

VOLUME VII
CHAPTERS 9.3 To 11

WHITES POINT QUARRY & MARINE TERMINAL

ENVIRONMENTAL
IMPACT
STATEMENT



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9.3 HUMAN ENVIRONMENT AND IMPACT ANALYSIS

9.3.1 Heritage Resources – Marine Archaeology

Introduction

The land area of the proposed Whites Point Quarry site is approximately 380 acres with over 9 miles of coastline along the Bay of Fundy. The property is steeply sloping to the Bay of Fundy. Basalt bedrock outcrops are evident and overlain with a thin soil layer and a dominant softwood forest cover. The basalt bedrock extends into the intertidal zone and nearshore waters of the Bay. Most of the shoreline is massive basalt outcrops, except for Whites Cove which has a cobble beach. An abandoned pit/quarry exists on land near Whites Cove and approximately 60 acres of forest was recently clear cut along the southeast property line. The remains of a boat skidway exists in the intertidal zone at Whites Cove. No buildings or other structures presently exist on the property (PID 30161160).

Heritage resource investigations on the Whites Point Quarry property were conducted during the summer and fall of 2002. Investigations included both literature and on-site research. On-site land and nearshore water survey locations are shown on **Map 27**. The principal investigator was Charles R. Watrall, Ph.D., Archaeologist assisted by Barry Moody, Ph.D. Historian. Nearshore underwater surveys were conducted by Canadian Seabed Research Ltd. with data interpretation by Robbie Bennett, Marine Geophysicist. Data compilation and assessment was performed by Charles R. Watrall and carried out under Heritage Research Permit No.A 2002NS36 – Category C (Watrall 2003 **Ref. Vol. VI, Tab 35**).

9.3.1.1 Research

Literature and on-site investigations were conducted regarding possible marine archaeology in the nearshore waters at Whites Cove/Whites Point in the area of the proposed marine terminal. The Maritime Archaeological Resource Inventory site files indicate Paleo – Indian and Archaic material (i.e. pre 600 B.C.E.) materials have been recovered from below water levels in the Bay of Fundy. More specifically, a stone implement called an ulu, which stands in Inuktituk for “women’s knife” was found in 1977 in the Bay of Fundy near Sandy Cove. Both David Christianson of the Nova Scotia Museum and David Keenlyside of the Canadian Museum of Civilization have examined the ulu.

Subsequent to the discovery, further investigation of the Bay of Fundy bottom using multibeam bathymetric imaging has been conducted. This investigation confirms the presence of a large underwater ridge extending into the Bay from the Sandy Cove shoreline. Based on historic sea level interpretation, this ridge was a land mass during the time period of the ulu. With such a major morphological feature protruding from the coast, an excellent haul-out location for early humans would be provided. The discovery of walrus tusks and other bones by scallop fishermen in this area supports the idea that this ridge may have been a natural haul-out location for walrus and a prime hunting ground for early peoples.

Whites Point Quarry Little River, Digby County Nova Scotia

Environmental Assessment/ Impact Statement

Legend

- Highway 217
- Gravel Road
- Property Line
- Intermittent Watercourse
- Bottom Survey Area

Artifacts

- 1 Skidway Remains
- 2 Shipwreck - S.S. Newfield - 1900
- 3 Foundation Remains
- 4 Hydrographic Monument No. 7084
- 5 Household Remains

Onsite Investigations

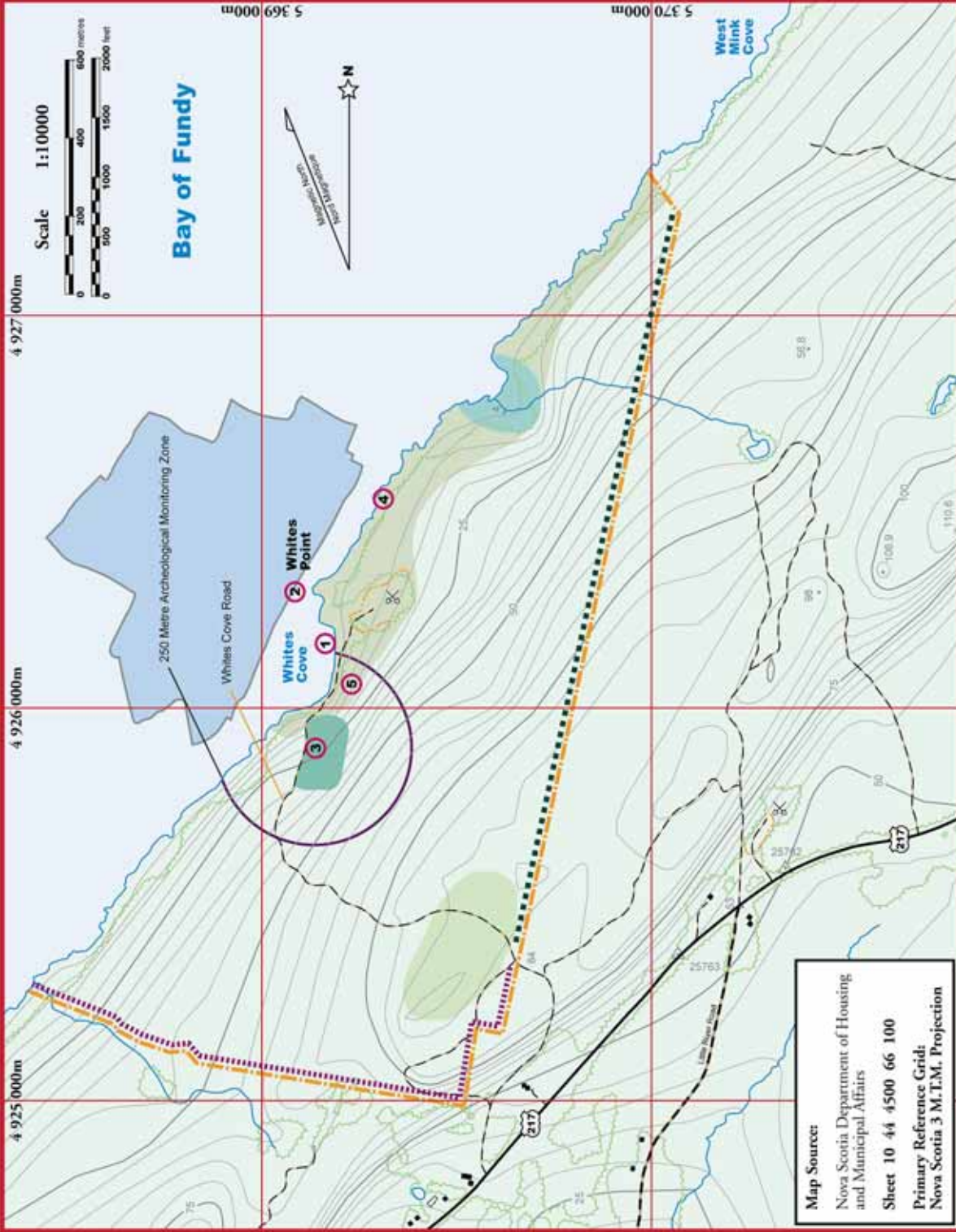
- Study Zone 1
- Study Zone 2
- Study Zone 3
- Study Zone 4
- Study Zone 5
- Study Zone 6

Produced for: Bilcon of Nova Scotia Corporation

Cultural Resources

Map 27

Graphic Design by Mark Owen, Bear River, N.S.



Map Source:
Nova Scotia Department of Housing
and Municipal Affairs
Sheet 10 44 4500 66 100
Primary Reference Grid:
Nova Scotia 3 M.T.M. Projection

More detailed explanations concerning the ulu discovery are contained in the following reference (Atlantic Marine Geological Consulting Ltd. 2005 **Ref.Vol. III, Tab 14**). Generally however, early settlement patterns are reported in more sheltered areas of the Bay of Fundy and Saint Marys Bay rather than the exposed Whites Cove/Whites Point coastline.

Review of available lists of shipwrecks in Nova Scotia waters turned up only one wreck in the Whites Cove area. On September 22, 1900, the Canadian government steamer Newfield, while provisioning lighthouses along the Fundy coast, ran aground in heavy fog at the entrance to Whites Cove. The Newfield was an iron vessel built in Sunderland in 1871, of 500 tons net and 785 tons gross and was 206 feet in length.

During the summer of 2002, underwater marine investigations of the nearshore at Whites Cove/Whites Point were conducted by Canadian Seabed Research Ltd. The extent of the underwater geophysical survey is shown on **Map 12** and includes the nearshore area of the proposed marine terminal. Side scan sonar data was collected within this area using a Klein 595 system operating at 100 kHz. Also, two seafloor video transects were taken in this area using a Sony DCR-TRV20 video camera.

9.3.1.2 Analysis



The discovery of a rare artifact, an ulu, to the north of the proposed Whites Point Quarry and Marine Terminal suggests other artifacts may occur in this region. Also, the discovery of the unusual seabed ridge and sea level history provides a morphological and temporal framework for understanding the paleogeography of the region. As stated in the reference document prepared by Atlantic Marine Geological Consulting Ltd. (**Ref. Vol. III, Tab 14**) “The large ridge (former beach) that occurs to the north of the proposed marine terminal offers the highest potential in the region for the discovery of marine artifacts. It is unlikely that artifacts will be discovered at the marine terminal location as the seabed is uniform and presents no unique morphological or sedimentological characteristics”.

The Newfield shipwreck on September 22, 1900 was the only recorded wreck in the area of the proposed marine terminal. On September 28, 1900, the wreck was sold at public auction, and purchased by Edward Lantalum of Saint John, New Brunswick for \$250.00.

The public auction and salvage indicates the vessel and remaining contents were removed from the site. Also, analysis of the side scan sonar and video of this bottom area, which was done in association with geophysical investigations, revealed no shipwreck-like features (personal communication – Robbie Bennett, Canadian Seabed Research Ltd.).

9.3.1.3 Mitigation

Prior to construction of the marine terminal and after pile footprint seabed areas are finalized, an application for archaeological investigation of the nearshore waters will be made to the Nova Scotia Museum. Professional divers trained in archaeological techniques will conduct the investigations. The proposed methodology for the investigation will be coordinated with the Nova Scotia Museum and include a systematic, grid based, diver observation and photographic assessment. If any evidence of marine artifacts is observed, the Nova Scotia Museum or other appropriate authorities will be notified. Construction will not commence until mitigation measures are determined in consultation with the Nova Scotia Museum and implemented by Bilcon of Nova Scotia Corporation.

9.3.1.4 Monitoring

After any required mitigation measures are completed, no monitoring will be undertaken.

9.3.1.5 Impact Statement

Marine Archaeology

Since it is unlikely that artifacts similar to the ulu exist in the construction area of the marine terminal and no shipwrecks are known to exist in the nearshore waters of Whites Point, and feasible mitigation measures will be undertaken by Bilcon of Nova Scotia Corporation, this would result in a *short term, neutral (no) effect, of local scale*.

9.3.2 Heritage Resources - Land Archaeology

9.3.2.1 Research

Review of “Protected Sites” administered by the Nova Scotia Department of Tourism, Culture, and Heritage under the Special Places Protection Act includes five sites designated in Nova Scotia to date. None of these sites are located in Digby County.

Regional and local background research consisted of consultation with archaeologists and the Algonquin ethnographic specialist on staff at the Nova Scotia Museum of Natural History. The Maritime Archaeological Resource Inventory site files at the Museum were also examined. Literature review of an ethnographic and archaeological nature included Erskine’s “Memoirs on the Prehistory of Nova Scotia 1957 – 1967”, ed. by Michael Deal.

An archaeological field reconnaissance strategy for the Whites Point Quarry site was developed by the principal heritage resource investigator (Dr. Charles Watrall) in consultation with archaeologists on staff at the Nova Scotia Museum. This strategy identified six zones within the proposed quarry site having a higher probability of potential cultural materials. These six study zones are shown on **Map 27**.

On-site field reconnaissance involved surficial visual examination of each zone and shovel testing of areas exhibiting potential soil disturbance or artifact presence. In general, the study zones included:

Study Zone #1 – the beach zone north and south of Whites Cove

Study Zone #2 – the stream north of Whites Cove

Study Zone #3 – the “Hersey House” foundation area

Study Zone #4 – the eastern property line

Study Zone #5 – the southern property line

Study Zone #6 – the southeastern upland area

9.3.2.2 Analysis

More specifically, on-site investigations of the six study zones revealed the following:

Study Zone #1 which included the coastal zone north and south of Whites Cove is comprised primarily of basalt boulders and outcrops of basalt rock shelves. This area was examined for prehistoric cultural materials such as lithic materials for prehistoric stone tool manufacture and the presence of pictographs and/or petroglyphs.

Subsoil examination of the cut bank along most of the northern beach area allowed for search of buried soil horizons, possible midden materials (i.e. shellfish remains, and/or fish and sea mammal remains), and prehistoric cultural remains. No faunal remains, cultural artifacts, potential lithic materials, or the presence of pictographs and/or petroglyphs, or buried soil horizons were found. In summary, no evidences of either surficial or subsurface cultural activity were found in Study Zone #1. In this regard, no further archaeological investigation is warranted in this area.

Study Zone #2 concentrated on the intermittent stream entering the Bay of Fundy north of Whites Cove. Surface examination and shovel tests revealed no evidence of prehistoric materials in this area. In this regard, no further archaeological investigation is warranted in this area.

Study Zone #3 concentrated in and around the possible “Hersey House” foundation. The surface area was examined for artifacts including any possible nearby refuse disposal area. A series of twelve shovel tests were conducted near the boulder foundation, within the pit area, and in the surrounding area. No artifact materials were found during visual and shovel test investigations. However, along the cut bank of the Whites Cove Road near the possible foundation site, four artifacts (2 broken glass fragments and 2 ceramic fragments) were recovered. The artifacts would all seem to date from the latter part of the 19th century. Based on the information available, the foundation site probably also dates to the latter part of the same century. The possible house feature is lacking in significant historical association, significant artifact or structure recovery and any unique functional interpretations. In this regard, no further extensive archaeological investigation is warranted in this area.

Study Zone #4 comprises the eastern property line of the proposed quarry site. Field reconnaissance along this property line transect consisted of visual search for soil surface irregularities indicating cultural activity and surface artifactual materials. Also, a series of shovel tests were performed along the transect at paced ten to fifteen m intervals. No cultural remains or artifact materials were found during these investigations. In this regard, no further archaeological investigation is warranted in this area.

Study Zone #5 comprises the southern property line of the property. Field reconnaissance along this property line transect consisted of surficial visual examination for cultural activities, disturbed soil profiles and artifact materials. Also, a series of shovel tests were performed along the transect at paced ten to fifteen m intervals. No archaeologically relevant materials were noted during any of these investigations. In this regard, no further archaeological investigation is warranted in this area.

Study Zone #6 comprises a relatively flat upland area at the southeastern portion of the property which was recently clear cut. This area was visually examined and a random pattern of shovel tests was performed. No cultural features or artifacts materials were found during this examination. In this regard, no further archaeological investigation is warranted in this area.

As stated in the reference document prepared by Dr. Charles R. Watrall (**Ref. Vol. VI, Tab 35**):

“No paleontological materials were found during this investigation”.

“No prehistoric cultural materials were found on the development site during this investigation. This included an absence of any recorded sites in pre-existing data files (i.e. Maritime Archaeological Resource Inventory Nova Scotia Museum) located on or in the immediate vicinity of the development site”.

“No prehistoric or historic period aboriginal materials were found during the field investigation of this study. This included a total absence of lithic artifacts or the presence of suitable materials for their production, the absences of any pictographic or petroglyph materials, and the absence of faunal materials constituting either prehistoric midden activities or later historic sea mammal hunting (i.e. late historic porpoise oil extraction activities)”.

“ It should be further stated that while the Whites Point/Whites Cove property did not in this study evidence any aboriginal materials, the pattern of sites in this region would indicate an aboriginal preference for locations having significantly different characteristics (i.e. calmer marine estuaries and bay and or shallow water shellfish resources)”.

The Archaeological Resource Impact Assessment of the Whites Point Quarry site under the terms of the Heritage Research Permit (A2002NS36) was reviewed by the Nova Scotia Museum. Their letter of May 14, 2003 (Appendix 28) accepts this report “as an acceptable archaeological impact assessment of the location for the proposed quarry”. Further, in response to an addendum to the original document, the Nova Scotia Museum in their letter of April 20, 2004 (Appendix 28) indicates “This additional information completes the requirements for the report and no further information is required”. Recommendations made by the Nova Scotia Museum are included in the following sections under “Mitigation” and “Monitoring”.

9.3.2.3 Mitigation

As recommended by the Nova Scotia Museum, if the “Hersey House” foundation cannot be avoided during quarry operations, further archaeological recording and limited testing will be done prior to any impacts. The “Hersey House” foundation is located within the proposed 30 m environmental preservation zone for the quarry project. Other possible structure locations such as “fish shacks” are also presently located within the environmental preservation zone proposed along the coastline.

Before construction of the quarry infrastructure and operation, an educational briefing concerning archaeological/historical resources will be conducted for quarry employees. If any evidence of archaeological materials or human remains is discovered during construction or operation, the Nova Scotia Museum or other appropriate authorities such as the local detachment of the Royal Canadian Mounted Police will be notified. Construction will not recommence until the artifacts are evaluated by the Museum and permission is granted by the Museum to resume work. Additionally, a local site archaeologist is on call if immediate situations arise.

9.3.2.4 Monitoring

As recommended by the Nova Scotia Museum, archaeological monitoring within a 250 m zone around the “Hersey House” foundation will be undertaken by Bilcon of Nova Scotia Corporation as part of their overall environmental monitoring program. The Nova Scotia Museum recommends this 250 m zone since any family plot burials, if present, would probably be within this zone. Since the “Hersey House” foundation is within 250 m of the four hectare quarry area, this zone has already been implemented by Bilcon of Nova Scotia Corporation.

If significant heritage resources are discovered, an appropriate monitoring or recovery program will be developed in consultation with the Nova Scotia Museum.

9.3.2.5 Impact Statement

Land Archaeology

Since no archaeological/cultural resources are known to exist on or near the Whites Point quarry site, this would result in a *long term, neutral (no) effect, of local scale*.

9.3.3 Aboriginal Land and Resource Use

9.3.3.1 Research

Bear River First Nation – L'setkuk – in Annapolis County, and also known as Muin Sipi, is composed of Bear River #6, 633.8 hectares in size, located 17.6 kms southeast of Digby and established on March 3rd, 1820; Bear River #6A, 31.2 hectares in size, located 9.6 kms southeast of Annapolis Royal and established March 3rd, 1938; and Bear River #6B, 24.3 hectares in size and located 6.4 kms southeast of Annapolis Royal and established October 1st, 1962.

As of April 2004, the population was 272 with 101 living on-reserve and 171 living off-reserve. From December 7th, 2003 to December 7th, 2005, the Chief is Frank Meuse and the Band Councillors are Stephen Edward Meuse and Dawn McEwan.

Very early in the environmental assessment process, and before an application was made under the Navigable Waters Protection Act triggering federal involvement, Bilcon recognized that Aboriginal Traditional Knowledge should be considered in any environmental impact assessment of the Whites Point project.

Accordingly, contact was made in October 2002 with the Confederacy of Mainland Mi'kmaq with respect to a Mi'kmaq Knowledge Study (MKS). Bilcon was advised by Michael Cox, Director of Lands, Environment and Natural Resources, that the current staff were fully booked at that time, but that a start could be made in the early part of 2003. However, Mr. Cox also advised that he would have to seek permission from the Ethics Committee in order to proceed.

In late 2002, Mr. Cox advised Bilcon that a conflict had arisen and the Confederacy were no longer willing to carry out the MKS for Bilcon, but that the Confederacy were in fact carrying out an MKS on behalf of the Bear River First Nation and that he would make this study available to Bilcon at the end of March 2003. Numerous attempts were made to contact the Chief of Bear River First Nations in an attempt to identify and resolve any conflict but these attempts were unsuccessful and the issue remains unresolved.

Contact was maintained with Mr. Cox to discuss timing, since by January 6th, 2003, Bilcon has been advised that a Comprehensive Study Report would be required for the project which would certainly include the requirement for an MKS.

Correspondence from the NSDEL on March 13th, 2003, indicated that they had had a request on behalf of First Nations' interests with respect to a botanical survey which led Bilcon to believe that an MKS was underway. This was confirmed by Mr. Cox who further indicated that he would make the study available to Bilcon by the end of March 2003.

In June of 2003, Bilcon was advised that it would be required to undergo a Panel Review of the project, confirming the requirements for an MKS.

In April 2004, contact was made with the Bear River First Nations and an information session took place at the Bilcon office in Digby on April 16th, 2004. Councillors Meuse and McEwan and the Economic Development Manager, Robert McEwan, respecting the Bear River First Nations and Bilcon project staff, including William Clayton Sr. and William Clayton Jr., the Project Manager, Paul Buxton, and Kristy Herron (Communications) were in attendance. The Chief was not able to attend but there was an excellent exchange of views, with the Councillors being particularly interested in job opportunities and training programs. Agreement was also reached that Bilcon could hold an information session at the Bear River First Nation Cultural and Heritage Centre.

This information session took place on January 11th, 2005, and following prayers and a smudging ceremony, a brief presentation was made by the Project Manager, followed by a lengthy question and answer session. Jobs and training were major topics, along with the issue of reclamation, the size of the development, and the potential impact on whales.

Following the release of the “Draft Guidelines for the Preparation of the Environmental Impact Statement for the Whites Point Quarry and Marine Terminal Project” in November, 2004, an undated letter (Appendix 15) was received from Donald M. Julien, O.N.S., of the Confederacy of Mainland Mi’kmaq and copied to the Panel Manager inter alia. This letter refers to the requirement to “identify the lands and resources of specific social, cultural, or spiritual value to Aboriginals of Nova Scotia with focus on current use of lands and resources for traditional purposes” and indicates that the Confederacy would look forward to discussing the possibility of submitting a full proposal to Bilcon for an MKS for the project.

Bilcon immediately responded to this letter indicating that it would be very pleased to discuss such a proposal.

On January 10th, 2005, Mr. Julien replied that the Confederacy had been made aware of a potential conflict that would not allow the Confederacy to prepare the MKS (Appendix 15).

On January 21st, 2005, Bilcon was provided with information by the Confederacy on two other groups who could be approached regarding an MKS.

In February 2005, contact was made with Thomas Johnson, Director of Operations, Eskasoni Fish and Wildlife Commission, who indicated that they could prepare an MKS for Bilcon and requested digital files to be forwarded in order that they could prepare an estimate. Follow-up discussions indicated that a problem had arisen over the issue of a Cape Breton group becoming involved with an MKS on the mainland and no proposal was submitted.

Contact was again made with Mr. Cox in March 2005, and it became apparent that an MKS was being prepared by the Confederacy and it was indicated that Bilcon would be provided with a copy upon its completion. As of November 2005, no copy has been received by Bilcon.

The above abbreviated chronology indicates that Bilcon has pursued the preparation of an MKS for three years, but has not had success in producing such a reference document. Nor has any consultation taken place with Aboriginal First Nations in the project area, although two information sessions did take place. In discussions with Eric Zscheile of the new organization Kwilnuk Maw-klusaqn (Mi'kmaq Rights Initiation) in the spring of 2005, Bilcon was advised that the position being taken was that consultation with First Nation groups could only be undertaken by the federal government with Kwilnuk Maw-klusaqn.

Bilcon assumes that the completed MKS will be presented to the panel at which time it will be available to Bilcon. Bilcon will review the MKS and respond to any concerns raised.

Addendum to 9.3.5.1

On January 10th, 2006, a report entitled “*The Mi'kmaq Use of Oositookum (Digby Neck), Its Surrounding Waters, and The Mainland Shore of St. Mary's Bay*” (Appendix 16) was submitted to the Panel by the Confederacy of Mainland Mi'kmaq (CMM). Participant funding was received by CMM for the preparation of this report.

The Background section of the report notes:

“This study is not consultation for justification of the infringement of constitutionally protected aboriginal and treaty rights.”

The study Summary is as follows:

The Mi'kmaq have used Oositookum (the Neck), and its surrounding waters, and the mainland shore of St. Mary's Bay since before the arrival of Europeans and continue to use the area for traditional purposes to this day.

Some Mi'kmaq land and resource-use sites have taken place and continue to take place in close proximity to the proposed project, including the historic Indian Hill Camp, situated at the northeast section of the present Whites Cove lot where moose and porpoise were hunted, and the heavy present day fishing in the waters surrounding the Neck.

It is also important to note that because of the high degree of use that has taken place in the area over the centuries, the possibility of pre-contact burial sites in the project area should not be ruled out.

Anecdotal information regarding the use of the Indian Hill Camp was received from Debbie Smith (granddaughter of George Washington Hersey) regarding use of the area by Mi'kmaq in the hunting season.

Archaeological sites in the area (Digby Neck and the mainland of St. Mary's Bay) are noted. Specific to the Project area are the site near Tiddville and the site off Sandy Cove where an ulu was discovered (see **Ref. Vol. III, Tab 14**).

Under Current Mi'kmaq Land and Resource Use, it is noted that:

There is significant traditional current Mi'kmaq use in Oositookum (Digby Neck) and its surrounding waters.

In the waters surrounding Digby Neck in the Bay of Fundy and in St. Mary's Bay, haddock, lobster, halibut, trout, pollack, mackerel, herring, scallop, and crab are harvested. Current fishing activities are heavy in all waters surrounding the Neck, but are particularly concentrated in the northern waters of St. Mary's Bay and along the mainland shore near Meteghan.

There are group campsites and an overnight site at several locations on the Neck, including in the north near Waterford and near Sandy Cove.

Harvesting on the Neck has taken place for wood, stones and clay, food plants, berries, wild fruit, quills and seashells.

Duck, and deer have been hunted on the Neck, and there is one moose kill site near Lake Midway.

9.3.3.3 Project Impacts

An archaeological survey was carried out on the specific quarry site (**Ref. Vol. VI, Tab 35**) under a permit from Nova Scotia Museum and no evidence was discovered with respect to aboriginal camp sites or other aboriginal use.

However, notwithstanding the lack of evidence, Bilcon has agreed that, should any artifact be discovered during the clearing and grubbing operation, all work will be stopped in the area until an investigation is carried out by a qualified archaeologist under the direction of Nova Scotia Museum.

It is acknowledged that the waters of the Bay of Fundy and St. Mary's Bay are fertile fishing grounds and that there is considerable use of these areas by fishers. However, Bilcon has noted elsewhere in this EIS that the only impact on the fishery will be to the lobster fishers in close proximity to the marine terminal with respect to possible trap loss. Compensation for trap loss has been proposed.

9.3.4 Heritage Resources - History

9.3.4.1 Research

Literature research was conducted to establish early European settlement patterns on Digby Neck and the Little River area (Moody 2002 **Ref. Vol. VI, Tab 33**). There is no indication of settlement during the first century of French occupation of Nova Scotia as the Acadians generally sought the low tidal marshes on which to build their dykes and establish their farms. Digby County, especially the exposed Fundy shore offered little opportunities to the French settlers. Likewise, the first waves of English-speaking settlers bypassed the Digby Neck. It was not until 1783 – 1784 with the influx of the United Empire Loyalists, refugees of the American Revolution, that the communities of Digby and Weymouth were established and became the main Loyalist centres in the region.

Among the more prominent of the Loyalists to settle in Digby at this time was Lieutenant – Colonel Joseph Barton of New Jersey. However, Joseph Barton died in 1788 shortly after his settlement in Digby. Thereafter, his heirs gained the land originally granted to their father in 1784 plus an additional 1250 acres including a 300 acre lot on the Fundy shore, near Little River, designated Farm Lot 11 in Division N. Thus, the Barton property comprises the bulk of the present quarry site while the remaining portion was originally part of the grant to William Addington, who was also a Loyalist, from the Carolinas.

It would appear that at least for the first half of the 1800's, no permanent homes existed on the property. This is essentially born out by Church's Map of Digby County circa 1864 which shows no houses in the vicinity of Whites Cove. However, during the latter part and to the end of the 1800's, there is evidence of possibly four families residing at Whites Cove and of lands with "fishing privileges". These families probably included an extended Hersey family and that of Alonzo Morehouse. It would appear that by the early 1900's, permanent human occupation ended in the Whites Cove area. Whites Cove probably continued to be used by fishermen up to the 1950s as evidenced by the remains of a skidway and a concrete slab possibly used to mount a winch to haul boats up on shore. Also, an undated photo presumably of a fish shed at Whites Cove with buoys is possibly of the early to mid 1900s time period.

9.3.4.2 Analysis

Newspaper reports indicate deaths of Whites Cove residents occurred in the late 1800's. However, research indicates no order relating to the proposed quarry property had been made or is on deposit at the registry of deeds indicating the property was set apart or used as a place for the burial or permanent placement of human remains. Also, review of the cemetery registry for Digby County revealed no cemetery located on the property. Intensive on-site investigations indicated no evidence of tombstones, grave markers, or other monuments located on the property. This is not to say that unmarked graves could not exist on the property.

Research to date indicates that there is no evidence of a “cemetery” or an “abandoned cemetery”, as defined in the Cemeteries Protection Act on the proposed quarry property.

Historic materials dating from the late 1800s to mid 1900s including the possible “Hersey House” foundation, two fish sheds and a boat skidway, the latter identified on a 1933 survey plan, indicate little permanent settlement on the site. Any permanent human occupation of the site probably occurred briefly during the 1860 – 1900 time period and consisted of possibly four families. Based on this information, land use during the above time period would not constitute a “village” context.

As stated in the reference document prepared by Dr. Barry Moody, “This brief examination of the history of the piece of land under consideration (the proposed Whites Point Quarry site) would indicate that it possesses no special historical significance. Its history, while interesting, is similar to that of many other such properties in the county”.

9.3.4.3 Mitigation

As previously mentioned, before construction and operation of the quarry, an educational briefing concerning archaeological/historical resources will be conducted for quarry employees. More specifically, if any resources are uncovered such as potential human remains, procedures outlined in the Cemeteries Protection Act will be followed. Also, a local archaeologist is on call if immediate situations arise. In particular, if the “Hersey House” foundation area is disturbed by quarry operations, further archaeological recording and limited testing will be done in consultation with the Nova Scotia Museum. Also, photographic documentation of the skidway will be completed.

9.3.4.4 Monitoring

If significant heritage resources are discovered, an appropriate monitoring or recovery program will be developed in consultation with the Nova Scotia Museum.

9.3.4.5 Impact Statement

Historical Resources

Since only limited historical/cultural resources of local interest are known to exist on the Whites Point Quarry site, this would result in a ***long term, insignificant negative effect, of local scale.***

9.3.5 Heritage Resources - Heritage Properties

9.3.5.1 Research

Two categories of heritage properties exist in Digby County. Provincially registered properties and municipally designated properties. Review of the Municipality of the District of Digby's Heritage Properties indicates no registered or designated heritage properties exist on the Whites Point quarry property. Several provincially registered properties are located in nearby communities (Sandy Cove and Little River). Also, review of Digby Municipal Heritage Properties indicates a number of heritage properties have been designated on Digby Neck, the closest to the Whites Point Quarry property being located in Little River, Mink Cove, and Sandy Cove.

9.3.5.2 Analysis

Registered and designated heritage properties are located on Digby Neck. Since the quarry operation is not visible from Highway #217, no negative visual influences on heritage/cultural tourism travelers would result. Also, view planes from existing heritage properties would not be affected since the quarry is not visible from any of the registered or designated heritage properties.

9.3.5.3 Mitigation

The entrance road (Whites Cove Road) to the quarry property from Highway #217 is proposed to be upgraded and landscaped to maintain existing rural aesthetic qualities. Upgrading of the Whites Cove Road, since it is a public road, would be coordinated with the Nova Scotia Department of Transportation and Public Works.

9.3.5.4 Monitoring

Since no visual effects will result from the quarry operation in relation to heritage properties or cultural/heritage tourists traveling along Highway #217, monitoring is not proposed.

9.3.5.5 Impact Statement

Heritage Properties

Since there are no registered or designated heritage properties located on the quarry property and the quarry is not in a view plane from an existing heritage property, this would result in a *long term, neutral (no) effect, of regional scale.*

9.3.6 Aesthetics

9.3.6.1 Research

Several years ago Highway #217 was designated the “Digby Neck and Islands Scenic Drive” from Digby to Brier Island. The two-lane highway is generally located down slope and east of the ridge along Digby Neck with the Bay of Fundy to the west and St. Mary’s Bay to the east. Views of the Bay of Fundy are not present from Highway #217 while St. Mary’s Bay is visible from a few locations along the highway as it passes through Digby Neck. Many large tracts of forest have been clear-cut on Digby Neck and are visible along the highway as spruce trees infested with the spruce bark beetle have been harvested.

The site of the proposed Whites Point Quarry property lies between Highway #217 and the Bay of Fundy – see **Map 2**. Highway #217 generally parallels the 50-m contour elevation in this area and lies east of the Digby Neck ridge. Residences are located on either side of the highway in a rural setting. The horizontal distance between the highway and the quarry property varies from 150 m to over 700 m. A vertical change in elevation from the highway upslope to the top of the ridge and the quarry property line varies from 15 m to over 40 m. The working area of the quarry will be located on the western slope of Digby Neck and down slope from the ridge to the Bay of Fundy shore.

The highest density of residential development adjacent to the proposed quarry is in the community of Little River. The approximate number of residences in zones of 500 m from the quarry property is presented below.

	0-500m	500-1000m	1000-1500m	1500-2000m
Residences	9	38	40	5

North and south along Highway #217 beyond the 2000 m zone there is sparse residential development typical of the 1500 – 2000 m zone.

Whale and seabird cruises have become popular ecotourism attractions on the Bay of Fundy and St. Mary’s Bay. Presently, cruises originate from East Ferry, Tiverton, Freeport, and Brier Island during the tourist season. The peak tourist season (June – September) generally coincides with the season when the most whales appear in the Lower Bay of Fundy. Operators offer daily cruises during the summer months. Popular whale and seabird watching areas are shown on **Map 4**. Other than whale and seabird cruises, the Lower Bay of Fundy experiences little recreational boating activities such as sea kayaking, sailing, or pleasure cruising, when compared to the Atlantic coast.

The nearest pleasure craft marina is in Digby, approximately 40 km from the Whites Point Quarry site. However, the Digby marina does host pleasure craft from the United States and the Saint John, New Brunswick area. Most of the water use in the vicinity of Whites Point is by commercial fishermen.

Investigations regarding the popular whale watching areas on the Bay of Fundy during the summer of 2002 revealed little activity from the whale and seabird cruises in the Whites Point near shore area. Weekly observations during July and August for whale sightings conducted from Petite Passage to Sandy Cove indicated little whale activity in this area of coastline and near shore. Actually, only three Minke whales were sighted during these observation trips. The endangered North Atlantic right whale is a big attraction for whale watchers with the greatest concentration of right whales occurring in the Right Whale Conservation Area immediately southeast of Grand Manan Island – see **Map 25**.

The working area of the quarry will be located on the western slope of Digby Neck and down slope to the Bay of Fundy shore. The quarry property extends approximately 2.6 km along the Bay of Fundy coastline. A marine terminal will be located at the quarry site and will provide mooring for bulk carriers to transport the quarry products to export markets. The marine loading facilities will extend approximately 200 m from the shoreline into the Bay waters. On shore support facilities include buildings, crushers, fuel tanks, load out conveyors, and quarry operating equipment.

9.3.6.2 Analysis

Due to the horizontal set back and vertical change in elevation, the quarry will not be visible from Highway #217 nor from residential dwellings located along the highway. Additionally, a 30 m wide environmental preservation zone will be located within the quarry property along all property lines adjoining the quarry property. This will act as a further visual buffer zone in relation to existing adjoining properties as well as for environmental purposes – see **Figure 7**. It should also be noted that there will be an approximate 1000 m separation from the quarry processing plant to the nearest residence within the 0 – 500 m property boundary zone.

However, the proposed onshore infrastructure and marine terminal development will be visible from the Bay of Fundy waters. The onshore infrastructure required for the quarry operation will be located on approximately 10 hectares of land area. Nearshore infrastructure required for the marine terminal will require an additional 3 hectares. Permanent land infrastructure will comprise about 7 % of the total 152-hectare quarry site and be in place over the life of the project. A minimum 30-m environmental preservation zone will be located landward from the ordinary high water level of the Bay along the entire 2600-m water frontage thus maintaining the natural character of the landward shoreline. The marine facility will not be the typical massive sheet pile wharf structure common to container terminals but a less intrusive system of three independent mooring dolphins and individual conveyor support systems – see **Figure s 2 and 3**.

Since whale and seabird cruise operators tend to take tourists to where whales are most frequent, views of the quarry from the water by visitors would be infrequent. Also, since this area of the Bay is not a high use recreational boating area, views of the quarry from the water by recreational boaters or pleasure craft would be infrequent. Therefore, the group of Bay of Fundy water users most affected by views of the quarry operation would be the local commercial fishermen.

9.3.6.3 Mitigation

Specific mitigation measures are not proposed regarding aesthetic enhancement along Highway #217 since the quarry is not in a view plane from the highway. However, a minimum 30-m environmental preservation zone around the perimeter of the property will be maintained. This will include a preservation zone along the Bay of Fundy shoreline. Also, the operational schedule proposes to limit site disturbance to approximately 2.5 hectares per year thus minimizing visual site disturbance. Reclamation of previously disturbed land areas will be implemented on a five-year schedule to further reduce visual impacts when viewed from the Bay of Fundy waters. This reclamation effort would give priority to enhancing the aesthetics in the area between the shoreline and the land-based infrastructure – see **Figure 5**.

9.3.6.4 Monitoring

Monitoring measures proposed regarding aesthetics would include the maintenance of a healthy environmental preservation zone and the maintenance of a healthy land restoration. As mentioned in subsequent sections of this report, a land management program will be implemented by Bilcon of Nova Scotia Corporation.

9.3.6.5 Impact Statement

Highway #217 Aesthetics

Since the quarry is not visible from Highway #217, no view plane disturbance will be evident resulting in a *long term, neutral (no) effect, of regional scale*.

Bay of Fundy Aesthetics

Since the quarry will be visible from the Bay of Fundy waters and considering operational and restoration plans, minimal view plane disruption is expected resulting in a *long term, insignificant negative effect, of regional scale*.

9.3.7 Community Profile

Introduction

An assessment of demography, employment, education and income was conducted in order to establish a baseline of social and economic indicators for the region. While the primary geographic area of concentration was the local community of Digby Neck & Islands, the assessment also incorporated statistical analysis of the broader statistical regions of Digby County and the Southern Region (24) of Nova Scotia where possible. Moreover, an attempt was made to reflect the level of change that has occurred over time and the analysis, and, where meaningful, incorporates statistical data over a twenty-year time period. This level of analysis was conducted in order to establish a sufficient level of information from which to base assumptions on existing conditions, future trends and potential impacts the project may or may not have on the social and economic conditions of the region.

The analysis is based primarily on information readily available from official federal and provincial data sources. Statistics Canada Census data from 1981 to 2001 was reviewed in order to examine the region's demography, employment and education. The Census profiles were refined to the Dissemination Area level, which allowed for a more acute community specific analysis to be conducted. Tax filer information from 1989-2003, specific to Digby Neck and Islands, was reviewed in order to assess the region's income patterns over time. In addition to these two main sources of information, numerous other resources were reviewed in order to gain a better understanding of the social and economic dynamics of the region. These resources included other statistical records such as labour force surveys, provincial statistical reviews and literature resources specific to the region.

9.3.7.1 Demographic Profile

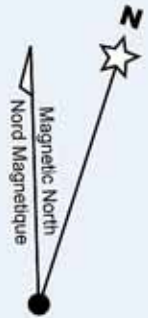
It should be noted that Statistics Canada made some modifications to its dissemination boundaries from 1981 to 2001 within the Digby Neck and Islands region. In order to maintain continuity of statistical information with regard to geographic representation, only the dissemination areas identified as 0035, 0036 & 0038 on **Map 28** were used to represent the local community. These dissemination areas represent a geographic distance of approximately 20 to 30 kilometres either side of the proposed Whites Point quarry and Marine Terminal. The communities of Freeport, Central Grove, Tiverton, Tiddville, Little River, Mink Cove, Sandy Cove, Lake Midway, Centreville and Waterford are included within this defined region.

9.3.7.1.1 Population Diversity

A review of census data from 1981 to 2001 indicated that the majority of the population within the defined area of Digby Neck was English speaking and mainly of British descent. In 1981, ninety-nine percent of the population identified English as their first language and in 2001 this figure was roughly 98%.

Legend

- Highway
- · - County Line
- Census Division
- 0000 Dissemination Area



Ferry to St. John

Bay of Fundy

Annapolis Royal

Digby

Whites Point Quarry

Digby Neck

Bear River

ANNAPOLIS COUNTY

Long Is.

St. Mary's Bay

DIGBY COUNTY

Brier Is.

Church Point

Weymouth

Kejimkujik National Park

Meteghan

Tobeatic Wilderness Area

Port Maitland

Digby Municipality
Clare Municipality

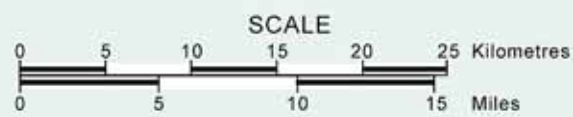
**Whites Point Quarry
Little River, Digby County
Nova Scotia**

**Environmental Assessment/
Impact Statement**

Produced for: Bilcon of Nova Scotia Corporation

Dissemination Areas

Map 28



Graphic Design by Mark Pease, Bear River, N.S.

The 2001 Census reflected that the majority of the population (79%) was third-generation or over and that there was a very small percentage of the population that considered themselves of aboriginal (Métis) descent (1.5%), Acadian descent (1.5%) or African Canadian/black (0%). A further review of census data from 1981 through to 1996 revealed similar proportions of diversity. However, the 1991, 1986 and 1981 censuses did not indicate that there were any persons of aboriginal descent within the area during those periods. As an aside, there were proportionately more individuals that identified that they were of German (3.8%), Dutch (4.5%) and Italian (2.7%) origin in 2001.

9.3.7.1.2 Population Growth

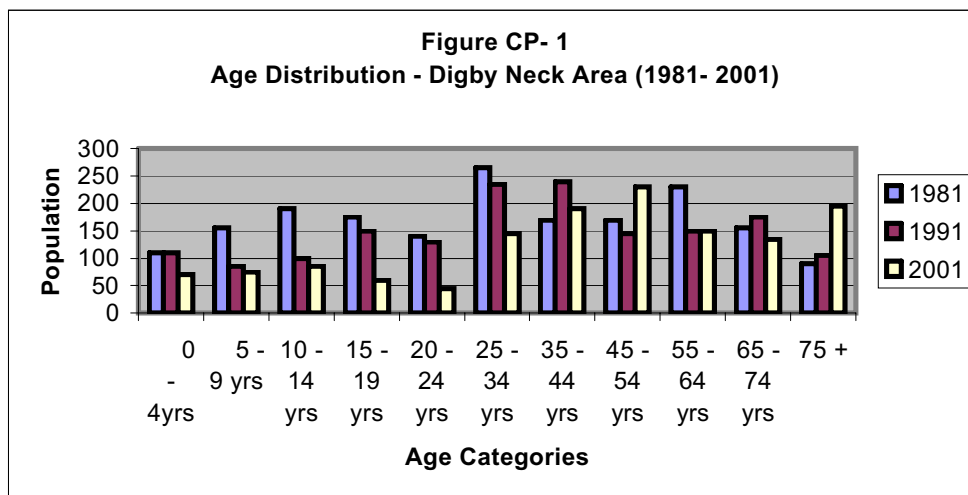
The 2001 Census indicates that this defined area within the Digby Neck and Islands region had a population of 1,325. The population within this area has declined 28.4% or an absolute decline of approximately 525 persons since 1981, a fairly significant decline (see **Table CP-1**). Moreover, the rate of decline between census years has been fairly consistent and if anything has accelerated slightly. Digby County experienced an absolute drop in population of 2,144 persons or a decline of 9.9% over the same time period. This decline is far less dramatic and more in line with the typical population trends experienced by rural communities in Nova Scotia. The Southern Region, which includes the counties of Lunenburg, Queens, Shelburne, Yarmouth and Digby, experienced a much lower overall decline in population of only 1.8%. Lunenburg and Yarmouth counties experienced some moderate growth in their relative populations from 1981 to 2001 (refer to **Table CP-2**)

Table CP - 1 Demographics Population by 5 - 10 year Age Groups Selected Region - Digby Neck & Islands								
	1981 Census		1991 Census		2001 Census		Percentage Change 1981 - 2001	
	#	%	#	%	#	%		
Total Reporting	1,850		1,590		1,325		-28.4	
By 5 to 10-year Age Groups								
0 - 4yrs	110	5.9	110	6.9	70	5.2	-36.4	
5 - 9 yrs	155	8.4	85	5.3	75	5.7	-51.6	
10 - 14 yrs	190	10.3	100	6.3	85	6.4	-55.3	
15 - 19 yrs	175	9.5	150	9.4	60	4.5	-65.7	
20 - 24 yrs	140	7.6	130	8.2	45	3.4	-67.9	
25 - 34 yrs	265	14.3	235	14.8	145	10.9	-45.3	
35 - 44 yrs	170	9.2	240	15.1	190	14.3	+11.8	
45 - 54 yrs	170	9.2	145	9.1	230	17.4	+35.3	
55 - 64 yrs	230	12.4	150	9.4	150	11.3	-34.5	
65 - 74 yrs	155	8.4	175	11.0	135	10.1	-12.9	
75 +	90	4.9	105	6.6	195	14.7	+116.7	

Source: Statistics Canada Profile Information, EA & DA's 1981-2001

9.3.7.1.3 Population Distribution

Table CP-2 and **Figure CP-1** profile the change in population by age category. The table reflects a sharp decline in the number of youth and younger labour force aged population within the “Digby Neck” region from 1981 to 2001 and a significant increase in the senior population over the same period. The greatest percentage decline was within the 20 to 24 age group, which experienced a decline in population of 67.9 percent. The largest increase was in the category of those aged 75+, which experienced a growth of 116.7 percent. A similar pattern of change, although less pronounced, was experienced in Digby County and the Southern Region over the same period (refer to **Table CP-2**).



Source: 1981,1991,2001 Census Data

Age Groups	Digby Neck			Digby County			Southern Region			Nova Scotia		
	1981	2001	Change %	1981	2001	Change %	1981	2001	Change %	1981	2001	Change %
Total	1,850	1,325	-28.4	21,689	19,545	-9.9	124,179	121,935	-1.8	847,442	932,389	10.0
0 - 14yrs	455	230	-49.5	4,850	3,130	-35.5	27,690	20,445	-26.2	198,654	166,582	-16.1
15 - 24 yrs	315	105	-66.7	4,075	2,095	-48.6	22,480	13,910	-38.1	163,942	123,469	-24.7
25 - 34 yrs	265	145	-45.3	3,090	2,315	-25.1	18,999	13,865	-27.0	139,400	123,332	-11.5
35 - 44 yrs	170	190	11.8	2,240	3,100	38.4	13,535	19,850	46.7	96,592	156,853	62.4
45 - 64 yrs	400	380	-5.0	4,350	5,310	22.1	24,340	32,905	35.2	155,954	234,607	50.4
65+	245	330	34.7	3,120	3,600	15.4	17,135	20,905	22.0	92,898	127,546	37.3

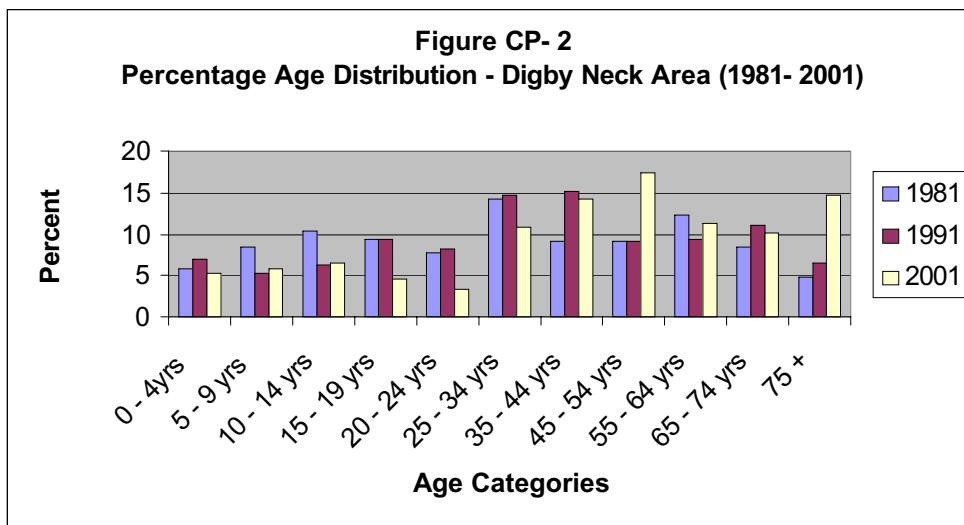
Source: Statistics Canada, Census of Canada

The percentage of dependent youth, those aged 0 to 14 years of age has declined 49.5% in the “Digby Neck” region. A similar level of decline is evident in the “young workforce” aged population of 15 to 34 years of age. This age group experienced an absolute decline of 330 persons or 56.9 percent from 1981 to 2001. The primary labour force population aged 20 to 64 has declined 22.1 percent. There has been an increase of 34.7 percent of those aged 65+, refer to **Table CP-3** below.

