The elevation within the General Project Area ranges from approximately 190 to 270 metres ASL.

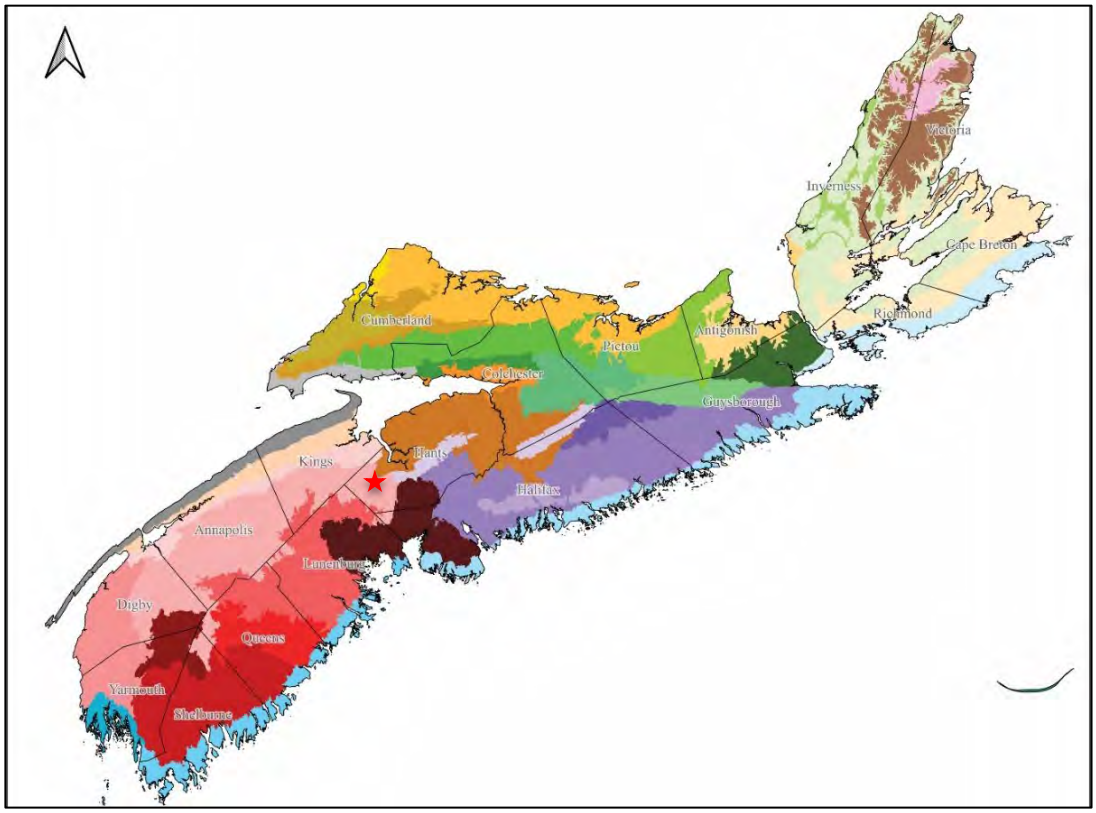


Plate 2: Western – South Mountain (Unit 720) ecodistrict and approximate study area (red star) (Province of Nova Scotia, 2021).

Surficial Geology

The ecodistrict predominately contains *Gibraltar* series soils (Soil Types: ST2, ST2-G, ST1, ST15, ST15-G), with some *Nictaux* (ST1, ST15, ST2) and *Peat* (ST14, ST4) soils also present (Keys, 2007, pp. 34-35). Derived from granite, *Gibraltar* soils within the ecodistrict are generally well-drained, yellowish brown, sandy loams. This series of soils is generally very stony and prone to natural cementation. *Nictaux* soils, derived from deep deposits of gravel or coarse silica sand, are typically well-drained, loamy sands. *Peat* soils generally consist of poorly drained, partially decomposed, organics deposited in depressional areas over varying mineral materials. Soils within the General Project Area are part of the of *Gibraltar* Series with some *Swampy Land* in wet areas.

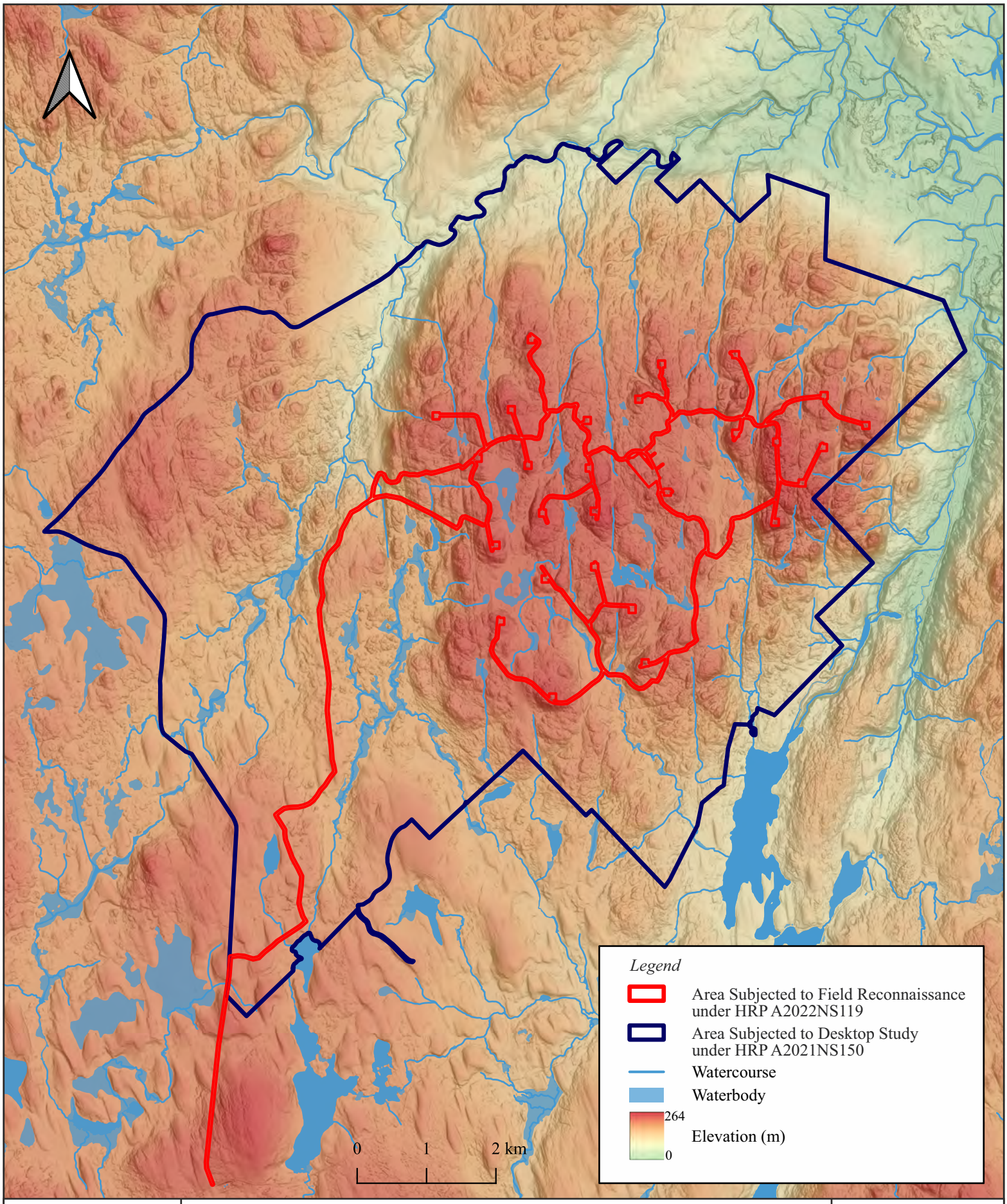
Hydrology

The *South Mountain* ecodistrict is characterized by abundant lakes, rivers, and wetlands. The General Project Area lies about 1.9 kilometres northwest of the Avon River, about 1.7 kilometres southeast of the West Branch Avon River, and about 1.1 kilometre southeast of the Southwest Branch Avon River. The nearest named lakes to elements of the study area are Bennet Lake (about 95 metres), Five Island Lake (about 180 metres), Duck Ponds (about 260 metres), Pine Lake (about 650 metres, and Burnt Lake (about 660 metres).

Vegetation

The *South Mountain* ecodistrict is a rugged upland dominated by pine and spruce forests. Red oak, red pine and white pine are commonly found where soils are dryer, very coarse, and less fertile, like those found throughout the study area. Growth potential of all forests in this ecodistrict is greatly influenced by the granite till and surface stoniness (Neily, Basquill, Quigley, & Keys, 2017, p. 187).

Typical woodland flora in the ecodistrict includes bunchberry, wild lily-of-the valley, bluebead lily, sarsaparilla, and starflower. Blueberry, huckleberry, teaberry, witch-hazel, lambkill, and bracken are also common (Neily, Basquill, Quigley, & Keys, 2017, p. 188). Many of these plants are known traditional Mi'kmaw medicinal plants. Bunchberry can be used to treat kidney and stomach ailments, as well as applied topically to treat wounds. Wild sarsaparilla has several medicinal uses including application as a poultice to treat wounds, and for treating cold and influenza symptoms. Aside from the berries being used as a general tonic, the leaves and roots of the blueberry bush can be used to treat rheumatism. Aiding in the prevention of blood clots, steeped Teaberry can be used in the recovery from heart attack or stroke. Witch hazel, prepared as a tea, is used to treat headaches as well as an aphrodisiac; applied topically it can be used to treat rash and swelling. Though poisonous if ingested, lambkill can be used topically to reduce inflammation (Lacey, 2012, pp. 14, 43, 64, 65, 80, 92).



CRM Group
Cultural Resource Management Group Ltd.

LiDAR Digital Elevation Model

BENJAMINS MILL WIND ENERGY PROJECT
ARCHAEOLOGICAL FIELD RECONNAISSANCE 2022
BENJAMINS MILL, NOVA SCOTIA

Figure 3

November 2022

Scale: 1:70,000

4.2.2 Cultural Heritage Context

The following section describes cultural heritage context of the PDA area, including its proximity to registered archaeological sites, cemeteries, National Historic Sites, registered heritage properties, and other protected areas (***Figure 4***).

Registered Archaeological Sites

In Nova Scotia, information regarding archaeological sites is stored in the Maritime Archaeological Resource Inventory (MARI), a provincial archaeological site database, maintained by the Nova Scotia Museum. This database contains information on archaeological sites registered with the province within the Borden system. The Borden system in Canada is based on blocks of latitude and longitude. Each block is referenced by a four-letter designator. Sites within a block are numbered sequentially as they are recorded. The General Project Area is located at the northern end of the BfDb Borden Block.

