

**FUNDY TIDAL ENERGY DEMONSTRATION PROJECT:
ARCHAEOLOGICAL RESOURCE IMPACT ASSESSMENT**

HERITAGE RESEARCH PERMIT A2009NS115



DECEMBER 2009

REPORT SUBMITTED TO:

Fundy Ocean Research Centre for Energy
c/o Minas Basin Pulp and Power Co. Ltd.
53 Prince Street, PO Box 401
Hantsport, Nova Scotia B0P 1P0

**FUNDY TIDAL ENERGY DEMONSTRATION PROJECT:
ARCHAEOLOGICAL RESOURCE IMPACT ASSESSMENT**

**Heritage Research Permit A2009NS115
Category C**

Davis MacIntyre & Associates Limited

Principal Investigator: Stephen A. Davis
Report Compiled by: April D. MacIntyre & Stephen A. Davis

Cover: Cable landing area looking southwest toward Black Rock and Cape Split.

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Executive Summary

Davis MacIntyre & Associates Limited conducted an archaeological resource impact assessment of the proposed Fundy Tidal Energy Demonstration Project in Cumberland County, Nova Scotia. The assessment was a follow-up to an earlier desktop study and preliminary reconnaissance which was conducted in October 2008. Since that time, the location of the proposed development site has changed which necessitated a second archaeological field reconnaissance. The proposed development site is now located approximately 200 metres east of the original site. The background study conducted in 2008 revealed that the community of Black Rock, later known as Union Valley, was originally granted to Loyalists and may have been occupied by First Nations people prior to this. Consequently, the area was determined to be of elevated potential for both historic period and precontact archaeological resources. The 2009 follow-up reconnaissance indicated that the development area was of low potential for historic period resources. However, the potential for First Nations resources along the shore remains and, therefore, it is recommended that archaeologists be on site to monitor the excavation of the trench from the cable landing site to the building site.

1.0 INTRODUCTION

In November 2009, Davis MacIntyre & Associates Limited was contracted by Fundy Ocean Research Centre for Energy (FORCE) to conduct an archaeological resource impact assessment of the Fundy Tidal Energy Demonstration Project in Cumberland County. The purpose of the 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 was a follow-up to an earlier archaeological assessment conducted by Davis Archaeological Consultants Limited in October 2008 (HRP A2008NS72). Since that time, the project location has been shifted approximately 200 metres east of the original development area, requiring an archaeological assessment of this new development area.

This assessment was conducted under Category C Heritage Research Permit A2009NS115 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 STUDY AREA

The development area is located on the north shore of the Bay of Fundy, immediately west of Cape Sharp and north of Cape Split, in Cumberland County on the south side of West Bay Road. Three turbines will be anchored to the bedrock underwater in the Bay of Fundy, with a cable reaching up onto shore to link them to the power grid. There will also be an interpretive building on the shore, as well as a parking lot (Figures 2.0-1 and 2.0-2).

The study area is contained within natural theme region #710, Basalt Headland (Figure 2.0-3).¹ It is an area of mixed basalt and sandstone, cut across by three major fault lines, one running east from Partridge Island, near the development area. Partridge Island and Cape Sharp are both comprised of basalt-capped blocks eroded into cliffs. The Parrsboro shore, which includes the development area, is comprised of glacial outwash deposits, which provide the gravel for cobble beaches like the one bordering Black Rock.

Soils in the Basalt Headlands region are Diligence or Kirkhill series soils, the former producing clay loam and the latter, shale loam. Vegetation in the area includes trees such as Spruce, fir, Eastern Hemlock, pine, birch, maple, and aspen. Blueberry fields grow on old farm lands, and some salt marshes appear along the coast.