	Age Category	1981 #	2001 #	Percent Change 1981- 2001
Youth (Dependent)	0 - 14	455	230	-49.5
Young Workforce	15 - 34	580	250	-56.9
Young Family	20 - 44	575	380	-33.9
Primary Working	20 - 64	975	760	-22.1
Retired (Dependent)	65+	245	330	+34.7

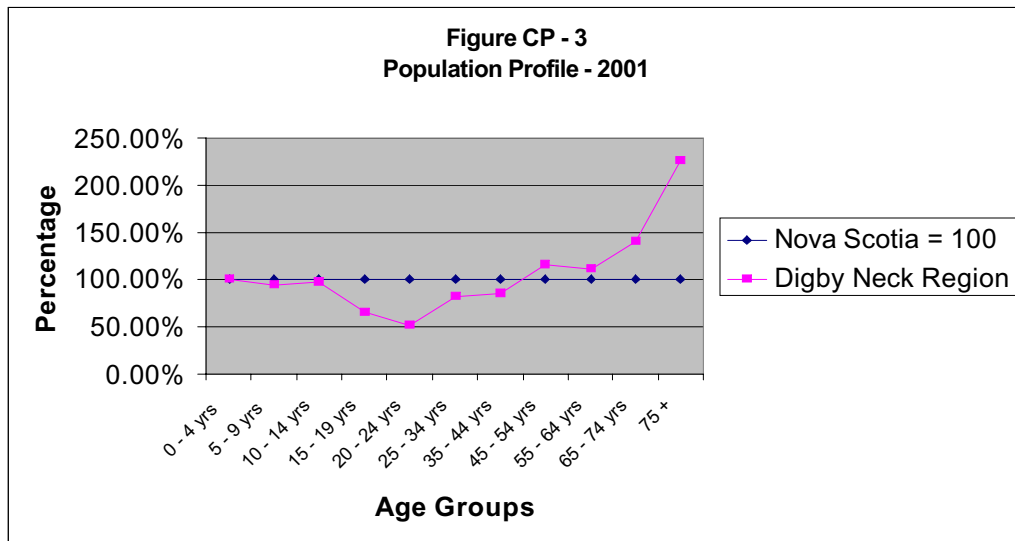
Source: 1981, 2001 Census Data

While the absolute growth or decline in population is an important measure of demography so too is the overall change in distribution. The following figure reflects the percentage change in distribution that occurred within the Digby Neck area from 1981-2001.



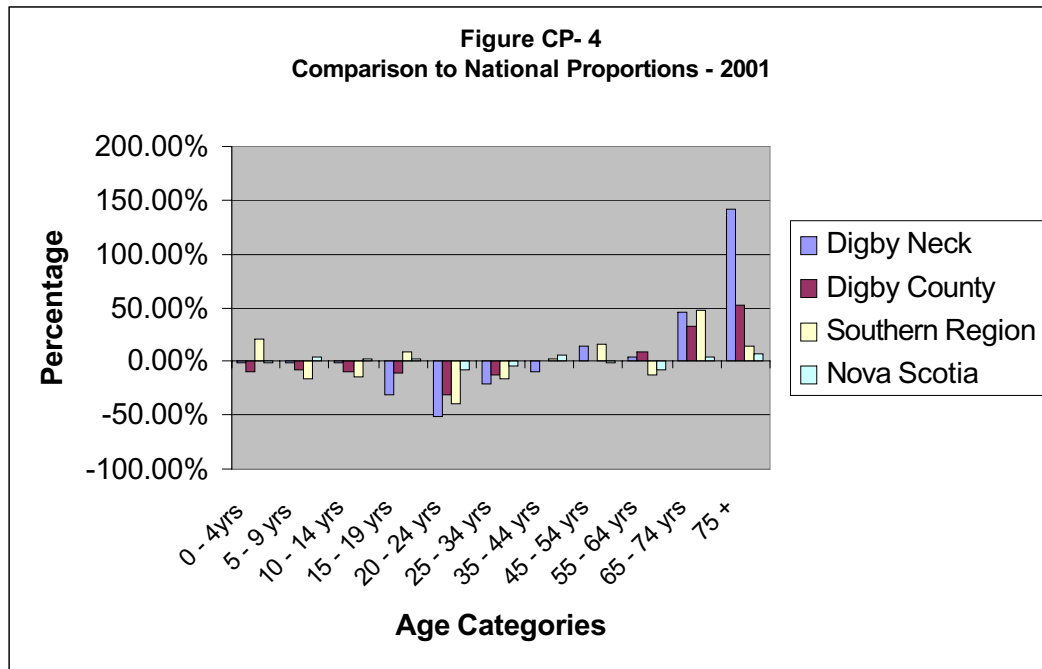
Source: 1981,1991,2001 Census Data

The area is experiencing a shift from a fairly evenly proportioned population with respect to age, to one that has shifted significantly toward a growing older, dependent population. Digby Neck, relative to Nova Scotia has a shortage of persons in the active age category, age 15 through 64. **Figure CP-3** represents an index of the proportion of population per age group within the Digby Neck Region relative to the province. Nova Scotia represents the base or 100 percent, anything below this line indicates a shortage relative to Nova Scotia and above a surplus. There is clearly an abundance of individuals above the age of 64 or senior, dependent population, relative to the provincial proportion. Moreover, and maybe more importantly, there is a shortage in the “active age” categories through ages 15 to 54. The significance of this latter statistic is that growth or stability within the “active age” categories is typically indicative of the strength of an economy as it pertains to an economy’s ability to retain labour force. There is usually a direct correlation between job opportunities and mobility of labour force. The fact that the region has a shortage in this “active age” category may indicate that there has been a loss of job opportunities within the region and this has prompted individuals within this age category to seek employment elsewhere.



The following figure, **Figure CP-4** is based on the national proportion from the 2001 Census and reflects the percentage deviation per age group from the national levels. The baseline or national proportion is represented as zero and a lower relative proportion falls below this line and a higher proportion above. What is apparent from this, is that the provincial population distribution mirrors fairly closely that of the national proportions with the exception of some subtle deviations. However, this can not be said of the Digby Neck area, Digby County or the Southern Region.

Analysis of the Digby Neck, Digby County and the Southern Region each reveal a similar pattern of deviation from the national level. Proportionally, there are fewer young adults aged 15 to 34 and a greater proportion of adults over the age of 64. Digby Neck and Digby County have a disproportionate level of adults over the age of 75. This basically reaffirms the areas trend toward an aging population, however while this is not a symptom specific to Digby Neck and is experienced in most rural coastal communities across Nova Scotia and the Maritimes, it does appear to be a somewhat more critical issue.



Source: Statistics Canada 2001 Census

The decline in growth that is occurring in rural populations in Nova Scotia is thought to be primarily the product of a couple of factors, weak growth due to low birthrates and migration, two factors that have a cumulative effect. According to a discussion paper entitled (“Rural Population in Atlantic Canada” prepared for the Pan Atlantic Repopulation Committee, Rural Secretariat – Atlantic Region , Ref. 164), there are very few rural communities and small towns in Atlantic Canada that are “non-metro-adjacent” that are growing. These are growing slowly, but most are suffering from population loss due to death rates exceeding birth rates, communities receiving little of the migration of adults from urban to rural communities and communities experiencing out-migration of youth and young adults. A similar pattern is befalling the coastal communities of the Southern Region of Nova Scotia.

9.3.7.1.4 Vital Statistics

In 1965, the province of Nova Scotia had a live birth rate of 24.9 births per 1000 population and a death rate of 8.5 per thousand. The gap had narrowed significantly by the turn of the new millennium and in 2003 the live birth rate was only 9.1. The death rate has remained fairly consistent averaging about 8.5 since 1965. The province is quickly approaching a point of decline in natural population growth, a point that Digby County and the Southern Region of Nova Scotia reached some time ago.

Table CP- 4 shows the vital statistics characteristics for live births and deaths for Digby County, the Southern Region and Nova Scotia from 1997 to 2003. Digby County and the Southern Region experienced a net natural loss in population in each year due to birth rates being below the replacement rate. In 2003, Digby County had a net loss of 111 persons or 5.6 persons per thousand with the Southern Region experiencing a similar decline of roughly 3.0 persons per thousand. The significance of this is that the region is not able to maintain a natural level of replacement and therefore becomes far more dependent on immigration in order to sustain population levels. However, as is evidenced in the following sections, the region is also experiencing net losses in migration due to an exodus of youth and younger aged workers and this is exasperating the region’s declining population problem.

9.3.7.1.5 Mobility

The following table (**CP-5**) presents mobility patterns of the population aged five-years and older within the Digby Neck Region derived from Census of Canada information from 1981 to 2001.

Table CP - 4
Vital Statistics - Birth and Death Rates (1997 - 2003)

Year	Digby		Southern Region				Nova Scotia					
	Live Births	Rate	Deaths	Rate	Live Births	Rate	Deaths	Rate	Live Births	Rate	Deaths	Rate
2003	159	8.1	270	13.7	971	7.8	1,342	10.8	8,536	9.1	7997	8.5
2002	149	7.2	197	9.6	998	7.9	1,231	9.7	8,545	9.0	7921	8.4
2001	178	8.6	210	10.2	1,051	8.3	1,276	10.1	8,757	9.3	7803	8.3
2000	191	9.2	239	11.6	1,101	8.7	1,232	9.8	8,977	9.5	7813	8.3
1999	158	7.6	239	11.5	1,095	8.6	1,227	9.7	9,427	10.0	7568	8.1
1998	161	7.8	247	11.9	1,166	9.2	1,267	10.0	9,448	10.1	7995	8.6
1997	212	10.2	225	10.8	1,185	9.3	1,331	10.5	9,952	10.6	8044	8.6

Source: NS Vital Statistics Summary 1998 - 2005

Mobility The following table (CP-5) presents mobility patterns of the population aged five-years and older within the Digby Neck Region derived from Census of Canada information from 1981 to 2001.

Table CP - 5
Mobility
Digby Neck Area (1981- 2001 Census Data)
Prior 5 years

	1981	%	1986	%	1991	%	1996	%	2001	%
Persons 5 yrs & over	1,775	100.0	1,570	100.0	1,490	100.0	1,365	100.0	1,235	100.0
Non Movers	1,295	72.9	1,210	77.1	1,245	83.6	1,145	83.9	965	78.1
Movers	475	26.8	375	23.9	240	16.1	225	16.5	260	21.1
Moved within Municipality	315	17.8	290	18.5	165	11.1	150	11.0	140	11.3
Moved within Province	55	3.1	15	1.0	20	1.3	25	1.8	85	6.9
Moved within Canada	80	4.5	40	2.5	60	4.0	40	2.9	45	3.6
Moved outside Canada	20	1.1	10	0.6	0	0.0	0	0.0	0	0.0

Source: Statistics Canada Census Data 1981 - 2001

The data indicates a relatively consistent pattern of mobility within the Digby Neck area from 1976-2001. The relative proportions of non-movers to movers did not change substantially over this period, however this does not necessarily suggest a level of stability. There has been a consistent pattern of decline in the number of persons moving to the area (-45.3%) and this, in concert with a declining population due to out-migration, has been why the proportional balance between non-movers and movers has been maintained. The decline in the number of movers to the area is significant, because the area is becoming more and more dependent on immigration to stabilize its population in order to compensate for losses due to low birth rates verses replacement and out-migration.

The 2001 Census data does indicate an increase in the level of movers to the area from the previous census. This may be a sign that the area has “rounded the corner” and is experiencing an increased level of immigration. Unfortunately, there is no way to speculate whether this is indeed a change from the consistent pattern of decline the area has been experiencing or an anomaly until new census data is available.

Another notable change that has occurred is the make-up of movers to the area. According to census data collected in 1981, approximately 475 persons moved to the area within the preceding five years. The estimate reflects that a large proportion of the “movers” (66.3%) originated from within the municipality of Digby (non-migrant) and that there were very few movers from other municipalities in Nova Scotia (intra-provincial), other provinces (inter-provincial) or from outside Canada. The recent census data (2001) reflects some subtle changes in the origin of movers to the area. There were proportionally fewer movers that originated from within the municipality (53.8%) and an increase in the proportion of intra-provincial movers to the region.

9.3.7.1.6 In-Out Migration

A review of tax filer data from 1991 to 2004 was conducted to assess migration patterns within Digby County, the Southern Region and Nova Scotia. Unfortunately, Statistics Canada does not refine tax filer migration estimates to a level where the community of Digby Neck and Islands could be specifically looked at. Nevertheless, there are similarities in the migration patterns present among the geographic regions analyzed, which in general are most likely applicable to the Digby Neck area. A caveat to this assumption though is that rural areas tend to be very heterogeneous and migration flows of individual communities within the same region can be vastly different.

Table CP-6 outlines migration estimates by age category from 1991-1992 to 2003-2004 for Digby County, the Southern Region and Nova Scotia. The table is broken down into three sub-categories reflecting migration estimates between census periods. Digby County experienced a net loss in population due to higher levels of out-migration in each period analyzed.

The losses were mainly in the younger age groups with the highest losses occurring within the age categories of 18-24 and 25-44. The Southern Region also experienced a net outflow during each period with a similar demographic pattern albeit proportionally less pronounced. Provincially, there was a net gain overall, however it too experienced a net out-migration in the 18-24 age category.

Tables CP-7 & CP-8 provide a year by year comparison of migration estimates within Digby County from 1999-2000 to 2003-2004, which is the latest tax filer information available. Table CP-7 breaks down migration by age group and Table CP-8 is broken down by gender and geographic movement. Table CP-7 reflects a continued trend toward a loss of young, primary workforce aged persons. Between 1999 and 2004, the age group 45-64 was the only category to experience a net gain from migration, 127 persons. All other age groupings experienced a net loss over this period with the 18-24 group experiencing the greatest loss. There was an estimated difference (loss) of 240 persons in the 18-24 year age category due to a higher level of out-migration.

Table CP- 6						
Migration Estimates by Age Group County, Region, Nova Scotia 1991 - 1992 to 2003 - 2004						
1991 - 1992 to 1995 - 1996						
	0 - 17	18 - 24	25 - 44	45 - 65	65+	Total
In Migrants						
Digby County	660	492	980	407	195	2,734
Southern Region(24)	4,032	2,729	6,159	2,721	1,028	16,669
Nova Scotia	43,943	33,099	70,507	19,815	6,962	174,326
Out Migrants						
Digby County	779	712	1,077	308	196	3,072
Southern Region(24)	4,218	3,872	6,382	1,889	1,064	17,425
Nova Scotia	40,460	36,026	69,865	16,253	6,480	169,084
Net - Migration						
Digby County	-119	-220	-97	99	-1	-338
Southern Region(24)	-186	-1,143	-223	832	-36	-756
Nova Scotia	3,483	-2,927	642	3,562	482	5,242
1996 - 1997 to 2000 - 2001						
	0 - 17	18 - 24	25 - 44	45 - 65	65+	Total
In Migrants						
Digby County	691	508	1,069	562	253	3,083
Southern Region(24)	3,941	2,700	6,161	3,285	1,278	17,365
Nova Scotia	38,774	31,095	68,320	21,671	8,385	168,245
Out Migrants						
Digby County	673	660	1,165	395	267	3,160
Southern Region(24)	3,845	3,978	6,078	2,194	1,356	17,451
Nova Scotia	36,615	35,048	66,928	18,999	7,951	165,541
Net - Migration						
Digby County	18	-152	-96	167	-14	-77
Southern Region(24)	96	-1,278	83	1,091	-78	-86
Nova Scotia	2,159	-3,953	1,392	2,672	434	2,704
2001 - 2002 to 2003 - 2004						
	0 - 17	18 - 24	25 - 44	45 - 65	65+	Total
In Migrants						
Digby County	455	289	698	354	177	1,973
Southern Region(24)	2,588	1,663	3,965	2,293	844	11,353
Nova Scotia	22,208	20,037	41,211	15,112	5,506	104,074
Out Migrants						
Digby County	479	475	748	309	179	2,190
Southern Region(24)	2,453	2,587	3,889	1,692	960	11,581
Nova Scotia	21,457	21,424	39,958	13,574	5,450	101,863
Net - Migration						
Digby County	-24	-186	-50	45	-2	-217
Southern Region(24)	135	-924	76	601	-116	-228
Nova Scotia	751	-1,387	1,253	1,538	56	2,211

Source: Statistics Canada; Small Area Administrative Data

A comparison by gender and movement reflects that a slightly higher proportion of men migrated from Digby County than women and that predominately migration was to other areas within the province.

Table CP- 7

Migration - Digby County (1999-2004)

	In-Migration					Total
	0-17 years	18-24 years	25-44 years	45-64 years	65+ years	
1999-2000	154	121	220	118	50	663
2000-2001	138	92	222	140	57	649
2001-2002	153	100	226	122	60	661
2002-2003	175	103	271	106	53	708
2003-2004	127	86	201	126	64	604
Total	747	502	1140	612	284	3285

	Out-Migration					Total
	0-17 years	18-24 years	25-44 years	45-64 years	65+ years	
1999-2000	118	130	213	88	59	608
2000-2001	168	137	251	88	54	698
2001-2002	166	178	283	100	72	799
2002-2003	156	148	229	112	50	695
2003-2004	157	149	236	97	57	696
Total	765	742	1212	485	292	3496

	Net-Migration					Total
	0-17 years	18-24 years	25-44 years	45-64 years	65+ years	
1999-2000	36	-9	7	30	-9	55
2000-2001	-30	-45	-29	52	3	-49
2001-2002	-13	-78	-57	22	-12	-138
2002-2003	19	-45	42	-6	3	13
2003-2004	-30	-63	-35	29	7	-92
Total	-18	-240	-72	127	-8	-211

Source: Statistics Canada; Small Area Administrative Data

Table CP - 8

Migration - Digby County (1999-2004)

	In-Migrants						Total Both genders
	Intraprovincial		Interprovincial		International		
	Males	Females	Males	Females	Males	Females	
1999-2000	187	221	114	129	7	5	663
2000-2001	217	245	85	88	10	4	649
2001-2002	203	248	91	104	9	6	661
2002-2003	204	240	120	128	8	8	708
2003-2004	198	207	95	96	4	4	604
Total	1009	1161	505	545	38	27	3285

	Out-Migrants						Total Both genders
	Intraprovincial		Interprovincial		International		
	Males	Females	Males	Females	Males	Females	
1999-2000	200	230	84	87	3	4	608
2000-2001	222	271	106	92	3	4	698
2001-2002	276	288	110	108	9	8	799
2002-2003	225	269	99	98	2	2	695
2003-2004	250	284	76	78	6	2	696
Total	1173	1342	475	463	23	20	3496

	Net-Migrants						Total Both genders
	Intraprovincial		Interprovincial		International		
	Males	Females	Males	Females	Males	Females	
1999-2000	-13	-9	30	42	4	1	55
2000-2001	-5	-26	-21	-4	7	0	-49
2001-2002	-73	-40	-19	-4	0	-2	-138
2002-2003	-21	-29	21	30	6	6	13
2003-2004	-52	-77	19	18	-2	2	-92
Total	-164	-181	30	82	15	7	-211

Source: Statistics Canada; Small Area Administrative Data

9.3.7.1.7 Analyses

“Rural depopulation has been a problem and a challenge for the Atlantic region and its provinces and municipalities for several decades now. However, in recent years the problem has been much more acute as it has been coupled with a seemingly long-term period of economic adjustment and decline. A handful of rural places, within close proximity to the largest urban centres within the region, have been growing and changing rapidly, while most other rural parts of the region have suffered slow and steady population decline...A naturally aging population, youth out-migration, a falling birth rate below replacement rates, and a lack of immigration to the region as a whole and to the rural parts of Atlantic Canada more specifically are the demographic realities...”(Rural Repopulation in Atlantic Canada, prepared for the Pan Atlantic Repopulation Committee, Rural Secretariat – Atlantic Region : 1, Ref. 164).

The excerpt from the above discussion paper suitably describes, from a demographic perspective, what has taken place in the community of Digby Neck over the past couple of decades. The area appears to be a community in decline. Its population declined 28.4% between census years 1981 and 2001 and there is no evidence to suggest that this trend of decline has abated. A recent study entitled “Between the Land and the Sea (2004)” commissioned by the Coastal Communities Network, identified Digby Neck as one of few communities in Nova Scotia with “severe population losses”. It further went on to say that, “It is assumed that such areas may lose their social and economic viability in terms of maintaining services and supporting healthy, independent communities”.

This is an inherent problem in communities that have experienced a large level of population decline. It creates somewhat of a “vicious circle” resulting in fewer and fewer opportunities to sustain economic viability and maintain social identity. “The impacts of continued population loss have been well documented in a number of studies and reports. The list is lengthy, and includes:

- Fewer opportunities for economic development, new business development, and job creation;
- Depression of the resale housing market;
- Rising vacancy rates in rental properties (including social housing properties in some areas);
- Diminished access to and provision of social services (healthcare, education etc.) as population levels fall below demand thresholds; and
- Diminished municipal capacity to provide critical and necessary municipal infrastructure due to an eroding tax base”(Rural Repopulation in Atlantic Canada :5).

9.3.7.2 Education

“Some informants saw school as a place where things just didn’t fit with the world as they knew it. Nebulous, frightening or unattractive “opportunities” were offered in school and school learning tasks were often constructed as “invisible” and related to skills and materials which had no tangible place in the community” (Corbett, 2000: 180, Ref. 238).

This section provides a general overview of the level of education attained within the defined area of Digby Neck and the level of enrolments at Digby Neck and Island schools over the past 20 to 25 years.

9.3.7.2.1 Level of Attainment

Education attainment levels show the potential an area has to diversify its economy (**Gardner Pinfold, Ref. Vol. VI, Tab 32**). **Table CP-9** reflects the levels of attainment reported in the 1981, 1991 & 2001 censuses. The censuses indicate that there has been a general trend toward a higher level of attainment. In 1981, approximately 69% of the population reported that they had not graduated from high school and a large proportion of these, 27.6%, had less than a grade nine education. Seven point six percent (7.6%) reported that they had graduated from high school. By 2001, the number of people reporting an attainment less than high school had dropped to 52.2%. However, there was actually very little improvement made between 1991 and 2001. The percentage of those reporting less than a grade nine education actually increased over this period.

The percentage of the population reporting post secondary completion increased significantly from 1981 to 2001 from 15.3% to 27% respectively. Some caution should be used in interpreting this data. The data is based on a hierarchy of attainment, where completion of college has higher standing than completion of high school etc. However, it should not be assumed that an individual reporting that they had some or completed a post secondary education necessarily completed high school. For this reason, it is very difficult to make any definitive comment on whether there has actually been a higher level of attainment. The percentage reporting having attained a university bachelor degree or higher has remained about the same in both absolute and relative terms.

Table CP - 9

**Educational Attainment - Digby Neck Area
(1981 - 2001)**

	1981	%	1991	%	2001	%
Total Reporting	1375	100.0	1320	100.0	1015	100.0
Less than High School	950	69.1	830	62.9	530	52.2
Less than Gr. 9	380	27.6	205	15.5	190	18.7
Without secondary certificate	570	41.5	625	47.3	340	33.5
High School Graduate	105	7.6	145	11.0	120	11.8
Some Post Secondary						
College	55	4.0	50	3.8	15	1.5
University	30	2.2	10	0.8	30	2.9
Post Secondary						
College	170	12.4	145	11.0	245	24.1
University	40	2.9	70	5.3	30	2.9
University Bachelor or Higher	45	3.3	70	5.3	50	4.9

Source: Censuses 1981, 1991 & 2001

The table that follows shows attainment levels for the province as a whole, the Southern Region, Digby County and the defined area of Digby Neck based on 2001 Census data. It is interesting to note that while there is a significant difference between the relative level of attainment when comparing Digby Neck to provincial levels, there is very little difference when comparing it to the Southern Region or Digby County.

Table CP - 10

**Educational Attainment - Nova Scotia, Southern Region, Digby County
(2001)**

	Nova Scotia		Southern Region		Digby County		Digby Neck Area	
	2001	%	2001	%	2001	%	2001	%
Total Reporting	670,930	100.0	92,170	100.0	14,965	100.0	1015	100.0
Less than High School	212,670	31.7	38,280	41.5	7,015	46.9	530	52.2
Less than Gr. 9	63,640	9.5	15,120	16.4	2,785	18.6	190	18.7
Without secondary certificate	149,030	22.2	23,160	25.1	4,230	28.3	340	33.5
High School Graduate	65,435	9.8	9,055	9.8	1,460	9.8	120	11.8
Some Post Secondary								
College	27,160	4.0	3,825	4.1	480	3.2	15	1.5
University	35,710	5.3	2,980	3.2	395	2.6	30	3.0
Post Secondary								
College	209,395	31.2	27,870	30.2	3995	26.7	245	24.1
University	17,965	2.7	2,150	2.3	415	2.8	30	3.0
University Bachelor or Higher	102,590	15.3	8,040	8.7	1215	8.1	50	4.9

Source: 2001 Census Data

The similarities are most likely due to the economic opportunities available within these regions. The economies of coastal and non-coastal rural communities are still relatively dominated by primary industries (agriculture, fishery, forestry) and there is little requirement or use for that matter for formal education. The skills required to work in these industries are learned through “on the job training” or apprenticeships typically passed down from family members that have worked in these industries.

“Real education did not happen in school; it often was understood as the ability to watch what people did locally and learn from them and apply that learning” (Corbett, 2000: 238).

A thesis entitled “Learning to Leave: The Irony of Schooling in a Coastal Community” by Michael Corbett provides an in-depth account of how education was viewed and the role it played over time within the community of Digby Neck. Corbett’s study addressed a very complex set of economic and social influences that occurred within the community from the 1960’s through to the late 1990’s. Corbett conducted interviews with people that stayed and those that had moved away from the community in order to gain insight into the dynamics of the decision by those to stay or move and the function of education in this decision process. Interviewees were broken down into three cohort groups. The first cohort group was those that had attended classes between 1963-1974, the second between 1975-1986 and the third 1987-1998.

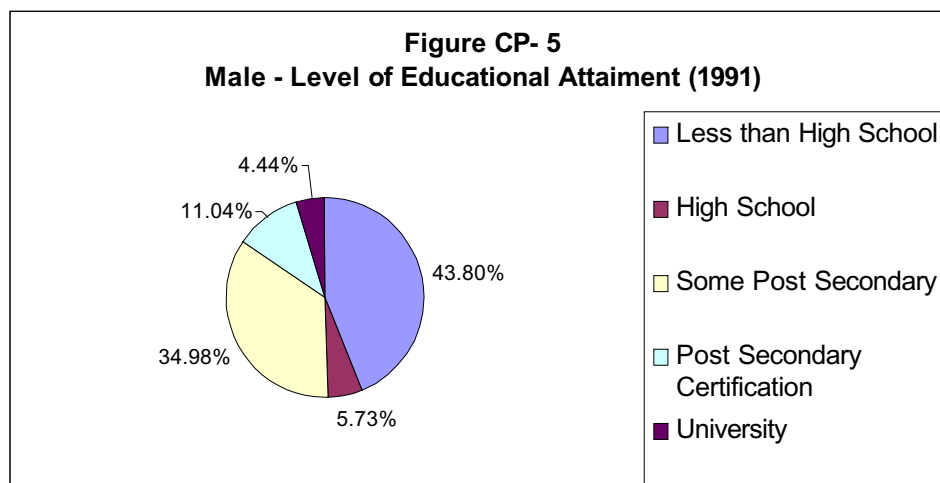
The intent of this section is not to provide a dissertation of the thesis, but simply to acknowledge some of its findings as they relate to educational attainment. The following passage is from the conclusion portion of Mr. Corbett’s thesis and while it represents an oversimplification of his findings, it does provide a level of insight as to why the community of Digby Neck may have a lower level of educational attainment as compared to the provincial average.

“Through the 1970’s and 1980’s, the industrial fishery boomed providing a strong economic reason for young men and for some young women to resist formal education.” In this context, it comes as no surprise that out-migration rates fell in this period. But, the late 1980’s and 1990’s was a period in which the prevalent discourse was that of fish stocks collapsing, communities dying and general decline in coastal communities. This discourse of decline though, was received by Digby Neck youth in tandem with an equally pessimistic discourse of diminished urban opportunities, “downsizing” and industrial decay. Urban opportunities were made available principally through the acquisition of mobile educational capital. The Basic Data Bank and the Community, Schooling and Migration Survey show that mobile out-migrant Digby Neckers who settled in the area outside the 50 kilometre “around here” zone, have indeed acquired significantly higher levels of post secondary credentials. On the other hand, those who remained inside the 50 kilometre circle seem very able to negotiate their lives with relatively low levels of formal education. The “around here” area and its occupational and social structure continues to provide a context within which resistance to higher education is supported, particularly for men” (Corbett: 311).

It was a very conscious decision for those to leave school and pursue a career in the fishery. “The pursuit of formal education did not relate experientially to financial success; in fact, it was perceived to be just the opposite” (Corbett: 208). The attainment of higher education was in some respects viewed as counter productive to the sustainability of Digby Neck. Those that sought higher levels of education were typically the same individuals that ultimately migrated from the area in pursuit of employment opportunities outside those offered by the fishery or other primary industries in the region. “Most men who got any education beyond high school or vocational training without high school completion left the community” (Corbett: 175).

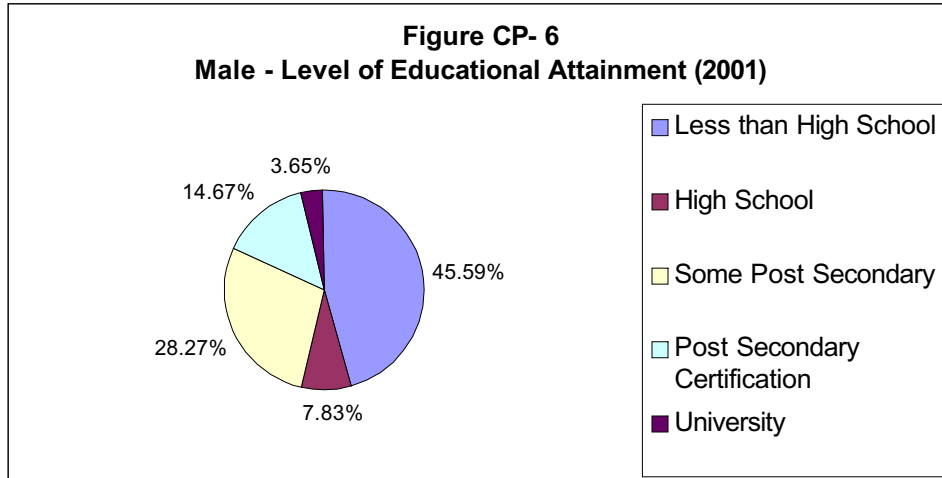
The following figures reflect a comparison of the level of attainment by gender and the change in levels from 1991-2001.

Figures CP-5 and CP-6 show the percentage level of attainment by males in 1991 and 2001 respectively. The percentage reporting having completed less than high school increased from 43.80 percent in 1991 to 45.59% by 2001 and the percentage total reporting some post secondary and secondary completion, including the completion of university, decreased from 50.46% to 46.59%.

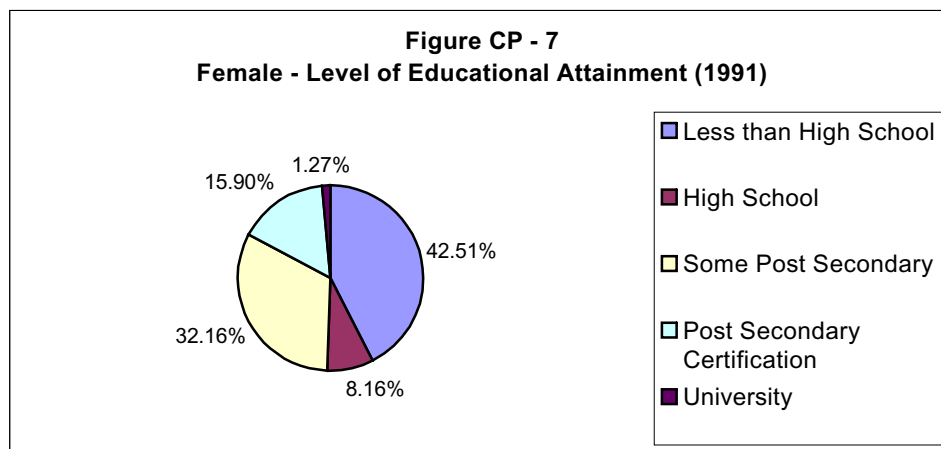


Source: Nova Scotia Community Counts

Source: Nova Scotia Community Counts

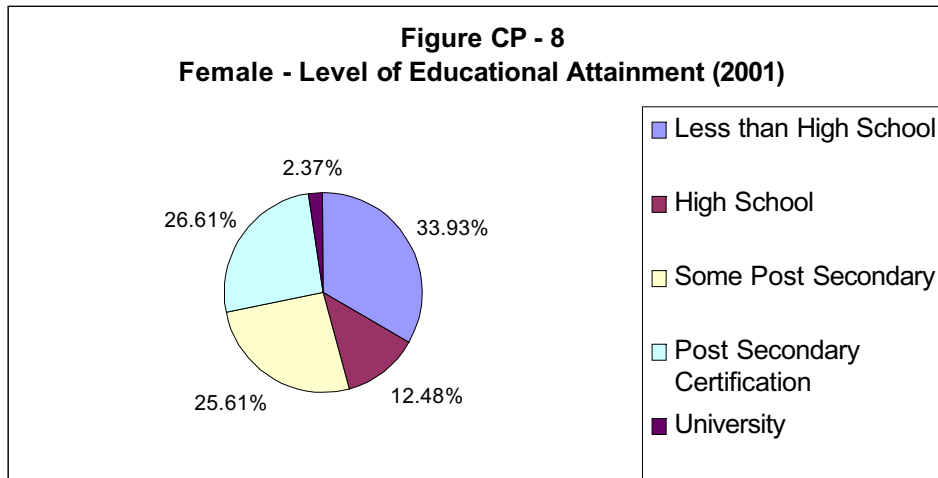


The attainment levels reported by females on Digby Neck reflected in figures CP-7 and CP-8, show a somewhat different trend. The level of those reporting less than high school dropped significantly from 42.51% in 1991 to 33.93% by 2001 and the total reporting attainment of some post-secondary and greater increased from 49.33% to 53.59% over the same period. Interestingly, both genders experienced a drop in the percentage reporting a university degree or higher. This may be a factor whereby students have relocated to urban areas to obtain specialized education or those with higher education sought work outside the community and this has impacted the overall level of attainment. Another consideration as to why this has occurred may be due to the decline in the economic base on Digby Neck, which has made it increasingly difficult to afford higher education as described in Corbett’s thesis. “...yet the paradox is that into the 1990’s the economic base of Digby Neck has declined making it increasingly difficult for most young Digby Neckers to access the financial resources needed to acquire higher education and to migrate with any sort of security or reasonable chance of finding a living wage off the Neck”(Corbett, 2000:326).



Source: Nova Scotia Community Counts

Source: Nova Scotia Community Counts



9.3.7.2.2 Schools and School Enrolments

There are three schools in the Digby Neck and Islands region, Digby Neck Consolidated, Islands Consolidated and the Westport Village School. These schools are all under the Tri-County Regional School Board. Digby Neck Consolidated is an elementary school located in Sandy Cove. The school teaches grades primary through 6 and the level of enrolment based from the 2004-2005 school year was 47 students. Islands Consolidated, located in Freeport, is the largest school in the Digby Neck area with a reported enrolment of 142 students. Grades taught at Islands Consolidated are primary to grade 12. The Westport Village School, located in Westport, is an elementary school catering to grades primary through five. The school's current enrolment is 16 students, the smallest enrolment of any school under the Tri-County School Board.

Table CP-11 and Figure CP-9 reflect the level of student enrolments at the three schools from the 1980-81 school year to the 2004-05 year. As the table indicates, total enrolments have declined by 49.6% at Digby Neck & Islands schools over the past twenty-five years. Individually, enrolment at Digby Neck Consolidated declined 69.9%, Islands Consolidated declined by 26.4% and Westport Village declined 60.9% from 1980-81 to 2004-05. While school enrolments have continued to decline over the past decade it has been at a continually diminishing rate.

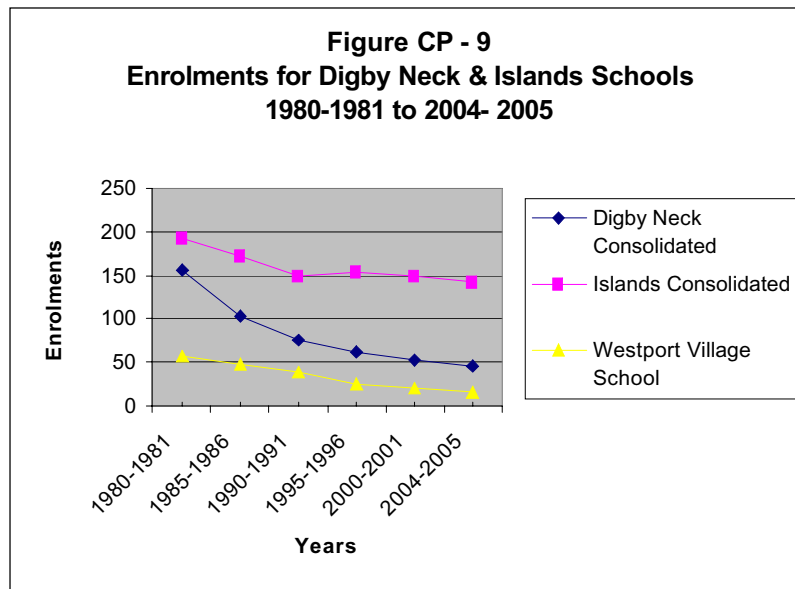
Table CP - 11

**School Enrolments for Digby Neck & Islands Schools
1980-81 to 2004-2005**

Schools	Enrolments						Change %
	1980-1981	1985-1986	1990-1991	1995-1996	2000-2001	2004-2005	
Digby Neck Consolidated	156	103	75	62	53	47	-69.9
Islands Consolidated	193	172	149	153	148	142	-26.4
Westport Village School	58	48	40	26	21	16	-60.9
Total	407	323	264	241	222	205	-49.6

Source: Nova Scotia Department of Education, Statistical Division

Source: Nova Scotia Department of Education, Statistical Division



Declining enrolments is not a phenomenon specific to Digby Neck and Islands. As is shown in **Table CP-12**, provincial enrolments also declined (21.7%) over the same period 1980-81 to 2004-05, albeit proportionately much less.

Table CP - 12

**Provincial School Enrollments
1980-81 to 2000-2001**

Schools	Enrolments						Change %
	1980-1981 ⁽²⁾	1985-1986	1990-1991	1995-1996	2000-2001	2004-2005	
Elementary	99,502	89,736	87,303	86,180	80,418	71,394	-28.2
Junior	46,118	44,460	39,069	38,317	37,130	36,537	-20.8
Senior ⁽¹⁾	39,965	38,418	39,367	39,523	38,325	37,465	-6.3
Total	185,585	172,614	165,739	164,020	155,873	145,396	-21.7

Source: Nova Scotia Department of Education, Statistical Division

⁽¹⁾ Senior includes High School Vocational programs

⁽²⁾ Includes Auxiliary & Special Education Students from all levels

9.3.7.2.3 Senior High Withdrawal Rates

Table CP-13 compares the level of Senior High School withdrawal rates for Islands Consolidated, Digby Regional High School and provincial levels from 1990-91 to 2000-01. The figures indicate that Islands Consolidated steadily reduced its withdrawal rate over the period and it had a much lower rate of withdrawal relative to Digby Regional High School and the provincial average.

	Enrollments	Withdrawals	Rate ⁽¹⁾
			%
1990 -1991			
Islands Consolidated	38	3	7.9
Digby Regional	287	41	14.3
Province	36,445	4,402	12.1
1995 -1996			
Islands Consolidated	36	2	5.6
Digby Regional	247	19	7.7
Province	36,869	4,024	10.9
2000 -2001			
Islands Consolidated	48	1	2.1
Digby Regional	256	22	8.6
Province	37,355	3,724	10.0

Source: Nova Scotia Department of Education; Statistical Division

⁽¹⁾ is the percentage of students who withdraw compared to total enrollment

9.2.7.2.4 Analyses

The level of formal education on Digby Neck and Islands is typical of many rural regions in Nova Scotia. The level of attainment is lower on average than urban regions and this is due in part to the area's resource based economy, which for the most part demands less formal education skills of its workforce. However, inaccessibility to higher levels of education whether it is based on affordability or having to leave the community has also played a part in lower levels of attainment. As is pointed out in a report entitled, "Painting the Landscape of Rural Nova Scotia, 2003" (Ref. 97, "there are many reasons for this disparity in education levels. Although two-thirds of post-secondary campuses are located in rural communities, there are more programs and opportunities for specialization in urban than in rural Nova Scotia. Thus, many rural Nova Scotians relocate to urban areas to obtain a specialized education, thereby contributing to the out-migration of youth from rural Nova Scotia." This out-migration of youth from the Neck and Islands is compounded by a lack of industries requiring formal education within the community, which has perpetuated this circle of seemingly low levels of educational attainment.

It should not be construed that a lower level of educational attainment is synonymous with an unskilled workforce. The economy of Digby Neck and Islands has flourished in the past with its "informal" education of on-the-job training and the area is somewhat dependent on the continuation of this means of training.

9.3.7.3 Income

A key indicator of the economic health of a region is the growth and level of income. The following section looks at the growth and characteristics of income within the Digby Neck and Islands region, providing comparative analysis of provincial and national benchmarks where applicable. The analysis relies heavily on tax filer information and special tabulations by the Small Area Administrative Data Division of Statistics Canada. Tax filer data from 1989-2003 was reviewed in order to reflect the trend in income within the area.

9.3.7.3.1 Tax Filer Growth

Digby Neck and Islands experienced virtually no growth in the number of tax filers from 1989 to 2003. In 2003 there were 1,090 tax filers on Digby Neck and Islands slightly less than in 1989. In comparison, the percentage growth in tax filers provincially and nationally was 18% and 29% respectively over this time period. Table CP-14 provides a breakdown of the number of tax filers per category and an index of growth.

9.3.7.3.2 Average Income

According to the 2001 Census total average individual income on Digby Neck and Islands was \$22,507, approximately 84% of the provincial average. However, tax filer data for the same year suggests that average income on the Neck and Islands exceeded the provincial average. Table CP-15 and Figure CP-10 provide a breakdown of average income for Digby Neck and Islands and comparative provincial and national averages.

Year	Number of Tax Filers			Index of Growth		
	Digby Neck Area	Nova Scotia	Canada	Digby Neck Area	Nova Scotia	Canada
1989	1,100	589,160	17,888,750	100%	100%	100%
1990	1,130	604,330	18,407,120	103%	103%	103%
1991	1,150	610,450	18,711,310	105%	104%	105%
1992	1,200	642,400	19,649,400	109%	109%	110%
1993	1,220	663,110	20,423,400	111%	113%	114%
1994	1,160	651,610	20,350,860	105%	111%	114%
1995	1,170	656,470	20,675,760	106%	111%	116%
1996	1,130	658,670	20,918,670	103%	112%	117%
1997	1,130	660,960	21,218,070	103%	112%	119%
1998	1,140	665,600	21,453,800	104%	113%	120%
1999	1,110	672,610	21,805,870	101%	114%	122%
2000	1,080	677,890	22,131,680	98%	115%	124%
2001	1,090	689,520	22,709,910	99%	117%	127%
2002	1,090	690,090	22,798,980	99%	117%	127%
2003	1,090	692,750	23,070,200	99%	118%	129%

Source: Small Area Administrative Data Division

Average Income

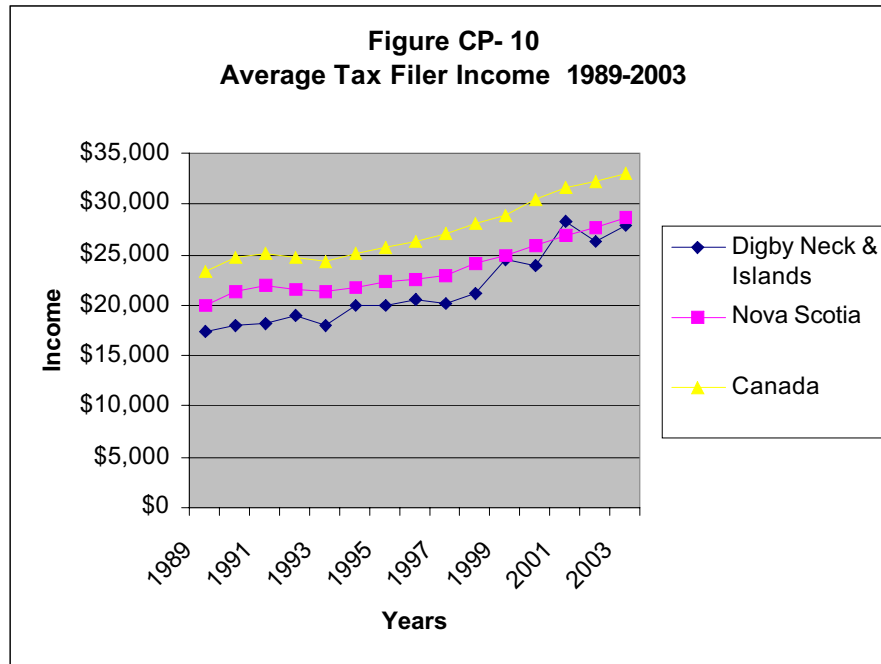
According to the 2001 Census total average individual income on Digby Neck and Islands was \$22,507, approximately 84% of the provincial average. However, tax filer data for the same year suggests that average income on the Neck and Islands exceeded the provincial average. Table CP-15 and Figure CP-10 provide a breakdown of average income for Digby Neck and Islands and comparative provincial and national averages.

Year	Digby Neck ⁽¹⁾	Nova Scotia	Canada	Index	
				Provincial	National
1989	\$17,328	\$19,981	\$23,414	86.7	74.0
1990	\$18,070	\$21,410	\$24,698	84.4	73.2
1991	\$18,284	\$21,938	\$25,127	83.3	72.8
1992	\$19,030	\$21,607	\$24,772	88.1	76.8
1993	\$18,023	\$21,262	\$24,393	84.8	73.9
1994	\$19,910	\$21,807	\$25,066	91.3	79.4
1995	\$20,020	\$22,254	\$25,783	90.0	77.6
1996	\$20,658	\$22,478	\$26,271	91.9	78.6
1997	\$20,121	\$23,016	\$27,084	87.4	74.3
1998	\$21,254	\$24,033	\$28,085	88.4	75.7
1999	\$24,439	\$24,959	\$28,966	97.9	84.4
2000	\$23,863	\$25,968	\$30,541	91.9	78.1
2001	\$28,242	\$26,846	\$31,692	105.2	89.1
2002	\$26,326	\$27,711	\$32,306	95.0	81.5
2003	\$27,884	\$28,585	\$33,117	97.5	84.2

Source: Small Area Administrative Data Division

⁽¹⁾ Denotes Digby Neck & Islands

Source: Small Area & Administrative Data Division, Statistics Canada



Digby Neck and Island’s average tax filer income has been on par with the provincial average since 1999. Average individual income in 2003 was \$27,884 or 97.5% of the provincial average and 84.2% of the national average. The area actually experienced somewhat better relative and absolute growth in average income over the period 1989 to 2003 relative to provincial and national averages. Average income grew from \$17,328 in 1989 to \$27,884 in 2003, an increase of 60.9%. Relative growth provincially and nationally was 43.1% and 41.4% respectively over this period.

While overall average income on Digby Neck and Islands is relatively similar to the provincial average, there are stark differences in income levels when comparing genders. Male earners on the Neck and Islands tend to have a disproportionately higher average income than that of female earners. Tables CP-16 & CP-17 and corresponding Figures CP-11 & CP-12 reflect average incomes of male and female earners with averages broken down by Digby Neck, Nova Scotia and Canada.

