

**APPENDIX E**

**Archaeological Resources Impact Assessment**



**GLEN DHU WIND FARM:  
ARCHAEOLOGICAL RESOURCE IMPACT ASSESSMENT**

**Heritage Research Permit A2007NS45  
Category C**

**Davis Archaeological Consultants Limited**

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**Report Compiled by:** Heather MacLeod-Leslie & April D. MacIntyre

*Cover:* A portion of the *Topographical Map of Pictou County* by Ambrose F. Church, 1867, overlaid onto proposed development map.

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## **EXECUTIVE SUMMARY**

An archaeological resource impact assessment of the proposed Glen Dhu Wind Farm development was conducted by Davis Archaeological Consultants Limited. The impact assessment was limited to a desktop study which included consultation of the Maritime Archaeological Resource Inventory database at the Nova Scotia Museum, historical documents at Nova Scotia Archives and Records Management in Halifax, aerial photographs at the Department of Natural Resources Library, as well as secondary resources. The study revealed that the general area has been impacted by historical settlement of the area, beginning in the last half of the eighteenth century, though most heavily in the nineteenth century. High potential exists for archaeological resources related to those periods. The likelihood of encountering Mi'kmaq archaeological resources is low on the mountaintops, though moderate to high potential exists in the intervening valleys as nearby Merigomish was of major importance in the Mi'kmaq seasonal round. This can present concerns for corridors, right-of-ways and access roads. It is recommended that the study area be subjected to an archaeological reconnaissance prior to any ground disturbance.

## 1.0 INTRODUCTION

In June 2007 Davis Archaeological Consultants Limited was contracted by Fulton Energy Research to conduct an archaeological resource impact assessment of the proposed Glen Dhu Wind Farm in Pictou County. The purpose of this assessment was to determine the potential for archaeological resources within the development zone and to provide recommendations for further mitigation if deemed necessary. This assessment included consultation of the Maritime Archaeological Resource Inventory in the Heritage Division of the Nova Scotia Museum as well as historic maps, manuscripts, and aerial photographs of the study area.

This assessment was conducted under Category C Heritage Research Permit A2007NS45 issued by the Nova Scotia Heritage Division. This report conforms to the standards required by the Heritage Division under the Special Places program.

## 2.0 DEVELOPMENT AREA

The study area for the Glen Dhu Wind Farm falls within Pictou County, east and north of Barney's River Station and east of Barney's River. The impact area is defined by the turbine locations as well as the location of access roads and right-of-ways, which expand across the breadth of the study area. The development area is located north and south of the TransCanada Highway #104 at exit #29 (Figure 2.0-1). The area to the north is the Glen Dhu Wind Project and proposes 37 turbines and associated infrastructure. The area to the south is the Weaver's Mountain Wind Project and proposes 13 turbines and associated infrastructure. It is the area covered by these two wind projects that is the focus of this study. The development area is located over a convergence of four Nova Scotia Theme Regions – 1. Pictou-Antigonish Highlands, 2. Dissected Margins (sub unit# 320b French River), 3. Northumberland Plain (sub unit# 521a Northumberland Straight) and 4. Pictou Valleys (sub unit# 582b McArras Brook) (Figure 2.0-2).

The first of these, Pictou Antigonish Highlands (natural region # 312) is an area of old crustal rocks of Precambrian and Ordovician origin, characterized, within the current study area, by soils, "...developed on shaly loam tills derived principally from Silurian shales...[with the] Barney series [well-drained loam]...somewhat less stony and...finer textured than the others".<sup>1</sup> These soils are considered marginally productive and supported only subsistence level farming for the Scottish settlers here in the early nineteenth century. East of Kenzieville lie softer strata that have been downfaulted, such as the portion of the Arisaig Formation known as the Kenzieville Trough. This natural theme region has dendritic drainage patterns that are heavily influenced by fault lines and supports abundant wildlife of which relatively little is known, though it does include moose, fishers, White Sucker, Brook Trout, sticklebacks, Golden Shiner, Yellow Perch and Banded Killifish. The drainage patterns across these highland areas also support many, mills constructed by settlers from the eighteenth to the twentieth centuries. Forests

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<sup>1</sup> Davis and Brown 1996:31



in the study area portion of this region are comprised of White Spruce, colonized on old farmlands, Yellow Birch, Sugar Maple, American Beech, Red Spruce, Eastern Hemlock and Balsam Fir with diverse and vigorous shrubby vegetation.