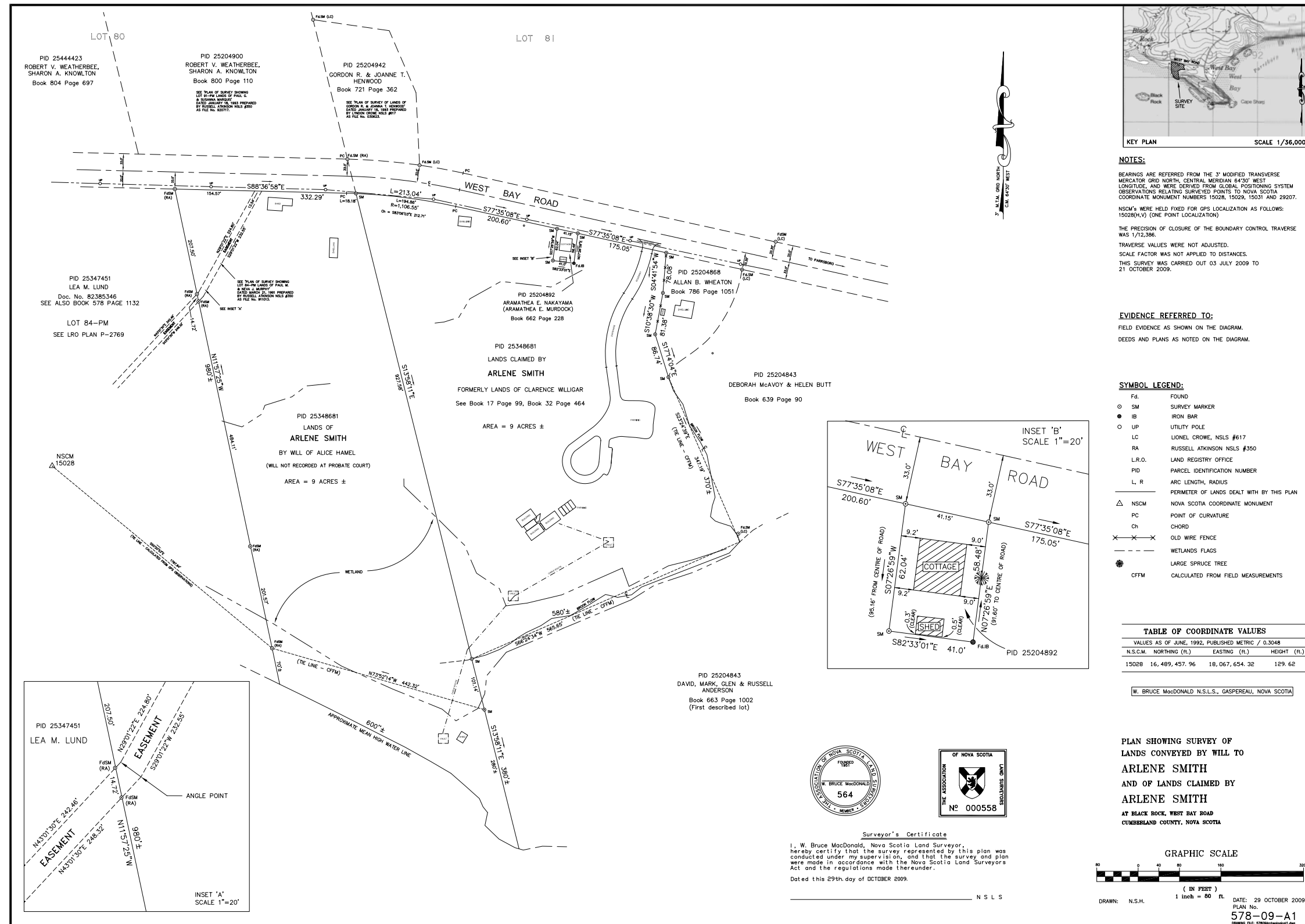


Figure 2.0-1: Map of the study area (PID 25348681) showing the proposed layout for the building, parking lot, and cable (courtesy AECOM).



Figure 2.0-2: Aerial view of the study area showing the proposed shore installation layout for the building and the offshore cable.

Animals in the region include deer and a long list of birds: Black Duck, Common Goldeneye, Bufflehead, Double-crested Cormorant, Common Eider, Great Blue Heron, Herring Gull, Black-backed Gull, Black Guillemot, Scoters, loons, Peregrine Falcon, miscellaneous migratory shore birds, Ruddy Turnstone, Black-bellied Plover, Willet, Sharp-tailed Sparrow, and Vesper Sparrow. Shore life includes Slipper Limpets, sponges, and Hornwrack.

The region’s geology and biology has influenced the area’s historical cultural activity, including fishing, forestry, farming, and fossil-hunting.