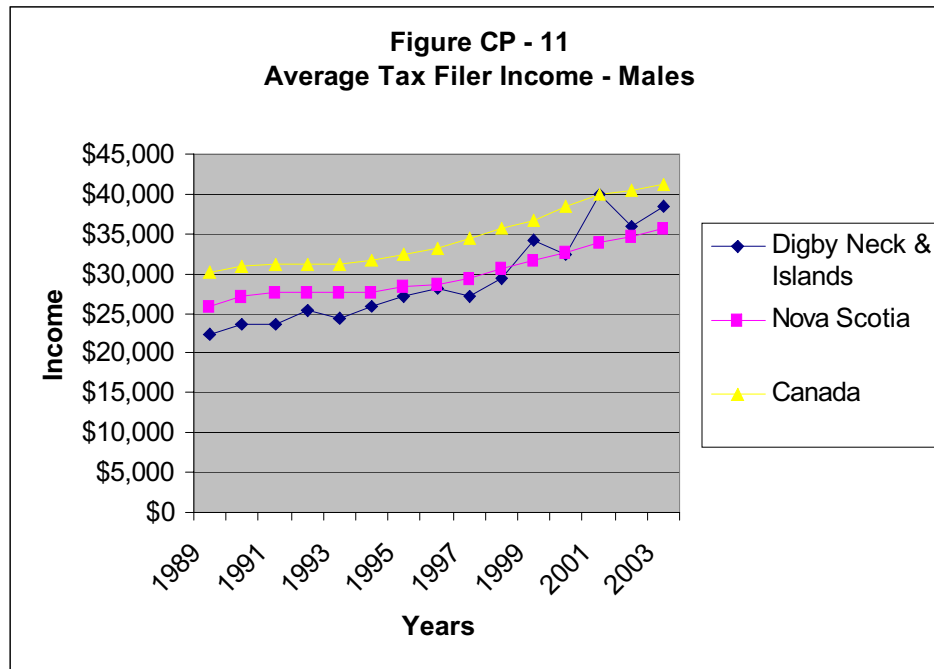
The average income of male earners on Digby Neck and Islands has been on par with or exceeded the provincial average since about 1999. Male earners actually attained a level of parity in 2001 with their male counterparts nationally. Income growth from 1989 to 2003 has significantly outpaced both provincial and national trends. While male earners in the area have made significant strides with regard to the growth of their levels of income, female earners have struggled to maintain status quo. Table CP-17 & Figure CP-12 reflects average incomes of female earners. Average earnings by females in 2003 were 74.7% of the provincial level and only 64.7% of the national average. Moreover, unlike the male earners, it doesn’t appear that the income gap is narrowing, as the area’s female income growth has been moderately weaker than the provincial and national income growth rates of female earners.

Table CP - 16
Total Average Tax Filer Income (1989-2003)
(Male)

Year	Digby Neck ⁽¹⁾	Nova Scotia	Canada	Index	
				Provincial	National
1989	\$22,410	\$25,920	\$30,044	86.5	74.6
1990	\$23,607	\$27,118	\$30,930	87.1	76.3
1991	\$23,742	\$27,586	\$31,052	86.1	76.5
1992	\$25,460	\$27,626	\$31,240	92.2	81.5
1993	\$24,416	\$27,728	\$31,247	88.1	78.1
1994	\$25,922	\$27,735	\$31,557	93.5	82.1
1995	\$27,107	\$28,384	\$32,429	95.5	83.6
1996	\$28,203	\$28,608	\$33,109	98.6	85.2
1997	\$27,214	\$29,356	\$34,320	92.7	79.3
1998	\$29,416	\$30,692	\$35,603	95.8	82.6
1999	\$34,116	\$31,776	\$36,640	107.4	93.1
2000	\$32,496	\$32,781	\$38,566	99.1	84.3
2001	\$40,049	\$33,860	\$39,854	118.3	100.5
2002	\$35,926	\$34,731	\$40,391	103.4	88.9
2003	\$38,379	\$35,610	\$41,297	107.8	92.9

Source: Small Area Administrative Data Division

⁽¹⁾ Denotes Digby Neck & Islands



Source: Small Area & Administrative Data Division, Statistics Canada

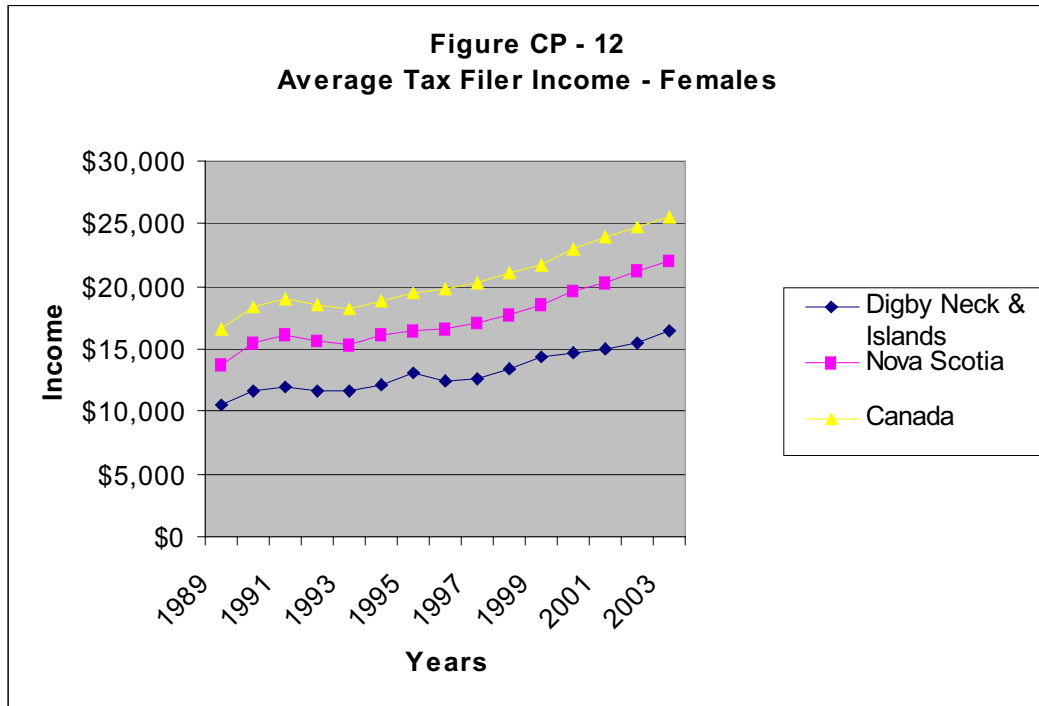
Table CP - 17

Total Average Tax Filer Income (1989-2003)
(Female)

Year	Digby Neck ⁽¹⁾	Nova Scotia	Canada	Index	
				Provincial	National
1989	\$10,519	\$13,689	\$16,544	76.8	63.6
1990	\$11,575	\$15,444	\$18,325	74.9	63.2
1991	\$11,904	\$16,081	\$18,955	74.0	62.8
1992	\$11,717	\$15,626	\$18,540	75.0	63.2
1993	\$11,614	\$15,340	\$18,184	75.7	63.9
1994	\$12,079	\$16,067	\$18,868	75.2	64.0
1995	\$13,018	\$16,369	\$19,452	79.5	66.9
1996	\$12,473	\$16,640	\$19,783	75.0	63.0
1997	\$12,644	\$17,015	\$20,239	74.3	62.5
1998	\$13,325	\$17,789	\$21,018	74.9	63.4
1999	\$14,325	\$18,568	\$21,751	77.1	65.9
2000	\$14,631	\$19,619	\$23,013	74.6	63.6
2001	\$15,011	\$20,282	\$24,012	74.0	62.5
2002	\$15,504	\$21,149	\$24,717	73.3	62.7
2003	\$16,483	\$22,064	\$25,464	74.7	64.7

Source: Small Area Administrative Data Division

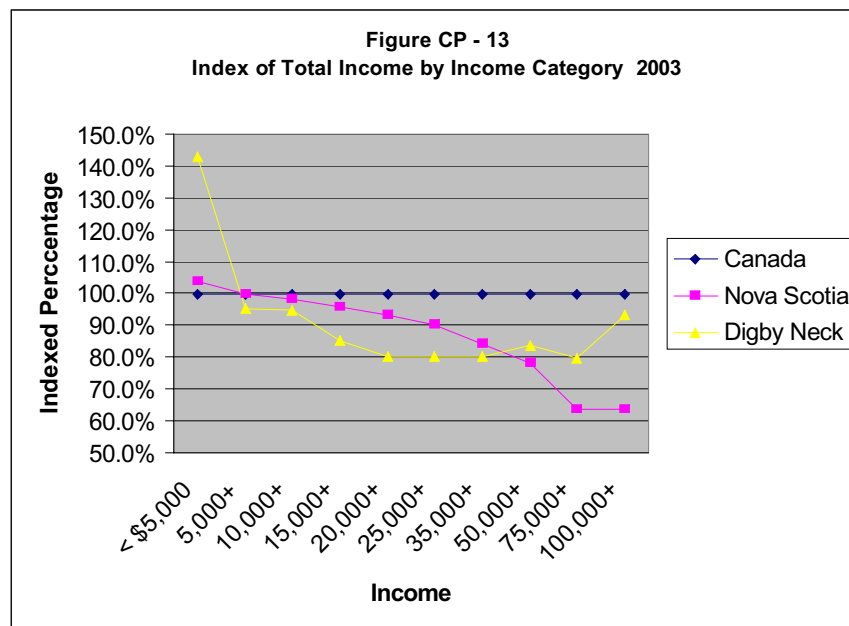
⁽¹⁾ Denotes Digby Neck & Islands



Source: Small Area & Administrative Data Division, Statistics Canada

9.3.7.3.3 Income by Gender and Age

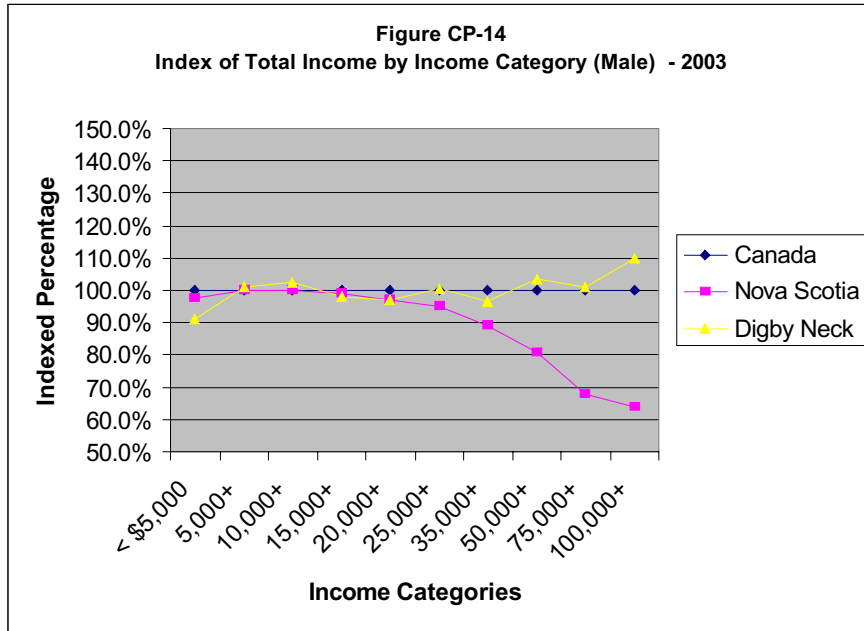
The following figures are based from Tables CP-18 through 20 and reflect an indexed comparison of the percentage of income reported in 2003 by income category for Digby Neck and Islands, Nova Scotia and Canada where Canada is the base or equal to 100. Figure CP-13 shows that the Digby Neck area had a significantly higher proportion of individuals who reported income below \$5,000 than either the provincial or national proportion. It also indicates that there was a lower proportion of persons in the middle income categories of \$15,000 to \$35,000 and a greater proportion in the higher income brackets of \$50,000 to \$100,000 relative to the provincial level, with the percentage of people in the highest income level almost on par with the national level. This suggests that there may possibly be a divide between low and high income earners on the “Neck”.



Source: Small Area & Administrative Data Division, Statistics Canada

Male earners, as shown in Figure CP-14, have a similar proportional spread to the national baseline and reflect a far higher percentage of male earners in the higher income categories compared to the province. Female earners on the other hand reflect a much lower level of earners across all categories with the exception of the lowest income category of below \$5,000, refer to Figure CP-15.

These figures once again indicate a disparity between male and female earners on Digby Neck and Islands.



Source: Small Area & Administrative Data Division, Statistics Canada

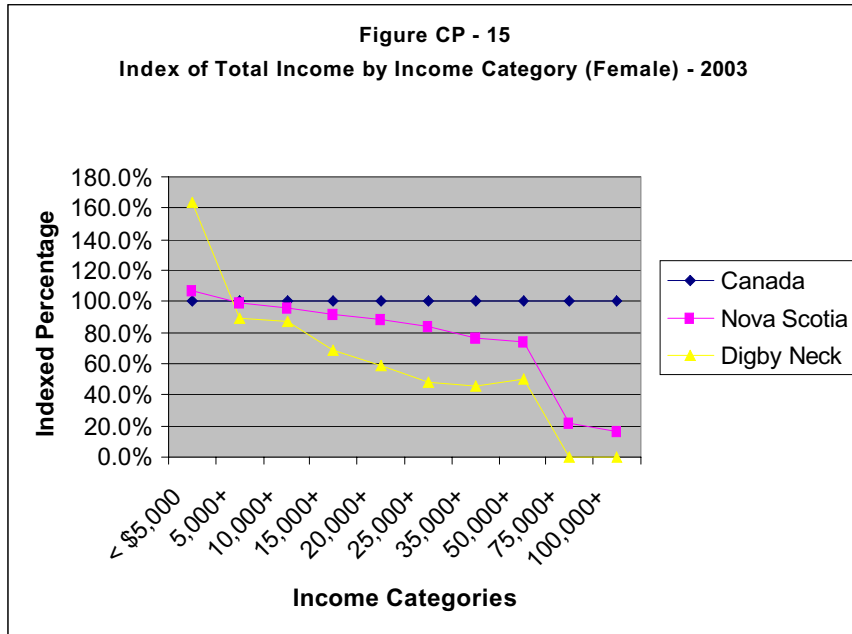


Table CP - 18
Taxfilers and Dependents with Income by Total Income, Sex & Age Group - 2003
(Canada)

Males								
Total Income	0-24	25-34	35-44	45-54	55-64	65-74	75+	Total
< \$5,000	420,840	125,850	118,480	108,850	83,760	22,360	7820	887,960
5,000+	1,088,250	1,739,740	2,219,000	2,069,000	1,446,240	1,000,560	699,600	10,262,390
10,000+	732,190	1,594,330	2,068,910	1,920,790	1,316,560	969,880	685,130	9,287,790
15,000+	502,360	1,452,100	1,931,460	1,793,270	1,196,600	824,490	572,920	8,273,200
20,000+	348,020	1,307,260	1,803,370	1,683,990	1,102,050	650,660	412,510	7,307,860
25,000+	236,570	1,153,490	1,664,520	1,568,340	1,002,930	530,570	316,050	6,472,470
35,000+	98,570	823,050	1,339,160	1,301,090	778,210	325,230	179,870	4,845,180
50,000+	26,540	423,620	869,550	899,360	487,390	156,310	85,970	2,948,740
75,000+	3,570	120,030	355,710	412,890	223,210	57,440	32,340	1,205,190
100,000+	860	41,040	155,630	192,930	116,810	31,780	16,700	555,750
Total	1,509,090	1,865,590	2,337,480	2,177,850	1,530,000	1,022,920	707,420	11,150,350
Females								
Total Income	0-24	25-34	35-44	45-54	55-64	65-74	75+	Total
< \$5,000	441,960	228,930	276,240	240,700	239,290	43,740	16,250	1,487,110
5,000+	1,063,130	1,767,750	2,189,140	1,959,010	1,262,510	1,086,980	1,104,250	10,432,770
10,000+	641,530	1,553,000	1,959,890	1,746,510	1,024,920	897,110	1,008,640	8,831,600
15,000+	371,490	1,320,280	1,722,020	1,539,610	843,560	609,940	690,650	7,097,550
20,000+	216,810	1,084,640	1,480,490	1,347,070	705,120	399,620	384,710	5,618,460
25,000+	127,570	872,070	1,253,410	1,169,230	589,480	290,100	267,480	4,569,340
35,000+	39,410	510,710	831,300	811,940	380,220	151,620	136,350	2,861,550
50,000+	7,280	189,740	402,850	429,470	184,720	63,530	59,540	1,337,130
75,000+	1,010	36,960	114,810	131,700	58,450	20,520	20,650	384,100
100,000+	360	11,970	43,830	48,610	23,220	10,530	10,120	148,640
Total	1,505,090	1,996,680	2,465,380	2,199,710	1,501,800	1,130,720	1,120,500	11,919,880
Total								
Total Income	0-24	25-34	35-44	45-54	55-64	65-74	75+	Total
< \$5,000	862,800	354,780	394,720	349,550	323,050	66,100	24,070	2,375,070
5,000+	2,151,380	3,507,490	4,408,140	4,028,010	2,708,750	2,087,540	1,803,850	20,695,160
10,000+	1,373,720	3,147,330	4,028,800	3,667,300	2,341,480	1,866,990	1,693,770	18,119,390
15,000+	873,850	2,772,380	3,653,480	3,332,880	2,040,160	1,434,430	1,263,570	15,370,750
20,000+	564,830	2,391,900	3,283,860	3,031,060	1,807,170	1,050,280	797,220	12,926,320
25,000+	364,140	2,025,560	2,917,930	2,737,570	1,592,410	820,670	583,530	11,041,810
35,000+	137,980	1,333,760	2,170,460	2,113,030	1,158,430	476,850	316,220	7,706,730
50,000+	33,820	613,360	1,272,400	1,328,830	672,110	219,840	145,510	4,285,870
75,000+	4,580	156,990	470,520	544,590	281,660	77,960	52,990	1,589,290
100,000+	1,220	53,010	199,460	241,540	140,030	42,310	26,820	704,390
Total	3,014,180	3,862,270	4,802,860	4,377,560	3,031,800	2,153,640	1,827,920	23,070,230

Small Area & Administrative Data Division, Statistics Canada

Table CP - 19
Taxfilers and Dependents with Income by Total Income, Sex & Age Group - 2003
Nova Scotia

Males								
Total Income	0-24	25-34	35-44	45-54	55-64	65-74	75+	Total
< \$5,000	13,580	3,330	3,130	3,190	2,400	340	80	26,050
5,000+	28,220	48,360	65,360	63,620	47,620	31,860	22,420	307,460
10,000+	17,910	44,250	60,730	58,330	42,770	31,060	22,080	277,130
15,000+	11,570	39,950	57,010	54,540	38,650	25,820	17,570	245,110
20,000+	7,350	34,590	52,450	50,450	35,080	19,980	12,040	211,940
25,000+	4,560	28,810	47,070	46,070	31,290	16,220	9,290	183,310
35,000+	1,820	18,390	35,230	36,100	22,560	9,660	5,200	128,960
50,000+	400	8,380	21,040	22,670	12,250	4,070	2,260	71,070
75,000+	60	1,770	6,660	8,620	5,170	1,270	740	24,290
100,000+	0	570	2,650	3,790	2,710	660	350	10,730
Total	41,800	51,690	68,490	66,800	50,020	32,200	22,500	333,500
Females								
Total Income	0-24	25-34	35-44	45-54	55-64	65-74	75+	Total
< \$5,000	14,310	6,010	8,450	8,100	8,970	1,350	550	47,740
5,000+	28,320	51,290	64,970	58,440	38,430	33,880	36,190	311,520
10,000+	15,750	44,580	57,300	50,410	29,390	26,410	32,600	256,440
15,000+	8,260	36,510	49,020	43,220	23,450	16,880	19,520	196,860
20,000+	4,330	27,900	40,350	36,560	18,720	10,660	10,390	148,910
25,000+	2,270	20,740	32,690	30,780	15,120	7,510	7,050	116,160
35,000+	610	10,340	19,030	19,620	8,750	3,790	3,560	65,700
50,000+	150	3,580	8,670	10,320	4,060	1,400	1,540	29,720
75,000+	0	490	1,820	2,100	1,050	370	460	6,290
100,000+	0	150	680	790	430	180	220	2,450
Total	42,630	57,300	73,410	66,540	47,400	35,230	36,740	359,250
Total								
Total Income	0-24	25-34	35-44	45-54	55-64	65-74	75+	Total
< \$5,000	27,890	9,340	11,580	11,290	11,360	1,690	630	73,780
5,000+	56,540	99,650	130,320	122,060	86,050	65,740	58,610	618,970
10,000+	33,660	88,830	118,030	108,740	72,160	57,470	54,680	533,570
15,000+	19,830	76,460	106,030	97,760	62,100	42,700	37,090	441,970
20,000+	11,680	62,490	92,800	87,010	53,800	30,640	22,430	360,850
25,000+	6,830	49,550	79,760	76,850	46,410	23,730	16,340	299,470
35,000+	2,430	28,730	54,260	55,720	31,310	13,450	8,760	194,660
50,000+	550	11,960	29,710	32,990	16,310	5,470	3,800	100,790
75,000+	60	2,260	8,480	10,720	6,220	1,640	1,200	30,580
100,000+	0	720	3,330	4,580	3,130	840	570	13,170
Total	84,430	108,990	141,900	133,350	97,410	67,430	59,240	692,750

Source: Small Area & Administrative Data Division, Statistics Canada

Table CP - 20
Taxfilers and Dependents with Income by Total Income, Sex & Age Group - 2003
Digby Neck

Males								
Total Income	0-24	25-34	35-44	45-54	55-64	65-74	75+	Total
< \$5,000	20	0	0	0	0	0	0	40
5,000+	40	70	90	100	80	60	60	510
10,000+	30	70	90	90	80	60	60	470
15,000+	20	70	80	90	70	40	40	400
20,000+	0	60	80	80	60	20	30	350
25,000+	0	60	70	70	50	20	30	320
35,000+	0	50	50	60	40	0	0	230
50,000+	0	40	30	30	30	0	0	130
75,000+	0	0	20	0	20	0	0	60
100,000+	0	0	0	0	0	0	0	30
Total	60	80	100	110	80	60	60	550
Females								
Total Income	0-24	25-34	35-44	45-54	55-64	65-74	75+	Total
< \$5,000	30	0	20	20	20	0	0	110
5,000+	20	60	80	80	60	60	80	420
10,000+	0	50	60	60	40	40	70	350
15,000+	0	30	40	50	30	20	40	220
20,000+	0	20	30	40	20	20	20	150
25,000+	0	0	20	30	20	0	20	100
35,000+	0	0	0	20	0	0	0	60
50,000+	0	0	0	0	0	0	0	30
75,000+	0	0	0	0	0	0	0	0
100,000+	0	0	0	0	0	0	0	0
Total	50	70	100	90	80	60	80	540
Total								
Total Income	0-24	25-34	35-44	45-54	55-64	65-74	75+	Total
< \$5,000	50	20	30	20	30	0	0	160
5,000+	60	130	170	180	140	120	140	930
10,000+	40	120	150	160	120	100	130	810
15,000+	20	100	120	140	100	60	80	620
20,000+	20	80	100	120	90	40	50	490
25,000+	20	70	90	100	70	30	40	420
35,000+	0	60	60	80	50	20	20	290
50,000+	0	40	40	40	30	0	0	170
75,000+	0	0	20	0	20	0	0	60
100,000+	0	0	0	0	0	0	0	30
Total	110	150	200	200	160	120	150	1,090

9.3.7.4 Growth and Distribution of Income by Source

9.3.7.4.1 Growth

The rate of growth in total income for Digby Neck and Islands has been moderately slower paced than the relative provincial and national income growth rates. Table CP-21 shows the level of total income and distribution for Digby Neck and Islands, Nova Scotia and Canada over a ten-year period from 1994 to 2003. Total income for Digby Neck and Islands grew roughly \$7.3 million or 31.6% from 1994 to 2003 to a level of \$30,394,000. Comparative growth rates provincially and nationally were 39.4% and 49.8% respectively over this period.

9.3.7.4.2 Distribution of Income

The following section is based on Table CP-22, which reflects the percentage distribution of income by source and is derived from figures presented in Table CP-21.

Wages & Salaries

Wages and Salaries on Digby Neck and Islands account for a somewhat smaller percentage of total income as compared to the relative provincial and national proportions. The percentage of income derived from wages, salaries and commissions changed substantially from 1994 to 2003 on Digby Neck. In 1994, only 34.9% of income was attributed to paid earnings, however, by 2003 the percentage had increased to 53.3%. While this was a significant increase, the percentage was still far less than the provincial and national averages of 65.1% and 69.5% respectively.

Self-employment Income

The percentage of income derived from self-employment dropped significantly from 1994 to 2003. Income derived from self-employment in 1994 was \$5,844,000 or 25.3% overall. By 2003 self-employment income had dropped to \$3,305,000 or 10.9% of total income. This decline is contrary to the national trend where the percentage of income derived from self-employment has remained stable. Provincially though, a slight downward shift has been experienced.

While self-employment still remains a relatively important component of total income on Digby Neck and Islands as compared to provincial and national proportions, its recent decline suggests that a significant shift has occurred within the economy with regard to the dynamics of the distribution of income. This shift may be the result of the sell off of fishing licenses and related assets in recent years resulting in a less diversified and independent fishing fleet. This in-turn may have very negative ramifications as opportunities to earn income become increasingly dependent on employment in an area that has a shrinking industrial base.

Employment Insurance Benefits

Income derived from employment insurance benefits declined over the period from 1994 to 2003. In 1994, employment insurance benefits made up 12.3% of total income on the Neck and Islands, the percentage fell to 7.2% by 2003. However, employment insurance still remains a very important source of income for the region. As is shown in Table CP-20, the area is still relatively more dependent on employment insurance benefits as compared to Digby County, the Southern Region, Nova Scotia and Canada.

Other Transfer Payments

The percentage level of government transfers received within the area, excluding employment insurance, for such transfers as the Canada Child Tax Benefit, Old Age Security, Canada Pension Plan etc., predominately fell within similar proportions to that of provincial and national levels. However, the levels paid out in Old Age Security and Canadian Pension benefits, relative to total income, are somewhat higher than the provincial and national figures and this is to be expected given the relatively higher level of population over the age of sixty-five in the Digby Neck area.

9.3.7.5 Economic Dependency

The following section provides a comparison analysis of levels of dependency of government transfers for Digby Neck and Islands, Digby County, the Southern Region, Nova Scotia and Canada. The level of dependency is measured by a simple ratio comparing the level of transfer payments received in an area as they relate to employment income. The section entitled “Economic Dependency Ratio” in Table CP-20 provides a breakdown of the various ratios based on 2002 tax filer information for the regions defined above.

The overall dependency ratio of government transfers was 34.8 on Digby Neck and Islands according to tax data for 2002. This is relatively high in comparison to the Southern Region, the province and Canada. However, the ratio was slightly lower than that of Digby County and overall, the ratio is fairly typical of what you would see in the coastal and non-coastal rural regions of Nova Scotia.

The dependence on employment insurance benefits is relatively high in comparison to the other regions identified, however the area is far less dependent than some of the northern regions of Nova Scotia and Cape Breton.

Table CP - 21

Distribution of Income by Source
Digby Neck & Islands, Nova Scotia & Canada

Year	Employment		Income		Investment		Social				Private, Other	
	Total Income '000	Wages, Salaries Commissions '000	Self-Emp. '000	Income '000	Income '000	Income '000	Employment Insurance '000	Old Age Security '000	CPP '000	Child Tax Benefit '000	Other '000	Pensions, RRSPP '000
Digby Neck & Islands												
1994	\$23,096	\$8,057	\$5,844	\$849	\$2,833	\$1,587	\$1,242	\$317	\$491	\$1,876	\$2,015	\$2,015
1995	\$23,423	\$7,781	\$5,972	\$1,204	\$2,527	\$1,788	\$1,313	\$287	\$536	\$2,253	\$2,253	\$2,253
1996	\$23,344	\$7,031	\$6,526	\$1,396	\$2,303	\$1,770	\$1,382	\$262	\$421	\$2,854	\$2,854	\$2,854
1997	\$22,737	\$8,943	\$3,467	\$1,168	\$2,318	\$1,847	\$1,430	\$282	\$428	\$2,605	\$2,605	\$2,605
1998	\$24,229	\$10,989	\$3,037	\$1,149	\$2,386	\$1,881	\$1,496	\$289	\$397	\$2,368	\$2,368	\$2,368
1999	\$27,127	\$12,737	\$4,643	\$1,092	\$2,335	\$1,752	\$1,556	\$284	\$367	\$2,190	\$2,190	\$2,190
2000	\$25,773	\$12,425	\$3,515	\$1,423	\$2,296	\$1,689	\$1,497	\$323	\$396	\$2,273	\$2,273	\$2,273
2001	\$30,784	\$17,177	\$3,631	\$1,644	\$2,142	\$1,778	\$1,499	\$327	\$392	\$2,348	\$2,348	\$2,348
2002	\$28,695	\$14,954	\$3,403	\$1,674	\$2,241	\$1,835	\$1,583	\$340	\$518	\$1,515,063	\$1,515,063	\$1,515,063
2003	\$30,394	\$16,211	\$3,305	\$1,837	\$2,195	\$1,944	\$1,658	\$378	\$501,612	\$1,808,427	\$1,808,427	\$1,808,427
Nova Scotia												
1994	\$14,209,916	\$8,790,397	\$734,848	\$495,441	\$729,489	\$619,739	\$654,977	\$175,807	\$494,155	\$1,970,912	\$1,970,912	\$1,970,912
1995	\$14,608,990	\$8,880,452	\$781,558	\$598,594	\$604,576	\$677,522	\$686,805	\$169,959	\$501,612	\$1,808,427	\$1,808,427	\$1,808,427
1996	\$14,805,869	\$8,940,974	\$784,106	\$606,699	\$566,757	\$700,707	\$725,895	\$172,183	\$500,121	\$1,903,851	\$1,903,851	\$1,903,851
1997	\$15,212,882	\$9,310,364	\$801,990	\$567,085	\$506,842	\$720,198	\$755,197	\$174,494	\$472,861	\$1,970,354	\$1,970,354	\$1,970,354
1998	\$15,996,555	\$9,971,536	\$789,702	\$572,717	\$503,393	\$752,873	\$787,777	\$177,861	\$470,342	\$1,832,712	\$1,832,712	\$1,832,712
1999	\$16,787,822	\$10,714,567	\$844,183	\$691,605	\$489,061	\$756,324	\$815,772	\$186,849	\$456,749	\$1,895,900	\$1,895,900	\$1,895,900
2000	\$17,603,339	\$11,340,983	\$831,979	\$743,839	\$508,194	\$778,529	\$841,649	\$212,623	\$449,643	\$1,994,261	\$1,994,261	\$1,994,261
2001	\$18,510,856	\$12,047,242	\$830,345	\$716,776	\$549,033	\$813,579	\$878,165	\$236,303	\$445,152	\$2,092,342	\$2,092,342	\$2,092,342
2002	\$19,123,132	\$12,455,302	\$852,797	\$698,002	\$580,881	\$833,550	\$929,009	\$248,338	\$432,911	\$2,137,920	\$2,137,920	\$2,137,920
2003	\$19,802,295	\$12,895,505	\$858,733	\$725,937	\$595,175	\$867,206	\$961,594	\$255,158	\$505,067	\$43,216,284	\$43,216,284	\$43,216,284
Canada												
1994	\$510,105,691	\$343,416,294	\$24,508,864	\$24,187,007	\$14,357,913	\$17,438,918	\$17,811,510	\$5,259,174	\$19,909,727	\$46,210,528	\$46,210,528	\$46,210,528
1995	\$533,090,440	\$355,653,750	\$26,549,261	\$29,103,591	\$12,403,730	\$18,967,039	\$18,719,180	\$5,213,284	\$20,270,087	\$50,563,977	\$50,563,977	\$50,563,977
1996	\$549,562,295	\$364,979,727	\$28,591,341	\$29,281,508	\$11,830,127	\$19,688,259	\$19,824,898	\$5,215,504	\$19,586,954	\$54,489,515	\$54,489,515	\$54,489,515
1997	\$574,660,496	\$385,672,033	\$31,862,590	\$26,800,515	\$10,282,111	\$20,422,406	\$20,733,173	\$5,297,082	\$19,101,071	\$58,680,932	\$58,680,932	\$58,680,932
1998	\$602,535,719	\$406,735,118	\$32,589,549	\$27,150,796	\$10,182,345	\$21,303,248	\$21,372,416	\$5,411,343	\$19,109,972	\$55,435,128	\$55,435,128	\$55,435,128
1999	\$631,625,086	\$432,579,116	\$34,852,847	\$31,079,910	\$9,664,141	\$21,693,838	\$22,273,874	\$5,654,572	\$18,391,660	\$58,393,967	\$58,393,967	\$58,393,967
2000	\$675,921,102	\$468,523,901	\$36,978,276	\$32,972,184	\$9,158,183	\$22,578,734	\$23,047,765	\$6,566,008	\$17,702,084	\$62,938,573	\$62,938,573	\$62,938,573
2001	\$719,728,639	\$498,908,545	\$39,342,801	\$34,412,269	\$10,718,758	\$23,867,729	\$24,217,056	\$7,352,621	\$17,970,287	\$66,749,173	\$66,749,173	\$66,749,173
2002	\$736,538,862	\$510,011,589	\$40,550,545	\$30,643,252	\$12,375,522	\$24,679,207	\$26,007,618	\$7,736,546	\$17,785,410	\$69,731,563	\$69,731,563	\$69,731,563
2003	\$764,005,577	\$530,875,930	\$41,051,537	\$31,008,629	\$12,611,872	\$25,906,266	\$27,149,428	\$8,014,124	\$17,656,228			

Source: Small Area Administrative Data, Statistics Canada

Table CP - 22

Percentage Distribution of Income by Source
Digby Neck & Islands, Nova Scotia & Canada

Year	Employment		Income		Investment		Social			Private Pension, RRSP, Other		
	Total Income %	Wages, Salaries Commissions %	Income %	Self-Emp. %	Employment Insurance %	Old Age Security %	CPP %	Child Tax Benefit %	Other %	Private Pension, RRSP, Other %		
Digby Neck & Islands												
1994	100.0	34.9	25.3		3.7	6.9	5.4	1.4	2.1		8.1	
1995	100.0	33.2	25.5		5.1	7.6	5.6	1.2	2.3		8.6	
1996	100.0	30.1	28.0		6.0	7.6	5.9	1.1	1.8		9.7	
1997	100.0	39.3	15.2		5.1	8.1	6.3	1.2	1.9		12.6	
1998	100.0	45.4	12.5		4.7	7.8	6.2	1.2	1.6		10.8	
1999	100.0	47.0	17.1		4.0	6.5	5.7	1.0	1.3		8.7	
2000	100.0	48.2	13.6		5.5	6.6	5.8	1.3	1.4		8.7	
2001	100.0	55.8	11.8		5.3	5.8	4.9	1.1	1.3		7.1	
2002	100.0	52.1	11.9		5.8	6.4	5.5	1.2	1.4		7.9	
2003	100.0	53.3	10.9		6.0	6.4	5.5	1.2	1.7		7.7	
Nova Scotia												
1994	100.0	61.9	5.2		3.5	4.4	4.6	1.2	3.5		10.7	
1995	100.0	60.8	5.3		4.1	4.6	4.7	1.2	3.4		11.7	
1996	100.0	60.4	5.3		4.1	4.7	4.9	1.2	3.4		12.2	
1997	100.0	61.2	5.3		3.7	4.7	5.0	1.1	3.1		12.5	
1998	100.0	62.3	4.9		3.6	4.7	4.9	1.1	2.9		12.3	
1999	100.0	63.8	5.0		4.1	4.5	4.9	1.1	2.7		10.9	
2000	100.0	64.4	4.7		4.2	4.4	4.8	1.2	2.6		10.8	
2001	100.0	65.1	4.5		3.9	4.4	4.7	1.3	2.4		10.8	
2002	100.0	65.1	4.5		3.7	4.4	4.9	1.3	2.3		10.9	
2003	100.0	65.1	4.3		3.7	4.4	4.9	1.3	2.6		10.8	
Canada												
1994	100.0	67.3	4.8		4.7	3.4	3.5	1.0	3.9		8.5	
1995	100.0	66.7	5.0		5.5	3.6	3.5	1.0	3.8		8.7	
1996	100.0	66.4	5.2		5.3	3.6	3.6	0.9	3.6		9.2	
1997	100.0	67.1	5.5		4.7	3.6	3.6	0.9	3.3		9.5	
1998	100.0	67.5	5.4		4.5	3.5	3.5	0.9	3.2		9.7	
1999	100.0	68.5	5.5		4.9	3.4	3.5	0.9	2.9		8.8	
2000	100.0	69.3	5.5		4.9	3.3	3.4	1.0	2.6		8.6	
2001	100.0	69.3	5.5		4.8	3.3	3.4	1.0	2.5		8.7	
2002	100.0	69.2	5.5		4.2	3.4	3.5	1.1	2.4		9.1	
2003	100.0	69.5	5.4		4.1	3.4	3.6	1.0	2.3		9.1	

Source: Tabulation from Table CP-18, Small Area and Administrative Data, Statistics Canada

Table CP - 23

Distribution of Income by Source - 2002
Digby Neck & Islands, Digby County, Southern Region, Nova Scotia & Canada

Geography	Year 2002	Employment		Income Self-Emp.	Investment	Employment Insurance	Old Age Security	Social		Child Tax Benefit	Other	Private, Other
		Wages, Salaries Commissions	Wages, Salaries Commissions					CPP	CPP			
Digby Neck		\$28,695	\$14,954	\$3,403	\$1,674	\$2,241	\$1,835	\$1,583	\$340	\$392		\$2,273
Digby County		\$381,421	\$218,731	\$21,950	\$14,954	\$22,599	\$28,291	\$22,869	\$6,131	\$8,868		\$37,029
Southern Region		\$2,428,176	\$1,453,486	\$144,919	\$109,250	\$110,317	\$147,401	\$135,672	\$14,300	\$52,990		\$241,005
Nova Scotia		\$19,123,132	\$12,455,302	\$852,797	\$698,002	\$580,881	\$833,550	\$929,009	\$248,338	\$432,911		\$2,092,342
Canada		\$736,538,862	\$510,011,589	\$40,550,545	\$30,643,252	\$12,375,522	\$24,679,207	\$26,007,618	\$7,736,546	\$17,785,410		\$66,749,173

Percentage Distribution of Income by Source - 2002
Digby Neck & Islands, Digby County, Southern Region, Nova Scotia & Canada

Geography	Year 2002	Employment		Income Self-Emp.	Investment	Employment Insurance	Old Age Security	Social		Child Tax Benefit	Other	Private, Other
		Wages, Salaries Commissions	Wages, Salaries Commissions					CPP	CPP			
Digby Neck		100.0	52.1	11.9	5.8	7.8	6.4	5.5	1.2	1.4		7.9
Digby County		100.0	57.3	5.8	3.9	5.9	7.4	6.0	1.6	2.3		9.7
Southern Region		100.0	59.9	6.0	4.5	4.5	6.1	5.6	0.6	2.2		9.9
Nova Scotia		100.0	65.1	4.5	3.7	3.0	4.4	4.9	1.3	2.3		10.9
Canada		100.0	69.2	5.5	4.2	1.7	3.4	3.5	1.1	2.4		9.1

Economic Dependency Ratio
Digby Neck & Islands, Digby County, Southern Region, Nova Scotia & Canada - 2002

Geography	Year 2002	Employment		Income	Employment Insurance	Old Age Security	Social		Child Tax Benefit	Other	Ratio
		Government Transfers	Government Transfers				CPP	CPP			
Digby Neck		\$18,357	\$6,391	34.8	\$2,241	\$1,835	10.0	\$1,583	\$340	\$392	2.1
Digby County		\$240,681	\$88,758	36.9	\$22,599	\$28,291	11.8	\$22,869	\$6,131	\$8,868	3.7
Southern Region		\$1,598,405	\$460,680	28.8	\$110,317	\$147,401	9.2	\$135,672	\$14,300	\$52,990	3.3
Nova Scotia		\$13,308,099	\$3,024,689	22.7	\$580,881	\$833,550	6.3	\$929,009	\$248,338	\$432,911	3.3
Canada		\$550,562,134	\$88,584,303	16.1	\$12,375,522	\$24,679,207	4.5	\$26,007,618	\$7,736,546	\$17,785,410	3.2

Source: Tabulation from Table CP-18, Small Area and Administrative Data, Statistics Canada

9.3.5.7.1 Analyses

Income levels on Digby Neck and Islands are relatively high in some respects in comparison to other areas of the province. However, there appears to be a significant disparity between male and female incomes, far beyond the provincial and national levels. Much of the difference is probably attributable to the types of job opportunities available in the two dominant industries on the Neck and Islands, the fishery and tourism. The lucrative part of the fishery is still relatively a male dominated industry as females are typically relegated to menial, low paying processing jobs. Similarly, employment opportunities in the tourism industry, which are typically dominated by females, are low paying on average as well.

9.3.7.5.2 Structures

Buildings by type within 4 km of the quarry property are shown on **Maps 3A, 3B, 3C, 3D, 3E and Maps 6A and 6B**. The 4 km zone extends from Tiddville north to Sandy Cove. In this zone, there are approximately 197 residences including seasonal residences and residences with commercial signage. Other building types include residential out-buildings (67), commercial/industrial (12), fisheries related (40), government/community (8), and abandoned buildings (3). The source of information is: Service Nova Scotia and municipal Relations 2004, 1:10 000 base map and on-site reconnaissance July 2005.

9.3.8 Transportation – Land and Marine

Introduction

The present land use in the area of the proposed Whites Point Quarry is primarily forestry with interspersed rural residential. Collector Highway #217 is the only transportation route serving Digby Neck between the Town of Digby and the community of East Ferry. Highway #217 is located east of the ridge on the Digby Neck peninsula between the Bay of Fundy and Saint Marys Bay. As a result, residential and limited commercial/industrial development has been established on either side of the highway on the more level lands.

Small fishing communities such as Little River, Whale Cove, Mink Cove, and Sandy Cove have also been established at points of easy access to the waters of either the Bay of Fundy or Saint Marys Bay. Historically and today, the fishing industry has been the economic mainstay for permanent residents on Digby Neck. Other resource industries such as agriculture, have generally declined. The forest industry has been declining due in part to infestations of the spruce bark beetle which has affected the dominant softwood forest. As a result, the once cleared agriculture lands have become overgrown and diseased forests have been left to die or have been clear cut.

9.3.8.1 Research

Collector Highway #217, a two lane, paved road is the only land transportation route serving Digby Neck and the proposed Whites Point Quarry. Heavy commercial traffic on Highway #217 consists mainly of trucks involved with either the fishing or forest industries. The majority of vehicular use is the private auto as residents from Brier Island, Long Island, and Digby Neck travel to gain goods and services in the Town of Digby and area. Direct access to the Whites Point Quarry property is via the Whites Cove Road No. 442, an unimproved public gravel road, with steep gradients and in places severely eroded. Traditionally, Whites Cove Road has provided local residents with access to the Bay of Fundy shore.

The most applicable traffic counts for Digby Neck and the area of the Whites Point quarry were taken on Highway #217 by the Nova Scotia Department of Transportation and Public Works (Ref. 153). Average daily traffic counts for the section of Highway #217 from Waterford to East Ferry – see **Maps 6A and 6B**, were taken in 1996, 1997, and 2000. The average number of vehicles passing the count location (1.5 km east of East Ferry) in a 24 hour period based on a short temporary count was 658 on September 24, 1996, 983 on August 26, 1997 and 877 on June 28, 2000. Due to the time of year for the recorded counts, tourist and resident vehicles would be included. However, seasonal variation on this section of Highway #217 is considered to be low. Since a temporary counter was used, trucks as a percent of the annual average daily traffic is not provided.

Average daily traffic counts on sections of Highway #217 were also taken north and south of Digby Neck. These counts were taken 1 km east of Rossway and just west of Central Grove on Long Island. The count between the Town of Digby and Waterford is over double that of Digby Neck between Waterford to East Ferry. Also, the count for Long Island between the Tiverton Ferry Terminal and the Freeport Ferry Terminal is approximately the same as recorded for Digby Neck.

Digby Neck Consolidated School, a small, rural elementary school is located in Sandy Cove on Highway #217 approximately 4 km from the Whites Point quarry. This school zone will experience some increased truck traffic during quarry construction from trucks delivering materials, equipment, fuel, and explosives. During operation of the quarry, truck traffic will generally be reduced to fuel deliveries by tanker truck and explosives every two weeks. These trucks would be licensed for their appropriate material transport. All traffic through the designated school zone would be expected to adhere to the 50 km speed limit when children are present. As mentioned previously, no quarry products will be transported on public roads.

Designated shipping lanes (inbound and outbound) – see **Map 4**, in the Bay of Fundy exist approximately 13 km off shore from the proposed marine terminal at Whites Point. Large vessels presently visit the ports of Saint John and Bayside, New Brunswick, Eastport, Maine, and Hantsport, Nova Scotia using these shipping lanes. Approximately 800 large vessels per year enter and leave the designated shipping lanes. Traffic to Saint John is primarily tankers transporting crude and refined oil products and represents the majority of traffic and the largest ships. Bayside and Eastport, New Brunswick represent approximately 100 vessels and Hantsport, Nova Scotia 110 vessels per year. Additionally, vessels not required to report upon entering the shipping lanes such as bulk carriers, tugs, cruise ships, container ships, government vessels, the Saint John – Digby Ferry, and fishing vessels comprise the greatest majority of total commercial vessel traffic in the Bay of Fundy.

9.3.8.2 Analyses

Transportation of rock products produced at the Whites Point Quarry is proposed to be exclusively by water. This will effectively eliminate heavy truck traffic from the quarry on rural Highway #217, for the 50 year life of the project. As a result, the perceived inconvenience of heavy truck traffic on a rural two lane highway will not be experienced by local residents. Nor will noise, vibration, or increased emissions from trucks hauling heavy loads be experienced by residents living along Highway #217. An increase in truck traffic and private automobile will likely be experienced during the proposed one year construction phase of the project.

Machinery, equipment, and materials delivery by land will take place. However, much of the construction materials and equipment for the marine terminal may be delivered by water. Truck traffic from delivery of fuel and explosives will occur approximately once every two weeks during operation of the quarry.

To ensure safe access to the quarry property from Highway #217, the Whites Cove Road will require upgrading. This would include upgrades to the intersection at Highway #217 and widening of Whites Cove Road. Presently, no residential dwellings are served by the Whites Cove Road.

Shipment of quarry products is proposed exclusively by water from the Whites Point Marine Terminal. Traditional fisheries such as lobster, herring and sea cucumbers presently occur in the nearshore waters. It is anticipated that the frequency of shipments by water will be once per week throughout the year. Approximately 40,000 tons of product will be loaded into the holds of a bulk carrier similar to the Canadian Steamship Lines “Spirit”, a Panamax – class vessel. Some inconvenience of the nearshore lobster and sea cucumber fishery may be experienced during these weekly shipments. The duration of the vessel in nearshore waters during approach, loading, and departure is expected to be less than 24 hours. A half mile radius from the terminal may be required for manoeuvring and docking of the vessel depending on weather and tides.

Presently, marine traffic such as recreational/tourism boating and commercial fishing boats is not managed in the area of the marine terminal or in most other areas of the Bay of Fundy. These boats are all licensed for their particular use. For marine accidents and spills and other marine emergencies, refer to **Paragraph 11.2**.

9.3.8.3 Mitigation

A primary mitigation measure involves the shipping of quarry products directly from the site by water, thereby eliminating heavy truck traffic on rural, two lane highways. This method of product transportation will also eliminate associated noise, vibration, and inconvenience to residents living and traveling along Highway #217. Fuel storage capacity, on-site, will be sufficient to minimize frequent tanker truck deliveries, again reducing the frequency of truck traffic. No explosives will be stored on-site and deliveries are planned once every two weeks by certified vehicles. To minimize road deliveries of machinery, equipment, and construction materials during the anticipated one year construction period, whenever possible, deliveries will be made by water, especially the major marine terminal components.

Upgrading of the Whites Cove Road will meet current Department of Transportation and Public Works standards. As mentioned previously, an alternate location for the access road to the quarry property is presently being investigated. Whichever option is selected, the access road will be paved to reduce dust that could affect nearby residences.

Shipping of quarry products may occur a total of twenty-four days during the six month lobster fishing season. Arrival and departure of the bulk carrier will potentially affect a one half mile radius of nearshore fishing waters in the vicinity of the Whites Point Marine Terminal. To minimize inconvenience to local fishermen, advance notice of shipment schedules will be provided to fishers who traditionally fish these waters. Also, a designated ship route and docking radius requirements will be provided to the fishermen.

Consultation with the lobster fishers fishing the nearshore waters indicates a reasonable solution can be reached. Bilcon of Nova Scotia Corporation proposes a “lobster trap fund” which would be contributed to by Bilcon and administered by the lobster fishers fishing the Whites Cove area.

9.3.8.4 Monitoring

Monitoring of any loss of fishing gear as a result of the bulk carrier transporting aggregates would be the responsibility of the local lobster fishermen’s group. A seasonal report would be furnished by them to Bilcon of Nova Scotia Corporation.

Public participation is proposed to continue during quarry construction and operation. Bilcon of Nova Scotia Corporation intends to re-establish the Community Liaison Committee (CLC) that was established as a result of the permitting of the 4 hectare quarry site in 2002. In this regard, a fisherman who fishes the Whites Point area will be invited to participate on this committee and monitor shipping activities.

