

**ENVIRONMENTAL IMPACT STATEMENT GUIDELINES
FOR THE REVIEW OF THE
WHITES POINT QUARRY AND MARINE TERMINAL
PROJECT
MARCH 2005**

TABLE OF CONTENTS

PART I: CONTEXT OF THE REVIEW	5
1. ENVIRONMENTAL ASSESSMENT OF THE PROJECT.....	5
1.1 BACKGROUND	5
1.2 THE JOINT REVIEW PANEL MANDATE.....	5
2. THE REVIEW PROCESS.....	6
2.1 SCOPE OF THE PROJECT.....	6
2.2 SCOPE OF THE ASSESSMENT.....	6
2.3 ENVIRONMENTAL IMPACT STATEMENT	6
2.4 PURPOSE OF THE EIS GUIDELINES	7
2.5 TIMING	7
3. PRINCIPLES	8
3.1 USE AND RESPECT FOR TRADITIONAL AND COMMUNITY ENVIRONMENTAL KNOWLEDGE	8
3.2 PUBLIC INVOLVEMENT	9
3.3 SUSTAINABLE DEVELOPMENT	10
3.4 THE ECOSYSTEM APPROACH	11
3.5 THE PRECAUTIONARY APPROACH.....	12
4. GUIDANCE ON THE PREPARATION OF THE EIS.....	13
4.1 USE OF EXISTING INFORMATION	13
4.2 EIS FORMAT	13
4.3 EXPECTATIONS.....	14
PART II: DESCRIPTION OF THE ENVIRONMENTAL IMPACT STATEMENT	15
5. EXECUTIVE SUMMARY.....	15
6. INTRODUCTION TO THE EIS.....	15
6.1 THE PROPONENT.....	15
6.2 PROJECT OVERVIEW AND PURPOSE	16
6.3 THE PROJECT SETTING.....	16
6.4 THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS AND APPROVALS.....	16
6.5 REGULATORY ENVIRONMENT	16
6.6 INTERNATIONAL AGREEMENTS.....	16
6.7 STUDY STRATEGY AND METHODOLOGY	17
7. PROJECT DESCRIPTION	17
7.1 NEED FOR, PURPOSE OF, AND ALTERNATIVES TO THE PROJECT.....	17
7.2 ALTERNATIVE MEANS OF CARRYING OUT THE PROJECT.....	17
7.3 THE PROJECT.....	18
7.4 LAND REQUIREMENTS.....	19
7.5 SCHEDULE AND BOUNDARIES	19
7.6 COST AND WORKFORCE.....	19
7.7 CONSTRUCTION PHASE.....	19
7.8 OPERATION AND MAINTENANCE PHASE.....	20
7.9 MODIFICATION	21
7.10 DECOMMISSIONING AND RECLAMATION PHASE.....	21
8. IMPACT ASSESSMENT METHODOLOGY.....	21

8.1 METHODS.....	22
8.2 PUBLIC PARTICIPATION	22
8.3 SELECTION OF VALUED ENVIRONMENTAL COMPONENTS.....	23
8.4 BOUNDARIES	23
8.4.1 <i>Spatial Boundaries</i>	24
8.4.2 <i>Temporal Boundaries</i>	24
8.5 APPLICATION OF THE PRECAUTIONARY PRINCIPLE	24
9. DESCRIPTION OF EXISTING ENVIRONMENTS	25
9.1 EXISTING PHYSICAL ENVIRONMENT	26
9.1.1 <i>Terrain, Geology, and Soils</i>	26
9.1.2 <i>Physical Oceanography</i>	26
9.1.2.1 Marine Sediment Quality and Quantity	26
9.1.2.2 Ocean Currents and Tides.....	27
9.1.2.3 Water Quality	27
9.1.3 <i>Terrestrial Water Quality and Quantity</i>	27
9.1.3.1 Surface Water.....	27
9.1.3.2 Groundwater	28
9.1.3.3 Wetlands.....	28
9.1.4 <i>Climate</i>	29
9.1.5 <i>Air Quality</i>	29
9.1.6 <i>Noise and Vibration</i>	30
9.1.7 <i>Light</i>	30
9.2 EXISTING BIOLOGICAL ENVIRONMENT	30
9.2.1 <i>Species at Risk</i>	30
9.2.2 <i>Fish, Invertebrates and Habitat</i>	31
9.2.3 <i>Birds and Bird Habitat</i>	32
9.2.4 <i>Wildlife and Wildlife Habitat</i>	32
9.2.5 <i>Marine Mammals</i>	33
9.2.6 <i>Vegetation</i>	33
9.3 EXISTING HUMAN ENVIRONMENT	33
9.3.1 <i>Community Profile</i>	33
9.3.2 <i>Demographics</i>	34
9.3.3 <i>Economy</i>	34
9.3.3.1 Fisheries and Harvesting	34
9.3.3.2 Tourism and Recreation	35
9.3.4 <i>Education, Training and Skills</i>	35
9.3.5 <i>Land Use and Value</i>	35
9.3.5.1 Aboriginal Land and Resource Use	36
9.3.6 <i>Heritage Resources</i>	36
9.3.7 <i>Human Health and Community Wellness</i>	36
9.3.8 <i>Socio-Cultural Patterns</i>	36
9.3.9 <i>Infrastructure and Institutional Capacity</i>	36
9.3.10 <i>Transportation</i>	37
9.3.10.1 Land Based.....	37
9.3.10.2 Marine Based.....	37
9.3.11 <i>Other Undertakings in the Area</i>	37
10. ENVIRONMENT IMPACT ANALYSIS.....	37
10.1 PHYSICAL ENVIRONMENT IMPACT ANALYSIS.....	38
10.1.1 <i>Terrain, Geology, and Soils</i>	38
10.1.2 <i>Physical Oceanography</i>	39
10.1.2.1 Marine Sediment Quality and Quantity	39
10.1.2.2 Ocean Currents and Tides.....	39
10.1.2.3 Water Quality	39
10.1.3 <i>Terrestrial Water Quality and Quantity</i>	40
10.1.3.1 Surface Water.....	40

10.1.3.2 Ground Water	40
10.1.3.3 Wetlands	41
10.1.4 Climate	41
10.1.5 Air Quality	41
10.1.6 Noise and Vibration.....	42
10.1.7 Light.....	42
10.2. BIOLOGICAL ENVIRONMENT IMPACT ANALYSIS.....	42
10.2.1 Species at Risk	42
10.2.2 Fish, Invertebrates and Habitat.....	43
10.2.3 Birds and Bird Habitat.....	43
10.2.4 Wildlife and Wildlife Habitat	44
10.2.5 Marine Mammals	44
10.2.6 Vegetation.....	44
10.2.7 Biodiversity.....	45
10.3. HUMAN ENVIRONMENT IMPACT ANALYSIS	45
10.3.1 Community Profile.....	45
10.3.2 Demographics and Mobility	45
10.3.3 Economy	45
10.3.3.1 Fishing and Harvesting	46
10.3.3.2 Tourism and Recreation	47
10.3.4 Education, Training and Skills	47
10.3.5 Land Use and Value	47
10.3.5.1 Aboriginal Land and Resource Use	48
10.3.6 Heritage Resources.....	48
10.3.7 Human Health and Community Wellness.....	48
10.3.8 Social and Cultural Patterns	49
10.3.9 Infrastructure and Institutional Capacity	49
10.3.10 Transportation.....	49
10.3.10.1 Land Based.....	49
10.3.10.2 Marine Based.....	49
10.3.11 Other Undertakings in the Area	50
10.4 SUMMARY TABLE OF IMPACTS	50
11. CUMULATIVE IMPACTS	50
12. ENVIRONMENTAL MANAGEMENT.....	51
12.1 MANAGEMENT CRITERIA	52
12.2 ACCIDENTS AND MALFUNCTIONS	53
12.3 ENVIRONMENTAL PROTECTION	53
12.4 MONITORING	54
12.5 MITIGATION MEASURES.....	55
12.6 FOLLOW-UP PROGRAM.....	57
12.7 RESIDUAL IMPACTS.....	57
12.8 COMPENSATION.....	58
13. EIS ATTACHMENTS.....	58
APPENDIX 1: JOINT PANEL AGREEMENT	60
APPENDIX 2: GLOSSARY AND ACRONYMS.....	70
APPENDIX 3: GUIDANCE MATERIALS.....	74
APPENDIX 4: PROJECT MAP.....	75

PART I: CONTEXT OF THE REVIEW

1. ENVIRONMENTAL ASSESSMENT OF THE PROJECT

1.1 Background

A Joint Review Panel (the Panel) has been established by the Minister of the Environment, Canada (under the authority of the *Canadian Environmental Assessment Act*), and by the Minister of Environment and Labour, Nova Scotia (under the authority of the *Nova Scotia Environment Act*), to consider the possible environmental effects associated with the Whites Point Quarry and Marine Terminal Project (the Project), proposed by Bilcon of Nova Scotia, Corporation (the Proponent).

The Proponent is proposing to construct and operate a basalt quarry, processing facility and marine terminal on Digby Neck, Digby County, Nova Scotia, where quarrying and associated activities are scheduled to take place on 150 hectares of land. Production is expected to reach 2 million tonnes of aggregate per year, or approximately 40,000 tonnes per week. The quarry is expected to expand its operational footprint by four hectares each year of operation. Land-based operations are expected to occur year-round, with aggregate stockpiled for ship loading once each week. Drilling and blasting of basalt rock, loading, hauling, crushing, screening, washing and stockpiling will be done on-site.

Land-based structures will include rock crushers, screens, closed-circuit wash facilities, conveyors, load-out tunnel, support structures and environmental control structures. Associated construction processes will include erection of on-land aggregate processing equipment, conveyors and wash-water pumping systems.

Marine facilities will include a conveyor, ship loader, berthing dolphins and mooring buoys. Construction processes for the marine terminal infrastructure would include the anchoring of pile support structures to the seafloor, along with the construction of concrete caps as dolphins. Ship visits for the purposes of loading aggregate will occur weekly.

1.2 The Joint Review Panel Mandate

The Panel has been charged with the responsibility to identify, evaluate and report on the potential impacts (adverse and beneficial effects) of the Project on the physical, biological and human environments. The mandate of the Panel is defined in the Agreement signed by Federal and Provincial levels of government (see Appendix 1). The Agreement explicitly states, “The Panel shall conduct its review in a manner that discharges the requirements set out in the *Canadian Environmental Assessment Act*, Part IV of the *Nova Scotia Environment Act* and the Terms of Reference attached hereto as an Appendix.”

The Agreement and Terms of Reference (TOR) found in Appendix 1 of this document outlines the factors the Panel must consider in conducting its environmental assessment. The Panel has considered these factors in developing the EIS Guidelines. It is the responsibility of the Proponent to prepare an EIS that identifies and evaluates the effects of the Project for submission to the Panel.

All materials related to the Project received by the Panel and federal and provincial departments will be made publicly accessible through a Public Registry available online and in designated sites in the community.

At the conclusion of the public hearings on the Project, the Panel will prepare a Report that will include its findings and recommendations, and will submit the report to the Ministers.

2. THE REVIEW PROCESS

2.1 Scope of the Project

The scope of the Project is described in Part I of the Panel's TOR (Appendix 1).

2.2 Scope of the Assessment

The factors that define the scope of the environmental impact assessment review are described in general terms in Part III of the Panel's TOR.

2.3 Environmental Impact Statement

Environmental impact assessment is a planning tool intended to identify and mitigate significant adverse environmental effects induced by projects.

The definition of environmental effect forms the basis for the assessment and includes consideration of physical, biological and human elements and the interactions between them. In understanding impacts, the Panel is guided by federal and provincial legislation and definitions of environmental effects and adverse effects; in the case of different standards in the legislation, the higher standard will prevail.

The *Canadian Environmental Assessment Act* (1992) defines "environmental effect" to mean: any change that the Project may cause in the environment, including any change it may cause to a listed wildlife species, its critical habitat or the residence of individuals of that species, as those terms are defined in subsection 2(1) of the *Species at Risk Act*, any effect of any change referred to in

paragraph (a) on health and socio-economic conditions, physical and cultural heritage, the current use of lands and resources for traditional purposes by Aboriginal persons, any structure, site or thing that is of historical, archaeological, paleontological or architectural significance, or any change to the Project that may be caused by the environment, whether any such change or effect occurs within or outside Canada.

In addition, the Panel is mandated to consider the direct socio-economic effects of the Project.

The Nova Scotia *Environment Act* defines “adverse effect” to mean “an effect that impairs or damages the environment, including an adverse effect respecting the health of humans or the reasonable enjoyment of life or property”.

The Environmental Impact Statement (EIS) document produced by the Proponent will identify the effects (both beneficial and adverse) of the Project on the environment. The EIS will serve as the cornerstone of the Panel’s review and evaluation of the potential impacts of the Project. The public (including Aboriginal peoples), interested parties and government representatives will be invited to comment on the completeness and accuracy of the EIS, and to submit materials for the Panel to consider. Should the Panel deem further information necessary, it may arrange for additional studies which it will include in the Public Registry. The Panel will consider all materials included in the Registry in evaluating the Project.

The EIS will help regulators and members of the public to understand the Project, the existing environment, and the potential adverse or beneficial effects of the Project.

2.4 Purpose of the EIS Guidelines

This document provides specific direction to the Proponent regarding the preparation and structure of the EIS. The EIS Guidelines define the issues that the Proponent must address. It is the responsibility of the Proponent to provide sufficient data and analysis on any potential adverse environmental effects to permit proper evaluation by the Panel, the public, and technical and regulatory agencies. The Guidelines outline the minimum information required by the Panel while leaving the Proponent some latitude in selecting methods to compile the EIS.

2.5 Timing

The Proponent will prepare and submit the EIS to the Panel. The Panel will make the EIS available to the public and other stakeholders for examination and comments regarding the document’s completeness, accuracy, and compliance with the guidelines. The Panel will receive written comments during a review

period of not less than 90 days. Comments submitted in writing to the Panel will immediately be provided to the Proponent and added to the Registry. Following the examination period, the Panel may determine that deficiencies identified during the review of the submitted EIS require additional information from the Proponent. The Panel will issue requests for additional information within fifteen (15) days of either the expiration of the public examination period or receipt of the Proponent's response to the public's written comments, whichever occurs later.

As appropriate, not later than fifteen (15) days after the completion of the public examination period, the Proponent shall provide to the Panel a response to written comments provided by the public and other stakeholders.

Following the Proponent's response, should the Panel believe that deficiencies remain in the EIS, or that the Panel requires additional information for a proper evaluation of evidence, the Panel has the authority to commission expert studies. Any such studies will be provided to the Proponent and added to the Registry.

Once the Panel is satisfied that sufficient information has been provided it will hold public hearings. The Panel will set hearing dates after considering the volume of material accumulated for public review and the right of the Proponent to a timely hearing. In any event, the Panel will give not less than thirty (30) days notice of the hearings.

Within ninety (90) days of completion of public hearings, the Panel will prepare and submit its report to the provincial Minister of Environment and Labour and the federal Minister of the Environment. The report will include recommendations on all factors set out in section 16 of the *Canadian Environmental Assessment Act* and, pursuant to Part IV of the *Nova Scotia Environment Act*. At that time, the Panel will recommend either approval (including mitigation measures) or rejection of the Project.

3. PRINCIPLES

In conducting its review of the Project, and in framing its expectations for the EIS, the Panel is guided by the following principles.