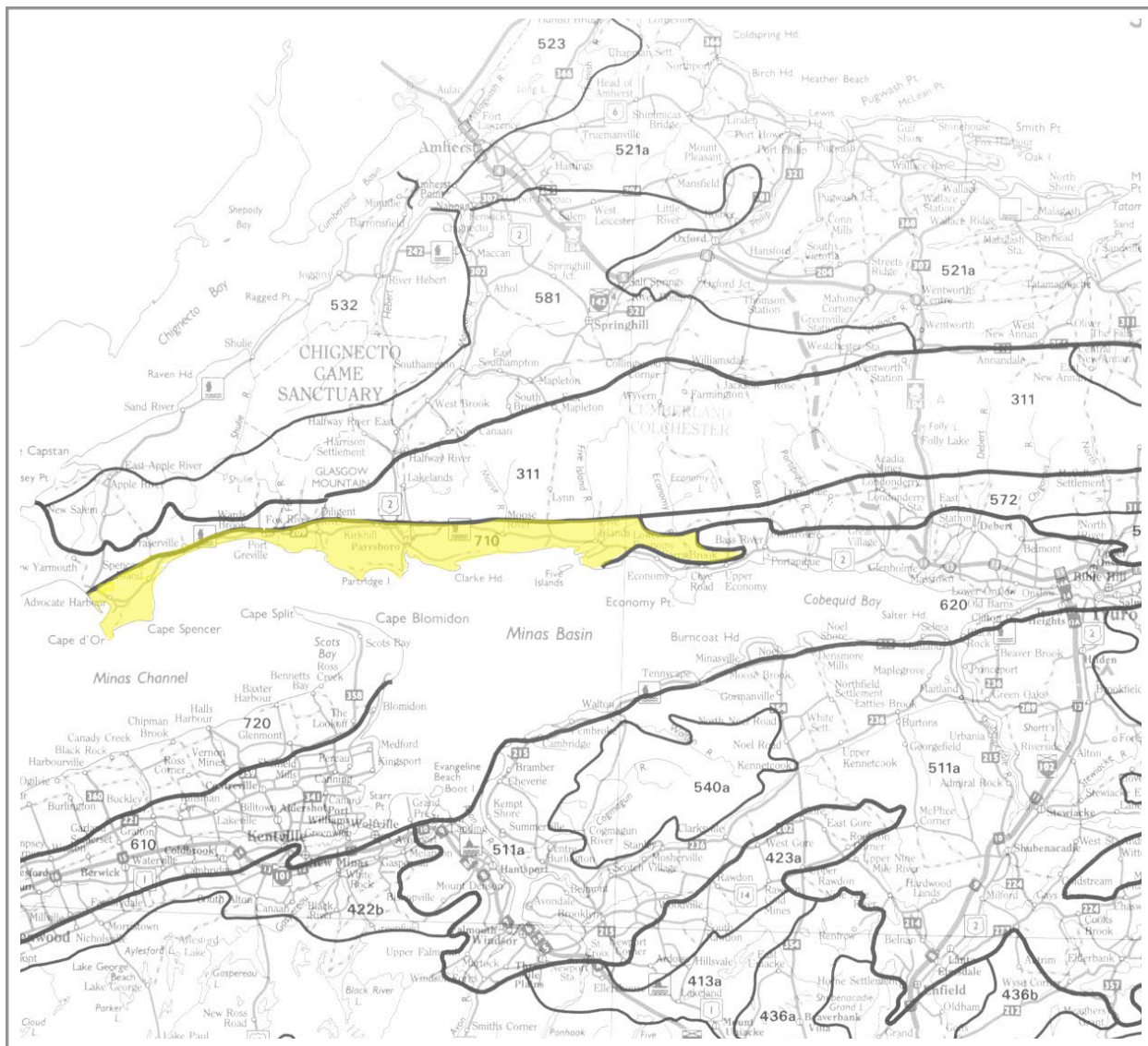


Figure 2.0-3: Natural Theme Regions of Nova Scotia, showing region #710 (highlighted) - Basalt Headland.

3.0 METHODOLOGY

A historic background study was conducted by Davis Archaeological Consultants Limited in September 2008 as part of the initial archaeological assessment. Historical maps and manuscripts and published literature were consulted at Nova Scotia Archives and Records Management in Halifax. The Maritime Archaeological Resource Inventory, held at the Nova Scotia Museum's Heritage Division, was searched in December 2009 to understand prior archaeological research and known archaeological resources neighbouring the study area. Finally, a search of the Nova Scotia Museum's Marine Heritage Database was conducted in 2008 as part of the previous archaeological assessment

In November 2009, an archaeological reconnaissance of the study area was conducted in order to determine the potential for extant archaeological resources within the study area.

3.1 Maritime Archaeological Resource Inventory

A review of the Maritime Archaeological Resource Inventory at the Nova Scotia Museum revealed only one isolated find in the area. The find consists of several glass trade beads from the post-contact period, attributed to indigenous historic activity. The beads were found on a sand bar on the north shore of the Micmac Channel, described as 4.7 miles west-southwest of Parrsboro. The exact location of the find is not known, but the description corresponds with the coastline very near the impact area. No other archaeological finds or sites are recording in the Resource Inventory.

3.2 Historical Background

3.2.1 The Precontact Period

The history of human occupation in Nova Scotia has been traced back approximately 11,000 years ago, to the Palaeo-Indian period or *Sa'qewe'k L'nu'k* (11,000 – 9,000 years BP). The only significant archaeological evidence of Palaeo-Indian settlement in the province exists at Debert/Belmont in Colchester County.

The *Saqiwe'k Lnu'k* period was followed by the *Mu Awsami Kejikatwe'k L'nu'k* (Archaic period) (9,000 – 2,500 years BP) which included several traditions of subsistence strategy. The Maritime Archaic people exploited mainly marine resources while the Shield

Archaic concentrated on interior resources such as caribou and salmon. The Laurentian Archaic is generally considered to be a more diverse hunting and gathering population.

The Archaic period was succeeded by the Woodland/Ceramic period or *Kejikawek L'nu'k* (2,500 – 500 years BP). Much of the Archaic way of subsistence remained although it was during this period that the first exploitation of marine molluscs is seen in the archaeological record. It was also during this time that ceramic technology was first introduced.

The Woodland period ended with the arrival of Europeans and the beginning of recorded history. The initial phase of contact between First Nations people and Europeans, known as the Protohistoric period, was met with various alliances particularly between the Mi'kmaq and French.