A review of the MARI determined that there are no registered archaeological sites within the PDA. The nearest registered site, BfDb-03, is located approximately 1.7 kilometres north of the PDA. BfDb-03, the S.W. Avon Site, represents the isolated find of a ground slate point near a tributary of the Avon River during installation of the transmission line that extends through the General Project Area.

Cemeteries or Individual Burial Plots

The combined results of background research, engagement, and archaeological reconnaissance yielded no evidence of human burials in the vicinity of the PDA. The nearest known cemetery is the Redden Family Cemetery, located approximately 2.2 kilometres to the northeast beside a residence on Mountain View Drive. This small cemetery has burials dating to ca. 1772.

National Historic Sites

The results of background research yielded no evidence of National Historic Sites in the vicinity of the PDA. The nearest, located in Windsor, are the Chapel on the King's College grounds, approximately 11.8 kilometres to the northeast, and Fort Edward located approximately 12.6 kilometres to the northeast.

Designated Special Places

The results of background research yielded no evidence of Designated Special Places in the vicinity of the PDA.

National or Provincial Parks

The results of background research yielded no evidence of National or Provincial Parks in the vicinity of the PDA. However, the Falls Lake Provincial Park is located approximately 4.1 kilometres to the southeast.

Registered Heritage Properties

The nearest registered heritage property to the PDA is a Municipally Registered Property known as All Saints Anglican Church, located at 652 New Ross Road, Leminster, approximately 5.5 kilometres to the south. The structure is a simple wood frame Gothic Revival church built in 1872 (Parks Canada, 1993).

Protected Areas

The PDA intersects a single Crown land parcel. Identified as PID 45063443 and measuring 930 hectares, this parcel lies at the eastern end of the footprint. The Moses Mountain hiking trail is approximately 10 metres from the eastern boundary of the PDA at its closest point. The nearest

protected wilderness area is South Panuke Wilderness Area, located approximately 9.2 kilometres to the southeast.

Mi'kmaw Cultural Landscape

Archaeological studies strive to consider the ecological, socio-cultural, and economic values of a traditional Mi'kmaw cultural landscape, as well as physical cultural resources such as structural features and artifacts. Cultural landscapes are identified as landscapes that have been affected, influenced, or shaped by human involvement. A cultural landscape can be associated with a person or event or a combination of both. Collectively, cultural landscapes are narratives of culture, and expressions of identity (Lewis, 2018, p. 1).

The Mi'kmaw term *weji-sqalia'tiek*, meaning "we sprouted from [this landscape]," vividly conveys a personal and cultural connection with the landscape of Mi'kma'ki. The strength of this bond is reflected in Mi'kmaw legends and placenames, both of which often highlight cultural elements such as local historic events, key resources, and essential meaning, demonstrating an intimate understanding of the area gained through countless generations of exploration, use, and occupation (Sable & Francis, 2012, pp. 17, 19, 42).

Mi'kmaw legends, which help reveal traditional Mi'kmaw cultural landscapes, identify the crest of Blomidon as Kluskap's dwelling place. Observing Blomidon and recalling its legends is part of the lives of those who dwell in sight of this cape, including the residents of Windsor/Falmouth. Relevant legends include the following:

> *But the most remarkable personage of their traditions is Glooscap. The Indians suppose that he is still in existence, although they do not know exactly where. He formerly resided in Nova Scotia, but, of course, shifted his habitation. He was, to say the least, almost an object of worship. He looked and lived like other men; he ate, drank, smoked, slept, and danced along with them. But he never died, never was sick, never grew old. He lived in a very large wigwam. Cape Blomidon still bears his name, Glooscapweek (Glooscap's home). The Basin of Minas was his beaver-pond, - for he had everything at a large scale. The dam was at Cape Split; and we are indebted to this wondrous personage, so goes the tradition, for the privilege of sending our ships down this passage. For there he cut open the beaver-dam, - and the fact is established by the name which it still bears. The Indians call it call it Pleegum (the opening made in a beaver dam). That is still its name; and two rocks, somewhat resembling dogs seated on their haunches, near u'toowome (his kettle) are called u'teck (his dogs). The kettle is now bottom upward, and the dogs were transformed into rocks when he went away. His canoe was also of stone . . . Glooscap gave vent to his anger, and in his rage, abandoned the country, turned over his kettle as he went off, and changed his dogs into rocks. There the faithful sentinels still keep watch; and when he returns he will be as able to restore them to their former life as he was at his departure to fix them where they now are* (Rand, 1894, pp. xliv-xlvi).

> *Before going further up the bay, Glooscap now crossed over to Utkogŭncheech (Cape Blomidon). There he arrayed and adorened his aged female companion, decked her out with beautiful beads and strings of wŏmpŭm, making her young, active, and beautiful, and for her sake making all those beautiful minerals for which the 'hoary cape' has been so long celebrated. My aged friend, Thomas Boonis, who related this narrative to me, assured me with much animation that he had seen these beautiful minerals with his own eyes, - emphasizing his*

> *assertion by saying in broken English. 'Glooscap, he makum all dese pretty stone'* (Rand, 1894, p. 291).
>
> *Kluskap, the giant, legendary Mi'kmaw figure, wanted to take a bath. He called his friend Beaver and told him to find some water. Beaver built a huge dam across the mouth of a great river. Water backed up behind the dam and stopped flowing into the sea. As Kluskap stepped into the water, Whale stuck her head over the dam and asked, 'Why have you stopped this water from coming to my domain?' Not wanting to anger his friend, Kluskap got up and walked back to land. With a stroke of her mighty tail, Whale destroyed the dam and sent salt water flooding into the river. As she turned and swam back out to sea, she set the water of the Bay sloshing back and forth, a movement it has kept to this day* (Confederacy of Mainland Mi'kmaq, 2007, p. 20).

Mi'kmaw placenames, too, can convey a key story of an area, including features of the landscape, historic events, or important resources (Sable & Francis, 2012, p. 42). Mi'kmaw methods of naming a place, using a verb-based language, frequently reflect the meaning of the area to the Mi'kmaq. This type of naming relies on an intimate understanding and repeated use of an area. Traditional Mi'kmaw names for places near the General Project Area are listed in the table below (***Table 1***).

Table 1: Traditional Mi'kmaw place names near study area (Ta'n Weji-sqalia'tiek Mi'kmaw Place Names Digital Atlas, 2019)

Traditional Name	English Translation	Contemporary Name	Distance from Study Area
Apukji'jue'katik	Place of the mice	Pine Lake	0.7 km NE
Amaqapskiket	Flowing over rocks	Avon River	1.9 km SE
Apsetkwijk	Small River	Avon River West Branch	--
Amaqapskikejk	Smaller stream flowing over rocks	Avon River Southwest Branch	1.1 km northwest
Pesikitk / Tuitnuk	To flow splitwise	Avon River Forks	4.4 km NE
Niktue'k	At the forks	Windsor Forks	4.4 km NE
L'nui-Maqmikew	Reserve land	New Ross Reserve No. 20	9.0 km SW
Kwesawatqek	Thickly wooded point	Falmouth	10.0 km NE
Pesikitk	To flow splitwise	Windsor	11.0 km NE
Panuk	At the opening	St Croix Reserve No.34	11.6 km E

The Mi'kmaw name for Windsor is *Pesikitk*, which translates to "to flow splitwise" (Ta'n Weji-sqalia'tiek Mi'kmaw Place Names Digital Atlas, 2019), from which the Acadian period name for the region, Piziquid, is derived. The Mi'kmaq name for Falmouth is *Kwesawatqek*, meaning "thickly wooded point". The Mi'kmaq name for the main branch of the Avon River is *Amaqapskiket*, meaning "flowing over rocks" (Ta'n Weji-sqalia'tiek Mi'kmaw Place Names Digital Atlas, 2019). The Avon River West Branch is known as *Apsetkwijk*, meaning "small river" (Ta'n Weji-sqalia'tiek Mi'kmaw Place Names Digital Atlas, 2019). Pine Lake, within the study area, is known as *Apukji'jue'katik*, meaning "place of the mice" (Ta'n Weji-sqalia'tiek Mi'kmaw Place Names Digital Atlas, 2019). Panuke Lake is a derivation of the Mi'kmaq word *Panuk*, meaning "at the opening" (Ta'n Weji-sqalia'tiek Mi'kmaw Place Names Digital Atlas, 2019).

Amaqapskiket, or the Avon River, would have been an important transportation corridor facilitating travel inland from the Minas Basin, and providing a resource base for the Mi'kmaq, their ancestors for millennia prior to the arrival of European settlers. The river would also have been a significant

source of salmon, trout, eel, and other fish species.

Relative to the PDA, the nearest contemporary First Nation land is New Ross Indian Reserve Number 20 (New Ross No. 20), located approximately 9.0 kilometres to the southwest (***Figure 5***). Originally surveyed in 1866, this reserve is a 405-hectare parcel accessed by Red Shirt Road and is governed by Sipekne'katik First Nation.

In 1907, heirs of politician Philip Carteret Hill conveyed the lands of the Micmac Missionary Society to the Crown to create Horton (now Glooscap) IR35 Reserve, located approximately 13.5 kilometres north of the PDA (Hill, 1907).

Geopolitical boundaries and foreign place names seen on contemporary maps did not exist prior to the European exploration and ultimate colonization of Mi'kma'ki beginning in the seventeenth-century. Rather, the Mi'kmaq recognized seven "districts," still organized today, with an eighth, *Ktaqmkuk* (Newfoundland) added in 1860 (Sable & Francis, 2012, p. 19). The district boundaries followed natural elevated divides separating drainage basins but would likely have been seen as being flexible and permeable, reflecting changing conditions and the needs of people in each area, rather than acting as geopolitical boundaries (Sable & Francis, 2012, p. 21).

The General Project Area is part of the greater Mi'kmaw territory known as *Sipikne'katik* meaning 'place of groundnuts' (***Plate 3***) (Sable & Francis, 2012, p. 21; Ta'n Weji-sqalia'tiek Mi'kmaw Place Names Digital Atlas, 2019).