9.3.8.5 Impact Statements

Land Transportation – Construction

During the one year construction phase of the quarry and marine terminal, increased vehicular traffic from delivery of materials and equipment, and the work force can be expected resulting in a ***short term, insignificant negative effect, of regional scale.***

Land Transportation - Operation

Since transportation of quarry products will be by water, disruption of existing land transportation networks and residential quality of life by heavy truck traffic is expected to result in a ***long term, neutral (no) effect, of regional scale.***

Marine Transportation

Potential inconvenience for local fishers during construction and vessel arrival and departure, especially lobster fishermen, may occur in nearshore waters once a week during the six month lobster fishing season resulting in a ***long term, insignificant negative effect, of regional scale.***

9.3.9 Economy – Whites Point Quarry and Marine Terminal

Introduction

Rural Canadians consider economic challenges as among the most pressing challenges facing their communities (Government of Canada 2001 Ref. 118). “In particular, a lack of permanent and well-paying jobs, and the corresponding impact on incomes, places considerable pressure on the sustainability of rural communities. Many of the economic issues facing rural communities are common throughout rural Canada, but are exacerbated in Nova Scotia by its relatively weak economic performance in relation to the Canadian average” (RCIP Project 2003 Ref 96).

The proposed Whites Point quarry and Marine Terminal is located on Digby Neck in Digby County, Nova Scotia. Digby Neck constitutes the local economic area of influence for the quarry which lies within the broader regional economic area of Digby County. Digby Neck is a narrow peninsula between the Bay of Fundy and Saint Mary’s Bay leading to two islands (Long Island and Brier Island). Traditionally, the Digby Neck and Islands economy has been highly dependent upon the fishing industry as its primary source of economic activity.

Many coastal communities in Nova Scotia are facing changing economic conditions, Digby Neck/Islands are no exception. These changes are being induced by several factors including a rationalization of the fishing industry, a general lack of economic diversification and growth, an aging population and deteriorating service infrastructure, especially community wharves. Further complicating these structural industry factors are two general population trends: increasing migration to urban areas and a low birth rate. As a result, rural areas are becoming hard-pressed to retain youth and to rejuvenate stagnating economies.

9.3.9.1 Research

An economic profile of the regional and local area of the Whites Point quarry and Marine Terminal was compiled in 2005 – see – Gardner Pinfold Consulting Economists Ltd. “Digby Neck/Islands Economic Profile”. December 2005 **Ref. Vol. VI, Tab 32**. This study investigated general economic indicators and focused on two industry sectors – the fishery and tourism. The fishery and tourism were identified as key industries throughout the community consultation process. These two sectors will be discussed in detail in subsequent sections of this EIS.

The economic impact of the proposed quarry and marine terminal utilized the EcoTec Economic Impact Model. This state of the art model is a privatized version of the Statistics Canada Interprovincial Input-Output Model. Input-Output analysis simulates how various sectors of the economy interact through the purchase or supply of goods and services. The model provides a means to estimate economic changes that result from new economic activity. In this case, the establishment of a quarry at Whites Point is assumed to be the economic change.

Industries

Overall economic activity by industry during 1991 - 2001 on the Digby Neck/Islands is shown in Table E – 1 – Labour Force by Industry.

Table E - 1 Labour Force by Industry - Digby Neck and Islands

INDUSTRIES	1991 Census		1996 Census		2001 Census	
	#	%	#	%	#	%
All industries	910	100.0	885	100.0	860	100.0
Agriculture and related services	0	0.0	0	0.0	0	0.0
Fishing and trapping	295	32.4	270	30.5	310	36.0
Logging and forestry	10	1.1	0	0.0	0	0.0
Mining, quarrying, and oil well	0	0.0	0	0.0	0	0.0
Manufacturing	305	33.5	190	21.5	130	15.1
Construction	0	0.0	20	2.3	10	1.2
Transportation and storage	25	2.7	40	4.5	40	4.7
Communication and other utility	10	1.1	10	1.1	0	0.0
Wholesale trade	10	1.1	75	8.5	40	4.7
Retail trade	90	9.9	80	9.0	75	8.7
Finance and insurance	20	2.2	0	0.0	10	1.2
Real estate operator & insurance agent	0	0.0	10	1.1	10	1.2
Business services	0	0.0	10	1.1	20	2.3
Government services	40	4.4	10	1.1	20	2.3
Educational services	35	3.8	10	1.1	25	2.9
Health and social services	20	2.2	30	3.4	50	5.8
Accommodation, food and beverage services	10	1.1	40	4.5	90	10.5
Other services	10	1.1	65	7.3	45	5.2
Industry – non applicable	10	1.1	30	3.4	15	1.7

Detailed data are suppressed for communities with population less than 100.

Source: Nova Scotia Community Counts web page – data modeled from Statistics Canada, Census of Population 1991, 1996, 2001.

The previous table is inclusive of the population 15 years of age and over, excluding institutional residents, who worked at some time since January 1 the year prior to Census. Respondents were not necessarily employed on Census Day.

Please note that a value of 0 may represent a true zero count, unavailable data, or suppressed data.

Labour Force

Labour force trends for Digby Neck/Islands were also investigated and reflect shifts in the overall economic circumstances of the area. Between 1991 and 2001, the number of people employed on Digby Neck/Islands dropped by almost 10% while over the same period the unemployment rate rose from 12.0% in 1991 to 18.7% in 1996 and then to declined to 14.4% in 2001. In Digby County during 1991 – 2001, the number of people employed dropped by 3.8% while the unemployment rate was 13.0% (Gardner Pinfold 2005 **Ref. Vol. VI, Tab 32**).

Participation Rate

The participation rate in the labour force is also an indicator of an economy's overall strength with the higher percentage indicating the stronger economy. In 2001 the provincial participation rate was about 61% while Digby County was 58.8% and Digby Neck/Islands was 56.5%. The lower participation rate generally indicates fewer employment opportunities available and a smaller portion of the working age group population is drawn into the labour force. The lower participation rate is also an indicator that the effective unemployment rate in an economy is higher than official statistics indicate. This is commonly referred to as the “discouraged worker effect” where a certain proportion of the population has given up looking for work and thus have not joined the labour force.

The number of women who consider themselves “in the labour force” is substantially lower than men in rural areas, thus indicating that a greater number of rural women remain outside the labour force due to limited employment opportunities in rural areas (RCIP Project 2003 Ref. 96). The under employment of women is apparent on Digby Neck and Islands.

House Construction

Another indicator of community economic health is new house construction and related development. Construction is generally a signal of a rising population, an expanding economy and increased consumer confidence. Census data on housing indicates the number of occupied dwellings on Digby Neck/Islands decreased from 841 in 1991 to 790 in 2001. Also, indications are that the age of the housing stock on Digby Neck//Islands (pre 1946) is greater than the province as a whole and new construction (post 1980) is less than the province as a whole (Gardner Pinfold 2005 **Ref. Vol. VI, Tab 32**).

Employment

As indicated in Table E – 1, the fishing industry has and continues to dominate all industry sectors including both primary sector activity and fish processing. The manufacturing sector on Digby Neck/Islands primarily represents the fish processing sector. In 2001, data indicates accommodation, food and beverage service accounts for the third largest industry and retail trade the fourth.

Employment in many of these industry sectors is part-time and seasonal, including fishing and fish processing, tourism including whale and seabird cruises, and accommodation, food and beverage services. Also, as identified during the community business survey (Elgin Consulting and Research 2005 **Ref. Vol. IV, Tab 21**), many businesses are owner/family operated. The location of existing businesses and services in the community of Digby Neck and area are shown by type on **Maps 6A and 6B**. As shown on these maps, employment patterns are generally local and clustered around the various small harbours on Digby Neck and Islands.

Resources

Renewable land-based resource industries such as agriculture and forestry have shown little growth on Digby Neck/Islands during the past years. Some activity in the forest industry was evident as large stands were clear-cut in order to salvage timber as a result of softwood decline. There are no “supply managed” agricultural commodities on Digby Neck/Islands and few commercial agriculture operations. Three “registered” farms were operating on Digby Neck in 2005. Non-renewable resources such as sand, gravel, and quarry rock products are extracted on a local and regional demand basis. A water bottling plant is proposed for the Gullivers Cove area and is presently under regulatory process review. An ecotourism centre (Discovery Centre) is presently under consideration on Long Island. Waterfront land subdivision is also beginning to take place on Digby Neck.

Marine-based activities include a new small craft harbour at Tiverton and a proposed water based aquaculture site at West Mink Cove which is presently under regulatory process review.

Local and regional economic development goals identified during public consultation focused on the fishery and ecotourism. These economic activities will be discussed in detail in **paragraphs 9.3.10 to 9.3.14**.

In summary, the economy of Digby Neck/Islands is highly dependent upon one industry – the fishery. As a result, the labour force is also highly dependent upon the fishery. An unemployment rate of 14.4% in 2001 was evident on Digby Neck/Islands with a low participation rate in the labour force and below that of the province which indicates fewer employment opportunities on Digby Neck/Islands. Although ecotourism and aquaculture have helped to diversify economic activity during the past fifteen years, a lack of year round employment, economic diversity and resultant economic stability continues to plague Digby Neck/Islands and other coastal communities in Nova Scotia.

9.3.9.1.1 Local and Regional Economic Development Goals and Objectives

Public Consultation

With respect to local development, the main issues raised were with regard to the fishery and tourism. Both of these industries have suffered setbacks in recent years, although the lobster component of the fishery has seen an increase in revenues, and both industries are seen to be vulnerable. The fishery has seen a significant decline in the ground fishery and, hence, the processing sector while the tourism industry has seen several poor years due to the high Canadian dollar and the termination of the ferry service between Portland and Yarmouth.

Any development in the area not associated with the fishery and tourism is seen by some in these two sectors as a potential negative rather than a potential benefit from increased employment opportunities in the local area. Unfortunately, as noted elsewhere in this document, neither of the groups representing these industry sectors in the local area agreed to consult with the proponent. However, consultation was carried out with many individuals involved in these sectors and the degree of concern was lessened as it was explained that the quarry was not visible from Highway #217, that no product was to be shipped by road, that no sediment from the quarry operations would be discharged to the Bay of Fundy, that a fish habitat compensation plan was in place, and that an agreement had been reached with the lobster fishers of Whites Cove with respect to potential damage to gear.

Community Economic Development Plans and Strategies

Local

There are two organisations on Digby Neck and Islands promoting community development. “The Partnership for Sustainable Development of Digby Neck and Islands Society” and “The Digby Neck Community Development Association”. Neither organization agreed to meet with Bilcon. From web sites it would appear that their development thrust is toward eco-tourism and the fishery.

Regional Economic Development Plans and Strategies

Up to the mid 1990’s, Annapolis County and the Town of the Municipality of Digby operated industrial or development commissions. The Town and Municipality of Digby concentrated on increasing occupancy of its industrial park in Seabrook and attracting new business to the area whereas the County of Annapolis took the view that increasing the attractiveness of the County to new business would in itself take care of interesting employment opportunities. The closure of CFB Cornwallis in the mid 1990’s with the loss of almost a thousand civilian jobs imposed new stresses on the area.

Under a new policy directive from the provincial government, the Towns and Counties of Annapolis and Digby (including Clare) combined to create the Western Valley Development Authority (WVDA) and in 1995, the WVDA produced a Development Plan for the Western Valley (title). Until very recently, the WVDA with significant funding and staff levels promoted the Western Valley, particularly as a Smart Community. The emphasis, as with the original Annapolis County Development Commission, was to induce new business by creating an attractive environment. However, new business failed to materialize and the various municipal units removed their support for the WVDA in 2005, and collapsed the organization. Discussions are now underway to revive the industrial commission philosophy and actively pursue new business.

The Cornwallis Industrial Park created to utilize the Base infrastructure, however, actively pursued business and with provincial and federal support, has created more jobs than were lost with the military base closure (Shaw Wood, Converges, Pearson Peacekeeping Centre, etc.).

Infrastructure in the tourist market was greatly expanded in the 1980's and 90's with the Annapolis Royal project, Upper Clements Theme Park, Digby Marina, and significant expansion in the private sector with the addition of bed and breakfasts, country inns, craft stores and restaurants, and up until the past two years, the area has maintained and improved its share of the market. The WVDA promoted ecotourism and there is no question that the expansion of whale watching activities and the expansion of Brier Island Lodge increased numbers of ecotourists who visited the Neck and Islands.

There is no question, however, that the philosophy in the regional area has changed in the recent past and the Municipal governments are now calling for more aggressive recruitment of business to the area in an attempt to stem the tide of out-migration which is affecting all of rural Nova Scotia. Jobs in the traditional rural industries, fishing, agriculture, and forestry continue to be lost and this is impacting the ability of rural communities to survive. The out-migration is almost all in the 19 – 39 year age group and immigration is almost all in the 55+ age group which is causing an imbalance in the Western Valley, i.e., less family sustaining jobs, but the same demand for rural services.

The ability of Municipal governments to respond to the new rural paradigm is now being further complicated by the difference in aspirations of the immigrants in the older age groups. In general, they move to rural Nova Scotia having built up assets in urban centres, and do not necessarily want industrial development to take place. They have no need for jobs and tend to resist development on the grounds that rural peace and tranquillity will be damaged. This trend is apparent in the Western Valley area. While the preference is for “clean” industry, such as Convergys, the reality is that the pressure will always be for these industries to gravitate to low income areas with a high density population.

Provincial Economic Development Plans

Economic planning at the provincial level is the responsibility of the Department of Economic Development. This Department has regional officers who coordinate with the regional development authorities.

In terms of strategy, the provincial government issued “Opportunities for Prosperity” in 2001, and the view on Land Resources, Exports, and Investments is as noted below:

“LAND RESOURCES

Our land-based natural resources, including forests, minerals, and wildlife, have been the foundation of the economy for generations. These sectors provide about 10,000 direct well-paid jobs and \$1.5 billion in annual sales; they account for about one-third of the Province’s exports. Resource-based industries and businesses will continue to provide considerable economic value, especially in rural areas. Major challenges facing these sectors are the need to manage resources to ensure sustainability and to meet increasingly stringent environmental standards in export markets. Pressures on the land base are increasing for both consumptive and protection-oriented uses, such as resource extraction, hunting, and other outdoor recreation, wildlife and habitat, ecotourism, and conservation of natural areas. The appropriate balance can provide both economic and quality-of-life advantages to Nova Scotians. These sectors should also continue efforts to add more value to resources to provide greater economic benefits. To remain competitive and to meet increasingly stringent environmental requirements, the resource industries will have to continue to adopt new technologies, which, in turn, will have training implications for those employed in these sectors.

EXPORTS

We cannot make ourselves better off by selling to each other within the province. Exporting allows us to tap markets much larger than our own. Exports generate wealth and jobs. According to the Atlantic Provinces Economic Council, for every \$68,000 increase in exports, another Nova Scotian goes to work.

However, in the mid-1990’s, Nova Scotia exports were growing more slowly than those of most of the other provinces. In 1999, we had the second-lowest level of exports per person among the provinces. (Fig 2, Exports per Person, 1999).

INVESTMENT

Nova Scotia's economic performance in recent years relates directly to big investments in forestry, tire making, and natural gas production and distribution. Nova Scotia led all provinces in investment growth in the late 1990's. These investments play a big part in the province's current export boom.

But we have to do better. Nova Scotia currently has the second-lowest rate of investment per person in Canada. Nova Scotian companies need continued investment to compete in world markets. New investment boosts productivity and competitiveness. In today's dynamic environment, if companies are not investing in new technology that builds competitiveness, they are probably shrinking – in size, employment, and market share. Working with Nova Scotian companies to expand their investment in our province and put down deep roots is vital. (Figure 4, Investment per Person Expected in 2000)

Attracting new foreign investment is also important. Foreign-owned firms account for 75 percent of Canadian manufacturing exports and 1 out of every 10 jobs directly. Also nationally, 89 percent of foreign-owned firms conduct research and development, compared with 67 percent of Canadian-owned firms. Multinationals bring new technology and new management approaches. Most regions covet so-called anchor companies that hire and train new graduates, strengthen important industrial clusters, and create supply opportunities for a host of service companies.”

The Mineral Policy for the Province of Nova Scotia (2005) also notes:

“The Government of Nova Scotia recognizes mineral exploration and mining as a key sector contributing to jobs, wealth and a high quality of life for Nova Scotians. MINERALS - A Policy for Nova Scotia is the Government's blueprint to foster continued growth of the mineral industry and careful management of our mineral resources. This policy defines responsibilities for Government, industry and the public, and advocates change in the way they work together. It is a framework for mineral resource development that is economically and environmentally sustainable.

The Government will provide leadership by implementing the policy and ensuring that the necessary conditions are maintained for the mineral industry to create wealth for present and future generations of Nova Scotians.

The Government is committed to implementing this policy to the best of its ability subject to the availability of funds and resources.

Minerals are indispensable in our modern world. Mineral-based products are used in virtually every aspect of our daily lives. Through history the human ability to function as hunter, farmer, explorer, scientist and artisan has relied on the use of minerals. Experience tells us that society will continue to rely on mineral resources for the foreseeable future. Constant improvements in methods for discovering, mining and processing minerals have provided society with a substantial variety of indispensable materials.

Most mineral resources are hidden from view and difficult to find, which makes the process of discovery both financially expensive and risky. Mineral exploration efforts are often conducted over many years and even decades. Generally, only one in ten thousand mineral occurrences has the rich ore grade and quantity to be brought into production. The search for new mineral deposits must continue because the world's population requires an increasing supply of metals, fuels, minerals and mineral-based products.

The Government of Nova Scotia is working to improve the economic well-being of Nova Scotians by creating more opportunities for investment and long-term employment. This effort includes value-added production and job opportunities with an increasing emphasis on cooperation and partnerships. The mineral industry is an important participant in the province's economic strategy, especially with its contribution to value-added production and export revenue. Over the last ten years the value of Nova Scotia's mineral production (including petroleum) has grown at an average annual rate of 8 percent in current dollars. Over the same period minerals have contributed to the province's total foreign exports at an average annual rate of 10.5 percent.

Another, often overlooked, source of economic development is the use of rocks, ores, minerals and semi-precious stones for tourism and cottage craft industries. Encouraging rock and mineral collecting helps to promote tourism and to assist visitors and residents, as well as school groups, learn about Nova Scotia's geology and mineral resources. Likewise, cottage craft industries based on the use of minerals, rocks and ores contribute to the economic development of local communities.

Future supplies of minerals from Nova Scotia will continue to contribute to economic development and a growing global demand for metallic and non-metallic minerals. At the same time there is an urgency to find ways to adapt mineral resource initiatives to changing social, economic and environmental commitments.

Mining in Nova Scotia faces some important challenges. Primary among them is a loss of exploration and mining capital, much of which originates in Canada, to foreign countries which aggressively pursue these investment dollars. To increase the competitive position of Nova Scotia's mineral industry the province must create a positive business climate and promote the province's attributes and strengths. The Government will encourage support for and recognition of the mineral industry by including exploration and mining activity as part of its overall industrial strategy.

A competitive business climate will be supported with the following strategies.

Policy

2.0 Provide a competitive business climate

2.1 Support for the mineral industry

The Government will support the mineral industry by:

- a.. facilitating and stimulating research and development in mining and product development;*
- b.. facilitating technology transfer to improve cost effectiveness, production efficiencies and environmental performance;*
- c.. encouraging higher value-added production to enhance the economic value of mineral resource extraction; and*
- d.. providing market information to help identify niche markets and export opportunities for mining-related technologies and mineral products.*

2.2 *Maintain an efficient and effective mineral rights administration*

The Department will improve efficiency in mineral rights administration and improve the administrative process through the use of information technology. Use of the Internet, geographic information systems, wide area networks and regional offices will enable remote access to the Registry of Mineral and Petroleum Titles.

2.3 *Minimize the effort and cost required to meet regulatory requirements*

The Department of Natural Resources will support government-wide efforts to streamline and speed-up regulatory review processes. A “one-window” service for companies wishing to undertake exploration and mining activities will be provided to facilitate a more efficient process for administering regulations and assisting the industry. The Government will explore, with industry, opportunities for more self-regulation and performance monitoring

2.4 *Ensure that the regulatory regime is developed through consultation, stable over time, and easy to understand*

The Department of Natural Resources will continue to consult with the mineral industry and other stakeholders where needs arise for developing new regulations. The mineral industry and other stakeholders will be invited to participate in proposed amendments and periodic reviews of the regulatory regime to ensure that the rules are necessary, effective and easy to understand.”

9.3.9.1.2 Consistency of the Project with Goals and Objectives Identified in Economic Plans and Strategies

Provincial

The project fits the policies of the Government's blueprint – “Minerals – A Policy for Nova Scotia” which outlines a policy to foster continued growth of the mineral industry and careful management of Nova Scotia's mineral resources. In addition, the current Minister of Natural Resources has stated that Nova Scotia (Mining Matters Conference 2004 and Annual Meeting of the Nova Scotia Chamber of Mineral Resources 2004) is “Open for Business” in the mining field.

Regional

In a 2000 evaluation of the progress of the WVDA, PRAXIS Research noted the WVDA goals with respect to natural resources as “Develop a community-based plan for natural resources management that includes the processing of those resources in the local area”. Forestry, fisheries, and agriculture are noted but there is no mention of any mineral resource extraction. In fact, it is clear that the staff of the WVDA did not support the project and refused to consult with the proponent on any of the issues raised by the community.

As noted above, the approach to community economic development adopted by the staff of the WVDA did not reflect the community's approach as expressed by the various councils in the area and the organization has been disbanded. The project certainly fits with the desire to bring meaningful employment and investment to the area which is the target of the proposed new Industrial Commission.

Local

Local development plans and strategies appear to centre on the fishing industry and on the tourism sector and particularly ecotourism. Plans are in the works for a Discovery Centre but there is still significant dispute as to its location. While the consensus appears to favour Freeport, there are significant objectives from the tourism industry in Westport who feel that Brier Island has a much better claim to the Centre.

In any event, the fact that the quarry cannot be seen from Highway #217 and that similar operations in Nova Scotia have not affected the tourism industry in those areas, mitigate the influence the quarry may have on tourism on Digby Neck or the Islands. The effects noted elsewhere in this report with respect to the fishing industry are being mitigated or compensated and, hence, no conflict is seen with the local planning strategy.

9.3.9.1.3 Capacity of Renewable Resources That are Likely to be Significantly Affected by the Project to Meet Present and Future Needs

The primary renewable resources on Digby Neck are the fishery and forestry with the tourism sector, in dollar terms, a low ranked third (Ref. Gardner Pinfold).

Reference to the section in this report on the fishery will show that the only impact on the fishing industry is the impact on the lobster fishery caused by the once-a-week passage of the bulk carrier to and from the shipping lanes to Whites Cove. This effect will occur only during the lobster season and compensation has been agreed upon with the fishers affected, by means of compensation to damaged lobster gear. There will be no affect with respect to increased sedimentation in the waters adjacent to Whites Cove.

The impact of the destruction of fish habitat by the placement of pipe piles will be mitigated by the compensation plan for fish habitat which has been approved in principle by DFO.

The impact on the forestry is generally positive. As noted elsewhere in this report, many areas of forest on Digby Neck have been recently clear cut due to the impact of the spruce bark beetle, including a section of the quarry site which was clear cut in 2001-2002. While the remainder of the forestry resource on the quarry site will be clear cut over the next fifty years, the entire quarry area will be remediated and much improved from a forestry standpoint over this period. In addition, areas peripheral to the quarry site itself acquired by Bilcon will undergo a silviculture program to improve the forest resource on this land and provide a much more pleasing aspect from Highway #217.

The tourism industry on Digby Neck and Islands has grown significantly over the past fifteen years, but the more recent two years have been disappointing, as they were for Nova Scotia as a whole. The demise of the Portland to Yarmouth ferry service, the high Canadian dollar, and competition generally in the industry, have all contributed to a significant downturn in tourism revenues. Nonetheless, the industry is an important contributor on the Neck and Islands and provides seasonal employment to a significant number of people.

The impact of the quarry and marine terminal, as noted elsewhere in this report, is seen to be insignificant. The quarry is not visible from Highway #217, the only road traversing Digby Neck, nor will traffic on Highway #217 be significantly increased since no product will be moved by road. The main factor appears to be the view that the presence of a quarry on Digby Neck will be a negative influence on those tourists who are visiting as ecotourists. In this regard, it should be noted that two existing quarries are visible from the road, at Rossway and Tiverton, and these are not seen as a negative influence. Further, the large quarry at Auld's Cove, which has been operating for over fifty years, is highly visible to all tourists entering Cape Breton and from the tourist bureau in Port Hastings, yet is not seen as a negative influence on the Cape Breton tourist industry. The Whites Point quarry can be observed from the Bay of Fundy but, as noted elsewhere in this report, the vast majority of whale-watch tours do not frequent this area.

9.3.9.2 Analysis

Two major phases of the Whites Point quarry and Marine Terminal project were analyzed to determine potential effects on the local, regional, provincial and national economies. The construction phase is expected to take approximately one year to complete for a total capital cost of \$40.6 million. Operation and maintenance is expected to continue for the fifty year life of the rock reserves with an annual expenditure of approximately \$20.0 million. Final decommissioning will take place during the final year of operation. High-quality basalt rock reserves are estimated to be in excess of 100 million tonnes within the active quarry area on the site. Bilcon of Nova Scotia Corporation intends to construct and operate the quarry and marine terminal without public monies.

Economic impacts of the quarry and marine terminal have been estimated for both construction and annual operation. Direct and spin-off impacts from expenditures made to develop and operate the new facility are defined as follows:

- Direct impact is defined to include expenditures made by Bilcon of Nova Scotia Corporation and resulting in an economic impact
- Spin-off impacts include both indirect and induced impacts. Indirect impacts are those gained by firms supplying goods and services to Bilcon's activities and induced impacts are those attributable to income and employment generated by consumer spending at the direct and indirect impact stages

Construction

Capital construction expenditures are estimated to be \$40.6 million with \$7.5 million for mobile equipment, \$14.0 million for plant infrastructure, and \$19.1 million for a marine terminal and loading system.

Total construction employment resulting from construction of the Whites Point quarry and Marine Terminal in Nova Scotia amounts to 225.4 person-years of employment including all direct and spin-off impacts. Forty-five of these person years will be attributable to Digby County. At an annual average salary of \$35,000.00, over \$1.5 million would be attributable to Digby County construction workers.

Gross Domestic Product (GDP) is an important measure of economic activity. The total construction GDP for Nova Scotia is \$14.5 million including direct and spin-off impacts of which \$2.4 million are attributable to Digby County.

Federal and Provincial tax revenues will be generated from construction activities at the quarry and marine terminal. Total Federal tax revenue for both direct and spin-off will be almost \$2.0 million with an additional provincial tax revenue of \$1.6 million. Of this total, Federal tax revenue from Digby County would amount to \$.31 million and \$.27 million for provincial tax revenues from Digby County.

Operation

Total annual employment, including direct and spin-off is estimated to be 91 person-years in Nova Scotia. Of this total employment, almost 52 person-years of employment will be attributed to Digby County. Over the fifty year life of the project, total employment will exceed 4,550 person-years. At an annual average salary of \$30,000.00, over \$1.5 million would be attributable to the Digby County work force associated with the quarry and marine terminal each year.

A full-time work force of 34 persons working two shifts will be employed for approximately 44 weeks per year. Wages will range from \$12.50 to \$20.00 per hour. It should be noted that quarry employment is one of the highest paying industries. Skill requirements and training will be discussed in **paragraph 9.3.23**.

Gross Domestic Product (GDP) associated with annual operations is estimated to total \$6.3 million in Nova Scotia. Over the fifty year life of the quarry project, a total GDP of over \$315.5 million is estimated.

Federal, Provincial, and Municipal tax revenues will be generated from quarry operations each year. Total Federal tax revenues attributable to the quarry would be about \$1.0 million, total provincial tax revenues about \$.8 million and municipal taxes payable to the Municipality of Digby to be approximately \$400,000.00. Tax revenues to be paid by Bilcon of Nova Scotia Corporation to the Municipality of Digby alone would amount to \$20.0 million over the fifty year life of the quarry.

In conclusion, the Whites Point Quarry and Marine Terminal will provide direct, full-time employment at the quarry for 34 persons working two shifts for approximately 44 weeks per year. Wages will range from \$12.50 to \$20.00 per hour. Skill requirements and training are discussed in **paragraph 9.3.23**. Incremental tax revenues for municipal, provincial, and federal levels of government will result without expenditures of public monies. The Whites Point quarry and Marine Terminal will be privately financed and no government wage subsidies are applied for. A community opportunity will result which will include direct, stable, full-time employment and indirect supply of local goods and services. In broader economic context, the quarry project will provide alternative, sustainable choices to existing seasonal industries presently operating on Digby Neck/ Islands. Economic diversification, stability and resiliency will result in more favourable long term economic conditions for this coastal community.

9.3.9.3 Mitigation

None proposed

9.3.9.4 Monitoring

None proposed

9.3.9.5 Impact Statements

Construction – Employment

Total employment (direct and spin-off) during construction of the quarry and marine terminal is estimated to be 45 person-years in Digby County resulting in a ***short term, significant positive effect, of county scale.***

Construction – Gross Domestic Product

Total Gross Domestic Product (direct and spin-off) during construction of the quarry and marine terminal is \$14.5 million in Nova Scotia resulting in a ***short term, insignificant positive effect, of provincial scale.***

Operation – Employment

Total annual employment (direct and spin-off) from quarry operation is estimated to be 51.8 person-years in Digby County resulting in a ***long term, significant positive effect, of county scale.***

Operation – Gross Domestic Product

Total annual Gross Domestic Product (direct and spin-off) from quarry operations is estimated to be \$6.3 million in Nova Scotia resulting in a ***long term, insignificant positive effect, of provincial scale.***

Operation – Tax Revenue

Total annual Federal and provincial tax revenue (direct and spin-off) from operations at the quarry will be over \$1.8 million resulting in a ***long term, insignificant positive effect, of provincial/national scale.***

Operation – Municipal Tax Revenue

Total annual Municipal tax revenue (direct and spin-off) from quarry operations payable to the Municipality of Digby will be approximately \$400,000.00 resulting in a ***long term, significant positive effect, of county scale.***

9.3.10 Economy - Fishery

Generally, during the past years, the number of fishers and the number of vessels in the province have both declined. However, the value and tonnage of commercial landings have risen substantially since 1995. This indicates that after the recent rationalization in the fishing industry, the economic benefits of the industry are now being shared by fewer people (RCIP Project 2003 Ref. 96). One exception to the above trend is the lobster fishery. During the past 10 to 15 years, the landed value and number of lobster fishers have maintained a similar pattern. This indicates there has been a constant distribution of benefits over time. Moreover, at present, this industry sector has maintained economic stability.

The Bay of Fundy supports a fixed and mobile gear commercial fishery for groundfish (the more common species include cod, haddock, and pollock); pelagic species such as herring and mackerel; crustaceans (primarily lobster); molluscs (primarily scallop); and local harvesting of sea plants in the area of the proposed Whites Point Quarry and Marine Terminal. Localized harvesting of periwinkles, sea urchins, and more recently an experimental sea cucumber fishery is also carried out in this area of the Bay. Without question, the fishery represents the mainstay of the economy on Digby Neck/Islands. Although the fishery is not as dominant as it once was, it still accounts for the largest source of employment and income for fish harvesters and fish processing workers. The most lucrative sector is the lobster fishery.

Commercial fishing activities are presently occurring on land and water in the vicinity of the proposed Whites Point Quarry. Lobster, herring and sea cucumbers were observed being harvested during the spring and summer of 2002 in the near shore waters in the Bay of Fundy. Traditional community knowledge investigations indicate the once popular herring weir fishery has experienced a steady decline. Historically, a weir was located at Whites Cove but is presently non-existent. Eleven weirs presently exist along the coast of Digby Neck (Bay of Fundy and Saint Mary's Bay) however, only six are active. Again, traditional community knowledge attributes the demise of the herring weir fishery is due to changing technology and the large herring seiner boats that "stalk" the mouth of the Bay of Fundy. The nearest weir is located at Sandy Cove West, approximately four kilometres from Whites Point. Local harvesting of periwinkles was also observed in the intertidal zone. No commercial sea plant harvesting leases are presently issued for this particular section of coastline, (personal communication: Justin Houston, Coastal Zone Coordinator, Nova Scotia Department of Fisheries and Agriculture – June 2005). Traditional community knowledge consultations indicate local harvesting of dulse does occur. Commercial fisheries in the Bay of Fundy for Atlantic salmon were closed after the 1984 season. However, local commercial fisheries for shad, herring and gaspereau in gillnets and herring weirs; and interprovincial herring seiners have remained open and are required to release any Atlantic salmon by-catch dead or alive. Land and water based aquaculture operations are also present on Digby Neck and in the adjacent waters of the Bay of Fundy and Saint Mary's Bay.

Historically, settlement patterns within the community of Digby Neck evolved around natural harbour locations. According to traditional community knowledge, most coves, including Whites Cove, at one time, supported fishing activities. A number of “dorey” fisherman used the cove in the early to mid 1900s. Soon after the 1950s, the engine-powered “Cape Islander” became the primary fishing vessel and wharf structures began to replace the skidways and haul-ups.

This era marked the beginning of the influence of the small boat dragger on the Neck and Islands fishery. Conflicts arose between the “fixed” (hook and line fishers) and “mobile” (drag net fishers) gear fishers, which in some cases continues today. It was contended that the draggers killed small fish, destroyed ocean bottom habitats, broke up fish shoals and overexploited stocks. As one fisher argued:

“The draggers have fished themselves out of business, and with themselves lots of others. Ya can’t just dip, dip, dip and hope there’ll always be fish to replace the ones ya take. After awhile it’s got to catch up with ya” (Davis, 1991 p. 47, Ref. 107).

It should be noted that this technological change in fleet structure dramatically impacted local communities. From 1957 to 1983 the small boat fleet declined by 40% with 35.7% fewer fishers in 1983 than reported in 1957 (Davis 1991). With the shift from line fishing to drag net fishing the overall productivity per fisher increased almost two and one half times during this time period. However, the increased catch did not translate into more employment in the processing sector as technological changes were also occurring in fish processing. The increased productivity per worker reduced the number of workers required. As Davis states about Digby Neck and Islands:

“Those communities most affected by these changes in employment opportunities are profoundly threatened in terms of their future participation in the fishing industry. Currently, they do not contain many employment opportunities for their residents. Young people, especially, have no choice but to leave in pursuit of work. These developments raise very important questions concerning the socio-economic future of many communities”.

Today, fishing villages such as Little River and Sandy Cove support the larger population concentrations on the Neck. Presently, approximately 200 people reside in Little River and Sandy Cove has a summer population of approximately 150 and a winter population of 100 (Lee 2002 Ref. 133). Other fishing villages on the Neck include Rossway, Gullivers Cove – pop. ±40, Centreville – pop. ±50, Whale Cove – pop. ±40, and East Ferry – pop. ±55. The location of these villages is shown on **Maps 6A and 6B**.

Lobster has traditionally been and is today the primary fishing industry sector on Digby Neck with boats fishing out of the above mentioned ports. Although Little River supports mostly lobster boats (13), three weir/aquaculture boats, one trawler, and four draggers fish out of Little River. Of the approximately 63 people employed in fishing out of Little River, 75% live nearby in the community of Digby Neck. The Sandy Cove wharves also support lobster boats and draggers for a total of 24 boats.

Although few captains live in Sandy Cove, some of the crew members reside in Sandy Cove. Fishing activities at Rossway are limited and mainly consist of weir fisherman in Saint Mary's Bay. Two commercial fishing boats at Gullivers Cove mainly harvest periwinkles and dulse. Employment at these two villages is predominately from the immediate area. The fishing industry at Centreville consists of twelve fishing boats and employs from Centreville to Little River. Whale Cove consists of five to six fishing boats with employment from Centreville to Tiddville. Finally, East Ferry supports seven fishing boats and employs from Digby Neck with only a few employees living in East Ferry (Lee 2002).

In summary, with the exception of Sandy Cove, employment in fishing is from the various villages within the community of Digby Neck. Direct employment in this primary industry sector is approximately 172 people (Lee 2002). Three industry sectors – aquaculture, intertidal, and nearshore – of the local fishing industry are presented in the following sections.

9.3.11 Economy – Fishery/Aquaculture

9.3.11.1 Research

Review of the Nova Scotia Department of Agriculture and Fisheries: Aquaculture Site Mapping (2002) indicates several aquaculture licenses have been issued in the Digby Neck area for both land and water based aquaculture operations – see **Map 6B**.

These operations include species such as Bay Quahogs, Sea Urchins, Atlantic and Steelhead Salmon, Halibut, and Flounder. The nearest land based license issued is for an Atlantic salmon hatchery in Mink Cove while the nearest water based license issued is for Atlantic and Steelhead Salmon in Saint Mary’s Bay, southwest of Tiddville. These operations are approximately 2.5 km and 8 km respectively from the proposed quarry site.

9.3.11.2 Analyses

During Community Liaison Committee meetings, potential effects on area aquaculture operations were raised, primarily from the aspect of noise from the quarry site. Presumably, the effects from blasting (vibration and pressure changes) are of greatest concern, and more specifically the possible effects on land based hatchery operations and water based rearing operations. Generally, overpressure in excess of 100 kPa will result in adverse effects on pelagic fish including eggs and larvae. Little information is known concerning lethal and sublethal effects on shellfish and crustaceans.

In this regard and in accordance with the criteria contained in “Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters” (Wright and Hopky 1998) Ref 92, potential effects were assessed. More specifically, the proposed set back distance contained in Table 2 of the previously referenced document is used in relation to spawning habitat, or in this case, a land based fish hatchery. Also, the proposed set back distance contained in Table 1 will be used in relation to rearing/general fish habitat from the centre of detonation of a confined explosive in rock substrate for water based aquaculture.

For example, the setback distance from spawning habitat recommended in Table 2 for the weight of explosive charge of 100 kg is 150.9 m. The nearest licensed aquaculture hatchery is approximately 2,500 m away. The setback distance from fish habitat recommended in Table 1 for a similar weight of explosive charge (100 kg) in rock substrate is 50.3 m. The nearest licensed fin fish aquaculture site in Saint Mary’s Bay is approximately 8,000 m away.

For a more detailed explanation of blasting at the Whites Point quarry – see Bilcon of Nova Scotia Corporation “Whites Point Quarry Blasting Protocol” Appendix 9.

It should be noted that some commercial fishing operations, including aquaculture in the Bay of Fundy have historically used acoustic harassment devices (AHD). These “acoustical alarms” are used to deter, primarily seals, from approaching finfish aquaculture sites. Some of these alarms are advertised to have a source level rating of 200 dB. Effective sound levels in the water of 128 dB at 3.5 km and 132 dB at 2.5 km from the aquaculture sites have been recorded.

9.3.11.3 Mitigation

Even though the setback distances from the proposed quarry and existing licensed aquaculture sites in the area are substantially greater than those outlined in the referenced guidelines, the following precautions will be taken.

- 1 Weights of the explosive charge will be kept to a minimum.
- 2 For multiple charges, time-delay detonators will be used to create a series of single explosions.
- 3 Larger charges will be subdivided into a series of smaller charges in the blast holes.
- 4 Blast holes will be back-filled with sand or gravel to grade.
- 5 Set-back distances from the blast site to the fishery will be based on the maximum weight of explosive charge to be detonated at one instance in time and the type of fish habitat (rearing/general fish habitat or spawning habitat where eggs or early fish development are occurring) in the area of the blast in accordance with the “Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters”.

9.3.11.4 Monitoring

Monitoring of noise, including blasting, will be conducted by Bilcon of Nova Scotia Corporation in accordance with the Nova Scotia Department of Environment and Labour requirements. All blasts will be monitored for noise and ground vibration at the east and west property lines to ensure noise is less than 128 dBA and ground vibration is less than 12.5 mm/s peak particle velocity. A monthly summary of monitoring results will be submitted to the Nova Scotia Department of Environment and Labour.

9.3.11.5 Impact Statement

Licensed Aquaculture Sites

Noise, including blasting from quarry operations, on existing land and water based off-site licensed aquaculture sites would result in a *long term, neutral (no) effect, of regional scale.*

9.3.12 Economy – Fishery/Intertidal

9.3.12.1 Research

On-site investigations during the spring and summer of 2002 confirmed local harvesting of periwinkles along the intertidal zone of the Whites Point Quarry property. This was also confirmed through traditional community knowledge (personal communication – Wanda Van Tassel) that this portion of the intertidal zone is used for harvesting periwinkles and dulse.

9.3.12.2 Analysis

Existing access, generally for all terrain vehicles, to the intertidal zone for harvesting periwinkles is via the public Whites Cove Road and then in a northern direction along the coast over private land. Access in a southerly direction from Whites Cove is difficult due to the rugged terrain and apparently is not presently being attempted. When the quarry becomes operational, an access road from the quarry property line to the coastline will be maintained. Existing all terrain vehicle trails along the coast may be altered to avoid the sensitive areas of the proposed environmental preservation zone, associated environmental control structures, and conveyor systems. Also, access to certain coastal areas may be restricted during blasting for safety reasons.

9.3.12.3 Mitigation

Access to the coast and northerly along the coastline through quarry property for local harvesters is proposed upon appropriate arrangements.

9.3.12.4 Monitoring

To ensure the safety of the harvesters, especially during periods of blasting, a “check in” procedure at the quarry will be initiated. Registration at the quarry office would be required before harvesters cross quarry property to the intertidal zone.

9.3.12.5 Impact Statement

Intertidal Fishery

Access over quarry property for harvesters working in the intertidal zone would be maintained resulting in a *long term, neutral (no) effect, of local scale.*

9.3.13 Economy - Fishery - Nearshore

9.3.13.1 Research

The modern day fishing fleet on Digby Neck/ Islands operates out of thirteen ports located on Saint Mary's Bay and the Bay of Fundy. In 2005, there were 132 registered vessels active in the fishery. The dominant vessel class length is the 35 – 44.9 foot category with 95 vessels accounting for 72% of the Neck/Islands fleet. Thirteen vessels are registered in the 45 – 64.9 foot class. For a vessel summary by home port and length class for 2005 – see Gardner Pinfold 2005, **Ref. Vol. VI, Tab 32, Table 8.**

In total, there are 309 licensed fishermen on Digby Neck/Islands comprised of 103 core fishermen and 206 non-core (a core fisherman is a person who holds two or more key fishing licenses or one vessel based Licence and has earned \$25,000. or more from their fishing enterprise for two or more years). The ports of Little River, Tiverton, Freeport, and Westport account for 71% of the fishermen. For a breakdown of the number of core and non-core licensed fishermen by home port – see Gardner Pinfold 2005 **Ref. Vol. VI, Tab 32 Table 9.**

The fishermen on Digby Neck/Islands hold a wide variety of licenses. These licenses by species and type are presented below.

Species Licence	Licence Type
Alewives/Gaspereau	Bait (variety of species)
Groundfish	Non-vessel (clams)
Clams	Fixed gear groundfish
Herring	Lobster (Category A)
Herring/Mackerel	Mobile (groundfish)
Lobster	Scallop (recreational)
Mackerel	Herring (vessel-based)
Sea Scallop	Mackerel (vessel-based)
Marine Plants	Squid
Sea Urchin	Swordfish
Eel	Herring fixed gear
Shark	Sea Scallop (vessel-based)
Squid	Crab rock (exploratory)
Swordfish	Seal skin predator
Oysters	
Seal Skins	
Shrimp	
Marine Worm	

On-site observations during 2002 and 2003 confirmed nearshore fishing activities with fixed and mobile gear. Species being fished included lobster, herring and sea cucumbers. The nearshore waters of the Bay of Fundy adjacent to the proposed Whites Point Quarry and Marine Terminal are located within Lobster Fishing Area (LFA) 34. This area extends from Prim Point near Digby around to Baccaro Point in Shelburne County. LFA 34 is a six month fall season which begins the last Monday of November to May 31. As of December 31, 2002, this area had 1,171 licenses with the capability of setting 400 traps per license. LFA 34 is approximately 11,500 square miles in area. The nearshore area adjacent to the Whites Point Quarry property is a traditional lobster trap setting area used by local lobster fishermen. Herring fishermen also set gill nets in these nearshore waters starting in June and continuing until late September. No herring gill nets were observed in nearshore waters in the vicinity of Whites Point in 2003. Also, herring and mackerel are fished by mobile gear purse seiners. These waters have also attracted fishers partaking in a recently established experimental sea cucumber fishery. No diving for sea urchins was observed in this particular area of the Bay.

Additionally, the following First Nations have LFA 34 lobster licenses.

Acadia	13 licenses
Glooscap	2 licenses
Indian Brook	9 licenses
Native Council of NS	4 licenses

Also, the following First Nations have Full Bay of Fundy scallop licenses.

Tobique	5 licenses
Millbrook	2 licenses
Eskasoni	1 license
Acadia	1 license
Annapolis	1 license
Oromocto	1 license
Woodstock	1 license
Indian Brook	1 license

9.3.13.2 Analysis

The value of fish landings by species for the years 1998 – 2004 is presented below in **Table NF – 1**. During this period (1998 – 2004), the total value of landed species on Digby Neck/ Islands increased from \$14.8 million to \$22.9 million, a 65% increase. As can be seen in **Table NF – 1**, lobster landings have the highest value followed by cod, scallop, and haddock.

Table NF - 1 Value of Fish Landings by Species - Digby Neck and Islands 1998-2004

Table 10 Digby Neck/Islands by Species 1998 - 2002 (\$ 000)						
Name of Species	Species Code	1998	1999	2000	2001	2002
Cod	100	1,205.2	1148.3	1,159.4	967.8	716.9
Haddock	110	1,251.4	1,505.3	1,800.8	1,483.9	1,281.9
Redfish	120	88.0	91.4	303.6	225.2	82.2
Halibut	130	94.6	83.2	64.4	131.0	141.0
American Plaice	140	0.2	10.6	33.2	6.2	1.4
Yellowtail	141	3.0	7.9	10.5	0.0	0.2
Greysole/Witch	142	19.2	16.5	13.6	4.6	14.1
Winter Flounder	143	84.0	57.5	76.4	83.3	41.9
Greenland Halibut/Turbot	144	0.0	0.0	0.0	0.0	0.0
Flounder, Unspecified	149	19.6	39.9	74.3	26.7	11.5
Skate	160	0.0	0.0	0.0	0.4	0.0
Dogfish	161	15.6	126.6	286.7	396.6	300.8
Pollock	170	806.3	607.1	249.3	241.7	192.9
White Hake	171	92.3	47.0	121.9	98.9	96.0
Silver Hake	172	0.1	0.1	0.1	0.0	0.0
Cusk	173	4.1	1.3	2.2	4.2	2.8
Catfish	174	7.5	6.9	6.6	1.5	0.4
Monkfish	177	17.6	17.6	24.7	6.9	2.0
Red Hake	180	0.0	0.0	0.0	0.0	0.0
Sculpin	181	2.0	1.0	9.0	6.2	8.8
Tilefish	190	0.0	0.0	0.0	0.0	0.0
Groundfish, Unspecified	199	2.3	1.9	1.2	1.1	0.0
Herring	200	31.2	29.8	2.4	151.1	101.3
Mackerel	250	0.0	0.2	0.0	0.3	0.6
Eel	352	0.0	0.0	0.1	0.1	0.0
Shad	355	0.0	0.0	0.0	0.0	0.0
Sturgen	359	3.5	0.0	0.0	0.0	0.0
Shark, Porbeagle/Mackerel	369	2.5	0.0	0.0	0.7	0.0
Shark, Blue	372	0.0	0.0	0.0	0.0	0.0
Shark, Mako	375	0.2	0.0	0.0	0.3	0.2
Shark, Unspecified	379	1.6	1.7	1.0	0.2	1.2
Clams, Bar	600	0.0	0.0	0.7	0.0	0.0
Clams, Soft Shell	601	0.0	0.1	276.0	0.0	629.0
Quahaugs	602	0.0	0.0	12.1	0.0	15.0
Clams, Littleneck	605	0.0	0.0	0.0	0.0	695.4
Scallop, Sea	612	762.2	1,080.6	615.9	715.7	636.2
Sea Urchins	650	120.3	526.2	604.4	551.3	398.8
Lobster	700	10,115.1	14,935.4	15,522.4	18,003.1	19,528.1
Crab, Jonah	703	38.9	11.6	98.0	195.0	249.6
Crab, Rock	704	12.0	17.4	15.2	64.3	73.5
Crab, Snow	705	9.8	0.0	0.0	0.0	0.0
Crab, Unspecified	707	4.9	3.2	27.6	2.8	1.6
Dulse	900	0.0	0.0	1.8	3.1	0.0
Rockweed	906	13.0	31.1	0.0	7.3	0.0
Livers, Unspecified	944	0.1	0.0	0.0	0.0	0.0
Other						
Overall Total		14,828.3	20,407.4	21,415.5	23,381.5	25,225.3

The summary **Table NF – 2** shows the changes in the relative importance of various species groups between 1998 – 2004. Lobster landings increased from \$10.1 million in 1998 to \$19.2 million in 2004, an increase of 90%. In 1998, lobster accounted for 68.2% of the total landings and increased to 83.9% by 2004. Groundfish, the second most valuable group landed on Digby Neck/Islands, declined during this period from \$3.7 million in 1998 to \$2.2 million in 2004. Groundfish species percentage share also dropped from 25.0% in 1998 to 9.6% in 2004. Shellfish such as scallop, clam, crab, and sea urchin have increased in value from \$0.9 million in 1998 to \$1.4 million in 2004.