The Mi'kmaq inhabited the territory known as *Mi'kma'ki* or *Megumaage* which included all of Nova Scotia including Cape Breton, Prince Edward Island, New Brunswick (north of the Saint John River), the Gaspé region of Quebec, part of Maine and southwestern Newfoundland (Figure 3.2-1). Cumberland County in Nova Scotia, and Westmorland, Albert, Kent, Saint John, Kings and Queens Counties in New Brunswick were known to the Mi'kmaq as *Siknikt* meaning “drainage area”.

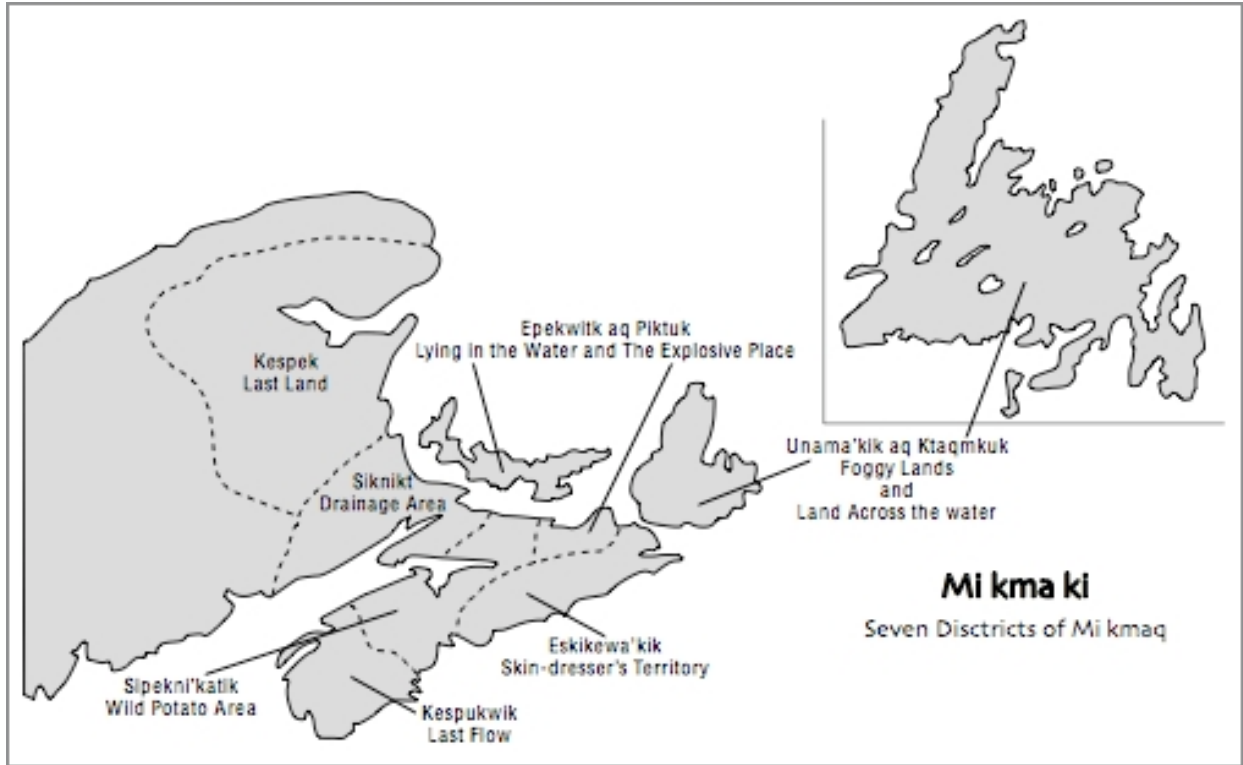


Figure 3.2-1: Map of the Mi'kmaq territories.¹

3.2.2 European Settlement

Black Rock, which would later be known as Union Valley, was first settled by Europeans in 1784 and 1785. Members of the New Jersey Volunteers, a Loyalist militia group during the American Revolutionary War, held the first land grants in the area. These settlers included Lieutenant William Reid and Thomas Potts.² They were granted long, narrow tracts of land that began northwest of Cape Sharp, on the study area, and extended north past Diligent River (Figure 3.2-2).

Ambrose F. Church's 1873 map of Cumberland County shows that there was considerable settlement at Black Rock (Figure 3.2-3). Though many of the names are difficult to read in this version, there appear to be as many as twelve households in the immediate study area, including names like Bowden, Phinney, Jenks, Welliger, and Hill.

¹ Confederacy of Mainland Mi'kmaq, 2007:11.