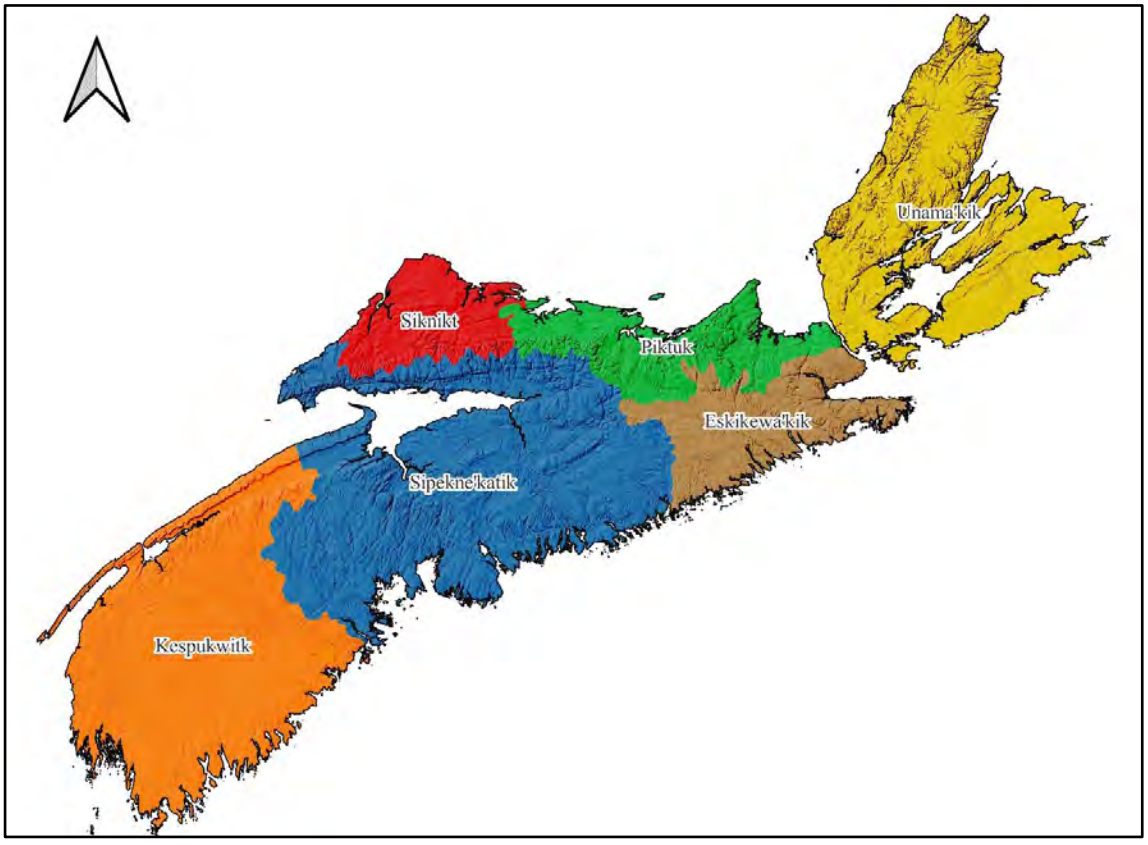
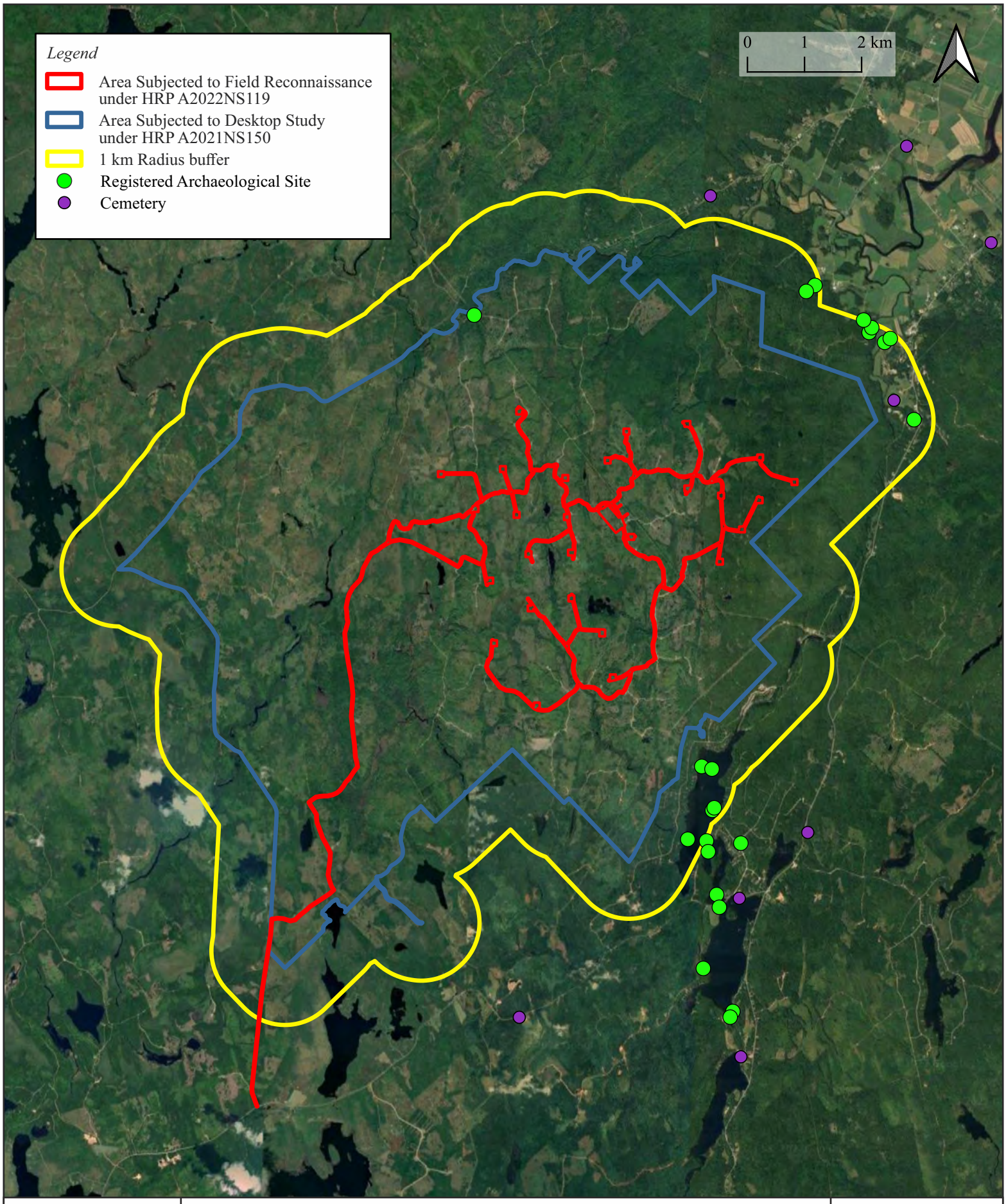


Plate 3: Mi'kma'ki Districts in Nova Scotia based on Cultural Landscape Units (Adapted from Sable & Francis, 2012).



CRM Group Cultural Resource Management Group Ltd.	*Cultural Heritage Context*	*Figure 4*
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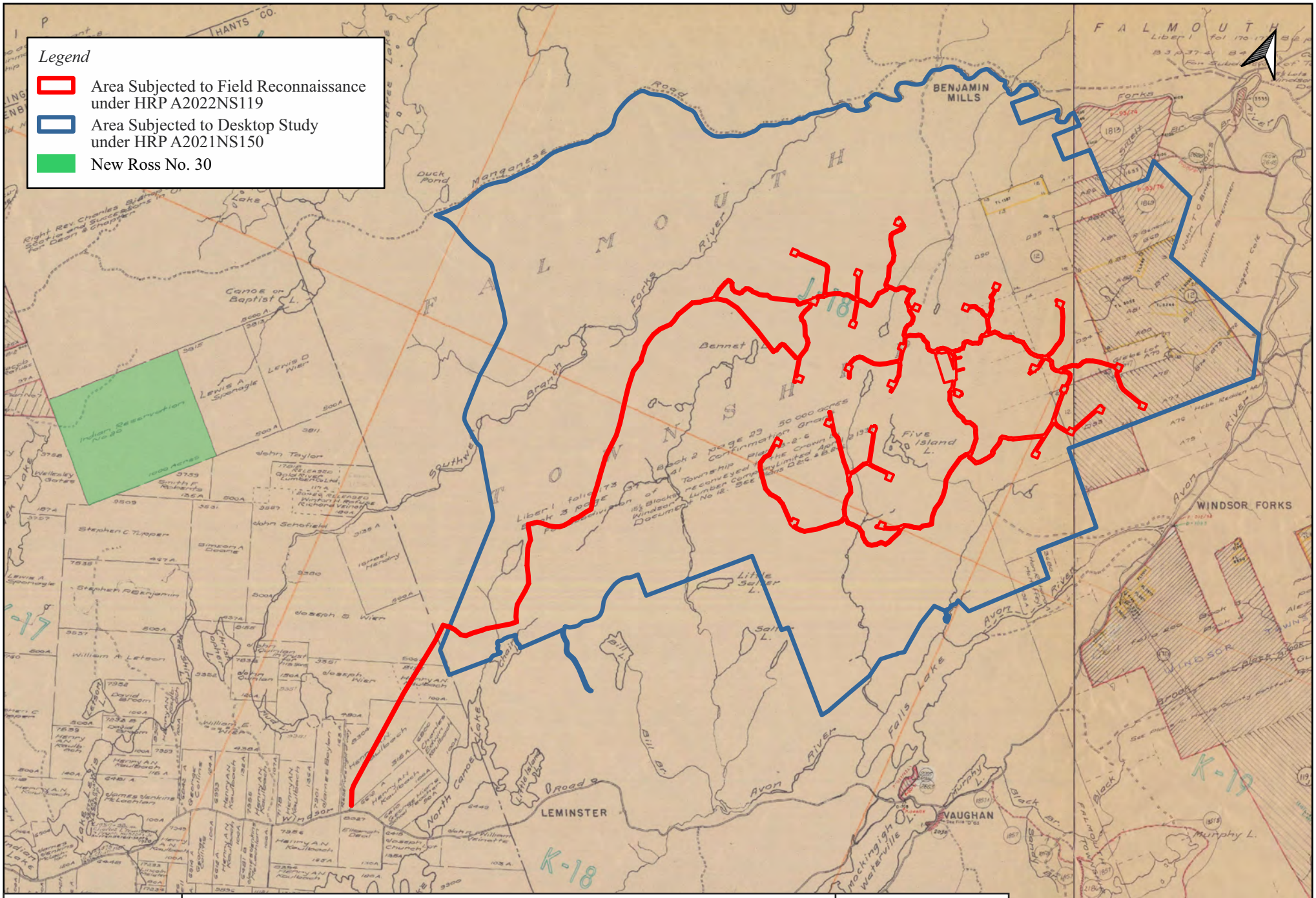
		Scale: 1:85,000



CRM Group Cultural Resource Management Group Ltd.	*Crown Land Index Sheets Nos. 45 & 54*	*Figure 5*
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4.2.3 Land Use History

Investigating the history of land use – the modification of the natural environment for the purposes of habitation, agriculture, or other industry or activity – is essential in evaluating the archaeological potential of a given study area.

Pre-contact Land Use

The earliest human inhabitants of Mi'kma'ki are known as *Saqiwe'k L'nuk*, meaning the "Ancient People" (CMM 2007: 1). Present within the region during what archaeologists call the Palaeo period (13,000 to 9,000 years BP), the Saqiwe'k L'nuk may have arrived at the Maritime Peninsula with the emergence of periglacial environmental conditions that made the area a haven for caribou and other game animals (Deal, 2016, p. 38).