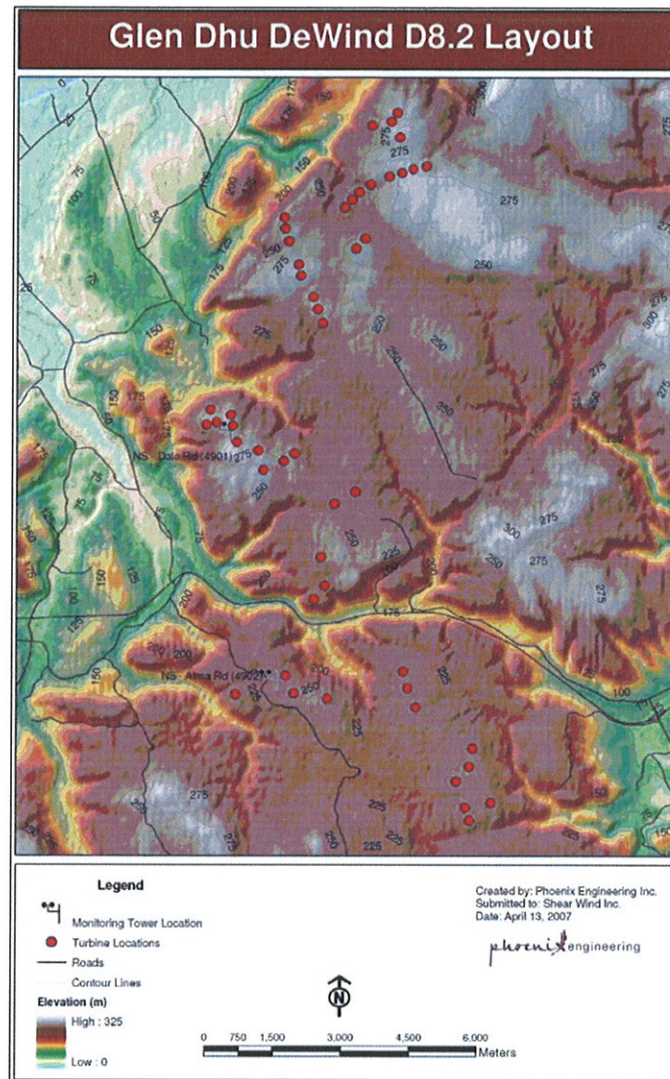


Figure 2.0-1: Red dots indicate proposed turbine locations. (Fulton Energy Research 2007).

The French River sub unit (#320b) of the Dissected Margins theme region is defined by the kame and esker fields, which create foothills and uplifted plateaus. This landscape is hilly with steep narrow valleys and its soils result from varied bedrock and Carboniferous glacial material redeposited from the north. Here, again, Barney soils have developed on shaly clay loams that have been derived from Silurian shales. Animals in this region mimic the array in the Cobequid Hills region with Goshawk, Red-tailed Hawk, Barred Owl and the Great Horned Owl nest and others species present including Common Raven, Pileated Woodpecker, Ruffed Grouse, Grey jay, chickadees, warblers



and insectivorous birds, Eastern Redback Salamanders, beaver, coyotes, bobcats and Snowshoe Hares as well as Brown Trout and Brook Trout, common in smaller tributaries.<sup>2</sup>

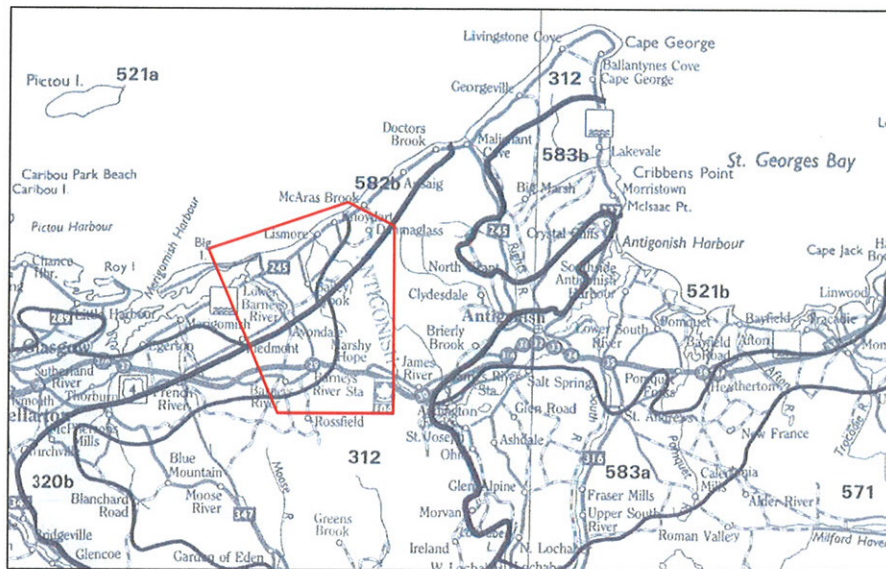


Figure 2.0-2: Approximate study area (red outline) on subset of *The Natural History Theme Regions of Nova Scotia* map (Province of Nova Scotia 1997) in Davis & Browne (1996).

