VOLUME V
CHAPTERS 7 & 8

WHITES POINT QUARRY & MARINE TERMINAL

ENVIRONMENTAL IMPACT STATEMENT

BILCON OF NOVA SCOTIA

March 31, 2006

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7.0 PROJECT DESCRIPTION

The Whites Point quarry is a basalt rock quarry with a marine terminal for shipping processed aggregate products. Major components include a physical plant area for processing, screening, washing, and stockpiling aggregate products and a ship loading facility consisting of mooring dolphins, radial arm ship loader, and conveyors – see **Figures 1 and 4.**

Land based infrastructure and activities will include the quarrying of approximately 300 acres of the 380 acre site over 50 years. Annual production of aggregate products is estimated to be 2 million tons. Rock would be extracted by drilling and blasting, then loaded, transported, crushed, screened, washed, and stockpiled at the processing plant area. The plant area comprises approximately 27 acres and is located 30 m above sea level. Other land based infrastructure includes quarry roads, a compound area comprising approximately 5 acres, and dyked organic and sediment disposal areas comprising approximately 30 acres each. All land development and activities will take place within the 380 acre site.

An integral aspect of the land based development is an environmental preservation zone, approximately 30 m wide which will separate the quarry area from adjacent properties. Landward from the environmental preservation zone along the coast, environmental control structures will be developed. These environmental control structures will consist of drainage channels, sediment retention ponds, and constructed wetlands. Also, on the uplands, dyked disposal areas for organic and sediment storage will be constructed. Incremental reclamation of disturbed areas is proposed approximately every five years.

Water based infrastructure and activities will include the ship loading of approximately 40,000 tons of aggregate weekly. Aggregate would be loaded into the hulls of bulk carriers for shipment to New Jersey. Marine infrastructure including conveyors, radial arm ship loader, and mooring dolphins would be constructed over the water and supported by pipe piles anchored to the bedrock in the intertidal and nearshore waters. The ship loading facilities will require a 10 acre water lot lease and extend approximately 200 m into the Bay of Fundy. Water depth at the mooring dolphins would be approximately 16 m below chart datum.

The pipe pile construction technique used to support the marine facilities minimizes alteration to fish habitat. Minimal effects on bottom habitat and tidal movements will result from this construction method. As a result, no dredging or dredge disposal, or fill will be placed in the intertidal or nearshore marine waters.

Electricity would be the primary energy used for operating the land and marine facilities. Diesel fuel will be used for mobile equipment such as loaders and trucks. Ammonium nitrate-fuel oil based explosives will be used for blasting. Water for aggregate washing will be obtained from storage of surface water runoff and recycled after the washing process. Waste oil from the mobile equipment will be recycled and used as fuel for heating the compound area buildings.

7.1 Need for, Purpose of, and Alternatives to the Proposed Project

The following sections address the "Need for", "Purpose of", "Alternatives to", and "Alternative Means" as presented in the Canadian Environmental Assessment Agency's Operational Policy Statement OPS-EPO/2-1998 (Ref. 197). These sections are presented from a private sector proponents perspective. Alternatives To and Alternative Means are, at this stage of project development, broad in scope and conceptual in context.

Bilcon of Nova Scotia Corporation is a private, family owned business. Its parent company Clayton Concrete Block and Sand manufactures concrete products in New Jersey. Bilcon needs a source of raw aggregate materials that is not subject to market fluctuations or market disruptions. Their development of the Whites Point quarry could satisfy this need for the next 50 years. Thus, the fundamental rationale for development of this quarry is to supply a stable "fixed market" with a raw material necessary for their manufacturing processes. The importance of achieving market stability cannot be overstated. Clayton Concrete Block and Sand presently purchases aggregate on the "open market". In order to ensure a dependable, uninterrupted supply, not subject to inconsistencies, Clayton Concrete Block and Sand, through Bilcon, intends to develop and control their own supply of aggregate exclusively for Clayton Concrete Block and Sand. In essence, this stability of a guaranteed market eliminates the instability of the competitive market place which has contributed to the demise of other mining ventures in Nova Scotia.

The main function of the quarry will be to produce aggregates for Clayton Concrete Block and Sand to manufacture concrete and value added concrete products. Since this is an export product, competition with local and regional quarries will not be a factor. In fact, construction and operation of the Whites Point quarry, without public money, will generate stable local, regional, and provincial economic benefits over the next 50 years. During operation, a stable employment environment will be created. Thirty-four, high paying, full time jobs will be realized in the regional area accompanied by local economic diversification. Diversification has been recognized as a corner stone for sustainability of rural coastal communities.

"Alternatives to" the project is defined as functionally different ways to meet the project need and purpose, from the perspective of the proponent – OPS-EPO/2-1998 (Ref 197). Clayton Concrete Block and Sand presently recycles used concrete and other construction materials to supplement their demand for raw aggregate materials. Unfortunately the supply of recyclable materials does not meet their needs or provide a stable supply. Therefore the company is investigating alternatives to their present aggregate supply which will return an economic benefit to the company. Alternatives include purchasing aggregate on the open market and developing their own quarry to supply their needs.

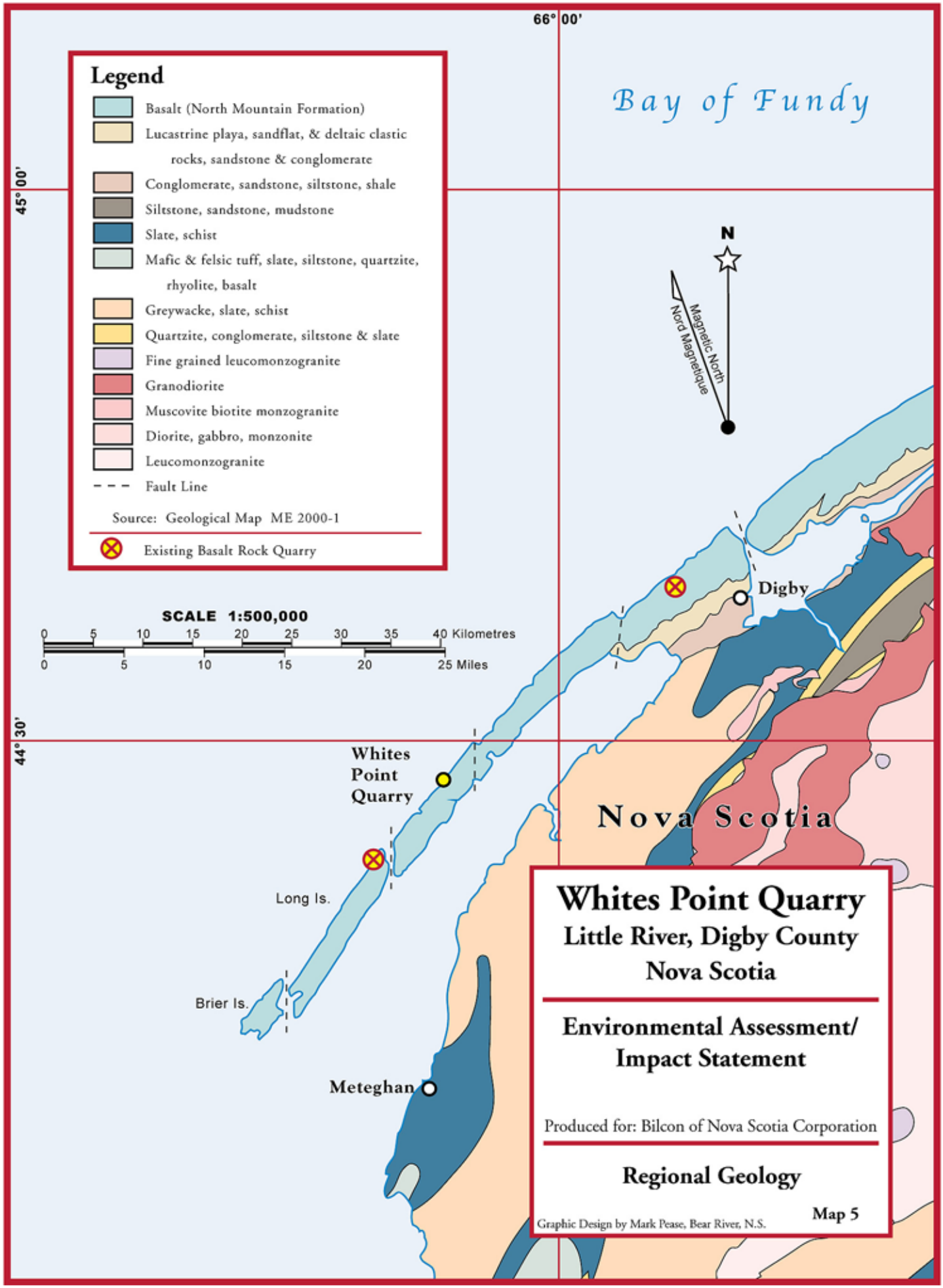
The "do nothing" alternative will not result in a viable economic diversification opportunity for the Digby Neck and region. Past land use of the proposed Whites Point quarry site has included historic use as a pit, farming, boat haul-up, unmanaged forest lands, and recently clear cutting. These past land uses have provided little or no economic diversification benefits for the local and regional area. Without a Planning Strategy in place for Digby County and much of the land in absentee ownership, these historic land use trends are likely to continue into the near future.

Alternative quarry sites were investigated in the Atlantic Provinces and Nova Scotia. These investigations included preliminary literature research and on-site evaluation of the existing physical, biological, and socio-economic conditions. General categories of criteria used at this stage of alternative evaluation included:

- Suitability of the geological resource
- Availability and size of land base
- Proximity to residential development
- Adequacy of transportation systems
- Engineering feasibility
- Economic diversity and sustainability
- Social/cultural health and quality of life
- Unique heritage resources
- Presence of species at risk and biodiversity
- Quality of fish habitat and wetlands

Preliminary evaluation of alternative sites on a provincial scale indicated certain sites possessed some negative attributes based on the general criteria categories mentioned above and were rejected at this stage of investigation.

On a regional scale, potential alternative locations for basalt rock quarries exist throughout the North Mountain Basalt Formation which extends from Brier Island to Cape Blomidon, see **Map 5** – Regional Geology. During preliminary investigations, alternative basalt rock quarry sites were investigated in this region. Several basalt rock quarries presently operate in Digby and Annapolis Counties. After preliminary regional studies concerning environmental sensitivities, subsurface investigations, and economic development costs, Whites Point was selected for further study. During the permitting process for the 3.9 hectare quarry in 2002, on-site environmental surveys were conducted. This information forms the basis of the rationale presented below.


66° 00'
45° 00'
44° 30'
Bay of Fundy
Legend
Basalt (North Mountain Formation)
Lucastrine playa, sandflat, & deltaic clastic rocks, sandstone & conglomerate
Conglomerate, sandstone, siltstone, shale
Siltstone, sandstone, mudstone
Slate, schist
Mafic & felsic tuff, slate, siltstone, quartzite, rhyolite, basalt
Greywacke, slate, schist
Quartzite, conglomerate, siltstone & slate
Fine grained leucomonzogranite
Granodiorite
Muscovite biotite monzogranite
Diorite, gabbro, monzonite
Leucomonzogranite
Fault Line
Source: Geological Map ME 2000-1
Existing Basalt Rock Quarry
N
Magnetic North
Nord Magnetique
SCALE 1:500,000
0 5 10 15 20 25 30 35 40 Kilometres
0 5 10 15 20 25 Miles
Digby
Whites Point Quarry
Nova Scotia
Long Is.
Brier Is.
Meteghan
Whites Point Quarry
Little River, Digby County
Nova Scotia
Environmental Assessment/ Impact Statement
Produced for: Bilcon of Nova Scotia Corporation
Regional Geology
Map 5
Graphic Design by Mark Pease, Bear River, N.S.

Following are the general reasons for selection of the Whites Point site.

- Feasible water depth for the location of a marine terminal to ship aggregates rather than trucking through rural communities.

- The quarry could be developed and not be visible from Highway 217, a seasonal tourist route. Permitted quarries in nearby Tiverton and Seabrook are highly visible from Highway# 217.

- Whale watching tours, recreational boating or adventure boating in the Bay of Fundy presently do not frequent the nearshore waters in the Whites Point area.

- A minimal depth of overburden exists on the site, especially below the 45 m land elevation, which limits the potential for sediment production.

- Minimal nearshore sediment deposits exist, especially within the area of the proposed marine terminal construction, which will limit the potential for turbidity production during construction.

- Construction of the marine berthing facilities will be on bedrock thereby eliminating the necessity for dredging and dredge material disposal during construction and operation.

- No salmonid fresh water fish habitat exists within the active quarry site.

- Nationally, this region is in the lowest category of wetlands and provincially, the quarry site possesses no significant wetlands.

- The quarry is located so ship traffic to and from the marine terminal avoids passing through the designated conservation area of the endangered North Atlantic right whale.

- Winter refuge areas for the Harlequin duck, a species of concern, do not exist along the quarry coastline.

- No spawning rivers for the endangered inner Bay of Fundy (iBoF) salmon exist on the site and the probability of migrating iBoF salmon passing along the quarry shoreline is extremely unlikely.

- The geology of the quarry possesses high quality basalt rock, is of simple and stable character, of volcanic origin with limited permeability, and highly stable cut face integrity.

- Nationally, the quarry site is located in an area of low seismic hazard and no earthquakes have been recorded on Digby Neck.

- Provincially, the quarry site is highly unlikely to contain artifacts or heritage values of archaeological significance.

Any quarry site located in this region could present environmental and socio-economic ramifications. During the following detailed environmental assessment/impact analysis, the Whites Point site did not present any likely significant adverse (negative) impacts that could not be mitigated with currently available technology or project management/ operational procedures. The above reasons for site selection present an overview. Clearly, the preferred alternative, based on the general categories of criteria, which meets the need for the project and achieves the purpose of the project, is development of the proposed quarry site at Whites Point. The complete, documented rationale and analysis is contained in subsequent sections of the Environmental Impact Statement.

7.2 Alternative Means of Carrying Out the Project

Alternative means for accomplishing the major components of the proposed project – land based quarrying and marine terminal construction and operation were investigated. This investigation included alternative means that are deemed to be technically and economically feasible.

The land based portion of the quarry and associated infrastructure is located primarily on previous disturbed lands (abandoned gravel pit, clear cut area, and the recently cleared 3.9 hectare quarry site). Buffer areas in the form of an environmental preservation zone surround the quarry operation. Sensitive and valued environmental components are included in the preservation zone. The quarry site comprises 380 acres with approximately 300 acres scheduled for development. Incremental reclamation procedures are proposed with priority along the coastline to provide a greater visual and environmental buffer along this sensitive zone.

Land based quarrying of this type of massive, hard, volcanic flow of basalt rock generally includes drilling and blasting rock faces. This means is considered to be the industry standard for this type of basalt to produce the proposed production of 2 million tonnes per year. The unfractured, massive nature of the rock structure existing on the Whites Point site basically precludes alternative means or methods of rock extraction such as ripping or auguring. However, alternative methods and processes for blasting and explosive use were investigated. In this regard, all blasting will be done to exceed the guideline criteria stated in "Guidelines for the Use of Explosives in or Near Canadian Fisheries Waters". Blast patterns, timing of delays, weight of explosives, and setbacks from the marine environment will be conducted in a conservative manner.

Also, rock processing will be enclosed and use the latest technologies to minimize noise such as rubber screens, and to minimize air borne particulates with closed circuit washing.

Environmental preservation zones around the quarry site in many places exceed the minimum regulatory requirements of the Nova Scotia Department of Environment and Labour.

Incremental reclamation procedures will also be implemented. Implementation procedures and compliance with regulatory requirements indicate no likely significant adverse (negative) impacts will result from quarrying that could not be mitigated with currently available technologies.

Existing marine infrastructure does not exist along the coastline of the proposed quarry site. As well, no known marine infrastructure presently exists within the region with the required ship loading capability. However, marine terminal location and construction

methods were investigated to reduce marine habitat disruption and existing commercial fishing patterns. Alternative means of construction included in water blasting and dredging, rock fill, and pipe pile construction methods. Due to the sensitivities of the marine environment, blasting and dredging in the intertidal zone and nearshore waters was ruled out. Rock fill as part of marine terminal construction was also ruled out due to habitat and nearshore current alteration associated with fill placement. Also, rock fill construction could result in excessive turbidity during placement. The least intrusive alternative – pipe pile construction – was therefore selected and is expected to produce no net loss of marine habitat that cannot be compensated. This proposed construction method will not result in a likely significant adverse (negative) impact.

Associated with the quarry operation is the means of transporting quarry products. Land transport by rail is not an alternative since rail lines in this region have been abandoned and removed. Land transportation using trucks is an alternative for transport of product to an existing marine terminal. This means was ruled out due to the excessive distance to a suitable existing marine terminal capable of handling the quarry products. Fossil fuel consumption and emissions contributing to "greenhouse gases" as well as probable social/ community disruptions also supported ruling out truck transportation. Water transportation was judged to involve the least social and environmental impact and be the most cost effective method of quarry product transportation. Proposed shipping routes are planned to use designated shipping lanes and avoid sensitive marine mammal habitat in U.S. and Canadian waters. More specifically, routes will avoid designated endangered Right Whale conservation areas and critical habitat in U.S. and Canadian waters. The selected alternative transportation means will not result in a likely significant adverse (negative) impact.

The above discussions identify feasible economic and technical alternative means of carrying out the major components of the proposed project (quarrying, marine terminal and shipping). Whenever applicable guidelines, regulations, or standards present quantitative criteria or thresholds, these were used to determine the least environmental effect of alternative means. Also, comparable projects that have been in operation with ongoing monitoring have been used as applicable to the proposed Whites Point quarry and marine terminal. However, at the stage of alternate means selection, qualitative criteria in conjunction with community traditional knowledge and multidisciplinary team professional judgment is heavily relied upon. Beneficial and adverse effects for the selected alternate will be presented in the following sections of this Environmental Impact Statement.

Options considered for the location and timing of project construction, especially marine construction, is proposed to avoid sensitive biological areas and life cycle periods. Sediment retention ponds are proposed to be constructed before land clearing begins and will be located in the abandoned pit area. Recently clear-cut areas will be used for

temporary holding areas for stripped organic materials and for sediment disposal until needed for reclamation purposes. The selected site for the quarry compound area is proposed within the recently clear-cut area. Since the life of the project is 50 years, much of the existing undisturbed terrestrial habitat will be maintained until required for quarrying.

Proximity of sufficient water depth within a reasonable distance to the land influenced the location of the marine terminal. Fish habitat in the intertidal and sublittoral marine zones influenced the choice of pipe pile marine construction rather than an infill alternative to reduce the amount of fish habitat disturbed. Disruption of nearshore currents will be minimized as compared to the infill alternative.

Recycling of surface water runoff into the proposed closed circuit wash water system eliminates the need for deep well water supply for aggregate washing and dust suppression. Recycling of organic overburden materials as new on-site quarry areas are opened is proposed. Organic materials will be mixed with sediment materials to create the soil for the proposed incremental reclamation process. Also, used oil from mobile quarry equipment is proposed to provide fuel for heating the quarry shop and office buildings. Clarification of wash water will be accomplished using flocculants as an integral part of the closed circuit wash water system.

Alternatives for ship loading include trucking aggregate materials to an existing marine facility or directly to the market. Both of these alternative means are not cost effective. The timing and scheduling of ship loading is dependent upon processing capacity. Loading of ships once per week coincides with production and stockpiling capacity.

Alternative means of transporting aggregate products from the Whites point Quarry by ship were investigated. Two alternative methods of shipping, one by a Bilcon of Nova Scotia Corporation owned bulk carrier, another by a “common” bulk carrier such as a ship owned by Canadian Steamship Lines. An advantage of an “owner” bulk carrier is a more dependable schedule of product shipment to a designated port in the northern New Jersey area. Also, the duration of the round trip from the Whites Point Marine Terminal would meet the scheduled weekly demand for delivery. At this time, the feasibility of a Bilcon owned bulk carrier was dismissed due to the long wait time for construction of a new bulk carrier and the cost at this initial stage of project development.

Options for reclamation and decommissioning (closure), assuming a 50 year project life, include reclamation when the quarry is scheduled for closure. This alternative means was rejected in favour of incremental reclamation for visual and environmental quality reasons. Decommissioning options could include not removing the marine terminal infrastructure and adapting for current (2056) marine demands. Other land use options would be investigated depending on demand at that time.

Mitigation measures for alternative means were evaluated during the analysis and selection of the preferred means of construction and operation. After selecting the means with the least environmental effect, in conjunction with feasible and technically achievable mitigation measures, the preferred means was determined. These selected means will be further analyzed in subsequent component sections of this Environmental Impact Statement.

Criteria are generally defined as a "standard, rule, or test by which a correct judgment can be made". Alternative selection used customized criteria for this type of rock quarry since criteria specific to analyzing alternatives to rock quarries are not readily available. Therefore, generalized criteria from the literature were adapted. A summary of these sources and their applicability is presented below.

Ratcliffe (Ref. 160) proposed the following criteria for evaluating sites in Britain. These criteria were adopted by the Nature Conservancy Council (NCC) to protect a representative cross section of British habitat types and ecosystems of international importance. These consist of six primary criteria and four secondary criteria.

Primary criteria

Size of habitat or site
Diversity
Naturalness
Rarity
Fragility/sensitivity
Typicalness

Secondary criteria

Recorded history
Position in an ecological/geographical unit
Potential value
Intrinsic (or aesthetic) appeal

Dickson, Kern, Ruska, Cairns (Ref. 109) discusses criteria to evaluate quantitative and qualitative environmental component data such as diversity and productivity. They also propose a "working set of criteria that can be applied to each component of the assessment", and where a "uniform set of criteria cannot be established, each discipline be required to identify and carefully define criteria used in making value judgments".

National Energy Board Filing Manual (Ref. 203) suggests the following criteria for evaluation of likelihood and significance of residual adverse effects:

- Direction
- Magnitude
- Duration
- Frequency
- Spatial extent
- Reversibility
- Probability of occurrence
- Permanence; and
- Ecological context

And when defining significance, the use of clear criteria based on the:

- Magnitude
- Duration
- Geographic extent; and
- Degree to which the adverse effects are reversible or irreversible.

Ohio Biological Survey (Ref. 93) established generalized criteria for the evaluation of eighteen environmental components to determine their significance. Significance categories included the following:

- International/national significance
- Statewide/regional significance
- Local significance
- Degraded features

Evaluation criteria were developed for each environmental component by discipline to fit the above significance categories.

In addition to the criteria mentioned above, regulatory criteria which establishes acceptable thresholds, are used whenever possible to provide quantitative analysis of potential adverse or beneficial effects.