3.1 Use and Respect for Traditional and Community Environmental Knowledge

Aboriginal peoples, people of Acadian, African-Canadian and Loyalist descent, and existing communities of the region have substantial and unique knowledge about the local environment, how it functions, and the ecological relationships that characterize it. This traditional and community environmental knowledge,

hereafter referred to as traditional knowledge, makes an important contribution to project planning and the assessment process.

Traditional knowledge refers to the broad base of knowledge held by individuals and collectively by communities that may be based on spiritual teachings, personal observation and experience on land and sea or passed on from one generation to another through oral and/or written traditions. This tradition is a dynamic, substantive, and distinct living knowledge.

Traditional knowledge, in combination with other information sources (such as scientific and engineering knowledge), is valuable to those seeking a better understanding of potential impacts of projects. Traditional knowledge may, for example, contribute to the description of the existing physical, biological and human environments, natural cycles, resource distribution and abundance, long and short-term trends, and the use of lands, the ocean, and resources. It may also contribute to Project siting and design, identification of issues, the evaluation of potential impacts and their significance, understanding of the effectiveness of proposed mitigation measures, understanding of potential cumulative impacts and the consideration of follow-up and monitoring programs.

Certain issues (such as harvesting of the land and sea, cultural well-being, land and ocean use, heritage resources) relevant to the review process are firmly grounded in traditional knowledge. Although traditional and science-based knowledge have different bases, both can, independently or collectively, contribute to the understanding of issues.

The Panel will promote and facilitate the contribution of traditional knowledge to the environmental impact review process. This information shall be obtained and presented in one of two ways.

- The Proponent will make best efforts, with the co-operation of other parties, to incorporate into its EIS traditional knowledge to which it has access or which it may reasonably be expected to acquire through appropriate diligence, in keeping with appropriate ethical standards and without breaching obligations of confidentiality; and,
- Alternatively, the Proponent may facilitate the presentation of such knowledge by persons and parties having access to this information to the Panel during the course of the review.

3.2 Public Involvement

Public participation is a central objective of the overall review process and a means by which the concerns and interests of the public are taken into account. In particular, these guidelines require the Proponent to demonstrate an understanding of traditional uses, interests, values and concerns, and to recognize and respect them in preparing the EIS.

The Panel process will be conducted in a manner that promotes public participation. The Panel held Scoping Sessions (for feedback on draft guidelines), and will provide opportunities for the public to comment on the adequacy and content of the EIS and to provide information with respect to potential impacts of the Project.

Within the EIS the Proponent will demonstrate the nature and degree of consultation with residents, Aboriginal people, organizations and other stakeholders who are likely to be affected by the Project. The EIS will describe objectives, methods and results achieved in these consultations. Provide a summary table (referred to as a concordance table) as a means of showing how the public's concerns have been addressed.

Meaningful public participation in the environmental assessment depends on a clear and early understanding of the proposed Project and a readiness to engage the community in the process. Therefore, the EIS must detail how the Proponent has: a) continually and promptly provided Project information to the public, especially to communities potentially most affected; b) expediently updated this information to reflect any changes; and c) explained the environmental assessment process and results in a clear and direct manner to make all issues comprehensible to as broad an audience as possible.

3.3 Sustainable Development

Promotion of sustainable development is a fundamental purpose of environmental assessment and provides an effective means of integrating environmental, socio-economic and cultural factors into decision-making. The environmental assessment process allows the Panel to consider the Project's contribution towards achieving sustainability.

The CEAA defines sustainable development as development that meets the needs of the present without compromising the ability of future generations to meet their own needs. The guiding goals to be considered are protecting the environment from significant adverse impacts of proposed developments; and protecting the social, cultural and economic well-being of residents, Aboriginal people and communities.

The factors that the Panel will take into consideration which are directly pertinent to the task of assuring sustainability and that provide measures of sustainable development include:

- the extent to which the Project affects biological diversity;
- the capacity of renewable resources that are likely to be significantly affected by the Project to meet the needs of present and future generations;

- the preservation of ecosystem integrity, including the capability of natural systems to maintain their structure and functions and to support biological diversity;
- respect for the right of future generations to the sustainable use of renewable resources; and,
- the attainment of durable and equitable social and economic benefits from the Project.

Therefore, in reviewing the EIS and other submissions, the Panel will evaluate the Project's contribution to sustainability on the basis of:

- the extent to which the Project makes a positive overall contribution towards the attainment of ecological and community sustainability, both at the local and regional levels;
- the effort made to enhance positive effects of the Project on the physical, biological and human environment, as well as mitigation of adverse effects;
- how the planning, design, and operation of the Project will strengthen local and regional capacities and opportunities to achieve a sustainable future;
- how monitoring, management and reporting systems will attempt to ensure continuous progress towards sustainability; and,
- appropriate indicators to determine whether this progress is being maintained.

3.4 The Ecosystem Approach

While, for the purpose of studies and reporting, it may often be convenient to segment the environment into physical, biological, and human components, such a categorization tends to mask the importance of the complex interactions and symbiosis within ecosystems and communities. The Panel believes that the Project has to be evaluated in a holistic manner, using an ecosystem approach, where the interconnections receive as much attention as the discrete components.

In the EIS, the Panel will expect evaluations of the potential impacts of the Project on:

- the interconnections between the physical environment, the biological environment, and the human environment;
- the links between terrestrial, coastal zone, and oceanic processes;
- the interchanges between the subsurface, the surface, and the atmosphere; and,
- the repercussion of potential local impacts at a regional, national, and global level.

3.5 The Precautionary Approach

To be valid, environmental decision-making must address the reality of scientific uncertainty and incomplete knowledge. The Precautionary Principle informs the decision-maker to take a cautionary approach, or to err on the side of caution, especially where there is a large degree of uncertainty or high risk.

The Rio Declaration of 1992, to which Canada is a signatory, states that the precautionary approach requires that: “Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.”

The Panel believes that the precautionary approach will be relevant in circumstances where it is identified that a Project activity could cause serious or irreversible adverse impact on the environment and the cause and effect relationships cannot be clearly established.

Further, the Panel understands the application of the precautionary principle to require:

- that the onus of proof shall lie with the Proponent to show that a proposed action will not lead to serious or irreversible environmental damage, especially with respect to overall environmental function and integrity, considering system tolerance and resilience;
- verifiable scientific research and high-quality information; and,
- access to information, public participation, and open and transparent decision-making.

The Proponent shall indicate how the Project conforms to the precautionary principle in at least the following ways:

- that in designing and operating the Project priority has been given to strategies that avoid the creation of adverse impacts;
- that control of deleterious outputs or other potentially damaging activity goes beyond current emission standards where warranted by the potential environmental effects;
- that contingency plans explicitly address worst-case scenarios and include risk assessments and evaluations of the degree of uncertainty;
- that monitoring programs are designed to ensure rapid response and correction where adverse effects are detected; and,
- that liability and insurance regimes are established that hold the Proponent and its contractors accountable for adverse effects and associated damages, and their limitation and control, throughout the life of the Project, including its decommissioning and rehabilitation.

4. GUIDANCE ON THE PREPARATION OF THE EIS

4.1 Use of Existing Information

Although the primary purpose of the Scoping phase was to receive comments on the draft EIS guidelines, the Panel believes that written submissions and oral presentations recorded in the session transcripts constitute important contributions to the review process. The Panel therefore encourages the Proponent to consider information in the Public Registry when preparing the EIS.

The Panel encourages the Proponent to make use of existing information related to the environment affected by the Project in preparing the EIS. When that information is used to meet some of the EIS requirements, include it directly in the EIS or identify its source. This may be done through cross-referencing, direct citation or any other means that permits immediate access. When relying on existing information, comment on its appropriateness and/or relevance over space and time, along with any perceived limitations regarding the inferences or conclusions that have been drawn.

The EIS must provide sufficient information to identify, describe and determine the significance of potential impacts on the environment that could arise from the Project. With the cooperation of appropriate parties, obtain and incorporate traditional knowledge into the EIS.

4.2 EIS Format

For clarity and ease of reference, present the EIS in the same general order as the Guidelines. That is, the EIS should begin by describing the Project, proceed to describing the existing environment, then describe potential impacts on the environment, and finally explain the approach to managing, monitoring and mitigating impacts. Since some monitoring and mitigation measures will apply to multiple environmental components and multiple potential effects, the Panel believes the EIS can reduce repetition by treating them collectively.

Provide a table within the EIS that cross-references the EIS Guidelines with the location of information in the EIS. Provide sufficient detail to help readers locate information easily. Include references to appendices, supporting documents, and cited materials, as appropriate.

Reference rather than repeat information presented in other sections of the EIS. A key subject index, glossary of technical terms and acronyms, and detailed table of contents are required. Provide supporting documentation, including background studies and technical documents, in separate volumes, and reference it by volume, section and page in the text of the main EIS. Include a commitments table in order to summarize planned mitigation measures and

stated company intentions. This should be cross referenced with environmental issues and/or potential impacts.

Write the EIS in the clearest language possible. Provide charts, tables, diagrams and maps wherever useful to clarify the text, including perspective drawings that clearly convey what the developed Project site would look like at various stages during its lifetime. Produce maps using a limited number of common scales in order to permit inter-comparison and overlay of mapped features.

Provide the EIS in both print and digital format according to digital format specifications provided by the Panel.

4.3 Expectations

The Panel expects the Proponent to observe the intent of the Guidelines and to identify and describe all significant environmental (biological, physical, and human) effects likely to arise from the Project, including situations not explicitly identified in these Guidelines. If the Proponent omits from the EIS any matters required in these Guidelines, then that omission must be clearly indicated so that the Panel, the public and other interested parties will have an opportunity to comment on and respond to this judgement. When the Panel disagrees with the Proponent's judgement, it may require the Proponent to provide additional information.

The Panel expects the Proponent to make use of environmental assessment guidance materials published by federal and provincial departments (see Appendix 3) and to respect the principles identified by the Panel as guiding its evaluation. The Panel expects the Proponent to employ properly qualified and knowledgeable professionals to conduct the assessment according to the highest standards in each subject area (and to document the credentials of experts in an appendix). The EIS must support any analyses, interpretation of results and conclusions by providing all relevant references.

PART II: DESCRIPTION OF THE ENVIRONMENTAL IMPACT STATEMENT

5. EXECUTIVE SUMMARY

Provide a plain language Executive Summary that provides the reader with a concise but complete overview of the EIS. Include background on the Proponent; a brief Project overview; the Project setting (physical, biological and human environments); and key findings of the assessment.

As it may be used as a stand-alone document, the Executive Summary should present the information in a general manner focusing on the main issues and findings. Use maps, tables, and figures to aid the presentation.

6. INTRODUCTION TO THE EIS

Provide an introductory chapter that gives a brief overview of the context for the environmental review. The introduction will identify the Proponent, give an overview of the Project, describe the setting, discuss the assessment process, describe the regulatory environment, and highlight the study strategy and methodology.

6.1 The Proponent

Identify the ownership arrangements for various portions of the Project, Clarify the links between Bilcon of Nova Scotia, Corporation, Global Quarry Products, Nova Stone Exporters Inc., Clayton Block Company and Bilcon of Delaware.

Provide summary information on the nature of the management structure and organizational accountability for designing, constructing, operating and modifying the Project; implementing environmental mitigation measures and environmental monitoring; and managing potential adverse environmental effects.

Provide details on relevant corporate experience (the Proponent and related companies) with similar large-scale operations in Canada and in other countries with similar regulatory and social policy regimes. Describe experience in operating other quarry or industrial operations and related transportation systems (including marine terminals). Provide a record of the environmental performance and capability of the Proponent in conducting this type of project (including management of the quarry site to date). Indicate the environmental record of key sub-contractors (e.g., shipping companies).

6.2 Project Overview and Purpose

Summarize the Project, including its purpose, location, components and phases, workforce and equipment, associated activities, schedule and cost.

6.3 The Project Setting

Provide an overview of the geographic, ecological, social, economic and cultural setting which may affect or be affected by the Project. Explain the interrelationships between the physical and biological environment and the people and their communities.

Provide a list and map of communities in the region potentially affected by the Project and indicate the distance between those communities and the specific Project components as appropriate. Identify the proposed shipping routes to take the aggregate to market.

6.4 The Environmental Impact Assessment Process and Approvals

Identify the planning context for the environmental assessment of the Project. Discuss government policies, regulations, and land use plans that have a bearing on the Project. Identify the requirement for the environmental assessment under the *Canadian Environmental Assessment Act* and the *Nova Scotia Environment Act*.

Summarize the main steps in the environmental assessment process leading to the establishment of the Panel and the main approvals required to undertake the Project. Briefly explain the environmental assessment review process. Describe the role of the EIS in the overall environmental assessment process.

6.5 Regulatory Environment

Describe the existing regulatory environment (federal, provincial, and municipal) including all permitting, licensing and regulatory requirements and any municipal planning and bylaw requirements that apply to all phases of the Project and associated infrastructure. Describe the guidelines and standards that apply to the Project. List each regulatory approval required in a table with the following details: activity requiring approval and when it is required; regulatory agency; name of approval or permit; and associated legislation.

6.6 International Agreements

Describe the implications of international agreements (e.g., NAFTA, Kyoto protocol), designations (e.g., World Biosphere Reserve), or action plans (e.g., Gulf of Maine) that may influence the Project or its environmental effects.

6.7 Study Strategy and Methodology

Outline the main steps carried out in conducting the environmental assessment. Briefly describe the approach, strategy and methodology used.

7. PROJECT DESCRIPTION

Provide specific and sufficient detail to clarify the nature of the Project and to identify its potential effects. The Project description should, when read in combination with the description of the existing environment, allow the Panel to understand the selection of Valued Environmental Components (VECs), their interactions, and potential impacts that may be caused on them by the Project. Although the approach to environmental management will influence the entire EIS, describe environmental protection and monitoring strategies later in the EIS.

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

From the perspective of the Proponent, describe the need for and purpose of the Project. Explain the problem or opportunity that the Project is intending to solve or satisfy from the perspective of the Proponent. Clearly identify the fundamental rationale for the Project. Identify the main function of the Project, and who will benefit from the Project.

Describe alternatives to the Project (functionally different ways to achieve the Project need and purpose), including, but not limited to, the "do nothing" scenario. Discuss the reasons for selecting the Project as the preferred alternative, and the reasons for rejecting other alternatives. Describe criteria used for assessing each alternative. Identify the major beneficial and adverse effects of the alternatives considered.

7.2 Alternative Means of Carrying out the Project

Identify technically and economically feasible ways that the Project can be carried out and the potential impacts associated with them. Describe alternative means of carrying out the Project including, but not limited to, alternatives regarding location, size of the quarry, use of existing marine infrastructure, quarrying methods, production rates and alternative means of transportation. Describe criteria used to determine the technical and economic feasibility of the alternative means. Identify the potential beneficial and adverse effects of each feasible alternative means. Consider options for the location of and timing for the Project. Discuss how the environment influenced the choice of alternative means.

Include an analysis of alternative means of carrying out the Project in each phase and component and provide reasons for selecting the proposed mean(s). For example, include alternative sites of aggregate, extraction methods, recycling of

materials, technologies for wastewater treatment, transportation modes and routes, ship loading methods, timing and scheduling, reclamation and decommissioning options, selection of mitigation measures, etc. Include alternatives to marine transportation of the aggregate. Identify the reasons for selecting the proposed Project, including the justification for rejecting alternative means.