The Northumberland Plain (sub unit #521a Northumberland Strait) covers the northwestern portion of the study area and, therefore, the characteristics of this unit's eastern and northern edges apply. Here the unit is underlain by Late Carboniferous Pictou Group sandstones. Between Pictou and Knoydart, a submerged rolling coastal lowland predominates this small area. Soils here are sandy loams and sandy clay loams that derive from glacial tills. These soils are comprised of tightly packed particles and are impermeable to rapidly moving waters running down from the adjacent highlands. Alternating bands of weaker and more resistant strata have developed dendritic drainage patterns, flowing northward, and beaver-influenced wetlands creating wet meadows and shrub swamp. This Maritime Lowlands Ecoregion contains Black Spruce, Jack Pine, Larch, White Spruce, Red Spruce, Red Maple, White Pine and Eastern Hemlock; the latter tending to be the first species to colonize disturbed areas, though alders often recolonize old fields, followed by White Spruce. American Beech and Sugar Maple can often be found on slopes near larger streams. Strong winds off of the Northumberland Strait influence the forests of this area, causing many to lean away from the shore and have one-sided crowns. Abandoned farmland influences the animal habitat in this theme region significantly, with its relatively flat topography and imperfectly drained soils. Among the species to call this region home are beaver, coyote, muskrat, mink, raccoon, Red Fox, most ducks and marsh birds, Osprey, Bald Eagle, Semipalmated Plover, Common Tern and a host of birds that nest in low lying areas and along steeper coasts.

<sup>2</sup> Davis and Browne 1996:38.

Oysters, Quahogs, Atlantic Salmon, Gaspereau, Brown Trout, Brook Trout and the rare Brook Stickleback are found in this unit where the threatened Wood Turtle can also be found along abundant river habitat.<sup>3</sup>

The final theme region that converges within the study area is the Pictou Valleys sub unit #582b McArras Brook. This small unit corresponds with the northeastern portion of the study area. Here Woodbourne soils (gravely clay loam) and Barney soils, each derived from shales and sand, both occur. Rectangular drainage patterns occur across extensive floodplains. This area supports significant salmonid species and is characterized by White Spruce and Balsam Fir on old fields and pastures along with Sugar Maple, Yellow Birch, American Beech, Red Maple and Aspen. The productive soils of this unit have influenced the cultural development of this landscape, supporting Scottish and some Irish settlement in the late eighteenth century with fishing, farming and lumbering supporting small community economies within the sub unit.<sup>4</sup>

In sum, the study area's physiography and natural resources provided many opportunities for aboriginal people, particularly along shorelines and valleys, and for early settlers in the late eighteenth and early nineteenth centuries. As a result, mills, abandoned farmland, century and bicentenary farms, fishing and forestry operations and traditional hunting and gathering activities have influenced the cultural landscapes.

### **3.0 METHODOLOGY**

Historical maps and manuscripts, aerial photographs, and published literature were consulted at Nova Scotia Archives and Records Management and the Department of Natural Resources Library in Halifax. The Maritime Archaeological Resource Inventory, held at the Nova Scotia Museum's Heritage Division was searched to understand prior archaeological research within and near the study area. Historic maps were overlaid onto the turbine development plan map using a first order polynomial registration procedure within ArcGIS 9.1.

#### **3.1 Historical Background**

A total of nine archaeological sites were recorded in the Maritime Archaeological Resource Inventory near the study area, eight of which clearly date to the historic period and one for which a date is not clear, comprised of possible human skeletal material. This last site was reported in 1929 and no analyses were done on the material, nor was any archaeological excavation carried out in the area (at Barney's River bridge, likely at the mouth of Barney's River) to suggest cultural affiliation. Given the fact that Merigomish Harbour and its tributary, Barney's River were touted as a "major Micmac

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<sup>3</sup> Davis and Browne 1996:109.

<sup>4</sup> Davis and Browne 1996: 141.



(sic) camping ground”<sup>5</sup>, it is possible that these remains were from an Aboriginal burial. The eight historic sites were recorded in 2004 by Michelle LeLièvre. Although within the vicinity of it, none of these historic sites are located directly within the development area. These sites represent some of the industrial features in the area associated with the railway as well as sites and structures related to grist and saw mills.

First Nations’ presence in Pictou County bordered the coast and river valleys to exploit both the food sources and transportation routes that the water afforded. We know that Merigomish, whose name comes from the Mi’kmaq language and means, “the merrymaking place” was an important area for summer food collection and gathering of Mi’kmaq bands. There is little to suggest that Mi’kmaq people or their ancestors inhabited the mountaintops in and around the study area, but they may have been used for sighting and hunting ungulates passing through or along the many valleys, streams, and rivers. Cascades and waterfalls are considered to have greater potential for Mi’kmaq archaeological resources, including those of a spiritual nature. Therefore, the potential for First Nations’ archaeological materials to be encountered is at least moderate.