Traditional community knowledge (TCK) was gathered through individual personal contacts, while public involvement helped identify and select alternative means for construction and operation through the Community Liaison Committee.

7.2.1 Potential Environmental Effects on the Project

The location of the quarry and marine terminal on the Bay of Fundy coastline presents the possibility of potential adverse natural forces such as tides, wind, wave action, and storm surges. These individual and potential combinations of forces will present the greatest effect on components of the marine terminal (conveyor, ship loader, and berthing dolphins). Preliminary investigations and engineering indicates that the structural systems chosen will be capable of withstanding these natural forces. Detailed design studies will be conducted to ensure adequate infrastructure over the 50 year life of the project.

Land based components of the quarry infrastructure will be located above the 10 m contour elevation and above the coastal flood plain. No significant streams or rivers exist on the site, thus no freshwater flood plains present potential adverse changes to the land based development as a result of extreme rainfall events. Positive surface drainage will be maintained on the quarry site with drainage ways and sediment retention ponds designed for 10 year flood events.

Fog and atmospheric inversions may influence the timing of blasting activities at the quarry. Blasting will not be conducted during periods of fog or atmospheric inversions and will be delayed until clear weather prevails.

This area of the Bay of Fundy is ice free and ice should not pose a navigational hazard.

7.3 The Project

The Whites Point quarry is a small, basalt rock quarry designed to produce 40,000 tons of aggregate products per week and approximately 2 million tons per year over a 50 year project life. Construction is expected to begin in 2006. The quarry is located on Digby Neck in Digby County, Nova Scotia along the Bay of Fundy. Regional location of the quarry and marine terminal is shown on **Map 1.**

The major infrastructure components include a rock processing plant, environmental control structures, marine terminal/ship loading facility and a compound area – see **Figures 1, 2, 3, and 4.** This infrastructure is proposed for construction during 2007 – 2008. Construction and operation plans of the quarry in five and ten year increments are outlined on **Plans OP 1-8.** Permanent infrastructure (roads, processing plant, marine terminal, compound area, and utilities) are proposed. No temporary facilities are proposed at this time.

For a more detailed discussion of construction, operation and maintenance, modifications and decommissioning and reclamation see **paragraphs 7.7, 7.8, 7.9, and 7.10.**

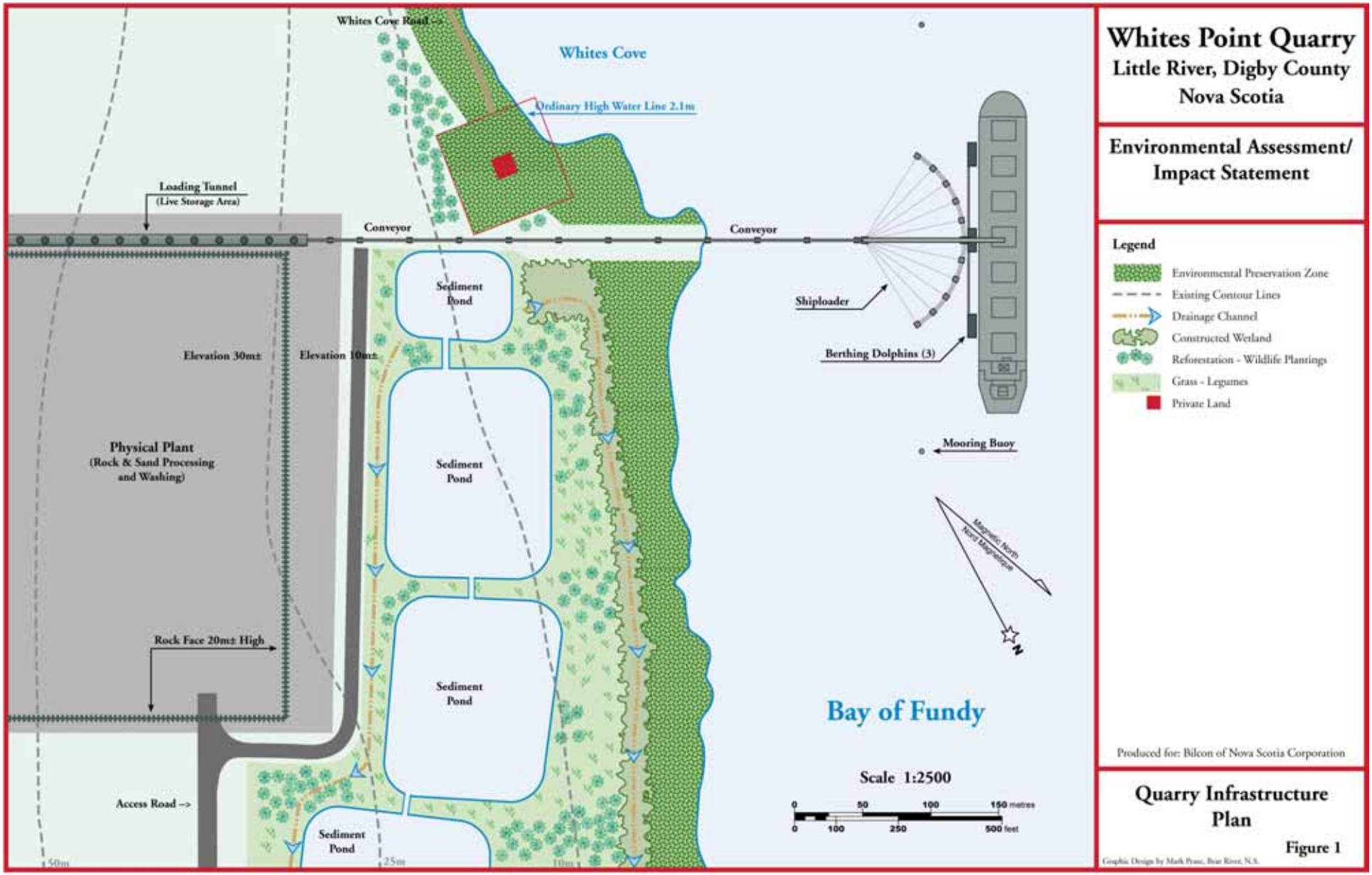
It is anticipated at this time that the marine terminal will only be used for berthing of ships to be loaded with quarry products. During quarry operation, the marine terminal could be used in the event of an emergency in the Bay of Fundy. During and after decommissioning of the quarry, the berthing facilities will be evaluated for further use as a marine facility based on market demand.

The overall site plans illustrating quarry infrastructure development over the 50 year life of the project (**Plans OP 1-8**) are presented at the same scale (1:10 000) as many subsequent physical, biological, and human resource plans. This is a rather elementary, two dimensional method which facilitates “overlaying” development and resource maps to identify compatibility or conflict.

The boundary of the quarry property in relation to adjacent properties, roads, and land use is shown on **Map 2** Properties with domestic water wells are shown on the same map. No rail lines presently exist in the project region.

Designated inbound/outbound shipping lanes in the Bay of Fundy, along with the proposed ship route to and from the marine terminal are shown on **Map 4.**

Existing land use adjacent to the project is generally rural residential with limited commercial and industrial uses in the village of Little River. Buildings by type within 4 km of the quarry property are shown on **Maps 3 A, 3B, 3C, 3D, 3E.** Businesses and services for the community of Digby Neck are identified on **Maps 6A and 6B .**



Whites Point Quarry

Little River, Digby County
Nova Scotia

Environmental Assessment/ Impact Statement

Legend

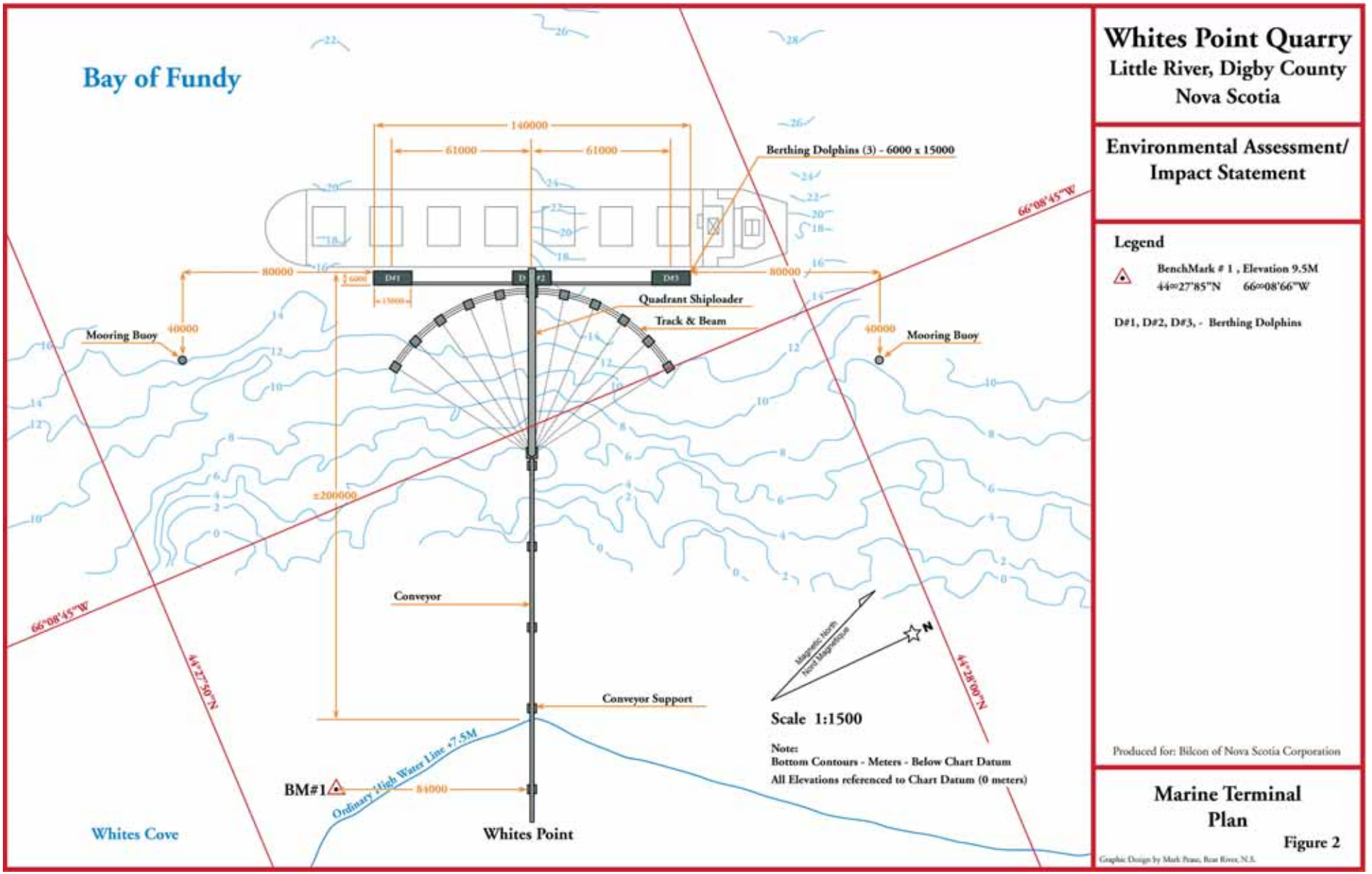
- Environmental Preservation Zone
- Existing Contour Lines
- Drainage Channel
- Constructed Wetland
- Reforestation - Wildlife Plantings
- Grass - Legumes
- Private Land

Produced for: Bilcon of Nova Scotia Corporation

Quarry Infrastructure Plan

Figure 1

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



Whites Point Quarry

Little River, Digby County
Nova Scotia

Environmental Assessment/ Impact Statement

Legend

BenchMark # 1 , Elevation 9.5M
44°27'85"N 66°08'66"W

D#1, D#2, D#3, - Berthing Dolphins

Produced for: Bilcon of Nova Scotia Corporation

Marine Terminal Plan

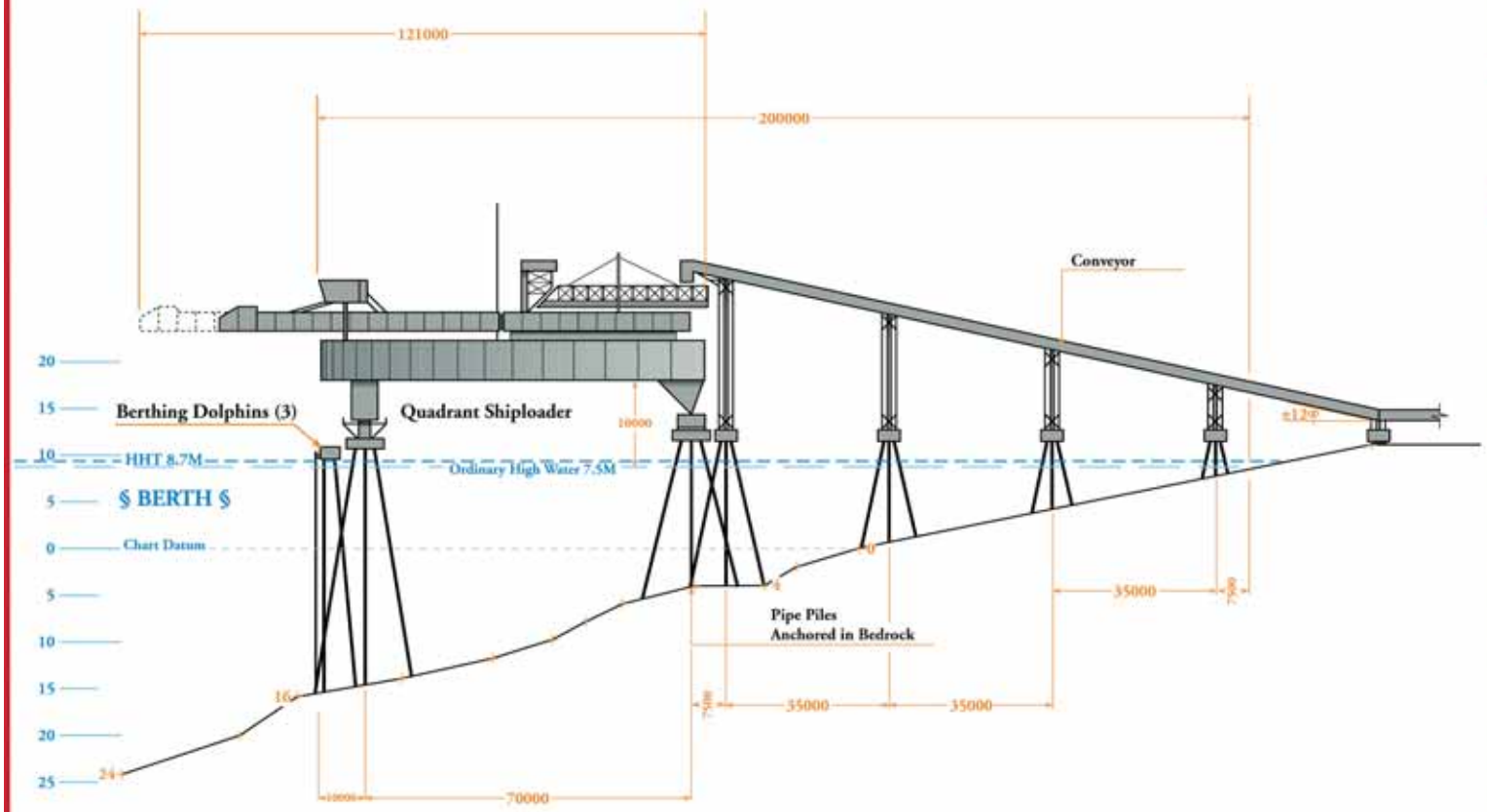
Figure 2

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

Whites Point Quarry

Little River, Digby County
Nova Scotia

Environmental Assessment/ Impact Statement



Horizontal Scale 1:1000
Vertical Scale 1:500

Note:
All Elevations referenced to Chart Datum (0 meters)

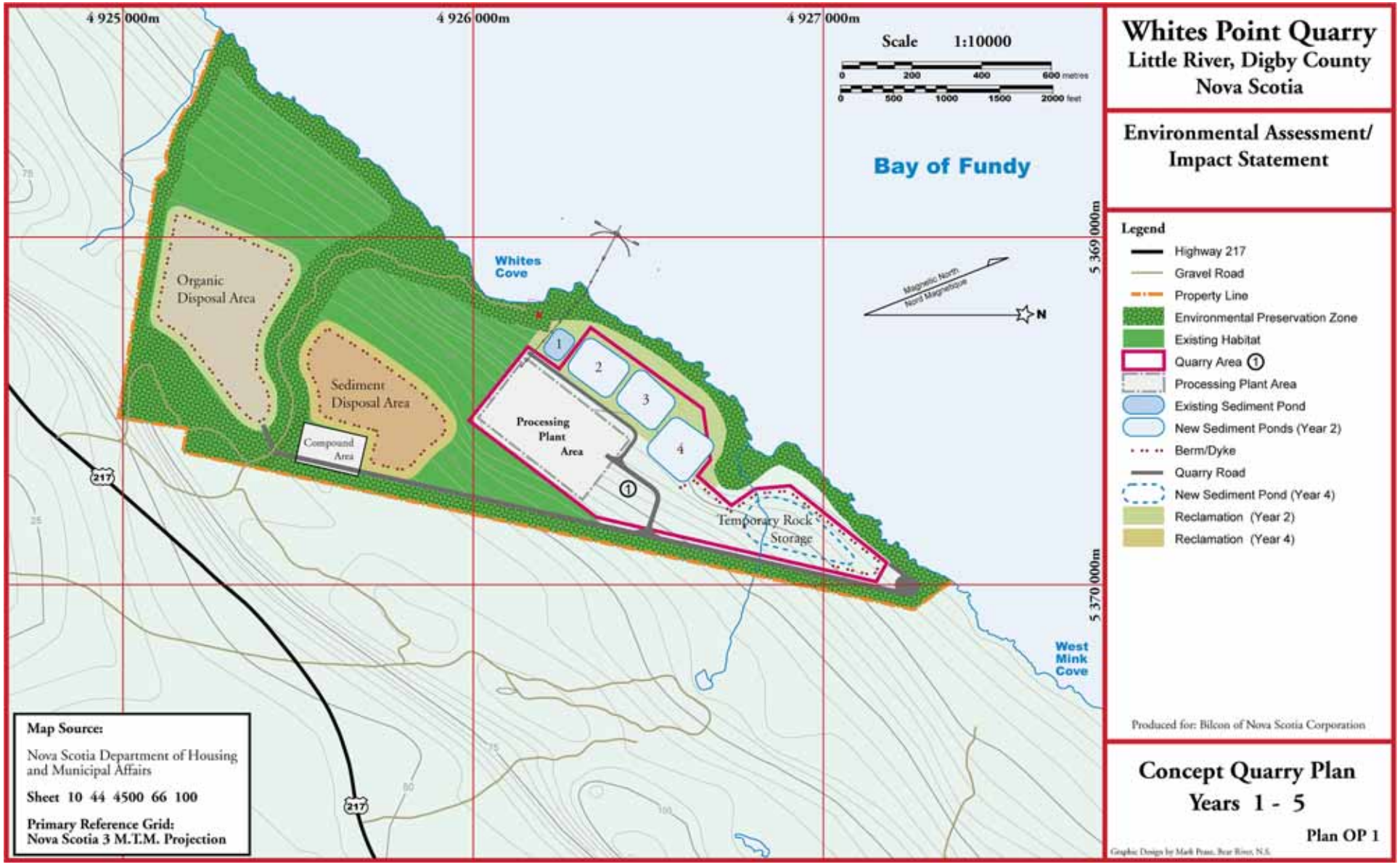
Produced for: Bilcon of Nova Scotia Corporation

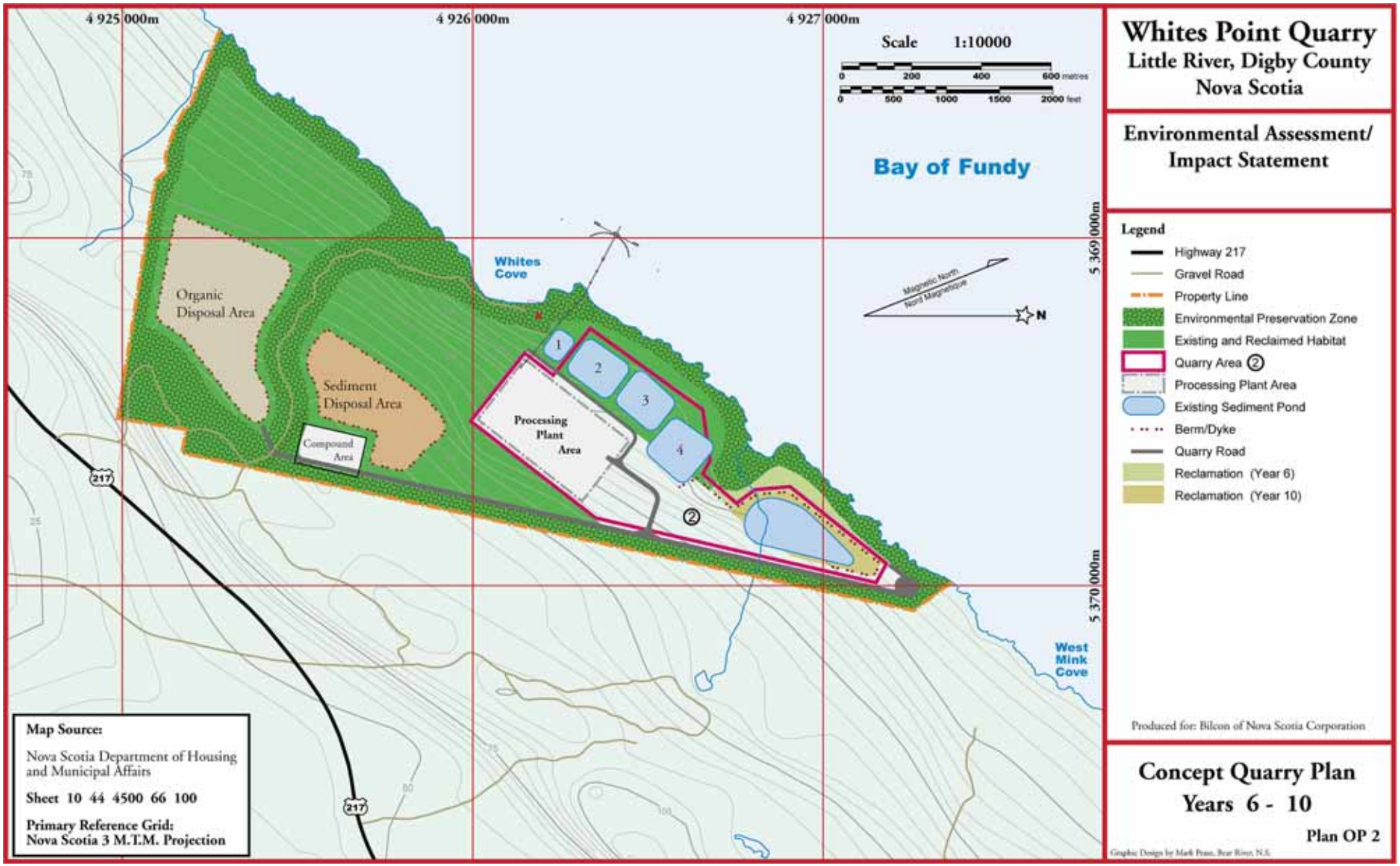
Marine Terminal Elevation

Figure 3

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


Disposal Area Dyke
Fuel Storage
Disposal Area Dyke
Sediment Spoil Area
Organic Spoil Area
Maintenance Shop
Office
Electrical
Parking
Gate
Gate
To Quarry
Whites Cove Road
Scale 1:1200 (1 inch = 100 feet)
Whites Point Quarry
Little River, Digby County
Nova Scotia
Environmental Assessment/
Impact Statement
Legend
Environmental Preservation
Zone - 30M wide
Security Fence
Landscaped Areas
Well
Septic Field
Electrical Power Poles
Produced for: Bilcon of Nova Scotia Corporation
Quarry Compound
Plan
Figure 4
Graphic Design by Mark Prasc, Bear Rivers, N.S.