² Place-Names and Places of Nova Scotia, p.691

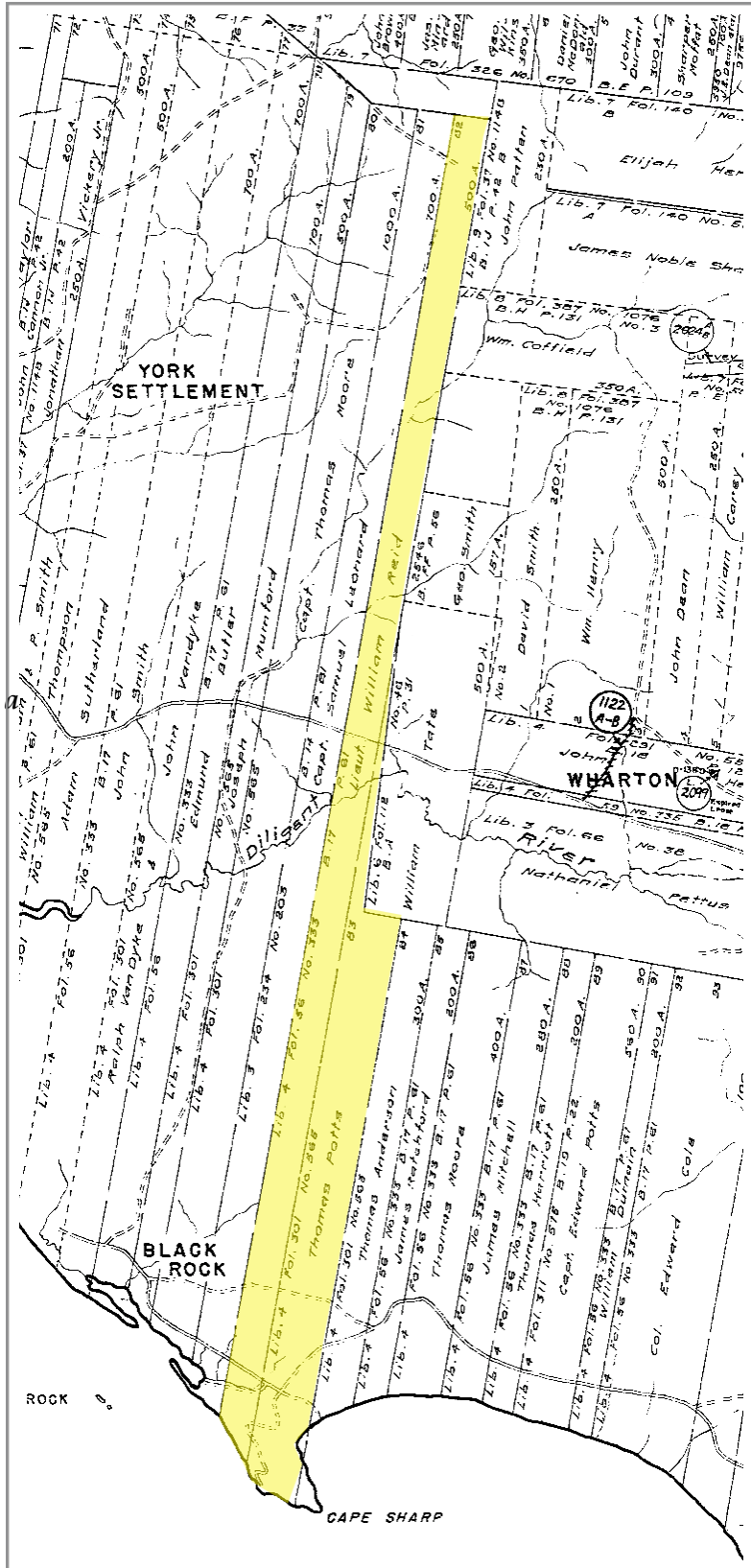


Figure 3.2-2: Part of Crown Land Index Sheets showing first land grantees in the

³ Department of Lands and Forests, 1950; 1951.

The 1905 Geological Survey Map of Canada for the area shows reduced settlement by the twentieth century, limited to three buildings just west of Cape Sharp (Figure 3.2-4). By 1945, about five structures can be seen in the area, including a school across the road from the impact area (Figure 3.2-5).



Figure 3.2-3: A portion of Ambrose F. Church's maps of Cumberland County (1877). There is settlement clustered around the study area, immediately west of Cape Sharp.



Figure 3.2-4: A portion of the Geological Survey of Canada map (1905), showing settlement in Black Rock and three isolated buildings west of Cape Sharp.