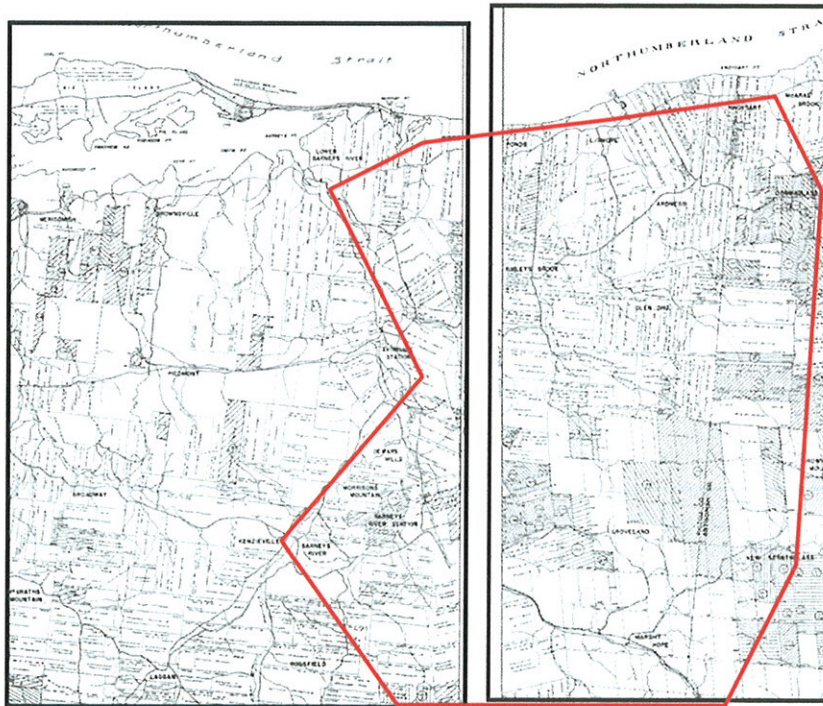


Figure 3.1-1: Crown Land Grant mapsheet nos. 93 & 98. Study area included in background historical document (study area outlined in red).

The earliest indications of historic land use at Barney’s River and the area immediately surrounding it suggests that Irishman, Barnabas McGee (for whom the river is named) settled here in 1776 or 1777. In 1886, McGee’s property was being occupied by a Mr.

<sup>5</sup> Ferguson 1967: 34.

McDonald<sup>6</sup>. Shortly after McGee, in 1788, to the east of the mouth of Barney's River, John Bailey settled at Bailey's Brook. Waves of Scottish settlers followed between 1790 and 1805. In this period, William Hattie is supposed to have constructed the first mill in the area opposite the burying ground at Avondale<sup>7</sup>. It's likely that much of this early settlement was concentrated in the lowlands, valleys and around the rivers, brooks and shorelines of the area, however given that the majority of historical settlement of the area was by Highland Scots, it may be that the settlement of the more mountainous areas was simply less-well documented.

We are able to define a substantial trace through historical cultural landscape evolution in the development area through historical map products. Among the earliest are the Crown Land Grant maps, however the information portrayed is largely cultural, with the only natural features available for orientation being hydrological features. Still, these maps provide information about land owners and allow us to gain a sense of familial ownership and occupancy in an area over time. When used in conjunction with the other types of maps, we gain a sense of the property boundaries that reflected broad landscape features and the progress of settlement over the years. Among the grantees in the development area, surnames such as Robertson and McArthur are found in the area of the Weaver's Mountain Wind Project and in that of the Glen Dhu Wind Project, McGilvrays and McDonalds dominate the grants. In the southeast portion of the Glen Dhu Wind Project study area, many grants have been laid out but their ownership remains anonymous. This suggests that early settlement of the area did not extend across this part of the landscape, though it would soon become populated and heavily used for transportation, via the Old Road and the Old Crockett Road<sup>8</sup> (Figure 3.1-2). The latter travels across the unlabelled expanse, though appears to lead to the homestead of William Crockett, a grantee bordering the western edge of this expanse noted on Crown Land Grant sheet #98. Though not mapped, the presence of these roads would make cultural use of the area along them more feasible.