Table NF - 2

Relative Value of Fish Landings on Digby Neck/Islands by Major Species Category 1998 vs. 2002

	1998		2004	
	\$000	% of Total	\$000	% of Total
Total Groundfish	3,713.0	25	2,204.7	9.6
Total Other Finfish	39.0	0.3	39.2	.2
Lobster	10,115.1	68.2	19,262.0	83.9
Total Other Shellfish	948.1	6.4	1,452.9	6.3
Total Other	13.1	0.1	0.0	.0
TOTAL	14,828.3	100.0	22,958.8	100.0

In terms of value, Digby Neck/Islands accounts for between 6.8 and 8.6% of total value for LFA 34 over the period 1998 – 2002 – see **Table NF – 3**.

Table NF - 3

Lobster Landings LFA 34 Compared with Landings on Digby Neck/Islands 1998 - 2004

	LFA 34		Digby Neck/Islands		
	Tonnes	Value(\$)	Tonnes	Value(\$)	% of LFA 34 Values
1998	11,360	149,446	757	10,115	6.8
1999	14,599	201,644	1,082	14,935	7.4
2000	14,431	192,790	1,176	15,522	8.1
2001	18,940	242,768	1,406	18,003	7.4
2002	17,577	252,786	1,352	19,528	7.7
2003	17,879	266,638	1,494	22,463	8.4
2004	16,465	224,298	1,423	19,262	8.6

Construction of the marine terminal and shipping activities may inconvenience the traditional lobster and herring fishery adjacent to Whites Point. The berthing dolphins of the marine terminal extend approximately 200 m from the ordinary high water line and are located at a depth of approximately 16 m below chart datum. Although the physical location of the marine terminal is not expected to disrupt lobster trap setting areas, vessel traffic will occur through these water depths. Vessels to be loaded with quarry products will approach and depart from the terminal through these nearshore waters. The expected frequency of ship loading is one per week throughout the year with an expected duration of 24 hours (including approach, loading, and departure). An estimated one half mile radius (.8 square mile) of nearshore surface waters around the marine terminal could be influenced by the vessel once per week for a 24 hour period. This potential area of disruption amounts to approximately .007% of LFA 34. A defined course to and from the shipping lanes and the marine terminal is proposed as indicated on **Map 4**.

During the six month lobster season, vessels will approach and depart the terminal through a traditional lobster fishing area and possibly disrupt lobster trap buoys. This possible disruption could occur on twenty four days during the lobster season. However, it should be noted that the frequency of ship arrival and departure will be reduced during the mid-winter period of the lobster fishing season. This reduction will occur during the months of January and February. Herring nets were observed near the proposed location of the marine terminal. Nets set within the one half mile radius of the terminal could also be affected during arrival and departure of the vessel. However, these herring nets are generally set closer to the coastline than the course of the vessel.

9.3.13.3 Mitigation

Recognizing the potential disruption of lobster buoys, lines, and traps and herring nets, set in nearshore waters, specific ship lanes will be designated. Several consultation meetings have been held with lobster fishermen presently setting traps in the Whites Cove/Whites Point waters. In addition to a designated ship route from the inbound/outbound shipping lanes to the marine terminal at Whites Point, local lobstermen requested a wider ship approach/departure in the vicinity of the terminal. A wider approach/departure area in the vicinity of the marine terminal would allow traps to be set in an area presently being fished. This area will be determined in consultation with the lobstermen in accordance with marine safety and marked with buoys or delineated by longitude/latitude. Upon request, advance notice of shipment schedules will be provided to fishers who traditionally fish these nearshore waters. Discussions are presently in progress concerning a lobster trap fund to be established by Bilcon of Nova Scotia Corporation, and administered by the local lobster fishermen, to provide compensation for lost traps and related gear due to shipping activities.

9.3.13.4 Monitoring

Shipment records will be kept by Bilcon of Nova Scotia Corporation documenting the frequency and duration of vessels throughout the year.

9.3.13.5 Impact Statement

Nearshore Fishery

Considering the extent of nearshore water area for lobster and gill net herring fishing, permanent disruption by construction of the marine terminal, and induced, intermittent ship approaches and departures could result in a *long term, insignificant negative effect, of regional scale.*



9.3.14 Economy - Tourism

9.3.14.1 Research

The Digby Neck/Islands tourism industry is primarily natural resource based including land, coastal, and marine attractions. In 2003 and 2004 individuals and businesses were contacted by a local consulting firm to develop a list of tourism businesses on Digby Neck/Islands – see Elgin Consulting and Research 2004 **Ref. Vol. IV, Tab 22**. At the time this list was compiled there were 7 grocery/convenience stores, 7 craft/gift/gallery establishments, 17 accommodations and restaurants, 3 campgrounds, and 10 adventure tour operators. Most of these businesses are operated seasonally and many are operated on an owner-operator basis.

The seventeen accommodation businesses accounted for a total of 84 rooms available on Digby Neck/Islands. The Brier Island Lodge is the largest and accounts for almost 50% of the total with 40 rooms. The Olde Village Inn in Sandy Cove has the next largest number of rooms with thirteen. All other accommodation businesses reported offering no more than three rooms. The number of rooms available per accommodation in five year intervals from 1985 to 2005 are shown in **Table TO-1**.

TABLE TO - 1

DIGBY NECK ACCOMODATIONS & CAMPGROUNDS - ACTIVE/NON-ACTIVE

YEAR	NAME	LOCATION	# of ROOMS	OPEN	STATUS	YEAR EST.
2005	Graham's Pioneer Retreat	Centreville	3	Apr. - Dec.	Active	1998
	Innisfree Cottage	Lake Midway	1	Year-round	Active	2004
	Lake Midway Cottage	Lake Midway	1	Year-round	Active	-
	Olde Village Inn	Sandy Cove	13	June - Oct.	Active	1976
	Gulliver's Cove Ocean View Cottage	Gulliver's Cove	1	NOT KNOWN	Active	2005
	Rambling Rowes B&B	East Ferry	-	May - Oct.	Not Active	1999
	Direct Descendants Guest House	Tiverton	3	June - Oct.	Active	2000
	Fisherman's Needle Guest House	Tiverton	3	May - Oct.	Active	2002
	Seacliff B&B	Tiverton	2	June - Sept.	Active	1998
	Island Mist Guest Cottage	Tiverton	-	May - Oct.	Not Active	2002
	Ruggles Guest Cottage	Tiverton	1	May - Oct.	Active	1999
	Tiny Tattler Accommodation	Tiverton	3	Year-round	Active	1986
	Freeport House B&B	Freeport	3	Apr. - Oct.	Active	1997
	Cottage on Beautiful Cove	Freeport	1	May - Oct.	Active	2003
	Summer Solstice B&B	Freeport	3	May - Oct.	Active	2004
	Sunset Over the Bay B&B	Freeport	-	June - Sept.	Not Active	1996
	Bay of Fundy Inn	Westport	3	Year-round	Active	2002
	Brier Island Backpackers Hostel	Westport	-*	Year-round	Active	1997
	Brier Island Lodge	Westport	40	May - Oct.	Active	1989
	Dock & Doze Motel	Westport	3	May - Oct.	Active	1985
	Total		84			
	Whale Cove Campground	Tiddville	15 WE	May - Oct.	Active	1996
* Brier Island Backpackers Hostel offers 12 beds.						
YEAR	NAME	LOCATION	# of ROOMS	OPEN	STATUS	YEAR EST.
1996	Olde Village Inn	Sandy Cove	13	May - Oct.	Active	1976
	Sandy Cove B&B	Sandy Cove	3	June - Oct.	Not Active	1985
	Wingberry House B&B	Sandy Cove	3	June - Nov.	Not Active	1981
	Brier House	Westport	3	Apr. - Oct.	Not Active	-
	Brier Island Lodge	Westport	24	Apr. - Dec.	Active	1989
	Westport Inn	Westport	3	May - Oct.	Not Active	1989
	Total		49			
	Moby Dick Campground	Central Grove	15 WE	May - Oct.	Not Active	1993
YEAR	NAME	LOCATION	# of ROOMS	OPEN	STATUS	YEAR EST.
1991	Olde Village Inn	Sandy Cove	15	May - Oct.	Active	1976
	Sandy Cove B&B	Sandy Cove	3	June - Oct.	Not Active	1985
	Wingberry House B&B	Sandy Cove	3	June - Nov.	Not Active	1981
	Brier House	Westport	3	Apr. - Oct.	Not Active	-
	Brier Island Lodge	Westport	10	May - Oct.	Active	1989
	Westport Inn	Westport	3	May - Oct.	Not Active	1989
	Total		37			
YEAR	NAME	LOCATION	# of ROOMS	OPEN	STATUS	YEAR EST.
1985	Olde Village Inn	Sandy Cove	17	May - Oct.	Active	1976
	Wingberry House B&B	Sandy Cove	3	June - Nov.	Not Active	1981
	Total		20			
	Digby Neck-Champlain Trailer Park	Sandy Cove	72 WE, 9Sew, 25U	June - Sept.	Not Active	-

Source: (Compilation of information from Doer's & Dreamer's Guides, WVDA Business Database, Reistry of Joint Stock)

Further, a comparison of the accommodation sector for Digby County and Digby Neck/ Islands for the past five years (2000 – 2004) is shown in Table TO-2.

Table TO - 2

Accommodation Data			
Rooms Sold	Digby Neck/Islands	Digby County	Digby Neck as % of Digby County
2000	5,115	79,362	6.9%
2001	4,931	77,002	6.4%
2002	5,697	78,059	7.3%
2003	5,363	74,856	7.2%
2004	5,629	76,484	7.3%

The most recent analysis of the potential tourism opportunities on Digby Neck/Islands is contained in the “Concept Plan and Feasibility Assessment for a Bay of Fundy Discovery Centre” prepared for the Western Valley Development Authority in May 2002. In this study, whale watching is considered the number one tourism activity with the following whale-watching statistics:

<u>Year</u>	<u>Statistics</u>
1997	15,453
1998	17,516
1999	19,917
2000	19,048
2001	21,834

This study indicates that 56% of the whale-watching tours originated from Brier Island and 30% from the Petite Passage area and, that Digby Neck/Islands accounts for about 15% of the total Maritime market of 140,000 participants or 21,834 persons. In 2001, this would translate into about \$562,000. in tourism expenditures at \$25.00 per person or \$875,000. at \$40.00 per person in 2005. Other ecotourism activities include bird watching, hiking, and fishing.

The 2000 Nova Scotia Visitor Traffic Flow Report analyzes non-resident visitor traffic for Digby and Brier Island – see Table TO-3, and trip purpose and region of origin – see Table TO-4.

Table TO - 3

Visitor Traffic

2000⁶	Brier Island	Digby
Party pass-throughs	1,700	57,600
Party stops	1,300	5,200
Party visits	13,000	23,700
Overnight party trips	2,400	27,800
Total party trips	18,400	114,300
Parties	18,100	94,200
Party nights	5,100	57,500
Capture rate	91%	50%

Definitions

Party Pass Throughs: Represents the number of non-resident party trips passing through or by a specific community without stopping.

Party Stops: Represents the number of non-resident party trips involving a stop of less than one-half hour in a specific community.

Party Visits: Represents the number of non-resident party trips involving a stop one-half hour or more, but not overnight, in a specific community.

Overnight Party Trips: Represents the number of non-resident party trips involving a stop of one or more nights in a specific community.

Total Party Trips: Represents the sum of party pass throughs, party stops, party visits and overnight party trips for a specific community.

Parties: Represents the total number of unique, non-resident parties passing through, stopping, visiting or staying overnight in a specific community.

Party Nights: Represents the total number of nights stayed by non-resident parties in a specific community.

Capture Rate: Percent of total party trips through a community that involved a stop, a visit or an overnight stay.

Table TO - 4

Visits by Trip, Purpose and Region

	Brier Island	
	Total Party Trips	Party Nights
Trip Purpose		
Business	200	0
Pleasure (purchased accommodation)	13,700	2,500
Visiting friends & relatives	4,200	2,500
Other	400	0
Region of Origin		
Atlantic Canada	1,600	1,200
Other Canada	6,400	1,500
International	10,400	2,400

The third source of visitor information available in 2001 is the number of passengers taking the two ferries that operate on Digby Neck/Islands. This data is shown in Table TO-5 and indicates a total visitor traffic of 43,509 persons.

Table TO - 5

Estimate of Visitors to Digby Neck/Islands Based on Average Ferry Traffic 2002 - 2004

	Total Vehicles	Resident Vehicles	Visitor Vehicles
January	3,792	3,792	0
February	3,760	3,760	0
March	4,408	4,408	0
April	4,928	4,928	0
May	5,820	4,500	1,320
June	7,123	4,500	2,623
July	9,789	4,500	5,289
August	11,027	4,500	6,527
September	7,917	4,500	3,417
October	6,043	4,500	1,543
November	4,769	4,769	0
December	4,812	4,812	0
Total	74,188	53,469	20,719
Average Jan-Apr 4,411 and Nov/Dec Say 4,500			2.1 people /party
Total			43,509

A final indicator of tourist visitation is the Visitor Information Centre Statistics published by the Evangeline Trail Tourism Association for the Visitor Information Centre at Tiverton.

<u>Year</u>	<u>Statistics</u>
1999	4,994
2000	3,698
2001	4,388
2002	14,268
2003	2,946
2004	2,606

This data shows an anomalous year in 2002 which is not supported by other data presented previously.

9.3.14.2 Analysis

The above tourism statistics provide insight into the scale of the existing tourism industry on Digby Neck/Islands. During the past ten years (1996-2005) the number of rooms available on Digby Neck/Islands has almost doubled from 49 in 1996 to 84 in 2005. A major indicator of the performance of the tourism industry is the number of rooms sold. On Digby Neck/Islands, the number of rooms sold during the peak tourist season (June – September) averaged about 5,000 room nights during 2000 to 2004 as compared to 59,000 for the whole of Digby County. This number of room nights sold during peak season has remained fairly constant during the past five years in Digby County and on Digby Neck/Islands. Digby Neck/Islands represents 6.9% of the room nights sold in Digby County.

Another indicator of performance of the accommodation sector of the tourism industry is occupancy rate. The average occupancy rate for Digby Neck/Islands (2000 – 2004) during peak season was 54.2% as compared to 64.9% for Digby County. This would indicate a lower capture rate on Digby Neck/Islands which could be due to a variety of reasons.

A primary tourist attraction on Digby Neck/Islands is whale and seabird cruises (adventure tours). In the early 1990s, the fishing industry was undergoing a rationalization due to the decline of the groundfish industry. A government funded program – the TAGS program – was put in place to encourage fishermen to seek other types of employment and leave the fishing industry to reduce capacity. For many coastal communities the TAGS program offered alternatives to fishing while creating opportunities for people in the fishing industry to use their skills, knowledge, and equipment in a “new” sustainable business. The tourism sector fit this new opportunity specifically whale and seabird cruises as well as campgrounds and fixed roof accommodations. Adventure tours by the mid 1990s began its own rationalization and by 1997 an over supply of adventure tour operators versus demand came into question – see – The Economic Planning Group of Canada 1997, Ref. 173. In 2004 there were ten adventure tour operators on Digby Neck/Islands. This number of operators has remained fairly constant for the previous five years. Although one whale and seabird cruise operator has

an office in Little River, the closest departure port to the proposed Whites Point quarry for tours is East Ferry, which is approximately 8 km away from the quarry property. Further, the majority of ports of departure for tours are on Long Island at Tiverton and Freeport and on Brier Island at Westport – see **Map 4**.

Quantitative Assessment

An order of magnitude of the economic impact of tourism for both Digby County and Digby Neck/Islands for 2004 was estimated. Data from the Department of Tourism, Culture, and Heritage was used – see Table TO-6 for provincial (Nova Scotia), sub-provincial (Annapolis Valley), regional (Digby County), and local (Digby Neck/Islands).

Table TO - 6 - Economic Impact Attributable to Tourism - 2004

	Province of NS	Annapolis Valley	Digby County(1)	Digby Neck /Islands(2)
Tourism Revenue (000,000)	\$1,314.0	\$170.8	\$42.0	\$3.1
Payroll (Direct & direct) (000,000)	\$513.6	\$66.8	\$16.5	\$1.2*
Employment (Direct & Indirect)	33,900	4,400	1,086	80*
Room Nights Sold	2,2569,600	309,900	76,484	5,629

Room nights sold are used as the basis for estimating tourism expenditures at the county and local levels. Using this approach and as shown in Table TO-6, tourism revenue for Digby County is estimated at \$42 million and \$3.1 million for Digby Neck/Islands. Digby Neck/Islands would account for 7.4% of all tourism expenditures in Digby County. Of this total revenue of \$3.1 million for Digby Neck/Islands, a total payroll of approximately \$1.2 million would be paid to 80 tourism sector workers for an average annual salary of \$15,000. This total payroll of \$1.2 million paid to 80 workers in the tourism industry is approximately equal to the \$1.2 million payroll that will be paid to operate the Whites Point quarry annually.

Qualitative Assessment

A similar quarry project, directly visible from a tourist destination area was investigated. Martin Marietta operates a major aggregate quarry at Cape Porcupine near the Canso Causeway. Aggregate from this quarry is exported to the United States by ocean-going vessels similar to those proposed for the Whites Point quarry. The Martin Marietta quarry is located at the gateway to Cape Breton Island, a world-renowned tourism destination. The quarry operation is directly visible, about 2 km across the Strait of Canso, from the Nova Scotia Visitor Centre located on Cape Breton Island.



View of Martin Marietta Quarry from the Nova Scotia Tourism Office - in Cape Breton

This Visitor Centre at Port Hastings is the busiest in Nova Scotia and has the highest visitor traffic flow of 430,000 person trips in Nova Scotia.

To assess the potential impact the quarry operation at Cape Porcupine may have on the tourism industry in Cape Breton, the manager of the Nova Scotia Visitor Centre was consulted. Questions from visitors about the quarry are raised. It is estimated that on a typical busy day with 2,000 visitors, approximately 40 may ask a question about the quarry. The nature of the questions varies greatly. About half are general curiosity – where the product goes, etc. The other half could concern questions related to the environment. This is especially the case if dust levels are visibly high. Commentary by the Visitor Centre manager indicated they have not heard anyone express a view that the quarry operation has ruined their opinion of Cape Breton and will deter them from making a return visit.

In summary, the proposed Whites Point quarry is not visible from the “Digby Neck and Islands Scenic Drive” (Hwy #217) or from any tourist accommodations (fixed roof or campgrounds), adventure tour ports, designated heritage buildings or the proposed sites for the “Discovery Centre”. Also, since the greatest concentration of whales and whale watching effort does not occur along the Digby Neck coast of the Bay of Fundy, views of the quarry and marine terminal from tour boats will not be common.

9.3.14.3 Mitigation

The majority of the coastline of the quarry site will be maintained in its natural state with an environmental preservation zone. Along the coast, expanded preservation zones are proposed at sensitive areas. This zone will provide some visual buffer along the coast. Since the quarry will be developed in increments, the land south of Whites Cove Road along the Bay will remain undisturbed for many years. The land north of Whites Cove Road will be initially developed with the construction of environmental control structures. This area is also the first priority for reclamation, especially inland from the coast between the environmental preservation zone and the sediment retention ponds berms.

9.3.14.4 Monitoring

Public participation is proposed to continue during quarry construction and operation. Bilcon of Nova Scotia Corporation intends to re-establish the Community Liaison Committee (CLC) that was established as a result of the permitting of the 4 hectare quarry at the Whites Point site in 2002. In this regard, a tourism industry representative from the area will be invited to participate on this committee and monitor industry activities.

9.3.14.5 Impact Statement

Tourism

Since the quarry operation will not be visible from surrounding land tourist attractions and views from the water from adventure tour boats are anticipated to be infrequent, this would result in a *long term, insignificant negative effect, of regional scale.*

9.3.15 Economy - Land Use and Value

9.3.15.1 History of the Land Uses of the Site

Past

The archaeological assessment carried out by Dr. Watrall (**Ref. Vol. VI, Tab 35**) found no evidence of land use at Whites Cove by aboriginal peoples nor was there any settlement by the Acadians as they expanded outward from the Annapolis area. The first waves of English-speaking settlers bypassed Digby Neck, although what is now Digby County did receive its first European settlers with the arrival of the New England Planters beginning in 1760.

All of Digby Neck was granted to a group of Halifax officials in 1765 but non-fulfillment of the terms under which the grant was made led to the land being escheated. In 1783-84, much of present day Digby County was granted to the refugees of the American Revolution. Much of Digby Neck was laid out in plots for the refugees and much of the subject property was granted to Joseph Barton. This grant was confirmed to the heirs of Joseph Barton but it appears that long before the new grant, Barton's children had moved back to New Jersey (**Barry Moody, Ref. Vol. VI, Tab 33**).

The grants to the heirs of Joseph Barton and others in 1801 were made with certain stipulations, primarily concerning the clearing of land, the building of a house, and the establishment of a farm. One of the terms of the grant was that if the land was not suitable for farming, the grantee was to establish a stone quarry and employ at least one man to work it for every fifty acres granted (Barry Moody).

In 1648, the two remaining Barton heirs sold the subject parcel to Robert Timpany and the property would be held by Digby Neck families for the next 150 years. Various deeds mention houses and other buildings at Whites Cove (**Barry Moody, Ref. Vol. VI, Tab 33**) and it would appear that in 1877, four families lived in Whites Cove and that Whites Cove was occupied on a year-round basis from approximately the 1860's to the end of the 19th century.

The subject property would have been very difficult for the practice of agriculture (but not impossible as traditional knowledge of farming on the site shows) due to the slopes and poor soil conditions but the proximity to the Bay of Fundy would have enabled fishing activities and at some time in the 19th century "Fishing Privileges" at Whites Cove came into existence. Even after Whites Cove was abandoned by the last family, the Cove continued to be used as a launch and haul out facility for fishing boats up until the late 1940's with access being provided by the Whites Cove road.

In the early 1950's, the area parallel to the shore line was extensively used as a gravel pit and apparently much of the material taken from the pit was used in the construction of Highway #217. From the 1950's to the present time, the property has seen little activity apart from the clear cutting of the timber on the higher ground in 2001. However, the Cove was used for recreational walking and picnics during this period and the Whites Cove road gave access to beach harvesters for dulse and periwinkles. No dulse or periwinkle harvesting has been observed during the past three years.

Current

There are no current activities taking place on the subject property other than the activities of the Proponent. In 2002, a permit was granted by the NSDEL for a less than 4 Ha quarry. Approximately half the 4 Ha was cleared and grubbed and environmental control structures constructed. There is little merchantable timber left on the property following the clear cut operation of 2001 and as noted above, no dulse or periwinkle harvesting has been observed over the past three years.

Discussions with the periwinkle harvesters (personal contact Ms. Wanda VanTassel) indicates that they are still anxious to access the beach areas from Highway #217 along the Whites Cove road and Bilcon has committed to providing beach access to harvesters at locations to be designated by the harvesters.

9.3.15.2 Land Uses Within the Project Site and In Other Areas That May be Affected By the Project Development

Planned

Planned uses by Bilcon within the quarry site are the subject of this EIS, but in brief, they comprise a crushing and screening operation, a quarry face, a shiploading facility, and a maintenance facility.

The abandoned road currently owned by the NSDTPW has not been maintained by the Department for many years and is severely eroded. The Department's plans for this road do not include maintenance but there is an issue of the extensive flow of sediment into the Bay of Fundy that needs to be addressed. The road, however, does provide access for beach harvesters though none have been observed over the past four years.

The small 50' x 50' parcel in private hands is apparently planned as a cottage lot. It is understood that while the owners have a permit for an on-site sewage disposal system, a building permit has been denied on access issues for emergency vehicles. There is also an additional problem due to the lack of a right-of-way to the lot which is the basis of an unresolved action currently in the courts.

Existing

At the present time, no use is being made of the project site other than the activities of Bilcon in assembling data for the EIS.

9.3.15.3 Existing Land-based Infrastructure Likely To Be Affected By The Project

Wells

Reference to the Hydrogeology section of the EIS (**paragraph 9.1.3**) shows that nineteen wells are sufficiently close to project activities that they could be affected. However, given that the wells are all located on the eastern site of the watershed at significant distance from the project and that they are all located in the till layer or in the middle or lower flow unit of basalt (and that quarrying will take place only in the upper flow unit) the risk of affecting these wells is extremely unlikely.

Six new monitoring wells have been drilled in strategic locations, including the eastern portion of the watershed, to supplement the original four core holes and these will be monitored on a continuous basis to determine if any changes to the water table are taking place due to the quarrying activities on the western portion of the watershed. Should any well be determined to have been affected by quarrying activities, Bilcon has committed to drilling a new well (**Paragraph 9.1.3**)

Waste Management Areas

Neither the Village of Little River nor any of the other communities along the length of Digby Neck have waste water management systems and, hence, none will be affected by the project. Individual buildings rely on on-site sewage disposal systems. These systems were approved by the Regional Health Board before the responsibility was transferred to the NSDEL when the On Site Sewage Disposal Regulations came into force.

Individual on-site systems are installed wither/whether? close to the surface in a field or contour type system when the soils are suitable or above ground in locations of poor soils or high water table. These systems will not be affected by the project.

9.3.15.4 Activity Areas Or Trails That May Be Affected By The Project

The only trail on the proposed quarry and marine terminal site is the unmaintained Whites Cove Road from Highway #217 to Whites Cove. At the time that Whites Cove was the site of a boat haul up and fishing activities were carried out at Whites Cove, this road was relatively well used. When fishing activities ceased in the early 1950's and Whites Cove was the site of a pit operation, the road was used to haul gravel for the reconstruction of Highway #217. Since the mid 1950's, the road has fallen into disrepair and is no longer maintained by the NSDTPW (NSDTPW).

Whites Cove Road, however, was used since the mid 1950's as an access road to the Whites Cove beach, both for beach harvesting and as a recreational trail. In the more recent past, the road has been used as an ATV trail and severe erosion now prevents access for most four-wheel drive vehicles.



Whites Cove Road

If Bilcon is unable to acquire Whites Cove Road from NSDTPW, the road right-of-way will be fenced to prevent access to the quarry or marine terminal property. Access will still be provided across quarry property to traditional beach harvesting areas as noted elsewhere in this report and to the beach adjacent to the road.

9.3.15.5 Coastline Patterns

The Digby Neck coastline pattern along the Bay of Fundy is relatively unobstructed and homogeneous. Basalt bedrock dominates the beach, intertidal zone and nearshore waters except for the sandy beach and waters at Sandy Cove west. This area of coastline is straight and interspersed with numerous small coves. Many of these coves were historically used for launching and hauling out small fishing boats. Presently, only a few coves along Digby Neck and the Bay of Fundy support active fishing operations, those at nearby Whale Cove, Sandy Cove west, Centreville, and Gullivers Cove. The previously used coves, like Whites Cove, have been abandoned as harbor improvements have been made at the larger, more accessible sites. The coastline of the Whites Point quarry and Marine Terminal property extends approximately 3.1 km (1.9 mi.) along the Bay of Fundy.



Digby Neck/Bay of Fundy Coastline South from Whites Cove - Photo by Ron Cooper

No designated protected areas, special harvesting sites, transportation corridors, recreation areas, ecologically important areas, or movement areas are known to exist along the Digby Neck/Bay of Fundy coastline.

A critical wildlife habitat for wintering harlequin ducks is known to exist at Trout Cove adjacent to the Centreville Harbour. Also, critical plant habitat is known to exist along the south branch of the Little River in the Tiddville/East Ferry area. A provincial picnic park is located at Lake Midway.



Digby Neck/Bay of Fundy North from Whites Cove - Photo by Ron Cooper

9.3.15.6 Property Values in the Area Affected by the Project

Since the granting of a Permit by the NSDEL to construct and operate a 4 Ha quarry at Whites Point in April 2002, there has been extensive coverage of the project by the local press and through the Panel Review Process for the larger quarry and marine terminal. In fact, one of the key findings of the Attitude Survey (Appendix 3) was the exceptionally high awareness of the project – 96% and constant across all age categories.

It can be assumed, therefore, that persons in the area covered by the Attitude Survey (Municipality of the District of Digby and the western portion of Annapolis County) buying property on Digby Neck and the Islands would be aware of the proposed larger quarry and marine terminal. Persons from outside of the area covered by the Attitude Survey would have had much less exposure to the project. However, prospective purchasers of property on Digby Neck and the Islands could hardly be unaware of the project as signs opposing the quarry are dotted along Highway #217 and most realtors would disclose the proposed project to prospective purchasers, particularly if the property in question were in Sandy Cove, Mink Cove, Little River, or East Ferry areas.

It is reasonable to assume, therefore, that purchasers of properties on Digby Neck and the Islands since the Spring of 2002 would have been aware of the proposed project. A review of the real estate sales statistics(Appendix 35) from 1999 to mid 2005 for Digby Neck and the Islands reveals the following:

- 1 From 1999 to 2002, 40 properties were sold
From 2002 to mid 2005, 90 properties were sold
- 2 From 1999 to 2002, 45% of the properties sold in 1-3 months
From 2002 to mid 2005, 58% of the properties sold in 1-3 months
- 3 From 1999 to 2002, 4 properties were sold in Sandy Cove and 2 in Little River
From 2002 to mid 2005, 9 properties were sold in Sandy Cove and 8 in Little River.

Note that Sandy Cove and Little River are the closest communities to the proposed quarry and marine terminal.

Due to the variable nature of the individual properties sold, it is not possible to compare values in the two time periods, but anecdotally property values on Digby Neck and the Islands are said to have risen in value during these two time periods in the same relative amount as one would expect given the rise in values in the rest of the Municipality of the District of Digby.

There is no question that there has been considerable interest in Digby and Annapolis County properties over the past five years from buyers outside of the local area (Halifax, Ontario, Western Canada, the U.S., and the U.K.) and this interest appears to be still growing. The values of properties in the Digby and Annapolis areas are still seen as bargains relative to the areas noted above, even with the significant increase in value of the Canadian Dollar over the past two years. Generally speaking, buyers from outside of the local area are interested in waterfront or at least water-view properties and prices have risen significantly for these properties. A very significant percentage of properties on Digby Neck and the Islands are now held by non-residents, primarily from the U.S.

It would appear from the real estate statistics for Digby Neck and the Islands referenced above, there is no general perception among buyers that the proposed quarry and marine terminal at Whites Point is likely to negatively affect property values on Digby Neck and the Islands. However, given the permitting and construction of the quarry and marine terminal, it is possible that the property values in the immediate area of the project could be affected.

Reference to three quarries or marine terminals in Nova Scotia and British Columbia (Auld's Cove, Hantsport, and Sechelt) noted in the Gardner Pinfold Report (**Ref. Vol VI, Tab 32**) shows that the effect may not necessarily be negative. Having the marine terminal in the view plane certainly appears to negatively affect waterfront land values but this effect is not apparent in Hantsport or Auld's Cove.

As noted earlier in this report, Bilcon has been acquiring properties adjacent to the proposed project as they become available. These acquisitions will provide an extensive buffer zone around the active site which will tend to mitigate perceived diminution of property values. It is also possible that if the Proponent is successful in hiring local people, there may be a positive effect on property values in the local area as some employees may wish to relocate closer to the project location.

9.3.15.7 Comparative Quarries

9.3.15.7.1 Parker Mountain Aggregates

Investigation of land development activities in proximity to a basalt rock quarry in neighbouring Annapolis County were conducted (Kern 2004 ,Ref. 27). The Parker Mountain Aggregates quarry is located on Parker Mountain Road in Granville Ferry adjacent to the Town of Annapolis Royal. The quarry has been in operation for approximately twenty years. Parker Mountain Road is a connector road between Highway #1 and the Shore Road along the Bay of Fundy. Development consists of various land uses including residential, industrial, institutional, commercial/retail, and tourism. The quarry operation is highly visible when proceeding toward the Bay of Fundy from Highway #1.



Parker Mountain Aggregates Quarry - Annapolis County - Photo by David W. Kern

To assess the effects the quarry has had on surrounding development patterns for the previous 15 years, the Municipality of Annapolis County Development and Building Permit Reports were reviewed. Analysis of development within three 2 km zones of the quarry by type and value was performed. The greatest amount of estimated construction value over the past 15 years occurred in the zone most affected by the quarry from a visual (view plane) and operational standpoint (heavy truck traffic).

This development zone within 2 km of the quarry included new residential housing, housing additions, new institutional development, new residential recreation, craft shop, and various accessory buildings. Most recently, a new residential unit was constructed within 300 m of the active quarry area.

In the case of the Parker Mountain Aggregates quarry, a greater amount of development occurred within the 2 km zones of the quarry than within the 2 – 4 km zone. More specifically it was concluded that:

- The community living and working along Parker Mountain Road continued to invest in new development opportunities and to enhance their quality of life within a 2 km radius of the operating quarry over the past 15 years.
- Institutional, residential, and tourism development continued to make significant investment within a 2 km radius of the operating quarry over the past 15 years.
- A greater diversity of type of development occurred in the area most effected visually and by quarry operation than in the control area (the 2 – 4 km zone) and
- A greater amount of investment in development occurred in the area most affected visually and by quarry operation than in the control area (the 2 – 4 km zone).

9.3.15.7.2 Tilcon Quarry

The Tilcon trap rock quarry in North Branford, Connecticut is located immediately adjacent to Lake Gaillard which supplies 45% of the water for the New Haven metropolitan area via a tunnel beneath the quarry. There are three schools located within 800 m of the quarry and all were built after the quarry had been in operation for many years. Some of the houses and most of the commercial buildings that are within 800 m of the quarry have been built recently. Crushed rock is transported by rail to the marine terminal in Pine Orchard which is set close to a significant number of expensive houses. Both the quarry and railroad are seen as good neighbours to Branford(Appendix 41).

9.3.15.8 Mitigation

There appears to be no general perception among buyers that the quarry and marine terminal is likely to affect property values generally on Digby Neck and Islands. However, there is a possibility that property values may be affected in areas immediately adjacent to the operation. It is proposed that an evaluation by a qualified real estate appraiser take place on residential properties within 800 m of the active quarry prior to construction and a re-evaluation be carried out five years later to determine whether value has been lost. Any loss so determined would be compensated by Bilcon.

9.3.15.9 Monitoring

Monitoring would be in the form of comparing property values prior to construction and after a period of five years. Valuations would be conducted by a qualified real estate appraiser

9.3.15.10 Impact Statement

Property Values

While property values in general on Digby Neck and Islands are unlikely to be affected, those properties within 800 m of the active quarry could be marginally affected resulting *in an insignificant negative effect in the local area.*

9.3.16 Recreation

9.3.16.1 Research

Historically, the Whites Cove Road has provided local residents with access to the Bay of Fundy coastline for recreational purposes. Traditional community knowledge consultations indicate the Whites Cove area was used by the local people for social/cultural/recreational activities. These activities included family picnics, lobster/corn boils, and leisure afternoons at the shore. Also, children enjoyed picking berries (cranberries and gooseberries) as treats for the family (Elgin Research 2005 **Ref. Vol. IV, Tab 23**). Other recreational/resource use of the quarry site by local people have included hunting and trapping.

Over the years, the Whites Cove Road has deteriorated. Severe erosion on the steep gradients makes it presently accessible primarily by four-wheel drive and all terrain vehicles. Presently, no recreation facilities exist on the proposed quarry site. However, a small parcel of private land, approximately 50 feet by 50 feet, exists near the Whites Cove shore. A trail from the terminus of the Whites Cove road leads in a northerly direction across the quarry property. This trail is presently used by all terrain vehicles and presumably has limited hiking use.

Nearby recreation facilities exist at a Provincial Picnic Park at Lake Midway. This park is located approximately 10 km north of the quarry site on Highway #217. Improved access to the Bay of Fundy shore also exists at the nearby villages of Whale Cove and Sandy Cove approximately 4 to 5 km south and north of the quarry site respectively.

9.3.16.2 Analysis

Existing access, via the public Whites Cove Road, presently exists from the southeast property line of the proposed quarry to the Bay of Fundy shore. In essence, Whites Cove Road provides access to Crown owned land below the ordinary high water line. This section of road is accessible by all terrain vehicles or by foot. The present trail leading in a northerly direction along the coast is over private land. Also, as previously mentioned, access to certain coastal areas may be restricted during blasting for safety reasons. Again, for public safety, access to the proposed industrial quarry site would be restricted for recreational use without permission of Bilcon of Nova Scotia Corporation.

9.3.16.3 Mitigation

Access to Crown lands via the public Whites Cove Road cannot be restricted. Unrestricted access along the shoreline on Crown lands below the ordinary high water line would be maintained. As with other private lands within the province, permission to trespass across the quarry property could be granted by Bilcon of Nova Scotia Corporation.

9.3.16.4 Monitoring

To ensure the safety of recreational users, especially during periods of blasting, a “check in” procedure at the quarry would be initiated. Registration at the quarry office would be required before any recreational user is permitted on quarry property.

9.3.16.5 Impact Statement

Recreational Use

Access to Crown owned lands via the public Whites Cove Road and access along the shoreline below the ordinary high water line would continue resulting in a ***long term, neutral (no) effect, of local scale.***

9.3.17 Human Health and Community Wellness

9.3.17.1 Introduction

Human health and community wellness in the region of the proposed Whites Point quarry and Marine Terminal was investigated by AMEC Earth and Environmental Limited – see AMEC, 2005, **Ref. Vol. VI, Tab 34**. This study addresses human health and community wellness issues raised by the public and those required by the Environmental Impact Statement Guidelines issued in March 2005. The population health approach is used to describe existing conditions found in the region prior to construction and operation of the proposed project.

The following definitions of health have been adopted: “health is a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity” (World Health Organization 1948) and “ the extent to which an individual or a group is able to realize aspirations and to satisfy needs to cope with changes or cope with the environment” (World Health Organization 1984). Many of the issues concerning community wellness are addressed in **paragraph 9.3.22** “Socio-cultural Patterns”.

Three community health components were selected as health determinants.

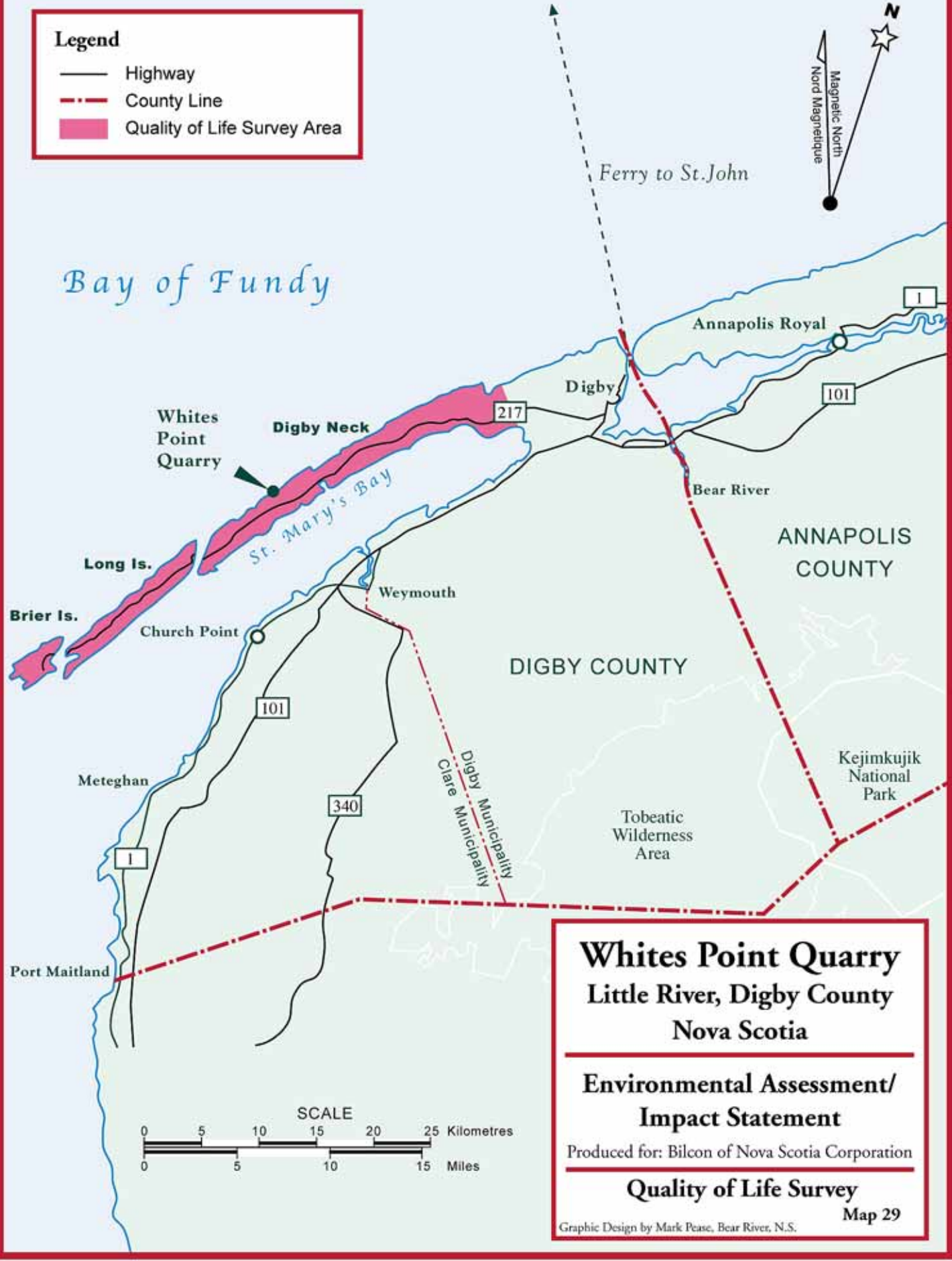
- Social and economic environmental components e.g. demographics, population health, employment, income, education, and social status
- Physical environmental components e.g. air, water, and soil quality; contaminants; noise and vibration; and light
- Individual factors e.g. personal health and coping skills

The use of determinates to understand the health of a population is also known as the population health approach which was officially endorsed in 1994 by the Canadian Federal/Provincial/Territorial Advisory Committee on Population Health. Recently, the Public Health Agency of Canada (2005), the Nova Scotia Department of Health (summer 2002), and the South West Nova District Health Authority (2005) are all promoting the population health approach. This approach is also suitable in the context of environmental impact assessment (Health Canada, 2005).

Baseline data was collected for the region. Primary data sources included interviews and surveys. Two surveys were conducted – an “Attitude Survey” in the Digby/Annapolis region with additional emphasis on the community of Digby Neck which is within close proximity of the proposed quarry – see **Map 7** and a “Quality of Life Survey” of the Digby Neck and Islands community – see **Map 29**. The results of these surveys are contained in AMEC, 2005 (**Ref. Vol. VI, Tab 34**).

Legend

- Highway
- - - County Line
- Quality of Life Survey Area



Whites Point Quarry
 Little River, Digby County
 Nova Scotia

**Environmental Assessment/
 Impact Statement**

Produced for: Bilcon of Nova Scotia Corporation

Quality of Life Survey
 Map 29

Graphic Design by Mark Pease, Bear River, N.S.

Secondary data sources included statistical information from the Nova Scotia Department of Health, the South West Health District Health Authority (DHA 2), and Statistics Canada (Canadian Community Health Survey and General Social Survey). In several instances, customized statistical data at the community level was prepared by Statistics Canada, for Bilcon, as contained in the “Community Profile” **paragraph 9.3.7**.

Regional data indicators of health status of a population (medical determinates of health) included the following: (AMEC, 2005 **Ref. Vol. VI, Tab 34**).

- Body mass index
- Population with arthritis/rheumatism
- Diabetes
- Asthma
- High blood pressure
- Healthy child development and
- Cancer occurrence

9.3.17.2 Mental and Social Health

Mental health issues have been reported as rather high in Digby County (SWHDHA 2005). Six percent of the population of the SWHDHA is estimated to be suffering from mood disorders and 12.2% from anxiety disorders (SWHDHA 2004). The following brief of the research carried out in the “Stirling County” studies summarizes and provides further insight into this condition.

For over fifty years, unique research has been on going in the regional and local study area for the Whites Point Quarry and Marine terminal in the field of Psychiatric Epidemiology/Community Mental Health. In 1948, Dr. Alexander Leighton, through the Department of Psychiatry, Faculty of Medicine, Dalhousie University, Halifax, Nova Scotia, assembled a premier research team that included multiple disciplines to conduct this research. Known as the “Stirling County Studies”, it is considered by mental health professionals to be one of the most important bodies of research in the field. (“Stirling County” is the fictitious name given to the area of Digby County for the purpose of the study).

It should be recognized that this study has been controversial in Digby County. Great care has been taken to preserve identities, but the long-term residents were initially very distressed that their community was portrayed in the study. It has only been in recent years that the residents of Digby County realize the magnitude of the constructive contribution the county has made to the field of mental health. The recent data has been published with little or no acknowledgment from the general population. Therefore, as requested in paragraph 9.3.7 Human Health and Community Wellness of the Environmental Impact Statement Guidelines for the Whites Point Quarry and Marine Terminal (Ref. 37) pertinent findings of the study are presented as a part of this EIS to provide temporal context in this aspect of human health.

This study was the first time that the social contexts were examined with reference to their association with persistent psychiatric etiologies. Dr. Leighton's pioneering work on such a vast scale in psychiatric epidemiology and cross-cultural psychiatry has yet to be fully assessed. We know however, that many scientists working in psychiatric research have been strongly influenced in their research design, methodological procedures and measuring instruments by Dr. Leighton's perspective. Many of the evaluative and psychometric tools that were developed for this study have become pivotal in the diagnosis and treatment of mental illness. Considered to be the gold standard for longitudinal studies in community epidemiology, (in particular the concept of community mental health), the studies are based on a comprehensive health survey designed by Cornell University that has been replicated for over fifty years. This is a legacy that is likely to become still more important in that it is rooted in scores of institutional settings. The current research chair is Dr. Jane Murphy (Leighton). Dr. Murphy, the spouse of Dr. Alexander Leighton, is a professor affiliated with Harvard Medical School and the Massachusetts General Hospital, where she is Chief of Psychiatric Epidemiology. In recent correspondence with her, Dr. Murphy stressed that the research is ongoing, and she is in the process of publishing the data from 2002. Hence, for well over half a century, the field of mental health has benefited from the research in the Stirling County Studies.

The site for the Stirling County Studies is Digby County, Nova Scotia – see **Map 30** . The studies, based on data collected from 1952 to 2002, is a long term epidemiological investigation of psychiatric disorders. Pertinent references include: Leighton 1959, Ref. 134, Hughes 1960, Ref. 122, Leighton 1963, Ref. 135, Murphy 1988, Ref. 143, Murphy 1991, Ref.143, Murphy 1994, Ref 145, and Murphy 1998, Ref.144.

Research methods included the Diagnostic Interview Schedule (DIS) which was employed to gather information from a representative sample of the residents of the county to assess the prevalence of the different types of depressive symptoms defined as major depressive episode (MDE) and/or dysthymic disorder (DysD). Eighteen depressive symptoms were identified. Focusing on the associated symptoms enumerated through symptom groups, the strongest associations were for “feeling worthless” and “thought disturbance”, followed by “sleep disturbance”. A somewhat different profile of associations pertained for the individual symptoms. After “feeling worthless”, next strongest was “trouble concentrating”, followed by “insomnia”. The weakest associations were for “weight gain”, “thoughts of death”, and “hypersomnia”.

With “feelings of worthlessness” especially prominent in the Stirling findings, such self-disparaging symptoms support the view that psychological symptoms are significant forerunners of depression. Self-disparagement may be particularly crucial in the progression toward clinical depression because it reflects loss of the idea that the “self” is a worthy person. It was noted in the studies that feelings of personal inadequacy deserve particular attention in the population at large because they are strongly associated with lifetime diagnoses and forecast the incidence of depression when people are followed over time.