Provide the analysis to determine feasibility of alternatives, including any criteria and assumptions used. Summarize and reference supporting studies used to establish criteria. Discuss how traditional knowledge was considered and how the public was involved in identifying and selecting alternative means.

7.3 The Project

Summarize the Project character, location, timeline, and scale. Describe all Project components and activities on land and in the marine environment. Describe by location and Project phase, from site preparation through to decommissioning and abandonment. Include both permanent and temporary facilities. Address all phases and components in sufficient detail to predict potential environmental effects and to address public concerns about the Project. Discuss the planned uses of the marine terminal and any potential use for it other than for the Project, during and after the decommissioning of the quarry.

Use appropriate plans, diagrams, photographs, maps, elevations, and preliminary designs to support the description. The scale and detail of the graphics used should facilitate the understanding of Project components and activities as they affect the physical, biological and human environment.

Indicate boundaries of the Project in relation to features such as other rights of way (e.g. rail lines, roads, shipping lanes), existing infrastructure, land uses, waste disposal areas, transportation systems and routes, important environmental features, structures, and wells. Identify key design features of the Project including, but not limited to, safety features and efficiency measures.

Describe any relationship of the proposed Project to a series of separate projects or to a larger project (as these could have implications for the consideration of alternatives, cumulative environmental effects and mitigation options). Discuss the relationship of the Project to applicable policy and plans at local, regional, provincial and national levels, and regional-scale management efforts.

Describe and identify the location of the major physical components of the quarry such as, but not limited to, aggregate extraction and processing equipment, loading facilities, stockpiles, roadways, topsoil and overburden piles, retention and settling ponds, fuel and dangerous goods storage areas, and administrative buildings. Describe proposed distances from private property not owned or leased by the Proponent.

Describe and identify the location of the major physical components related to the marine terminal including conveyors, ship loaders, berthing dolphins, mooring buoys, fuelling facilities, etc.

Describe the properties and anticipated volumes of any product to be produced, transported or disposed of during the operation of the proposed facilities. Describe phasing, schedules, hours of operation and management plans for the Project, including excavating, drilling, blasting, sediment control, and shipping (including ballast water control).

7.4 Land Requirements

Describe the land requirements and arrangements for the Project. Provide maps showing dimensions and location of the facility sites; indicate any land use designations that may apply.

Provide evidence of clear legal title to all lands within the footprint of the Project, or evidence of agreement with those who hold clear legal title to develop the Project on these lands. Identify the implications of the private property (held by others) and the public road right-of-way within the quarry site.

Identify any existing right-of-ways or legally entitled access (including access from the water) to the Project site. Clarify the status of claims of fishing or fisherman's privileges on properties within the quarry site.

7.5 Schedule and Boundaries

For each Project phase, describe in detail (including a mining plan) the scheduling and relative timing and duration of major activities; the factors that influence scheduling or that could cause schedule changes. Describe the spatial and temporal boundaries for Project facilities and activities and their change over time, including the rationale for their delineation.

7.6 Cost and Workforce

For each Project phase, describe the capital costs, the number of workers required by occupation and/or skill, education requirements by occupation or skill, training provided by employer, and an estimate of the proportion of local and regional workers.

7.7 Construction Phase

Identify and describe all physical works and activities carried out during the construction phase by location, timing, frequency and duration. Describe the types, amounts, and schedule of materials, equipment and workers transported.

Describe work required for site preparation and construction of the quarry, and the associated activities and techniques used. Explain the following (and others as appropriate): drilling and blasting (handling procedures, frequency and size, pre-blast surveys, weather condition considerations); site clearing (topsoil and overburden storage areas by location, dimensions, protective measures).

Describe site access roads (locations, gradient) and public roadways; sewage treatment and waste management systems; dangerous goods storage areas; watercourse crossings and diversions, including wetland alteration; location and type of structures (e.g., offices and warehouses) and utilities.

Identify structures and facilities associated with erosion and sedimentation control, visual effect management (e.g., landscaping, screening mounds and plantings) and techniques for noise abatement (on land and through water) during construction.

Describe the physical components required for constructing the marine terminal and associated infrastructure, and the techniques to be used. Describe the following (and others as appropriate): site preparation activities, including any land based activities associated with the installation of marine infrastructure; requirements for any drilling, blasting, or dredging, including handling and disposal procedures, frequency and size, pre-blast surveys, weather condition considerations, fishing-related activity considerations; mechanisms for anchoring of pile support structures and construction of concrete caps as dolphins, any use of rock fill or armour stone; and, all structures and utilities.

Describe proposed construction schedules (including days of the week, times of the day), seasonal schedules and anticipated commencement and completion dates. Describe clean-up and restoration of work areas, and strategies for reducing risks. Identify criteria selected to measure construction and clean-up success.

7.8 Operation and Maintenance Phase

Describe the physical components required for Project operation and maintenance, and the associated activities and techniques. Explain the lifespan of the Project, and annual average and maximum production rates. Describe all drilling and blasting (e.g., frequency, size, blast geometry, pre-blast surveys, weather condition considerations); crushing, screening, sorting, and washing facilities; all equipment used. Identify the location and nature of materials stockpiled.

Describe all water management (e.g., detailed water budget, including effluents, treatment and water recycling opportunities); all waste management (e.g., overburden, management of acid-generating rock, management of ammonia

from blasting activities); sewage and solid waste management; all dangerous goods use and waste dangerous goods management.

Describe the Project's requirements for land transportation (modes, routes, load size and frequency) and marine transportation (e.g., routes, vessel size and type, frequency, duration of berthing, contingency plans for storms or extreme conditions). Describe any goods (other than aggregate) likely to be carried in transportation vehicles and vessels. Explain ballast and bilge water management and cargo loading and unloading practices and precautions. Indicate whether the marine terminal will be used for purposes other than those associated with the Project.

Describe structures and facilities associated with environmental controls for noise, dust, and protection of views (from both land and sea). Discuss anticipated repair and maintenance activities that could result in interactions with the environment, including replacement of Project components, and maintenance dredging (including disposal of dredged materials).

7.9 Modification

Describe the management approach to, and conceptual plans for, potential modifications (including expansion or discontinuation) to the physical works or activities described above. Specify the conditions or potential risks which would necessitate modifications to the Project.

7.10 Decommissioning and Reclamation Phase

Describe the proposed approach to, and conceptual plans for, decommissioning Project facilities including the marine terminal, and reclaiming the site for future use. Describe the timing and nature of site clean-up and rehabilitation activities. Detail plans for progressive reclamation of the quarry site as operations advance, for removing equipment and structures on land and in the marine environment (including reclaiming exploration boreholes and test pits), and for the proposed future uses of the property following decommissioning.

Specify ownership, transfer, and control of the Project components and fiscal and legal responsibility for ensuring the integrity of decommissioned facilities.

8. IMPACT ASSESSMENT METHODOLOGY

This section of the EIS will explain the Proponent's approach to conducting the environmental assessment, and will describe and justify the methods used to predict and evaluate potential effects on Valued Environmental Components (VECs).

8.1 Methods

Explain and justify the methods used to predict potential impacts of the Project on the VECs, on interactions among these components, and on any broader relationships with the physical, biological and human environments. Describe linkages between Project-related effects (e.g., how impacts on the biological environment could affect the human environment).

Explain how scientific, engineering, traditional and other knowledge was used to describe the existing environment, evaluate potential impacts and reach conclusions. Identify and justify any assumptions made. Indicate the degree of certainty in the impact predictions and determination of significance (identify measures used). Document all models and studies so that, to the extent possible, the analyses are transparent and reproducible; support analyses and conclusions with reference to appropriate literature and provide all relevant references.

Identify which studies included the assistance of communities and who was involved; specify and reference sources for any contributions based on traditional knowledge.

8.2 Public Participation

Public participation plays a vital role in the assessment process. Outline the engagement activities undertaken in respect of the environmental assessment. Identify and report on key issues raised, and describe how those issues have been addressed.

Describe the methods used to identify, inform and solicit input to the assessment process.

Outline the types of support provided by the Proponent to communities, organizations or individuals involved in the public participation process. Identify and document the contributors of comments and input, including residents and organizations in affected communities, other organizations, resource users, and government agencies. Document outcomes of public engagement, including any additional information provided to those consulted and any information provided by them.

Document the role of public engagement in identifying VECs, issues, impact prediction and mitigation. Explain how the results of that engagement influenced the design of the Project. Describe the principles and methods that will be employed to provide information to, obtain input from or otherwise engage communities and groups (e.g., the fisheries and tourism sectors) regarding Project activities over the lifespan of the Project.

Document, track and describe any issues raised by stakeholders that may remain outstanding.

8.3 Selection of Valued Environmental Components

Valued Environmental Components (VECs) are used to focus the assessment on those elements of the physical, biological and human environments that have the potential to be affected by the Project, or conversely might exert an effect on the Project. They may be considered as important for physical, ecological, cultural, social or economic reasons.

In general, the VEC approach provides the predictive foundation for determining Project-related effects on the environment. Using VECs to identify potential impacts on and by the Project can assist in determining the likelihood of significant adverse effects on the environment.

The particular value of a VEC may relate not only to its role in the ecosystem, and in social and economic systems, but also to the value placed on it by humans. The culture and way of life of the people using the region affected by the Project are themselves considered valued components. Accordingly, these linkages may result in overlap of VEC attributes, or overlap in considerations relevant to potential impacts on those VECs.

Selection of appropriate VECs is a critical component of scoping in environmental assessment to ensure that the assessment remains focused and the analysis remains practical and manageable. The public Scoping sessions and these Guidelines formulated by the Panel have identified many VECs. The VECs identified through the Guidelines do not limit the Proponent from including others. For additional VECs describe the methods by which VECs were identified and the basis (or justification) for their selection.

Identify any indicators used in the assessment of impacts on VECs and provide the basis for their selection.

8.4 Boundaries

Definition of spatial and temporal boundaries creates an appropriate frame of reference that permits identification and assessment of environmental effects. The Scoping sessions provided an important component of this process that helped to focus on relevant issues and concerns. Boundaries can vary depending on the specific VEC under consideration. Given that the Project includes a marine terminal and transportation component, the Project area extends beyond the quarry site for many VECs.

8.4.1 Spatial Boundaries

When determining appropriate spatial boundaries for the assessment of potential environmental effects, consider (but do not be limited to) the following criteria:

- the physical extent (terrestrial and marine) of the proposed Project, including any offsite facilities or activities (such as shipping);
- the extent of aquatic and terrestrial ecosystems and communities potentially affected by the Project;
- the extent of potential effects arising from noise, light and atmospheric emissions, and from liquid emissions;
- land and ocean use for commercial, cultural, agricultural, recreational and aesthetic purposes by communities and Aboriginal peoples whose areas may be affected by the Project; and
- the size, nature and location of past, present and reasonably foreseeable projects and activities that could interact with the items above.

These boundaries will also define appropriate scales (e.g., ecosystem, local, regional and national) over which baseline descriptions and assessments of environmental effects must be presented. The Proponent 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. The EIS must contain a justification and rationale for all boundaries and scales chosen.

8.4.2 Temporal Boundaries

When characterizing potential environmental effects of the Project, consider historic and current baseline trends within the study region with sufficient completeness to permit evaluation of the effects on VECs. Include consideration of past projects and activities conducted by the Proponent and/or others.

Consider a time frame that encompasses the onset of Project-related pre-construction planning, through site clearing, construction, operation, maintenance and modifications, extending out to include the proposed duration of the Project, including its eventual decommissioning, reclamation and abandonment.

When assessing cumulative environmental effects, consider potential Project impacts in combination with other projects from the past, present and reasonably foreseeable future.

8.5 Application of the Precautionary Principle

Identify elements of the assessment where application of a precautionary approach warrants specific methods or evaluations. Under those circumstances, discuss whether a potentially serious or possibly irreversible Project-related

adverse impact can be avoided. Where potentially adverse impacts cannot be avoided, describe ways to reduce environmental risk, including a discussion of Project design and available technology, with reference to effectiveness and cost.

9. DESCRIPTION OF EXISTING ENVIRONMENTS

This section of the EIS shall provide baseline descriptions of the physical, biological and human (socio-economic) environments. A baseline environment is the condition that exists prior to Project development. Include those elements (along with processes, interrelationships and interactions) that are valued by the public, plus some measure of the inherent variability of elements and relationships. Express the information over time scales appropriate to the identified VECs.

Evaluate the quality, reliability and applicability of the data used. Identify any data gaps, insufficiencies, and uncertainties, especially those that will need to be remedied for monitoring purposes. Provide sufficient level of detail to allow determination and assessment of adverse or beneficial environmental effects that might be potentially caused by the Project.

Baseline data, developed primarily from recent and/or immediate data, must not be a static or steady-state description of the environment but rather should reflect its true state of continuous change. It should include, without being limited to, processes and interactions such as those specified in these Guidelines; legislated or regulated by government; identified in the Scoping process; or, judged by the Proponent to be important. Indicate to whom specific concerns might be important, along with the reasons why they are considered so.

Take an ecosystem approach. Integrate perspectives on ecosystem health and integrity which are drawn from scientific and traditional knowledge. Identify and justify the various indicators chosen to define the ecosystem, including measures of economic and social health and integrity. Relate these measures to Project monitoring, follow-up, and mitigation. Define the geographic area represented by ecosystems and relate it to the broader regional environment and economy (e.g., the contribution of Digby Neck to critical habitats, bird and fish stocks, the presence of particular species, including species at risk, and the economic dependence of the region on the fisheries and tourism).

Provide historical, current and projected information as to the health and importance of social and economic issues which broadly encompass and affect people and communities in the study area. Use a comprehensive and holistic approach that acknowledges any distinctiveness in economy, life style, social traditions or quality of life, along with any critical requirements for their maintenance and enhancement. Consider the status, health, persistence, vulnerability and resilience of the local economy, especially in relation to the

physical and biological environments. Provide context-sensitive information in sufficient detail to address a range of public interests and concerns, as well as to assist in recognition of the varying significance of the potential impacts on communities throughout the region.

9.1 Existing Physical Environment

9.1.1 Terrain, Geology, and Soils

Describe the regional/area setting with reference to the topography, geomorphology, bedrock geology, and surficial geology. For the Project site, provide specific information on the bedrock geology that includes geologic structures (e.g., faults, joint patterns and frequency), bedrock type (lithology), and stratigraphy. Provide up-to-date geological maps and available core sample descriptions that delineate the distribution of basalt suitable for quarrying vs. possible waste material. For the bedrock provide information on their chemical and petrologic character and their acid producing / consuming potential.

Describe and provide maps of the distribution, thickness, and types of surficial materials (soils, glacial regolith), and characterize these materials by chemistry, particle size distribution, permeability, porosity, and erosion risks.

For the Project site provide slope/aspect maps and identify landscape processes and areas of possible occurrence of landslides, mudflows, creep, slumping, or debris flow. On a regional and local scale identify fault zones and active seismic areas.

Indicate any sites of special geoscientific interest within the Project area.

9.1.2 Physical Oceanography

Describe local and regional oceanographic conditions using bathymetry (seabed topography), shoreline character and intertidal zone dynamics. Provide information on the potential for sea ice formation, its distribution and movement. Assess the possible magnitude and frequency of extreme events involving the cumulative effects of storm surges, tides, and meteorological conditions.