The earliest evidence of people on the land in Mi'kma'ki was found in present day Debert, located approximately 83 kilometres northeast of the study area. There, Palaeo habitation sites collectively known as the Debert/Belmont Complex lie in and around Mi'kmawey Debert, clustered along the edge of a sandy plateau south of the Cobequid Mountains. Radiocarbon dating of charcoal from these sites has suggested that they were occupied approximately 12,500 BP, during the extreme cold of the Younger Dryas Chronozone (*ca*. 12,900 to 11,700 cal BP), when a global reduction of average annual temperature caused local forests to return to tundra, and caused remnant glaciers in the Cobequid Mountains to re-advance (Deal, 2016, p. 38).

The proximity of registered archaeological site BfDb-03 and Apukji'jue'katik or Pine Lake, suggests that Mi'kmaq were active in the vicinity of the study area at least as eary as the time of the *Mu Awsami Saqiwe'k* (not so recent people), otherwise known as the Archaic Period, sometime between 10,000 to 3,000 B.P. Numerous other sites further to the north and south are attributed to the *Kejikawek L'nuk* (recent people), and would have been occupied during the Woodland Period, which lasted from 3,000 to 500 B.P.

Occupation of the region by Mi'kmaq into the historic period is indicated in mapping from the eighteenth century, which includes reference to a Mi'kmaq village ("Village Sauvage") in the Piziquid (now Windsor) region, between the Avon ("R. de Pigiguit") and St. Croix Rivers (***Figure 6***).

According to local tradition, a group of Mi'kmaq known as the Amquaret camped at a spot called Indian Orchard, located 2.8 kilometres north of the study area at the head of tide on the Avon River (Duncanson J. V., 1983, p. 45; Redden, 2001, p. 71). Amquaret was apparently "the family name of most of the band that numbered fifty-three souls when they were moved to Shubenacadie Reserve late in the nineteenth century" (Redden 2001: 25). Indeed, Pre-contact artifacts, including a projectile point and some flakes, were reported in the area, which is now a registered archaeological site (BfDb-9).

CRM Group Cultural Resource Management Group Ltd.	*Bellin, Carte de l'Accadie, 1744*	*Figure 6*
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Historic Land Use

The region was first settled by Europeans in the 1680s, when Acadian settlers, drawn to the area for its dyke-able salt marshes, first began establishing communities outside of the Port Royal (Annapolis Royal) area. A 1704 raid on Piziquid by Colonel Benjamin Church involved the burning of 40 Acadian houses and outbuildings, the death of livestock, and the breaking of dykes to destroy crops (Benjamin Church, 1851; Griffiths, 2005; Hody, 1974). The engagement also involved the death of one Mi'kmaw man and injuries to several others.

Despite the attack and the impact of a 1710 forest fire that swept between the Gaspereau and Pisiguit rivers, possibly affecting the study area, a census taken in 1714 recorded 65 households at 'de la Riviere Pisiguit' (Duncanson J. V., 1983, p. 66; LeBlanc Consentino, 1998). There were at least five distinct Acadian villages located on the Falmouth side of the Avon River, situated along tidal marshes from Hantsport to the head of tide at Upper Falmouth. Included among these are those located at the Castle Frederick complex of sites, situated approximately 2.8 kilometres northeast of the study area (***Figure 7***) (Duncanson J. V., 1983, p. 4).

In 1722, the Catholic parish at Piziquid was divided into two units, with the eastern side of the river retaining the original name of la paroisse de l'Assomption (Windsor) and the creation of a new parish on the western side, named la paroisse de Sainte-Famille (Falmouth). By 1727, approximately 160 Acadian families were recorded living along both sides of the river (Duncanson J. V., 1983, pp. 5-7).

The fragile peace that existed between Britain and France from the end of the War of the Austrian Succession (1740-48) to the beginning of the Seven Years' War (1756-1763) saw a build-up of military forces in the area by both sides. The region had just witnessed the French capture of Canso (1744), two unsuccessful French assaults on the fort at Annapolis (1744) and the capture of Louisbourg by New England forces (1745). The Treaty of Aix-la-Chapelle (1748), to the displeasure of New England, mandated the return of Louisbourg to the French, which they immediately began rebuilding and reinforcing. To substantiate their claim to the territory west and north of the isthmus of Chignecto, the French also began building a series of forts in the region, most notably Fort Beauséjour (Duncanson J. V., 1983).

In part to respond to the threat of Louisbourg, the British decided to build a major settlement on the Atlantic coast at Halifax, and to move their capital there. They also built a blockhouse at Grand Pré, Fort Sackville on the Bedford Basin, Vieux Logis at Grand Pré, and Fort Edward at Piziquid (Clark, 1968, p. 333). Historic mapping from 1750 by Samuel Holland shows domestic occupation along both banks of the Avon (Piziquid) River, the east bank of the St. Croix River, and along roads leading from Vieux Logis to Fort Edward and from Fort Edward to Fort Sackville (***Figure 7***). Chief Surveyor Charles Morris indicated that there were about 1,400 people living along the Piziquid River, with 800 on the left bank, 100 on the right bank and along the Kennetcook River, and about 500 on the St. Croix River (Clark, 1968, p. 217). Fort Edward played a significant role during the French and Indian War (1754–1763) and was used to hold Acadian prisoners as they were notified of their Deportation.

Following the Deportation, New England Planters began to settle the recently vacated Acadian lands, establishing the Townships of Falmouth in 1760 (along with Horton and Cornwallis townships) and Windsor in 1764 (Shand, 1979; Duncanson J. V., 1983, pp. 10-11). The study area, situated some distance from the Falmouth town site, was granted to its proprietors in 1759 (Public Archives of Nova Scotia, 1967, p. 700). Land within the western portion of the township was divided into 400-acre lots, while lots within the eastern portion of the study area, closer to the Avon River Valley, were divided into 100 to 200 acre lots (***Figure 8***). Of note, Lot A79, in the southeast portion of the

General Project Area and PDA, is listed as a glebe lot. Additionally, portions of lots D93 to D96, in the eastern half of the General Project Area and PDA were issued to army officer, landowner, and office-holder Colonel Henry Denson, namesake of Mount Denson. Additional research into the history of land grants within the study area may reveal further information on landownership. Following the American Revolution, an additional influx of United Empire Loyalists settled in the area.

Castle Frederick, located northeast of the General Project Area, was the 8,000-acre estate of Joseph Frederick Wallet DesBarres, who became renowned as a cartographer, Lieutenant Governor of Cape Breton and Governor of Prince Edward Island, Established upon the former Landry family village, Castle Frederick would serve as DesBarres' base of operations from 1764 to 1773 (***Plate 4***) (Morgan, 1987). DesBarres' "Chart of Nova Scotia" is one of the most important maps of the region from the eighteenth century. In his depiction of the Falmouth area, Castle Frederick is clearly indicated (***Figure 9***).

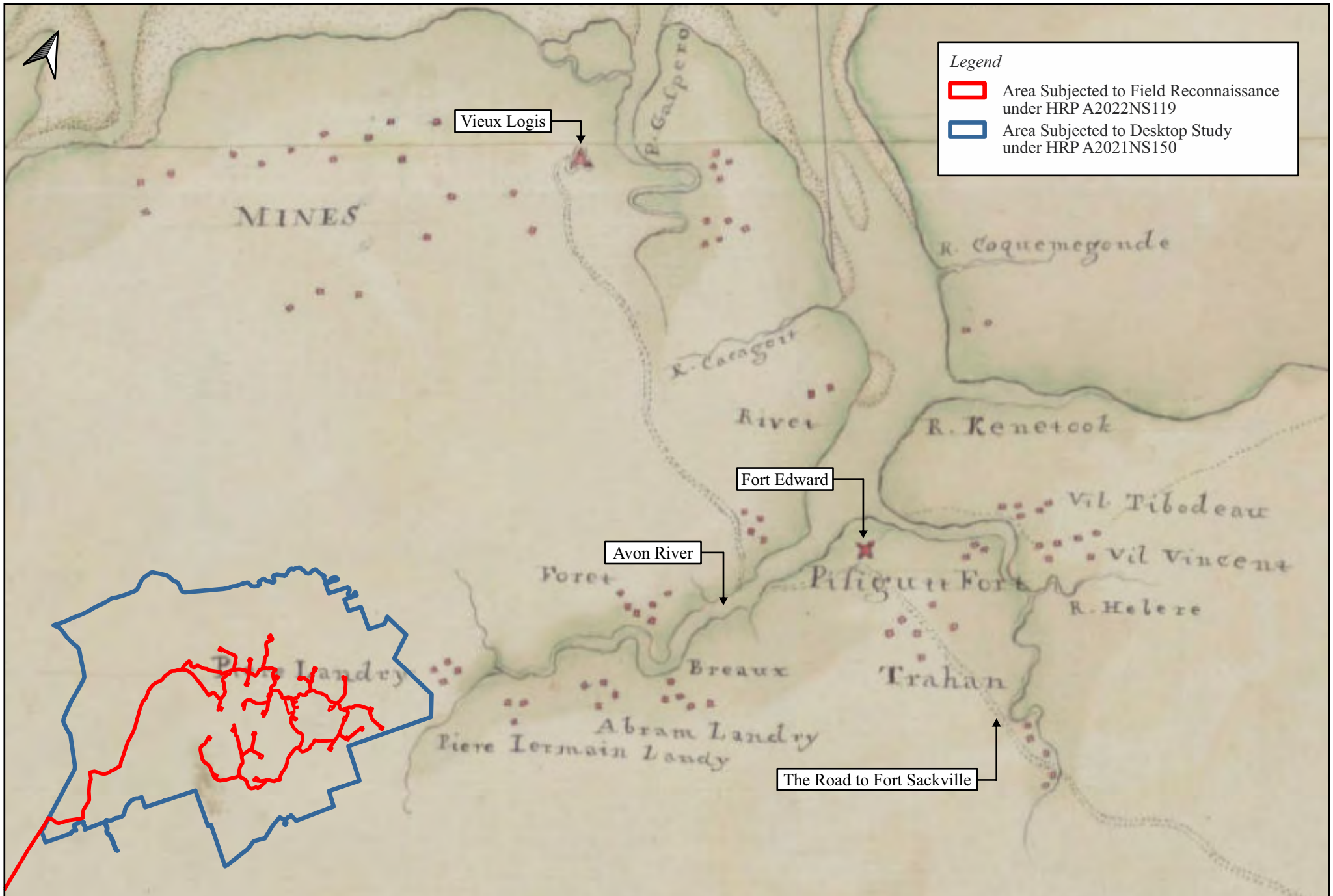
Plate 4: Water colour of the Castle Frederick Estate, 1776 (Duncanson J. V., 1983, p. 25).