4 925 000m
4 926 000m
4 927 000m
Scale 1:10000
0 200 400 600 metres
0 500 1000 1500 2000 feet
Bay of Fundy
5 369 000m
5 370 000m
Whites Cove
West Mink Cove
Organic Disposal Area
Sediment Disposal Area
Compound Area
Processing Plant Area
Temporary Rock Storage
1
2
3
4
217
Magnetic North
Nord Magnétique
N
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
Whites Point Quarry
Little River, Digby County
Nova Scotia
Environmental Assessment/
Impact Statement
Legend
Highway 217
Gravel Road
Property Line
Environmental Preservation Zone
Existing Habitat
Quarry Area 1
Processing Plant Area
Existing Sediment Pond
New Sediment Ponds (Year 2)
Berm/Dyke
Quarry Road
New Sediment Pond (Year 4)
Reclamation (Year 2)
Reclamation (Year 4)
Produced for: Bilcon of Nova Scotia Corporation
Concept Quarry Plan
Years 1 - 5
Plan OP 1
Graphic Design by Mark Penz, Bear River, N.S.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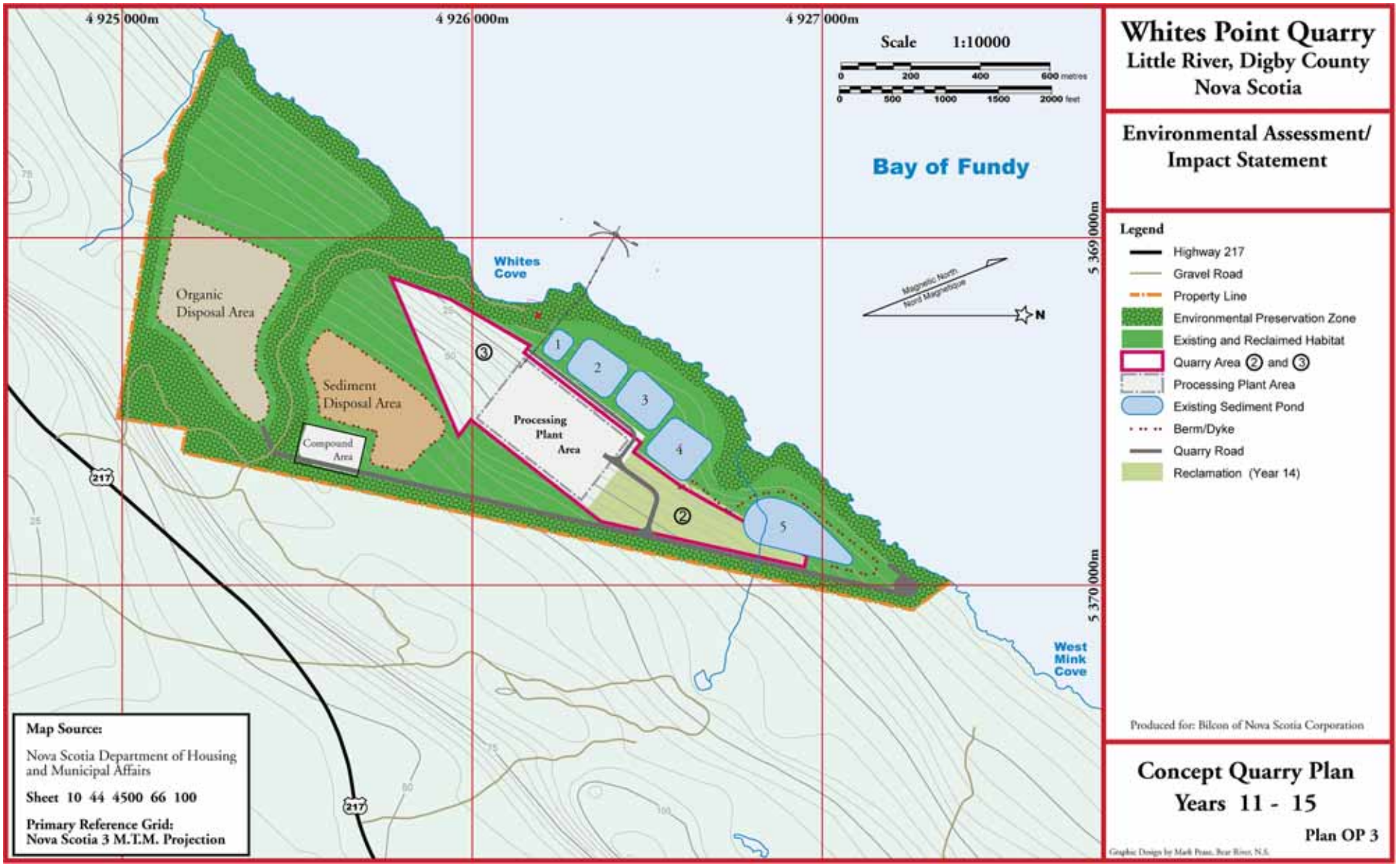
Impact Statement
Legend
Highway 217
Gravel Road
Property Line
Environmental Preservation Zone
Existing and Reclaimed Habitat
Quarry Area ②
Processing Plant Area
Existing Sediment Pond
Berm/Dyke
Quarry Road
Reclamation (Year 6)
Reclamation (Year 10)
Produced for: Bilcon of Nova Scotia Corporation
Concept Quarry Plan
Years 6 - 10
Plan OP 2
Graphic Design by Mark Prust, Bear River, N.S.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Nova Scotia Department of Housing and Municipal Affairs
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Environmental Assessment/
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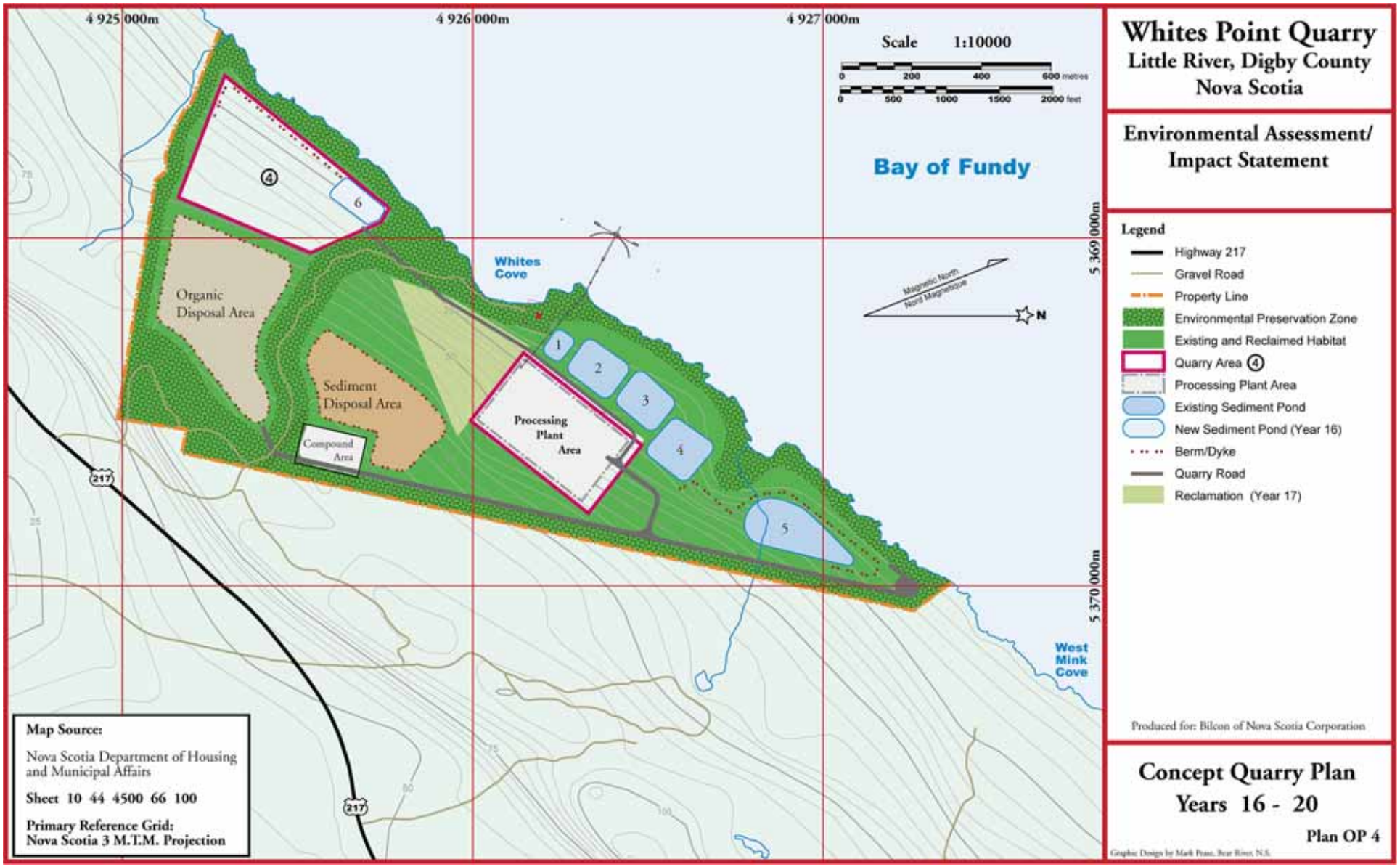
Property Line
Environmental Preservation Zone
Existing and Reclaimed Habitat
Quarry Area ② and ③
Processing Plant Area
Existing Sediment Pond
Berm/Dyke
Quarry Road
Reclamation (Year 14)
Produced for: Bilcon of Nova Scotia Corporation
Concept Quarry Plan
Years 11 - 15
Plan OP 3
Graphic Design by Mark Peace, Bear River, N.S.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Whites Cove
West Mink Cove
Organic Disposal Area
Sediment Disposal Area
Compound Area
Processing Plant Area
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2
3
4
5
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Magnetic North
Nord Magnétique
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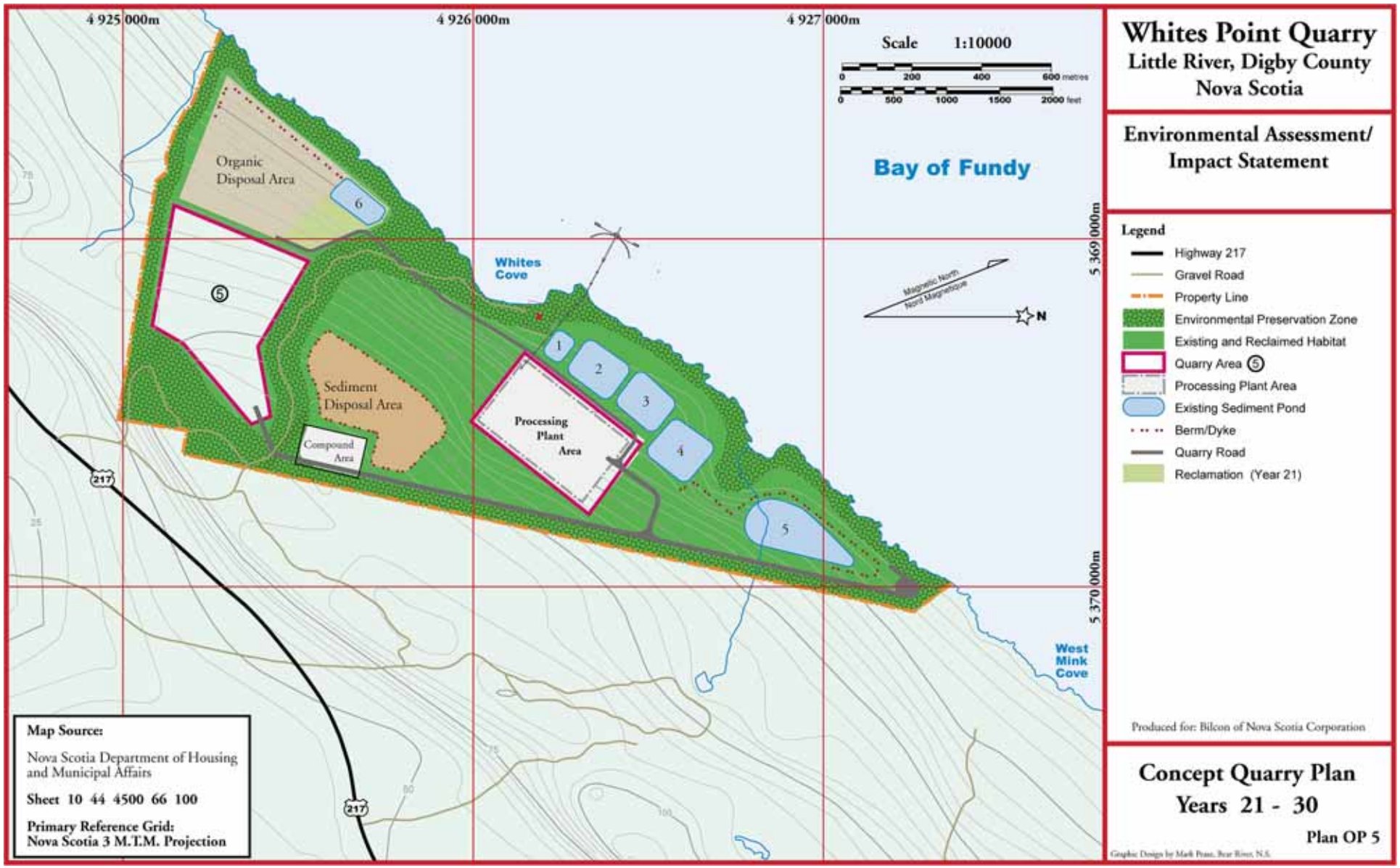
217
Map Source:
Nova Scotia Department of Housing and Municipal Affairs
Sheet 10 44 4500 66 100
Primary Reference Grid:
Nova Scotia 3 M.T.M. Projection
Whites Point Quarry
Little River, Digby County
Nova Scotia
Environmental Assessment/
Impact Statement
Legend
Highway 217
Gravel Road
Property Line
Environmental Preservation Zone
Existing and Reclaimed Habitat
Quarry Area 4
Processing Plant Area
Existing Sediment Pond
New Sediment Pond (Year 16)
Berm/Dyke
Quarry Road
Reclamation (Year 17)
Produced for: Bilcon of Nova Scotia Corporation
Concept Quarry Plan
Years 16 - 20
Plan OP 4
Graphic Design by Mark Penz, Bear River, N.S.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Map Source:
Nova Scotia Department of Housing and Municipal Affairs
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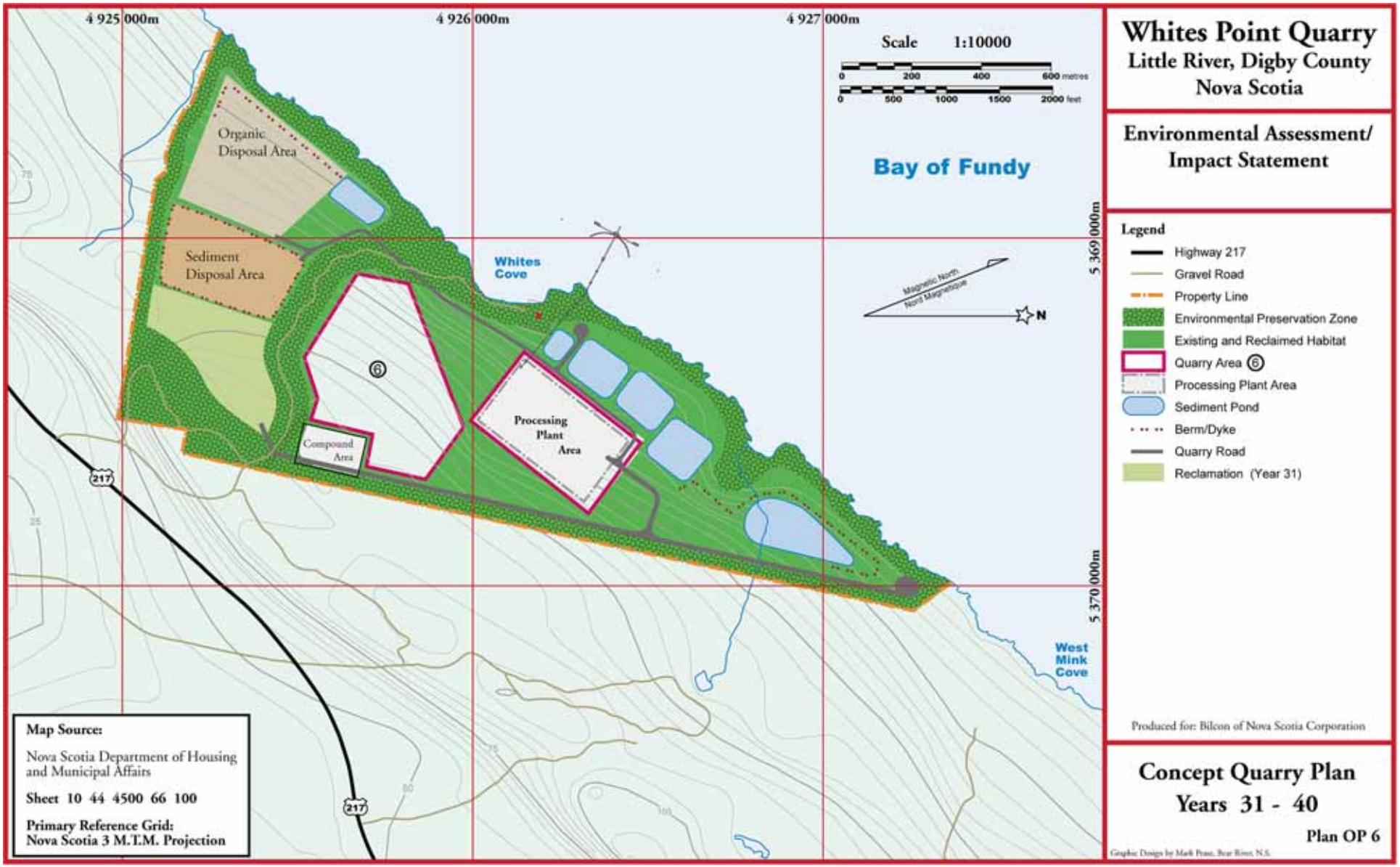
Primary Reference Grid:
Nova Scotia 3 M.T.M. Projection
Whites Point Quarry
Little River, Digby County
Nova Scotia
Environmental Assessment/
Impact Statement
Legend
Highway 217
Gravel Road
Property Line
Environmental Preservation Zone
Existing and Reclaimed Habitat
Quarry Area (5)
Processing Plant Area
Existing Sediment Pond
Berm/Dyke
Quarry Road
Reclamation (Year 21)
Produced for: Bilcon of Nova Scotia Corporation
Concept Quarry Plan
Years 21 - 30
Plan OP 5
Graphic Design by Mark Penz, Bear River, N.S.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⑥
Compound Area
Processing Plant Area
217
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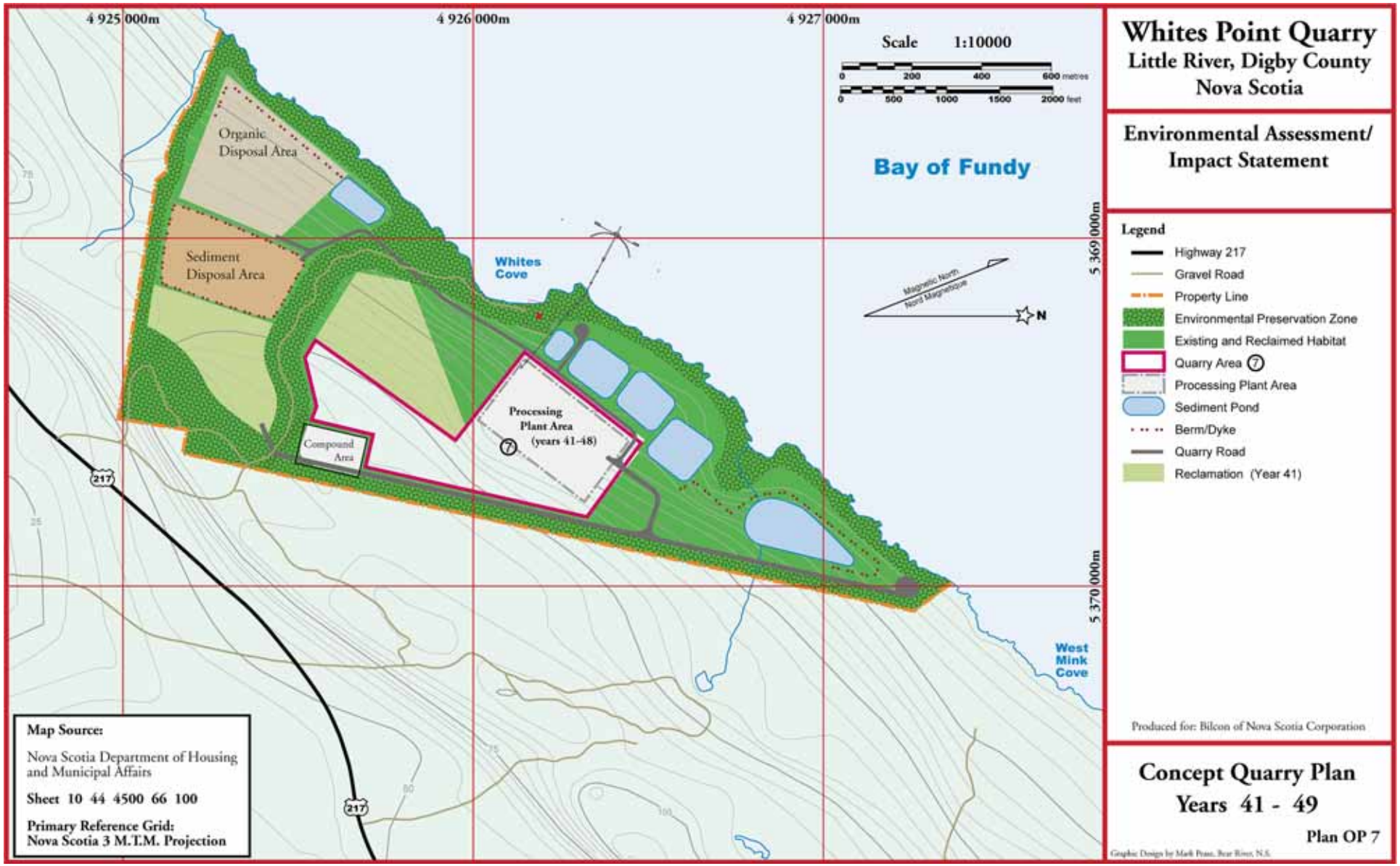
West Mink Cove
Map Source:
Nova Scotia Department of Housing and Municipal Affairs
Sheet 10 44 4500 66 100
Primary Reference Grid:
Nova Scotia 3 M.T.M. Projection
Whites Point Quarry
Little River, Digby County
Nova Scotia
Environmental Assessment/
Impact Statement
Legend
Highway 217
Gravel Road
Property Line
Environmental Preservation Zone
Existing and Reclaimed Habitat
Quarry Area ⑥
Processing Plant Area
Sediment Pond
Berm/Dyke
Quarry Road
Reclamation (Year 31)
Produced for: Bilcon of Nova Scotia Corporation
Concept Quarry Plan
Years 31 - 40
Plan OP 6
Graphic Design by Mark Peace, Bear River, N.S.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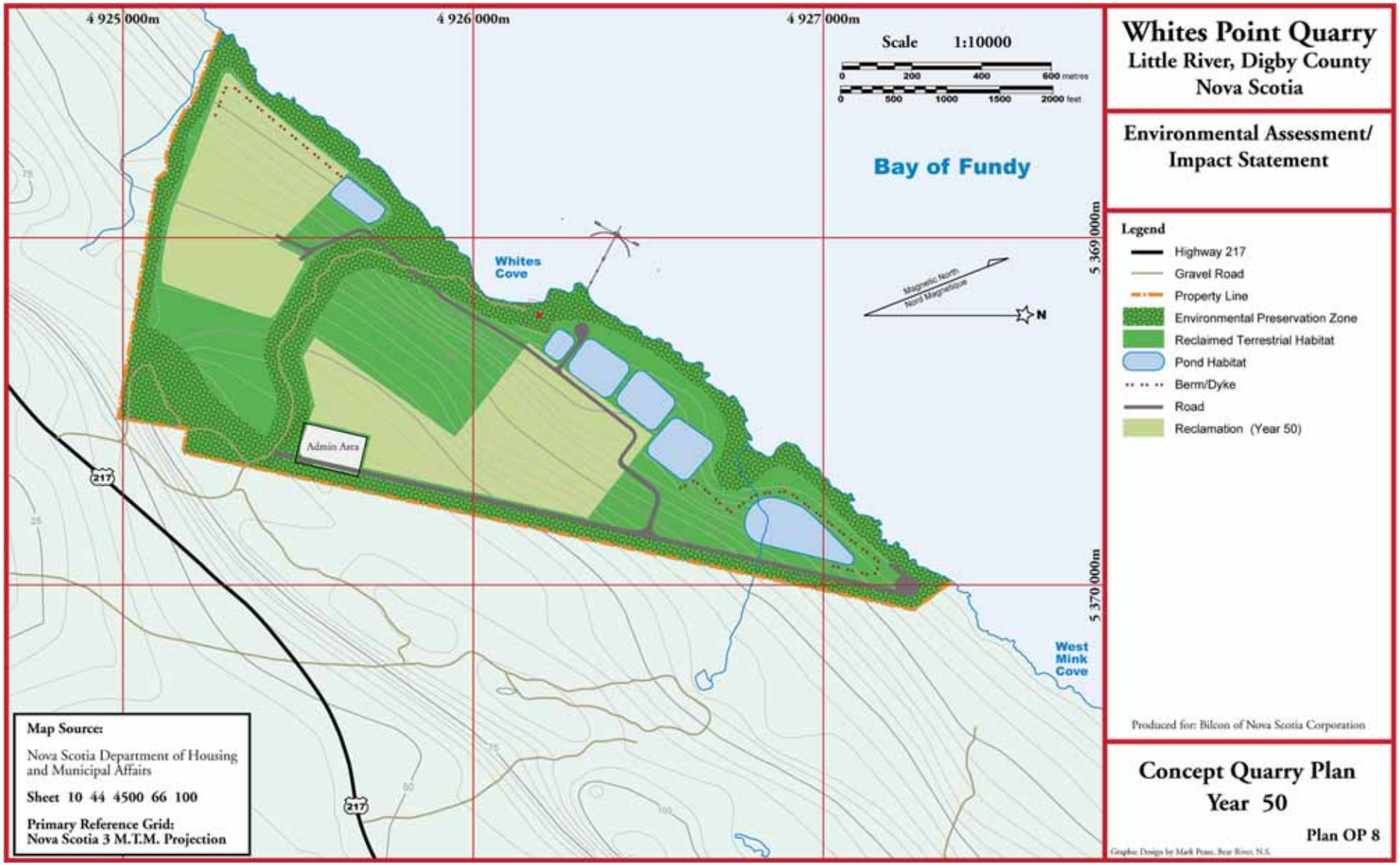
Bay of Fundy
Organic Disposal Area
Sediment Disposal Area
Whites Cove
Magnetic North
Nord Magnétique
N
Processing Plant Area (years 41-48)
7
Compound Area
217
5 369 000m
5 370 000m
West Mink Cove
Map Source:
Nova Scotia Department of Housing and Municipal Affairs
Sheet 10 44 4500 66 100
Primary Reference Grid:
Nova Scotia 3 M.T.M. Projection
Whites Point Quarry
Little River, Digby County
Nova Scotia
Environmental Assessment/
Impact Statement
Legend
Highway 217
Gravel Road
Property Line
Environmental Preservation Zone
Existing and Reclaimed Habitat
Quarry Area 7
Processing Plant Area
Sediment Pond
Berm/Dyke
Quarry Road
Reclamation (Year 41)
Produced for: Bilcon of Nova Scotia Corporation
Concept Quarry Plan
Years 41 - 49
Plan OP 7
Graphic Design by Mark Prust, Bear River, N.S.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Whites Cove
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West Mink Cove
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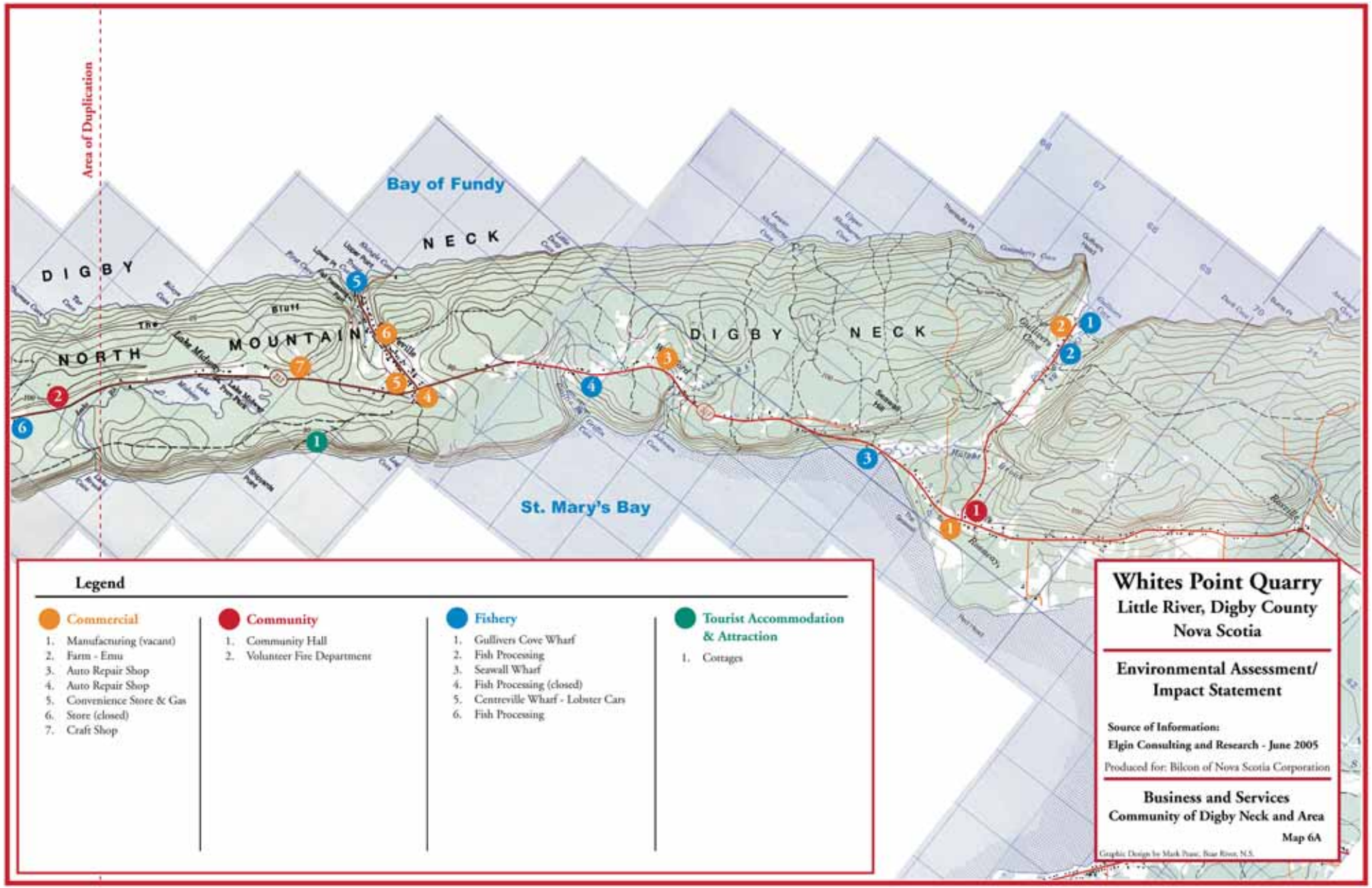
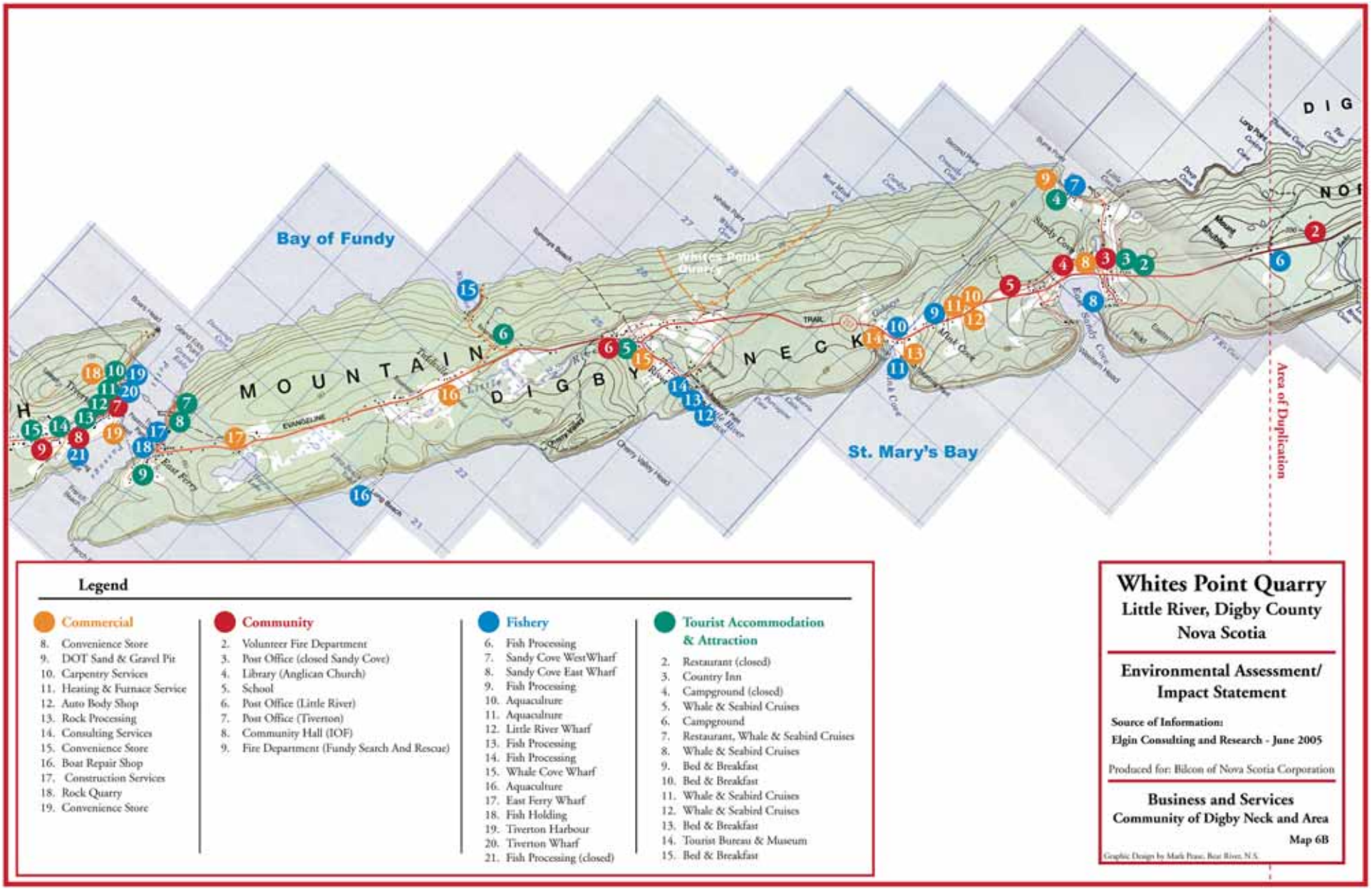
217
Map Source:
Nova Scotia Department of Housing and Municipal Affairs
Sheet 10 44 4500 66 100
Primary Reference Grid:
Nova Scotia 3 M.T.M. Projection
Whites Point Quarry
Little River, Digby County
Nova Scotia
Environmental Assessment/
Impact Statement
Legend
Highway 217
Gravel Road
Property Line
Environmental Preservation Zone
Reclaimed Terrestrial Habitat
Pond Habitat
Berm/Dyke
Road
Reclamation (Year 50)
Produced for: Bilcon of Nova Scotia Corporation
Concept Quarry Plan
Year 50
Plan OP 8
Graphic Design by Mark Peace, Bear River, N.S.