9.1.2.1 Marine Sediment Quality and Quantity

Describe marine sediments in the area affected by the Project, including an overview of the physical and biological processes related to sediment deposition, movement, and quality. Include sediment type, particle size, and spatial distribution; sediment thickness and vertical profiles (cores); sediment chemistry, organic content, and quality (such as heavy metals, organochlorines, and nutrients); and mechanisms and rates of sediment transport in relation to water depths.

Develop a conceptual/analytical model that describes the Debris Cycle (erosion, transportation, and deposition of sediment) on and around the site.

In marine areas that could be disturbed by the Project, including areas to be dredged or used for dredge spoil disposal, characterize sediments in relation to parameters identified in the Canadian Sediment Quality Guidelines for the Protection of Aquatic Life, the *Canadian Environmental Protection Act*, 1999, and its *Disposal at Sea Regulations*.

9.1.2.2 Ocean Currents and Tides

Describe for the Project site and adjacent areas affected by Project components (such as shipping) the average and maximum current speeds and directions, wind and swell characteristics, the fetch, tidal characteristics (range, period, seasonal variation), and coupling between wind and currents.

For the marine terminal site provide information on net current flow, tidal component flows, and wind-driven responses on a seasonal basis.

9.1.2.3 Water Quality

Describe and quantify the water column characteristics and their spatial and temporal variability for the Project site, and adjacent areas, in terms of temperature, salinity, suspended sediments, nutrient concentrations, and optical transmissivity. Evaluate current levels and trends in any environmental contaminants. Provide information on mixing and stratification of the water column at different seasons and its impact on the above listed parameters.

9.1.3 Terrestrial Water Quality and Quantity

Describe terrestrial water quality and quantity in surface water, groundwater, and wetlands. Pay particular attention to the interactions of the hydrologic components.

9.1.3.1 Surface Water

Provide a map delineating the watershed(s) and sub-watersheds within the quarry site and in the vicinity of the Project. Within the watershed(s) identify and delineate all recharge and discharge areas, ponds and lakes, and wetlands. Describe and quantify the hydrological conditions and water quantity and quality for all surface waters, including ephemeral streams, which may potentially be affected by pit dewatering, water extraction, or diversion by:

- describing flow regimes;
- seasonal flow patterns;
- channel / bed / drainage basin morphology and stability;
- sediment load – suspended and bedload;

- providing estimates of normal (base and mean) flows and extreme (high and low) flows and water levels;
- water chemistry and turbidity; and,
- identifying all freshwater streams whose groundwater supplies originate within the projected quarry area even though they may surface and flow outside the quarry site.

In each watershed, identify locations of existing and planned water use (domestic, municipal, industrial, camp, etc.) in relation to proposed facilities. For each area of water use that may be affected by the Project, identify the quantity of use, existing water quality, and seasonal or other temporal variation of water quality and use. Identify existing sources of water quality impairment and their locations in relation to Project facilities. Include a consideration of relevant federal and provincial guidelines, criteria, and legislation applicable to water usage.

9.1.3.2 Groundwater

Provide a map delineating the groundwater regime(s) within and in the vicinity of the Project area. Also, identify and describe the hydrostratigraphic units in the region that could potentially be affected by the Project in term of depth and thickness of the aquifers, their water quality, and yield characteristics. Evaluate the current vulnerability of aquifers to contamination by atmospheric or surface water pollutants, to saltwater intrusion, and to wells running dry through normal water withdrawal.

Provide a pre-development well-water survey to establish baseline well-water quality and quantity. Include detail on the type, depth, yield, number and location of all wells that might be impacted by the quarry development.

Describe the characteristics of surface water and groundwater interactions (e.g., physical features or mechanisms influencing recharge or discharge characteristics potentially affecting shallow and deep groundwater resources, and groundwater contributions to stream base flows in the study area) under different climatic and seasonal conditions.

Synthesize the groundwater and surface water data to produce a conceptual/analytical model of the hydrological cycle under and around the Project site.

9.1.3.3 Wetlands

Identify the location, size and class of any wetland on-site or downstream that may be affected by the Project. Evaluate their wildlife habitat potential (including wildlife at risk), groundwater recharge role and potential, and their role in surface flow regulation (storm water retention and flood control). Describe potential roles

of the wetlands in water treatment, and their potential importance for paleoecological studies.

9.1.4 Climate

Describe the existing or baseline climate conditions and climatic variability and trends, including, but not necessarily limited to:

- the location of recording stations and length of record for any meteorological data presented;
- prevailing climatic conditions, seasonal variations, predominant winds including direction and velocity, temperature and precipitation (snowfall, snow depth, rain, fog);
- occurrence and frequency of storm and extreme weather events;
- spatial and temporal boundaries for the description of climate; and,
- any current or historical climate-related extreme events that may affect the Project, including shipping, and frequency of occurrence.

In support of the baseline description define the 'current' climate normal period (baseline period) relied upon by describing how it was determined, and describe the variability/trends within the 'current' climate normal period and within the period of instrumental record. Also discuss the contribution of traditional knowledge to the understanding of climate conditions and variability.

Present the description of baseline conditions in a manner that reflects climatic variability and facilitates subsequent discussion of how changes in climate could change the Project, or particular Project components.

9.1.5 Air Quality

Describe existing air quality in the area affected by the Project and define the spatial boundaries of the airshed(s), including a rationale for its delineation. Provide the location of recording stations and length of record for any air quality data presented.

For each airshed, identify current sources of emissions, seasonal variations, climatic conditions affecting air quality (e.g., wind direction and velocity) and, if known, assimilative capacity. Characterize the existing air quality and precipitation chemistry in each airshed based on (but not limited to) parameters identified in national, provincial or other relevant air quality standards and objectives. Particularly emphasize information on substances that may be emitted due to the Project, such as ambient dust levels in areas where quarry or loading activities may contribute to increased dust levels, and decreased visibility.

9.1.6 Noise and Vibration

Describe the existing ambient acoustical environment at the Project site and offshore, and in any other areas where Project activities could be expected to have an environmental effect. Provide the spatial boundaries of existing noise and vibration levels, as well as locations of recording stations and length of record for any acoustic or vibration data presented. At these sites, describe existing sources of noise and vibration, including duration, types of variation, timing, frequency and levels. Consider the effects of different meteorological conditions on noise propagation. Provide information on any existing relevant standards, guidelines or objectives with respect to noise and vibration levels.

9.1.7 Light

Describe existing ambient light levels at the Project site and at any other areas where Project activities could have an environmental effect on light levels. Describe night-time illumination levels during different weather conditions and seasons.

9.2 Existing Biological Environment

9.2.1 Species at Risk

The federal *Species at Risk Act* (SARA) aims to prevent the extirpation or extinction of wildlife species; to provide for the recovery of extirpated, endangered or threatened species; and to assist “special concern” species from becoming endangered or threatened. SARA provides lists of “at risk” wildlife species that include mammals, birds, reptiles, amphibians, fish, molluscs, butterflies, lichens and mosses.

Identify all aquatic and terrestrial listed species (those found on the SARA *List of Wildlife Species at Risk*), and their critical habitat (if identified in a recovery strategy or action plan), found within the regional study area. Identify any additional species listed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) found in the regional study area, and indicate when each species is expected to become listed under SARA. Consider all species listed as Endangered, Threatened, Rare, Extirpated or of Special Concern as Valued Environmental Components (VECs) in the assessment.

For all of the above mentioned species, provide information on seasonality, frequency, habitat (as defined in Section 2 of SARA), critical habitat (if identified in a recovery strategy or action plan), and current ranking (e.g., endangered, threatened or species of special concern). Useful resources pertaining to these topics include: species specialists, the primary scientific literature and

COSEWIC status reports, recovery strategies, and action plans. If a critical habitat has not yet been identified for a given species, this should be noted.

In the assessment, identify and consider all species listed under the Nova Scotia *Endangered Species Act* as Endangered, Threatened, or Vulnerable. Identify species listed under the Nova Scotia General Status of Wild Species; include those designated as Red or Yellow in the assessment. To satisfy provincial requirements, include the required information as stated in the *Standards and Process Applied to Provincial Environmental Impact Assessments: Wild Species Priorities, Inventory and Mitigation Standards for Reporting* as prepared by the Nova Scotia Department of Natural Resources.

Conduct appropriate surveys to identify the presence of floral and faunal species, including any species at risk that might occur at or near the Project site, as well as throughout other areas that may be affected by the Project. Conduct surveys during appropriate times of the year. Identify the time(s) each study was conducted.

Identify all federal, provincial and municipal protected /conservation areas (e.g., national migratory bird sanctuaries and wildlife management areas, provincial wilderness areas, parks and sites of ecological significance and municipal water supply areas) in the vicinity of the Project.

9.2.2 Fish, Invertebrates and Habitat

Identify marine and fresh water fish and invertebrates occurring in any identified or receiving watercourses contiguous to the quarry site that might be impacted by the Project and its associated shipping activities, including:

- harvested and non-harvested finfish (pelagic and demersal), shellfish, crustaceans;
- seasonal and life cycle movements and sensitive periods;
- habitat requirements for each life stage (e.g., spawning, rearing, nursing and feeding);
- description of any seasonal variation in the location, abundance and activities of aquatic species;
- local and regional abundance, distribution and use of habitat types, including aquatic and riparian vegetation;
- migratory routes of appropriate species and the foods upon which they depend;
- sensitive, important or at-risk species and/or habitat types;
- baseline contaminant concentrations in harvested species that may change as a result of the Project;
- any known issues with respect to health of harvested species (e.g. parasites, disease, condition);
- harvest pressures (subsistence, sport fishing and commercial harvesting) by species, season and geographic area;

- a listing of existing non-native species; and,
- potentially invasive species that might be carried in the ballast water of ships that will service the Project. (Consult appropriate agencies for current lists.)

For species of concern, also describe specific location, population status, limits; and size, sensitivity and limiting factors.

In the course of describing aquatic species and habitats, consult with local fishermen and fishermen's associations to document traditional knowledge.

9.2.3 Birds and Bird Habitat

Describe existing birds and bird habitat within the areas affected by the Project, including:

- bird species present (both permanent and migratory, on land, shoreline and offshore);
- occurrence, abundance, distribution, range, seasonal movements, habitat requirements (breeding, moulting, staging, feeding) and sensitive periods;
- migratory routes that may exist within the quarry site, or in areas affected by the Project;
- habitat types including local and regional abundance and distribution; and,
- habitats or sites of special value or sensitivity, including species use and timing.

For species of concern describe specific location(s), population status and trends (e.g., seasonal variability over multiple years), limits and size, critical habitat, sensitivity and limiting factors, status and trends.

9.2.4 Wildlife and Wildlife Habitat

Describe existing wildlife resources within the areas affected by the Project with special attention to the uniqueness of any organisms or the kind and degree of interaction that might exist with other regional ecosystems. For any species of concern considered to be unique or integral to regional ecosystem, provide evidence of abundance and distribution, seasonal movements, habitat requirements and sensitive periods; a description of specific location(s), population status and trends, limits and size, critical habitat, sensitivity and limiting factors; habitat types including local and regional abundance and distribution; habitat or sites of special value or sensitivity, including species use and timing; and, migratory patterns, routes and timing in relation to Project facilities and activities.

9.2.5 Marine Mammals

Identify existing marine mammal species and their habitat within the areas affected by the Project including: actual species; their abundance and distribution; seasonal and life cycle movements; sensitive periods; local and regional abundance; distribution and use of habitat types; habitat or sites of special value or sensitivity, including species use and timing; known sensitive areas in terms of habitat type, species, and timing of use; and, for species of concern (e.g., Northern Right Whale) describe their distribution, population status, sensitivity to disturbance, and the factors that limit their distribution and population.

9.2.6 Vegetation

Describe and map the existing vegetation on the Project site and in offshore waters. Place the resulting information into a broader regional setting in order to provide a context for the Project. Specific information required includes: vegetation and vegetation assemblages; identification of species or assemblages that are rare, valued, protected or designated (e.g., vulnerable, threatened, endangered, extirpated); for species of concern describe specific location, population status, limits and size, sensitivity and limiting factors; baseline contaminant concentrations in harvested species or vegetation (e.g. berries) that may change as a result of the Project; and, potentially invasive species that might be carried in the ballast water of ships. Current lists of these organisms are available from the National Botanical Services in Ottawa, Ontario.

9.3 Existing Human Environment

9.3.1 Community Profile

Describe the profile of the existing human environment, including socio-economic conditions at the community and regional (e.g., South West Nova Scotia) levels, in such a way that the potential impacts on the functioning and health of the human environment and the significance of these effects can be assessed.

As appropriate, employ social and economic indicators to help define the features of the human environment. Ensure these are relevant to the selected VECs, direct and indirect potential impacts, affected communities and to concerns identified during public consultations. Social and economic indicators should include measures of demography, employment, income, education and skills, use of land (including water and shore lines) and resources, fishing, tourism, quality of life, health. Where possible, provide social and economic information by age, occupation, and community.

Describe the history, demography, economy and community characteristics of the region affected by the Project. Identify residences, communities and work places likely to be affected. Identify the various perspectives and aspirations for the future within the region. Consider the relationship between the Project and the relevant community and regional social and economic development strategies, policies and plans.

Obtain information on social and economic matters from sources that include existing literature; existing administrative and monitoring data held chiefly by responsible governments and agencies; social surveys; and traditional knowledge. Ethical social research standards require that the last two can only be obtained with the consent and cooperation of local residents. Accordingly, demonstrate that the Proponent has made best efforts either to obtain this information itself or to assist the appropriate Aboriginal or local organizations and persons, to provide it for inclusion in the EIS, or to present it directly to the Panel during the course of the review.

9.3.2 Demographics

Provide a demographic profile(s) of the region affected by the Project, including population and population trends by community and by region. Identify in/out migration by community and region, and factors that could contribute to migration patterns. Detail the number and map the location of residences within 4 km of the quarry site.

9.3.3 Economy

Describe the local and regional economies and their performance. Indicate the contribution of various industries and economic activities to the local and regional economies. Indicate employment rates (e.g., part-time, full-time, seasonal, self-employment) and employment by industry and occupation.

Describe the current status of the main industries in the region, and the factors that affect them. Discuss current and projected land-based and marine-based enterprises and economic activities, including those related to tourism, outfitting, agriculture, commercial harvesting, hunting, recreation, renewable resources and non-renewable resources. Discuss local and regional economic development goals and objectives as identified in public consultations, and community, regional and territorial economic development plans and strategies.

9.3.3.1 Fisheries and Harvesting

Identify the geographical locations of historical and current regional freshwater and marine fishing operations and the seasonal variations of fishing activities for

commercial, recreational and Aboriginal uses, including current use of the area or its potential use for aquaculture. Describe current and historic fishing and harvesting activities in the area. Describe the types and values of fisheries, including, but not limited to, lobster, scallops, crab, herring, mackerel, gaspereau, periwinkles, and marine plant harvesting. Identify any fishing grounds and boats operating within 2 km of the marine terminal. Identify the potential for new fisheries or harvesting of resources (e.g., sea urchins, aquaculture) that may be affected by the Project. In the course of describing the fisheries and harvesting, consult with local fishermen and fishermen's associations to document traditional knowledge.

9.3.3.2 Tourism and Recreation

Discuss the location, level and value of existing and planned tourism and recreational activities (e.g., hunting, fishing, hiking, bird watching, sea kayaking, whale watching and associated businesses) for the region that may be affected by the Project. Identify the contribution of tourism to the regional economy.