Whites Point Quarry

Little River, Digby County
Nova Scotia

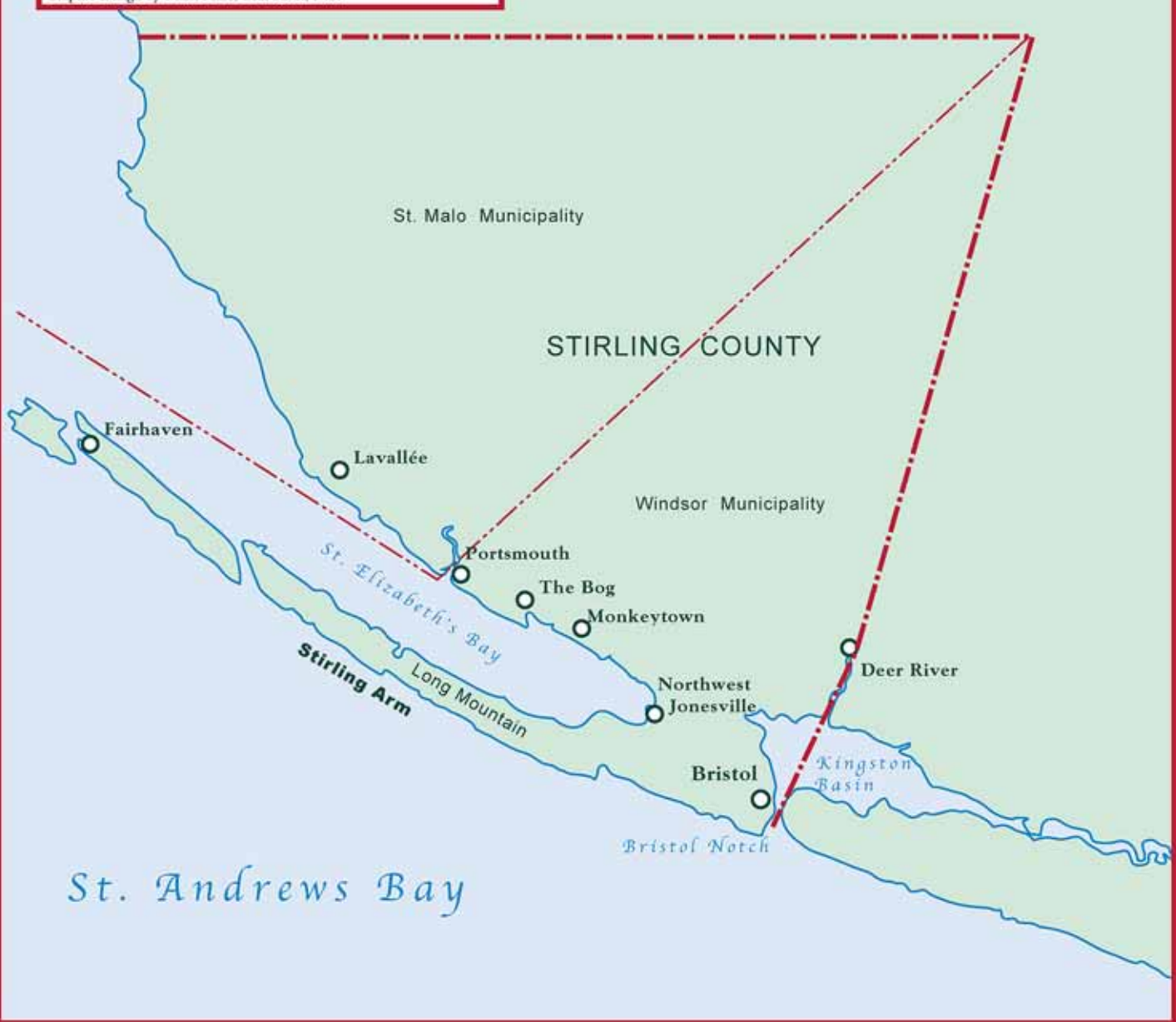
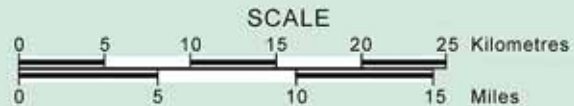
Environmental Assessment/ Impact Statement

Source of Information:
People of Cove and Woodlot, 1960

Produced for: Bilcon of Nova Scotia Corporation

"Stirling County" Map 30

Graphic Design by Mark Pease, Bear River, N.S.



The Stirling County studies estimated that 20% of the general population had an unaddressed need for psychiatric attention. The stability of the prevalence rates contrasts sharply with the fact that numerous social changes took place in the county over the 50 year study. There were, however, trends in the distribution of depression and anxiety by sex and age, especially an increased similarity in the overall rates for men and women in the age range of 40 to 69 years. While there are yet to be statistics published for the 2000 to 2002 data, it appears that there has been a consistency over time associated with the mental health status of the Stirling County participants. It is evident, however, that the studies show the rate of depression and depressive etiologies in the general population has increased, and it is paramount to note that the largest demographic group experiencing the increase in mental illness is the group aged 25 to 55. This age group is a primary component of a community's work force. It should also be noted that, according to Statistics Canada, the numbers of people in this demographic age group has declined in Digby County. Digby County has the second oldest aggregate age in the Province of Nova Scotia.

The reason for the above is that there is apparently a strong relationship between what is defined as "occupational position and psychopathology" (Leighton 1963, Ref. 135 and Murphy 1991, Ref 143). This appears to have remained a constant in that the group which consists of the chronically unemployed throughout the course of the study has consistently exhibited a significantly higher level of psychopathology as compared to persons who are employed in any capacity.

9.3.17.3 Framework

Potential physical environmental effects of the operation of the proposed quarry and marine terminal are the focus of the following human health assessment. Concerns expressed by the public during scoping sessions, comments on the public registry and on the Draft EIS Guidelines and by regulatory agencies will be addressed. Where health guidelines, standards, or thresholds exist, potential positive or negative effects of the quarry will be assessed in relation to these guideline criteria. If activities of quarry operations are expected to be within human health guideline criteria or regulatory requirements contained in the Nova Scotia Department of Environment and Labour's Pit and Quarry Guidelines or CCME guidelines, a significant effect on human health would not be expected.

Some physical environmental component health determinants have previously been included as VECs e.g. air quality (**paragraph 9.1.8**), noise and vibration (**paragraphs 9.1.9, 9.1.10, 9.1.11**), and light (**paragraph 9.1.12**). Following are additional VECs including drinking water quality, marine contaminants, land contaminants, and country foods. Quality of life components follow later in **paragraph 9.3.22** and assess determinants such as social relations, social capital, commercial patterns, and environmental quality of life.

9.3.18 Human Health – Drinking Water Quality

9.3.18.1 Research

The “Guidelines for Canadian Drinking Water Quality” set forth threshold criteria for various parameters. These guidelines are updated and published every spring in the form of a summary table. The April 2004 “Summary of Guidelines for Canadian Drinking Water Quality” (Ref. 64) are referred to for the purpose of assessing existing ground water quality at the Whites Point Quarry site. The guidelines for physical and chemical parameters are presented using three evaluation criteria.

MACs – maximum acceptable concentrations

IMACs – interim maximum acceptable concentrations and

AOs – aesthetic objective

It should be noted that some chemical and physical parameters have been identified as not requiring a numerical guideline – Ref. 64.

Ground water samples were taken from bore hole #1 – see **Map 12** in the basalt bedrock at the Whites Point Quarry site in September 2002. The samples were taken by Jacques Whitford Environment Limited and analyzed by PSC Analytical Services- see Appendix 42.

9.3.18.2 Analysis

All chemical and physical parameters met the MACs and IMACs guidelines as stated in the “Summary Guidelines for Canadian Drinking Water Quality (04/04) except manganese. Manganese exceeded the aesthetic objective (AOs) of less than or equal to 0.05 mg/L and is considered insignificant from a human health standpoint. Thus the existing baseline ground water quality data from the quarry site meets existing drinking water guidelines for MACs and IMACs and on-site wells, for domestic use are expected to provide good quality drinking water.

9.3.18.3 Mitigation

No mitigation is considered necessary. All wells constructed on-site for domestic water supply will meet the Nova Scotia Department of Environment and Labour’s regulations for the construction of water wells.

9.3.18.4 Monitoring

Chemical, physical, and biological well water parameters will be monitored both on-site and off-site at the specially constructed monitoring wells – see **Map 12**. Water samples will be taken from a monitoring well located on the quarry property line. Monitoring at this well will provide an early warning of any highly unlikely changes to the quality of drinking water at the quarry property line. Off-site monitoring will be conducted in the same ground water source as existing deep, domestic wells located in the immediate area along Highway #217. Monitoring in this ground water source will provide an early warning of any changes induced by off-site land uses that may affect the domestic water supply at adjacent residences.

As mentioned previously, public participation is proposed to continue during quarry construction and operation. Bilcon of Nova Scotia Corporation intends to re-establish the Community Liaison Committee (CLC) that was established as a result of the permitting of the 4 hectare quarry at the Whites Point site in 2002. In this regard, two neighbours with wells, adjacent to the quarry property will be invited to participate on this committee and be involved with the water well monitoring program.

9.3.18.5 Impact Statement

On-Site Drinking Water Quality

Since the ground water from on-site sources meets the “Summary Guidelines for Canadian Drinking Water Quality” for MACs and IMACs parameters, this would result in a ***long term, neutral (no) effect, of local scale.***

Off-Site Drinking Water Quality and Quantity

Quarry activities will be conducted in the upper basalt flow unit. Adjacent residential and industrial wells are either dug in till or drilled in the middle flow unit or deeper resulting in a ***long term, neutral (no) effect, of local scale.***

9.3.19 Human Health – Marine Contaminants

9.3.19.1 Research

The harvesting of marine organisms for human consumption is an important economic activity in the Bay of Fundy. As mentioned previously, heavy metal concentrations in sediments in the nearshore region of Whites Point were low as compared to other areas of the Bay. However, absorption and more importantly accumulation of metals in aquatic organisms is possible and could result in higher concentrations than those existing in the environment.

Contaminants such as metals have been measured in two important invertebrate fisheries – scallop and lobster – in the Bay of Fundy. Scallop from most of the Bay generally had metal levels comparable to those from uncontaminated areas (Bay of Fundy Ecosystem Partnership 2004, Ref. 99). Copper measurements in the tissues of lobster in the upper Bay of Fundy, predominately in a non-industrialized area, had levels as much as 30 – 100 times higher than industrialized areas. Copper concentrations of over 800 ug/g from upper Bay of Fundy lobster is unusually high. As with many other metals, Health Canada has no thresholds for copper levels in fishery products and implications to human health are uncertain.

The consumption of fish is a major pathway for heavy metals, such as mercury to transfer from the environment to humans. Since as much as 95% of the mercury present in fish is in the form of biologically active methylmercury, a great deal of attention has been placed in monitoring mercury in fish in the Maritimes. In this regard, Health Canada has set 0.5 ppm as a guideline threshold level for mercury in fish and fish products intended for human consumption. Higher levels trigger an advisory to limit the consumption of fish from the contaminated area. Mercury levels higher than the Health Canada guidelines have been detected in fish that inhabit the Bay of Fundy. Generally, fish from coastal waters have lower levels of mercury than fish in freshwater systems. Monitoring of mercury in fish such as herring has typically resulted in almost 1000 times lower levels than the Health Canada guideline.

The “Gulfwatch” mussel monitoring program is on going in the Gulf of Maine and the Bay of Fundy. Contaminants including several heavy metals are monitored. Since mussels are attached permanently to bottom substrate, they provide an indicator of site specific contaminants as compared to mobile species such as lobster or fish. After over a decade of monitoring, a baseline for contaminants is being established. Some locations are influenced by anthropogenic sources, while others by natural sources. The “Gulfwatch” monitoring indicates that in most of the Bay of Fundy, heavy metal concentrations in blue mussels are near natural levels (Bay of Fundy Ecosystem Partnership 2004).

The closest site to the Whites Point quarry that has been monitored for contaminants in the blue mussel (*Mytilus edulis*) is at Broad Cove located approximately 30 km north of Whites Point. The contaminants being monitored at this site include 9 trace metals, 24

polychlorinated biphenyl's (PCBs), 24 polycyclic aromatic hydrocarbons (PAHs), and 16 chlorinated pesticides. Mussels at this site have been monitored during 1993, 1996, and 1999 (Wells et al. 2005, Ref. 175). **Table MC – 1** presents contaminant data reported for blue mussels.

Table MC – 1

Levels of heavy metal and organic contaminants reported for blue mussels (*Mytilus edulis*) collected at Broad Cove, Digby Neck as part of the Gulf of Maine Gulfwatch Contaminants Monitoring Program (values are micrograms per gram dry weight for metals and nanograms per gram dry weight for organics).

Contaminant	1993			1996			1999		
	Min	Max	Median	Min	Max	Median	Min	Max	Median
Aluminium	201.83	262.71	213.66	230.00	260.00	260.00	100.00	360.00	255.00
Cadmium	2.75	3.31	2.89	2.40	2.70	2.60	2.10	3.00	2.40
Chromium	1.95	3.04	2.57	1.90	2.00	1.95	1.70	2.00	1.90
Copper	6.88	8.07	7.17	5.30	6.20	5.90	5.50	5.90	5.70
Iron	516.95	623.85	559.54	410.00	430.00	420.00	120.00	530.00	405.00
Lead	3.31	4.40	3.80	2.60	3.00	2.85	0.30	3.10	2.15
Mercury									
Silver	0.05	0.05	0.05	0.05	0.05	0.05	0.10	0.10	0.10
Zinc	110.09	137.61	123.05	82.00	110.00	94.00	48.00	97.00	76.00
Total PCBs	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Total PAHs	300.5	494.0	368.5	213.0	341.5	267.9	133.2	273.8	185.2
Total DDT	<2.0	<2.0	<2.0	2.46	<2.0	<2.0	<2.0	<2.0	<2.0

Contaminant levels in harbour porpoises in the Bay of Fundy were sampled in 1989 (Johnston 1995). Copper, cadmium, zinc and total mercury concentrations were determined for liver, kidney, and muscle tissue. Copper and zinc in Bay of Fundy porpoises were similar to values previously published from other locations and to other cetaceans in Canadian waters (Falconer et al. 1983 Ref 114).

Further, traditional community knowledge indicates the Whites Point quarry shoreline has been used for local harvesting of sea plants (dulse) and shellfish (periwinkles). In this regard, Bilcon of Nova Scotia Corporation has taken the following precautionary measures. On-site investigations in October 2005 revealed no harvestable quantities of dulse in the Whites Cove area. However, shellfish (periwinkles) were plentiful and samples were collected for laboratory analysis to determine baseline metal levels. The samples were sent to Maxxam Analytics Inc for analysis. Results of this analysis are presented in Appendix 31 .

9.3.19.2 Analysis

In the case of copper levels in the upper Bay of Fundy lobsters, it is likely that this could be attributed to the natural background copper content from the rivers flowing into the upper Bay. These rivers flow primarily through exposed sedimentary rock and have higher copper content as compared to the volcanic rock in southwestern Nova Scotia and the basalt rock at the Whites Point quarry site. Copper levels in the soil at Whites Point was low (39 mg/kg at EQL 2). Also, copper levels in surface water entering the Bay from the Whites Point site is extremely low (2 – 3 ug/L at EQL 2). Likewise copper in the intertidal marine waters was extremely low (0.8 mg/L at EQL 0.1). Copper content in the basalt rock to be processed at the quarry site was also low (27 – 61 mg/kg, depending on depth at EQL 2). Runoff from the quarry site will be contained in a series of sediment retention ponds before entering the Bay of Fundy where sediments and their metal content will be allowed to settle out. Disposal of these sediments will be on-site in dyked disposal areas for future use during land reclamation. Therefore, considering the low background copper and proposed sediment controls, it is extremely unlikely that the proposed quarrying of basalt rock will contribute to any increase in copper levels in the Bay of Fundy and marine organism receptors that may be used for human consumption.

Although mercury levels vary from freshwater to saltwater, the source is assumed to be from both natural and anthropogenic inputs. This could mean the mercury input is from natural geological sources and from long-range atmospheric transport. Background data on mercury concentrations in the intertidal waters off Whites Point were 0.06 ug/L at EQL 0.05 in the spring of 2002 and total mercury was not detected at DL 0.05 in July 2005 – see Appendix 43. Background data on total mercury concentrations in freshwater from the recently disturbed four hectare quarry site were not detected at DL 0.05 in July 2005 – see Appendix 45. Therefore, considering the low background levels of mercury from freshwater sources and proposed sediment controls, it is extremely unlikely that quarrying basalt rock will contribute to any increase in mercury in the Bay of Fundy.

Metal levels in the basalt rock to be processed at the Whites Point quarry were taken at depths of 5, 33, and 61 m - see Appendix 4. All background concentrations of metal contaminants were within the maximum allowable concentration identified for residential/parkland land use (Ref. 41). Several metals identified in the “Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health” were not detected in the basalt rock including arsenic and cadmium, others such as chromium, copper, and lead were well below the human health soil quality guideline for residential/parkland land use. It should be noted that not all metals have guidelines identifying maximum allowable concentrations of contaminants. Considering the low background levels of metals in on-site rock resources, and identified metals are within limits of the human health soil quality guideline, it is extremely unlikely that quarrying basalt rock will contribute to any increase in metal contaminants in the Bay of Fundy.

Laboratory analysis of metal levels in the periwinkle tissue by Atomic Spectroscopy from samples collected in the intertidal zone at Whites Cove was conducted by Maxxam Analytics Inc. Many metals were not detected and others generally reflect concentrations of naturally occurring background conditions. Aluminium (41.9 mg/kg), Copper (22.1 mg/kg) and Iron (114 mg/kg) are relatively low. As mentioned previously, the Summary of Existing Canadian Environmental Quality Guidelines – December 2003 have no guidelines for metals in tissue residue.

In conclusion, from a human health perspective it is extremely unlikely that the quarrying of basalt rock will result in increases of contaminants. Analysis of the on-site basalt rock, surface water, and sediments indicate no excessive levels of contaminants presently exist. Also, background studies of various marine organisms indicate contaminant levels are typical for this region. Therefore, it is highly unlikely that there will be any effects on marine receptors from quarrying resulting in human health risks.

9.3.19.3 Mitigation

The primary mitigation measure to control any on-site contaminants from quarry activities entering marine waters, is the on-land environmental control structures and operating procedures. A system of drainage channels and sediment retention ponds are proposed. Also, a closed circuit recycling of aggregate wash water is proposed. The source of the wash water will be from surface runoff collected in the sediment ponds. Disposal of sediments from the ponds will be on-site for future use during reclamation. Reclamation will proceed incrementally to stabilize areas disturbed by quarrying activities and reduce areas susceptible to erosion.

9.3.19.4 Monitoring

Monitoring of outflow from the sediment retention ponds will be conducted as described in the section on Surface Water (**para 9.1.6.4**).

9.3.19.5 Impact Statement

Marine Contaminants – Human Health

Considering the low background levels of metals in on-site rock, and that surface water runoff and sediments from quarry operations will be contained in on-land environmental control structures, and sediments for future use during reclamation will be placed in dyked disposal areas on-site, these precautionary measures will reduce the possibility of contaminants entering the marine environment and effecting marine organisms harvested for human consumption and result in a *long term, neutral (no) effect, of local scale*.

9.3.20 Human Health – Land Contaminants

9.3.20.1 Research

For the past fifty years or more, land use of the privately owned Whites Point quarry site has been predominately unmanaged forest resource. During the late 1940s and 1950s, a gravel pit was active on the site for extraction of construction materials for building Highway #217. The Whites Cove Road, a public road from Highway #217 to the Bay of Fundy shore was used as a haul road to and from the pit. This is the only known industrial use of the site during this time. Traditional community knowledge indicates some fish shacks and a summer camp occupied an area adjacent to Whites Cove (Elgin Research 2005 **Ref. Vol. IV, Tab 23**). However, after the 1950s, there was little mention of the site. After many years of no maintenance, the Whites Cove Road was upgraded by the present land owners of the surrounding land for community use and enjoyment. Later in 2002, approximately 60 acres of timber on the site was harvested by clear cutting. Today, the Whites Cove Road is again in disrepair due in part to all terrain vehicle use and only accessible to off-road vehicles.

In June 2003, water samples were taken for sediment analysis at a number of stations within the Whites Point quarry area – see **Map 13**. Laboratory analysis for Total Suspended Solids (TSS) for both organic and inorganic components were performed by PSC Analytical see – Brylinsky 2003, **Ref. Vol. II, Tab 12**.

9.3.20.2 Analysis

Past land use of the site, primarily as a forestry resource with little industrial and residential use, indicates that previous use of herbicides or pesticides on the site is highly unlikely. As mentioned, the public Whites Cove Road is presently in need of improvements and is currently eroding and contributing silt and gravel into the Bay of Fundy waters. Total Suspended Solids data in close proximity to the Whites Cove Road indicated TSS of almost four times greater than other sample sites in the immediate area and exceeded the TSS four hectare quarry permit requirement of 50 mg/L (Brylinsky 2003 **ref 3**). On-site chemical analysis of soil, rock, and water – see Appendices 4, 38, 42, and 45, indicate low background levels of chemical or metal parameters that could affect human health. Critical parameters are within the guidelines and regulations.

9.3.20.3 Mitigation

Bilcon of Nova Scotia Corporation does not intend to use pesticides or herbicides during quarry construction or operation. Only chemical agents registered for their particular use and their application by licensed persons will be used. The handling of hazardous materials, such as explosives, will be carried out by qualified persons in accordance with provincial and federal

regulatory requirements. No explosives will be stored on site. Diesel fuel, oils, greases, and coolants will be stored on site in spill containment areas. Vehicle fuelling, oil and coolant changing will be done using closed systems with dry break quick disconnect couplings, thereby minimizing spills with effective contamination control. Automatic greasing systems will be used on off-road mobile equipment and use grease that does not contain heavy metals. Also, the use of electricity as the primary power source for operation of the physical plant and ship loading reduces the overall use of fuel, oils, and greases thereby reducing the risk of leaks or spills. Sewage disposal will be by an on-site sewage disposal system designed and maintained in accordance with the NSDOE&L guidelines. Solid waste disposal will be contracted to a local hauler and disposed of in an approved landfill site.

9.3.20.4 Monitoring

Water and air are the most likely pathways for contaminants and will be monitored as discussed in previous sections of this EIS. If unforeseen contaminants affect any part of human food resources, adaptive management will be initiated in consultation with Health Canada or other regulatory agencies.

9.3.20.5 Impact Statement

Land Contaminants – Human Health

Considering the low background levels of metals in on-site soil, rock, and water, the proposed design considerations for spill containment, hazardous material handling, and proposed precautionary measures, the possibility of contaminants entering human food resources is extremely unlikely and would result in a *long term, neutral (no) effect, of local scale*.

9.3.21 Human Health - Country Foods

Introduction

The Whites Point quarry comprises approximately 380 acres of private land. Public access through the quarry site is presently provided by the Whites Cove Road from Highway #217 to the shore of the Bay of Fundy. The Whites Cove Road has a 66 foot right-of-way and the shoreline along the Bay of Fundy is accessible to the public. For safety reasons, the private lands will not be accessible to the public and will be fenced along the Whites Cove Road right-of-way. As previously stated in this EIS, access to the shoreline will be provided for beach harvesters (e.g. harvesting of dulse and periwinkles)

Fresh water fish habitat does not exist within the active quarry site negating the need for access to fresh water fishing. Hunting and trapping will not be permitted on the quarry site. Considering these factors, the most likely country foods to be harvested on public lands (Whites Cove Road right-of-way and shoreline) would consist of berries, dulse, and periwinkles. Traditional knowledge indicates that berries were harvested and hunting and trapping occurred on the quarry lands of the previous owners. Berry picking and the harvesting of dulse has not recently been observed on the site or adjacent shore. Harvesting of periwinkles was observed in 2002.

9.3.21.1 Research

Using the precautionary approach and to ensure a level of confidence to verify the protection of the health and well being of residents in the area, in the context of consumption of country foods, a site-specific risk assessment was undertaken by Bilcon of Nova Scotia Corporation. The objective of this assessment was to establish pre-construction background levels of contaminants.

In August 2005, samples of edible berries were collected at the Whites Point quarry site to establish baseline metal levels. Dewberry (*Rubus pubescens*), Lowbush Blueberry (*Vaccinium angustifolium*), and Wild Raspberry (*Rubus strigosus*) were collected according to prescribed laboratory procedures. Atlantic Metals in Terrestrial Biota (Tissue) were determined by Maxxam Analytics Inc. The analytical report is contained in Appendix 5. A control, off-site sample of raspberries was also taken and is presently archived in storage at Maxxam Analytics Inc.

Further, in October 2005, samples were collected of periwinkles from the intertidal zone adjacent to the proposed Whites Point quarry to establish baseline metal levels. These samples were collected according to prescribed laboratory procedures and analyzed by Maxxam Analytics Inc. The analytical report is contained in Appendix 31.

9.3.21.2 Analysis

It should be noted that “mining” operations can basically be divided into two groups: metals, which include gold, lead, copper, zinc etc. and non-metals, which include gypsum, salt, sulphur, peat, etc. Also, a third group classified as construction or “quarry” materials which include granite, limestone, sand, gravel, basalt, etc.

The Whites Point quarry project is classified as a quarry and will not produce an ore (a rock containing a high concentration of useful minerals or metals). Therefore, no ore processing such as separation of metal or minerals from the gangue by gravity, magnetic or flotation, or final conditioning or stockpiling gangue will be a part of the Whites Point quarry operation. Since these operations will not take place at the Whites Point quarry, the potential for pollutants and effects on human health are highly unlikely.

As indicated in Chapter 8 – Food Issues in Environmental Impact Assessment (Ref. 50), the contaminants commonly associated with an industrial operation such as a quarry are metals and pH changes. In this regard, water, soil, and air are considered possible pathways from the Whites Point quarry to potential receptors. Potential receptors could be humans who may frequent the public areas to gather and consume country foods.

Production of contaminants of potential concern (COPS) are highly unlikely at an industrial operation such as a basalt rock quarry and marine terminal, either during construction or during operation.

Surface water monitoring has been ongoing since 2002 when the four hectare quarry on the site was cleared and grubbed. Surface water runoff from the four hectare quarry was directed into a sediment retention pond. Monitoring at the outfall of this pond in 2002, 2003, and 2004 indicates total suspended solids (TSS) and pH did not exceed the thresholds established in the terms and conditions of the permit issued by the Nova Scotia Department of Environment & Labour. Also, all metals were within the CCME guidelines for aquatic life except aluminums which has high naturally occurring levels in this region. Fresh water analysis indicates total mercury was not detected in 2005.

Land sediment analysis of samples taken in the existing sediment retention pond in 2005 indicates no PCBs, PAHs, or organochlorinated pesticides were detected. Also, all metals were within CCME guidelines except copper. Copper has high naturally occurring levels in this region. Also, background concentrations of metals, at various depths in the bedrock indicated all levels were within CCME guidelines for residential/parkland land use.

Marine sediment analysis of samples taken in nearshore bottom areas indicate no PCBs, PAHs, organochlorinated pesticides or contaminants (metals) exceed CCME guidelines for marine aquatic life. Seawater analysis also indicates total mercury was not detected.

Since the intertidal and nearshore zones are predominately bedrock with little or no sediments, construction of the marine terminal is expected to produce minimal sediments. No dredging or marine disposal is proposed.

Ambient air quality within the Whites Point quarry region generally meets the maximum total suspended particulate (TSP) of 120 µg/m³ over a twenty-four hour averaging period. TSP has been the air quality parameter of most concern for quarry operations in Nova Scotia. The Whites Point quarry will be designed to reduce particulates at the source by enclosing most of the rock crushing and screening processes. External sources of particulates (stockpiles and roads) will be controlled by water spray applications as needed.

Contaminants (PCBs, PAHs, pesticides, herbicides or metals) are not expected to exceed CCME guideline levels at the Whites Point quarry and Marine Terminal site during construction or as a result of operations. Processing will involve the crushing of a naturally occurring basalt rock with inherent background characteristics as previously documented. Smelting, refining, or further manufacturing of the basalt rock will not be undertaken at the quarry site. All material extracted from the quarry will be utilized for various sized aggregate and fine sediments will be used during the reclamation process. It is therefore expected that contaminant levels will not exceed water, soil, or air CCME guidelines for an industrial site, and it is highly unlikely that harvestable country foods would be contaminated by quarry construction or operation.

9.3.21.3 Mitigation

Detailed mitigation measures regarding potential pathways (air, water, and soil) for country food contaminants are presented in previous sections of this EIS – see **paragraphs 9.1.8.3, 9.3.18 and 9.3.20**.

9.3.21.4 Monitoring

In addition to monitoring air, water, and soil pathways as presented in previous sections of this EIS, Bilcon of Nova Scotia Corporation proposes to monitor country foods. Every five years, laboratory analysis of the metal content in wild raspberries and periwinkles will be conducted. A report comparing background levels to present levels will be compiled and made available to Health Canada if requested.

9.3.21.5 Impact Statement

Country Foods – Human Health

Since the only processing at the proposed Whites Point quarry involves the naturally occurring basalt rock, and background levels of metals in the rock are within human health soil quality guidelines for residential/parkland land use, and this rock has no acid producing capability, effects on country food gathering and human consumption would result in a ***long term, neutral (no) effect, of local scale***.

9.3.22 Socio-Cultural Patterns

9.3.22.1 Research

The Whites Point quarry and Marine Terminal is located near the village of Little River and within the broader community context of Digby Neck and Islands, Digby County . Socio-cultural activities of area residents were investigated through quantitative and qualitative investigations. A Quality of Life Survey (AMEC 2005 **Ref. Vol. VI, Tab 34**), an Attitude Survey (AMEC 2005 **Ref. Vol. VI, Tab 34**), a Community/Business Consultation Report (Elgin Consulting and Research 2005 **Ref. Vol. IV, Tab 21**), an Individual Consultation Report (Elgin Research and Consulting 2005 **Ref. Vol. IV, Tab 22**), and a Traditional Knowledge Report (Elgin Research and Consulting 2005 **Ref. Vol. IV, Tab 23**).

The Quality of Life Survey was a telephone survey conducted in October 2005. The objective of this survey was to gather additional information on Digby Neck residents' social environment in the community of Digby Neck. AMEC developed the questionnaire and Market Quest Research Group Inc. administered the survey to 150 respondents over 18 years of age living on Digby Neck and Islands – see **Map 29**. The margin of error of the Quality of Life Survey is $\pm 7.3\%$, 19 times out of 20 or at the 95% confidence level.

The Attitude Survey was also a telephone survey conducted in October 2005. The objective of this survey was to gather information on regional concerns about the Whites Point quarry and Marine Terminal project. AMEC developed the questionnaire in consultation with Mr. Keith Story, a highly regarded social scientist working with Memorial University. ASDE Survey Sampler, Hull, Quebec, randomly selected the telephone numbers ensuring a balanced representation from all communities. Market Quest Research Group Inc. administered the survey to a sample size of 546 with 405 completed surveys. The areas selected – see **Map 7**, were based on the zone of influence of the project based on submissions that were brought forth by residents and interest groups at the public hearings conducted by the Review Panel and those on the Public Registry. Subsequent to the initial survey, a greater focus on Digby Neck and Islands, the immediate community; was conducted to increase the reliability of the results. Thus, an additional 71 telephone surveys were completed in the 834 telephone exchange – see **Map 7**. The sampling for the Attitude Survey provides a high level of reliability: plus or minus 5.0% at the 96% confidence level.

The Community/Business Consultation Report (**Ref. Vol. IV, Tab 21**) was conducted in December 2003 through January 2004. Fifty-two businesses were approached. An initial approach was made by letter, which resulted in very few responses. This was then followed –up with drop-in or telephone interviews. These were one-on-one interviews, held at the interviewees place of business whenever possible or by telephone. In several cases, the interviewee was not willing to meet. The primary objective of this consultation was to catalogue the concerns, problems and the perceptions of the stakeholders with respect to the Whites Point project.

Five open-ended questions were informally presented. In addition to the one-on-one interviews, group presentations/discussions were held with the following groups:

- Fishermen – Whites Cove/Whites Point
- Weymouth Falls Community Development Society (Black Community)
- Bear River First Nation (Aboriginal Community)
- Digby Municipal Council
- Digby and Area Board of Trade
- Crime Prevention Committee

The Individual Consultation Report was conducted in a very casual and informal manner. Contacts with interested individuals consisted of “drop ins” at the Bilcon office and with individuals in the community. In most cases, these contacts were employment related or for general information about the Whites Point quarry. Twenty-five personal consultations within the primary area of Digby Neck and Islands and twenty-nine outside the primary area were conducted.

The Traditional Knowledge Report, was conducted in order to gather information associated with cultural and past economic uses of the community and project site. Bilcon of Nova Scotia Corporation felt it was important to have an understanding of past influences on the community in order to better gauge the potential impacts the quarry may have. Traditional knowledge consultations focused on the “oral history” from older citizens with knowledge of the community of Little River and the Whites Point quarry property. Fifty-seven interviews were conducted in 2005. Since the project has been the subject of strong feelings and some controversy, confidentiality and privacy of the participant was assured and all identities are withheld. These consultations could best be described as “kitchen table” discussions with the participant directing the interview. However, three open ended questions were asked in order to engage discussion. These questions were:

- 1 What are your memories of the Neck/home community from your childhood to present day?
- 2 What are your memories of Whites Cove and what influence did it have on the adjacent communities?
- 3 What is your impression of the proposed Whites Cove project?

The traditional community knowledge consultation provided insight into community patterns of family and community life over past generations. Many of the older citizens described societal changes that have taken place as a result of improved access to the community, technological changes, especially in the fishing industry, and how these changes affected their way of life. The attitude and quality of life surveys provided a quantitative, contemporary, point in time picture of the community and region as influenced by the proposed Whites Point quarry project.

As well, the community/business and individual consultation provided qualitative opinions concerning the proposed project.

Investigations through traditional knowledge indicated major changes have affected the social and work patterns of the community during the past 75 years. These influences include:

- The construction of Highway #217 in the 1950s increased accessibility from the Neck and Islands to the Town of Digby. Prior to the road construction, families on the Neck were self-sufficient and their lives were dependent on the land and sea. This access to Town led to a shift from shopping at the local general store in the villages to shopping at the supermarket. Thus the traditional general store has practically vanished on the Neck as in most of rural Nova Scotia. With this accessibility, behaviour patterns associated with recreation/entertainment have shifted from family picnics and community suppers to movies and eating out at a restaurant as a treat. Access also brought new people – tourists, which some elderly citizens expressed resentment as an intrusion into their lives.
- Technology in traditional industries, primarily the fishery had profound influences on this primary industry on the Neck. Many blame the increase in the size of boats and increased efficiency of the gear as contributing factors to the decline and in some minds, the collapse of the fishery which so many on the Neck relied upon for their livelihood. Although not unique to the Neck, other technologies such as refrigerators, radio, television, and computers have changed life in rural areas.
- Many elderly citizens express a feeling of loneliness associated with not having their children or grandchildren close at hand. The downturn in the fishery, many elders believe, was the cause of their children and grandchildren having to move away. Increased mobility, educational opportunities and the lack of viable employment opportunities are all contributing factors to this situation.
- Changes in social structure are evident over time on the Neck. An increasing number of older and retired individuals are now living in the community. In the past, many of the older people would be cared for by their family and continue to live in a family home. Now, some elders lament the fact that they have to live in a seniors home away from their families. They attribute this to the busy life style of the younger generation and many of the children having to work away. Also, there has been a shift in community leadership. Whereas in the early 1900s community leaders were perceived to be the pastor/minister and those well educated such as physicians and teachers, today, leaders are more strongly associated with personal wealth. To this end, the employment opportunities that exist on the Neck are generally controlled by a small number of individuals. As in many rural communities, the position of the church as the centre of the

community has diminished. This is evidenced by the declining number of parishioners and the closing of numerous rural churches. Many of these trends are typical of the Neck, and rural areas in general. To quote from Dr. Jane Murphy (Harvard Public Health Review 2002) in speaking of a rural community, “Its standard of living has risen, its health care delivery improved, and its primary industries declined. Reliance on family and religion is down, and crime and drug use is up”.

Realizing community specific data did not exist to fully assess the perceived quality of life of residents on Digby Neck and Islands, Bilcon of Nova Scotia Corporation contracted to have a Quality of Life Survey conducted (AMEC 2005b). The survey instrument and quantification of statistical data are contained in (**Ref. Vol. VI, Tab 34**). The objective of this survey was to gather additional information on Digby Neck resident’s social environment and establish baseline data.

9.3.22.2 Analysis

Quality of life can be defined as a physical and psychological human state that gives the feeling of being satisfied in a particular environment (Andre and Bitondo 2001). Quality of life results from a social construct developed over time and is based on a sense of place, experience and expectations. The social construct is forged through perceptions and attitudes relating to quality of life (Andre and Bitondo 2001). Therefore, quality of life varies for each individual.

The quality of life survey asked 150 Digby Neck and Islands residents to rate their overall quality of life. The following results were recorded indicating various levels in perceptions of residents existing quality of life (AMEC, 2005b).

- Excellent – 22.0%
- Very good – 29.3%
- Good – 30.0%
- Fair – 14.7%
- Poor – 4.0%

As can be seen in Table QOL-1, quality of life was rated differently for various age groups. In this Table, no individuals between 18-30 years of age rated their quality of life as excellent, whereas 41% of people aged 51-60 rated their quality of life as excellent.

Table QOL – 1
Rate of Overall Quality of Life in Digby Neck by Age Group (%)
Digby Neck and Islands – 2005

Age Group	Poor	Fair	Good	Very Good	Excellent
18-30 (12)	8.3	8.3	41.7	41.7	0
31-40 (22)	9.1	27.3	27.3	27.3	9.1
41-50 (34)	0	17.6	38.2	26.5	17.6
51-60 (39)	5.1	10.3	25.6	17.9	41.0
61-70 (22)	4.5	13.6	31.8	36.4	13.6
Over 70 (21)	0	9.5	19.0	42.9	28.6
Total (150*)	4.0	14.7	30.0	29.3	22.0

Source: AMEC, 2005b

*Considering age weighting

In the same survey, the residents were asked to identify the importance of various quality of life factors. As can be seen in Table QOL – 2, the following factors ranked as “really important”.

- Healthy environment – 89.7%
- Safe environment – 88.9%
- Access to health care – 88.0%
- Good income and financial security – 84.6%
- Presence of family – 83.6%

Table QOL - 2 Importance of Factors on Quality of Life

Statement	Don't know/ No answer	Not at all important	Somewhat unimportant	Neither important nor unimportant	Somewhat important	Really important
Access to education	-	12.7	2.5	8.9	8.6	67.3
Access to healthcare	-	-	-	4.1	7.9	88.0
Access to recreational activities	-	4.7	6.9	27.4	22.4	38.6
A strong network of community services	-	.9	.5	9.4	20.3	68.9
A healthy environment	-	-	.5	5.2	4.6	89.7
An environment that is safe	-	-	-	2.5	8.6	88.9
Respect for your culture	-	2.3	1.3	8.5	12.8	75.1
Ability to preserve your culture	-	2.5	0.5	10.4	17.1	69.7
Presence of family	0.5	0.9	1.1	5.5	8.4	83.6
Good income and financial security	-	-	0.5	5.3	9.6	84.6
A network of friends	-	-	-	5.6	14.2	80.1
A good working environment	3.2	8.4	.5	7.7	12.9	67.3
Ability to achieve personal goals	0.5	2.8	2.3	4.4	18.9	71.1

Source: AMEC, 2005

Further in the same survey, the residents were asked to rate how satisfied they were with these factors in their daily life. As can be seen in Table QOL – 3, the following factors were ranked as “very satisfied” in order of importance.

- Network of friends
- Presence of family
- Safe environment
- Healthy environment
- Respect for your culture

Table QOL - 3 Satisfaction with factors that can have an effect on Quality (%) (2005)

Statement	Don't know/ No answer	Not at all satisfied	Somewhat unsatisfied	Neither satisfied nor unsatisfied	Somewhat satisfied	Very satisfied
Access to education	9.7	1.7	4.4	29.8	28.7	25.7
Access to healthcare	0.5	11.2	11.9	28.5	26.7	21.2
Access to recreational activities	4.9	14.1	26.0	33.3	11.0	10.7
A strong network of community services	3.0	6.7	7.3	30.4	28.2	24.4
A healthy environment	-	0.5	2.8	16.2	24.7	55.8
An environment that is safe	-	3.2	4.4	7.8	28.1	56.4
Respect for your culture	1.5	1.9	0.6	18.9	27.2	49.9
Ability to preserve your culture	1.5	2.5	3.8	18.2	28.4	45.6
Presence of family	0.9	1.4	2.9	11.2	22.3	61.2
Good income and financial security	-	5.9	5.4	18.9	29.1	40.6
A network of friends	-	0.5	1.7	8.3	27.0	62.5
A good working environment	17.8	4.4	4.9	13.7	27.8	31.5
Ability to achieve personal goals	6.7	0.9	8.1	21.8	29.9	32.7

Source: AMEC, 2005

Social Relations

As a result of interviews and surveys, some indication of social relations among generations are revealed. Traditional knowledge interviews indicated some elderly citizens are dismayed that their children and grandchildren were not nearby. Also, “presence of family” and “good income and financial security” ranked in the top five quality of life factors according to importance. Declines in population on Digby Neck and Islands have been especially dominant in the working age group, which is also the group most likely to have children. Some of this decline is due to a lack of employment opportunities in the community. In this regard, Bilcon of Nova Scotia Corporation is committed to hire local people. Also, it is quite likely that young families that have moved away may return if employment and good income opportunities are available. The quarry can provide financial security to its employees through full-time employment, pension plans, etc., thereby improving some individuals’ quality of life.

Access to health care ranked in the top five quality of life factors for residents surveyed on Digby Neck and Islands. In addition to provincial health programs, Bilcon of Nova Scotia Corporation will be providing its employees with supplemental health programs at company expense. These programs will cover health care such as dental plans etc. which are not covered by provincial programs. Thus, the quarry can provide supplemental health programs to its employees thereby broadening accessibility to health care.

Social Capital

Social capital is defined as the characteristics of social organization such as networks, norms, and social trust that facilitate coordination and cooperation for mutual benefits (Putman 1995 Health Canada, 2003). Indicators or criteria that can be used to measure social capital are trust, social cohesion, social support, civic engagement, income distribution, and health status (Health Canada, 2003). Of these six indicators for social capital, income distribution and health status are addressed elsewhere in the EIS.

Social cohesion involves the sense of belonging to one’s community. In general, people living in rural areas and having lived in their area for longer periods of time exhibit stronger social cohesion. This is evident for residents of Digby Neck and Islands. The quality of life survey asked residents to describe their sense of belonging to their local community. As can be seen in Table QOL–4, residents 60 years and older expressed “very strong” sense of belonging to their community.

TABLE QOL - 4 - Sense of Belonging to Local Community, by Age Group (%) (2005)

Age group	Very weak	Somewhat weak	Neither weak nor strong	Strong	Very strong
18-30 (12)	-	25.0	16.7	25.0	33.3
31-40 (22)	-	4.5	4.5	59.1	31.8
41-50 (34)	-	.0	17.6	50.0	32.4
51-60 (39)	-	5.1	15.4	41.0	38.5
61-70 (22)	-	9.1	9.1	18.2	63.6
Over 70 (21)	-	4.8	.0	19.0	76.2
Total (150)*	-	6.0	11.3	38.0	44.7

Source: AMEC, 2005

* Considering age weighting

Overall, all age group respondents rated their sense of belonging as follows (AMEC, **Ref. Vol. VI, Tab 34**).

- Very Strong – 44.7%
- Strong – 38.0%
- Neither weak nor strong – 11.3%
- Somewhat weak – 6.0%

This indicates a fairly high level of social cohesion and could be attributed to the fact that the communities on Digby Neck and Islands are small in size.

A sense of place can also be linked to people’s attachment to the local area (e.g. where they have been born, raised, or have experienced valuable times). This value placed on Digby Neck and Islands and in some cases Whites Cove, was evident in some of the traditional community knowledge interviews (Elgin Consulting and Research 2005 **Ref. Vol. IV, Tab 23**), Panel scoping sessions, and the public registry. In some people’s opinion, the proposed quarry could disturb that sense of place for those who previously conducted some activities there.

The Digby Neck and Islands population is divided over the quarry project. Some would welcome the employment and others would rather keep the Neck as is. As in the case with large scale projects in rural communities, the reasons for and against a project are numerous and often contentious. This has recently been exhibited by the local opposition to the Hyatt Water Bottling Plant proposed at Gullivers Cove and the Cooke Aquaculture expansion at Mink Cove. Both of these developments are by proponents “from away”. In contrast, a quarry at Tiverton, highly visible from Highway #217 and by tourist traffic waiting for the ferry at Petit Passage received no local opposition.

This particular quarry supplied rock for the construction of the Tiverton Harbour project which directly benefits the local community. In some cases when change is not initiated from within a rural area, where people have a higher sense of community cohesion, and when decisions are made outside the community networks, a community can feel a loss of control over their territory.

During the pre-project planning phase of the Whites Point quarry and Marine Terminal, including the environmental assessment/Panel Review, disruption of the communities' social cohesion has been evident. Individuals with different objectives are interacting and discussing potential effects of the project. Therefore, the pre-project planning phase and the environmental assessment will temporarily create an adverse effect on social cohesion. However, the project activities (construction and operation) which are on private land, "are not expected to have an adverse effect on social cohesion" (AMEC 2005 **Ref. Vol. VI, Tab 34**) as it relates to social capital.

Other than an occasional comment of mistrust of tourists expressed in the traditional knowledge interviews, no direct commentary concerning seasonal and full-time residents was expressed. Even though a direct question concerning this was not asked in the quality of life survey, a question regarding people's trust in each other and in institutions was asked. As can be seen in Table QOL-5, trust levels regarding people's trust in each other and the provincial government was fairly low. Trust levels in the federal government were very low.

TABLE QOL - 5 Agreement on Statement of Trust (%) (2005)_{nor}

Statement	Don't know/ No answer	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
Most people can be trusted	-	4.5	4.8	32.9	28.1	29.7
The federal government acts in everybody's best interest	3.1	35.1	20.5	27.5	12.3	1.4
It's best to be careful when dealing with people	-	1.6	4.2	18.0	29.2	46.9
The Nova Scotia government acts in people's best interests	-	23.4	23.6	28.1	21.7	3.1

Source: AMEC, 2005

Social organization as being part of social networks provides various benefits to individuals including exchange of information and emotional support (Statistics Canada 2004). Results from the quality of life survey indicated residents of Digby Neck and Islands spend the highest percentage of social contact with close family or other relatives and with friends. Table QOL -6 indicates responses regarding social contacts.

TABLE QOL - 6 Social Contacts (%) (2005)

Statement	Each Week	Once or twice a month	A few times a year	Never
Spending time with close family or other relatives	75.4	13.0	9.7	1.9
Spending time with friends	82.5	12.8	4.2	.6
Spending casual time with co-workers or colleagues	32.8	15.0	8.2	44.0
Spending casual time with people in recreational and community activities	31.9	28.4	22.6	17.0

Source: AMEC

Involvement in organizations, political or religious activities is an indicator of civic engagement (Statistics Canada 2004). In this regard, the quality of life survey (AMEC, 2005b) reported almost a 50 --50 split of those residents involved in volunteer and/or service organizations. This level of volunteerism in organizations is somewhat lower than the 61% of Canadians belonging to organizations in 2003 (Statistics Canada 2004).

Most individuals on Digby Neck and Islands maintain good social networks. Again, it is expected that pre-project planning, including the environmental assessment/Panel Review will temporarily have an adverse effect on some individuals' networks because of conflicting interests (for or against the project). However, in the long term "it is not expected that the project activities will have an effect on social support and individual networks" (AMEC 2005 **Ref. Vol. VI, Tab 34**). A greater level of volunteerism may be evident as a result of new people employed at the quarry wishing to become active in community organizations.

Commercial

Detailed research, analysis, mitigation, monitoring and predicted effects on harvested resources (fishery, forestry, and agriculture) are presented in **paragraph 9.2**. Similar details for tourism are presented in **paragraph 9.3**. Insignificant negative effects are predicted to occur during the lobster fishing season in the vicinity of the marine terminal. Neutral (no) effects are predicted to occur on harvesting in the intertidal zone. The remainder of the quarry lands is in private ownership and only land uses associated with the quarry are planned. Insignificant negative effects are predicted to occur on the tourism industry from visual disruption when the quarry is viewed from the water.

Environmental

The most important factor contributing to their quality of life expressed by the residents of Digby Neck and Islands was a "healthy and safe environment". Throughout public consultation, public hearings, and commentary on the Public Registry, concerns about environmental degradation have been a major concern expressed by the public. Assessment of environmental components such as water quality, air quality, noise, and aesthetics as a result of quarry operations are detailed in **paragraphs 9.1, 9.2 and 9.3**. Neutral (no) or insignificant negative effects are predicted for these environmental components.

Individual needs and perceptions are different among individuals, and inherently subjective in nature. As indicated above, the residents of Digby Neck had different perceptions of their quality of life. What is acceptable to one person, may not be acceptable for someone else. Even with environmental components being within regulatory standards, regulations, or guidelines, effects of quarry operations could impact some individuals' quality of life. This may be especially true for noise levels and aesthetics.

Investigations of comparable quarry projects indicated an environmental component such as noise from quarry operations at Sechelt, British Columbia were generally considered to be “background noise”. For the most part, quarry operations sounds are masked by other common daily noises such as road noise or wind or waves crashing on the shore. Issues that were raised at comparable quarry projects such as at Sechelt, Hantsport, and the Strait of Canso was visible dust and noise. These issues were commonly dealt with and resolved by communication with quarry operators.

9.3.22.3 Mitigation

Noise and dust are the most common citizen complaints raised by neighbours of quarry operations. Even though noise and dust control will be primary considerations and be maintained within regulatory requirements, mitigation measures are proposed. To insure adjacent property owners concerns are resolved, public participation is proposed to continue during construction and operation of the quarry. Bilcon of Nova Scotia Corporation intends to re-establish the Community Liaison Committee (CLC) that was established as a result of the permitting of the 4 hectare quarry at the Whites Point site in 2002. In this regard, a neighbour adjacent to the quarry property will be invited to participate on this committee and be involved with a complaint process to be established by Bilcon so that public concerns regarding environmental matters are addressed in a timely manner and to resolve any quality of life effects.

Continuing efforts will be made by Bilcon of Nova Scotia Corporation to meet with interested groups and individuals during the pre-project planning/environmental assessment phase of the project. The intent will be to provide information about the project, the opportunities of the project, involve the community in the project, and to resolve any outstanding issues.