In 1857, the Nova Scotia Railway extended to Windsor and the area became a centre for shipping, shipbuilding, and gypsum mining. In 1878, Windsor was incorporated as a town (Shand, 1979). An examination of historic mapping from 1871 revealed that at least one dam was constructed on the Avon River, just north of Falls Lake, but that no development had occurred within the General Project Area (***Figure 10***). Several residences, belonging to the Patterson, and Barkhouse families, among others, are depicted just north of the General Project Area, positioned along the beginnings of Mines Road. The communities of Windsor Forks, Mill Section (known as Mill Pond), and Vaughn (known as Waterville) are developed by this time.

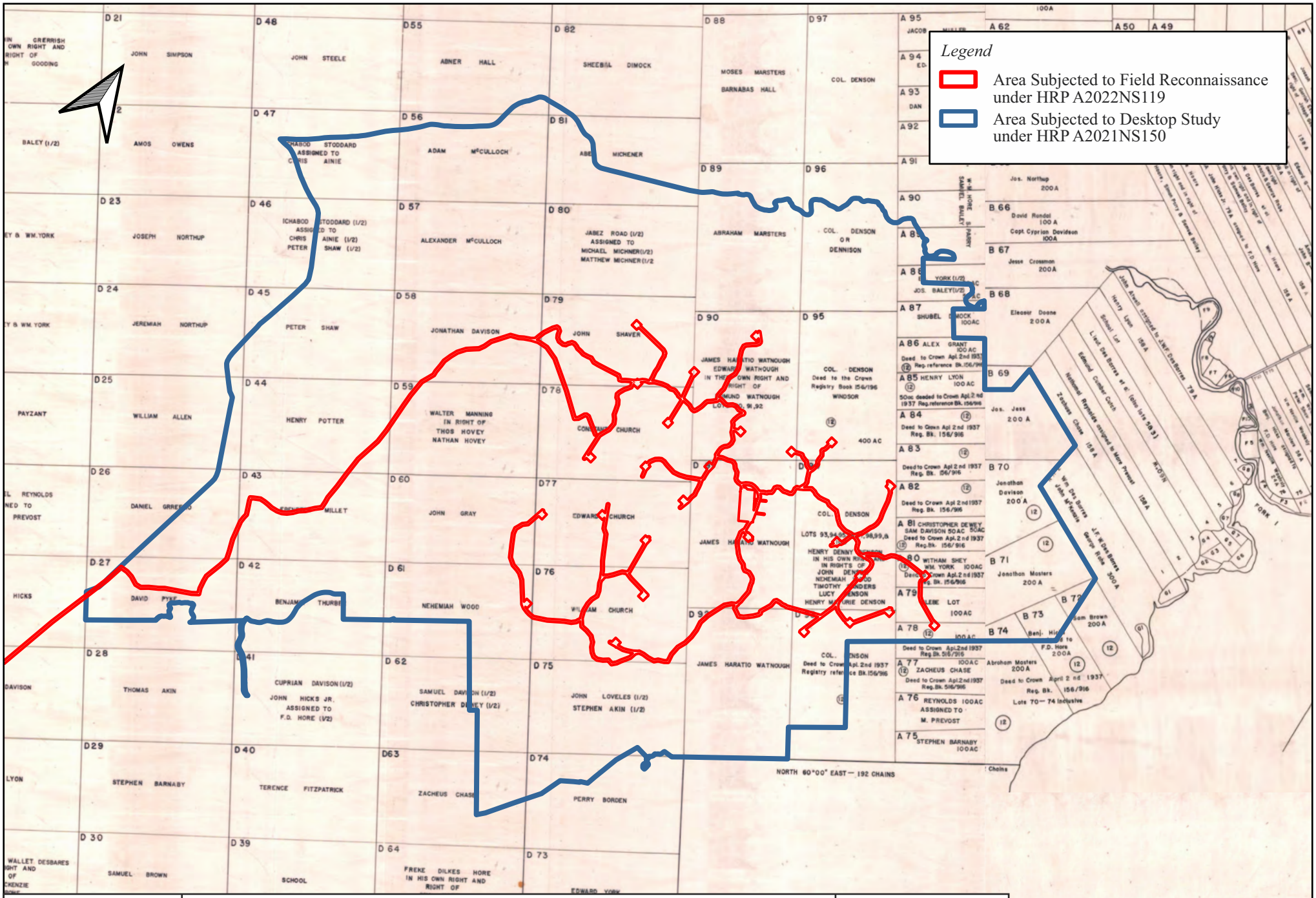
From 1896 to 1911, businessman S.P. Benjamin operated a sawmill on the West Branch Avon River (not to be confused with an earlier operation at White Rock, on the Gaspereau River) (***Plate 5***). Assuming the present-day placename has not shifted, this would place the mill approximately two kilometres northwest of the General Project Area. The mill reportedly contained a cookhouse and bunkhouse (Fry, 2021). As part of the history of forestry in the region, in 1937, several woodlots within the General Project Area were transferred from the Windsor Lumber Company to the Crown.

Plate 5: Early twentieth century photo of the S. P. Benjamin Lumberyard on the Avon River (West Hants Historical Society).

The 1911 Census of Canada records 6 Mi'kmaq living in Windsor (Wicken, 2010, p. 1). In 1913, J.W. Stephens, an Agent of the Windsor Agency, reported that the 26 Mi'kmaq in in the general Windsor area were engaged in "...basket-making, coopering, making axe handles, and one or two work on railroad" (House of Commons, 1914).



CRM Group Cultural Resource Management Group Ltd.	*Holland, Map of that part of Nova Scotia contained between... Halifax & Pisiguit..., 1750*	*Figure 7*
	BENJAMINS MILL WIND ENERGY PROJECT ARCHAEOLOGICAL FIELD RECONNAISSANCE 2022 BENJAMINS MILL, NOVA SCOTIA	November 2022



CRM Group Cultural Resource Management Group Ltd.	*A Plan of the Township of Falmouth, 1772*	*Figure 8*
	BENJAMINS MILL WIND ENERGY PROJECT ARCHAEOLOGICAL FIELD RECONNAISSANCE 2022 BENJAMINS MILL, NOVA SCOTIA	November 2022

CRM Group Cultural Resource Management Group Ltd.	*DesBarres, Atlantic Neptune Series, 1773*	*Figure 9*
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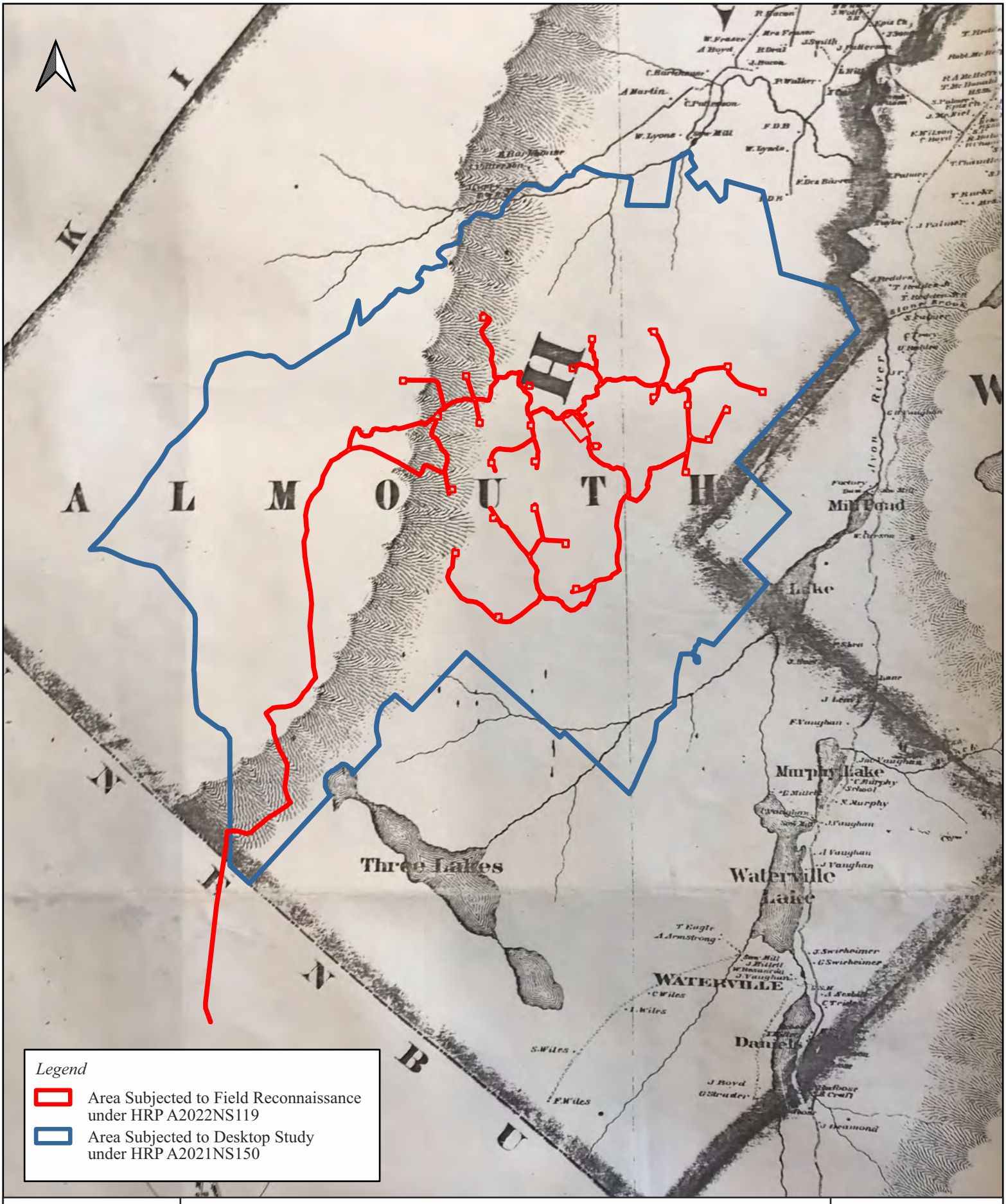
Legend

Approximate Study Area



CRM Group Cultural Resource Management Group Ltd.	*Church, Map of Hants Co., 1871*	*Figure 10*
	BENJAMINS MILL WIND ENERGY PROJECT ARCHAEOLOGICAL FIELD RECONNAISSANCE 2022 BENJAMINS MILL, NOVA SCOTIA	November 2022

4.3 Previous Archaeological Assessments

In 2021, CRM Group was retained by Dillon on behalf of Natural Forces to undertake the desktop study phase (Archaeological Screening) of an ARIA for the broad area that was then under consideration for development of the wind energy project south of Benjamins Mills. Involving Mi'kmaw engagement, background research, and archaeological potential modelling, the archaeological investigation was designed to model the distribution of archaeological resource potential across the General Project Area. Undertaken prior to implementation of planning for infrastructure, the Archaeological Screening provided an opportunity for Natural Forces to avoid suspected areas of archaeological concern during the planning stage of the wind energy project. Conducted under Heritage Research Permit (HRP) A2021NS150, it delineated areas of elevated (moderate and high) archaeological resource potential (***Figure 11***). Consequently, it was recommended that these areas of elevated potential be avoided in the design of the wind project and that the refined project impact footprint then be subjected to a program of archaeological field reconnaissance undertaken in advance of any ground disturbance (Shears, 2022).