9.3.4 Education, Training and Skills

Describe the education, skills and training levels that may be relevant to or affected by the Project. Identify education, training and/or certification programs available within the region that may be appropriate to workers employed by the Project. Describe the timing and duration of education and skills development programs that would be required for Project-related employment.

9.3.5 Land Use and Value

Identify the history of past and current land use(s) of the site. Describe the planned and existing land uses within the Project site and in other areas that may be affected by the Project development. Identify and describe existing land based infrastructure (such as wells, waste management areas, etc.) likely to be affected by the Project. Identify any traditional activity areas or trails that may be affected by the Project.

Describe historic and current land use and shoreline use patterns in the region affected by the Project, including e.g., protected areas, special harvesting sites, transportation corridors, recreational areas, ecologically important areas, critical wildlife habitats and movement areas.

Identify valued locations and their attributes, and lands and features of special interest or value, and their attributes. Describe property values in the area to be affected by the Project.

9.3.5.1 Aboriginal Land and Resource Use

Identify the lands and resources in the area affected by the Project of specific social, economic, cultural or spiritual value to Aboriginal peoples of Nova Scotia, with focus on the historic and current use of lands and resources for traditional purposes. Uses may include, but are not limited to, camping, travel on traditional routes, hunting, fishing, trapping, planting, harvesting, and collecting.

9.3.6 Heritage Resources

Identify and describe features of historical, archaeological, paleontological, architectural or cultural importance in terrestrial and marine areas associated with the Project. Give particular attention to Aboriginal, African-Canadian, Acadian and traditional cultural and historical resources. Evaluate culturally important sites, burial sites, and sites with heritage resource potential that may be affected by the Project.

9.3.7 Human Health and Community Wellness

Assess the physical, mental and social health and well-being of residents of the areas affected by the Project. Employ appropriate qualitative and quantitative indicators regarding elements of health (such as respiratory health) that may be affected by the Project to create baseline data. Address issues of potential concern identified during Scoping sessions.

Where data on people in the region allow, provide baseline data on the prevalence of contaminants expected to be produced by the Project that might impact on human health.

9.3.8 Socio-Cultural Patterns

Describe socio-cultural patterns and social organization in the communities in the area affected by the Project. Describe patterns of family and community life (such as community social organization, the organization of work). Discuss perceptions people have about their quality of life and their sense of place. Describe social relations between residents, among generations, and between seasonal and year-round residents.

9.3.9 Infrastructure and Institutional Capacity

Describe the local and regional infrastructure and institutions to indicate the baseline of existing services and their capacity to meet new needs. Describe the role of different orders of government (federal, provincial, local) in providing financing, public services and maintaining infrastructure that may be impacted by the Project. Discuss the status of community and local government institutions and organizations, including their capacity to deal with the Project. Describe

current levels of use of existing social, health and community services to meet additional and new needs. Discuss the ability of emergency response services to address current demands.

9.3.10 Transportation

Describe existing land-based and marine-based transportation infrastructure and networks.

9.3.10.1 Land Based

Describe the existing conditions of the proposed modes and routes of transportation (e.g. provincial roads and highways, arterial highways, on-site access roads) that will be used throughout the Project development. Include information on the existing types and volumes of traffic on roads near the site. Describe the areas through which trucks will travel (e.g. residential or school areas). Discuss volume of traffic, times, weights of trucks and other relevant details.

9.3.10.2 Marine Based

Describe existing marine transportation patterns, volumes, and types in the shipping lanes and near shore area of the Bay of Fundy, and in other areas to be affected by the proposed Project. Discuss current and historic risks of collisions, accidents and spills. Explain how current (and expected) vessel traffic is managed in the vicinity of the proposed marine terminal (including marine traffic such as recreational boating, shipping, fishing, commercial and passenger traffic); focus on navigation safety and avoidance of collisions with marine mammals. Describe mechanisms in place to deal with marine emergencies.

9.3.11 Other Undertakings in the Area

Indicate the type, size, location and any other relevant information of other current and historic undertakings or developments in the area to be affected by the proposed quarry and marine terminal. Identify proposals for other undertakings in the area that may affect cumulative impacts from the Project.

10. ENVIRONMENT IMPACT ANALYSIS

This section of the EIS must assess potential impacts of the Project on the VECs selected for the physical, biological and human environments over the lifespan of the Project. For each VEC, or its indicator, provide sufficient information to allow the Panel to understand the nature of the potential effects and how the

Proponent's conclusions were reached. The assessment must provide a clear, traceable path of information from the baseline conditions through the identification of potential impacts, monitoring, mitigation, residual impacts and determination of significance of effects. When appropriate, consider how natural variation or events might affect Project impacts.

With regard to the physical and biological effects, consider environmental sensitivity, trends and natural variation and the capacity of natural systems to recover from potential Project impacts. Describe the effects of the Project on the capacity of renewable resources to meet the needs of the present and those of the future.

When considering local impacts on the human environment, have due regard for the attitudes and perceptions of local residents, and how these are grounded in their culture, social organization, and historical experience. The Proponent shall, to the best of its ability, indicate how direct and indirect Project impacts might enhance and/or impair current social, cultural, and economic activities in the communities, as well as future economic planning. Consider possible reactions to Project-related effects and the capacity of the people, communities and institutions to respond. Discuss the range of changes that may be induced.

The assessment must recognize not only the complexity and inter-connectedness of all the parts that comprise a single environmental entity (e.g., the physical environment), but also the broader, even more complex, inter-connectedness between the physical, biological and human components. Awareness of this multi-layered, multi-dimensional inter-connectedness will offer guidance for monitoring and mitigation, for determining significant effects and identifying residual effects (in later sections of the EIS).

The assessment must identify the capacity of renewable resources that are likely to be significantly affected by the Project to meet the needs of the present and those of the future.

10.1 Physical Environment Impact Analysis

10.1.1 Terrain, Geology, and Soils

Describe and evaluate the potential impacts of the Project on the topography of the site and the consequent changes in slope and soil stability. Assess the effects of the quarry activities and quarry faces on erosion, including erosion of overland low-angle sloping terrain and working surfaces. Evaluate the chemical interaction, including acid producing and consuming potential, of newly exposed bedrock, crushed rock and waste-rock stockpiles with precipitation and surface waters. Provide information on the potential impacts of onsite waste rock and soil disposal, product stock piling, settling ponds, and the disposal of solid washing residue. Appraise the possible influence blasting on local and regional

seismic activity. Provide information on measures taken to preserve/document of sites of special geoscientific interest.

10.1.2 Physical Oceanography

Provide an assessment of the potential impacts of disturbances and modifications of seabed morphology, shoreline character and intertidal zone dynamics during the marine terminal construction, quarry construction, and production phases. Evaluate the effect of the marine terminal on sea ice, its distribution and movement. Assess the impact of extreme climatic events, possibly involving the cumulative effects of storm surges, tides, and meteorological conditions, on the structural integrity of the marine terminal and loading operations.

10.1.2.1 Marine Sediment Quality and Quantity

Describe and evaluate the potential impacts of the Project on:

- sediment influx due to terrestrial surface disturbance during the construction and operational phases, and aggregate washing operations;
- sediment redistribution during the construction of the marine terminal and its interaction with tides and currents; and,
- changes in sediment character and chemistry due to accidental or uncontrolled releases of solids from aggregate washing or releases of fuel oils, heavy metals, organochlorines, or nutrients.

In disturbed marine and intertidal areas characterize sediments in relation to parameters identified in the Canadian Sediment Quality Guidelines for the Protection of Aquatic Life, the *Canadian Environmental Protection Act, 1999*, and its *Disposal at Sea Regulations*.

10.1.2.2 Ocean Currents and Tides

Evaluate how currents and tides may be affected due to the construction or operation of the marine terminal. Explain how nearshore navigation, the marine ecology, and harvesting will be impacted by such changes in tides and currents.

For the marine terminal site provide information on changes in net current flow, tidal component flows, and wind-driven responses on a seasonal basis.

10.1.2.3 Water Quality

Describe and evaluate potential impact on the marine water column, including consideration of:

- changes in temperature, salinity, nutrient concentration and suspended sediments during construction and operational phases;

- changes in these parameters due to intentional releases of washing water;
- changes in these parameters and water chemistry due to accidental or uncontrolled releases from aggregate washing, fuel oils, heavy metals, organochlorines, or nutrients; and,
- impact of construction and loading operations on seasonal mixing and stratification of the water column and its impact on the above listed parameters and pollutant dilution.

10.1.3 Terrestrial Water Quality and Quantity

Describe and evaluate the potential effects of the Project on terrestrial water quality and quantity in surface water, groundwater, and wetlands. Pay particular attention to effects on the interaction of these hydrologic components.

10.1.3.1 Surface Water

Assess the potential impacts of Project-related changes in topography, terrain, and soil cover on surface drainage patterns, recharge areas, and other hydrologic components. Evaluate changes in seasonal flow patterns (including extreme high and low flows) of streams, as well as channel / bed / drainage basin morphology and stability, resulting from surface/groundwater withdrawal, pit dewatering, diversion, and topographic alteration. Evaluate the alteration of sediment load (suspended and bedload) of streams and their destinations. Appraise the impact of seepage and/or accidental atmospheric or aqueous releases on water chemistry and turbidity. Evaluate effects on every freshwater stream whose groundwater supplies originates within the quarry site (even though the stream may surface and flow outside the property).

10.1.3.2 Ground Water

Describe and evaluate the potential impacts of the Project on groundwater quantity and quality through alteration to the groundwater regime(s) and neighbouring regimes by Project-related changes in topography, terrain, and soil cover. Assess groundwater quality changes arising from sedimentation, chemicals, leaching, use of explosives, fuel spills, and quarry dewatering. Provide information on anticipated changes in yield characteristics of aquifers due to Project-related groundwater withdrawal or topographic and terrain changes. Evaluate the potential effects on the stability, yields, and chemical characteristics of existing and future off-site wells by repeated blasting operations.

Assess any alteration of aquifer vulnerability to contamination by atmospheric or surface water pollutants as a result of Project activities. Evaluate the potential of saltwater intrusion or wells running dry through Project-related groundwater

withdrawal or alterations to the groundwater regimes. Assess changes in recharge or discharge characteristics affecting shallow and deep groundwater resources, and groundwater contributions to stream base flows under varying climatic conditions.

10.1.3.3 Wetlands

Assess the potential impacts of the Project on the size, viability, and habitat potential of any wetland on-site or downstream. Evaluate the effects on contributions of impacted wetlands to groundwater recharge potential, to surface flow regulation (stormwater retention, flood control), and to changes in their potential role in water treatment.

Assess the value of the wetlands for paleo-ecological studies.

10.1.4 Climate

Describe and evaluate the potential impacts of the Project on climate by identifying sources, quantities, and frequencies of greenhouse gas (GHG) emissions (carbon dioxide, methane, nitrous oxide, and halocarbons) by on-site activities, as well as land-based and marine transportation related to Project activities, on an annual basis and over the lifespan of the Project. Assess the relative size of the potential GHG emissions from the Project from a regional perspective.

Evaluate how changes in climate could affect the Project, or particular Project components.

10.1.5 Air Quality

Identify the Project activities and components which would be sources of air emissions: for each emission of concern provide estimates including quantity, timing and duration. For normal operational conditions and upsets provide air quality parameters that could be affected by these emissions (e.g., dust, particulates, sulphur oxides, nitrogen oxides, methane, carbon dioxide, carbon monoxide, volatile organic compounds, formaldehyde, ground-level ozone, odour, acid deposition). Provide geographic dispersal patterns for emissions (concentrations and elevations) from the Project site and their variability with climatic conditions. Provide an assessment of the potential health impacts to humans, wildlife and vegetation (short-term and over Project lifespan) related to Project emissions. Consider how aerosol and particulate emissions affect the frequency and intensity of fog and ice fog, and the related impact on day and night visibility.

Discuss relevant provincial and federal air quality standards or guidelines, as appropriate, including their purpose and use in relation to the Project phases.

10.1.6 Noise and Vibration

Describe and evaluate the effects of Project-generated noise and vibration levels by identifying sources and types of variation in Project-related noise and vibration levels, particularly during blasting. Provide information on duration, frequency and levels of noise and vibrations in the atmosphere, subsurface, and the marine water column. Assess the effects of weather and terrain (including seabed morphology) on noise and vibration propagation in the atmosphere, subsurface and the marine environment (water column and seafloor). Provide an assessment of effects of acoustic and vibrational disturbances on fish, marine mammals, wildlife, and birds. Also, evaluate how such disturbances affect individuals / communities and their harvest, commercial and recreational activities, including tourism.

Provide an assessment of the potential health impacts related to Project-induced changes in noise and vibration levels, including potential impacts of sleep disturbance and annoyance. Describe the proximity of the Project to sensitive receptors (e.g., residences, workplaces, fishing grounds, camps, schools, recreational areas, hospitals). Discuss relevant provincial and/or federal noise standards or guidelines, as appropriate, including their purpose and use in relation to the Project phases

10.1.7 Light

Identify sources and types of variation in Project-related night-time light levels by providing information on duration, frequency, and levels of light emissions. Provide an assessment of effects of night-time light levels on fish, marine mammals, wildlife, and migratory birds. Also evaluate how such disturbances impact on individuals / communities and their harvest, commercial and recreational activities, including tourism.

10.2. Biological Environment Impact Analysis

10.2.1 Species at Risk

Consider any change the Project might cause to a listed species, its critical habitat or individual residences, as those terms are defined in subsection 2(1) of SARA. Take account of SARA requirements. Describe and evaluate potential Project effects on species identified in the Act.

Discuss potential Project impacts on species of concern in relation to applicable legislation, policy, management plans, recovery strategies, action plans or land use planning initiatives.

10.2.2 Fish, Invertebrates and Habitat

Describe and evaluate potential Project impacts on VECs related to fish, invertebrates and their habitats, including a consideration of:

- disruption of sensitive life stages or habitat (e.g., spawning and incubation, rearing, refugia, overwintering) including loss of seabed habitat, known sensitive or important sites;
- introduction of non-native species;
- disruption of food resources;
- changes to water quality or quantity;
- distribution or abundance;
- sensitive or important areas or habitat;
- contaminant levels in harvested species that could be changed by the Project;
- fish health and condition;
- blockages to movement;
- blasting;
- dredging or disposal of sediments;
- underwater noise associated with Project activities;
- water withdrawal;
- how Project-related changes in harvest pressures could impact the resource; and,
- document any streams with fish habitats.

Specifically, discuss the duration and geographic extent (distance downstream impacts can be anticipated) of potential impacts in relation to how fish and invertebrate populations and harvest activities could be affected.

10.2.3 Birds and Bird Habitat

Describe and evaluate the potential impacts of the Project on VECs related to birds and bird habitat, including a consideration of:

- disruption of sensitive life stages or habitat (e.g., nesting, rearing, staging, moulting, migrating);
- direct and indirect alteration of habitat (e.g., location of Project facilities, habitat quality) including footprint;
- sensitive or important areas or habitat;
- visual or auditory disturbance, including habitat avoidance in relation to Project facilities or activities and light disturbance;

- bird distribution or abundance; and,
- bird health and condition.