Area of Duplication
Bay of Fundy
NECK
DIGBY
NORTH
MOUNTAIN
DIGBY NECK
St. Mary's Bay
Legend
Commercial
1. Manufacturing (vacant)
2. Farm - Emu
3. Auto Repair Shop
4. Auto Repair Shop
5. Convenience Store & Gas
6. Store (closed)
7. Craft Shop
Community
1. Community Hall
2. Volunteer Fire Department
Fishery
1. Gullivers Cove Wharf
2. Fish Processing
3. Seawall Wharf
4. Fish Processing (closed)
5. Centreville Wharf - Lobster Cars
6. Fish Processing
Tourist Accommodation & Attraction
1. Cottages
Whites Point Quarry
Little River, Digby County
Nova Scotia
Environmental Assessment/
Impact Statement
Source of Information:
Elgin Consulting and Research - June 2005
Produced for: Bilcon of Nova Scotia Corporation
Business and Services
Community of Digby Neck and Area
Map 6A
Graphic Design by Mark Peare, Bear River, N.S.



Legend

Commercial

8. Convenience Store
9. DOT Sand & Gravel Pit
10. Carpentry Services
11. Heating & Furnace Service
12. Auto Body Shop
13. Rock Processing
14. Consulting Services
15. Convenience Store
16. Boat Repair Shop
17. Construction Services
18. Rock Quarry
19. Convenience Store

Community

2. Volunteer Fire Department
3. Post Office (closed Sandy Cove)
4. Library (Anglican Church)
5. School
6. Post Office (Little River)
7. Post Office (Tiverton)
8. Community Hall (IOF)
9. Fire Department (Fundy Search And Rescue)

Fishery

6. Fish Processing
7. Sandy Cove WestWharf
8. Sandy Cove East Wharf
9. Fish Processing
10. Aquaculture
11. Aquaculture
12. Little River Wharf
13. Fish Processing
14. Fish Processing
15. Whale Cove Wharf
16. Aquaculture
17. East Ferry Wharf
18. Fish Holding
19. Tiverton Harbour
20. Tiverton Wharf
21. Fish Processing (closed)

Tourist Accommodation & Attraction

2. Restaurant (closed)
3. Country Inn
4. Campground (closed)
5. Whale & Seabird Cruises
6. Campground
7. Restaurant, Whale & Seabird Cruises
8. Whale & Seabird Cruises
9. Bed & Breakfast
10. Bed & Breakfast
11. Whale & Seabird Cruises
12. Whale & Seabird Cruises
13. Bed & Breakfast
14. Tourist Bureau & Museum
15. Bed & Breakfast

No important environmental features, except several small wetlands, are known to exist immediately adjacent to the quarry property.

Safety features incorporated into the project design include the upgrading of the intersection of the quarry access road and Highway 217. Private access roads within the quarry will be gated and the Whites Cove Road right-of-way will be fenced for security.

Few industrial development projects are known to be planned within the community of Digby Neck. A water bottling plant is under consideration near Gullivers Cove. Also, a water based aquaculture development is presently proposed at Mink Cove. A small craft harbour was recently constructed at Tiverton on Long Island.

The quarry project is approximately 1 km west from the village of Little River within Digby County. Digby County presently does not have a Municipal Planning Strategy or Zoning By-Laws. Industrial development, such as a quarry, is the responsibility of the province. A permit was obtained from the Nova Scotia Department of Environment and Labour in 2002 for the operation of a four hectare quarry within the proposed Whites Point quarry site. Presently, there are no known regional-scale management plans in place for Digby Neck or Digby County.

Major physical components of the quarry are shown on **Figures 1, 2, 3, and 4. Plans OP 1-8** show the development plan in five and ten year increments for the 50 year life of the quarry. For details of the construction, operation and maintenance, and decommissioning and reclamation phases see **paragraphs 7.7, 7.8, and 7.10.** The properties closest to the quarry property are forested. The closest residential dwelling, not owned by Bilcon of Nova Scotia Corporation, is located approximately 450 m from the active quarry area (the area of rock extraction). A total of 5 residences are located within 500 m of the active quarry area and 19 within 500 – 1000 m.

Various sizes of basalt rock aggregates ranging from ¼" to 1", grits, and concrete sand products will be produced for shipment from the quarry. Approximately 40,000 tons is planned to be shipped each week for a total of 2 million tons per year. Clearing and grubbing of land before quarrying will produce approximately 15 acre/feet of organic material for each ten acres cleared. Also, sediments from the aggregate washing process will produce approximately 45 acre/feet per year of sediment for disposal. Organics and sediments will be stored on-site in dyked disposal areas.

Phasing of construction, operation and maintenance, and decommissioning and reclamation are presented in **paragraphs 7.7, 7.8, and 7.10.** Briefly, the quarry will operate for approximately 44 weeks of the year with an 8 week maintenance period during winter months. Hours of operation will be from 0600 to 2200 including two workforce shifts. Specific management procedures for extraction, drilling and blasting, sediment control, and shipping (including ballast water management) are presented in subsequent sections of the Environmental Impact Statement.

7.4 Land requirements

Lands Within the Footprint of the Project

The Proponent does not have title to lands within the footprint of the project. The 380 acre parcel of land is leased from the title holders (see Appendix 25) for a period of 90 years.

The owners of the land and the Proponent are aware that a small (50' x 50') parcel of land exists on the foreshore which is now owned by local residents. The precise location of this parcel is unknown. This parcel of land does not interfere with the quarry layout and there is no structure on this parcel. It is understood that the owners of this parcel have made application for a building permit to erect a cottage on the property but that the application was denied on the grounds that there is no access to the property for emergency vehicles or a right-of-way over private property to the parcel.

The owners of this small parcel have commenced legal action to establish the location of the parcel and to establish a right-of-way to the parcel from the Whites Cove Road and this matter is still before the courts. As noted above, none of the locations suggested for this parcel lie within the footprint of the quarry layout but would lie in the designated buffer zone.

Implications of the Private Property Held by Others and the Public Right-of-Way within the Quarry Site

The location of the 50' x 50' parcel of land held by the local residents on the foreshore of the 380 acre parcel of land leased by the Proponent has not been precisely located but two options have been suggested by surveyors engaged by the owners of this parcel. Neither of these options lie within the boundaries of the working area of the quarry but lie in buffer areas.

Since there is no structure on this parcel, the issue of blasting setback under provincial guidelines does not apply.

The Whites Cove Road which provides access to Whites Cove from Highway #217 is an abandoned road still owned by the Department of Transportation but is not maintained. Severe scour, particularly on the lower section towards the Bay of Fundy, now restricts access to all but four-wheeled drive vehicles.

The layout of the quarry operation is designed to work around the Whites Cove Road and the road itself will not be used by the quarry operation. New roads will be constructed to serve the various areas of quarry operation.

If the Whites Cove Road cannot be acquired, the Proponent will fence the length of the road within the quarry footprint in order to maintain site security, and buffer areas will be maintained along the road.

An additional major issue is the volume of silt, sand, and gravel arising from the scour of the road fill which is currently entering the Bay of Fundy. Acquisition of the road right-of-way would enable control structures to be put in place by the Proponent to prevent sediment from entering the Bay from the road structure.

Existing Rights-of-Way

The only existing right-of-way on the 380 acre quarry site is the right-of-way of the Whites Cove Road, an abandoned road.

A right-of-way does not exist to the previously described 50' x 50' parcel of land not owned by the title holders of the 380 acre parcel.