The Great Map, dating to 1831, shows settlement in the area of Barney's River and Barney's River Station as being limited to the area along the river itself. In the southern portion of the study area, just below the latter community, this map shows a D. Robertson settled where A.F. Church later (1867) shows an A. Robertson along the lower portion of Barney's River (Figure 3.1-2b). Likewise, William McKenzie, Peter Grant, J. McKenzie, Mrs. Hattie and John Ross appear along this stretch of the river ending at the Free Church. For each of these places, structures are shown along the course, though for William McKenzie, two structures as opposed to one appear associated with his homestead. According to the Great Map, the area east of the hydrological feature known as Barney's River, where the two impact areas are located, is unpopulated at this point, according to The Great Map. It should be noted that nineteenth century mapping standards were not as precise as they are today. Middle and lower class residents were often not represented for a variety of reasons. As well, difficult terrain could present

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<sup>6</sup> NSARM, mfm 9589, MG100 vol.92 # 31 (Bruce, 1886)

<sup>7</sup> NSARM, mfm 9589, MG100 vol.92 # 31 (Bruce, 1886)

<sup>8</sup> Each of these roads are so labelled on the 1893 Geological Survey of Canada (GSC) map (sheet # 35)

obstacles and obscurity for mapping of socio-cultural landscape features, such as highland and other rural homesteads.

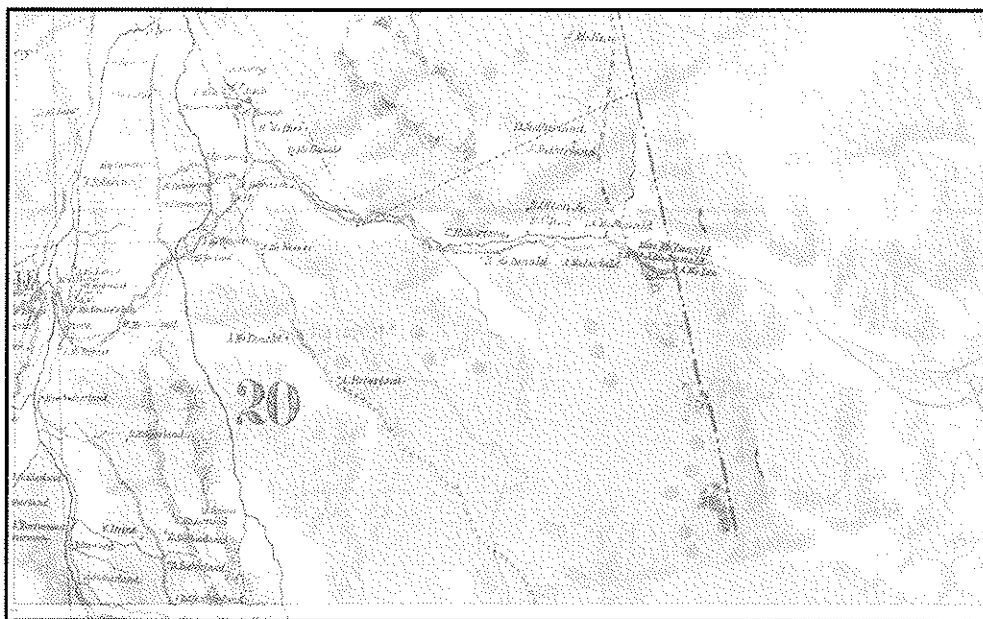
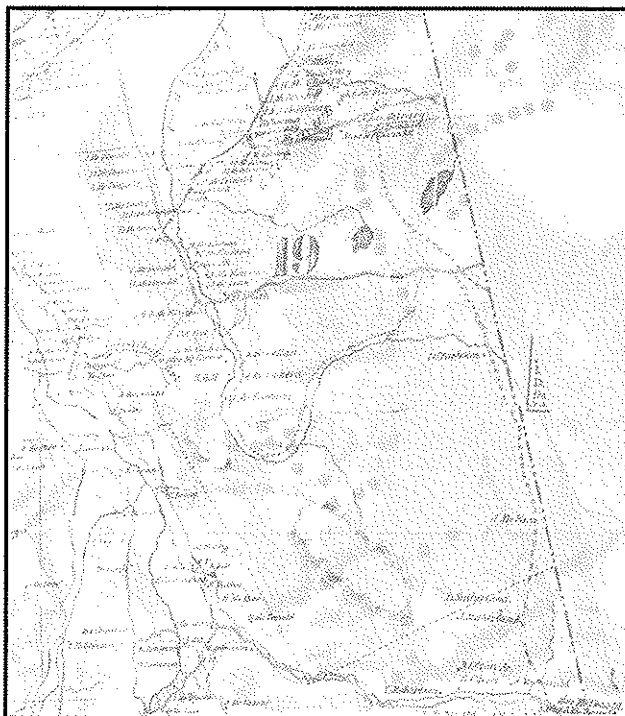


Figure 3.1-2: A.F. Church's map of Pictou County (1867) registered to map of turbine locations, a. Glen Dhu (above), b. Weaver's Mountain (below).