10.2.4 Wildlife and Wildlife Habitat

Describe and evaluate the potential impacts of the Project on VECs related to wildlife or wildlife habitat, including a consideration of:

- direct and indirect alteration of habitat (including its physical extent);
- visual or auditory disturbance, including habitat avoidance in relation to Project facilities or activities;
- disruption of sensitive life stages or habitat;
- wildlife movement patterns, home ranges, distribution or abundance;
- sensitive or important areas or habitat;
- population cycles;
- predatory-prey relationships; and,
- wildlife health and condition.

Specifically, discuss the duration and geographic extent (e.g., distance of noise-related disturbance) of potential impacts in relation to how wildlife populations could be affected.

10.2.5 Marine Mammals

Describe and evaluate the potential impacts of the Project on VECs related to marine mammals and their habitat, including a consideration of:

- disruption of sensitive life stages or habitat;
- disruption of feeding activities;
- distribution and abundance;
- contaminant levels in species that could be changed by the Project;
- marine mammal health and condition;
- sensitive or important areas or habitat;
- migratory patterns; and,
- potential for interaction between marine mammals and ships.

In particular, describe and evaluate the potential effects of dredging, spills, accidents, disposal of sediments and Project-related increases in ambient underwater noise on marine mammals.

10.2.6 Vegetation

Describe and evaluate the potential impacts of the Project on vegetation on land and in the water, including a consideration of:

- alteration or loss of species, or vegetation assemblages that are rare, valued, protected or designated sensitive or important areas or habitat;
- sensitive or important areas;

- introduction of non-native species;
- re-establishment of vegetation (including replanting plans); and
- vegetation control.

10.2.7 Biodiversity

Describe and assess the ways in which the Project might influence biodiversity, through changes in ecosystem and habitat loss; habitat fragmentation and barriers to movement; the recovery capacity of habitats or species; edge effect responses; species distributions; the occurrence of invasive or non native species; polluting emissions to water and air; species of concern; harvest levels; and important habitats.

10.3. Human Environment Impact Analysis

10.3.1 Community Profile

Describe and evaluate the beneficial and adverse effects of the Project on those VECs selected for the human environment, explaining the rationale used. Identify changes to the human, physical and biological environment induced by the Project, and how people and communities could adapt to these changes. Describe and evaluate changes to health and to social and economic conditions that may occur as a result of Project-related impacts to the biological and physical environments.

Identify and take into account the particular needs, interests, and values of various segments of the local populations (e.g., youth, seniors, fishers), and consider how the Project may affect them. In assessing the effects of the Project on fishing and tourism activities, give particular attention to the comparative adverse and beneficial effects on social and economic systems and determinants of human health.

10.3.2 Demographics and Mobility

Describe and evaluate the potential impacts of the Project on demographics and mobility, including a consideration of age distribution, residence patterns, and in/out migration.

10.3.3 Economy

Describe and evaluate the potential effects of the Project (by Project phase) on local, regional, provincial and national economies.

Estimate employment and income for each year of construction and operation; indicate numbers and length of employment, form of employment (full time, part-

time, seasonal), skills category; estimate the proportion of regional, local, and Aboriginal participation. Discuss the extent to which the skills of the available workers match the job requirements; describe the level of interest in Project-related work. Include any hiring practices and policies and any preliminary arrangements already made for labour. Indicate if these provisions will apply to any sub-contractors.

Identify any impacts Project employment may have on the local economy, including any effects on the cost of living or the viability of other industries. Identify local and regional spin-off economic activity from wages and purchases related to the proposed Project.

Consider how Project-related impacts may affect harvested resources or harvest activities and thereby affect household economies and the sustainability of traditional economic activities. Discuss the effect of the Project on land values in the region.

Identify constraints that could affect economic benefits or opportunities. Describe consistency of the Project with goals and objectives identified in provincial, regional and community economic development plans and strategies.

10.3.3.1 Fishing and Harvesting

Identify the predicted effects on the fisheries and/or loss of access to particular fishing grounds due to the Project (e.g., consider the effects resulting from the construction phase and operation of the marine terminal, navigational restrictions during berthing, escape of sediments from retention ponds, contaminated bilge water, invasive organisms in ballast water). Discuss potential damage to fishing gear or vessels, and plans for monitoring and mitigation of those effects. Consider ways in which the Project may help or undermine efforts to restore the health of marine ecosystems to enhance the fisheries.

Describe and evaluate the potential impacts of the Project on fishing and harvesting, including a consideration of changes in harvester access, travel patterns, and costs; disturbance of harvest patterns; or loss or alteration of high-value harvest areas (including changes in response to changes in light, noise, dust, silt); changes in harvest level; changes in the abundance and distribution of harvested resources. Describe consequent impacts on the well-being and income of harvesters from potential losses.

Discuss potential competition between harvesters within and between communities as a result of loss, alteration, or displacement from the land or marine sites due to the Project. Consider changes in the quality of harvested species (e.g., contamination) that would adversely affect their consumption or sale.

Identify the quantity of commercial and non-commercial forest products that would be harvested as a result of the Project.

10.3.3.2 Tourism and Recreation

Describe and evaluate the predicted effects the Project will have on current and projected tourism and recreation activities and opportunities in the region and the province (e.g., whale-watching, bird-watching, kayaking, coastal trail development, tourism-related businesses). Discuss the effect of the Project on the regional strategy of sustainable development through ecotourism. Discuss the effects of the quarry operation on landscape aesthetics and views from land and water. Describe consequent impacts on the well-being and income of local and regional communities from the potential loss of tourism opportunities.

10.3.4 Education, Training and Skills

Discuss the education and training programs required for Project-related employment for each phase, including local and regional training opportunities available; timing and duration of programs, in relation to the Project schedule; which skills and experience gained in the Project workforce could be applied to other available projects or sectors.

Describe any education or training programs that the Proponent would provide or sponsor. In particular, discuss which types of programs could be completed in time to qualify for Project-related employment (in both the construction and operation phases) and which could not. Identify when training would have to start in order to be complete when jobs would be available.

10.3.5 Land Use and Value

Describe and evaluate the predicted effects that the proposed Project will have on existing and planned land and water uses (e.g., changes in aesthetics and/or economic, education, and recreational opportunities caused by the construction, operation and modification of the Project in terms of increased noise levels, lowered air and water quality, alteration of visual and topographic characteristics of the area).

Describe and evaluate the potential effects on existing structures (e.g. building foundations, wells) caused by activities associated with the Project. Discuss temporary and permanent restrictions on land use and water-based activities during construction and operation. Assess effects of the Project on site, local, and regional land values during operation and after decommissioning.

Describe and evaluate how the Project could affect the Bay of Fundy as an important conservation site and world biosphere reserve.

10.3.5.1 Aboriginal Land and Resource Use

Describe and evaluate the effects on traditional and Aboriginal land and resource use from construction activities, the presence of the quarry and marine terminal and associated activities, and after decommissioning and abandonment.

10.3.6 Heritage Resources

Describe and evaluate the potential impacts of the Project on physical and cultural heritage, including a consideration of historic, archaeological, paleontological, cultural and heritage resources; trails and traditional use sites; valued locations and their attributes. Describe proposed measures to preserve, protect, recover or document these resources. Discuss the effects that site grubbing and clearing may have already had on potential heritage resources and identify measures taken to minimize adverse impacts.

10.3.7 Human Health and Community Wellness

Describe and evaluate the potential effects of the Project on human health and community wellness. Consider effects on physical, mental and social health and well being. Address issues of concern about potential changes in the quality of life as a result of the Project. Describe and evaluate potential effects on measures of health (such as respiratory health) that may be affected by the Project.

Consider how Project-related changes in the quality of food affect may affect health and community wellness; characterize possible sources of contaminants, exposure pathways and consumption patterns that may generate health impacts. Describe and evaluate potential health impacts that may arise from changes in water quality and quantity.

Describe and evaluate the effects of the Project on the health and safety of Project workers, and those working in the areas affected by the Project, including the possible effects of any accidents or spills.

Consider any potential effects of air emissions associated with the Project on human receptors within the region (e.g., health effects of dust, nitrogen oxides, volatile organic compounds, carbon monoxide, dioxins/furans, metals). Describe and evaluate any potential effects of Project-generated noise or blast-generated materials on human receptors within the region.

10.3.8 Social and Cultural Patterns

Describe and evaluate the potential impacts of the Project on social and cultural patterns and social organization. Consider effects on traditional lifestyles, values and culture. Consider any effects on patterns of family and community life (such as household and community organization, including the organization of work).

Consider implications of the Project on residents' perceptions of quality of life and sense of place. Describe and evaluate potential impacts on social relations between residents, among generations, and between seasonal and full-time residents, among those who are employed and unemployed, and among those who support and oppose the Project.

Describe and evaluate how Project-related impacts on harvested resources or economic activities such as tourism may affect social and cultural patterns.

10.3.9 Infrastructure and Institutional Capacity

Describe and evaluate the potential impacts of the Project on infrastructure and institutional capacity. Discuss any temporary and permanent changes to infrastructure and services and the capacity of institutions and organizations to deliver those services. Describe measures proposed to reduce the financial burden caused by the Project on infrastructure and institutional capacity or to enhance local and regional resources. Estimate incremental costs to municipal, provincial, and federal governments resulting from the Project.

10.3.10 Transportation

Describe and evaluate the potential effects of the Project on land-based and marine transportation.

10.3.10.1 Land Based

Discuss the predicted effects on local and regional traffic volumes and road conditions, including provincial highways, arterial highways and on-site access roads that will be used throughout the Project. Include information on the potential effects on the areas through which trucks will travel, such as residential or school areas. Address concerns related to the transportation of explosives.

10.3.10.2 Marine Based

Discuss the predicted effects of increased ship traffic on existing marine transportation in the Bay of Fundy and Whites Cove. Assess the risk of potential

conflicts (including navigation restrictions) between marine traffic and Project-related construction vessels, and conflicts between marine traffic and aggregate carriers. Indicate effects according to vessel type, size, route, schedule, and number associated with all components of the Project.

Discuss the risks of disruption of marine traffic through accidents associated with the loading and transport of aggregate, including groundings, fuel spills, and collisions with whales. Consider potential interference with navigation and fishing activities due to presence of the berthing dolphins, mooring buoys and dredged material disposal sites.

10.3.11 Other Undertakings in the Area

Describe and evaluate the predicted effects that the proposed Project may have on other undertakings in the region and the province.

10.4 Summary Table of Impacts

Develop a table that summarizes the identified potential effects of the Project on all components and relationships in the environment.

11. CUMULATIVE IMPACTS

Cumulative impacts may occur when the effects of one project or activity combine with the impacts of other past, present and future projects and activities. Identify and assess the cumulative adverse and beneficial environmental effects of the Project in combination with other past, present or reasonably foreseeable projects or activities in the Bay of Fundy region. Explain and justify the approach and methodologies used to identify and assess cumulative impacts.

The assessment of cumulative environmental effects of the Project must include the following, but may also address other items.

Identify the VECs, or their indicators, on which the cumulative impacts assessment is focused, including the rationale for their selection. Present spatial and temporal boundaries for the cumulative impact assessment for each VEC selected. Emphasize VECs with special environmental sensitivities or where significant risks are involved.

Identify the sources of potential cumulative impacts. Specify other projects or activities that have been or will be carried out that could produce impacts on each selected VEC within the boundaries defined, and whose impacts would act in combination with the residual impacts of the Project.

Evaluate the likelihood of development of other quarry or aggregate operations, by the Proponent or others, that may appear feasible because of the proximity of the Project's infrastructure.

Limit assessment to cumulative impacts on the physical, biological, and human environments that are likely and for which measurable or detectable residual impacts are predicted.

A reasonable degree of certainty should exist that proposed projects and activities will actually proceed for them to be included. Projects that are conceptual in nature or limited as to available information may be insufficiently developed to contribute to this assessment in a meaningful manner. In either case, provide a rationale for inclusion or exclusion.

Analysis of the total cumulative effect on a VEC over the life of the Project requires knowledge of the incremental contribution of all projects and activities, in addition to that of the Project. Include different forms of impacts (e.g., synergistic, additive, induced, spatial or temporal). Identify impact pathways and trends.

Potential impacts on a VEC are not necessarily the result of one project. While a Project-specific assessment of cumulative impacts is not responsible for assessing all external impacts, the impact assessment must consider how a Project-specific effect, or suite of Project-specific effects, would interact with these external factors. Make clear the contribution of the Project to a total potential cumulative effect.

Place potential cumulative Project impacts in an appropriate regional context; consider regional plans, community conservation plans, species recovery plans, management plans, objectives and/or guidelines need in an integrated manner in order to understand the aspirations of people and communities in the region.

When assessing cumulative environmental impacts, identify any changes in environmental effect predictions, any changes in assessing their significance, the effectiveness of proposed mitigation and compensation measures, any response to such changes, and any implications for monitoring and follow up programs.

Prepare a summary table of cumulative impacts.

12. ENVIRONMENTAL MANAGEMENT

In this section of the EIS, describe the approach to environmental management, and outline strategies for monitoring, mitigation, follow-up, and compensation for all VECs. Describe and evaluate residual effects and their significance.

12.1 Management Criteria

Achieving the objectives of sustainable development and environmental protection requires sound environmental management through the course of the Project. Describe plans for environmental management to identify strategies to avoid or reduce adverse effects and maximize beneficial effects through the Project, and to identify commitments for monitoring, follow-up, mitigation, and compensation as required.

Identify and describe proposed environmental monitoring programs in terms of:

Compliance Inspection: the activities, procedures and programs undertaken to confirm the implementation of approved design standards, mitigation, conditions of approval and company commitments, including proposed mitigation.

Monitoring: programs to track conditions or issues during the Project lifespan or at certain times; and

Follow-up: a program to verify the accuracy of impact predictions and determine the effectiveness of mitigation measures.

Detail should be adequate to allow an understanding of the purpose of the programs, how issues, subjects or indicators would be selected, how the programs would function, who would be responsible for their implementation and how reporting would take place. Identify any regulatory requirements relevant to monitoring as well as corporate management plans, programs, policies and quality assurance/quality control measures.

Describe how the results of the programs would be used to refine or modify the design and implementation of management plans, mitigation measures and Project operations. Include the process by which the programs would be developed, the timing of program development and updating and the method(s) by which adequacy and effectiveness of the programs would be evaluated and tracked. Discuss how programs would be managed over the lifespan of the Project: if adaptive management is proposed, explain how it will operate, and the role of the public in the process.

Identify the communities, agencies, boards, regulators, or independent researchers that would be involved during the preparation and management of the programs and any opportunities for partnerships, coordination and participation. Discuss the ways in which holders of traditional knowledge and area residents would be involved in the design and implementation of the programs.

Discuss how monitoring and follow-up results would be communicated back to the communities and public involvement in program refinement (if refinement is required).

12.2 Accidents and Malfunctions

Identify and discuss, for each Project phase and activity, the potential accidents or malfunctions that may occur as a result of the Project, including consideration of risks such as spills of hazardous materials (on land and in water), explosion and/or fire, use of explosives and timing of blasts, transportation accidents, destruction of fishing gear, collision with marine mammals, release of invasive or hazardous species through ballast water. Describe and evaluate the potential impacts of Project-related accidents and malfunctions on the environment, including impacts on the regional economy and social or cultural elements of the environment and human health. Evaluate worst-case scenarios.

Focus particular attention on sensitive components of the environment that could be affected in the event of an accident or malfunction and that could make the consequences major or worse (e.g., proximity of communities, ecosystems of particular value). Where potentially significant impacts could occur as a result of an accident or malfunction, assess the probability of such an occurrence, taking into account weather or external events that present contributing factors.