Riparian Rights

The following extract sets out the law with respect to Riparian Rights**.**

> "...I refer to *Water Law in Canada - The Atlantic Provinces* (Ottawa: Queen's Printer, 1973) by Gerald V. LaForest and Associates at p. 200:
>
> > *The owner of land adjoining a river stream or lake has certain rights respecting the water therein whether or not he owns the bed. These rights arise from his ownership of the bank, and from the Latin word for bank, ripa, they derive their name of riparian rights. The owner is similarly referred to as a riparian owner.*
> >
> > *It is sufficient for the land to be riparian that it comes in contact with a body of water for a substantial part of everyday in the ordinary course of nature, but such contact need not continue for the whole of the day. Thus land that comes in contact with the sea or a tidal stream at high tide is riparian land, and its owner is entitled to riparian rights in respect of it.*
>
> Riparian rights include the right of access to the water, the right of drainage, rights with respect to the quality of the water and rights with respect to the quality of the water and rights relating to the use of the water." (Corkum v. Nash).

Bilcon has leased all lands in Whites Cove, save a 50' x 50' lot. The leased lands extend up to the shore of the Bay of Fundy. By virtue of the extension of the boundaries to the shore, Bilcon has riparian rights including the right of access to the water, the right of drainage, rights with respect to the quality of the water and rights relating to the use of the water. There is no other ownership of lands fronting up to the sea or extending to the high water mark and therefore there is no other land owner that can assert riparian rights.

There is one other property interest within the boundaries of Bilcon's lands in Whites Cove, that being a 50' x. 50' lot owned by Mary Scott and Carol Mahtab. There is litigation on the precise location of the lot but there is no part of the legal description of that lot that describes the boundaries of the property as extending to the shore of the Bay of Fundy, in contrast to the clear expression in the description for the Bilcon lands. Accordingly, the owners of the 50' x 50' lot are not in a position to assert riparian rights.

In the event that it was determined the location of the Scott-Mahtab lot was such as to establish riparian rights, the proposed development would not interfere with the rights of access from the lot.

Status of Fishing or Fishermen's Privileges

Counsel for the Proponent has been unable to determine any case law that establishes any doctrine for the issue of Fishing or Fishermen's privileges.

The closest concept that could be found is contained in the *Angling Act* which allows as follows:

> *3(1) Any resident of the Province shall have the right to go on foot along the banks of any river, stream or lake, , upon and across any uncultivated lands and Crown lands for the purpose of lawfully fishing with rod and line in such rivers, streams or lakes.*

This allows individuals to cross woodlots and other uncultivated lands for the purpose of fishing but does not appear to create a right-of-way in the sense of something similar to a common law easement.

7.5 Schedule and Boundaries

Physical development of the Whites Point quarry and Marine Terminal spans fifty years including the construction phase in Year 1, the operational and maintenance phase in Years 2 through 49, and the decommissioning phase in Year 50. Quarry plans (mine plans) for the 380 acre land area are shown on **Plans OP 1 – 8** for the fifty year life of the project. Following are time frames and spatial definition for construction and operation of the quarry and marine terminal development.

Year 1 Construction

Construction of the quarry and marine terminal infrastructure is scheduled for Year 1. Conceptual layout for this infrastructure is shown on **Figures 1,2,3 and 4 .** Marine and land construction would proceed simultaneously. The marine terminal will require an approximate ten acre water lot, the physical quarry plant area approximately twenty-seven acres, and the compound area approximately five acres.

Sediment retention ponds (2,3,4) are on approximately fifteen acres, a dyked organic disposal area on approximately thirty acres, and a temporary rock storage area on approximately fifteen acres will be a first order of construction. The location of these areas is shown on **Plan OP – 1.**

Years 2 – 5 Operation

A transition from the construction phase to the operation phase will continue through years 2 – 5. The major construction/operational activities include the construction of a dyked sediment disposal area on approximately twenty acres, site preparation for quarry area 1 on approximately thirty acres, processing and shipment of stockpiled rock, construction of sediment retention pond (5) on approximately ten acres, reclamation of the area around sediment retention ponds 1 – 4, and reclamation of the dykes around the organic and sediment disposal areas. Quarrying, processing, and shipment of rock from quarry area 1 would begin. The location of these areas is shown on **Plan OP – 1.**

Years 6 – 10 Operation

This time frame would include quarrying, processing, and shipment of rock from a portion of quarry area 2. Reclamation of the area surrounding sediment retention pond 4 would be completed. Site preparation of the remaining portion of quarry area 2 on approximately thirty acres would be done. The location of these areas is shown on **Plan OP – 2.**

Years 11 – 15 Operation

This time frame would include quarrying, processing, and shipment of rock from the remaining portion of quarry area 2 and reclamation of a portion of quarry area 2. Site preparation of quarry area 3 would begin on approximately thirty acres of land. The location of these areas is shown on **Plan OP – 3.**

Years 16 – 20 Operation

This time frame would include the quarrying, processing, and shipment of rock from quarry area 3. Construction of sediment retention pond 6 and site preparation of quarry area 4 on approximately forty-five acres of land would be completed. The location of these areas is shown on **Plan OP – 4.**

Years 21 – 30 Operation

This time frame would include the quarrying, processing, and shipment of rock from quarry area 4. Reclamation of a portion of quarry area 4 and relocation of the organic disposal area to the previously quarried area 4 would be completed. Incremental site preparation of quarry area 5 on approximately forty acres of land would also be completed. The location of these areas is shown on **Plan OP – 5.**

Years 31 – 40 Operation

This time frame would include the quarrying, processing, and shipment of rock from quarry area 5. Reclamation of a portion of quarry area 5 and relocation of the sediment disposal area would be completed. Incremental site preparation of quarry area 6 on approximately fifty acres of land would be completed. The location of these areas is shown on **Plan OP – 6.**

Years 41 – 49 Operation

This time frame would include the quarrying, processing, and shipment of rock from quarry area 6 and the incremental site preparation of quarry area 7 on approximately thirty acres of land. Quarrying, processing, and shipment of rock from quarry area 7 would take place in the latter portion of this time frame and complete quarrying activities. Reclamation of a portion of quarry area 6 would be completed. The location of these areas is shown on **Plan OP – 7.**

Year 50 Decommissioning

This time frame would include the decommissioning of the quarry including removal of the processing plant equipment, conveyors, and ship loader. Removal, grading, and reclamation of the organic and sediment disposal areas and final reclamation of quarry areas 6 and 7 including the physical plant area would be completed. The location of these areas is shown on **Plan OP - 8.**

7.6 Cost and Workforce

Capital cost and workforce considerations for the Whites Point Quarry and Marine Terminal have been broken down into three distinct phases – construction, operation, and decommissioning/reclamation.

Construction Phase

The construction cost of the Whites Point Quarry and Marine Terminal has been estimated at $33.1 million. The capital cost for the development of land infrastructure (roads, utilities, compound area facilities, environmental control structures, processing plant inclusive of operations equipment) has been estimated at $14.0 million with associated costs for marine infrastructure (conveyors, radial arm ship loader, mooring dolphins, and buoys) at $19.1 million. In addition, an allocation of $7.5 million has been made for the purchase of various pieces of mobile equipment. (loaders, trucks, excavators, bulldozers, crane, compressors, boats, and a drill rig) The total initial capital cost requirements of the project has been estimated at $40.6 million.

The anticipated construction employment impact, as it relates to the province of Nova Scotia as a whole, has been estimated at 225.4 person-years of employment. (A person-year of employment means one person is employed full-time for one year) This figure was derived from an analysis of expenditures utilizing the EcoTec Economic Impact Model and reflects an estimate of the total direct, indirect and induced impacts on employment. Approximately forty-five of these person years are attributable to Digby County specifically, and of these, 38.5 are considered direct employment impacts with 6.6 full-time equivalents created from spin-off employment. (Gardner Pinfold 2005, **Ref. Vol. VI, Tab 32**).

A skilled and unskilled construction workforce will be required during the construction phase of the project. Marine and land based construction activities will be contracted to local or provincial contractors whenever possible. The work force will consist of workers skilled in concrete and steel fabrication, heavy equipment and crane operators, drillers and blasters, truck drivers, welders, electricians, conveyor system specialists, building trades, computer specialists, environmental technicians, and general labourers. Educational requirements will vary depending upon occupation, however, all trades people will be licensed in their particular trade as applicable.

Operation and Maintenance Phase

Annual operating expenditures at the Whites Point Quarry and Marine Terminal have been estimated to be in excess of $20.0 million. This estimate includes direct expenditures for wages, shipping costs, electricity, blasting and fuel and general operating expenditure considerations for debt service costs, repairs and maintenance, taxes, administrative salaries, insurance, environmental monitoring, reclamation, and other miscellaneous expenditures. These annual expenditure allocations are expected to remain relatively stable over the life of the project.

The total employment impact from operations (direct and spin-off), on an annual basis, has been estimated at 43.5 person-years of employment for Digby County with an additional 39.1 person-years attributable to the rest of Nova Scotia for a total impact of 82.6 person-years of employment. Of the person-years of employment attributable to Digby County, 37.0 are considered full-time direct equivalents created from the operation of the quarry with an additional 6.5 full-time equivalents generated from spin-off activity directly resultant of the quarry. (Gardner Pinfold 2005 **Ref. Vol. VI, Tab 32).** The majority of direct employment impacts from the operation of the quarry would be felt predominately within neighbouring communities of the quarry site.

A skilled and unskilled work force will be required during the operational phase of the quarry over the 50-year life of the project. Skill requirements include a plant manager and operator, office clerk, heavy equipment operators, truck drivers, drillers, mechanics, electricians, welders, quality and environmental control technicians, fuel/greasers, and general labourers. The anticipated hourly wage rates to be paid vary from $12.50 to $20.00. The total annual budget estimate for direct wages and administrative salaries has been established at $1.16 million annually.

The expected operation/technical efficiency of the quarry operation will require a team of skilled workers. In this regard, Bilcon of Nova Scotia Corporation is committed to employing local persons and providing training programs. This corporate position is intended to maintain a highly skilled and committed workforce. Specialized and professional training for equipment operators and maintenance personnel is planned to be provided by the primary equipment supplier on a continuing basis as technologies evolve. Appropriate educational backgrounds would be required for such occupations as the quality and environmental control technicians and plant managers/operators.

Decommissioning and Reclamation Phase

Decommissioning is planned to take place in the final year of operation, year 50, as shown on the Concept Quarry Plan – **Plan OP-8.** Stationary equipment would be removed from the site by the quarry workforce. Final quarrying of the area occupied by the physical plant would be completed. The compound area facilities, utilities, roads, environmental control structures (sediment ponds, constructed wetlands and environmental preservation zones) would remain in place. Also, to avoid disturbance in the marine environment and for potential use, the mooring dolphins, buoys, and conveyor support system would remain in place.

Reclamation of disturbed areas will be incremental over the life of the project as shown on the Concept Quarry Plans -**Plans OP 1-8.** Costs for reclamation are approximately $7,000.00 per hectare as provided in the operational cost estimates. Reclamation would be completed using quarry equipment and contracts with local landscapers. The final areas of reclamation would include the areas used for sediment and organic storage and the last area to be quarried.

7.7 Construction Phase

Infrastructure

The primary construction activities for the Whites Point Quarry and Marine Terminal consists of the physical plant area and marine terminal – see **Figures 1, 2, and 3;** the quarry compound area – see **Figure 4** and environmental control structures – see **Plans OP 1-8.** Land and marine construction will proceed simultaneously and take approximately one year to complete. The following sequence of construction activities is proposed.

7.7.1 Land

Access Road

An access road will be constructed from Highway #217 to the quarry property. Upgrading of the Whites Cove Road is being considered as well as a new access road on Bilcon property to the north of the Whites Cove Road. The new access road location would provide greater separation from existing residences. The access road would be paved and designed to accommodate tanker truck vehicles. The intersection of the access road and Highway #217 will be designed to meet the Nova Scotia Department of Transportation and Public Works standards. Limited cut and fill is expected during road construction. Fill materials would be obtained from the quarry site. Vegetation will be cleared and chipped, and along with materials from grubbing, will be disposed of in the organic disposal area on the quarry site – see **Plan OP-1.** Burning of brush during construction is not planned. Gradients on the access road would not exceed 10%. Necessary environmental controls would be put in place prior to road construction.

Utilities

Electrical energy would be provided from upgraded services on Highway 217 to the quarry compound area. The electrical services to the quarry site would follow the access road right-of-way. On-site distribution would be controlled from the quarry compound area. Other utilities would include an on-site sewage disposal system and domestic water supply. Sewage disposal and water well drilling will be done in accordance with the Nova Scotia Department of Environment and Labour guidelines. Solid waste disposal would be contracted to a private company.

Quarry Compound Area

A layout plan of this area is shown on **Figure 4.** The compound area encompasses approximately 5 acres and would be surrounded with security fencing with gated road access. Construction in this area would include a pre-engineered maintenance shop

approximately 60'x100' of 30' bay height and a lower office/lab and employee facility approximately 40'x40' with an eave height of 14'. The maintenance shop will be constructed on a reinforced concrete slab with adjacent "water stop" sealed curb walls to contain any accidental spillage of fuels or lubricant materials within the building. An electrical distribution centre, on-site sewage, domestic water well, vehicle and equipment parking and fuel storage tank will also be located within the compound area.

The fueling area at the storage tank will be erected on a reinforced concrete slab contained within two side curbs and with a sloping floor that is ramped from a lowpoint at the centre to a high point at the exit and entrance to the fuel station. This configuration will contain any spillage or surface drops within the slab. Release of any water from the fuel pad reservoir will be after filtration and processing is completed.

The majority of the compound surface will be paved. A 30 m environmental preservation zone will buffer adjacent lands. No explosives will be stored on-site.

Quarry Roads

Construction of quarry roads from the compound area to the organic disposal area, processing plant area, Bay of Fundy shoreline, sediment retention ponds, and the marine terminal location are shown on **Plan OP-1.** Subsequent extension of these roads are shown on **Plans OP-4, 5, and 6.** Disposal of materials cleared and grubbed from this road construction will be placed in the berm/dyked organic disposal area also shown on **Plan OP-1.** Fill material for road construction will be obtained on-site. The flow in any drainage ways encountered will be maintained during road construction with culverts, especially the drainage feeding the coastal bog. No wetlands were identified within the proposed road rights-of-way. Gradients on these roads will not generally exceed 10%. Necessary environmental controls will be put in place prior to road construction.

Processing Plant

The physical plant location for processing, stockpiling, and ship loading is shown on **Figure 1.** The processing plant will be located at the 30 m elevation and require approximately 27 acres of land. Rock blasting will be required to create the platform. Drilling and blasting will be conducted in accordance with the Nova Scotia Department of Environment and Labour and the Department of Fisheries and Oceans guidelines. Rock removed from the processing site preparation will be temporarily stored in the northern portion of the quarry property as shown on **Plan OP-1.** This rock may also be used for various land construction activities such as road base and other structural and environmental control structure activities.

Once the platform is established, the crushing and screening equipment will be installed. Crushing and screening equipment will be enclosed to control dust and noise. Also, the crusher feeds and discharges will be treated with an atomized dust suppression vapour that captures the airborne dust generated by the size reduction equipment. The manufactured sand product, the smallest particle product produced at the processing plant , will be processed through a wet classification system, thus removing dust emissions.

On the lower 10 m elevation level, the load out tunnels will be constructed and conveyors installed. Electrical power supply will be provided for the conveyor motors.

Environmental Controls

Once the roads are constructed to the area of the sediment retention ponds, these ponds will be constructed – see **Plan OP-1.** The berms of these ponds will be the first areas to be reclaimed. Erosion control, visual enhancement and creation of wildlife habitat will be the intent. The sediment ponds will be in place before construction of the physical plant begins. Also, site preparation will be carried out and a berm/dyke will be constructed around the temporary rock storage area before rock is stockpiled. This berm/dyke will form the berm for a future sediment retention pond.

It should be noted that the coastal bog is in the environmental preservation zone in the area of the temporary rock storage and will not be disturbed. During this initial construction phase, berm/dykes will also be constructed around the organic disposal area and the sediment disposal area.

7.7.2 Marine

Marine infrastructure will include the construction of mooring dolphins, a radial arm ship loader, conveyor supports, conveyors, and mooring buoys. A schematic plan and elevation are shown on **Figures 2 and 3.** A water lot lease of approximately ten acres is required for the marine construction and has been requested from the Nova Scotia Department of Natural Resources. Also, a registration has been filed with Transport Canada as required under the Navigable Waters Protection Act for the marine works. No blasting, dredging, or fill placement is anticipated in the marine environment.

Mooring Dolphins

Three rectangular, concrete capped mooring dolphins, approximately six m wide by fifteen m long are proposed. The construction technique for the pile supported dolphins will use conventional marine methods from a conventional floating barge. The dolphins and piles will be designed to resist horizontal loads due to the berthing of vessels and environmental loads (wind, waves, etc.).

Temporary pile templates will be anchored to the bottom to support the steel pipe piles and dolphin caps. The proposed thirty-six inch diameter pipe piles would then be installed using conventional methods such as pile driving hammers and churn drills. Once seated into the bedrock, the inside of the pile would be churn drilled and cleaned out using a suction lift pressure jet or pump. Any contaminants would be stored for land disposal. After flushing the pile, an approximate four inch diameter core would be drilled into the bedrock for the pile anchor and grouted. The interior of the pile would then be filled with concrete using the tremie method. It should be noted that the majority of the work is inside the pile thereby reducing direct contact with the marine environment. Formwork for the concrete caps would then be installed, supported by the temporary pile template. Spill containment would be installed as part of the formwork and the caps would be poured. Also, depending on the final details, silt curtains and acoustic blankets may be required. For further details on marine noise and sediments refer to **paragraphs 9.1.7.1 and 9.2.1.5.**

Radial Arm Shiploader

Steel fabrication for the shiploader would be done off-site and delivered to the site by barge. Steel pipe piles would be anchored into the bedrock with concrete caps, similar to the dolphin construction, for the shiploader bridge support. The shiploader bridge would contain the mechanical components such as the electrical room, shuttling winch and shiploader drive. The main components of the shiploader are the quadrant shiploader boom with operators cab, the quadrant shiploader shuttle, and the quadrant shiploader suspended conveyor. Both the shuttle and boom are equipped with drip trays. Installation of the shiploader components is proposed to be done from a floating platform. Lighting on the shiploader will be shielded to direct light downward on the conveyor during night loading. Navigational lighting will be provided as required by Transport Canada.

Shiploader at Sydney Steel

Conveyors

The loadout conveyor extending from onshore to the shiploader conveyor will be supported using the same technique of pipe piles with concrete caps. The conveyor trusses allow a 35 m span between support structures thereby reducing the number of supports in the intertidal zone and nearshore waters. Installation of the pipe piles in the intertidal zone would be done at low tide from land. Depending upon final design, smaller diameter pipe piles may be appropriate for the conveyor supports. The loadout conveyor would be equipped with spill containment.

Mooring Buoys

Standard mooring buoys for the previously described panamax size vessel will be installed for bow and stern lines.

7.8 Operation and Maintenance Phase

Operation

The operational life of the quarry and marine terminal is expected to be 50 years based on the available basalt rock reserves on the site. Yearly production is estimated to be 2 million tons with weekly shipments of 40,000 tons. Concept quarry plans – **Plans OP 1 – 8** – show the quarry operation in 5 and 10 year increments over the 50 year life of the project.

Quarrying and ship loading will be carried out for 44 weeks during the year with an 8 week maintenance period during the winter months. Proposed operating hours of the quarry will be from 0600 to 2200 hours. The workforce will consist of two shifts – twenty workers on the first shift and fourteen on the second for a total of 34 during normal production operations. Skill requirements for the workforce will include a plant manager and office clerk, quality control and environmental control technicians, plant operator, quarry face loader operator, quarry rock truck drivers, mobile equipment mechanic, electrician, fuel person, water truck driver, equipment operators, welders, rock driller and helper and labourers.

Administration and Maintenance

The quarry compound area will function as an operations headquarters with office space for administration and technical support staff (manager, office clerk, quality control and environmental technicians). The office will also house the electronic control centre. A maintenance shop will provide space for mobile equipment servicing and repairs as well as interior storage space for oils, greases, and coolants. This interior space will have spill control containment. Heating systems for the office and shop will be fueled by recycling waste oil from the mobile equipment. A double walled fuel storage tank with an alarm system and surrounding spill containment will be located in the compound area. The fuel storage tank will be constructed according to the latest ULC – S601 or UL – 142 standards with ISO 9001 Quality Controls. This area will have security fencing and will be gated at its access point. Services such as parking, electrical control, domestic water supply, and an on-site sewage disposal system will also be located in the compound area – see **Figure 4.**

Stationary Equipment

The operation of the quarry will require stationary equipment to process and load the projected 2 million tons of aggregate products per year. A radial arm ship loader, jaw crusher with feeder and 150 ton rock box, rock crushers, screens, load-out tunnel, conveyors, sand processing equipment, waterlines and pumps, water clarification tank, dewatering screens for sand products, and an emergency generator will be required. The primary energy for the stationary equipment will be electricity.

Mobile Equipment

The operation of the quarry will require mobile equipment for loading, transporting, servicing and environmental controls. The primary mobile equipment includes a face loader, off-road rock trucks, bulldozer, excavators and wheeled loaders, water trucks, crane, miscellaneous service trucks, work boat, barge and a drill rig. The primary energy for the mobile equipment will be diesel fuel.

Blasting

Blasting is planned every two weeks during production. The size and configuration of the blast holes and weight of explosives will vary depending upon production requirements, time of year, proximity to the Bay of Fundy and required set-backs from fish habitat, and proximity to adjacent residences. Blast geometry will also vary depending upon production and site location. All blast design will be done by certified blasters licensed in Nova Scotia. Pre-blast surveys will be conducted in accordance with the requirements set forth by the Nova Scotia Department of Environment and Labour. Blasting will not be conducted during periods of atmospheric inversion. Storage of explosives is not planned on the quarry site. For further details on blasting, refer to "Bilcon of Nova Scotia Corporation – Blasting Protocol" – see Appendix 9.

Process Description

Loading and transportation of the quarried rock will take place within the quarry site. Quarried rock will be loaded and transported to the physical plant area – see **Figure 1**, in off-road trucks. The rock will be deposited into the dump hopper of the primary crusher at the north end of the process plant. A vibratory grizzly feeder then moves the rock at a controlled rate into the jaw of the primary crusher. This crusher will reduce the size of the rock and is housed, along with appurtenances, in an enclosure to provide sound and dust emission control. The crushed material will then travel by belt conveyor to the primary scalping screen for size separation. The material is then conveyed to surge piles according to size.