9.3.22.4 Monitoring

Environmental components such as water quality, air quality, and noise will be monitored as outlined in **paragraphs 9.1.3, 9.1.8, 9.1.9, 9.1.10, 9.1.11.**

9.3.22.5 Impact Statements

Quality of Life – Social Relations

Increased health programs, income and financial security and presence of family opportunities for employees will all result from quarry construction and operations resulting in a ***long term, insignificant positive effect, of community scale.***

Social Capital – Pre-project Planning

Differences of opinion about the project among residents of the community presently exist creating a disruption of social cohesion resulting in a ***short term, insignificant negative effect, of community scale.***

Social Capital – Life of Project

Once a decision of whether or not to proceed with the project is made, project activities (construction and operation) are not expected to disrupt social capital indicators (trust, social cohesion, social organization, or civic engagement) resulting in a ***long term, insignificant positive effect, of community scale.***

Commercial Patterns

Nearshore fishing patterns will experience some inconvenience as a result of the marine terminal and shipping activities as well as some visual degradation if tourism cruises venture along this section of Digby Neck coastline resulting in a ***long term, insignificant negative effect, of community scale.***

Quality of Life – Environmental

Perceptions of quality of life vary among individuals and what may be acceptable to one person may be unacceptable to another even though quarry activities are within regulatory requirements resulting in a ***long term, insignificant negative effect, of local scale.***

9.3.23 Education, Training and Skills

9.3.23.1 Research

The fixed and mobile equipment for the project will be modern and state of the art. This will mean that, while experience is an essential asset, upgrading will almost certainly be required for all employees.

For the electrical and welding trades, a journeyman status will be required for employment. A significant portion of the training program for these trades will be accomplished during the construction and fitting-out process by working with the subcontractors during this period. The tradesmen will thus be familiar with the drawings, equipment details, and operational protocols by being hands-on involved in the construction and testing of the equipment. It will, however, be necessary to provide the electrician with the training for the maintenance of the computer system which will control the crushing process and this will be arranged by Bilcon with the supplier of the system.

For the mobile equipment mechanics, a journeyman status will be a requirement and experience in the type of equipment to be used will be seen as an advantage. For specific upgrading on the site equipment, the mechanics will be enrolled in the equipment manufacturers training program at Bilcon's expense.

For the crusher equipment, experience will be required and an on-site training program will be conducted by the Operations Manager.

For mobile equipment operators, some experience will be required on heavy equipment but all operators will be upgraded for the specific equipment at Bilcon's expense.

For the Environmental and Occupational Health and Safety position, a fully-qualified and experienced person will be sought, since responsibilities will be in place from day one of operations.

All on-site staff will receive safety and occupational health training on an initial and ongoing basis in accordance with regulations and corporate policy (for example: Fall Protection, Workplace Hazardous Materials Information System (WHMIS), First Aid, Cardiopulmonary Resuscitation (CPR). These courses are available in the local areas (Digby) and in some cases, on site.

Programs are generally available for trades at both Middleton and Yarmouth Campuses of the Nova Scotia Community College (NSCC), in addition to the remote campus in Digby. However, for mobile equipment operators, the programs are available at both NSCC and at the Dexter Institute.

9.3.23.2 Analysis

As noted elsewhere in this report, one of the reasons for selecting Whites Cove was the availability of a trained or at least partially-trained work force. As of 1998, there were 87 identified quarry sites in Digby County (source WVDA), although many are inactive; and in 2003, there were 1171 permitted quarries in Nova Scotia (source NSDEL). The general skills for a quarry operation are clearly available in Digby County and Nova Scotia as a whole. Further, although no job applications have been solicited by Bilcon, 148 applications have been submitted to the Digby office indicating significant interest in the positions available, which were made available through the CLC.

A breakdown of applications submitted to date shows the following areas of interest:

Labourer	57
Truck Trade qualification	29
Office	22
Heavy Equipment Certification	11
Heavy Equipment with Crane Certification	2
Welder (Journeyman)	8
Forestry Certification	4
Environmental Biology & Environmental Management	3
Electrical Trade Certification (Journeyman)	3
Journeyman Mechanic	3
Auto Mechanic with Heavy Equipment Operation	2
Carpenter	2
Heavy Equipment Mechanics Certification	1
Heavy Equipment and Welder	1

The upgrading of skills for specific equipment will be the challenge and Bilcon will primarily carry this out on-site or with the assistance of specific equipment suppliers.

As far as timing and duration of training activities, these will vary from perhaps four months for electricians and welders being trained during construction operations to several days for WHMIS, CPR, and other safety courses. All personnel will have received the training necessary to perform the specific job in a safe and efficient manner before their first shift. This is critical not only from a safety and occupational health perspective, but from an efficiency and protection of assets basis. In addition, training will be ongoing for all personnel throughout the life of the project.

9.3.23.2.1 Extent to Which Skills of Available Workers Match the Job Requirements

Although no advertising for quarry positions has taken place, a listing of jobs available with typical wage rates was released to the CLC, and applications have been submitted over the past three years. To this date, 148 applications are on file at Bilcon's Digby Office.

These applications have been reviewed to determine what skill levels are available in the local area, since it is the stated policy of Bilcon to hire in the local area. This review leads the Proponent to believe that, with training, all positions, with the exception of the senior environmental and occupational health position, can be filled from the local area. It is possible that this exception can be overcome with advertising in the local area. The policy with respect to training is set out in in this section.

Subcontractors used in the construction phase will be engaged in the local area where possible, and priority will be given to local subcontractors.

Impacts of Project Employment on the Local Economy

See 9.3.9.2 Construction and Operation

9.3.23.3 Mitigation

None Proposed

9.3.23.4 Monitoring

The Operations Manager will be responsible for all hiring and the stated corporate policy is to hire locally, where possible, and train, where necessary. An annual review will be carried out to assess the success of this strategy.

9.3.23.5 Impact Statement

Education, Training and Skills

Bilcon is committed to a local hiring policy with training provided for all employees at Bilcon's expense over the life of the project. This training will be portable and will ***result in a long-term, insignificant positive impact of regional scale.***

9.3.24 Infrastructure and Institutional Capacity

9.3.24.1 Research

Baseline of Existing Services and their Capacity to Meet New Needs

Fire services

Fire Departments on Digby Neck, the Islands, and Digby were interviewed as to their existing capacity (Elgin Consulting and Research, **Ref. Vol. IV, Tab 22**).

- **Digby Neck Fire Department (Sandy Cove)** – This Department does not have sufficient volunteer resources and are undertaking a personnel drive. The Department is barely able to manage flood calls and would have great difficulty in responding to a major fire. They do have a mutual aide agreement with Tiverton, Digby, and Freeport, but Digby and Tiverton are 30 minutes away and Freeport longer still.
- **Tiverton Fire Department** – This Department has 19 volunteers which is seen as adequate but they have some equipment concerns.
- **Freeport Fire Department** – This Department has an adequate number of volunteers but at the present time their building is being replaced due to structural issues.
- **Digby Fire Department** – This Department has adequate equipment and a good volunteer base (47).

All fire departments noted a concern during lobster season as a number of volunteers are fishermen. The main concern raised was the possibility of forest fires in the large clear cut areas on Digby Neck.

The issue of volunteers on Digby Neck is seen as stemming from the out-migration of younger people due to the decline in the fishery and the absence of new industry to keep displaced fishermen on the Neck.

Waste Service

There is a private C&D site just outside the Town of Digby. Industrial producers of waste pay dumping fees and the operators indicate that they have adequate capacity to handle further volume.

EMO Fundy Ground Search and Rescue

This organization has an adequate volunteer base. The current search masters, John Ivens and Mac Bishop, together with the President, Clifton Moore, see the development of an access road to the Fundy Shore at Whites Cove as a positive. At this time, any ground search and rescue on the Fundy Shore is difficult due to the poor state of the Whites Cove Road. The organization also noted that there is no Helipad on the Neck for emergency airlift.

Ferry Services

The ferry services between East Ferry and Tiverton and Freeport and Brier Island have adequate capacity and would only be impacted by workers living on the Islands.

EHS Expanded Capacity Program

The main concern of EHS is site access and since all quarry roads will be fully maintained, this is not an issue. The organization presently has sufficient capacity to deal with a quarry activity.

Health Services

Digby General Hospital is a twenty-bed facility with full emergency capacity. Six physicians rotate on coverage with support from locums. However, as with most rural areas of Nova Scotia, there is a physician shortage and this has led to the closure of the emergency room on some occasions. The hospital is also equipped with diagnostic labs for x-ray, ultrasound, and blood work. Other services covered are palliative care, physiotherapy, a specialist clinic, home care, hospice society, VON offices, alcohol and drug dependency, and dieticians. The third floor of the hospital is an eighteen-bed Senile Dementia nursing home facility affiliated with the Tideview Terrace complex adjacent to the hospital. The Digby Hospital no longer has obstetrics or surgery facilities.

In 2000, the NSDOH, through Emergency Medical Care, established the Expanded Capacity Island Health Initiative, the first of its kind in North America. Paramedics were given additional training within their scope of practice to assume Primary Care functions associated with wellness and injury. A nurse practitioner (NP) was added to the program in 2002. The NP working in collaboration with off-site physicians can review prescriptions, conduct regular physicals, and provide treatment for most non-critical/acute medical needs. The service is also involved in immunization, well baby, well elderly, public health, occupational health and safety, injury care, flu and cold care, and health promotion programs. Bilcon has supported the Annual Health Fair on two occasions. Secondary care in the area is provided at Yarmouth Regional Hospital, Valley Regional Hospital in Kentville, and Soldiers Memorial Hospital in Middleton. Tertiary care is provided at the QE II Hospital in Halifax.

Rehabilitation

In the event of an industrial accident involving long-term supportable physical rehabilitation, the Nova Scotia Rehabilitation Centre in Halifax is the only site in Nova Scotia.

Mental Health Services

There are in-patient units at the Yarmouth Regional Hospital and the Valley Regional Hospital, and there is an out-patient clinic in Digby. Long-term psychiatric rehabilitation is provided by Kings Regional Rehabilitation Centre in Waterville.

Schools

Schools in Digby County have experienced a 27% decline in enrollment over the last decade (Nova Scotia Department of Education). Digby Elementary, Digby High, Digby Neck Consolidated, and Islands Consolidated Schools (administratively includes Westport Village School) were all constructed to provide education to more students than are currently enrolled. There is adequate capacity to handle any influx due to quarry employment.

9.3.24.2 Analysis

A quarry project supplying the local market can have a significant effect on infrastructure and particularly the roads. Heavy truck traffic can significantly shorten the life expectancy of the road structure causing a financial burden on the Provincial Government through increased maintenance. The Whites Point project will increase traffic to some extent during the construction phase, but it is anticipated that the majority of heavy equipment will be brought in by ship. Further, there will be no delivery of crushed product to the local market and, hence, no significant increase of heavy truck traffic during the operational phase. No significant effect on road infrastructure is anticipated.

The Whites Point project will require a significant quantity of electricity which will necessitate upgrading the supply line from Digby to Little River. The Proponent will be required by Nova Scotia Power Inc. to fund this upgrade and the upgrade itself will be of positive benefit to residents of Digby Neck.

Given the relatively small workforce anticipated during the operational phase of the project, and the fact that the majority will be hired in the local area, no increase in institutional capacity is anticipated.

Incremental Costs to Government Resulting from the Project

As noted elsewhere in this report, the Proponent has made no application for government assistance at either the Municipal, Provincial, or Federal levels. It is the Proponent's intent to fund the construction, operations, training, and reclamation programs totally from its own funds.

It should also be noted that as cited in the introduction, the cost of the Panel Review process is wholly recoverable by the senior levels of government and the Proponent has been contributing incrementally in this regard.

It is acknowledged that some costs are borne by the senior levels of government and are not recoverable from the Proponent, for example, the funding set aside to assist the public to participate in the assessment process. This is, however, more than offset by the taxes generated by the project for government at all levels. Reference to the report prepared by Gardner Pinford (**Ref. Vol. VI, Tab 32**) shows that taxes received by government are estimated to be at the following levels:

1) Construction Activity		
	Federal Tax Revenue	\$2.0 Million
	Provincial Tax Revenue	\$1.6 Million
2) Operational Activity		
	Annual Federal Tax Revenue	\$1.0 Million
	Annual Provincial Tax Revenue	\$0.8 Million
	Annual Municipal Tax Revenue	\$0.4 Million

Measures Proposed to Reduce the Financial Burden Caused by the Project on Infrastructure and Institutional Capacity

As noted above, the Proponent has made no application for financial assistance to any level of government for any phase of the project. All infrastructure costs, including the upgrading of the Whites Cove road, should this be determined to be the primary access point to the quarry, will be funded by the Proponent. There is, therefore, no anticipated financial burden on infrastructure.

With respect to institutional capacity, it will be the policy of the proponent to hire the workforce in the local area and judging by the number of job applications received, it would appear that this is possible. There will, therefore, be no significant influx of workers into the area requiring housing, schools, and other services.

It is Bilcon's intent to provide basic fire-fighting and first-aid services on site. There may be occasions when external assistance is required, but this will be infrequent and there is sufficient capacity in the local area to handle any service requirement.

Portions of the required infrastructure for the project may result in enhanced services in the local area. For example, the power supply to the Little River area will need to be upgraded to provide the necessary capacity for the quarry operation and all residents of Digby Neck would benefit from this upgrading.

A quarry project supplying the local market can have a significant effect on infrastructure and particularly the roads. Heavy truck traffic can significantly shorten the life expectancy of the road structure causing a financial burden on the Provincial Government through increased maintenance. The Whites Point project will increase traffic to some extent during the construction phase, but it is anticipated that the majority of heavy equipment will be brought in by boat. Further, there will be no delivery of crushed product to the local market and, hence, no significant increase of heavy truck traffic during the operational phase. No significant effect on road infrastructure is anticipated.

The Whites Point project will require a significant quantity of electricity which will necessitate upgrading the supply line from Digby to Little River. The Proponent will be required by Nova Scotia Power Inc. to fund this upgrade and the upgrade itself will be of positive benefit to residents of Digby Neck.

Given the relatively small workforce anticipated during the operational phase of the project, and the fact that the majority will be hired in the local area, no increase in institutional capacity is anticipated.

9.3.24.3 Mitigation

None Proposed

9.3.24.4 Monitoring

Follow-up with local providers of services will be carried out on an annual basis to determine whether the quarry operations are affecting the provision of services.

9.3.24.5 Impact Statement

Infrastructure and Institutional Capacity

Little or no additional burden on local services is anticipated and some upgrades may be necessary by Bilcon (for example the power supply) which may improve capacity resulting ***in a short term neutral (no) impact, of regional scale.***

Incremental Costs to Government Resulting from the Project

Since Bilcon would not seek public funds for any aspect of the project and tax revenues will be substantial, ***there will be a significant positive impact on a local scale and an insignificant positive impact on a regional and national scale.***

9.3.25 Other Undertakings in the Area

The Digby Neck and Islands have historically evolved around the primary fishing activity and the fish processing industry. As a result, most development has centered on this industry on land and in the marine environments. Two fish processing plants are located in Little River approximately 2.5 km from the quarry site. For a listing of industries by category see **Table E - 1**. Small harbours are located along the Bay of Fundy and Saint Mary's Bay with varying degrees of facilities. A new harbour at Tiverton was recently constructed. The location of existing businesses and services on Digby Neck are shown on **Maps 6A and 6B**.

More recently, the tourism industry has experienced minimal development of ecotourism attractions such as the Balancing Rock Trail in Tiverton. Also, a Discovery Centre at Freeport is presently in the planning stages which would provide an additional ecotourism attraction. Presently, the primary ecotourism attraction is whale watching and adventure tour cruises which operate from existing wharves or other structures.

Limited marine and land undertakings are occurring in this area. Land development such as subdivision and housing construction is limited. Between 1996 and 2001 only 25 housing units were constructed on Digby Neck and Islands. Evidence of past forestry clear-cutting is evident along Digby Neck. Forestry is the primary resource land use as the majority of past agricultural land use has been abandoned. Two small basalt rock quarries have been in operation in the Digby Neck area supplying rock for local demand. The rock quarry at Tiverton supplied rock for the Tiverton Harbour Project and the quarry at Seabrook supplies rock for local construction of roads and other uses. Other small sand and gravel pits exist along Digby Neck supplying products for local use.

Few new industrial developments are planned for Digby Neck. A land-based aquaculture facility at West Mink Cove has recently expanded and presently has a water-based site under going regulatory approval. Another planned industry at Gullivers Cove, a water bottling plant, has recently withdrawn its regulatory application for a water withdrawal permit. Many local wharves are in need of maintenance, however, declining use of these facilities makes justification of repairs difficult. In general, land and water based development at the present and in the future is apparently not in an expansionary mode in the community of Digby Neck. Little ongoing or proposed future development reduces the possibility of developmental cumulative effects in conjunction with the proposed Whites Point quarry and Marine Terminal project.

In a broader county or regional spatial context, the proposed quarry and marine terminal development at Whites Point is not anticipated to be incremental to other similar undertakings. No similar undertakings are known to be planned in the near future. Competition with other quarries or marine development is not expected since the Whites Point quarry is an export product operation. Also, the marine terminal is dedicated to shipments of products from the quarry. A more detailed analysis of possible direct cumulative effects resulting from development of the Whites Point quarry and Marine Terminal is contained in **Chapter 10**.

9.4 Summary Table of Impacts

The following **Table 2** presents a Valued Environmental Component Impact Summary for the Whites Point quarry and Marine Terminal project.

Valued Environmental Component Impact Summary

Whites Point Quarry and Marine Terminal
Environmental Impact Statement

Table 2, Part 1

Physical Environment	Time		Type/Significance of Effect				Scale
	Short Term	Long Term	Significant Positive	Significant Negative	Neutral	Insignificant Positive	Insignificant Negative
Climate - Greenhouse Gas	☉				●		
Geology - Basalt rock	☉				●		Ⓡ
Hydrogeology - Residential Well Water Yield	☉			●			Ⓛ
Hydrogeology - Residential Well Water Quality	☉			●			Ⓛ
Surficial Geology and Soils	☉			●			Ⓛ
Little River Watershed	☉			●			Ⓡ
On-site Surface Water Drainage - Wetlands	☉			●			Ⓛ
On-site Surface Water Drainage - Quality	☉			●			Ⓛ
Physical Oceanography - Turbidity	☉					●	Ⓛ
Physical Oceanography - Tides and Currents	☉					●	Ⓛ
Air Quality - Particulate Emissions	☉				●		Ⓛ
Noise and Vibration - Blasting	☉				●		Ⓛ
Noise and Vibration - Processing Plant	☉				●		Ⓛ
Noise and Vibration - Shiploading	☉				●		Ⓛ
Light - Night	☉						Ⓛ

Valued Environmental Component Impact Summary

Table 2, Part 2

Whites Point Quarry and Marine Terminal
Environmental Impact Statement

Biological Environment	Time		Type/Significance of Effect				Scale	
	Short Term	Long Term	Significant Positive	Significant Negative	Neutral	Local	Regional	National/International
	●	●	●	●	●	●	●	●
Terrestrial Ecology - Habitat Alteration	●				●			
Terrestrial Ecology - Habitat Diversity	●	●						
Terrestrial Floral Species at Risk	●	●						●
Terrestrial Vertebrate Species at Risk	●				●			
Terrestrial Odonata Species at Risk	●	●						
Terrestrial Lepidoptera Species at Risk	●				●			
Terrestrial Wetlands	●	●						
Migratory Land Birds	●				●			
Aquatic Ecology - Freshwater Fish Habitat	●			●				
Aquatic Ecology - Marine Intertidal Habitat	●				●			
Aquatic Ecology - Marine Intertidal Habitat	●			●				
Aquatic Ecology - Marine Nearshore Habitat	●				●			
Aquatic Ecology - Marine Nearshore Habitat	●			●				
Marine Mammals and Waterbirds - Nearshore	●				●			
Fish - Endangered (Inner Bay of Fundy Salmon)	●				●			●

Valued Environmental Component Impact Summary

Table 2, Part 3

Whites Point Quarry and Marine Terminal
Environmental Impact Statement

	Time		Type/Significance of Effect					Scale			
	Short Term	Long Term	Significant Positive	Significant Negative	Neutral	Significant Positive	Significant Negative	Local	Regional	Provincial	National/International
Fish - Threatened and Special Concern	●		●								Ⓝ
Waterfowl - Special Concern	●		●								Ⓝ
Marine Reptiles - Endangered	●		●								Ⓝ
Blasting - Fish Habitat	●			●			Ⓛ				
Blasting - American Lobster	●			●			Ⓛ				
Blasting - Marine Mammals	●			●			Ⓛ				
Blasting - Marine Mammals - Species at Risk	●			●							Ⓝ
Blasting - Waterbirds	●			●			Ⓛ				
Ship Interactions - North Atlantic Right Whale Conservation Area	●			●							Ⓝ
Ship Interactions - North Atlantic Right Whale Nearshore	●			●							Ⓝ
Ballast Water	●			●						Ⓡ	
Noise and Vibration Marine	●			●			Ⓛ				
Human Environment											
Heritage Resources - Marine Archaeology	○			●			Ⓛ				
Heritage Resources - Land Archaeology	●			●			Ⓛ				

Valued Environmental Component Impact Summary

Table 2, Part 4

Whites Point Quarry and Marine Terminal
Environmental Impact Statement

Component	Time		Type/Significance of Effect				Scale				
	Short Term	Long Term	Significant Positive	Insigificant Positive	Neutral	Insigificant Negative	Significant Negative	Local	Regional	Provincial	National/International
Heritage Resources - History	●		●					Ⓛ			
Heritage Resources - Heritage Properties	●		●						Ⓡ		
Aesthetics - Highway #217	●		●						Ⓡ		
Aesthetics - Bay of Fundy	●		●						Ⓡ		
Economy - Quarry Construction Employment	●	●							Ⓡ		
Economy - Quarry Construction GDP	●	●		●						Ⓟ	
Economy - Quarry Operation Employment	●	●							Ⓡ		
Economy - Quarry Operation GDP	●	●		●						Ⓟ	
Economy - Quarry Operation Tax Revenue	●	●		●						Ⓟ	Ⓝ
Economy - Quarry Operation Mun. Tax Revenue	●	●		●					Ⓡ		
Economy - Fishery - Aquaculture	●			●					Ⓡ		
Economy - Fishery - Intertidal	●			●					Ⓡ		
Economy - Fishery - Nearshore	●							Ⓛ			
Economy - Tourism	●			●						Ⓡ	
Economy - Land Value	●			●							Ⓛ
Recreation	●			●							Ⓛ

Valued Environmental Component Impact Summary

Table 2, Part 5

Whites Point Quarry and Marine Terminal
Environmental Impact Statement

Component	Time		Type/Significance of Effect					Scale		
	Short Term	Long Term	Significant Positive	Insufficient Positive	Neutral	Significant Negative	Local	Regional	Provincial	National/International
Socio-Cultural - Quality of Life - Social Relations	●	●	●					Ⓡ		
Socio-Cultural - Social Capital - Pre-project	○		●					Ⓡ		
Socio-Cultural - Social Capital - Life of Project	●							Ⓡ		
Socio-Cultural - Commercial Patterns	●			●				Ⓡ		
Socio-Cultural - Quality of Life - Environmental	●			●			Ⓛ			
Community Infrastructure	●			●				Ⓡ		
Community Institutional Capacity	●			●				Ⓡ		
Education Training and Skills	●			●				Ⓡ		
Transportation - Land - Construction	○			●				Ⓡ		
Transportation - Land - Operation	●			●				Ⓡ		
Transportation - Marine - Construction and Operation	●									Ⓛ
Human Health - Offsite Drinking Water Quality	●									Ⓛ
Human Health - Onsite Drinking Water Quality	●			●						Ⓛ
Human Health - Marine Contaminates	●			●						Ⓛ
Human Health - Land Contaminates	●			●						Ⓛ
Human Health - Country Foods	●			●						Ⓛ

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10.0 CUMULATIVE EFFECTS

10.0.1 Introduction

Cumulative effect assessment (CEA) is defined, for the purposes of this Environmental Assessment/Impact Statement, as changes to the environment that are caused by an action in combination with other past, present, and future human actions that would result in incremental effects over space and time. In this regard, the Whites Point quarry and Marine Terminal is considered a “single-project assessment” as opposed to regional planning which may not have a single project as a focus and as a definite starting point.

The Canadian Environmental Assessment Agency’s “Cumulative Effects Assessment Practitioners Guide” indicates that a project-specific cumulative effects assessment fundamentally needs to do the following:

- Determine if the project will have an effect on a VEC.
- If such an effect can be demonstrated, determine if the incremental effect acts cumulatively with the effects of other actions, either past, existing, or future.
- Determine if the effect of the project, in combination with the other effects, may cause a significant change now or in the future in the characteristics of the VEC after the application of mitigation for that project.

Therefore, for the CEA, only VECs potentially being effected at the regional scale, or at a sensitive level of concern (e.g. a species at risk), and for a long-term duration will be considered.

10.0.2 Approach

Generally, an ecosystem approach has been followed for the major environmental component categories of the physical, biological, and human environments. Valued environmental components (VECs) were identified within each of these categories. Residual effects, both positive and negative for each VEC are presented in **Table 2 – Valued Environmental Component Impact Summary**, in the preceding **paragraph 9.4**. Generally, cumulative effects would be considered as those effects of broader influence than those of the direct effects of the project “footprint”. These direct effects of project development and activities are considered to be of a “local” influence and are identified in **Table 2**. Therefore for the CEA, the focus will be on influences of the project on a secondary level, the regional scale.

10.0.3 Cumulative Effects Framework

Assessment of direct effects of the proposed project at the local scale is considered to have a greater confidence level of prediction due to the greater level of supporting baseline data for decision making. Predictions for the regional scale effects inherently will have lesser confidence levels. Further, prediction into the future becomes more speculative due to uncertainties regarding implementation of planned actions. As spatial boundaries and temporal time frames are expanded, confidence levels are further reduced.

Planned undertakings or activities in Digby County are especially difficult to forecast since there is no Municipal Planning Strategy in place on Digby Neck/Islands to provide a future planning context, nor does the province of Nova Scotia have a coastal zone management plan for this area of the Bay of Fundy.

The following criteria are intended to provide a spatial and temporal framework which is considered “reasonable” and within the intent of CEA for the Whites Point quarry and Marine Terminal.

- The spatial context proposed is the “regional” scale for the CEA. This is based on the ecological regions defined in the “Spatial Boundaries” **paragraph 8.4.1**. For terrestrial systems the region is defined as the Theme Region 810 – Basalt Peninsula; marine systems as the outer Bay of Fundy; and human systems as Digby Neck and Islands/Digby County.
- The temporal context proposed is defined as the time period from the year 1995 to 2010. This time frame considers pre-project and reasonable future undertakings within the region that may contribute to incremental effects of project development and associated activities.
- Incremental effects of the proposed project in association with other undertakings in the region are considered in the context of direct human actions, in this case the construction and operation of the Whites Point quarry and Marine Terminal.

Even though the planned life of the project is expected to be 50 years and in many cases historic trends were identified in 5 to 20 year and greater increments, reasonable predictions for similar undertakings/activities within the region over a 50 year time frame is considered speculative. As indicated in **paragraph 9.3.25** “Other Undertakings in the Area”, development having similar potential effects is not likely based on historic development trends, especially on Digby Neck and Islands. Digby Neck in particular is experiencing a decline in land and marine development activities.

Review of the Valued Environmental Component Impact Summary – **Table 2**, indicates the majority of predicted effects are either “neutral” or of “local” scale and are not predicted to permeate beyond the project site and its immediately adjacent lands and waters. However, some effects could occur beyond this “local” scale. These VECs will therefore be assessed in relation with other similar past, present, and future undertakings/activities that could produce incremental cumulative project effects. These are discussed below.

10.0.3.1 Greenhouse Gas (GHG)

Fuel consumption is the major producer of GHGs. Pit and quarry development in Nova Scotia contributes less than 0.3% of the greenhouse gas in the province. Traditionally, there has been and are presently many small pit and quarry operations in the region. Two basalt rock quarries are presently in operation and are likely to continue in operation in the near future. No new basalt rock quarries other than the proposed quarry are known to be in the planning or permitting stages within the region. Planned mitigation for the proposed Whites Point quarry proposes no open burning, on-site forest management and conservation, incremental clearing, and incremental reclamation to offset GHG production. An insignificant negative cumulative effect is predicted for the region after proposed mitigation.

10.0.3.2 Flora Species at Risk

The regional ecosystem possesses flora species at risk of Federal and Provincial designations. Any land development (construction, forestry, agriculture, pit and quarries, tourism/recreation etc.) have the potential to affect regional species at risk. As a precautionary measure the Whites Point quarry underwent site specific botanical surveys. These surveys revealed flora species at risk exist on the quarry site. Planned mitigation measures for these species include an environmental preservation zone with expanded buffer areas for protection. Preservation of these species at risk will contribute positively to Provincial flora conservation efforts and maintenance of biodiversity in this regional ecosystem and sensitive coastal habitats. A significant positive cumulative effect is predicted for the region after proposed mitigation measures.

10.0.3.3 Marine Mammals – Blasting

The North Atlantic right whale and other marine mammals frequent this designated ecosystem region of the Bay of Fundy. Marine mammals are sensitive to noise transmitted into the marine environment. Blasting is not routinely conducted in this area of the Bay of Fundy. Future production blasting at the Whites Point quarry is proposed once every two weeks. Each blast will last less than one second. Mitigation measures include setbacks from the marine environment in accordance with the Department of Fisheries and Oceans

“Guidelines for the Use of Explosives in or Near Canadian Fishery Waters”, reduced weights of explosives when blasting near the coastline, and observations to determine that no marine mammals are present in the prescribed “safety zone” before blasting. Considering the proposed mitigation measures and the present infrequency of blasting in the region, cumulative effects would rarely occur. An insignificant negative cumulative effect is predicted for marine mammals/species at risk after proposed mitigation.

10.0.3.4 Marine Mammals – Ship Interactions

The North Atlantic right whale and other marine mammals frequent this designated ecosystem region of the Bay of Fundy. Interactions between ships and marine mammals can be a cause of fatal and non-fatal injuries. Designated shipping lanes exist in the Bay of Fundy for vessels such as those proposed to transport quarry products from the Whites Point quarry. Approximately 50 ships per year are planned to traverse waters between the shipping lanes and the marine terminal during shipping activities. A significant mitigation measure was the location of the marine terminal within the marine region in an area of low marine mammal density, especially the North Atlantic right whale. Shipping activity to and from the Whites Point marine terminal is not required to go past or through the designated North Atlantic right whale Conservation Area. Large vessel traffic may increase in the future in the Bay of Fundy, however, cumulative effects of increased shipping between the shipping lanes and the marine terminal is not expected to increase in the future since only production from this quarry is planned to be shipped. There is no known planned marine development for this region of the Bay which would generate incremental vessel traffic. The only regional cumulative effect would be the additional 50 large vessels per year. An insignificant negative cumulative effect is predicted for marine mammals/species at risk after proposed mitigation.

10.0.3.5 Bay of Fundy Aesthetics

The Whites Point quarry and Marine Terminal will be visible from the coastline and waters of the Bay of Fundy. The coastline along this area of the Bay is relatively inaccessible and has no improved recreational facilities. Another basalt rock quarry visible from the water and land with an associated small craft harbour was recently constructed at Tiverton, Long Island in Petit Passage. Other fishing harbours have traditionally existed along the Bay of Fundy coastline with associated land development. With the exception of an approximate three month whale and seabird cruise season, the majority of nearshore use of the Bay of Fundy is for industrial purposes – e.g. fishing and fish processing. Whale and seabird cruises generally do not frequent this particular region of the coast since greater opportunity for whale and seabird sightings exist in other waters of the Bay. There are no known or planned future marine developments in this area of the Bay of Fundy. The proposed marine terminal and quarry would contribute to the present sparsely developed industrial coastline. An insignificant negative cumulative effect is predicted from an aesthetic value when the development is viewed from the coastline or nearshore waters.

10.0.3.6 Employment/Quarry Operation

The majority of employment in the region is generated by the fishing and fish processing industries. Stable employment opportunities and diversification have expanded recently within the broader region of Digby County mainly as a result of the service and commercial sectors. Some of these businesses have offered full-time employment opportunities in contrast to the traditional seasonal employment offered by the fishing or tourism industries. The Whites Point quarry will offer 34 full-time employment opportunities. These opportunities may benefit those men and women in the working age group that are presently under employed. These quarry jobs will pay industry standard wages, which are generally one of the higher industrial wage rates. Since there has been, and trends indicate a continued high rate of unemployment in this region, additional employment opportunities will add positively to the incremental cumulative effect. A significant positive cumulative effect is predicted on regional employment opportunities as a result of the quarry operations.

10.0.3.7 Municipal Tax Revenue/Quarry Operation

The Whites Point quarry and Marine Terminal will pay municipal taxes to the Municipality of Digby. These taxes will be incremental to existing revenues and contribute to the costs of municipal services for the residents of the County. A significant positive cumulative effect on the broader regional (County) tax base is predicted from operation of the quarry.

10.0.3.8 Tourism

The Digby Neck and Islands tourism industry is seasonal with whale and seabird cruises and outdoor activities the main attraction to the region. A “Discovery Centre” is in the planning stages in the vicinity of Freeport on Long Island. The Discovery Centre would supplement other physical attractions such as the Tiverton Museum and the Balancing Rock Trail. Many natural resource based developments such as pits and quarries, forest clear-cutting, or agriculture can affect scenic qualities of a regions landscape. Although the quarry will not be visible from the primary tourist route – Highway 217, it will be visible from the Bay of Fundy and its coastline. Although most whale and seabird cruises frequent other areas of the Bay, some tourists may be exposed to the quarry site. This industrial site could be considered cumulative with other industrial activities (fishing industry), resource extraction (pits and quarries) and forestry practices such as clear-cutting. Mitigation measures such as an environmental preservation zone around the perimeter of the quarry property, managed forest lands, incremental forest clearing, and incremental reclamation are proposed. An insignificant negative cumulative effect within the region is predicted if tourism participants view the quarry from the Bay of Fundy coastline or waters.

10.0.3.9 Quality of Life

Even though residents of a community may have different perceptions regarding their quality of life, a healthy and safe environment, access to health care, presence of family and good income and financial security ranked high among the community residents. The industrial development proposed at the Whites Point quarry could provide all of the above quality of life opportunities for some individuals in the community. Since all environmental regulations and standards will be adhered to, no environmental degradation is expected while the other factors will be available, thereby providing incremental opportunities to those already in place by existing industry. Little industrial diversification has occurred in the recent past and trends indicate limited growth in the future. Considering the potential quality of life opportunities presented by incremental cumulative industrial development, an insignificant positive cumulative effect is predicted resulting from the quarry operation.

10.0.3.10 Social Capital

Residents of rural areas generally exhibit a stronger community cohesion – a sense of belonging to one’s community – than urban residents. A strong sense of belonging may also be characteristic of communities based on a primary resource industry. Although the community as a whole may not be in total support of the proposed quarry project, the Whites Point quarry has committed to employing and training a workforce of local people with an emphasis on women. In the long-term, this hiring practice from “within” the community will tend to strengthen community social cohesion such as networks, volunteerism, and social support systems. This strengthening of community cohesion will contribute to a predicted insignificant positive cumulative effect, in the long term, as a result of the quarry project.

The following **Table CEM - 2** presents a Valued Environmental Component Cumulative Effect Summary for the Whites Point quarry and Marine Terminal project. **Table CEM - 1** presents the monitoring program for the valued environmental component cumulative effect.

Whites Point Quarry and Marine Terminal
TABLE CEM - 2 CUMULATIVE IMPACT SUMMARY TABLE
VALUED ENVIRONMENTAL COMPONENT (VEC)

POTENTIAL CUMULATIVE ENVIRONMENTAL COMPONENT	SCALE	CUMULATIVE EFFECT Significance / Type	PROBABILITY
Greenhouse Gas	Regional	Insignificant / Negative	Possible
Flora Species at Risk	Provincial	Significant / Positive	Likely
Marine Mammals - Blasting	National	Insignificant / Negative	Unlikely
Marine Mammals - Ship Interaction	National	Insignificant / Negative	Unlikely
Bay of Fundy Aesthetics	Regional	Insignificant / Negative	Possible
Employment	Regional	Significant / Positive	Likely
Municipal Tax Revenue	Regional	Significant / Positive	Likely
Tourism	Regional	Insignificant / Negative	Possible
Quality of Life	Regional	Insignificant / Positive	Possible
Social Capital	Regional	Insignificant / Positive	Likely



Whites Point Quarry and Marine Terminal
Table CEM - 1 Summary Table
Cumulative Environmental Component Monitoring

Environmental Component	Project Phase		Frequency	Description/EIS Paragraph	Regulatory Requirement
	Construction	Operation			
<i>Greenhouse Gas</i>	Yes	Yes	Annually	•Measurement of energy consumption by type of fuel (para. 10.0)	No
<i>Flora Species at Risk</i>	Yes	Yes	Varies by Species	•Maintain liaison with federal and provincial agencies regarding additions or deletions of regional species at risk (para. 10.0)	No
<i>Marine Mammals - Blasting</i>	Yes	Yes	Varies by Species	•Maintain liaison with federal and provincial agencies regarding additions or deletions of regional species at risk and adaptive management procedures (para. 10.0)	No
<i>Marine Mammals - Ship Interactions</i>	Yes	Yes	Varies by Species	•Work with the shipping company and DFO to develop detection systems for marine mammals in the designed ship route to and from the shipping lanes and the Whites Point Marine Terminal (para. 10.0)	No
<i>Bay of Fundy Aesthetics</i>	Yes	Yes	5 years	•Photographic documentation of view planes from the Bay of Fundy to the coastline to appraise effectiveness of reclamation (para. 10.0)	No
<i>Employment / Quarry Operation</i>	No	Yes	Annually	•Maintain a list of direct employment by occupation of quarry workers (para 10.0)	No
<i>Municipal Tax Revenue / Quarry Operation</i>	No	Yes	Annually	•Maintain amount of direct taxes paid to Municipality (para. 10.0)	No
<i>Tourism</i>	No	Yes	Annually	•Maintain rural landscape at entrance to quarry at Highway 217 (para. 10.0)	No
<i>Quality of Life</i>	No	Yes	after 5 years	•Assess quality of life of residents on Digby Neck by survey (para. 10.0)	No
<i>Social Capital</i>	No	Yes	after 5 years	•Assess success of training and local hiring of workforce at quarry (para. 10.0)	No

10.0.4 Development by the Proponent or Others That May Appear Feasible Because of the Proximity of the Project's Infrastructure

The development of the Whites Point project by Bilcon is designed to supply Bilcon's parent company, Clayton Concrete Block and Sand, with washed aggregates to be used in the current concrete and block operations in New Jersey.

Clayton's requirement is for 2M tonnes per year and the capacity of the Whites Point Quarry operation has been designed to supply this quantity. Bilcon has no other land holdings capable of producing aggregate other than those in the Little River/Whites Point area.

The capacity of the shiploader is estimated to be 5,000 tonnes per hour and, theoretically, significantly more product could be loaded than the 2 M tonnes per year anticipated; however, while the shiploader has surplus capability, there is no additional space for stockpiling.

Bilcon has no intention of making the shiploader available to other producers in the area, since this would have serious effects on the efficiency of the anticipated operation and would create additional environmental impacts from trucking activities.

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11.0 ENVIRONMENTAL MANAGEMENT

Corporate Philosophy

The Proponent commits to the highest of standards in all aspects of its operations, including environmental protection, health, and safety. The company undertakes to act responsibly as a steward of the resources and work for the wellbeing of its employees and the community in which it operates.

The Proponent will:

- Carry out training programs for all its employees to ensure that they have the skills to maintain an environmentally safe and a healthy and injury-free workplace;
- Implement site-specific health, hygiene, safety, environment and emergency response policies, management programs, and practices;
- In all quarry and marine terminal activities, minimize risks to the environment, health, and safety and ensure compliance with the requirements of all regulatory authorities;
- Require all contractors and subcontractors to adhere to practices consistent with Bilcon's environmental, health, and safety programs;
- Maintain a monitoring program to ensure compliance with this policy and laws and regulations; and
- Communicate regularly with the public, employees, and other stakeholders on activities involving the environment, health, and safety.

11.0.1 The Approach to Environmental Management and Strategies for Implementation

General Strategy

The Proponent will follow the principles of its parent company and involve all employees in Environmental Management. Training programs will be carried out and sound work procedures will be established and enforced for all work stations.

A specific Environmental Management team under the overall direction of the Operations Manager will be established prior to the commencement of construction and will operate throughout the life of the quarry. This team will be responsible for ensuring that all mitigation measures and monitoring programs described in this document are followed and monthly meetings of the team will review each of the mitigation and monitoring elements to ensure compliance with the corporate commitment and with all thresholds established by regulatory agencies.

A senior health, safety, security, and environment (HSSE) supervisor will be engaged and provided with the appropriate staff work space and equipment to carry out the various health, safety, and monitoring programs and to ensure that mitigation procedures are being followed. Weekly reports will be provided to the Operations Manager and these reports will be reviewed by the Environmental Management team at its monthly meetings. The effectiveness of mitigation measures will be reviewed each month and, if necessary, adaptive management techniques (developing improved techniques while conducting management activities) will be employed in consultation with the appropriate regulatory authority. Action, where necessary, will be the responsibility of the Operations Manager.

Monitoring reports, where required by regulatory agencies, will be forwarded at the time intervals required by the agencies.

The Operations Manager will be responsible for follow up on any issues identified in the weekly meetings of the Environmental Management team and to ensure the accuracy of impact predictions.

Specific Procedures and Programs

An operations manual will be prepared which will set out for each of the valued environmental components, the conditions of approval, the commitments of the company, the mitigation measures, and the monitoring program.

At each monthly meeting of the Environmental Management team, each of the elements of each of the valued environmental components will be reviewed using the weekly reports submitted by the senior HSSE supervisor. An assessment will be made and recorded for each of the components so that conditions can be tracked for specific time periods and over the life of the project.

Each of the valued environmental components will be reviewed to verify the impact predictions and to determine the effectiveness of the mitigation measures being carried out. Where necessary, consultants will be engaged to verify the effectiveness of mitigation measures; for example, for the protection of the *Prenanthes racemosa* (Glaucous Rattlesnake-root) identified in the Plant Survey of Whites Cove Property prepared by Ruth Newell. Consultants' reports will be filed with the appropriate regulatory authority.

Regulatory Authorities

As noted above, regulatory authorities will be furnished with monitoring reports at the intervals stipulated by the authorities and the consultant reports for specific valued environmental components. In addition, the appropriate regulatory authorities will be updated on a regular basis on the success or otherwise of mitigation measures and, where necessary, asked to become involved in adaptive management.

Records

Records of all monitoring, assessments of mitigation measures, consultants' reports, and assessments carried out by the Environmental Management team will be maintained on site for inspection by regulatory authorities throughout the life of the project. Those monitoring reports required to be submitted on a periodic basis will be submitted by the Quarry Manager at the required time intervals.

Public Involvement

It is the intent of the company to establish a new Community Liaison Committee to ensure that the community is made aware of the effectiveness of the mitigation measures and to discuss any ongoing concerns raised by the community. It is proposed that this committee meet on a quarterly basis at the on-site quarry offices, and that a tour of the operation be given so that members can observe first-hand the measures being undertaken.

The committee would be made aware of monitoring results on an ongoing basis and an annual review of monitoring results would be prepared by the company for review by the committee and for distribution to the residents of the local community.

It would also be the intent to hold an open house for the general public at the quarry site once the construction process is complete and the quarry operational. This event would provide an opportunity to anyone interested to ask questions of the quarry staff and to see first-hand the work of a quarry and the environmental management plan in operation.

Compensation

The Environmental Management team will also deal with the issue of compensation. A compensation plan has been discussed with lobster fishers who traditionally fish in Whites Cove and it is acknowledged that some lobster traps may be lost as a result of ships entering and leaving the marine terminal, even with the ship maintaining a pre-designated route and notification of ships movements to the lobster fishers. It is agreed that the lobster fishers will form a committee which will assess damage and that a compensatory sum will be provided by the company to be administered by the committee.

The Environmental Management team will meet with the committee on an annual basis to review the results and to make any adjustments where necessary.

The company has also made the specific commitment that it will compensate any drilled- well owner whose well has failed due to quarry activities (Appendix 47) The Environment Management team will review such claims and, where appropriate, ensure that new wells are drilled.

A compensation plan has been approved with the Department of Fisheries and Oceans with respect to destruction of fish habitat. Part of the monitoring program which will be developed in consultation with the Department will be to assess the level of success for the compensation plan.

Partnerships

Bilcon would welcome the opportunity to participate in partnerships with academe or others to further practical research and the Clayton companies have a history of such participation (See Appendix 13, Rutgers University). Bilcon sees such opportunities arising, particularly in the reclamation process which, after the first five years of operation, will be carried out on a continuous basis.

Adaptive Management

As noted in 3.5 in this document, Bilcon will apply the precautionary principle to all phases of the project through its approach to environmental risk management. Where there is uncertainty with respect to the effectiveness of measures that are used to prevent serious or irreversible environmental effects, Bilcon will take an adaptive management approach. Adaptive management uses monitoring results to accommodate uncertainty. This will permit early intervention through the use of additional mitigation or avoidance to control potential environmental damage.

The use of an adaptive management approach, based on scientifically defensible performance-based standards, will be Bilcon's strategy throughout the life of the project.

Quality Assurance and Quality Control Measures

a) Environmental Quality Assurance Plan

As noted under the section Environmental Criteria 11.1, the Proponent is committed to developing and implementing an environmental quality assurance plan to the ISO 14001, or similar standard, to ensure compliance with corporate philosophy and Federal and Provincial Regulations and Guidelines.

b) Product Quality Control

The sole produce from the quarry operation will be crushed rock of various sizes which will be wholly used for the Clayton concrete and block operation. The quality of the product produced at Whites Point will, therefore, directly impact the quality of Clayton's finished product. Quality control is, therefore, imperative at the crushing, screening, and washing operation, and the various stockpiles will be continuously monitored for quality. All products, as noted, will be exported and will meet the requirements of the finishing process (concrete or block) in the markets in which they are distributed. No regulatory approval of the product is required prior to its shipment.

11.1 Management Criteria

The philosophy and approach to Environmental Management is set out in 11.0. The criteria for Environmental Management is set out for each VEC in the EIS and tabulated in the Mitigation Table, the Monitoring Table, and the Commitment Table, set out in 11.4, 11.5, and the Executive Summary. Specific VECs are dealt with under 11.8, Compensation.

As noted under 11.0, an Operations Manual will be prepared which will set out for each of the VECs, the conditions of approval, the commitments of the Company, the mitigation measures and the monitoring program. All Environmental Management will be carried out under an environmental quality assurance plan to the ISO 14001, or similar standard.

11.2 Accidents and Malfunctions

The concept of accidents and malfunctions must be considered in terms of both likelihood of an event and the exposure time over which that event could occur. To that extent, exposure to accident risks during a relatively brief construction activity must be considered separately and differently from a longer-term exposure for example, from routine production operations over a 50-year term. Similarly, the effect of an accident on the ecology will differ with each eco-receptor. As a consequence, the proponents approach to the potential accident will differ for each case.

The Proponent's safety culture, approach to site operation and management is critical to avoidance and mitigation of adverse effects due to accidents and malfunctions. Bilcon of Nova Scotia and parent Company Clayton corporate philosophy in this matter is clear, and is characterized in the statement “ *Clayton Companies has had longstanding corporate policies of providing a safe and healthful work place, protecting the environment, and conserving energy and natural resources. Clayton companies are committed to environmental compliance and stewardship in all of its business activities.*”

Accidental events can lead to injury to the biophysical environment as well as effects on human health and safety. The severity of effects from accidental events is dependent upon the magnitude of the event, location of the event, and the time of year.

Accidental events can be generally categorized as either spills or releases to the environment of such materials as fuel, hazardous materials and wastewater, or the failure of engineered designs that may result in material spills or releases to the environment, vehicular accidents and fire. Although this section of the EIS will identify potential accidents and malfunctions that could occur at the Whites Point Quarry and Marine Terminal project site, such accidents and malfunctions are notably rare occurrences.

The reader must bear in mind that all aspects of the Whites Point Quarry and Marine Terminal project, from construction activities to full quarry and ship loading operations and cargo vessel transits are already in progress at numerous locations in Nova Scotia, elsewhere in Atlantic Canada, along the Eastern Seaboard and throughout the world. Many similar operations can be viewed operating within environmental compliance and safety on a routine daily basis. As examples, a few similar operations located within the Atlantic area are identified below for the convenience of the reader.