Identify the contingency and/or response measures that would be in place should an accident occur. Describe company programs regarding facility monitoring, emergency preparedness and environmental management over the lifespan of the Project, by phase. Describe plans for managing the risks associated with the Project (such as uncontrolled releases of substances). Provide sufficient detail to explain the scope of the programs, how they work, how they are developed, the link to any regulatory requirements and the expected components of these programs.

12.3 Environmental Protection

Describe the Proponent's planning for environmental protection to avoid or manage potentially adverse effects of the Project on VECs. Discuss the environmental management system(s) proposed to guide the protection plan that the Proponent will develop. Consider how the results of the environmental impact review process, Project monitoring, and public consultations may guide creation of and revisions to the environmental protection plan during the Project.

Present a draft environmental protection program that includes measures to control, minimize, and mitigate any contaminants (such as heavy metals, suspended solids, hydrocarbons, dust, dioxins, carbon monoxide, oxygen demanding materials or organic contaminants) that may be released or generated by the Project. Describe plans to control air emissions (including

greenhouse gases) from the Project. Describe plans to manage technology / human / wildlife interactions on the site and adjacent areas, and in affected marine environments, and address hazards presented by the Project. Describe plans for ongoing site management and rehabilitation during the life of the Project.

Describe any plans, programs and policies relevant to the design and implementation of standard mitigation practices or monitoring programs that would be followed during the lifespan of the Project. Explain the purpose, scope and function of the programs; describe who would be responsible for their implementation and how reporting would take place. Describe how the results of the programs would be used to refine or modify the design and implementation of management plans, mitigation measures and Project operations. Describe the process by which the programs would be developed, approved and enforced; timing of development and updating; and the method(s) by which adequacy and effectiveness of the programs would be evaluated and tracked.

Identify any regulatory requirements relevant to monitoring as well as corporate management plans, programs, policies and quality assurance/quality control measures.

12.4 Monitoring

Monitoring of the effects of the Project provides important data to ensure that regulatory requirements are met, sustainable development objectives are advanced and adverse environmental effects are avoided or minimized. Sound environmental management relies on complete, accurate, and consistent monitoring of the effects of the Project on the environment, accompanied by swift and appropriate action to avoid, reduce or mitigate the effects, and compensate if necessary.

Describe the proposed approach for monitoring each of the VECs identified. Justify all decisions of criteria and indicators. Describe the monitoring programs to detect effects on the physical, biological, and human environments for all phases of the Project. Describe timing, frequency, methods, and agents responsible for monitoring. (Where it may not be possible to specify the details of a component of a monitoring program, explain why; explain when and how the program will be defined, and when it will be reviewed by public and regulatory agencies.) Include a framework for compliance and monitoring of all effects throughout the life of the Project, including eventual abandonment. Provide information on all proposed monitoring activities and a framework for taking action to respond to monitoring results.

Describe how the results of monitoring programs will be used to refine or modify the design and implementation of environmental protection and management plans. Describe strategies for enforcement, penalties for non-compliance, and

mitigation measures. Identify the role of community members and government agencies in the monitoring process.

Indicate the level (e.g., community or regional, species or ecosystem) and indicators to be used in proposed monitoring programs. Describe the criteria used (including the role played by ecological risk monitoring) in selecting subjects and indicators. Identify specific regulatory requirements for monitoring. Identify the approaches, methods, and consultants to be used to analyze monitoring data.

Describe reporting and response mechanisms, including criteria for initiating a response, the procedures to be followed, and the reasons for selecting these criteria. Describe how monitoring results will be integrated with other aspects of the Project including adjustments for operating procedures and refinement of mitigation measures. Describe procedures to assess the effectiveness of monitoring programs, mitigation measures, and recovery programs for areas disturbed by the Project. Describe sources of funding for all monitoring programs. Describe quality assurance and quality control measures to be applied to monitoring programs.

Provide a table showing all VECs and impacts to indicate where and how monitoring is proposed to manage effects and cumulative effects; indicate any regulatory regimes that apply.

12.5 Mitigation Measures

Describe proposed measures to mitigate any adverse effects and to enhance beneficial effects over the lifespan of the Project that have been identified in the Environmental Impact Analysis and the Cumulative Impact Analysis. Place the highest priority on impact avoidance (e.g., pollution prevention). Impact minimization opportunities may be required when avoidance is not possible; this is less desirable. Compensation should be recognized as a last resort that depends on the acceptability of predicted effects. Evaluate the effectiveness of mitigation measures by demonstrating how they contribute positively to sustainable development objectives.

Identify protection goals and possible mitigation measures for each VEC based on criteria that will include government policies, regulations and standards. For specific VECs, identify any relevant objectives, policies, guidelines, timing restrictions proposed to be followed when carrying out the Project.

Describe proposed measures to mitigate adverse impacts of the Project on the physical, biological and human environment (on ecosystems and communities). Identify measures used to create or enhance beneficial impacts identified over the lifespan of the Project. Identify trigger points when an adverse effect

uncovered by monitoring will result in remedial action, mitigation, or cessation of activity.

Indicate which mitigative measures are proven and which are experimental. Provide any analysis that supports any statements regarding the effectiveness of proposed mitigation measures. Outline proposed rehabilitation and revegetation procedures for the Project site. Include details on any plans for landform design and reconstruction to return the site to a stable and functional configuration, as well as erosion controls. Specifically address the stabilization of settling ponds to a safe permanent state. Indicate which measures mitigate or enhance the impact over the lifespan of the Project.

Identify the implications of policies suggesting 'no net loss of wetlands' and consider the potential for wetlands restoration on the site. Identify relevant policies, management plans or other measures to protect or enhance habitat for fish, invertebrates, birds, marine mammals or other wildlife and their habitat (including timing restrictions or regulations). Describe the proposed methods for mitigating effects on the existing transportation infrastructure.

Describe measures to reduce GHG emissions from the Project through energy efficiency and reduction measures, as well as the use of alternative energy sources. Describe any initiatives taken to register with the Voluntary Challenge and Registry Program, as part of a commitment to reduce emissions of GHG. Identify technologies to be used to minimize gaseous, liquid, and solid emissions of concern and indicate their effectiveness. Identify and describe any policies, guidelines, applicable codes of practice and/or best management practices that are proposed to be followed with respect to Project activities.

Identify proposed methods to mitigate changes to the Project caused by the environment.

Provide a commitments table that summarizes planned mitigation measures and stated company intentions in relationship to identified effects.

Where agreements with the federal or provincial governments will be relied upon as mitigative measures, provide the following information: the impacts which will be mitigated; a general description of the mitigation measure(s); the parties to the agreement; an overview of implementation and monitoring plans for any such agreement.

With respect to mitigation measures to reduce or offset adverse effects on the way of life and well-being of individuals, families and communities most directly affected by the Project, indicate how mitigation would address impacts experienced by residents by age group and occupation. Describe how Aboriginal and community organizations will be involved in the development, application and ongoing evaluation of these measures.

Describe criteria for evaluating the success of mitigation or reclamation measures; indicate when and how this evaluation would be conducted.

12.6 Follow-Up Program

Develop plans for a formal follow-up program pursuant to the *Canadian Environmental Assessment Act* to verify the accuracy of the environmental assessment and the effectiveness of the mitigation measures taken. If the process identifies adverse environmental effects, then the Proponent shall adjust existing mitigation measures or, if necessary, develop new mitigation or compensation measures.

Identify the need for a follow-up program, its objectives and main components. Describe how it will be structured, including enforcement and penalties for non-compliance. Explain which monitoring activities would support the follow-up program by providing relevant information and describe the roles to be played by the Proponent, regulatory agencies, community members, independent researchers or others in such a program. Discuss the sources of funding for the programs; and describe information management and reporting schedules.

Describe how the follow-up programs would verify any predictions of significant adverse effects on the physical, biological, and human environment and the effectiveness of related mitigation. Discuss how the programs could identify or measure how the Project advances the objectives of sustainability and maximizes beneficial impacts in the areas affected by the Project.

12.7 Residual Impacts

Residual impacts are those effects that remain following the application of mitigation measures to avoid or reduce adverse effects. To assist in the characterization of each residual effect, describe direction (i.e., adverse, beneficial, neutral); magnitude; geographic extent; timing and duration; frequency; reversibility; and other social and economic features or implications. Additional descriptors may be used, if explained and supported.

Identify and evaluate significant residual Project-related impacts on any of the physical, biological and human environmental VECs, including ecosystems, communities and the inter-relationships between them. This assessment must provide an explicit, traceable link for each VEC between potential impacts and measures of significance.

Describe and document: how significance was determined (i.e., the process carried out or the methods used); the basis for determining significance, along with documentation for existing thresholds (e.g., stakeholder input, traditional knowledge, standards, guidelines or quantitative risk assessment). Where

professional opinion or experience is the basis for determination of significance, identify the individuals involved along with the assumptions they used to form their opinions.

Both process and criteria for significance can vary among VECs. Therefore, describe specific methods where appropriate. Discussion of residual impacts and significance should indicate how the Project might contribute to sustainable development in the area affected by the Project.

12.8 Compensation

Where other mitigation measures have not fully avoided or sufficiently reduced the adverse environmental effects of the Project, compensation may be necessary as a mitigation measure.

Describe any plans to offer compensation or community benefits to enhance the beneficial effects of the Project. Describe any plans for compensation that would be part of proposed mitigation to address negative or adverse impacts from the Project. Describe mechanisms to be put in place to finance proposed compensation plans.

Describe plans to compensate resource users, property owners, and communities for losses or damage that may occur as a result of the effects of the Project. Refer, where appropriate, to specific requirements under legislation (e.g., Subsection 35.2 of the *Fisheries Act*). The Scoping sessions for reviewing the draft EIS guidelines identified concerns about many potential threats to the people and communities of the region (ranging from worries about groundwater supply to fears about the loss of the fisheries or ecotourism base of the economy). Discuss compensation terms and conditions relating to mitigation measures that would be necessary to address the full range of community concerns about potential adverse environmental effects due to the Project.

Describe consultation activities with communities to discuss mitigation and compensation plans.

13. EIS ATTACHMENTS

Attach appendices and background studies as required to support the EIS.

APPENDIX 1: JOINT PANEL AGREEMENT

AGREEMENT

concerning

**The Establishment of a Joint Review Panel
for the Whites Point Quarry and Marine Terminal Project**

between

The Minister of the Environment, Canada

and

The Minister of Environment and Labour, Nova Scotia

PREAMBLE

WHEREAS the Minister of Environment and Labour, Nova Scotia, has statutory responsibilities pursuant to the Nova Scotia *Environment Act*; and

WHEREAS the Minister of the Environment, Canada, has statutory responsibilities pursuant to the *Canadian Environmental Assessment Act*; and

WHEREAS Bilcon of Nova Scotia Corporation (Proponent) is proposing to construct and operate a basalt quarry, processing facility and marine terminal located on Digby Neck in Digby County, Nova Scotia, which is subject to an environmental assessment under both the *Canadian Environmental Assessment Act* and the Nova Scotia *Environment Act*; and

WHEREAS the Whites Point Quarry and Marine Terminal project (Project) was referred to a review panel in accordance with section 21 of the *Canadian Environmental Assessment Act*; and

WHEREAS the Minister of Environment and Labour, Nova Scotia, may, pursuant to section 47 of the Nova Scotia *Environment Act*, enter into an agreement with another government agency to conduct a joint review and to adopt, for the purposes of the review, all or part of that government agency's procedures for environmental assessment; and

WHEREAS the Minister of Environment and Labour, Nova Scotia, may, pursuant to section 48 of the Nova Scotia *Environment Act*, enter into an agreement with another government agency to provide for a single hearing process; and

WHEREAS the Minister of Environment and Labour, Nova Scotia, and the Minister of the Environment, Canada, have determined that a joint review of the Project will ensure that the Project is evaluated according to the spirit and requirements of their respective legislation while avoiding unnecessary duplication, delays and confusion that could arise from separate environmental assessments; and

WHEREAS the Minister of the Environment, Canada, has determined that a joint review panel should be established pursuant to paragraph 40(2) (a) of the *Canadian Environmental Assessment Act*;

THEREFORE, the Minister of Environment and Labour, Nova Scotia, and the Minister of the Environment, Canada, hereby establish a joint review panel (Panel) for the assessment of the Project in accordance with the provisions of this Agreement and the Terms of Reference attached hereto as an Appendix.

1. Definitions

For the purpose of this Agreement and of the Appendix attached hereto,

“**Agency**” means the Canadian Environmental Assessment Agency.

“**Environmental Impact Statement**” means the document that presents the results of the environmental assessment conducted by the Proponent.

“**Federal Authority**” refers to such an authority as defined in the *Canadian Environmental Assessment Act*.

“**Environmental Effect**” means, in respect of the Project,

- (a) any change that the Project may cause in the environment, including any change it may cause to a listed wildlife species, its critical habitat or the residence of individuals of that species, as those terms are defined in subsection 2(1) of the *Species at Risk Act*,
- (b) any effect of any change referred to in paragraph (a) on
 - (i) health and socio-economic conditions
 - (ii) physical and cultural heritage
 - (iii) the current use of lands and resources for traditional purposes by

Aboriginal persons

- (iv) any structure, site or thing that is of historical, archaeological, paleontological or architectural significance, or
- (c) any change to the Project that may be caused by the environment,

Whether any such change or effect occurs within or outside Canada.

“Follow-up Program” means a program for

- (a) verifying the accuracy of the environmental assessment of the Project, and
- (b) determining the effectiveness of any measures taken to mitigate the adverse environmental effects of the Project.

“Panel” means the joint review panel established by the Minister of Environment and Labour, Nova Scotia, and the Minister of the Environment, Canada, pursuant to this Agreement.

“Mitigation” means, in respect of the Project, the elimination, reduction or control of the adverse environmental effects of the Project, and includes restitution for any damage to the environment caused by such effects through replacement, restoration, compensation or any other means.

“Parties” mean the signatories to this Agreement.

“Project” means the Whites Point Quarry and Marine Terminal project, located near Digby, Nova Scotia, as described in Part I of the Appendix attached hereto.

“Proponent” means Bilcon of Nova Scotia Corporation.

“Report” means the document produced by the Panel which shall contain the recommendations of the Panel pursuant to the Nova Scotia *Environment Act* and the Panel's rationale, conclusions and recommendations, including any mitigation measures and follow-up program, pursuant to the *Canadian Environmental Assessment Act* with respect to the environmental assessment of the Project.

“Responsible Authority” refers to such an authority as defined in the *Canadian Environmental Assessment Act*.

2. Establishment of the Panel

- 2.1.** A process is hereby established for the creation of a joint review panel, pursuant to sections 40, 41 and 42 of the *Canadian Environmental*

Assessment Act, and sections 47 and 48 of the Nova Scotia *Environment Act*.

- 2.2. Nova Scotia Environment and Labour and the Agency will make arrangements for the coordination of joint announcements respecting the joint review of the Project.

3. Constitution of the Panel

- 3.1. The Panel shall consist of three members, one of whom shall be the chairperson.
- 3.2. Each of the Parties will provide a list of three nominees, and at least one nominee selected by each of the Parties will be appointed to the Panel. The Parties will agree on the nomination of one of the three final nominees to be chairperson. The Minister of the Environment, Canada, will appoint the members of the Panel, including the chairperson.
- 3.3. The Panel members shall be unbiased and free from any conflict of interest relative to the Project and are to have knowledge or experience relevant to the anticipated environmental effects of the Project.