The larger rock (9"x3") that was segregated to the primary surge pile is automatically reclaimed through an "under pile" tunnel conveying system that meters the rock into a coarse material cone crusher. This crushed rock is deposited onto a belt conveyor and delivered to a double deck sizing screen. This screen will send oversized rock back to a secondary surge pile and any minus 1" product will be conveyed to a tertiary surge pile.

The plus 1" size material that was returned to the secondary surge pile is metered onto a belt conveyor within an "under pile" tunnel to be sent to a second crusher with a medium fineness crushing cavity and is then returned to the double deck sizing screen previously

mentioned. It should be noted that the crushers and screens are enclosed in structures similar to the primary crusher. As the material size is reduced through this crushing/ screening circuit, the 1"x 0" crushed rock is sent to a final tertiary surge pile to be metered into the product screening system.

The product in the tertiary surge pile is then conveyed within an "under pile" tunnel/ conveying system to a triple deck product screening station. This final screening will rinse the stone products as they are being screen-separated to size. The spray wash will remove dust and minus ¼" stone fractions and the slurry will be pumped to a classification and de-watering system. Concrete sand will be separated and the remaining water pumped to a flocculent tank. Here, the particulated solids will drop out of the water. The clarified water will then be recycled to the rinse screen process and the particulates (sediments) pumped to the dyked sediment disposal area. All site water is recycled and reused, all crushed products are utilized as product or during site reclamation, and noise and dust from the processing is controlled as close to the source as possible.

Shiploading

The finished aggregate storage piles will have a reclaim tunnel below the piles with a conveyor system to carry aggregates to a second conveyor that will transport and discharge materials onto a movable ship loading stacking conveyor. Material conveyed over the shoreline and waters of the Bay of Fundy by the belt conveyor will be within long-span gallery trusses. These trusses will have a solid plate steel floor. As well as reducing the number of supports within the Bay, the solid steel gallery floor will provide personnel and equipment access to the conveyor for maintenance or repairs. All conveyors will be equipped with emergency stop switches, mis-alignment switches, and motion switches located on non-powered pulleys.

As mentioned previously, all conveyor systems are electrically powered. There are no oil or lubricant reservoirs required that could introduce petroleum products into the water below. A small amount of lubricant is required within the cast iron gear reducers, no more than several quarts per drive. The reducers are fitted with a drip pan to catch any minute amounts of lubricant. Inspection of seals in the reducers will be performed as part of routine maintenance procedures and replaced during down time as required.

Finally, the radial arm ship loader will then load the materials into the various holds of the bulk carrier. Use of a radial arm shiploader increases loading efficiency since the vessel will not have to move after mooring as would be the case with a stationary shiploader. This will allow the ship to be loaded in less than 10 hours under normal conditions. The frequency of shiploading is expected to be on a weekly basis.

Water Management

Washing of aggregate products is planned as an integral part of production. Wash water systems will be arranged in closed circuit. Surface water runoff will be collected and stored in sediment retention ponds. No deep wells are proposed for wash water supply. Make-up water for aggregate washing will be pumped from the sediment ponds to a flocculent tank, to remove particles, before being pumped to the production area. This water will then be collected, directed and recycled back to the sediment ponds. For a detailed water budget for this process – see Strajt, David. MGI Limited. "Preliminary Results of Hydrologic Budget Analysis, Whites Point Quarry, Digby Neck, Nova Scotia" October 2005. **Ref. Volume V, Tab 30.**

The water budget was prepared for the projected fifty year life of the Whites Point quarry project and is based on the concept quarry plans **OP – 1-8**. Available surface water supply for aggregate washing from the watershed north of the Whites Cove Road was calculated on a monthly basis. The water budget model maintained and operated by the Hydrometeorology Division of the AES, Environment Canada was used. This model is based on the Thornthwaite and Mather Water Balance Procedure. As a result and assuming a five per cent loss from the washing process, a net available water supply exists except for the months of August and September from years 5 through 40. The deficit during these two months is minimal and ranges from 8,000m^3 to 12,000m^3.

Waste Management

Incremental clearing and grubbing for quarry expansion will produce organic materials which will be stockpiled on-site. Also, sediment materials from the flocculent tank will be stockpiled on-site. These material disposal areas will be contained with dykes to control potential runoff. These materials (organics and sediments), will be mixed and recycled during the reclamation process. The location of these disposal areas are shown on the Quarry Concept Plans – **OP – 1-8**. Sewage waste will be handled by an on-site disposal system, while solid waste will be collected by a private contractor and disposed of in an approved landfill. As mentioned previously, waste oil will be collected, stored, and recycled as a heating fuel.

Ammonia from blasting with ammonium nitrate-fuel oil explosives is normally completely consumed during the blast event. Any residue, in the form of nitrates, will be directed by surface water runoff from the blast area to the sediment retention ponds. This will prevent any nitrates from directly entering the Bay of Fundy. Acid-generating rock does not exist on the site. For chemical analysis of the basalt rock – see **paragraph 9.1.2.1** and Appendix 4.

Dangerous Goods

As mentioned previously, explosives will not be stored on-site. Explosives will be trucked to the quarry site on an as needed basis approximately once every two weeks during production blasting. Supply and trucking of explosives will be contracted to a licensed explosives provider. All explosives handling will be done by certified persons.

Diesel fuel will be stored on-site in a bulk tank. Delivery by tanker truck will be approximately once every two weeks during production. The double walled storage tank will be located within a security fenced area and within a spill containment area. Distribution of fuel from the bulk tank to the mobile equipment will be done with an approved fuel truck. All fuel transfers will use dry-break quick disconnect couplings.

Land Transportation

Quarried products will be transported by ship thereby eliminating heavy truck traffic on rural roads and through rural residential areas. Truck traffic from Highway 101, to Highway 217, to the quarry site will increase during the one year construction phase. Delivery of materials and equipment, and the construction workforce will increase traffic during the construction phase. Load size and weights will vary and adhere to restrictions by the Nova Scotia Department of Transportation and Public Works. For further details on land transportation refer to **paragraph 9.3.8** .

Marine Transportation

The Whites Point Marine Terminal will be designed to accommodate “Panamax” bulk carriers. The overall length of this type of vessel is approximately 225 m, a molded

breadth of approximately 32 m, and a molded depth of approximately 19.5 m. Dead weight is approximately 70,018 tonnes with a gross tonnage of 41,428. The proposed route of the vessel from the inbound shipping lane to the marine terminal and from the marine terminal to the outbound shipping lane is shown on **Map 4 .** The frequency of call at the marine terminal will be on an average of once per week for a duration of an approximate 10 hour loading time. If severe weather is forecast, the ship's captain will determine an appropriate course of action. Aggregates and sand products are the primary materials to be loaded from the Whites Point Marine Terminal. No off-loading of any materials is anticipated at this time nor will the marine terminal be used for any other purposes except for the Whites Point quarry. If an instance of severe weather develops in the Bay of Fundy, the Whites Point marine terminal could offer refuge for fishing boats or ships in the immediate area. Ship loading will be by conveyor with spill containment. For further details on marine transportation refer to **paragraph 9.3.8.**

Ballast and Bilge Water

Management responsibility of ballast and bilge water lies with the shipping company to operate with reference to Transport Canada's guidelines and regulations. For further details on ballast water management refer to **paragraph 9.2.1.4 .**

Environmental Controls

Noise resulting from operation of the quarry and marine terminal will be controlled by attenuation (the distance between the source and receptor), vertical separation, environmental preservation zones, and design of stationary and mobile equipment. Noise from quarry operations, including blasting, will meet the guidelines set forth in Appendix D of the Nova Scotia Department of Environment and Labour's Pit and Quarry Guidelines. For further details on noise control refer to **paragraphs 9.1.9, 9.1.10, 9.1.11 and 9.2.15.**

Dust will be controlled whenever possible at the source. Examples of dust control measures include enclosed crushing and screening equipment, water sprays during aggregate screening and water sprays for dust control on roads. Dust control will meet the requirements of the Nova Scotia Department of Environment and Labour's guidelines for particulate emissions. For further details on dust control refer to **paragraph 9.1.8 .**

The quarry operation is not visible from Highway 217 due to the vertical change in topography, horizontal separation and forested slopes. The Whites Cove Road, a public road, is practically inaccessible except by four-wheel drive vehicles, all terrain vehicles, or by foot. This road will have security fencing along both sides and an environmental preservation zone to buffer views of the quarry. Also, views from the coastline and Bay of Fundy will be buffered with an environmental preservation zone and/or berms planted with evergreen trees. For further details on aesthetic controls refer to **paragraph 9.3.6.**

Once the plant begins processing, water from the sediment ponds will be drawn to the flocculent tank where sediments will be removed. Periodically, sediments accumulated in the flocculent tank will be pumped to the sediment disposal area. The sediment disposal area encompasses a maximum of approximately 25 acres while the organic disposal area encompasses approximately 35 acres. Organic and sediment materials will periodically be reused as site reclamation materials.

Maintenance Activities

Quarry infrastructure is designed for the 50 year life of the project. Expansion of the production area is not anticipated at this time. However, if infrastructure or environmental technologies evolve, adaptive management procedures maybe implemented. All repairs and maintenance activities would adhere to environmental regulations in place at that time. Since the marine terminal is to be constructed on bedrock and limited bottom sediments exist in the intertidal and nearshore area, no dredging or disposal of dredge materials is anticipated.

7.9 Modifications

Modifications to the basic quarry infrastructure or operating procedures are not anticipated in the near future. However, the life of the project is projected to be 50 years. Technological and scientific advancements are likely to occur during this time frame and may warrant changes and modifications. In this regard, an adaptive management process is recommended to ensure industry and regulatory authorities are involved in developing feasible and economically viable project modifications.

7.10 Decommissioning and Reclamation Phase

Decommissioning

As mentioned previously, in year 50, Bilcon of Nova Scotia will begin closure of the quarry. This process is expected to take one year. All processing equipment, conveyors and ship loader will be removed from the site. Infrastructure such as the quarry compound area, electrical services, and roads will remain in place for future use. Portions of the marine infrastructure, such as the conveyor support system, gallery trusses and floor, mooring dolphins and buoys will also remain. Navigational lighting will remain. No underwater demolition is proposed. The environmental control structures such as the sediment retention ponds and constructed wetlands will be left in place as wildlife habitat. Any portions of core holes remaining after rock extraction in the quarry area will be appropriately filled.

All of the quarry property is in private ownership. Upon completion of quarrying as a land use, certain infrastructure, as mentioned above, could remain in place. The created land – see **Figure 5,** could be easily developed for a higher economic land use. Land uses such as a resort, residential or eco-tourism development could be considered at that time based on market demand.

Reclamation

Reclamation of the Whites Point Quarry lands is proposed to proceed incrementally over the 50 year life of the project. Approximately six acres of quarry will be opened each year. Burning of brush is not planned during operation. All wood fibre will be chipped and composted in the organic disposal area along with other cleared and grubbed materials. The Concept Quarry Plans – **Plan OP 1 - 8**, identifies land uses in five and ten year increments. Reclamation would include site grading and drainage, soil preparation and planting. The priority area for reclamation would be lands along the coastline north of the Whites Cove Road and landward from the environmental preservation zone and environmental control/constructed wetland area. Reclamation of this coastal area first will increase the buffer area between the quarry and the marine environment providing

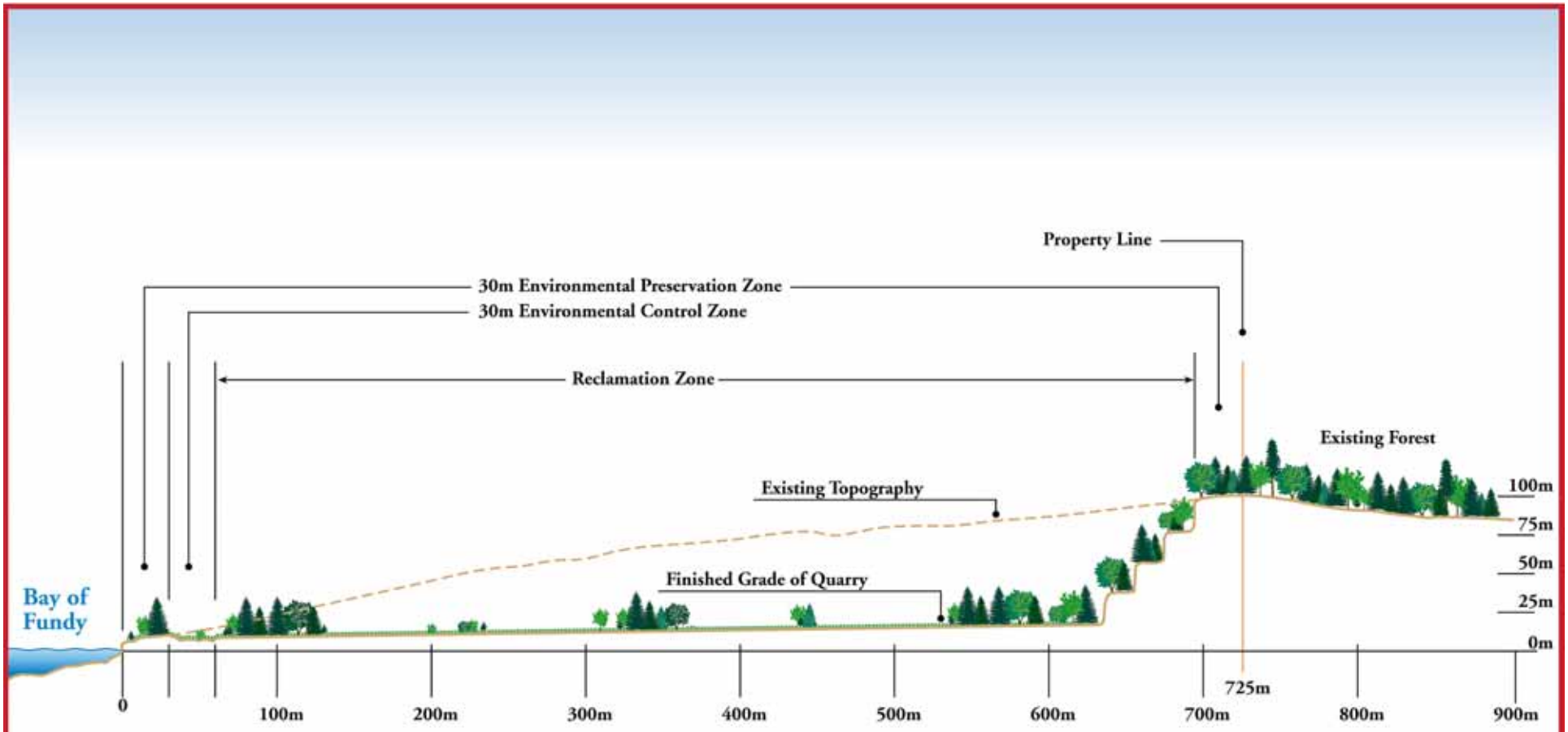
more effective erosion control, noise attenuation, enhanced aesthetics, and wildlife habitat. This area would be fully reclaimed after approximately ten years. As quarrying is completed inland from the coast, additional lands will be reclaimed on an incremental basis – see **Plans OP 1 - 8.**

The premise of the environmental reclamation program for the quarry is to maintain and increase a more ecologically diverse and productive quarry site, during and after completion of resource extraction. During project operation, maintaining sensitive habitats and creating habitat diversity is a primary objective. This is accomplished by maintaining an environmental preservation zone, especially along the sensitive coastline, and the creation of constructed wetlands, incremental planting to create various successional stages of vegetation for food and cover for wildlife, and the establishment of a more productive soil regime and forest.

The reclamation process begins after the environmental controls (sediment retention ponds, drainage channels, etc.) are in place. Merchantable timber will be harvested and residual woody plant material will then be chipped and stockpiled for composting. The remaining organic material and overburden will then be cleared and stockpiled in a dyked disposal area for future land reclamation use. Also, sediment retention ponds would be periodically cleaned out, sediments de-watered in a dyked disposal area along with processing sediments for reclamation use. Upon completion of quarrying in a given area, land reclamation would begin.

The area identified for reclamation would be rough graded and contoured for surface drainage. Stockpiled organics and sediments would be mixed and spread on the area to be reclaimed. Soil analysis indicates the existing soils require amendments. The pH is low and requires approximately 15 tons of agricultural limestone per hectare. As well, nitrogen, phosphorus, potassium, and calcium are also low. Appropriate amounts of these nutrients will be added for healthy and productive plant growth. Thus, lime and fertilizer would be incorporated into the soil. An erosion control mix of native grasses would then be seeded. This mix would contain grasses and legumes for nitrogen fixation.

Areas with suitable soil depth would be reforested with softwoods such as red and white spruce or balsam fir. Softwoods for shelter belts and commercial reforestation blocks would be included. Native hardwoods such as white birch, white ash, or red maple would also be included to maintain species diversity. Also, since no herbicides are proposed, natural regeneration would be allowed to occur. The series of benches adjacent to the east and south property line would be seeded and reforested in areas near the faces. Areas at the foot of the faces would be left for natural regeneration. A schematic section of the quarry after year 50 is shown on **Figure 5.**



Whites Point Quarry Reclamation
Schematic Section

Scale 1:2500

0 50 100 150 metres
0 100 250 500 feet

Produced for: Bilcon of Nova Scotia Corporation

Figure 5

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

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8.0 IMPACT ASSESSMENT METHODOLOGY

The Whites Point Quarry and Marine Terminal environmental assessment/impact statement was compiled by a team of professionals. The environmental assessment process for the project began in the spring of 2002. The team represented disciplines in marine geology, geology, hydrogeology, mining engineering and operation, economics, marine geophysics, acoustical physics, terrestrial biology, freshwater and marine biology, planning, environmental design and assessment, archaeology, history, psychology, and sociology.

The impact assessment methodology involved the following process for the various physical, biological, and human environmental components.

Research studies included general literature searches, including statistical data research and community/site specific research from secondary sources. Original social research was conducted through community surveys and traditional knowledge interviews. Scientific site specific investigations were conducted in the physical, terrestrial, and aquatic environments. The intent of this research was to establish baseline conditions for the physical, biological, and human resource components.

Analysis of the research data was then performed in relation to the proposed project construction development and operational activities. Data analysis was performed using both quantitative and qualitative methods. These methods included modeling, trend analysis, and professional judgement. The intent of the analysis was to document potential positive and/or negative effects that may occur on the various environmental components as a result of project development and operational activities.

Mitigation measures were then developed to ameliorate any identified adverse effects. These measures include structural alterations and modifications to project components and alterations to operational and maintenance activities. The intent of the mitigation measures is to reduce any adverse effects to within acceptable limits and within technical and economic feasibility.

Monitoring programs were also developed on a case by case basis to determine the effectiveness of the proposed mitigation measures in relation to baseline data and regulatory requirements. The intent of the monitoring programs is to assess the actual effects of project development and operations to determine if adaptive management procedures may be warranted.

Impact statements for each valued environmental component are then prepared based on the following framework. The impact statement identifies the temporal phase of project development, magnitude of residual effect, positive, neutral, or negative, type of effect and the relative scale of effect. The intent is to summarize the temporal phase of project

development (pre-project, construction, operation, or decommissioning), the magnitude (insignificant or significant), the type (positive, neutral, or negative), and the relative scale (local, regional, provincial, or national/international) of the effect.

The impact assessment terminology is further interpreted and defined as follows.

Temporal means the project time period of development and is defined as either *short term* or *long term* in relation to the expected life of the project. More detailed definition and rationale for time periods is contained in **paragraph 8.4.2.** These terms are defined as follows.

Short term effects would occur in the pre-project phase, the construction phase and the decommissioning phase.

Long term effects would occur during the operation and maintenance over the 50 year life of the project.

Magnitude means the significance of the effect and is defined as either *insignificant* or *significant*.

Type means the effect is predicted to be *positive* (incremental to the viability of the environmental component), *neutral* (having no effect), or *negative* (detrimental to the viability of the environmental component).

Scale means the spatial influence of the predicted effect. The proposed hierarchy of scale includes *local, regional, provincial, and national/international.* These spatial definitions are to provide a relative context for the effect assessment. More detailed definition and rationale for the particular geographic area in relation to environmental components is contained in **paragraph 8.4.1.** These terms are defined as follows.

Local would include project effects on valued environmental components on the quarry and marine terminal site and adjacent surrounding land and water area.

Regional would vary depending upon the particular valued environmental component and include a regional terrestrial zone, a regional marine zone, and regional human component zones.

Provincial would include effects on valued environmental components of the province of Nova Scotia's land and waters.

National/International would include effects on valued environmental components of other Maritime provinces and New England land and waters.

8.1 Methods

Criteria

The application of environmental evaluation criteria is used throughout the EIS to predict potential project effects on valued environmental components. Establishment of baseline conditions as part of the research effort provides a sound basis for predictions. Analysis of the interaction of the project development or operational activity on the valued environmental components uses one or a combination of quantitative and qualitative criteria to assess the type of effect (positive, neutral, negative). Quantitative criteria would include standards or thresholds published in regulatory policy or guideline. Qualitative criteria would include diversity, productivity, stability and rarity/uniqueness in evaluating natural or man-made systems. Application of these criteria in an EIS usually involves professional experience and judgement. The following criteria are used to determine the type of effect.

- If the project development or activities is incremental to the viability of the environmental component, a positive effect would result (e.g., the preservation of a habitat for a species at risk, increased employment opportunities, or habitat diversification).
- If the project development or activities are within environmental regulatory regulations or guidelines established for a particular environmental component, a neutral effect would result (e.g., effluent discharges within regulatory water quality requirements of guidelines, compensation of habitat loss).
- If the project development or activities exceed regulatory regulations or guidelines established for a particular environmental component, after mitigation, a negative effect would result (e.g., effluent discharges exceeding regulatory water quality requirements of guidelines, loss of habitat without compensation, or loss of employment opportunities).

Considering the amount and quality of on-site investigations, baseline data collected, modeling and trend analysis within the region, the reliability of effect prediction is high.

All studies including scientific, engineering, and traditional knowledge are referenced in relevant sections of the EIS. These studies are included as reference documents as prepared by the team member. Any models used are identified and referenced in these documents.

Significance

The determination of whether an effect is considered *insignificant or significant* is based primarily on the level of spatial scale (local, regional, provincial, national/ international) and after mitigation measures are considered. Generally, to be considered *significant* the influence of effect would have to be greater than a regional scale – e.g., provincial or national/international in spatial scale. For example, a direct effect on a nationally

or provincially listed species at risk that would destroy core habitat would constitute a potential *significant negative effect* if this effect could not be appropriately mitigated, - whereas a direct effect on a nationally or provincially listed species at risk to preserve its habitat would constitute a potential ***significant positive effect.***

Environmental Impact Statement

A concluding impact statement including the three elements (*temporal, type, and scale)* is then made for the valued environmental component/components. An Environmental Impact Summary Table - **Table 2 -** is presented for the environmental components identified as critical to the proposed project's implementation. The Impact Summary Table is found in Chapter 9.4.