4.4 Archaeological Potential Model

Utilizing the preceding background study as well as the Primary Data identified in ***Section 3.4***, an Archaeological Potential Model was produced for the Benjamins Mill General Project Area ***(Figure 12)***. In the absence of standards for archaeological potential modeling in Nova Scotia, CRM Group applied regulatory standards from other jurisdictions. The potential model produced for the 2021 ARIA (HRP A2021NS150) was updated, with a focus on second-order (or higher) watercourses and named water bodies, and the refined results were applied to the 2022 ARIA.

Following results and recommendations from 2021 ARIA, the design of the PDA for the Benjamins Mill Wind Project worked to avoid areas of elevated archaeological resource potential. Updated potential modeling identified no areas of elevated archaeological resource potential within the 2022 PDA.

4.4.1 Factors for Elevated Archaeological Potential

As discussed in ***Section 3.4***, areas of elevated archaeological potential within the General Project Area are ascribed based on several cultural, environmental, and geomorphological factors. Furthermore, these areas have been subdivided into high and moderate potential for encountering archaeological resources. Once a field truthing of the potential model has been undertaken, the distinction between these two levels of potential will have implications regarding recommendations for any warranted cultural resource management measures.

Proximity to Water

Proximity to water and drainage order are, by far, the most important factors in determining archaeological site potential. Distance to water has been heavily relied on as a primary indicator for potential modelling, as it is assumed that sites are more likely to be found near a reliable source of potable water. One of the pioneering efforts in the Maritimes for potential modeling using distance to water was developed by the Archaeological Heritage Branch of the New Brunswick Department of Tourism, Heritage and Culture and utilizing data from over 300 sites (Suttie, Vincent, & Nicholas, 2007).

In producing the potential model for the Benjamins Mill study area, proximity to water was broken down into areas of high potential (0-50 metres from the edge of existing and extant watercourses) and areas of moderate potential (50-80 metres from the edge of existing and extant watercourses). This model has the potential to identify 95+% of the sites that could be expected to be present (Suttie, Vincent, & Nicholas, 2007, p. 10).

By applying a Strahler Stream Order algorithm to the hydrographic and LiDAR DEM data, a whole value is applied to each stream in the data. As a "top down" system, the order rankings are increased as streams of the same order merge. If two rivers with different stream orders merge, the resulting stream is given the higher of the two numbers (Strahler, 1957; Strahler, 1964). This organization allows archaeologists to focus on high order streams that have the best potential for encouraging human usage, for subsistence or travel.

Horton Stream Order, a "bottom up" system where the stream order number increases by one at every confluence, is useful in identifying possible land crossings between high-ranking branches of watercourses (Horton, 1956).

It should be noted that the use of the category "proximity to water" has become over-simplified and should not be considered as the sole factor in determining site potential. Other biophysical factors and the scale of a project need to be considered when implementing a potential model (Young, Horne, Varley, & Clish, 1995, p. 35).

Historic Documentation

The archaeological potential modeling for Euro-Canadian and Post-contact Mi'kmaw sites was derived by reviewing historic documentation of European settlement in the landscape surrounding the study area. Unlike the environmental modeling necessary for determining Pre-contact Mi'kmaw land use, human habitation after approximately 1700 is partially documented and it is recognized that these historic sources provide more specific locational information than could be gained through geographic analysis. The maps and primary documents used in this study are discussed in ***Section 4.2.3***. In order to identify areas of archaeological potential, known historic structures, settlement areas, and transportation routes were plotted as closely as possible over the study area. The greatest potential for encountering Euro-Canadian sites is found in proximity to these mapped features.

Mi'kmaw Traditional Knowledge

Archaeological site potential models are based primarily upon environment and geomorphological data assumed to represent conditions existing in the past. When combined, the criteria chosen for the potential model had to represent a comprehensive view of the past that would allow the capture of all high and moderate potential areas representing all periods of Mi'kmaw occupation within the study area landscape. Since the needs of the Sa'qiwe'k L'nu'k (the Ancient People – 11,500 to 9,000 BP), the Mu Awsami Kejikawe'k L'nu'k (the Not So Recent People – 9,000 to 3,000 BP), the Kejikawe'k L'nu'k (the Recent People – 3,000 to 500 BP), and Kiskukewe'k L'nu'k (Today's People – 500 BP to present) would have been much different from those of later agriculturalists, the model needed a sufficiently broad scope to ensure that all culture groups and time frames were included.

Based on CRM Group's Request for Information discussed in ***Section 4.1***, information regarding Mi'kmaw traditional knowledge of the General Project Area was used to expand upon information gained through archival research to better understand the cultural and archaeological importance of this area, as well as support CRM Group in conducting the assessment with an approach that included the landscape changes witnessed and experienced by Mi'kmaw ancestors since time immemorial. This knowledge was used to inform both CRM Group's background study methodology, as well as the potential modeling and recommendations.

Proximity to Known Registered Archaeological Sites

The locations of registered archaeological sites were garnered from the MARI, maintained by CCTH. Based on ***Section 2.3.1.1*** of the New Brunswick Archaeological Guidelines and Procedures, the landscape surrounding known registered archaeological sites is ascribed high archaeological potential. The area of high archaeological potential extends 200 metres from known Pre-contact

archaeological sites and 100 metres from known historic archaeological sites (Archaeological Heritage Branch, 2012, p. 22).

4.4.2 Factors for Low Archaeological Potential

Although it is difficult to determine areas of low archaeological potential prior to the field component of an archaeological assessment, several criteria can reduce the potential of a given area, such as steep slope, wetland conditions, and knowledge of areas where modern ground disturbance has stripped away any archaeological-resource-bearing strata.

Slope

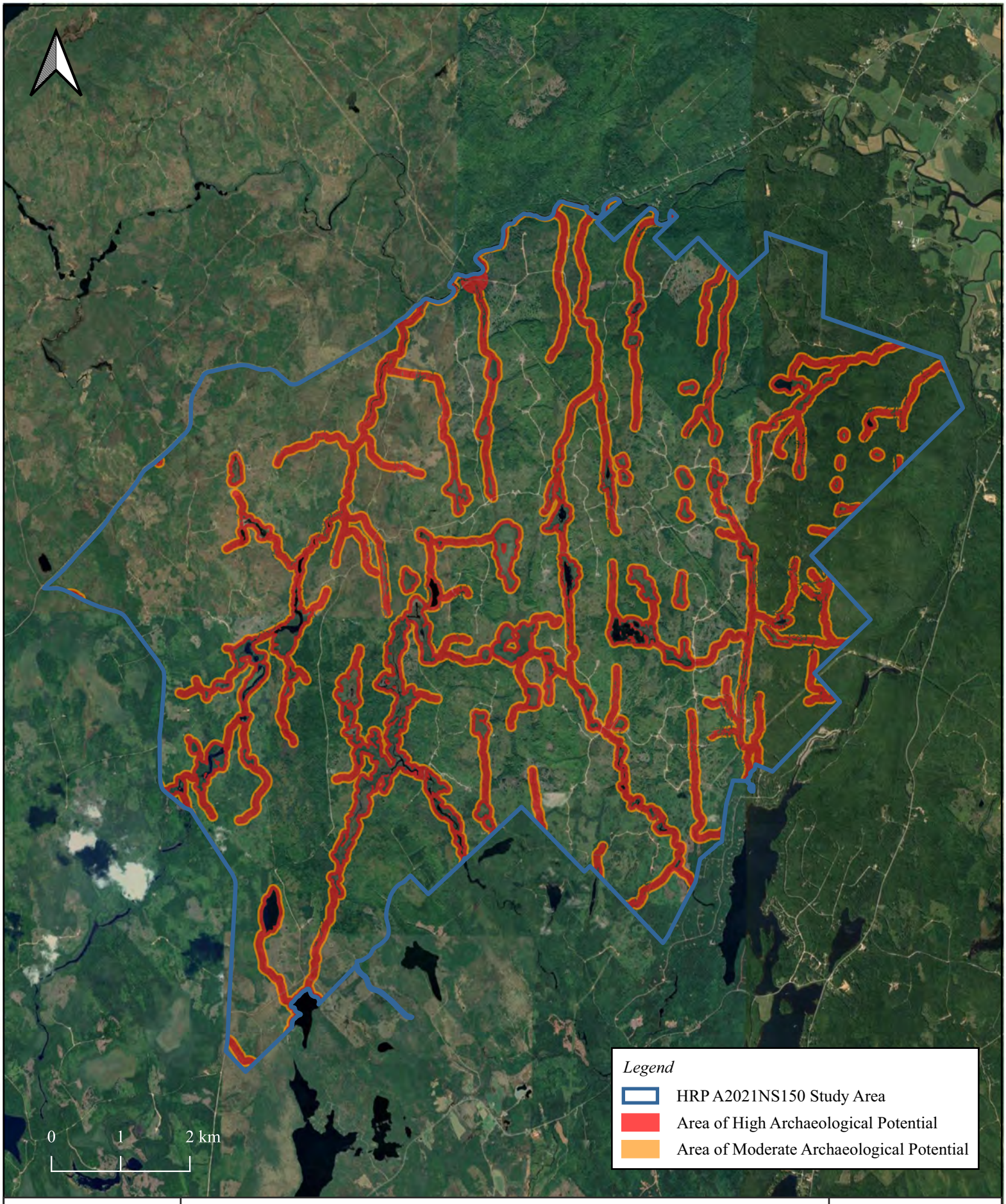
Based on ***Standard 2.a.iii.*** in ***Section 2.1*** of Ontario Standards and Guidelines for Consultant Archaeologists, areas identified as having steep slopes (greater than 20 degrees) have low potential for encountering archaeological resources (Ministry of Tourism and Culture, 2011, p. 28).

Although it is unlikely that evidence of human occupation would be visible within areas of steep slope, it is possible that archaeological potential remains. Given the general topography of Nova Scotia, and instances of glacial erratics and exposed bedrock, where areas of high potential meet areas with exposed bedrock, there may be potential for encountering petroglyphs.

Modern Ground Impacts

For the purposes of this study, integrity relates to the extent that modern groundwork has modified or disturbed the physical landscape and consequently, impacted archaeological resource potential. Land that has been fully disturbed down to glacial till or bedrock retains little or no archaeological integrity, whereas unmodified maintains any existing archeological potential/integrity.

Road infrastructure within the study area was obtained from the Nova Scotia Topographic Database, contemporary satellite images, LiDAR DEM, historic aerial photos, and historic maps and was applied to the potential model.