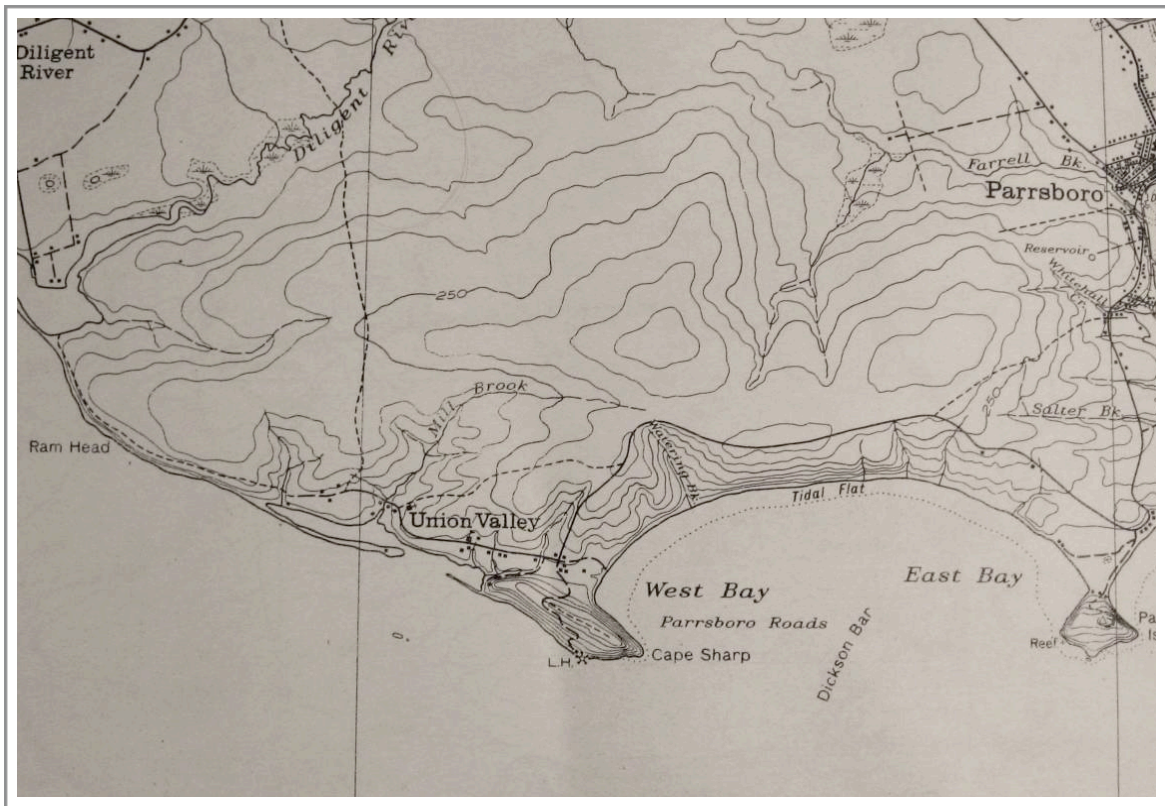


Figure 3.2-5: A 1945 map of the area.⁴

⁴ NSARM 1945.

3.2.3 Marine Heritage Database

A search of the Nova Scotia Museum's Marine Heritage Database in September 2008 indicated that four schooners were stranded off Cape Sharp in the twentieth century. These included the *Irisbrook* (1910), the *Alice P. Turner* (1913), the *Otis Miller* (1913), and the *Abbie Keast* (1922). The fate of these ships is not known.

3.3 Reconnaissance

A reconnaissance of the study area was conducted on 30 November 2009. Geotechnical testing had been conducted prior to the archaeological reconnaissance. Six geotechnical test pits were excavated by backhoe along the east side of the study area (Figure 3.3-1) (Plate 1). No archaeological resources were seen in the disturbed soils. The visible soils in the test pits were medium brown sandy silt with gravel.