Ambrose F. Church's Map of Pictou County (1867), shows significantly greater settlement of the area of the Glen Dhu Wind Project (Figure 3.1-2a) and several homesteads in the vicinity of the Weaver's Mountain Wind Project. His map of Antigonish County, covering the northeastern-most turbines, suggests settlement patterns mimic those across the county line. The "Old Road", noted on the 1893 GSC map, (Figure 3.1-3) appears on Church's map surrounded by a dozen homesteads, a dye mill and a saw mill. As Church's map precedes the GSC map by only 25 years, this suggests that the "old" road was created at least between 1831 and 1867. The "Old Crockett Road" does not appear on Church's map, but this road does provide access to main roads for the Oulton residents near Marshy Hope. S. Olton and S. Olton Jr. appear on the 1867 map while a C.W. Oulton appears on the 1893 map above where the earlier Oltons are located. It is accepted that minor inaccuracies in Church's maps have appeared and, so, it is possible that the Old Crockett Road, serving as an early nineteenth century "driveway" for the Oultons/Oltons was, at the time Church was collecting data for his maps, a pathway not well-known or mapped. William Crockett does appear on the Crown Land Grant map, though the origin of this path/roadway may derive from the need for a shortcut from Marshy Hope to the mouth of Barney's River and Merigomish, rather than a throughway to Marshy Hope for residents of the lower portions of the river. We do know, thanks to Meacham's Atlas of Pictou County, that by 1879 lands in the vicinity of Old Crockett Road were property of the "Heirs of Wm. Crockett (Figure 3.1-4b). It also shows several homesteads of McGillvray and McDonald families along the "Old Road" that no longer appear on the 1893 GSC map. Finally, Bruce's 1886 article mentions the presence of a "little graveyard", on a farm at East Branch where James McDonald owns the former Robertson homestead<sup>9</sup> (Figure 3.1-3). This highlights the need to be aware of the potential for family cemeteries on the homesteads established across the study area.

In the area of the Weaver Mountain Wind Project, only a few homesteads appear on Church's map, two additional homesteads appear in Meacham's Atlas along the road at McIver's Brook (John Baxter's and Alex McDonald's) and in 1893, an "old mill" is mapped on Brian Daly Brook. Meacham's map of this area closely resembles that by the GSC, suggesting that homesteads continued to spring up deeper into this area as the nineteenth century progressed. Comparison of Church's data to the map of turbine locations (Figure 3.1-2b) reveals significant lateral displacement of the road feature on the former, however, its representation on the more geodetically sound GSC map (Figure 3.1-3) suggests that, Church simply mis-mapped the location of the road, though not the homesteads along it as the surnames endure on each of the maps. As well, the GSC map reveals that Ken McIvor (perhaps a descendant of Church's J. McKeever) had a forge here in the late nineteenth century. The modern map of turbine locations clearly locates this road feature in the modern landscape and turbine sites near it seem likely to coincide with these historic features (Figures 3.1-3 & 3.1-4).

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<sup>9</sup> NSARM, mfm 9589, MG100 vol.92 # 31 (Bruce, 1886: 7).