Probability

Since many of the environmental components under consideration do not have quantitative threshold criteria, guidelines, standards, or regulations, the probability of an occurrence or event happening is usually a qualitative judgment. Professional judgment using qualitative analysis is commonly used to predict a level of probability (the ratio of the chances favouring an event to the total number of chances for and against it). The following hierarchy of terminology is used in this Environmental Impact Statement to provide a relative scale for statements concerning qualitative probability.

Qualitative Terminology	Probability
Extremely unlikely (occurrence not documented)	< 1%
Highly unlikely	< 5%
Unlikely	< 25%
Possible	50%
Likely	> 75%
Very likely	> 95%
Extremely likely (occurrence documented)	> 99%

In summary, a significant positive or significant negative effect for physical and biological components must be judged to have a provincial or national/international scale of effect and a likely probability of occurence resulting in a ***likely, significant positive or negative environmental effect***. In the case of human components, a significant positive or significant negative effect must be judged to have a regional, provinical or national/ international scale of effect and a likely probability of occurence resulting in a ***likely, significant positive or negative environmental effect.***

8.2 Public Consultation

8.2.1 Requirements, Approach and Methodology

Legislative Requirements

Public awareness and participation are key principles of the Canadian Environmental Assessment Agency. "The Canadian Environmental Assessment Agency encourages public participation because protecting Canada's environment is everyone's business."(See Ref. 229) This is evident in Section 4, subsection 1(d), under the purposes of this act, where it states "to ensure that there be opportunities for timely and meaningful public participation throughout the environmental assessment process."

Public awareness and participation are also one of the 17 key requirements of the Equator Principles, October 2002.(see Ref. 230) The Equator Principles, adopted by thirty-six financial institutions in sixteen countries, are "An industry approach for financial institutions in determining, assessing and managing environmental & social risk in project financing"(See Ref. 231)

The following is a synopsis of the fundamental principles of Bilcon's public consultation program:

- Public consultation on the Project is an indispensable element of the project and the EIS process.
- Bilcon will ensure public participation (e.g. informing the public about the project and inviting the public to take part in project consultation) at all stages of the project and EIS process.
- Bilcon will give the public the opportunity to receive project and EIS information in a timely manner.
- Public comments submitted about the project will be organized, recorded and responded to and will be taken into consideration by the company during the pre-project planning process

Philosophy, Rationale, Goals and Objectives

A basic premise of all information disclosure and public consultation associated with large-scale projects is that success of a project is predicated on encouraging meaningful and effective public consultation. A key component of any successful public consultation is early planning and implementation in order to allow the public and stakeholder groups sufficient time to influence key stages of a project and its design. Bilcon entered into project discussions early on in the planning stages of the Whites Point project in order to try to reach mutually beneficial goals and objectives.

This has helped and will continue helping to:

- Improve understanding of the potential impacts of the proposed project;
- Identify solutions and mitigation measures;
- Improve environmental and social soundness;
- Clarify values and "trade-offs" associated with different alternatives;
- Identify contentious issues;
- Create accountability and a sense of local ownership during project implementation; and
- Effectively manage risks.

Results of such a project specific consultation process include:

- Fewer conflicts and delays for both Bilcon and the public in achieving their long range goals and in conducting their daily business; and
- Reduced direct, indirect and reputation risk for both Bilcon and the public.

Goals of this project's specific consultation process include:

- Identification of environmental and social opportunities and risks of all project components under consideration;

- Enhanced understanding by public agencies and NGOs regarding their interest in the proposed project;

- Greater understanding of the potential impacts of the project on the people that it may affect;

- Improved mechanisms for ensuring that appropriate mitigative measures are in place, maximum benefits are realized and appropriate compensation programs are applied when necessary;

- Assurance that efficient and effective communication practices are applied in order to minimize recycling of issues;

- Identification of additional opportunities for local employment and the supply of goods and services, by individuals and businesses to the project who might otherwise be marginalized; and

- Enhanced project implementation planning and management, particularly with respect to issues of concern to key stakeholders.

Two primary objectives of Bilcon's public consultation program are:

- To link the input of the major public constituents of this project to the EIS process by identifying project related issues of those constituents and ensuring that Bilcon effectively incorporates and responds to those issues in the EIS (See Chapter 5 Cross Reference of Issues and Where they are Found in the EIS); and

- To ensure that CEAA and Bilcon's public consultation philosophies, requirements and practices are consistently adhered to.

To achieve the first goal, public consultation (i.e. issues scoping) was initiated early on in the project's development. The EIS was then based on those identified issues as well as on other information and data requirements necessary to satisfy regulatory as well as Bilcon's own internal requirements. The EIS document clearly and satisfactorily addresses those issues. The public consultation process will continue to ensure that the public is informed of how their issues have been addressed. Thus, public consultation is the issues management "driver" that links the various components of the EIS.

To achieve the second goal, Bilcon outlines in this section of the EIS how it has met the requirements in a manner that is:

- Transparent;
- Interactive and participatory; and
- Systematic (i.e. information exchange occurs on a regular scheduled basis).

Approach

Bilcon adheres to the following basic set of public consultation principles:

- Bilcon provides consistent key messages and information to all stakeholders;

- All queries, questions and issues are responded to in an appropriate and timely manner;

- Bilcon works with all stakeholders to ensure that all viewpoints are heard in order to balance inputs from particular individuals or organizations that could be viewed as "key experts" with those of potentially affected community members; and

- A systematic public consultation process is rigorously followed based on a work plan that includes specific milestones, locations, dates, times, responsibilities, audiences, intended outcomes, and communication tools.

Key to achieving the goals of the program has been an issues-based assessment and planning process based on identifying and categorizing stakeholders and their issues. To do this Bilcon has tried to understand the stakeholders' 'interest' in the project which leads, in turn, to the identification of key issues that form the focus of on-going consultation activities with each interested party. This approach has been accomplished by prioritizing stakeholders so that effort can be managed to achieve best effect for the project.

Prioritization of stakeholders including the three levels of 'interest' is found in Table 1

Table 1 Prioritization of Stakeholders

Level	Stakeholder	Rationale
1	Decision makers	Can affect outcome of the process/project
2	Affected parties	Are directly affected by the project and need to be involved in the process to understand the nature, breadth, scope and timing of the project and possible impacts (both positive and negative) on them.
3	Third-party interests	Indirectly affected but could affect the project without sufficient knowledge of the project's nature, breadth, scope and timing and/or sufficient opportunities to provide input.

All categories include either individuals and/or agencies/organizations. Level 3 includes organizations/agencies, which in themselves are 'unaffected parties', but which may include individual members and/or subgroups.

Geographical Scope

As a general principle, the scale and effort of public consultation decreases with increasing distance from the project. Notwithstanding this principle, public consultation has been and will continue to be conducted in distinct geographic areas, each with an interest in the proposed project. These areas are:

- Digby Neck; and Islands and;
- Digby and Annapolis County communities within a 50 km radius of the project site

In addition, other pockets of interest may develop as the EIS proceeds. A communications plan will be developed for these stakeholders based on the nature, scope and level of concern regarding the issues raised.

Methodology

The basis for conducting full public consultation and disclosure is to ensure that a rigorous focus is maintained on identifying and resolving key impact issues through meaningful involvement of stakeholders. This means early and substantive involvement by Bilcon with the public and systematic methods of maintaining that involvement throughout the life of the project.

Bilcon first began this systematic identification of key stakeholders and issues in 2002. In addition, a concerted methodological effort has been placed on resolving key impact issues through early and focused discussions. The primary method used is "Public Information Sessions" in which key project personnel are available for extended time periods on a specified publicly advertised day to discuss with stakeholders issues of mutual concern and begin arriving at mutually satisfactory resolutions.

Since project planning initiation, Bilcon has made substantive communications efforts to obtain public opinion about project, input into project plans and to convey project information. In addition, the company constantly monitors its communications efforts in order that they can be improved.

8.2.2 Information Disclosure and Public Consultation Process

The following section outlines the process and philosophy for information disclosure and public consultation.

Information Disclosure

Issues Scoping

As a result of previous public consultation initiatives, special efforts have been made to include issues scoping input from, and discussions with, representatives of Indigenous peoples and the fishing industry, particularly in those regions directly affected by project activities.

During the issues scoping phase, Bilcon provided information regarding the project as it became available.

The issues scoping process was designed not only to provide project information, but also to gather input on how communications could be improved throughout the life of the project. This two way dialogue has already resulted and will continue to result in a regularly updated communications plan to address and integrate feedback.

Methods for providing this information included the Community Liaison Committee, public information session, individual interviews, media notices, workshops, website, panel displays and handouts.

EIS Participation

Information about the project will continue to be disseminated in as broad a spectrum as possible during the review process. Based on the initial issues scoping, several initiatives will be undertaken to ensure that the information reaches the appropriate target audiences. This includes a regularly updated website, open houses and appropriate newsletter articles.

Construction and Operations

Bilcon recognizes the importance of on-going community involvement and encourages employees to participate in community events and will continue to work with community organizations throughout the area. The company has provided and will continue to provide information to environmental groups, local governments, business groups and the general public throughout the life of the project.

Bilcon recognizes the need to keep its own employees aware of project developments throughout the life of the project and will institute various appropriate internal communications once the project proceeds.

8.2.3 Public Consultation

Issues Scoping

Prior to undertaking a planned public consultation process, Bilcon conducted an issues scoping exercise in order to:

- Identify issues to be addressed in the public consultation process;
- Determine their importance to the overall EIS process and, therefore, the level of effort and detail required;
- Facilitate communication regarding the EIS process itself, and
- Provide an efficient process that saves time and other resources.

More than 107 different stakeholders' consultation records have been documented and reviewed (See Appendix 34). The consultation records were produced between 2002 and 2005 as part of Bilcon's efforts to identify and address community concerns and to gather Traditional Community Ecological Knowledge (TCEK) information. Activities initiated by Bilcon include stakeholders' interviews conducted by Elgin Consulting and meeting notes from the CLC meetings (See Appendix 2).

Table 2: Past Public Consultation

Responsible for Consultation	Period of Consultation	Consultation Records
Whites Point Project Personnel through the CLC	July /02 to October /02	Meeting minutes (13 meetings organized)
Elgin Consulting and Research	September/03 to May/05	Notes from meetings with Digby and Area Board of Trade -February 13/03; Whites Cove Lobster fishermen-(November 4/03 February 11/04, March 10/04; Bear River First Nations-(January 4/05; Tourism Sector-(February 15/05 and Weymouth Falls CDS Black Community-May 12/2005
Elgin Consulting and Research	September/03 to May/05	More than 47 interviews with business and community stakeholders
Elgin Consulting and Research	September/03 to May/05	57 traditional knowledge interviews with older citizens who had knowledge of the site and local area
Elgin Consulting and Research	September/03 2003 to May/05	Open Houses-(December 15/03 and December 7 and 8/04

EIS Participation

A number of other initiatives that allow for the open and frank exchange between Bilcon and interested parties have and will continue to take place. These include an open house, an attitude survey, and a store front operation.

Stakeholders interviewed or that participated in CLC's or joint-review panel meetings were local and regional residents, owner and employees of tourism and fishing businesses as well as other businesses (retail, galleries, accommodations and restaurants), community organizations, governmental and non-governmental organizations.
In 2005, AMEC Earth & Environmental, a subcontractor of Bilcon's, conducted an Attitude Survey through an independent consulting group.

Other consultation records reviewed include the joint-panel review scoping meeting minutes, public submissions and the exit survey from the open house as part of the environmental assessment process (See Table 3).

Table 3: EIS Public Consultation

Responsible for Consultation	**Period of Consultation**	**Consultation Records**
Joint Review Panel	January/05	Scoping session minutes and presentations to Panel- Review Members (four sessions held)
AMEC Earth & Environmental	August to September/05	Interviews with stakeholders
AMEC Earth & Environmental	November/05	Public Information Session

Construction and Operations

Public consultation during construction and operations of a project is key to maintaining the already established relationship between Bilcon and the affected stakeholders. During construction and operations, many individuals and groups will experience the actual effects of the project that were discussed during the EIS. Ongoing consultation is important to:

- Keep those affected by the project informed of ongoing changes in project activities;
- Provide a forum of on-going discussion about the actual as opposed to predicted or perceived impacts;
- Manage issues and concerns as they arise; and
- Monitor the effectiveness of environmental and social mitigation and compensation.

Issues Management

The most critical element of public consultation is an effective issues management system. To support the public consultation effort, a computer based data management system has been established. This system identifies:

- Location of the meeting;
- Date, time and length of meeting;
- Type of meeting and its purpose;
- Participants;
- Meeting context;
- Category of issues discussed (e.g. environmental, socio-economic); and
- Comment made, the response by Bilcon, and follow-up required including by when and by whom.

Communications Tools

In order to conduct an effective and focused public consultation process, a variety of communication tools are required. These tools are being used throughout the entire project and EIS process and include: public information session, open houses, focus groups, information programs, meetings, printed and audio-visual materials and other. Since visual aids can be an effective means of communications, efforts have been made to convey project related information through large-scale maps and diagrams, which are available on the website at http://www.Bilconof.ns.ca/.

The following information disclosure communication tools (Table 4) have been and will be used throughout the project and EIS process.

Table 4: Information Disclosure Communication Tools

Type	Where	Audience	When	Purpose
Press Releases	Daily News Digby Courier Halifax Herald	Interested public	On going	Notification of public information session, meetings, obtain public input
Displays	Public inform-ation session, Proponent's office	Interested public	On going	Provide information
Project description meeting minutes posters, reports	Upon request and/or dissemination	Interested public	Ongoing	Provide information
Photos, maps, diagrams	Website www.bilconof.ns.ca Meetings, open houses, public information sessions	Interested public	Ongoing	Provide information
Factsheets	Digby, Digby Neck and Islands	Interested public	January/03 April/03 October/03	Provide information
Newsletters 6 issues	Digby,Digby Neck and Islands, Brighton, Barton Marshalltown, Bear River, Smiths Cove	Interested public, first 4 reached 2500 households and the last 2 reached 4000	January/03 February/03 April/03 October/03 November/04 April/05, ongoing	Provide information

The following public consultation communication methods are being used (Table 5).

Table 5: Public Consultation Communication Methods

Type	Where	Audience	When	Purpose
Interviews	Various Locations	Approx 107 Key Stakeholders	July 02 - present	Issues Scoping
Open Houses	Bilcon Office	Digby Municipal Council, Tourism Operators, Interest Groups and Communities 23 attended the 1st open house & 15 attended the 2nd	Dec 15 03 Dec 7&8 04	Exchange information obtain input
Public Information	Sandy Cove Firehall	42 Attendees - 26 signed in, 16 chose not to	Nov 1 05	Exchange information obtain input
Attitude Survey	Digby County and Annapolis County	598 Surveyed	Oct-Nov 05	Identify main concerns and measure understanding
Quality of Life Survey	Digby Neck and Islands	150 Surveyed	Oct 05	Identify main concerns and measure understanding
Exit Surveys	Public Information Session	Session Attendees - 11 completed	Nov 05	Obtain additional information

Schedule

Public consultation will occur throughout the life of the project, but many activities took place during July 2002 to December 2005. During the initial stages, the public was informed about the project and asked for their input as to issues and concerns. During the EIS process scheduled for 2006, the public will be informed about the EIS document. All public comments received up to the submission of the EIS have been incorporated into the EIS document (See Appendix 11).

8.2.4 Specific Activities

Bilcon of Nova Scotia's Office

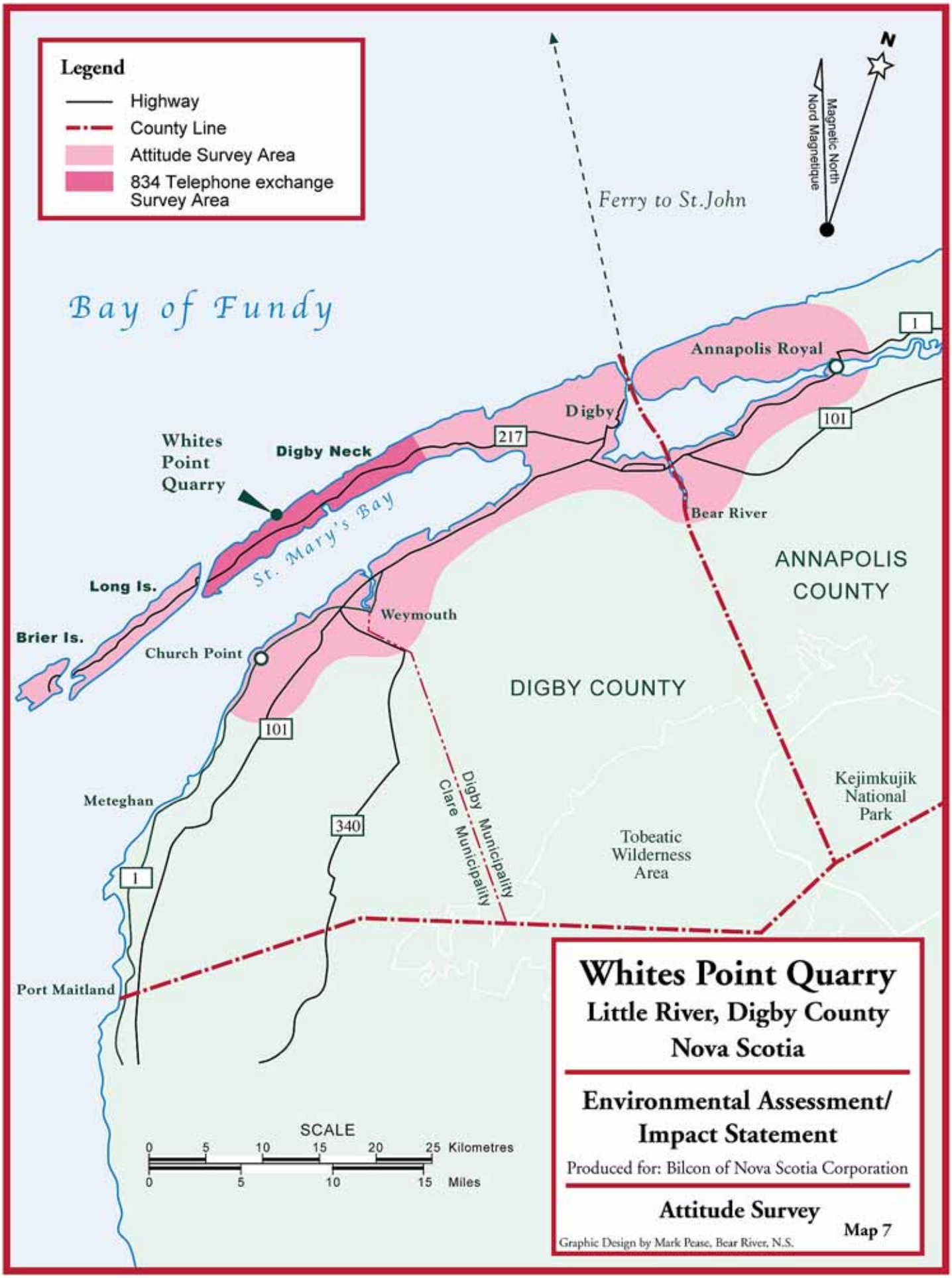
Bilcon's office is located in Digby, Nova Scotia. This office serves as a centre for project management as well as public consultation, information dissemination, and communications. Bilcon's office staff provides a focal point for consultation and communications with local municipalities, schools, businesses, NGO's, other community groups and the media.

Attitude Survey

An attitude survey was conducted to identify the main concerns of residents regarding the project and also to determine the premise for their attitudes – in other words – why they hold certain opinions about the project.

Part of this survey was conducted October 12 – October 21, 2005 with a total sample size of 546 people from Digby Neck, Town of Digby, and adjacent Annapolis County communities - see **Map 7** . The first question asked of respondents was if they were familiar with the project and, if they were not, they were dropped from continuing the survey. The remainder of the survey was completed by 405 respondents. From November 21-21 an additional 52 surveys were collected that focused on the communities of Centreville, Sandy Cove and Little River for a total sample of 457 respondents. This provides a high level of reliability: plus or minus 5.0% at 96% confidence level.

Based on the total sample of 457 respondents, the majority (77.3%) reside in the Digby area. Of the remaining 22.7% respondents, 77.1% are from Annapolis County which is adjacent to Digby County. 6.9% of respondents who do not reside in Digby County have summer homes or residences in the area. The majority of non residents **(**58.6%) visit the area more than four times per year and the duration of their visit varies.


Legend
Highway
County Line
Attitude Survey Area
834 Telephone exchange Survey Area
N
Magnetic North
Nord Magnetique
Ferry to St.John
Bay of Fundy
Annapolis Royal
1
Digby
101
217
Whites Point Quarry
Digby Neck
St. Mary's Bay
Bear River
ANNAPOLIS COUNTY
Long Is.
Brier Is.
Weymouth
Church Point
DIGBY COUNTY
101
Meteghan
340
Digby Municipality
Clare Municipality
Kejimkujik National Park
Tobeatic Wilderness Area
1
Port Maitland
SCALE
0 5 10 15 20 25 Kilometres
0 5 10 15 Miles
Whites Point Quarry
Little River, Digby County
Nova Scotia
Environmental Assessment/ Impact Statement
Produced for: Bilcon of Nova Scotia Corporation
Attitude Survey
Map 7
Graphic Design by Mark Pease, Bear River, N.S.

The asked questions related to:

- Knowledge about the project and its timing;
- Type of benefits (personal, community, island) individuals expect from such a project;
- Issues/concerns regarding the development and it's impact on the economy;
- Where information is obtained; and
- Knowledge about Bilcon.