4. Conduct of the Review by the Panel

- 4.1. The Panel shall conduct its review in a manner that discharges the requirements set out in the *Canadian Environmental Assessment Act*, Part IV of the Nova Scotia *Environment Act* and the Terms of Reference attached hereto as an Appendix.
- 4.2. All Panel hearings shall be public and shall provide for public participation.
- 4.3. The Panel shall have all the powers and duties of a panel set out in section 35 of the *Canadian Environmental Assessment Act*.

5. Secretariat and Administrative Matters

- 5.1. Administrative, technical, and procedural support for the Panel shall be provided by a Secretariat, and the establishment of the Secretariat shall be the responsibility of Nova Scotia Environment and Labour and the Agency.
- 5.2. The Secretariat shall report to the Panel and shall be structured so as to allow the Panel to conduct its review in an efficient and cost-effective manner.
- 5.3. Following the appointment of the Panel, the Parties shall finalize a budget, agreeable to both Parties, for the review.

- 5.4. Costs associated with the review will be apportioned between the Parties in accordance with a cost-sharing agreement to be finalized following the appointment of the Panel.

6. Record of Review and Report

- 6.1. A public registry consisting of all submissions, correspondence, hearing transcripts, exhibits and other information received by the Panel and all public information relating to the review of the Project shall be maintained by the Secretariat during the course of the review in a manner that provides for convenient public access, and for the purposes of compliance with section 55 of the *Canadian Environmental Assessment Act* and the practices of Nova Scotia Environment and Labour.
- 6.2. On completion of the review of the Project, the Panel shall prepare a Report for submission to the Minister of Environment and Labour, Nova Scotia, and the Minister of the Environment, Canada.
- 6.3. The Report shall include recommendations on all factors set out in section 16 of the *Canadian Environmental Assessment Act* and, pursuant to Part IV of the *Nova Scotia Environment Act*, recommend either the approval, including mitigation measures, or rejection of the Project.
- 6.4. Once completed, the Panel will submit the Report, in both official languages, to the Minister of Environment and Labour, Nova Scotia, and the Minister of the Environment, Canada, and will make it public.
- 6.5. Once the Report is submitted to the Minister of Environment and Labour, Nova Scotia, and the Minister of the Environment, Canada, the responsibility for the maintenance of the public registry, pursuant to the *Canadian Environmental Assessment Act*, will be transferred to the Responsible Authority.
- 6.6. The Responsible Authority shall take into consideration the Report submitted by the Panel and, with the approval of the Governor in Council, respond to the Report. Then, the Responsible Authority shall take one of the courses of action provided for in subsection 37(1) of the *Canadian Environmental Assessment Act* that is in conformity with the approval of the Governor in Council.
- 6.7. The Minister of Environment and Labour, Nova Scotia, shall consider the recommendation of the Panel, and either approve with conditions, or reject the Project.

7. Other Government Departments

- 7.1. At the request of the Panel, federal and provincial authorities having specialist knowledge with respect to the Project shall provide available information and knowledge in a manner acceptable to the Panel.

Subject to clause 7.1 of this Agreement and subsection 12(3) of the *Canadian Environmental Assessment Act*, nothing in this Agreement shall restrict participation by way of submission to the Panel by other federal or provincial government departments or bodies.

8. Participant Funding

- 8.1. Participant funding for the review will be administered by the Agency pursuant to the federal Participant Funding Program.

9. Amending this Agreement

- 9.1. The Parties may amend this Agreement by written memorandum executed by both the Minister of the Environment, Canada, and the Minister of Environment and Labour, Nova Scotia. Subject to section 27 of the *Canadian Environmental Assessment Act*, this Agreement may only be terminated by mutual agreement of the Parties.

In Witness whereof the Parties hereto have put their signatures this _____ day of _____ 2004.

[Original signed on November 3, 2004]

[Original signed by]

Minister of the Environment,
Canada

[Original signed by]

Minister of the Environment and
Labour, Nova Scotia

Terms of Reference for the Joint Review Panel

Part I - Project Description

Bilcon of Nova Scotia, Corporation, is proposing to construct and operate a basalt quarry, processing facility and marine terminal located on Digby Neck in Digby County, Nova Scotia.

Quarrying is expected to take place on 120 hectares of land, with production expected to be 2 million tonnes of aggregate per year. Approximately 4 hectares of new quarry would be opened each year. The land-based quarry operations are expected to be year-round, with aggregate stockpiled for ship loading once per week. Drilling and blasting of basalt rock, loading, hauling, crushing, screening, washing and stockpiling would be done on-site.

Land-based permanent structures would include rock crushers, screens, closed circuit wash facilities, conveyers, load out tunnel, support structures and environmental control structures. Associated construction processes would include the erection of on-land aggregate processing equipment, conveyers and wash-water pumping systems.

Marine facilities would include a conveyor, ship loader, berthing dolphins and mooring buoys. Construction processes for the marine terminal infrastructure would include the anchoring of pile support structures to the basalt rock extending offshore, as well as the construction of concrete caps as dolphins. Approximately 40,000 tonnes of aggregate would be produced for loading each week.

Part II – Components of the Review

1. The Agency and Nova Scotia Environment and Labour shall prepare draft guidelines regarding the scope of the Environmental Impact Statement. The public and stakeholders shall be provided with forty-five (45) days to review the draft guidelines and provide comments to the Agency and Nova Scotia Environment and Labour. Comments received from the public and stakeholders will be provided to the Panel upon its appointment.
2. The Panel will hold scoping meetings in locations determined by the Panel within the area likely to be affected by the Project, or in any area reasonably close to where the Project is proposed to be carried out where appropriate.

3. After taking into account the comments received from the public and stakeholders, the Panel shall issue the Environmental Impact Statement guidelines.
4. The Panel shall require the Proponent to prepare the Environmental Impact Statement in accordance with the guidelines issued by the Panel. The Environmental Impact Statement shall be submitted to the Panel.
5. The Panel shall require the Proponent to distribute the Environmental Impact Statement for examination and comment by the public and stakeholders to determine whether additional information should be provided before convening public hearings. This information shall be made available for public examination and comment for a period of not less than sixty (60) days. Comments made by the public or stakeholders pursuant to this clause shall be filed in writing with the Panel.
6. Written comments received pursuant to clause 5 shall be immediately provided to the Proponent by the Panel. The Proponent shall, as appropriate, provide to the Panel its response to the written comments not later than fifteen (15) days following completion of the period for public examination and comment.
7. Should the Panel identify deficiencies after reviewing the Environmental Impact Statement, and in consideration of any comments received from the public, stakeholders or the Proponent pursuant to clauses 5 and 6, the Panel may require additional information from the Proponent. Any request for additional information shall be issued within fifteen (15) days following the expiration of the period for public examination and comment described in clause 5 or fifteen (15) days following receipt of written comments from the Proponent as described in clause 6, whichever occurs later. The Panel will determine the need, timing and location of any public meetings in connection with clauses 5, 6 and 7.
8. The Panel shall schedule and announce the start of public hearings once the Panel is satisfied that sufficient information has been provided. A minimum of thirty (30) days public notice will be provided prior to the start of the hearings.
9. The Panel will hold public hearings in locations determined by the Panel within the area likely to be affected by the Project, or in any area reasonably close to where the Project is proposed to be carried out where appropriate.
10. The Panel shall deliver its Report to the Parties within ninety days (90) following the close of the public hearings.
11. For procedural matters not specifically addressed herein, the Panel shall be guided by the *Procedures for an Assessment by a Review Panel*, a Ministerial

Guideline issued pursuant to paragraph 58(1)(a) of the *Canadian Environmental Assessment Act*.

Part III – Scope of the Environmental Assessment and Factors to be considered in the Review

The Minister of Environment and Labour, Nova Scotia, and the Minister of the Environment, Canada, have determined that the Panel shall include in its review of the Project, consideration of the following factors:

- a) purpose of the Project;
- b) need for the Project;
- c) alternative means of carrying out the Project that are technically and economically feasible and the environmental effects of any such alternative means;
- d) alternatives to the Project;
- e) the location of the proposed undertaking and the nature and sensitivity of the surrounding area;
- f) planned or existing land use in the area of the undertaking;
- g) other undertakings in the area;
- h) the environmental effects of the Project, including the environmental effects of malfunctions or accidents that may occur in connection with the Project and any cumulative environmental effects that are likely to result from the Project in combination with other projects or activities that have been or will be carried out;
- i) the socio-economic effects of the Project;
- j) the temporal and spatial boundaries of the study area(s);
- k) comments from the public that are received during the review;
- l) steps taken by the Proponent to address environmental concerns expressed by the public;
- m) measures that are technically and economically feasible and that would mitigate any significant adverse environmental effects of the Project;
- n) follow-up and monitoring programs including the need for such programs;

- o) the capacity of renewable resources that are likely to be significantly affected by the Project to meet the needs of the present and those of the future; and
- p) residual adverse effects and their significance.

APPENDIX 2: GLOSSARY AND ACRONYMS

Abandonment: the permanent removal from service of Project facilities.

Adverse Effect: an effect that impairs or damages the environment, including an adverse effect respecting the health of humans or the reasonable enjoyment of life or property.

Agency: the Canadian Environmental Assessment Agency.

Agreement: The Agreement between Canada and Nova Scotia setting up the Joint Review Panel (see Appendix 1).

Bathymetry: The measurement of ocean depths and the charting of the topography of the ocean floor.

Commitments table: A table that identifies the commitments of the Proponent in relation to managing the effects of the Project.

Contingency Plan: a program intended to address malfunctions, accidents or unplanned events that may occur in connection with the proposed Project.

Cumulative Environmental Effect: the additive and interactive effects of the proposed Project in combination with other projects or activities that have been or will be carried out.

Cumulative Impacts: changes to the environment that are caused by an action in combination with other past, present and future human actions. A cumulative impact assessment is an assessment of those impacts. Actions include both facilities and activities.

Day: a calendar day.

EIS Guidelines: the direction provided to the Proponent by the Panel on matters which must be addressed in the Proponent's Environmental Impact Statement.

Environment: the components of the earth and includes

- (a) land, water and air, including all layers of the atmosphere,
- (b) all organic and inorganic matter and living organisms,
- (c) the social, economic, recreational, cultural, spiritual and aesthetic conditions and factors that influence the life of humans and communities, and
- (d) a part or combination of those things referred to in paragraphs (a) to (c) and the interrelationships between two or more of them.

Environmental Assessment: an assessment of the environmental effects of the proposed Project that is conducted in accordance with the Agreement and Terms of Reference.

Environmental Effect: means, in respect of the Project,

- (a) any change that the Project may cause in the environment, including any change it may cause to a listed wildlife species, its critical habitat or the residence of individuals of that species, as those terms are defined in subsection 2(1) of the *Species at Risk Act*,
- (b) any effect of any change referred to in paragraph (a) on
 - (i) health and socio-economic conditions
 - (iv) physical and cultural heritage
 - (v) the current use of lands and resources for traditional purposes by Aboriginal persons
 - (iv) any structure, site or thing that is of historical, archaeological, paleontological or architectural significance, or
- (c) any change to the Project that may be caused by the environment,

Whether any such change or effect occurs within or outside Canada.

Environmental Impact Statement (EIS): the report that presents the results of the environmental assessment conducted by the Proponent.

Federal Minister: the Minister of the Environment of Canada.

Fetch: the extent of ocean over which wind blows to create waves.

Follow-up Program: a program to

- (a) verify the accuracy of the environmental assessment of the proposed Project,
- (b) determine the effectiveness of any measures taken to mitigate the adverse environmental effects of the proposed Project, and
- (c) implement measures to mitigate adverse environmental effects identified in (a) and/or (b).

Habitat: a place or environment where a plant or animal species naturally lives and grows.

Lithology: The description of rocks, in hand specimen and outcrop, on the basis of such characteristics as colour, structures, mineralogic composition, and grain size.

Mitigation: the elimination, reduction or control of the adverse environmental effects of the proposed Project, and includes restitution for any damage to the environment caused by such effects through replacement, restoration, compensation or any other means, and "mitigate" has a corresponding meaning;

Panel: the Joint Review Panel appointed pursuant to the Agreement.

Project: the proposed development described in the Agreement.

Proponent: Bilcon of Nova Scotia, Corporation.

Provincial Minister: the Minister of Environment and Labour of Nova Scotia;

Regolith: a general term for the entire layer of loose, fragmental and unconsolidated rock material, of whatever origin, that nearly everywhere forms the surface of the land and covers the more coherent bedrock.

Residual Effect or Impact: Environmental effect remaining after all mitigative measures have been applied.

Responsible Authority: federal body that is required under CEAA to ensure that an environmental assessment of the proposed Project is conducted.

Secretariat: administrative staff in support of the Joint Panel activities, established under the terms of the Agreement.

Stratigraphy: The arrangement of strata (bedded layers) of sedimentary and volcanic rocks as to geographic position and chronologic order of sequence.

Terms of Reference: Terms of Reference for the Panel, as set out in Appendix 1.

Valued Environmental Components: selected components of the physical, biological and human environments which will be the focus of the environmental assessments.

ACRONYMS

CEAA Canadian Environmental Assessment Act

COSEWIC Committee on the Status of Endangered Wildlife in Canada

EIS	Environmental Impact Statement
NAFTA	North American Free Trade Agreement
SARA	Species at Risk Act
TOR	Terms of Reference of the Panel
VEC	Valued Environmental Component

APPENDIX 3: Guidance Materials

In preparing the EIS, the Proponent should consult the following guidance documents:

Incorporating Climate Change Considerations in Environmental Assessment: General Guidance for Practitioners (November 2003). Available at: http://www.ceaa.gc.ca/012/newguidance_e.htm

Reference Guide: Determining Whether a Project is Likely to Cause Significant Adverse Environmental Effects (November 1994). Available at http://www.ceaa.gc.ca/012/newguidance_e.htm

Reference Guide: Assessing Environmental Effects on Physical and Cultural Heritage Resources (April 1996). Available at http://www.ceaa.gc.ca/012/newguidance_e.htm

Addressing Cumulative Environmental Effects under the Canadian Environmental Assessment Act (March 1999). Available at http://www.ceaa.gc.ca/012/newguidance_e.htm

Reference Guide: Assessing Environmental Effects on Physical and Cultural Heritage Resources (April 1996). Available at http://www.ceaa.gc.ca/017/images/cea25_2e.pdf

Follow-up Programs under the Canadian Environmental Assessment Act (October 2002). Available at: http://www.ceaa.gc.ca/012/archives_e.htm

TERMPOL Review Process (January 2001). Available at: <http://www.tc.gc.ca/marinesafety/tp/tp743/menu.htm>

The Canadian Sediment Quality Guidelines for the Protection of Aquatic Life. Available at: <http://www.ec.gc.ca/CEQG-RCQE/English/Ceqg/Sediment/>

Nova Scotia Pit and Quarry Guidelines (May 1999). Available from Nova Scotia Environment and Labour.

Standards and Process Applied to Provincial Environmental Impact Assessments: Wild Species Priorities, Inventory and Mitigation Standards for Reporting (2004). Available from the Nova Scotia Department of Natural Resources.

APPENDIX 4: Project Map