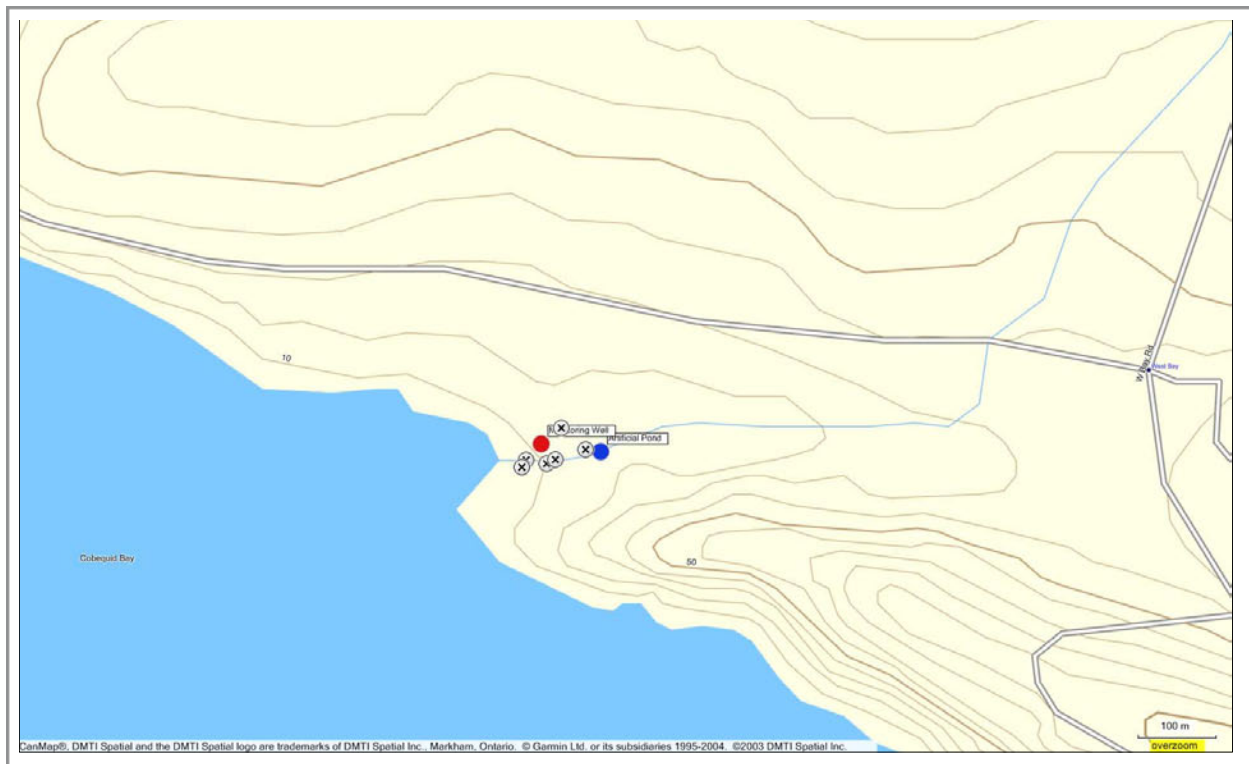


Figure 3.3-1: GPS coordinates of geotechnical test pits, as well as a monitoring well installation and a possible artificial pond.

The north end of the study area sits on elevated ground 50 to 100 metres above sea level. A dry ravine runs along the east edge of the study area from behind the property of Allan B. Wheaton (PID 25204868) toward a road that skirts along the base of the hill.

Here, a potential artificial pond was noted on the south side of the old roadway near the base of the hill (Plate 2). The land on the west side of the ravine has been cultivated in the past, indicating historic farming. Secondary spruce growth in this area is approximately 50 to 60 years old. A one-and-a-half storey Maritime Vernacular house with a dormer, which was popular from the 1840s to about 1900, is located toward the west end of the study area. The house has been abandoned and is in a state of disrepair. A ravine runs along the east side of the house. A wooden outbuilding is located on the west edge of the ravine and is associated with the collapsing house (Plate 3).

Further east of this house is a more modern bungalow (likely mid-20th century) which is also abandoned and in disrepair. This property is owned by one Aramathea E. Nakayama/Murdock (PID 25204892). A wooden outbuilding, likely an outhouse, is located behind the dwelling (Plate 4). Directly across West Bay Road, outside the study area, is an old abandoned school house (Plate 5). This is likely the school house indicated on the 1945 map (Figure 3.2-4). The school house is likely the same vintage as the Maritime Vernacular house located across the road. No additional outbuilding or features associated with these residences were noted during the archaeological reconnaissance.

Toward the beach, the hill drops off at a steep (35 to 40 degree) angle. The land between the base of the hill and the beach is overgrown with marsh grass (Plate 6). The beach itself is high energy, with drift wood and refuse being brought in by the tides. Beneath the high tide mark, the beach is sandy but above it, the slope (which is approximately 25 degrees) is rocky and constantly changing as a result of tidal action (Plates 7 and 8).

No First Nations resources were encountered along the beach although quartz, a material useful in stone tool production, can be seen along the beach. During the first archaeological reconnaissance in 2008 of the property to the west, landowner Lea Pelletier reported finding some sandstone net weights along the shore although, they appear to be of historical, and not pre-contact, origin (Plate 9).

4.0 RESULTS AND DISCUSSION

The historic background study conducted in 2008, as well as the 2009 archaeological reconnaissance, indicate that this area was occupied by Euro-Canadian immigrants in the late eighteenth and nineteenth centuries and standing buildings from late in that era still exist. Previous finds also suggest that the area may have been occupied by the Mi'kmaq prior to this. Four ships are known to have been stranded off shore near Black Rock in the twentieth century. However, no significant archaeological resources were encountered during the archaeological reconnaissance of the current study area.

5.0 CONCLUSIONS AND RECOMMENDATIONS

No significant historic or First Nations archaeological resources were encountered during the archaeological reconnaissance of the study area. However, given the presence of First Nations artifacts in the vicinity, it is recommended that archaeologists be present to monitor excavation of the trench from the beach to the building site.

Due to the turbidity and active tidal action in this area, there is little or no sediment on the sea floor and any shipwrecks that may have occurred have likely been carried away by currents. Furthermore, the cable and turbines will be anchored to bedrock and no excavation is expected to occur under water.

Should the current development plan change, it is recommended that an archaeological assessment be conducted to determine the potential for archaeological resources in those areas not surveyed for the current proposed development.

Finally, should any archaeological resources be encountered during ground disturbance activities, it is recommended that all activity cease and the Manager of Special Places, Mr. Robert Ogilvie (902-424-6475) be contacted immediately to determine a suitable method of mitigation.