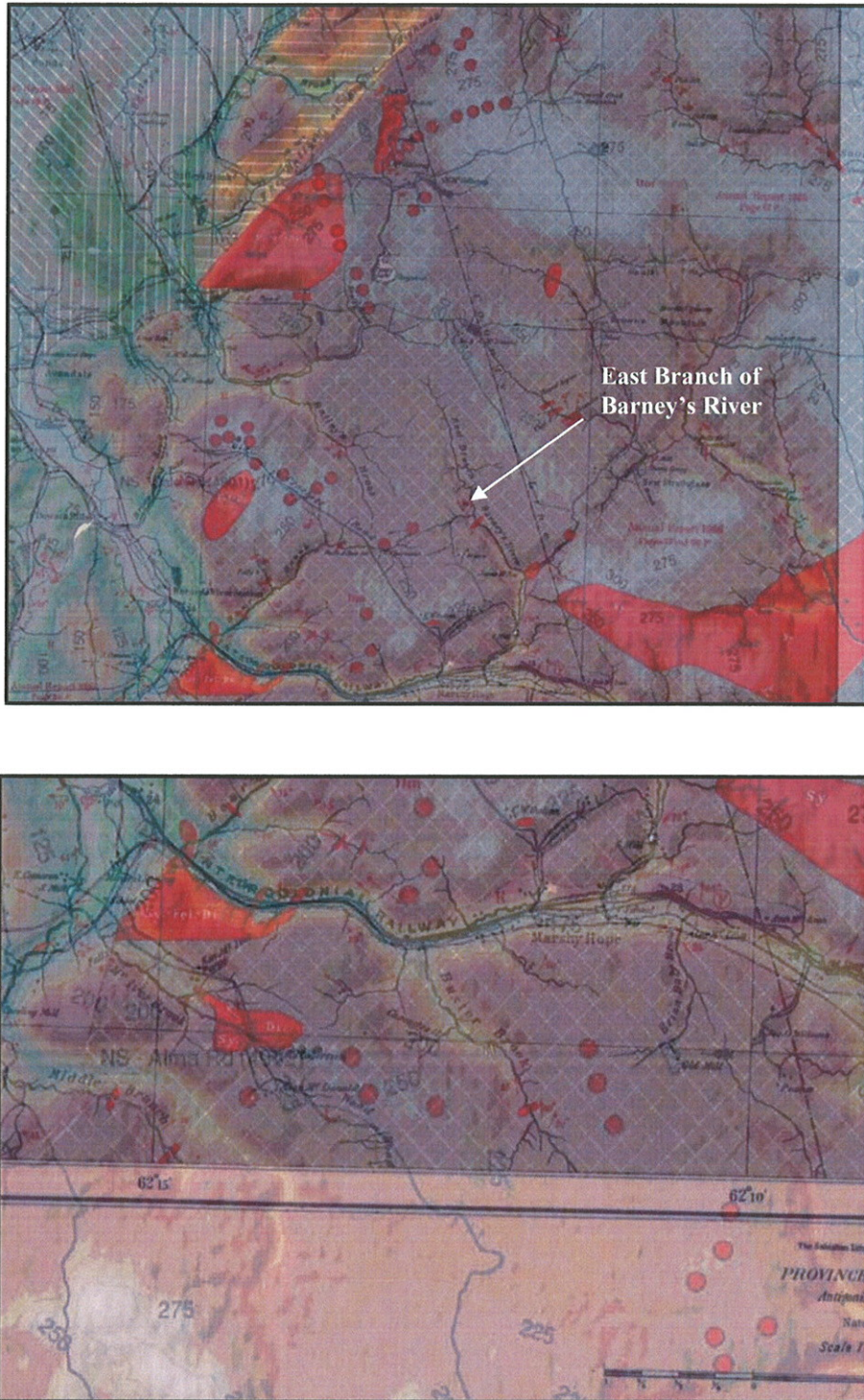


Figure 3.1-3: Subset of a Geological Survey of Canada map (sheet #93 (or 35)) of the area from 1893 overlaid on a. Glen Dhu Wind Project area (above) and b. Weaver Mountain Wind Project area (below).