Water Side Quarry and Ship Loading

Martin Marietta	Aulds Cove, NS
Little Narrows Gypsum	Little Narrows, NS
Atlantic Minerals	Port au Port Peninsula, NL

Ship Loading Terminals

Fundy Gypsum	Hantsport, NS
National Gypsum	Dartmouth, NS
Georgia Pacific	Point Tupper, NS
Savage CANAC Corp.	Point Tupper, NS
Sydney Coal Pier	Sydney, NS

Large Scale Quarry Operations

Fundy Gypsum	Wentworth Creek, Miller Creek, NS
National Gypsum	Milford, NS
Georgia Pacific	Kingsville, NS
Conrad Bros.	Dartmouth, NS
Municipal	Waverley, NS

The Bilcon approach to management of potential accidental events that could cause adverse environmental effects is imbedded within corporate culture. The key elements include:

- Effective design of the workplace facilities and equipment.
- Hazards controlled to prevent unsafe and unhealthful exposures.
- Monitoring of hazard condition
- Elimination or control accomplished in a timely manner.
- Application of Corporate resources
- Provide adequate surety to fund cleanup

The following text of this section addresses some key background project information; Valued Environmental Components (VEC) definition, and the proponents approach to each perceived risk relating to potential accidents and malfunctions.

11.2.1 Project Background

The Proponent

Bilcon has described the Whites Point Quarry and Marine Terminal (WPQMT) project elsewhere in this document; however, it is outlined here within the context of accidents and malfunctions and project phases.

Construction Phase

Duration 12 to 18 months

Activities

- Site infrastructure development and construction of site access and service roads, electrical power distribution, fuel storage, water supply, site water management and drainage structures, sediment retention ponds.
- Quarry and terminal site clearing - 27 acres
- Construction of site offices, stores warehouses and mechanical maintenance shops.
- Installation of crushing, screening and wash plant facilities.
- Construction of product lay down, reclaim and materials handling and transfer facilities.
- Construction of the marine shipping terminal including mooring dolphins and related mooring buoys, pile support structures, installation of aggregate handling conveyors and ship loader.

Operational Phase

Duration 50 Years

Activities

- Routine basalt aggregate production operations:

Quarry

- Clearing and quarry face development

Drill and blast

- Aggregate production

Erosion and siltation control

- Processing
- Crushing, screening and wash plant operations
- Aggregate stockpiling

Shipping

- Aggregate reclaim and ship loading operations
- Vessel size 50,000 tons
- Vessel transit to international waterway

Quarry Reclamation

- Slope reduction, erosion stabilization, revegetation
- Completion of 25 acre segments each 5 years

Shutdown and Reclamation

Duration 2 Years

Activities

Removal of all:

- Quarry plant and buildings
- Site infrastructure
- Reclamation of site to render it stable to erosion and of safe access

11.2.2 Valued Environmental Components

Bilcon has identified the site VEC's any of which could be adversely affected by accidental or malfunction occurrences. Listed below are those components of the VEC that could most likely be adversely impacted in the event of an accident.

Physical Resource Components

Ground Water

- Water Quantity
- Water Quality

Surficial Geology

- Soils

Surface Water

- Chemical Water Quality

Biological Resource Components

Terrestrial Ecology

- Habitat Alteration
- Habitat Diversity
- Floral Species at Risk
- Faunal Species at Risk
- Odonata and Lepidoptera Species at Risk
- Wetlands
- Migratory Land Birds

Aquatic Ecology

- Little River Watershed
- Freshwater Fish Habitat

Marine Intertidal Zone

Coastal – Nearshore Marine Habitat

- Migratory Waterfowl
- Fish Habitat
- Marine Mammals
- Marine Reptiles
- Marine Species at Risk
- North Atlantic right whale – Noise and Vessel Interaction

Human Resource Components

Water Use

- Intertidal Fishery
- Tourism
- Recreation

Human Health

- Air Quality
- Drinking Water Quality
- Noise and Vibration

11.2.3 Employee and Community Safety

Employee and community safety ranks very high on Bilcon and parent company Clayton, management priority. Corporate governance, policies and practices place high emphasis on these matters.

Clayton Companies have longstanding corporate policies of providing a safe and healthful work place, protecting the environment, and conserving energy and natural resources. Clayton companies are committed to environmental compliance and stewardship in all of its business activities.

A selection of portions of Clayton Corporate Policies is attached as an addendum as a sample of the corporate environment and culture under which Bilcon will operate. The attachments include documents relative to Corporate Policy; Health, Safety, and Environment, Facility Security Plan, Spill Prevention Control and Countermeasure (SPCC) Plan, and a Shipboard Oil Pollution Emergency Plan for a supplier under contract. Full documents can be made available for viewing at the request of the panel to the extent that requirements of corporate and regulatory confidentiality will permit. These documents are provided as indication that such provisions are familiar to Bilcon and are in the norm of everyday business. Documents and plans similar to the above mentioned plans specifically tailored to the WPQMT project will be prepared as required by the relevant legislation as the project advances.

Management commitment and employee involvement is complementary. Management commitment provides the motivating force and the resources for organizing and controlling safe work activities within the Clayton organization.

Ongoing work site analysis is done through a visual inspection process to identify not only existing hazards but also conditions and operations in which changes might occur that would create hazards. Industrial hygiene surveys are conducted as warranted. Employees are encouraged to take part in the inspection and/or work site improvement process. All injuries and incidents are investigated; causes and means for their prevention are identified.

Where feasible, hazards are prevented by effective design of the workplace facilities and equipment. Where it is not feasible to eliminate hazards, they are controlled to prevent unsafe and unhealthful exposures. Where a determination of a hazard condition is made, elimination or control is accomplished in a timely manner. Personal protective equipment is provided for by the Clayton organization. Medical monitoring is conducted in compliance with Federal Standards. A drug-free workplace policy is in effect in all areas of employment.

An introduction to safety and health programs is given at the time of hire. Training is conducted on a regular basis encompassing safety and health practices relative to the specific work site. Training in safe work habits encompassing programs mandated by various governmental agencies

Where necessary, correction of unsafe personal practices is enforced and clearly communicated through a disciplinary system.

A workers' compensation medical program, which includes available first aid measures and emergency medical care, is clearly established to minimize any injury or illness that does occur.

The Whites Point Quarry and Marine Terminal site will necessarily operate in accordance with provincial labour, health and safety and environmental legislation. The operating site will have controlled access to limit the possibility of access by unauthorized personnel. Standardized procedures and warning signals will sound in advance of blasting operations. Fire watches and alarms and suppression system will be employed where appropriate. The operating site will be equipped with adequate first aid personnel, in the event of accident involving injury to personnel. The site will have necessary equipment; trained personnel and a ready supply of early action environmental cleanup materials such as silt fencing and absorbents available for rapid use.

In the case of an accident, internal corporate resources will provide first order mitigation to reduce any adverse impacts. Arrangements will be made with external agencies to call up additional emergency resources when necessary to attend to on site conditions that exceed the capacity of site personnel and supplies. In addition, sufficient surety arrangements will be made to provide for cleanup financial resources to backstop corporate sources.

11.2.4 Hazardous Materials

Bilcon has identified a number of consumable materials to be used in relation to the WPQMT project that could if spilled, cause adverse environmental impact. Such materials include:

- Diesel fuel
- Gasoline
- Motor oil
- Lube oil
- Engine coolant
- Hydraulic fluid
- De-icing compound (glycol based)
- Explosives: ANFO, emulsions, primers
- Flocculent
- Cleaning solvents and paints
- Propane
- Acetylene
- Cement and concrete additives

All petroleum storage facilities will conform to the requirements of the Nova Scotia Standards for Construction and Installation for Petroleum Storage Tank Systems as issued under the Nova Scotia Petroleum Management Regulations.

Explosives will be stored offsite and delivered to the site in day use quantities. In summary, the procedures and requirements of the WHMIS program and other applicable government regulations will be enforced. If a spill does occur, the severity of the environmental consequences depends on the location of the spill, the volume of the spill, and the time of year. The volume of a hazardous material is dependent on the size and number of containers.

Accidental spillage of fuels or hazardous materials probably represents the highest probability of occurrence during both the construction and operating phase of the WPQMT project. Uncontained, such spills could impact the near shore environment. Proper design of facilities, careful management of operating procedures and advanced planning and preparedness for such potential events, will mitigate any adverse environmental impacts.

In the event of a liquid the spill will flow with the surface water and be captured within the drainage path or ultimately within surface water and sediment containment pond. At these locations actions can be taken to contain the spill, remove the offending materials and or treat the contaminated water.

Both the ground water and surface water divide is along the crest of the topographic high near the east boundary of the project. Both regimes will flow to the west into the Bay of Fundy. There is little risk of contamination of the ground water flows to the east. See section 9.1.3 on groundwater.

While there is some risk of accidental spillage, both the operations and also the materials are in very common use throughout Nova Scotia on a daily basis. Established sound management, operating and environmental practices will assure environmental compliance.

11.2.5 Accidental or Malfunction Events

Land Site Environment

Blasting

The use of explosives as a part of the quarrying process could be a source of an accidental explosion. The commonly used explosives are known as blasting agents ANFO (Ammonia Nitrate Fuel Oil) prill mixtures used under dry conditions and Emulsions used for wet conditions. This class of explosives is not easily detonated with out a “booster” charge to initiate the charge. As a consequence, the explosives are not considered an explosive risk while in transit or handling. The quantities of explosives handled will depend upon the size of the blast design; however, will be in the order of 0.4 kg per tonne blasted or approximately 7,500 kg for a 20,000-ton blast.

The record for accidental detonation in a Canadian mine / quarry controlled environment is free of incidents. At the WPQMT site all personnel will be removed from close proximity to the blast and blast warning and access restrictions will be strictly enforced. Fly rock from blasting operations can be problematic but in this case, a risk only to site property. From an accident point of view the village of Little River is not at risk for a blast accident.

Due to their physical nature spills of both the explosive prills and emulsions do not represent significant environmental hazards. Spills of both materials can be easily contained and readily cleaned up. Arrangements are normally made with commercial spill recovery firms to attend to large spills.

Vehicle Accident and Fuel Spill

Vehicular movements will be one of the most common activities on site in relation to personnel movements, aggregate excavation, loading, hauling, service activities etc. Vehicular accidents on site roads and in the quarry could result in spill of pit run aggregate, spill of fuel, or spill of hazardous materials depending on the service of the vehicle. The severity of the consequences would depend on the location (e.g. spill into a watercourse) and the time of year (e.g., spawning of fish, fishing seasons, seasonal occupations).

Spillage of pit run aggregate would not create a serious environmental hazard and can be readily contained and cleaned up. However; fuel spillage from large off road haulage units could cause environmental damage. Containment and recovery of fuel and hazardous materials will be a concern. The volume of any spill of oil or hazardous materials will be dependent on the size of the trucks and containers.

Fuel tanks on large off highway haulage units, excavators and dozers contain 500 L to 1200 L of diesel fuel. Other vehicles will have fuel tanks similar to commercially available industrial equipment less than 500 L capacity. Should the accident involve a fuel transfer vehicle, the quantity could be larger – in the order of 6000L.

In the case of spillage of gasoline and diesel fuels, lubricants and other equipment fluids; these materials in these quantities can easily be captured and retained by site facilities. Absorption materials will be readily available for clean up.

Oil Spill at Fuel Storage Facilities

Above surface fuel storage for project vehicle and equipment use is planned, situated between the proposed office and shop locations. There will be no fuel for bulk carrying ships stored on site. Storage for heating fuels for the offices, warehouse, shops and the enclosed sectors of the aggregate wash plant will be located at the respective facilities. All of these locations are within the permanent site drainage collection system that will direct drainage to the site water and sediment retention pond.

Oil spills can occur at the fuel storage facilities or during the delivery of oil to the storage facilities at the project site. The oil storage tanks could fail as a result of spontaneous rupture or explosions. Spills could also result from human error during delivery of fuel to the oil storage tanks (e.g., overfilling, leaving valves open). Fuel storage tanks and facilities will be designed to conform to the NSDEL regulations for petroleum storage tank installations. Key design features include the installation of impervious mats, containment dykes, and the installation of sump and collection systems.

Permit applications require submission of information such as:

- Name, address of owner and type of facility.
- Name of operator, if different from storage tank owner.
- Name of landowner, if different from storage tank owner.
- Location of storage tank system, if different from address of owner, unless the system is intended to be in place for less than 60 days, whereupon the system may be registered as having one of multiple temporary unspecified locations.
- Capacity of storage tank, or combined capacity of storage tanks if there is more than one in the storage tank system.
- Type of petroleum product or allied petroleum product.
- Year of installation of each storage tank system.
- Type of storage tank and piping material for each storage tank in the system.
- Corrosion protection provided, if applicable.
- Type of pump or pumps.
- Type of leak detection.
- Internal linings, if any.
- Type of secondary containment.
- Number and locations of monitoring wells.
- Type of overfills protection and volatile organic compound (VOC) emission control.
- Manufacturer of each storage tank in the system.
- Type of storage tank, whether horizontal or vertical and diking (for AST only).

In the case of a tank rupture or leak, emergency response and clean-up procedures will be implemented. The likelihood of any oil escaping to the environment as a result of a tank failure is considered very low. Spills of hazardous substances including fuels are required to be reported to NSDEL when the quantity of the spill exceeds the amounts shown in the following table.

Schedule “A” - Spill Report Requirements

Item No.	TDGA Description of Contaminant Class	Amount Spilled
1.	1 Explosives	any amount
2.	2.1 Compressed gas (flammable)	100 L
3.	2.2 Compressed gas (non-corrosive, non-flammable)	100 L
4.	2.3 Compressed gas (toxic)	any amount
5.	2.4 Compressed gas (corrosive)	any amount
6.	3 Flammable liquids	100 L
7.	4.1 Flammable solids	25 kg
8.	4.2 Spontaneously combustible solids	25 kg
9.	4.3 Water reactant solids	25 kg
10.	5.1 Oxidizing substances	50 L or 50 kg
11.	5.2 Organic peroxides	1 L or 1 kg
12.	6.1 Poisonous substances	5 L or 5 kg
13.	6.2 Infectious substances	any amount
14.	7 Radioactive substances	any amount
15.	8 Corrosive substances	5 L or 5 kg
16.	9.1 Miscellaneous products or substances, excluding (in part) PCB mixtures	50 L or 50 kg
17.	9.1 PCB mixtures of 50 or more parts per million (in part)	0.5 L or 0.5 kg
18.	9.2 Environmentally hazardous substances	1 L or 1 kg
19.	9.3 Dangerous wastes	5 L or 5 kg
20.	none Asbestos waste as defined in the Asbestos Waste Management Regulations	50 kg
21.	none Used oil as defined in the Used Oil Regulations	100 L
22.	none Contaminated used oil as defined in the Used Oil Regulations	5 L
23.	none A pesticide in concentrated form	5 L or 5 kg
24.	none A pesticide [in] diluted form	70 L
25.	none Unauthorized sewage discharge into fresh water or sensitive marine water	100 L
26.	none Ozone depleting substances as defined in the Ozone Layer Protection Regulations	25 kg

Facility Fire

The potential for fire at the WPQMT project could be a concern for project managers. The most obvious locations for fire potential will be; vehicles, fuel storage facilities and buildings, mechanical shops, processing plants, and materials handling facilities particularly conveyor systems. From an environmental impact perspective, the most critical of these is the fuel storage where there may be sufficient fuel to sustain a fire event. Generally, the quantities of combustibles in vehicles, processing plants, and materials handling facilities will not sustain fires for long periods of time.

Fire detection and protection systems will be provided in critical locations such as fuel and lubricant storage tanks. Bilcon employees will be trained for rapid first response to fire events until local fire fighting crews arrive on site. The emergency response procedure will be implemented immediately upon the detection of a fire. Fire fighting equipment will be deployed immediately.

Containment Ponds

Sediment retention ponds are planned on the WPQMT plant site. Competent engineering professionals will design and supervise the construction of these facilities. The dams, containment berms and discharge structures, will be designed and constructed to stringent engineering standards in accordance with probable maximum precipitation events. Routine monitoring and operational inspections will be conducted by Bilcon to assure proper operation and continued stability.

The earthen sediment retention ponds for runoff water and sediment can be subject to failure and have potential to become a source of adverse environmental impact. Failure of the structures can result from design inadequacy, component failure due to accident or act of nature. In any case, the result of the failure can be an unscheduled discharge of the ponds contents into the receiving environment.

The two main accidental events considered are:

1. Dam failure, resulting in the release of settled solids and surface waters covering the sludge that may contain contaminants downstream; and
2. Untreated overflow, as a result of storm events.

A total dam failure scenario is considered as a worst-case event. It should be recognized that perimeter dam failures are avoidable by proper design, routine inspection, and maintenance. Storm events will vary widely in duration and intensity. It is therefore difficult to predict the extent of water quality effects resulting from the release of a worst-case storm event.

Each facility will be designed such that normal discharge is possible at one perimeter dam location only. This location is selected based on environmental criteria and accessibility for maintenance and inspection purposes.

Sediment Storage Area

This area, which is shown on Plan OP - 1, will store sediment from the washing process as well as sediment removed from the sediment retention ponds.

Initially, these sediments will be in an unstable condition and will need to be contained by a berm system to prevent slumping and migration down slope towards the Bay of Fundy. These berms will be engineered to prevent failure and will be inspected on a regular basis. It should be noted that as the sediment drains and dries it becomes stable and the danger of slumping diminishes. With proper design of the berms there is little risk of sediment migrating down slope to the Bay of Fundy.

The sediments stored in the storage area are planned for reclamation use. Sediment will be mixed with the reclaimed topsoil which will also be stored in a bermed area, and used to reclaim areas where quarrying has been completed

Because the solids are planned for reclamation use, all solids will be removed on a five-year cycle and redistributed as vegetation substrate over the reclaimed site. As a result, the WPQMT will produce no accumulated fine wastes.

Marine Terminal and Ship Loader

The marine terminal more fully described elsewhere in this document will have the following key features:

- Concrete and steel pile supported conveyor bridge 200 m long
- Radial motion quadrant ship loader operating at 4,000 tph
- Three berthing dolphins providing 140 m berth at water draft of 16 m
- Two mooring buoys

This structure and materials operation does not present any particular accidental environmental hazard beyond those already discussed for the land based facilities. Potential for accidental events between the marine terminal and the cargo ship is discussed in the next sections.

Marine Environment

Shipping Vessel

Large self-unloading vessels will be used to transport aggregate product from the WPQMT site to markets in the USA. All ships operate under strict TC Regulations and ISM (marine version of ISO) standard practices from which corporate governance protocols, policies and operating manuals are drafted. Similar ships transit NS waterways on a daily basis hauling coal, aggregate, and gypsum.

Navigational assist equipment employing GPS systems, radar surveillance, weather forecasting and a variety of communication devices allows for reliable and safe ship operations under all weather conditions. Only the most severe weather conditions would interfere with ship operations.

Annual design production for the project is 2.0 M tons per annum. With a 40,000 tonne capacity vessel, approximately 50 vessel transits are required per year. Larger vessels will require fewer transits. Shipping schedule at the design rate and transit times to the NY destination may favour a dedicated vessel. In the unlikely event that a ship is damaged, fuel oil or aggregate product may be released into the marine environment.

A typical ship will be a 40,000 ton to 70,000 ton self-unloader. A double hull design of modern carriers offers particular environmental advantages that will not release fuel or product if holed. In addition, most ships are also equipped with bow thrusters to assist in docking. Such ships carry a fuel load of 800 to 1000 tons bunker "C" for ship propulsion fuel and 100 tons Marine Diesel Oil (MDO) which is consumed at 4 tons per day at dock side for ship power service. Modern ships all possess fire detection and fighting equipment to be used by trained crews.

The sailing speed for the vessels in open water is 13.5 knots (nautical miles) per hour slowing to less than 3 knots during transit to berth area and less than 1 knot to approach the dock. The vessels will navigate the Bay of Fundy along established shipping lanes exiting to transit to the Bilcon dock along pre-established routes a distance of 14 km.

For docking purposes, ship operators do not consider this location to be significantly different than other locations such as Atlantic Minerals, Port au Port, NL, and Belledune, NB. Tug assisted docking will not normally be required. If storm conditions are forecast, the master has other options; to stay at sea, go to anchor, to delay docking or departure awaiting more favourable conditions.

Vessel Accidental Hazards

Modern vessels operating under strict corporate and regulatory protocols do not present significant environmental hazards. Highly valuable shipping assets, costly cleanup fees and possibly fines for environmental accidents cause ship operators to operate with high levels of care and prudence.

Product Spillage

One of the more common events is the accidental spillage of product during loading operations. In this case the material spilled, non-reactive basalt aggregate, is not considered a great hazard to the environment. Any spills will be within the immediate vicinity of the dock. Large spills can easily be recovered allowing the affected area to return to pre spill conditions.

Oil Spills

No vessel fuelling operations are planned at the WPQMT dock; therefore, there is very little opportunity for fuel oil spill at dockside. A supply of oil absorbent materials will be available on site for immediate deployment in the case of a spill. Spill response teams are available in Digby, Yarmouth, St. John, NB, and Halifax. Arrangements for the provision of emergency response will be made with the closest available service provider. Initial response by Bilcon crews can be immediate followed by off site response in a matter of hours.

Fire on Board

Fire on board these vessels is not a common event and is not considered a major environmental hazard. One commercial shipper recalls two on board fire events in the past 20 years operating a fleet of 40 ships. Those two events both related to on board conveyor belts and were brought under control by ships crew. In the case of a mineral aggregate cargo, the fuel for a conveyor fire would be very limited.

The fuel for these vessels, bunker “C” and MDO require flame source to start and are not easily sustained. All ships are equipped with fire fighting system operated by trained crews.

Vessel Collision with Dock and Grounding

While not rare, these events do not represent a major environmental hazard except in the case of a vessel break-up. With the use of with double-hulled vessel, the exterior hull can be ruptured without jeopardizing the integrity of safe vessel operations.

Vessel fuel tanks are positioned in safe locations within the interior of the ship. In any event, the bunker ‘C’ product requires heating to allow the fuel to be moved. In the worst case event of the vessel sinking, the bunker ‘C’ would stay contained within the fuel tanks. The cool water temperature would not permit the bunker ‘C’ to migrate far if at all.

The MDO would flow in the case of a tank rupture. In the worst-case scenario, 100 tons of the MDO fuel would be discharged to the environment. In calm seas this can be contained by booms and collected by absorbent materials. In the more likely case of rough seas causing the hypothetical accident, dispersal of the MDO would be extensive particularly in the wave zone near the shoreline. The MDO like diesel oils will evaporate quickly.

Ballast Water

The introduction and establishment of “invasive”, “non-indigenous” or “exotic” species may adversely affect marine ecosystems. To combat this potential effect, the International Maritime Organization (IMO) adopted resolution A. 868 (20) on the 27th of November 1997 entitled “Guidelines for the Control and Management of Ships’ Ballast Water to Minimize the Transfer of Harmful Aquatic Organisms and Pathogens”. Subsequently, Transport Canada issued “Guidelines for the Control of Ballast Water Discharge from Ships in Waters Under Canadian Jurisdiction” as amended June 8th, 2001.

Annex V of the Transport Canada Guidelines addressing east coast waters is in draft form and under review. On June 11th, 2005, proposed “Ballast Water Control and Management Regulations” were gazetted and are proposed to come into effect early in 2006 and would be administered by Transport Canada under the *Canada Shipping Act*.

While the responsibility for adhering to the new regulations, when they come into force, lies with the shipping company, Bilcon will contract only reputable shipping companies.

For further details on the Management of Ballast Water, please refer to 9.2.14 in this document.

Fish Gear

There is some risk of vessel collision with and damage to stationary fishing gear. Vessels will transit along pre-established routes that will be made known to the local fishers. In the event that some gear is damaged, Bilcon has committed to a damage fund to be administered by local fishers. Similar arrangements between shippers and fishers elsewhere in the province function quite effectively to compensate fishers for loss of fishing gear in case of accidental damage or loss. It is not expected that the fishers or their communities will sustain any significant economic impact.

Whale Watching operations

Whale watching operations are in progress in this area of the Bay of Fundy from mid spring to mid fall. Ship transit routes will be made known to the whale watching operators. The ship arrival and departure schedules will be fairly regular and communication with the WPQMT will confirm the approximate shipping movement schedule. The ship operating at slow speed equipped with radar can easily see or detect the whale watching vessel and give adequate warning to stand clear even in dense fog conditions. It is not expected that the whale watching operators or their communities will sustain any significant adverse economic impact due to the shipping operations.

Collision with Marine Mammals

The Whites Point Quarry will generate additional ship traffic in the Bay of Fundy consisting of approximately 50 bulk carriers annually or a 6% increase in this category of ship traffic. Marine mammals and specifically the North Atlantic right whale, inhabit the Bay of Fundy and there is consequently the possibility of ship/whale interaction.

To diminish the risk of ship strikes, the shipping lanes were moved toward the Nova Scotia side of the Bay and further, from the right whale conservation area in July 2003. Ships serving the Whites Point Quarry will not pass through the conservation area either inbound or outbound.

While the impact assessment concludes that the risk of a whale/ship encounter between the terminal and the shipping lanes is small, this EIS sets out mitigation measures which will be carried out.

For further details on Collision with Marine Mammals, please refer to 9.2.13 in this document.

Addendum 1

Corporate Policy; Health, Safety, and Environment

Clayton Companies has longstanding corporate policies of providing a safe and healthful work place, protecting the environment, and conserving energy and natural resources. Clayton companies are committed to environmental compliance and stewardship in all of its business activities.

These fundamental business practices provide the foundation for the following corporate policy objectives:

- Provide a safe and healthful workplace and ensure that personnel are properly trained and have appropriate safety and emergency equipment.
- Be an environmentally responsible neighbour in the communities where we operate, act promptly and responsibly to correct incidents or conditions that endanger health, safety, or the environment. Report them to authorities promptly and inform affected parties as appropriate.
- Conserve natural resources by reusing and recycling materials.
- Develop, manufacture, and market products that are safe for their intended use, efficient in their use of energy, protective of the environment, and that can be reused, recycled or disposed of safely.
- Use development and manufacturing processes that do not adversely affect the environment, including developing and improving operations and technologies to minimize waste, prevent air, water, and other pollution, minimize health and safety risks, and dispose of waste safely and responsibly.
- Participate in efforts to improve environmental protection and understanding and share appropriate pollution prevention technology, knowledge and methods.
- Meet or exceed all applicable government requirements and voluntary requirements to which Clayton Companies subscribes.
- Strive to continually improve Clayton Companies environmental management system and performance.
- Conduct audits and self-assessments of Clayton Companies compliance with applicable rules and regulations.

Every employee and every contractor on Clayton Companies premises is expected to follow this policy and to report any environmental, health, or safety concern to Clayton Companies management. Managers are expected to take prompt action.

Clayton Corporation Safety Program

The health of our employees and the safety of our operations and products, from manufacturing through transportation and product use, are the paramount reasons why we conduct and give high priority to numerous training, awareness and other safety-related programs throughout the year. Our commitment to the health and safety of our employees, customers and the communities in which we operate is among the core principles upon which Clayton Corporation bases its business operations.

Our safety culture is characterized by five key principles:

- All injuries are preventable
- Safety is good business
- Management is accountable
- Employees are the key
- Safety must be managed through a structured process

We promote the development and administration of comprehensive health and safety programs to minimize hazards and to prevent injury or loss to our employees.

The Director of Health and Safety is responsible for the development of these safety programs and policies. Each plant supervisor or manager is responsible for the implementation of the programs and policies at their specific facility. Employees are charged with adhering to the safety policies and procedures at all times.

The Director of Health and Safety makes regular site inspections, conducts compliance audits, and evaluates the safety program annually. He/she also meets with management to plan and implement further improvements in the safety program. Common sense and personal interest in safety are still the greatest guarantees of employee safety at work, on the road, and at home. We take employee safety and health seriously and any wilful or habitual violation of safety rules will be considered cause for dismissal. The cooperation of every employee is necessary to make this company a safe place in which to work.

Employees are encouraged to report safety violations, industrial hygiene concerns and suggestions for improvement to the overall safety and health program to either their direct supervisor and/or directly to the Director of Health and Safety. All suggestions are taken seriously, receive prompt response; results of any actions or industrial hygiene surveys are reported to all concerned.

Addendum 2

FACILITY SECURITY PLAN (Sample selection)

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1.0 Security Administration and Organization of the Facility

1.1 _____, **will assume duties of the Facility Security Officer (FSO),**
08879. He can be contacted at the following numbers:

Cell Phone: ___ hours a day

Beeper:

Fax:

In addition, the onsite shift supervisor can be reached at:

The FSO shall be qualified through experience or training to perform the following;

1. Security administration and organization of the company vessel (s)
2. Vessel, facility and port operations relevant to the passenger vessel industry
3. Vessel and facility security measures, including the meaning and the consequential requirements of the different MARSEC Levels
4. Emergency preparedness and response and contingency planning
5. Security equipment and systems and their operational limitations (as it applies to his/her operation)
6. Methods of conducting audits, inspection and control and monitoring techniques

7. Techniques for security training and education including security measures and procedures
 8. Relevant regulations
 9. Methodology of security assessments, surveys and inspections
 10. Handling of SSI (Security Sensitive Information) and related communications
 11. Knowledge of current security threats and patterns
 12. Recognition and detection of dangerous substances, dangerous devices, and characteristics and behavioural patterns of persons who are likely to threaten security
 13. Techniques used to circumvent security measures
 14. Methods of screening
 15. Security drills and exercises and their assessment
- 1.1.1. FSO shall conduct or ensure that a Facility Security Assessment, an initial comprehensive security survey of the terminal has been conducted.
 - 1.1.2. FSO shall retain all responsibility for full implementation of this FSP although he may delegate certain specific tasks to other individuals.
 - 1.1.3. Have experience or training to carry out the function of FSO as stated in 33 CFR 105.205;
 - 2.1.4. Oversee the development, revision and implementation of the facility security plan and the integration of such with the facility security plan and ship security plan.
 - 1.1.5. Ensure the FSP is submitted to the COTP for approval as well as informing the COTP of any plans to change the facility.
 - 1.1.6. Any proposed amendments to FSP shall be submitted to the COTP for review 30 days before the amendment is to take effect. All relevant documentation to support such amendment shall be included.

- 1.1.7. Ensure that an annual audit is conducted and if necessary update or revise FSA and FSP.
- 1.1.8. The facility security officer must maintain the records required in this section for at least two years unless otherwise noted. These records will be made available to Coast Guard Officers or Petty Officers upon request.
- 1.1.9. Approve modifications to the facility security plan, when necessary, in order to correct any deficiencies and ensure consistency with the ship security plans.
- 1.1.10. Encourage security awareness, through formal as well as informal training sessions, and vigilance; and ensure that adequate training has been provided for personnel.
- 1.1.11. Ensure that facility personnel are briefed of changes in security conditions at the facility. This will be done in person through verbal as well as written communication. Any security changes that will have an immediate effect upon operations shall be made via phone, fax, and/or email by FSO.
- 1.1.12. Ensure that all proper signage regarding security awareness is posted and that visitors are informed of security procedures. In addition signage should read, "Failure to consent to screening or inspection will result in denial or revocation of authorization to enter."
- 1.1.13. Regular inspections of the terminal;
- 1.1.14. Ensure that FSP is exercised per 33 CFR 105.220
- 1.1.15. Propose modifications to the security plan to correct deficiencies and when necessary to satisfy the security requirements as specified in the facility security plan;
- 1.1.16. Ensure that all occurrences that threaten the security of the facility are recorded and reported to the owner or operator. Ensure notification to law enforcement and other emergency service providers to permit timely response to any transportation security incident.
- 1.1.17. Coordinate implementation of facility security functions with ship/vessel security officer;
- 1.1.18. Develop and maintain relationships with appropriate law enforcement, security professionals, and other government officials.
- 1.1.19. Ensure preparation and submission of required reports.

Addendum 3

SPILL PREVENTION CONTROL AND COUNTERMEASURE (SPCC) PLAN

**CLAYTON BLOCK COMPANY, INCORPORATED
METUCHEN, NEW JERSEY**

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1.0 Introduction

This Spill Prevention, Control and Countermeasure (SPCC) Plan, hereinafter referred to as the “Plan”, is required by Title 40, Code of Federal Regulations Part 112 (40 CFR 112). Facilities covered under the SPCC regulations must establish procedures and methods to minimize the Potential for the discharge of oil into the navigable waters of the United States. The regulations apply to facilities possessing either: (1) total aboveground petroleum storage capacity greater than 1,320 gallons, (2) a single aboveground container having petroleum storage capacity greater than 660 gallons, or (3) total underground petroleum storage capacity greater than 42,000 gallons and, which due to location could reasonably be expected to discharge oil into or upon navigable waters. The Clayton Block, Metuchen, New Jersey facility has an aboveground storage capacity of 24,425 gallons. No petroleum products are presently stored underground. Procedures and countermeasures specified in this plan are primarily intended to prevent the discharge of petroleum products into nearby storm sewers.

In preparing the SPCC Plan for the Clayton Block, Metuchen facility, the following reference documents were utilized. These documents are provided in Appendices A and B, respectively.

- Title 40, Code of Federal Regulations Part 112 (40 CFR 112).
- Suggested Procedure for Development of SPCC Plans, American Petroleum Institute, Second Edition, August 1, 1989.

The oil storage facilities covered in this Plan are those that were identified to the preparers of the Plan by Clayton Block personnel during a site inspection on June 19, 1991 and follow-up site inspections conducted on April 21, 1992 and July 2, 1992. Drawings and specifications for oil storage facilities were not available to the inspectors; therefore all information contained in this plan is based on the visual site inspections.

2.0 General Facility Information

Name of Facility: Clayton Block Company
Type of Facility: Cinder building block manufacturer
Name of Facility Operator: Mr. Doug Clayton
Address: 515 Lakewood-New Egypt Road
Lakewood, New Jersey 08701
Telephone: (908) 363-1800
Location of Facility: 1025 Route One South
Metuchen, New Jersey
Date of Initial Operation at this Facility: 1946
USEPA I.D. No.: NJD-982743111
Number of Reported Petroleum Product Spill Events Within Past 12 Months:
None

Designated Person Accountable for Spill Prevention:

Name: Mr. Douglas Clayton
Title: Corporate Operations Manager
Telephone: (908) 363-1800

Petroleum Product Storage Regulated Under 40 CFR 112:

Aboveground: Underground: None

Fuel Oil

(2) 10,000 gallon
(1) 1,000 gallon
(1) 500 gallon

Total Petroleum Product Storage Capacity:
24,425 gallons

Unleaded Gasoline

(1) 1,000 gallon
Motor Oil
(2) 275 gallon

Hydraulic Oil

(2) 275 gallon

Gear Oil

(1) 275 gallon

Waste Oil

(2) 275 gallon

3.0 Designation of Responsibility

The Corporate Operations Manager, Mr. Douglas Clayton, has been designated with the responsibility for spill prevention control and countermeasures recommended in this plan. His responsibilities include:

- Initiate storage facility inspections and proper record keeping as described in this Plan;
- Initiate corrective actions for deficiencies found during inspections.
- Revise and update drawings which show existing equipment and/or structures in place for spill prevention control and countermeasure purposes;
- Update the Plan as necessary to assure that it is current and responsive to the activities and operations performed at the facility;
- Review all plans and drawings related to oil storage, handling or transfer facilities for any new construction, maintenance, or remodelling to determine if amendment of this Plan is required, and all federal, state, and local regulations are being complied with;
- Initiate the personnel training as discussed in this Plan;
- Identify the number and types of personnel needing training. New employees shall be trained within six months from the date of employment;
- Conduct facility surveys at least once every three years to determine if modifications are required to achieve compliance with 40 CFR 112;
- Inspect security systems such as access control, locked storage areas, lighting, fencing, traffic control and others, to minimize the potential of a spill resulting from vandalism or unauthorized entry;
- Visually inspect vehicles that are delivering fuels to the facility for leaks and any obvious mechanical deficiencies which could cause a spill event or accident;

The Operations Manager may delegate some of the above responsibilities to Mr. Dan Clayton, Site Operations Manager, if necessary.

4.0 Certification and Management Approval

Name of Facility: Clayton Block Company

Location of Facility: 1025 Route One South, Metuchen, New Jersey

Name and address of owner or operator:

Name: Mr. Douglas Clayton
Address: 515 Lakewood-New Egypt Road
Lakewood, New Jersey 08701

Designated Person Accountable for Oil Spill Prevention at Facility:

Name: Mr. Douglas Clayton
Title: Corporate Operations Manager

MANAGEMENT APPROVAL

This SPCC Plan will be implemented as described herein.

Signature:

Date: _____

Name: Douglas Clayton

Title: Corporate Operations Manager

CERTIFICATION

I hereby certify that I am familiar with the facility and with the provisions of 40 CFR, part 112 and attest that this SPCC Plan has been prepared in accordance with good engineering practices.

Daniel D. Chen

Printed Name of Registered Professional Engineer

(Seal)

Signature of Registered Professional Engineer

Date _____

Registration No. 26059 State: New Jersey

Addendum 4

Extracted from

GREAT LAKES DREDGE & DOCK CO.

* FLEET OF VESSELS *

SHIPBOARD OIL POLLUTION

EMERGENCY PLAN

As defined by

MARPOL 73 / 78

Annex I

Regulation 26

Prepared by:

ECM/HUDSON MARITIME SERVICES, LLC
Connecticut Philadelphia Houston New Orleans Oslo

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FOREWORD

This Shipboard Oil Emergency Pollution Plan is provided to assist shipboard and shore side personnel in dealing with an unexpected discharge of oil. Its primary purpose is to set in motion the necessary actions to stop or minimize the discharge and to mitigate its effects. Effective planning ensures that the necessary actions are taken in a structured, logical and timely manner.

The plan makes use of flowcharts and checklists to guide the Master, Barge Captain or Person in Charge (PIC) through the various actions and decision that will be required in an incident response. The charts and checklists provide a visible form of information, thus reducing the chance of oversight or error during the early stages of dealing with an emergency situation.

With regard to tank plans, pipeline diagrams, capacity plans and general arrangement plans, reference is made in Chapter 6.2.

The plan is designed to link into the Company's corporate plan for dealing with oil pollution emergencies. The Master, Barge Captain or PIC will be backed up on-scene by management-appointed personnel as the circumstances and the position of the vessel at the time of the incident require.

- For any plan to be effective, it has to be:
- Familiar to those with key functions on board the vessel;
- Reviewed and updated regularly; and
- Tested for viability in regular practices.

Training and exercises in implementation of the onboard mitigation procedures must be held at regular intervals. Similarly, exercises in communication procedures are necessary to verify that the Company's corporate plan is also effective.

ENVIRONMENTAL POLICY

Great Lakes Dredge & Dock Company manages business in a socially, environmentally and economically responsible manner. Quality is an integral part of the Company's operating philosophy. Quality is reflected in the approach to all aspects of business policy in vessel owning, management and operations. Focus on Quality in turn fosters safe and ethical behaviour in the use of Company equipment and assets.

It is Great Lakes Dredge & Dock Company's policy, therefore, to avoid all types of pollution and to conduct operations with the utmost regard for the safety of its employees, the public and the environment- in accordance with sound business practice and in compliance with environmental regulations.

- All Great Lakes Dredge & Dock Company personnel will adhere to this policy and will correct or identify to appropriate supervisory levels situations that run counter to this policy. Specific guidelines to the SOPEP are set forth below:
- Vessel-specific Shipboard Oil Emergency Plans have been developed and distributed in accordance with Chapter 1.5 -Distribution.
- Plans will be updated as necessitated by good operating practice, trade modifications and requirements at international, national, state and province levels.
- SOPEPs will be maintained and updated on board and at corporate headquarters. Plans will be reviewed as outlined in Chapter 0.4 -Record of Changes and Chapter 1.4 - Administration and Updating.
- A Pollution Response Officer aboard each vessel will be designated in writing.
- The Pollution Response Officer will maintain an up-to-date library of oil spill prevention and response publications on board.
- An aggressive program of onboard pollution prevention and response to emergencies will be carried out, including training and exercises.
- Notification (alerting) shall be aggressively carried out in accordance with Section 2 - Reporting Requirements, Section 5 National and Local Coordination and Appendices 1 and 2. If doubt exists, the notification procedures shall be carried out.
- Both vessel and shore-based personnel shall extend all reasonable courtesy and cooperation to federal, state and local authorities consistent with the safety of the vessel.
- Public Affairs (meeting with the press) will not normally be undertaken by ship personnel. However, appropriate measures will be undertaken to favourably affect public opinion whenever possible.
- In the event of a discharge, prevention and minimization of the spillage are priority concerns - consistent with the safety of the vessel, crew and shore side personnel.
- Cleanup on board the vessel will proceed without delay. If dispersants or degreasers are utilized on deck care shall be taken that they do not migrate overboard.
- If a spill occurs that discharges, migrates or spreads overboard, the cleanup will be conducted by shore side personnel under a standing engagement, or as otherwise arranged.
- Over – the – side cleanup activities by the ship’s crew shall not normally be undertaken.
- Compliance with the provisions of this Shipboard Oil Pollution Emergency Plan is the responsibility of the Master or Barge Captain/PIC and the Emergency Response Team Leader.

Section 7 of the Canadian -Oil Pollution Prevention Regulations (SOR/93-3) and Regulation 26 of Annex I of MARPOL 73/78 require every oil tanker of 150 gross tons and above, and every vessel other than a tanker of 400 gross tons and above, to have a shipboard emergency plan with four elements;

- 1 procedures for reporting of pollution incidents;
- 2 a listing of authorities to be notified;
- 3 a detailed description of actions to be taken by a vessel's crew to reduce or control an oil discharge and
- 4 Procedures for coordinating on board activities with national and local authorities.

This Shipboard Oil Pollution Emergency plan meets the MARPOL requirements.

The plan required by Regulation 26 of Annex 1 of MARPOL 73/78 will **not** fully meet the US regulations under the Oil Pollution Act of 1990 (OPA 90). However, OPA 90 regulations only pertain to tankers and other-vessels that carry oil either as primary or secondary cargo. They do not apply to dry cargo vessels such as freighters, containerships, RO/ROs, etc. While there is no requirement to do so, operators of these vessels are encouraged to develop Vessel Response Plans in the unlikely event of a pollution incident as the result of bunker transfer operations or other incidents involving fuel. The OPA 90 Vessel Response Plan for these vessels meets the intent of OPA 90 for operations in US navigable waters.

Under OPA each state is allowed to develop more stringent regulations for spill prevention and spill response activities. As such some states also require owners and operators of dry bulk vessels to develop and maintain Vessel Response Plans. One state also requires owners and operators of tank and dry cargo vessels to develop and maintain Spill Prevention Plans.

RESPONSE PLAN REQUIREMENTS

This Shipboard Oil Pollution Emergency Plan has been prepared to meet the requirements in MARPOL 73 annex 1, Regulation 26 with later amendments and particular requirements from various countries. This plan contains all information and operational instructions required by the IMO Guidelines (MEPC Circ. 256).

This plan has been examined by the Canadian Board of Steamship Inspection and, except as provided below" no alterations or revisions shall be made to any part of it without prior approval of the Board.

Changes to Section 5 and the Appendices will not be required to be reviewed by the Board. This Section and the Appendices shall be maintained according to the procedures in Section 1.4.

11.3 Environmental Protection

The Environmental Protection Plan encompasses the approach to environmental management and strategies for implementation set out in 11.0.1, management criteria set out in 11.1, and accidents and malfunctions, set out in 11.2.

11.4 Monitoring

Bilcon of Nova Scotia Corporation will develop and conduct monitoring programs for various environmental components. The objective of the monitoring programs will be to determine the accuracy of impact predictions, effectiveness of mitigation measures, and to determine if any adaptive management actions should be taken. The goal would be to ensure that the major phases of the project (construction and operational activities) meet regulatory requirements and environmental management objectives.

Monitoring program outlines have been presented previously in the EIS for valued environmental components. Where quantifiable threshold criteria exists for an identified environmental component or permit requirements indicate thresholds, these thresholds will be used as indicators of compliance. For environmental components without quantifiable threshold criteria, qualitative professional judgement will be used. If monitoring data indicates non-compliance with permit requirements, adaptive management procedures will be discussed with the appropriate regulatory authorities.

Bilcon of Nova Scotia Corporation will be responsible for all monitoring activities including funding of data collection, data analysis including laboratory work, and report preparation. A similar scientific approach as previously conducted for pre-project baseline data collection and analysis will be followed. Scientific methods will be followed. Monitoring results will be made available to interested regulatory agencies. Public access to the results will be made available through the Community Liaison Committee.

Following is **Table ECM - 2** which summarizes the environmental components identified to be monitored, the timing, frequency, and reference to the particular paragraph of the EIS which describes the proposed monitoring program.

11.5 Mitigation Measures

As noted under 4.2 Format, Bilcon has dealt with each physical, biological, or human VEC under the various sections in this EIS and has set out the discussion under Research, Analyses, Mitigation, Monitoring, and Impact Statement. This methodology was felt to provide more continuity to the reader.

However, all mitigation measures have been extracted from each of the VECs and are set out in **Table ECM - 1**.

Bilcon will be responsible for all mitigation measures set out in **Table ECM - 1** and the effectiveness of the mitigation will be checked through the follow-up monitoring program set out under each VEC and in **Table ECM - 2**.

Bilcon's Operations Manager will be specifically responsible to ensure that mitigation programs are established at the appropriate times and to ensure that the monitoring program is carried out and reporting procedures observed.

11.6 Follow-up Program

For each of the VECs identified and examined which, following research and analysis, demonstrated the potential for a negative impact, a strategy for mitigation of the negative effect was established. This mitigation is shown in the section for each VEC and for the project as a whole, the mitigation measures are set out in **Table ECM - 1**

Each of these mitigation measures will be established by Bilcon at the appropriate time. However, it is critical to ensure that mitigation measures are having the desired effect. Accordingly, for each of the VECs where mitigation has been proposed, a program of follow-up monitoring is set out under the various VEC's and tabulated in the follow-up monitoring **Table ECM - 2**.

The procedures for ensuring that the monitoring regime is established and executed is set out under 11.0, Environmental Management, as are the strategies for reporting to both the Regulatory Agencies, where required, and to the community.

The proposed environmental monitoring program is designed to detect potential project impacts measured against an established baseline or threshold as described under each VEC. Exceeding a baseline or a threshold is a trigger for action and requires the Operations Manager to undertake adaptive management (developing improved techniques while conducting management activities) to reduce or eliminate environmental impacts. Adaptive management procedures are set out in para. 3.5 and 10.0.1.

11.7 Residual Impacts

Each identified VEC is examined in the EIS and the same methodology has been employed in each case. The parameters of the VEC are researched; the research is analyzed; where appropriate, mitigation measures are established; a monitoring program is specified to ensure that the mitigation measures are successful and, finally, the residual impact following mitigation is specified.

The impact statement in each case sets out the characteristics of the impact with respect to time, significance of the impact, and the scale of the impact following mitigation. The Impact Summary Table 2 in 9.4, sets out all the VEC's and the residual impacts.

Each VEC was selected as set out in 8.3 Section of the Valued Environmental Components, and Spatial and Temporal Boundaries are defined in 8.4.1 and 8.4.2. Further information on the Impact Assessment Methodology is contained in 8.0, as are definitions of temporal, magnitude, type, scale, significance, and possibility.

11.8 Compensation

Although no significant negative effects of the project were identified, there were several insignificant negative effects in which compensation is proposed as part of the mitigation plan:

- i) A small area of fish habitat will be lost in the footprint of the piles supporting the ship berthing dolphins and a compensation plan has been proposed by the Proponent and accepted in principle by the Department of Fisheries and Oceans Canada.
- ii) The bulk carrier will leave the shipping lanes and travel to Whites Cove through an area where lobster fishing is carried out from December through May. Typically in the early winter months, traps are set some distance from shore but in the spring, lobsters move closer inshore and there will be an issue with respect to damage to lobster gear. Meetings with the fishermen who traditionally fish in Whites Cove have resulted in a basic agreement that the bulk carrier will travel the same route, both inbound and outbound each trip, and advance notice will be given to fishers. The Proponent will additionally give a sum of money to a committee of Whites Cove fishers each season which will be administered by the committee to compensate for damage to traps and other fishing gear.

iii) While it is considered highly unlikely that any domestic water well in the vicinity of the quarry operation will be affected, the Proponent will compensate any property owner whose well does become affected, as a result of quarry operations, by drilling a new well at the Proponent's expense.

iv) There appears to be no general perception among buyers that the quarry and marine terminal is likely to affect property values generally on Digby Neck and Islands. However, there is a possibility that property values may be affected in areas immediately adjacent to the operation. It is proposed that an evaluation by a qualified real estate appraiser take place on residential properties within 800 m of the active quarry prior to construction and a re-evaluation be carried out five years later to determine whether value has been lost. Any loss so determined would be compensated by Bilcon of Nova Scotia Corporation.

There is also no evidence that communities in the area of the quarry operation will suffer damages or losses due to the operation of the project. To the contrary, there is evidence that family sustaining jobs will be gained in local communities which will in part counter recent out-migration. However, it is the Proponent's corporate policy to support local communities and local organizations. This has been demonstrated over the past four years and will continue throughout the life of the project.

The fish habitat compensation plan will be implemented upon the Proponent receiving approval for the project, while other compensation agreements will be honoured on an annual basis in the case of the Whites Cove fishers and on an as-required basis in the case of well problems. The Proponent is the subsidiary of a well established New Jersey family-held company which will provide funding for the construction of the Whites Point project (\$40.6 CAD million) from its own resources. No specific mechanism is proposed to finance the proposed compensation plans, other than from on-hand resources.