6.0 REFERENCES CITED

Church, Ambrose F. 1877. *Topographical Township Map of Cumberland County*. A. F. Church & Co., Bedford.

Confederacy of Mainland Mi'kmaq. 2007. *Kekina'muek: Learning about the Mi'kmaq of Nova Scotia*. Truro: Eastern Woodland Publishing.

Davis Archaeological Consultants Limited. 2008. *Fundy Tidal Energy Demonstration Project: Archaeological Resource Impact Assessment*. Heritage Research Permit A2008NS72. Manuscript on file, Nova Scotia Heritage Division and AECOM (Halifax).

Davis, Derek and Sue Browne. 1996. *The Natural History of Nova Scotia, Volume II: Theme Regions*. The Nova Scotia Museum and Nimbus Publishing, Halifax.

Department of Lands and Forests. 1951. Crown Land Index Sheet No. 51: Cumberland and Kings Counties.

Fergusson, C. Bruce, ed. 1967. *Place Names and Places of Nova Scotia*. Halifax: Public Archives of Nova Scotia.

Geological and Natural History Survey of Canada. 1905. *Province of Nova Scotia, Cumberland and King's Counties, Parrsboro, Sheet No. 83*.

NSARM. 1945. Parrsboro Map 21 H/8. On file, Nova Scotia Archives and Records Management.

PLATES



Plate 1: One of the six geotechnical test pits, looking west.

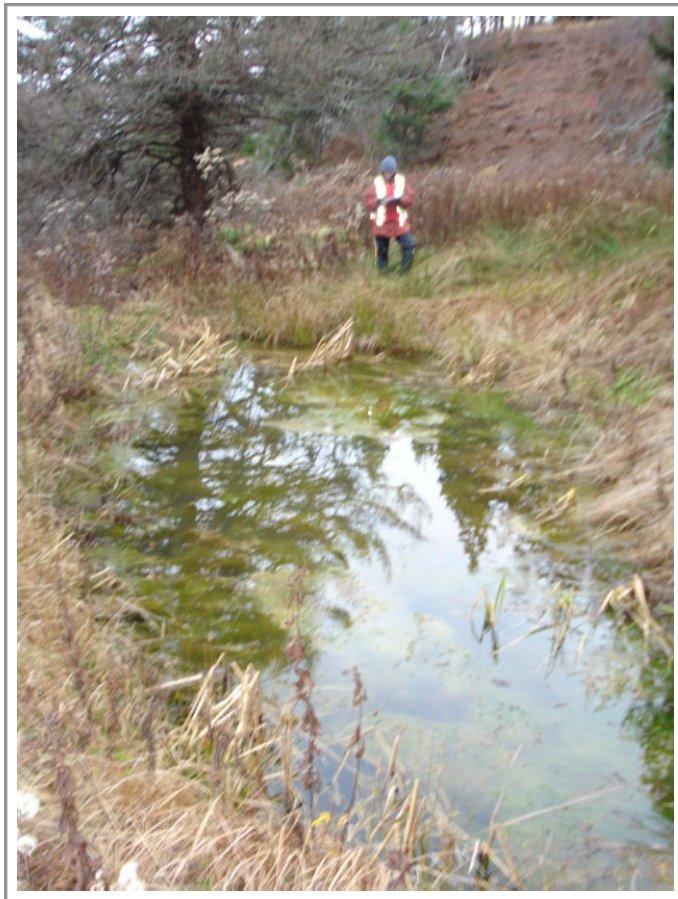


Plate 2: Possible artificial pond below old roadway at east edge of old roadway, looking southwest.



Plate 3: 19th century Maritime Vernacular house toward the west side of the study area, looking south from West Bay Road. The wooden outbuilding is out of frame to the left of the photo.



Plate 4: Mid-20th century house at east end of study area, looking southeast from West Bay Road. The wooden outhouse is located out of frame to the right of the photo.



Plate 5: Abandoned school house on the north side of West Bay Road, outside the study area, looking northwest from West Bay Road.



Plate 6: Low, wet marsh between the base of the hill and the beach, looking south.



Plate 7: Looking north up the slope of the beach from below the high tide line.



Plate 8: Looking northeast along the high water mark on the beach, showing the drift wood and refuse that is brought in by the tide.



Plate 9: Historical net weights reportedly found along the shore near the study area by a landowner.

APPENDIX A: HERITAGE RESEARCH PERMIT



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

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

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

Permit No. **A2009NS115**

The undersigned April MacIntyre
of 109 John Stewart Drive, Cole Harbour, NS B2W 4J7
representing (institution) Davis MacIntyre & Associates Limited

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

from 16 November 2009 to 31 December 2009

at Fundy Tidal Energy Demonstration Project

general location Cape Sharp, Cumberland 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 *April MacIntyre* Date 09 November 2009

Approved: *Bruce Shearer* Date Nov 17/09
Executive Director