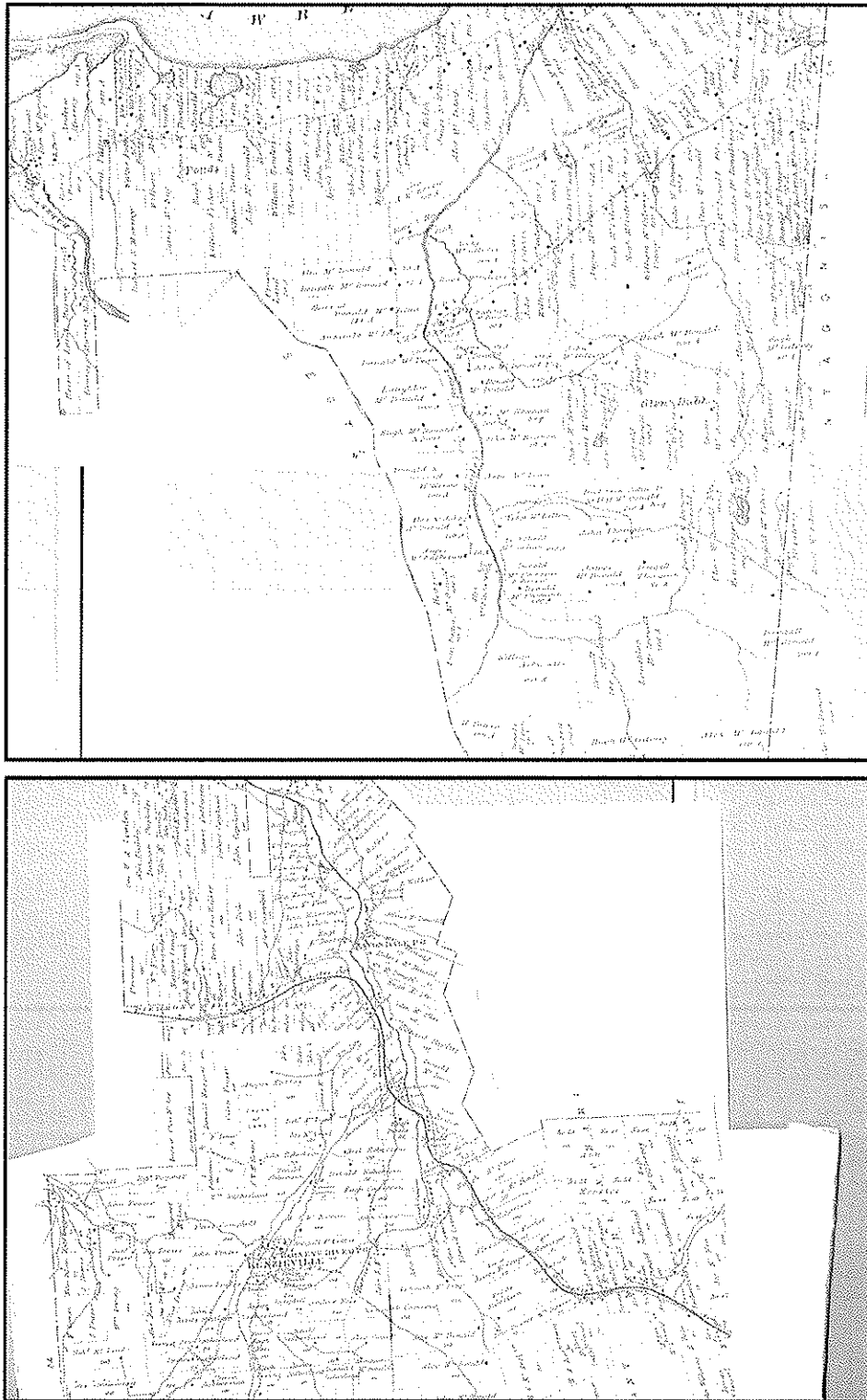


Figure 3.1-4: Coverage of study area in Sections a.19 and b. 20 from Meacham's Atlas of Pictou County (1879). Orientation is not continuous between sections.

Aerial photos over the study area taken in 1945 clearly show vegetation and field delineation patterning that reflects property boundaries as defined in the Crown Land Grant maps and Meacham's 1879 Atlas of Pictou County, though significant forest reclamation has also, clearly, taken place.<sup>10</sup> In sum, significant changes in landscape settlement and use appear to have occurred rapidly over the course of the nineteenth century, quickly obscuring historic homesteads and cottage industrial sites into the early twentieth century.

#### **4.0 RESULTS AND DISCUSSION**

Historical documentation and previous archaeological research suggest areas of moderate potential for First Nations archaeological resources based largely on the natural landscape. It is doubtless that Mi'kmaq people and their forebears were living in the area and using the complex of natural resources that occur in the Merigomish/Barney's River area and its contributing viewsheds and watersheds for thousands of years.

Historic period settlement and use is known in the study area through documentary and archaeological research. As the eighteenth century progressed, the landscape was increasingly colonized by waves of Highland Scots, beginning most intensively in the later years of the eighteenth century. The study area was most directly impacted by Invernesshire settlers who arrived in the first decade of the 1800s. Settlement continued to advance across the highlands throughout the entirety of the nineteenth century, petering out as the twentieth century dawned.

#### **5.0 CONCLUSIONS AND RECOMMENDATIONS**

The area has been determined to be of high potential for eighteenth and nineteenth century archaeological sites associated with Scottish settlement and use. Nine historic archaeological sites have been previously recorded within the Maritime Archaeological Resource Inventory near the mountainous study area, many of which correspond to the settlement of the area by Highland Scots. Additionally, there is moderate potential for First Nations' resources within the study area given the importance of the area for gathering of bands and the navigability of Barney's River. Therefore, it is recommended that the area be surveyed by qualified archaeologists prior to any ground disturbance.

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<sup>10</sup> A8461-64, 63, 61, 59; A8468-49, 51, 53, 55; A8470-51, 53, 55; A8469-49, 51, 53, 55; A8471-55, 57, 59, 61.

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**APPENDIX A:  
HERITAGE RESEARCH PERMIT**



Special Places Protection Act,  
R.S.N.S. 1989

Application for  
**Heritage  
Research Permit**  
(Archaeology)

Permit No. **A2007NS45**

(Original becomes Permit when approved  
by the Executive Director of the Heritage  
Division)

The undersigned April MacIntyre  
of c/o 6519 Oak Street, Halifax, NS B3L 1H6  
representing (institution) Davis Archaeological Consultants Limited

hereby applies for a permit under Section 8 of the Special Places Protection Act to carry out archaeological investigations during the period:

from 19 June 2007 to 30 September 2007

at Glen Dhu Wind Farm

general location Barney's River, Pictou County

specific location(s) (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.

I certify that I am familiar with the provisions of the Special Places Protection Act of Nova Scotia, and that I will abide by the terms and conditions listed in the Heritage Research Permit Guidelines for the category (check one).

- Category A - Archaeological Reconnaissance
- Category B - Archaeological Research
- Category C - Archaeological Resource Impact Assessment

Signature of applicant *A MacIntyre* Date 12 June 2007

Approved: Executive Director *Bill Greil* Date 15 June 2007