In summary:

- General awareness of the White's Point Quarry project is exceptionally high at 96.0% and consistent across all age categories;

- Overall awareness of specific project impacts is highest in the "834" telephone exchange which includes the communities of Centreville, Sandy Cove and Little River. The incidence of "don't know" to virtually all questions in the 834 exchange is generally much lower than the total sample;

- A high percentage of people (55.4%) have received their information by "word of mouth" and from the local newspaper (55.4%), and 59.8% indicated that local newspapers were the best way to inform the local community about development projects in the Digby area;

- 64.6% of respondents know that the project developer is from the United States but 91.2% cannot identify the name of the company;

- 28.9% of respondents think the project will be good for the area generally; 40.3% think the project would not be good while a relatively high percentage, are undecided (30.9%);

- 54.7% of respondents think the jobs created by the project will be important to the area, although concerns exist that local jobs will be unskilled and that workers will be brought in from the outside;

- 43% of respondents feel that current concerns about the project can be addressed so that the project can proceed; only 26.1% of respondents do not believe that issues can be addressed and 30.9% do not know;

- 30.5% of respondents at the time of the study support the project; 48.2% do not; the remaining 21.3% are undecided;

- Belief that the project would be good for the area is highest among respondents aged 31-40 and 41-50; overall support is highest among those aged 41-50; respondents under the age of 40 are most optimistic that issues can be addressed so that the project can proceed;
- There are a broad range of expectations regarding the economic impacts of the project – number of new jobs, how long the quarry will be viable, local economic impacts– indicating that people do not have consistent and reliable information on the potential or such impacts. Overall 27.4% of total respondents and 50% of the "834" respondents indicated that there would no financial benefits for the region. The incidence of "don't know' declines from 44.2% of the total sample to 23.5% for the 834 exchange
- Concern for environmental impacts – the fishery, traditional activities, the environment, quality of life – increases with age and increases significantly among age categories 51-60, 61-70 and over 70; These respondents are also the people most likely to not support the project; and
- 39.32% of respondents feel that they have not had sufficient opportunity to participate in discussions regarding the project indicating the need to provide the community with information. The preferred way of accessing that information is through newspaper and public information sessions.

More detailed analysis of the survey can be found in Appendix 3.

Issues Scoping

For informational disclosure purposes, Bilcon consulted initially with government agencies, followed by representatives of the Indigenous peoples, stakeholder groups and the general public. Consultation mechanisms varied depending on their suitability for specific groups.

The first issues scoping initiative was conducted during 2002. Meetings were held with individuals representing various organizations, agencies or departments.

During the second issues scoping phase, Bilcon sought advice from potentially affected communities as to their preferred methods of receiving project information. At the same time, the company conveyed project information through a brief project description and by informal presentations to local groups. The initial information disclosed included, but was not limited to, the following:

- Project planning
- Project description, scheduling and location
- Public Consultation Process
- Benefits from the project

Meetings

Government Meetings

Bilcon has promoted ongoing discussions with a broad range of parties interested in the project. Meetings with CEAA, EC,HC, DFO, NSDEL, NSDNR, NRC, TC, Municipality of Digby, Government Caucus Liaison, MLA Digby Annapolis and local administrations have been an important component in addressing regulatory issues. They participated in issues scoping, open houses and workshops. More than 10 meetings have been held with the three levels of government specifically related to issues scoping and/or the EIS process.

Meetings with Indigenous Peoples

Bilcon has made a concerted effort to establish working relations with the Indigenous peoples of the area since October 2002. During this time, exchanges of information occurred among the Bear River First Nations, the Confederacy of Mainland Mi'kmaq and Bilcon, including meetings, letters, telephone calls and two information sessions. The information sessions focused on jobs and training; other meetings and correspondence centered on conducting a Mi'kmaq Knowledge Study (MKS).

In March 2005, Bilcon was informed by Mr. Michael Cox, the Director of Lands, Environment and Natural Resources, that the Confederacy was carrying out a MKS on behalf of the Bear River First Nations and that Bilcon would be provided with a copy once the study was completed. As of November 2005, Bilcon had not received a copy of this study.

As a result of the MKS study, Bilcon has not conducted any public consultation with Aboriginal First Nations on the Bear River First Nations Reserve. Please refer to Chapter **9.3.5** for additional information.

Meetings with Individuals who have an Interest in the Project

Bilcon has made an effort to invite any and all interested parties or individuals to become involved in the project. A number of individuals have done so and their concerns have been addressed in the EIS document.

Meetings with School

Bilcon has made an effort to involve participation of the local schools in the project and EIS process. On November 1st, 2005, approximately 40 students and their teachers (4) from Islands Consolidated School attended the public information session at the Sandy Cove Fire Hall.

Business Meetings

Various meetings have been held with fish processing operators (6), retail businesses (11), craft, gift or galleries (6), accommodations and restaurants (13), campground operators (2), adventure tour operators (8), Aquaculture Industry (1) and the Harbour Authorities (a number of people consulted) to describe the project and obtain local and regional business and individual input. These meetings were held from November 2003 to February 2005. See Reference Document Volume IV, Tab 21. Elgin Consulting and Research, Community and Business Consultation Report for the Whites Point Quarry and Marine Terminal).

Focus Groups

Focus groups are a good method of eliciting a variety of opinions on a particular topic in a short time frame. Focus groups with interested individuals or groups were conducted April 2004 to May 2005. The groups included the Weymouth Falls Development Association, the Bay of Fundy Discovery Centre Society, Bear River First Nations Reserve, the Digby Neck and Islands Tourism Association and the Full Bay Scallop Association. These were often informal discussions centered around various issues of interest to the group in question. Other groups were contacted but declined to participate, including the Digby Neck Community Development Association.

Open House Sessions

Publication of Notification and Open House Sessions

The dates, times and locations of the public information sessions were publicized in local newspapers and on the local radio station. A household leaflet was also delivered to each household and business in the area. (See Appendix 34) 150 households and businesses were sent invitations to attend the open houses, ads were placed in the Digby Courier and a news release notifying the public of the open house was distributed by Bilcon. In addition, posters advertising the dates, times and locations of each Community Liaison Meeting and open house were placed in Digby Neck communities at least five days prior to each open house. Finally, Bilcon staff contacted individuals personally, particularly representatives of the indigenous community, about open house sessions.

Open House Sessions/Public Information Session

Bilcon conducted open house sessions on December 15, 2003 and December 7 and 8, 2004. Bilcon also held a Public Information Session on November 1, 2005.

In total 80 people attended the open houses and public information session.

Information disclosed through the panel displays at these sessions included:

- Project background, schedule and location;
- The environmental impact process;
- Shipping routes;
- Employment;
- Fisheries; and
- Geology.

Issues of concern to the general public and specific groups varied depending on the individual/group, residence, level of interest and ability to be affected by the project. Based on the two open houses, key issues included:

- Project details;
- Fishing concerns;
- Environmental and socio-economic concerns;
- Employment and supply and service benefits;
- Unfair business competition; and
- Insufficient information about the project.

Based on the public information session, key issues included:

- Economic benefits;
- Employment;
- Environment;
- Specific concerns regarding:
- Geology, loss of wells;
- Marine environment impact;
- Fishing impacts; and
- Oil spills.

Exit Surveys

At the November 1st, 2005, public information session, a detailed exit survey was offered to each person. Of the 42 people who attended the sessions, 11 filled out exit surveys. Of those who filled out the surveys, two were from East Ferry, and one each from of Church Point, Whale Cove, Bear River, Little River, St. Joseph, Freeport, Mink Cove, Sandy Cove and Deep Brook. Below is a summary of the responses to the exit surveys. (The complete results and analysis of these surveys can be found in Appendix 3.

- Overall, of the 11 people who were surveyed, 36.36% felt neutral about the effects of construction on their family, 0% said the effects would be somewhat positive, 27.27% thought the effect would be very positive, 9.09% felt they would be somewhat negative, 27.27% wrote that they would be very negative, and 0% gave no response.

- In terms of effects on the community, 0% felt that effects would be somewhat positive, 18.18% said they would be very positive, 36.36% felt neutral, 0% wrote the effects would be somewhat negative, 27.27% felt that they would be very negative, and 18.18% gave no response.
- With respect to the area, 18.18% felt that effects would be very positive, 18.18% thought they would be somewhat positive, 9.09% felt neutral, 0% wrote the effects would be somewhat negative, 36.36% said that they would be very negative, and 18.18% gave no response.
- Additionally, 20% felt that effects of construction on the environment would be somewhat negative, 30% said very negative, 10% were neutral, 10% thought the effects would be somewhat positive, 10% said they would be very positive, and 20% gave no response.
- Finally, 18.18% felt that impacts of the construction phase on the economy would be very positive, 27.27% felt somewhat positive, 0% were neutral, 27.27% felt that impacts would be very negative, 0% felt somewhat negative, and 27.27% gave no response.
- Overall, from the 11 people who were surveyed, 36.36% felt neutral about the impacts that operations would have on their family, 18.18% said operations would affect their family very positively, 18.18% felt it would be somewhat positive, 0% said it would be somewhat negative, 27.27% wrote they would be very negative, and 0% gave no response.
- In terms of effects on the community, 0% felt that impacts would be somewhat positive, 18.18% thought they would be very positive, 36.36% felt neutral, 9.09% said impacts would be somewhat negative, 27.27% wrote very negative, and 9.09% gave no response.
- Additionally, 18.18% felt that impacts would be very positive for their area, 9.09% said somewhat positive, 9.09% were neutral, 18.18% felt that impacts would be somewhat negative, 27.27% thought they would be very negative, and 18.18% gave no response.
- With respect to the environment, 18.18% felt that affects of operations would be somewhat negative, 27.27% said very negative, 18.18% were neutral, 18.18% thought the affects would be somewhat positive, 9.09% said they would be very positive, and 9.09% gave no response.
- Finally, 27.27% felt that impacts of operations on the economy would be very positive, 36.36% felt somewhat positive, 0% were neutral, 27.27% felt that impacts would be very negative, 0% felt somewhat negative, and 9.09% gave no response.

- In terms of benefits from the project, of the 11 people who were surveyed, 45.45% ranked jobs and employment as most important, 18.18% said increased foreign investment and business opportunities were most important, 18.18% ranked increased revenue as most important, and 18.18% ranked other things as most important.

- Regarding issues associated with the project, of the 11 people who were surveyed, 40% said that environmental issues were most important, 8.33% ranked negative impact on quality of life as their most important concern, 30% said that issues concerning negative impacts on the fisheries was most important, 14.28% ranked issues concerning negative impacts on the fisheries as most important and 16.67% said that other issues were most important for them.

Community Involvement

Bilcon recognizes the importance of community involvement. Its staff has participated in numerous community events and will continue to work with community organizations throughout the area in the future.

Bilcon has provided information and presentations to schools, environmental groups, local administrations, business groups and the general public. The company has supported a number of health, culture, education, social and recreation initiatives throughout the area including funding contributions to the Calvary Church, Christmas Daddies, Digby and Area Hospice Society, Digby Area Learning Association, Digby County Exhibition, Learning Grove Centre, Digby Minor Hockey, Digby Regional High School/Islands Consolidated School, Digby Scouts, Royal Canadian Legion - Clementsport, Royal Canadian Legion - Digby, Weymouth and Digby Cancer Society, to name a few.

8.2.5 Results

The following is a summary of results to date.

Stakeholders Identified, Relationships Established, Issues Management System Established

An intensive and systematic identification of stakeholders has taken place and been documented. Using the issues management system, at any time, a stakeholder, issue, response and follow-up can be identified. This system will be continued throughout the life of the project. Every effort will be made to identify stakeholders and respond to their information requests and concerns in a timely and effective manner.

Key Issues Identified and Included in the Project Planning Process

As a result of an extensive, broad and systematic issues identification process, Bilcon has identified the key issues associated with this project, understands the relative

importance of each issue and has incorporated mitigation measures, where required. Examples of this include, but are not limited to, damage to wells, marine wildlife protection guidelines, shipping routes, impact on tourism, and the employment process. All are examples of major issues raised through public consultation process, addressed in the EIS and now incorporated into Bilcon's planning process.

Interactive and Participatory Information Disclosure and Public Consultation Process

Bilcon has established a precedent and procedures for regular meetings with groups and individuals to provide requested project information, where known, and to solicit input into the project at the design stage. Information disclosure will continue through out the life of the project and public consultation will occur for those activities that directly affect the public (e.g. fishing/tourism related activities; etc.).

The Result is an EIS that is Better Informed and Facilitated

The result of this process is a better-informed public, an effective EIS and a project that meets the needs and expectations of both the public and Bilcon.

8.2.6 Future Plans

Bilcon will continue to follow its information disclosure and public consultation plan and will adhere to the philosophies and principles established in **paragraph 8.2.1**
In the long-term, tools to facilitate on-going discussion between those affected by the project and Bilcon will be established and will include:

- Continuation of the issues management system;
- Community forums for the provision of on going information exchange; and
- A stewardship process for community grants.

8.3 Selection of the Valued Environmental Components

A valued environmental component (VEC) is a resource or environmental feature that is important (not only economically) to a local human population, or has a national or international profile, or if altered from its existing status will be important for the evaluation of environmental impacts of industrial developments.

Furthermore, within the Nova Scotia Environmental Assessment Regulations, Valued Environmental Components are interpreted as being environmental, socio-economic, human health, reasonable enjoyment of life and property, cultural, historical, archaeological, paleontological and architectural features that may be impacted, whether positive or negative, inside or outside the Province, by the proposed undertaking. (Ref.77 Guide to Preparing an EA Registration Document for Pit and Quarry Developments in Nova Scotia. December 2002).

Furthermore, within the Environmental Impact Statement Guidelines for the Review of the Whites Point Quarry and Marine Terminal Project, March 2005. Valued Environmental Components are defined as "selected components of the physical, biological, and human environments which will be the focus of the environmental assessments".

Valued environmental components were identified by Bilcon of Nova Scotia Corporation through public consultation, coordination with Federal and Provincial government agencies, and those identified within the Draft Review Panel Guidelines and Public Registry comments, Review Panel Scoping sessions, Final Review Panel Guidelines, the Public Registry, and Traditional Knowledge.

Also, as indicated in the Environmental Impact Statement Guidelines paragraph 9.2.1 "Species at Risk", species designated by SARA and COSEWIC as endangered, threatened, rare, extirpated, or of special concern are considered as VECs. In this regard, these designated species including mammals, birds, reptiles, amphibians, fish, mollusks, butterflies, plants, lichens, and mosses that may possibly occur on or adjacent to the Whites Point Quarry and Marine Terminal site are treated as VECs.

These Valued Environmental Components have been scientifically investigated by a team of qualified professionals – see Appendix 1 . Most components have undergone specific on-site scientific investigations while others have relied on comprehensive literature research and comparable scientific studies to determine and predict the probability of likely significant adverse effects. Considering the level of scientific effort involved, especially on-site and regional investigations, the confidence limits of the data presented in the Whites Point Quarry and Marine Terminal Environmental Assessment/Environmental Impact Statement, are considered high. Conclusions are accurate in relation to the level of scientific investigation in time and space.

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8.4 Boundaries

The spatial and temporal boundaries vary according to the environmental component systems being investigated. Time frames for effect assessment of project development and operation activities on valued environmental components have been previously established in paragraph 8.0. Time frames to adequately address historic trends will be set forth in **paragraph 8.4.2.** Realistic time frames are proposed and are based on availability of reliable data for meaningful applications. The gathering of traditional community knowledge through interviews provided insight for the past 75 years. Other component time frames have been researched back to early settlement of the quarry property. Geologic time frames are also applicable to certain physical components.

Spatial boundaries for different valued environmental components will be set forth in **paragraph 8.4.1**. Rationale for selection of the spatial boundaries are based on potential effects of project development and operational activities in relation to component systems. Realistic spatial boundaries are proposed based on reliable data and meaningful applications. Some socio-economic data is reliable at the community level through the national level. Other data such as geological or hydrogeological data may be only relevant at the project site or at a local level. In this regard, Bilcon of Nova Scotia Corporation intends to adhere to the statement in the Guidelines "Bilcon is not required to provide a comprehensive physical and socio-economic baseline description of the environment at every scale, but must provide sufficient detail to address the relevant environmental effects of the Project".

8.4.1 Spatial Boundaries

As mentioned previously, spatial boundaries will vary according to the environmental component systems being investigated. Three general component categories (terrestrial, marine, and socio-economic) are proposed. The terrestrial and aquatic system boundaries are ecosystem based, while the socio-economic boundaries are generally defined by political boundaries. There is no clear "line" defining these systems and interactions between systems are common. The intent is to place the various component systems (terrestrial, aquatic, and socio-economic) into a hierarchy of local, regional, provincial and national/international context to facilitate environmental decision making. This hierarchy and spatial boundaries are described below.

Local

Local spatial boundaries are defined as the project site and adjacent land and water area. This definition is based on the area of most direct effect from proposed development and operational activities of the quarry and marine terminal. More specifically, this "local area" would include the 380 acre quarry site and the 10 acre water lot proposed for the marine terminal. This local area would include properties adjacent to the property line, the adjacent marine intertidal zone, and nearshore waters adjacent to the marine terminal.

Regional

Regional spatial boundaries are defined differently for the three major environmental component systems. These areas are defined using ecological boundaries for the terrestrial and marine system components and political boundaries for the socio-economic system components. The regional area would be subject to potential indirect effects from the proposed development and operational activities of the quarry and marine terminal.

Terrestrial – regional boundaries are generally defined as Theme Region 810 – Basalt Peninsula (Natural History of Nova Scotia, Volume II). The Basalt Peninsula is a westerly extension of the North Mountain Basalt Ridge and includes the land area of Digby Neck and Islands from Gullivers Cove on Digby Neck to Brier Island.

Marine – regional boundaries are generally defined as a section of the outer Bay of Fundy. The outer Bay of Fundy is defined as Theme Region 912 – Outer Bay of Fundy (Natural History of Nova Scotia, Volume II). This would include the nearshore waters within a line running roughly from Digby, Nova Scotia to Saint John, New Brunswick which arbitrarily separates the outer Bay of Fundy from the inner Bay of Fundy; to the inbound shipping lane; and within a line running roughly from Grand Manan Island, New Brunswick to Brier Island, Nova Scotia. This line arbitrarily separates the Bay of Fundy from the Gulf of Maine.

Socio-economic – regional boundaries are more variable and based on both social/ human ecological boundaries (community definition) and political statistical boundaries. Some regional socio-economic spatial boundaries vary according to individual components and include the community (Digby Neck, and Digby Neck and Islands), the county (Digby County), and other regionally based entities such as Health Regions, Health Authorities, and School Boards.

Provincial

Provincial spatial boundaries are defined for component systems as being within Nova Scotia's designated land and water areas for terrestrial, marine and socio-economic components.

National/International

National/International spatial boundaries are defined for component systems as being within the Maritime provinces and New England's designated land and water areas.

8.4.2 Temporal Boundaries

Two different sets of time frames are applicable to the Whites Point quarry and Marine Terminal – historic time frames/boundaries applicable to establishing trends for environmental components and project time frames to assess potential effects of project development and operational activities on valued environmental components.

Historic time frames/boundaries are developed for environmental components as a basis for trend analysis and point in time baseline conditions. These time frames vary by component and according to available data, reliability of the data, and meaningful application of the data during effect analyses. Statistical socio-economic data usually provides comparable data in time and scale for reliable trend analysis. Natural resource data often contains gaps, in many cases is not gathered using standard methodologies, and for some components, the data currently available is very limited.

Project time frames/boundaries or phases are generally considered as pre-project planning, assessment of existing environments, and project design; project construction; project operation and maintenance; and decommissioning and final reclamation. Pre-project planning, environmental assessment and design is normally a three year time period, construction a one year time period, operation and maintenance a fifty year time period and decommissioning and final reclamation a one year time period.

Any cumulative environmental effects resulting from the development of the quarry and marine terminal and operational activities will be presented in **Chapter 10.**

8.5 Application of the Precautionary Principle

As previously discussed in paragraph 3.5 “The Precautionary Approach”, application of the precautionary principle has been incorporated into various project development phases. Bilcon of Nova Scotia Corporation recognizes that any activity affecting physical, biological, or human elements is not without some level of uncertainty or has some level of environmental risk. An important initial measure is to define a starting point on which environmental risk assessment can be based. Throughout this assessment, site or community specific baseline data has been gathered to document existing environmental conditions. Many environmental components have involved extensive scientific research to establish a reliable baseline for environmental decision making, prediction of possible adverse or irreversible environmental effects, and as a basis for monitoring long term effects.

The precautionary principle has been applied throughout the project phases. Some examples follow, others are contained in specific environmental component sections of the EIS. In many cases, reduction of environmental risk by application of the precautionary principle increases the overall cost of project development. In other cases, integrating environmental planning and design concepts as part of project development can reduce risks without increased costs.

8.5.1 Planning and Design

- Location of the quarry so that it is not visible from Highway #217
- Location of the marine terminal in deep water so that dredging or underwater blasting is not required
- Design of the marine terminal on pipe pilings, rather than dredging or filling, to reduce marine habitat impact
- Design of enclosed crushers to reduce noise and dust emissions
- Establishment of a Community Liaison Committee to ensure public input during project planning
- Project baseline data acquisition for physical, chemical, and biological elements
- Design of sediment retention ponds to control sediment runoff from disturbed land areas and provide storage for surface water for aggregate washing

8.5.2 Construction

- Establishment of an environmental preservation zone around the perimeter of the quarry property and expanded buffer areas around sensitive areas
- Placement of environmental control structures before construction begins
- Continuing input from the community liaison committee during the construction phase
- Environmental monitoring during construction activities to provide an early warning of potential adverse effects and to take appropriate adaptive management actions, for example, monitoring under water noise during periods that marine mammals may be present and monitoring of quality of water entering the marine environment
- Establishment of expanded buffer zones during times species at risk may be present, for example, a blasting separation zone three times that required by existing guidelines during times the inner Bay of Fundy salmon may migrate past the Whites Point site

8.5.3 Operation and Maintenance

- Using surface water for aggregate washing rather than ground water supplies.
- Incremental reclamation for erosion control and re-establishment of terrestrial habitat.
- Environmental monitoring on land and in the marine environment during quarry operation to provide an early warning of potential adverse effects and to take appropriate adaptive management actions; for example, monitoring in the marine nearshore to detect the presence or absence of invasive species.
- Continuing input from the Community Liaison Committee during the operation and maintenance phase.
- Reduction of noise by absorption using rubberized screens and truck body liners.

8.5.4 Reclamation and Decommissioning

- Leaving in place constructed wetlands and sediment retention ponds after quarry decommissioning for sediment control and wetland habitat.

- Leaving in place the marine construction on pipe pilings so demolition by underwater blasting does not take place.

- Leaving in place infrastructure such as roads, electrical services, domestic water wells, and navigational lighting for future generations.

Preproject baseline data acquisition and monitoring is an important aspect of the application of the precautionary principle over space and time. Baseline data provides the basis, and monitoring over time provides an early detection of possible irreversible consequences thus providing opportunity to enact adaptive management actions. Bilcon of Nova Scotia Corporation is currently, and will continue to be committed to working with regulatory agencies to develop adaptive management procedures, on a case by case basis, as new scientific data becomes available. It should be recognized that many environmental components presently do not have performance standards or defined acceptable ranges of environmental tolerance or resiliency. Bilcon intends to work cooperatively, by sharing monitoring data with regulatory agencies in the development of environmental threshold criteria, especially in regard to blasting activities in relation to species at risk.