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HRP A2021NS150 Archaeological Potential Model

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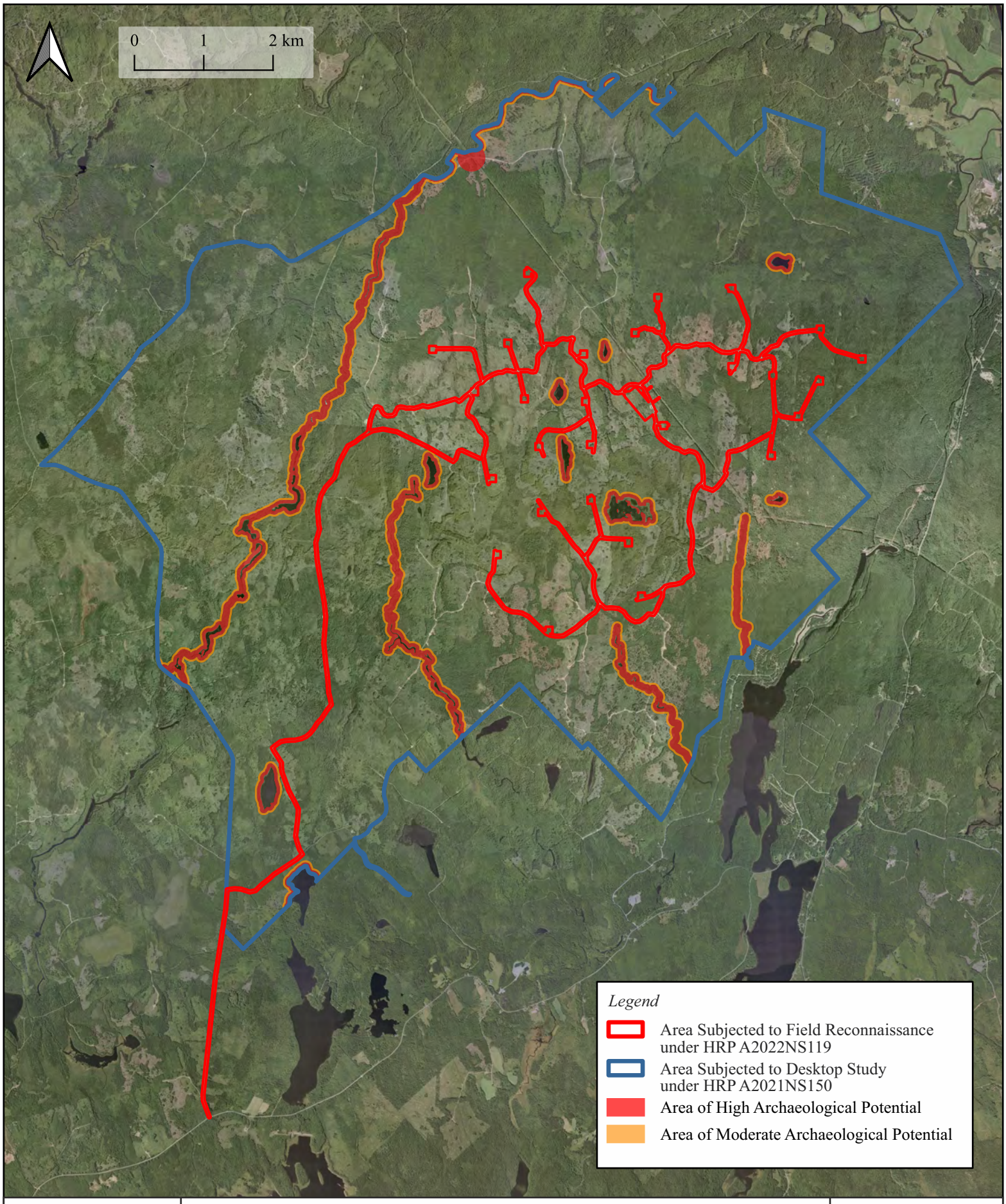
Figure 11

November 2022

Scale: 1:70,000



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HRP A2022NS119 Archaeological Potential Model

Figure 12

BENJAMINS MILL WIND ENERGY PROJECT
ARCHAEOLOGICAL FIELD RECONNAISSANCE 2022
BENJAMINS MILL, NOVA SCOTIA

November 2022

Scale: 1:70,000

4.5 Archaeological Fieldwork

During the 2022 Archaeological Reconnaissance phase of the ARIA for the Benjamins Mill Wind Project, CRM Group undertook archaeological reconnaissance within the PDA. Conducted between October 5 and 21, 2022, under the terms of HRP A2022NS119, the archaeological survey field program was directed by CRM Group Archaeologist Emily Redden and was completed with the assistance of CRM Group Archaeologists Kyle Cigolotti, Mike Sanders, and Logan Robertson, as well as Archaeological Field Technicians Roderick Peterson, Shawn MacSween, and Stewart MacPherson (*Error! Reference source not found.*).

On October 7, 2022, in turbine locations 6, 11, 24, 25, and their associated access roads, a GPS malfunction occurred and a track was not recorded. It should be assumed that a transect, approximately 30 metres from the recorded tracklog, was undertaken within the proposed turbine locations, and approximately 15 metres from the recorded tracklog within the proposed access road corridors.

4.5.1 Field Reconnaissance

Access to the study area was gained via the proposed project access road, which is an existing gravel access road that branches east off Hingley Road, north of New Russell Road; as well as an existing gravel access road that branches northwest off Pioneer Drive, north of New Ross Road (***Plates 6***). In general, the terrain within the study area was found to consist of a gentle to steep rise northward to the elevated ground of the proposed turbine locations, crossing low wetland areas between ridges (***Plates 7 & 8***). Glacial erratics and exposed bedrock outcrops were found to be common throughout the study area, with steeply sloped bedrock faces noted in the northeast portion (***Plates 9 & 10***). Past quarrying activity was visible near existing access roads throughout the study area. Ground conditions were primarily dry, but seasonal drainage channels and steadily flowing brooks were noted (***Plate 11***). The forest generally consisted of relatively open, immature mixed woods with a dense cover of low vegetation, along with areas of dense thickets of immature softwoods. Evidence of logging, historic and modern, was noted at dispersed locations throughout the study area (***Plate 12***). Areas of soil exposure at the base of uprooted trees exhibited thin soil development overlying glacial till deposits consisting primarily of cobbles and boulders (***Plate 13***).

Existing roads and trails used to access the majority of turbine locations were examined, as well as proposed access road and collector line corridors (***Plate 14***). A large, abandoned quarry, filled with standing water, was located within the east boundary of the proposed sub-station footprint (***Plate 15***). At the time of reconnaissance, machine access trails had already been cleared into some of the 28 proposed turbine locations and boreholes drilled for preliminary geotechnical investigations.

The only zone of elevated archaeological potential identified during the survey was at the site of a massive glacial erratic within the PDA for Turbine #7, in the northeast portion of the study area. There, a massive granite boulder was perched atop smaller glacial erratics and suspended somewhat above the underlying ground/bedrock surface, offering a naturally dry and protected cavity that may have attracted past human use as a rock-shelter (***Plates 16 & 17***). Large enough to shelter one or two individuals, this natural feature is located approximately 22 metres southeast of the proposed turbine location, within the 50-metre-radius construction zone. This area of high archaeological potential is situated approximately 1.3 kilometres west of Moses Mountain and approximately 2.2 kilometres northwest of the Avon 1 Hydro Plant on the Avon River.

Plate 6: Pioneer Drive access road, north of New Ross Road; facing northwest. October 7, 2022.

Plate 7: Elevated area within the proposed Turbine #3 PDA. October 14, 2022.

Plate 8: Wetland area within sub-station footprint. October 13, 2022.

Plate 9: Glacial erratic in the northeast portion of the study area. October 18, 2022.

Plate 10: Sheer rock face within the proposed access road corridor in the northeast portion of the study area. October 18, 2022.

Plate 11: Brook crossed by a proposed access road corridor in the northeast portion of the study area. October 18, 2022.

Plate 12: Evidence of past logging activity in the northwest portion of the study area. October 14, 2022.

Plate 13: Tree throw in the south portion of the study area exhibiting thin soil over stony glacial till. October 7, 2022.

Plate 14: Central, existing project access road, immediately east of the proposed sub-station footprint. October 13, 2022.

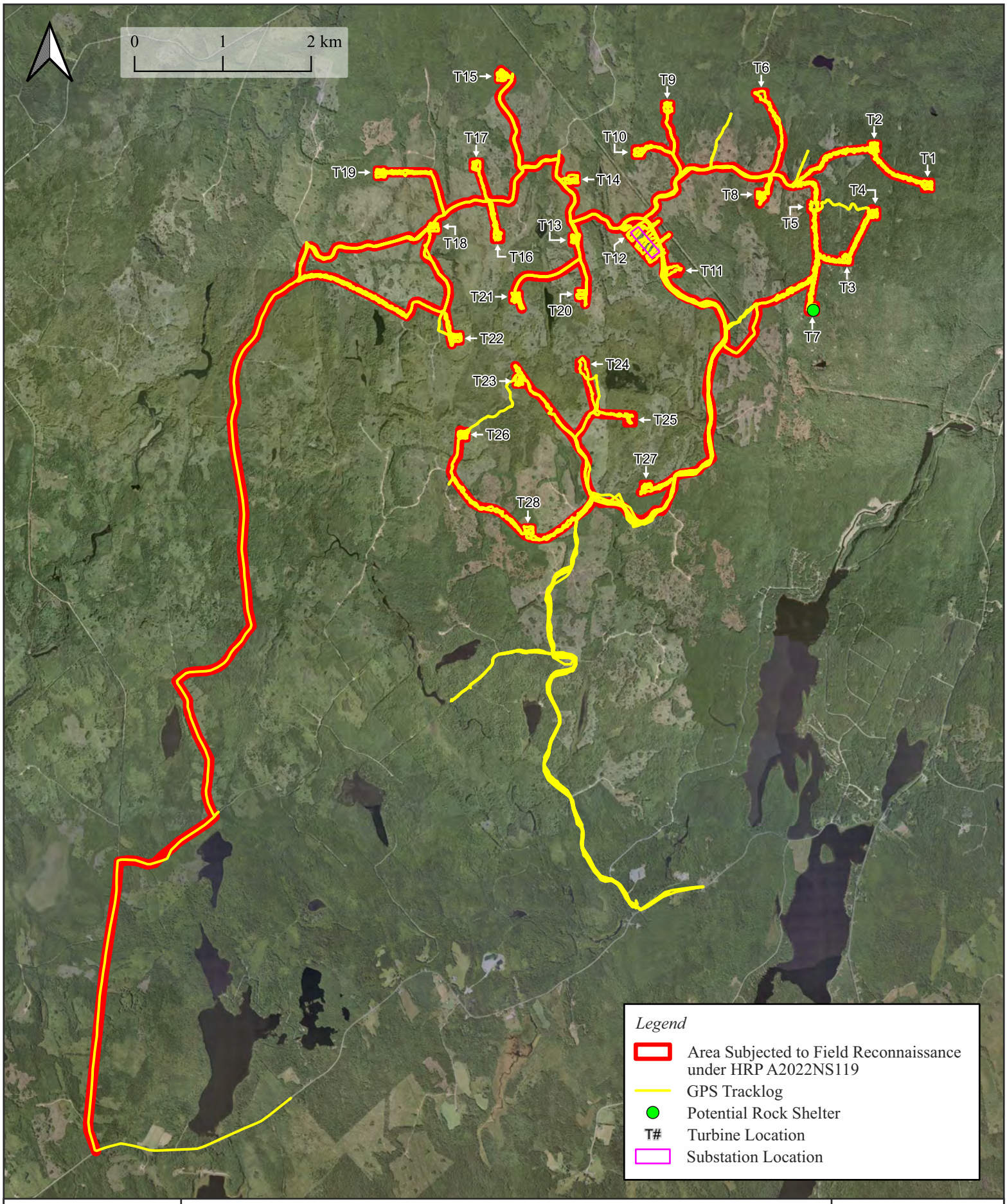
Plate 15: Water- filled quarry in within the east portion of the sub-station footprint. October 13, 2022.

Plate 16: Potential rock- shelter within the southeast portion of the PDA surrounding Turbine #7; facing northeast. October 18, 2022.

Plate 17: Potential rock shelter within the southeast portion of the PDA surrounding Turbine #7; facing southwest. October 18, 2022.

4.6 Artifact Analysis

No cultural material was observed or recovered during archaeological reconnaissance of the Benjamins Mill study area.



CRM Group
Cultural Resource Management Group Ltd.

Results of Reconnaissance

BENJAMINS MILL WIND ENERGY PROJECT PROJECT
ARCHAEOLOGICAL FIELD RECONNAISSANCE 2022
BENJAMINS MILL, NOVA SCOTIA

Figure 13

November 2022

Scale: 1:55,000

5.0 CONCLUSIONS AND RECOMMENDATIONS

The 2022 Archaeological Reconnaissance phase of the ARIA of the Benjamins Mill Wind Project study area consisted of Mi'kmaw engagement, background research, archaeological potential modelling, and fieldwork consisting of archaeological reconnaissance. The only area of elevated archaeological resource potential identified within the study area is a possible rock-shelter – the space beneath a large, perched granite boulder located within the PDA for Turbine #7 (***Figure 14***). Representing a dry and protective natural cavity in an elevated position within a generally rugged landscape, the open space beneath the boulder is ascribed high archaeological resource potential. Specifically, the concern is for archaeological resources to exist within the thin accumulation of vegetation and soil that overlies granite bedrock in the shelter of the large boulder.

Within the General Project Area, 2022 archaeological modelling ascribed high archaeological potential to land within 50 metres of the shore or bank of a named body of water or second-order (or higher) watercourse (***Figure 14***). Land from 50 to 80 metres outward from those features was ascribed was ascribed moderate potential. Likewise, land within 200 metres of a registered Pre-contact archaeological site was ascribed high archaeological potential. Although the very northeast edge of the moderate potential buffer surrounding Burnt Lake fell within the southern boundary of a proposed access road, field reconnaissance for the 2022 ARIA determined that this area in fact exhibits low archaeological potential based on the area being low lying and wet, surrounded by hummocky terrain with thin, rocky soils.

As evidenced by the background study, the General Project Area and vicinity has been utilized and occupied by European settlers from at least the second half of the seventeenth century. However, aside from possible sawmill activity along the northern boundary of the General Project Area in the late nineteenth to early twentieth centuries and the creation of modern logging roads, no historic period settlement or development of the area has occurred. Therefore, as part of the archaeological potential model, the PDA is ascribed low potential for encountering early Euro-Canadian archaeological resources.

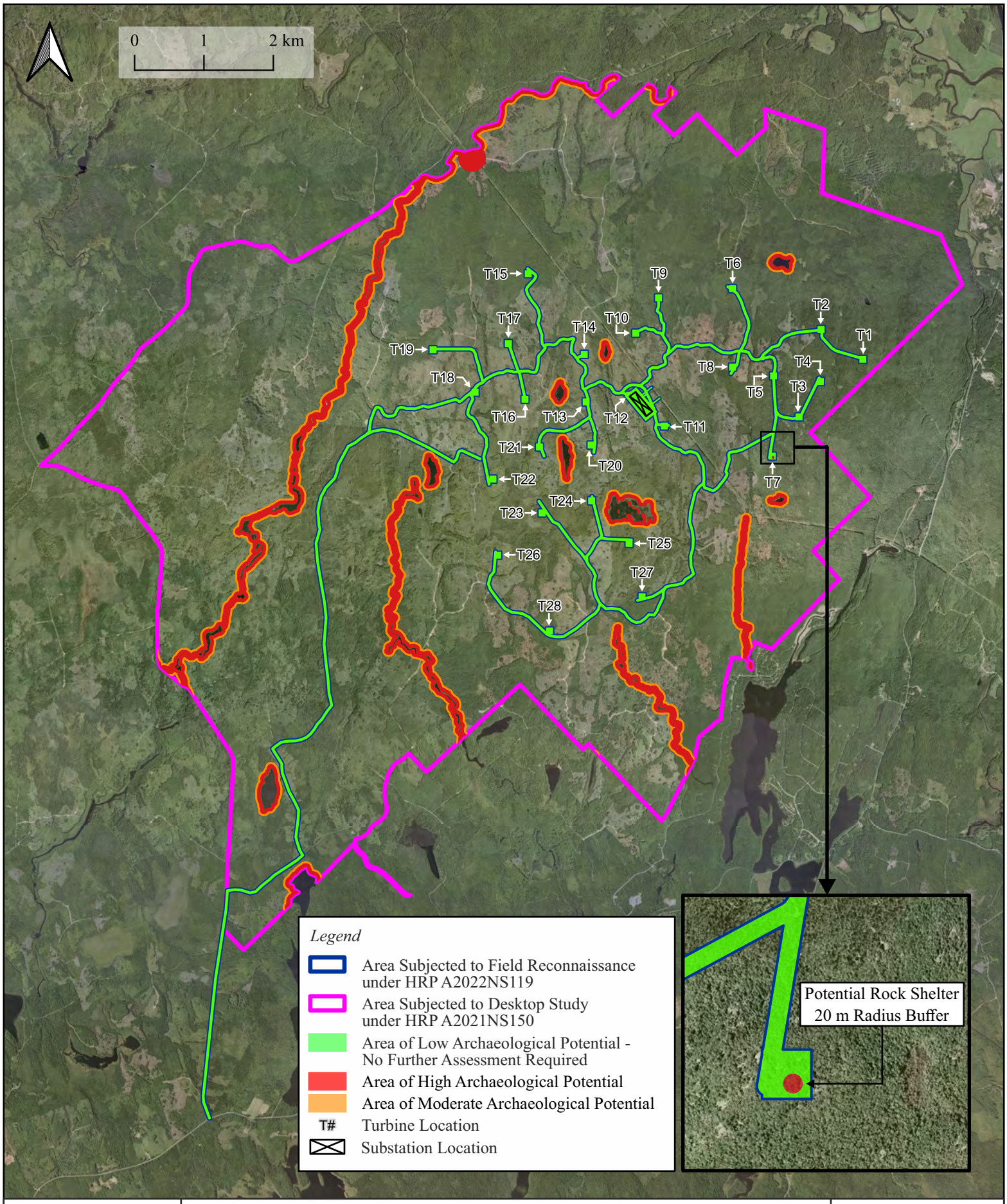
Based on these results, CRM Group offers the following management recommendations for the study area:

1. It is recommended that any ground disturbance within 20 metres of the footprint of the potential rock-shelter (***Figures 13 & 14***) be preceded by a program of strategic subsurface excavation within that footprint. Due to the presumed thinness of the soil and the restrictive size of the workspace, the test units would be excavated by trowel.

2. It is recommended that the remainder of the PDA as described and depicted in this report (***Figure 2***), be cleared of requirement for further archaeological investigation.

3. It is recommended that any proposed expansion of the Benjamins Mill Wind Project PDA avoid the modelled areas of elevated (moderate and high) archaeological resource potential be addressed by archaeological reconnaissance prior to any ground impact.

4. If archaeological deposits or human remains are encountered during construction activity within the study area, all work in the associated area(s) should be halted and immediate contact made with the Special Places Program (John Cormier: 902-424-4542).



CRM Group Cultural Resource Management Group Ltd.	*Recommendations*	*Figure 14*
	BENJAMINS MILL WIND ENERGY PROJECT ARCHAEOLOGICAL FIELD RECONNAISSANCE 2022 BENJAMINS MILL, NOVA SCOTIA	November 2022 Scale: 1:70,000

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7.0 APPENDICES

Appendix A: Heritage Research Permit Documents

NOVA SCOTIA

Heritage Research Permit (Archaeology)

Special Places Protection Act 1989

(Original becomes Permit when approved by Communities, Culture and Heritage)

Office Use Only
Permit Number:
A2022NS119

Greyed out fields will be made publically available. Please choose your project name accordingly

Surname Redden	First Name Emily

Project Name: Benjamins Mill Wind Energy Project Phase - Archaeological Resource Impact Assessment, Field Reconnaissance

Name of Organization: Cultural Resource Management Group Ltd.

Representing (if applicable): Dillon Consulting Limited

Permit Start Date July 25, 2022	Permit End Date December 31, 2022

General Location: Benjamins Mill, West Hants, Nova Scotia

Specific Location: *(cite Borden numbers and UTM designations where appropriate and as described separately in accordance with the attached Project Description. Please refer to the appropriate Archaeological Heritage Research Permit Guidelines for the appropriate Project Description format)*

The proposed wind farm project is located at Benjamins Mill in West Hants. The study area is bounded in the west by the intersection of Hingley and Mines roads (UTM 20T 391397.79m E 4971665.83m N), in the north by Mines Road and the West Branch Avon River, in the east by a property boundary located approximately 115 metres west of the Avon River (UTM 20T 404519.98n E 4974331.28m N), and in the south by a point approximately 260 metres east of Hingley Road and 750 metres west of North Canoe Lake (UTM 20T 394259.32m E 4964581.32m N).

Permit Category:
Please choose one

- ☐ Category A – Archaeological Reconnaissance
- ☐ Category B – Archaeological Research
- ☑ Category C – Archaeological Resource Impact Assessment

☑ I certify that I am familiar with the provisions of the *Special Places Protection Act* of Nova Scotia and that I have read, understand and will abide by the terms and conditions listed in the Heritage Research Permit Guidelines for the above noted category.

Signature of applicant 	Date July 12, 2022
Approved by Executive Director  Digitally signed by Christopher Shore Date: 2022.07.20 09:58:08 -03'00'	Date 7/20/22