From: Josephine Lowry#ns.aliantzinc.ca [josephine.lowry@ns.aliantzinc.ca]
Sent: Tuesday, April 03, 2007 10:54 AM
To: Myles,Debra [CEAA]
Subject: Re: Panel's response

Hi Debra,

I have attached Bilcon's responses to the Panel's Information Requests of February 27th, 2007. As discussed, Bilcon's responses to IR-7 - Blasting and IR-8 - CLC Community Liaison Committee will be forthcoming in due course.

Regards
Josephine

Josephine Monk Lowry
EIS Director
Bilcon of Nova Scotia
902 245-2567
www.bilcon.ca

----- Original Message -----
From: Myles,Debra [CEAA]
To: Josephine Lowry#ns.aliantzinc.ca
Sent: Monday, April 02, 2007 12:10 PM
Subject: RE: Panel's response

Paul

This is to acknowledge receipt of your March 27, 2007 Email.

The Joint Review Panel has been clear about its motivation to move forward with the environmental assessment of the Whites Point Project and will schedule public hearings when it has sufficient information to ensure that the hearings may be conducted in an efficient and effective manner.

With regard to the Panel's February 27th IR-2, Coastal Conditions, I refer you to the EIS Guidelines and the deficiencies identified by Panel members, government reviewers and others in their response to the EIS. Many of those deficiencies remain unanswered and the February 27th IR is a second attempt at recovering information that the panel feels is critical to the review process.

In order to facilitate this process the Panel would appreciate your forwarding the requested response (along with others that remain outstanding) at the earliest possible date.

Debra Myles
Panel Manager
Whites Point Quarry and Marine Terminal Project Joint Review Panel
c/o Canadian Environmental Assessment Agency, 160 Elgin Street, Ottawa, ON K1A OH3
Tel: 613-957-0626 Fax: 613-957-0941
Comments@WPQ-JointReview.ca

From: Josephine Lowry#ns.aliantzinc.ca [mailto:josephine.lowry@ns.aliantzinc.ca]
Sent: Tuesday, March 27, 2007 8:29 AM
To: Myles,Debra [CEAA]
Subject: Re:

000200

Debra,

Thank you for your email dated March 23, 2007 and received March 26, 2007.

We would request that the Panel consider fixing the dates of Public Hearings upon receipt of IRs 1, 2, 3, 4, 5, 6 and 9, provided Bilcon provides responses to IRs 7 and 8 at least 2 weeks prior to Public Hearings.

If the Panel is not prepared to consider this then there seems to be little value in submitting our responses in two sections. I think this is an important issue which must be resolved because we have serious issues with at least one of the questions. We believe that the Panel is asking for information not required at this stage and which would be extremely expensive and time consuming to provide. I refer of course to IR2 – Coastal Conditions. My point with respect to Public Hearings is that if the Panel does not accept our responses to 1, 2, 3, 4, 5, 6 and 9, then there would seem to be little purpose in us dealing with IRs 7 and 8.

I would remind you of my comments during our last telephone conversation. Bilcon would certainly like to follow this process through to the end but Bilcon is not prepared to have this process continue with what we believe are demands for details which add nothing to an environmental assessment process.

I believe that we need to resolve this issue this week so that Bilcon can determine how best to proceed.

Paul Buxton

----- Original Message -----
From: Myles,Debra [CEAA]
To: Josephine Lowry#ns.aliantzinc.ca
Sent: Friday, March 23, 2007 5:04 PM
Subject: RE:

Paul,
Thank you for your note of yesterday which I have discussed with the Panel. The Panel offers the following response and direction:

1. Please submit your response to the Panel's February 27, 2007 information requests #1, 2, 3, 4, 5, 6 and 9 without delay.

2. Please submit your response to information requests 7 and 8 at the earliest possible date and in consideration of the following direction from the Panel.

The Panel requires clear concise overviews of the blasting and CLC information. The purpose is to consolidate the information and not simply to cut-and-paste it into a single document. The overviews are intended to address the confusion and, in some cases, inconsistencies around the blasting and CLC information that has been provided to the Panel to date. Part of the confusion is due to the scattered and repetitive presentation of information in the EIS and response to comments document.

The blasting overview must present the important issues, potential effects, mitigation, etc. as detailed in the Panel's information request. The CLC overview must also link the proposed activities to ongoing project management. The Panel anticipates that overviews with an appropriate level of detail should be less than 50 pages in length, each.

I trust that this response from the Panel will allow you to move forward with providing the required information.

Regards,

Debra Myles
Panel Manager
Whites Point Quarry and Marine Terminal Project Joint Review Panel

c/o Canadian Environmental Assessment Agency, 160 Elgin Street, Ottawa, ON K1A OH3
Tel: 613-957-0626 Fax: 613-957-0941
Comments@WPQ-JointReview.ca

From: Josephine Lowry#ns.aliantzinc.ca [mailto:josephine.lowry@ns.aliantzinc.ca]
Sent: Thursday, March 22, 2007 10:54 AM
To: Myles,Debra [CEAA]
Subject:

Dear Debra,

Further to Mr. Fournier's letter to us of March 19th, 2007 and our telephone conversation of today's date, we can advise as follows:

1. With respect to Panel questions 1,2,3,4,5,6 and 9 I can advise that responses have been prepared and are currently in review.

2. With respect to questions 7 - Blasting and 8 - Community Liaison Committee, we are unclear as to what precisely is required. It is our current intent to extract the references on blasting from the EIS and the Response Documents and rearrange them generally and where possible into the bullets set out in question 7. We are not sure whether you are aware that this could be a 500 page document. With respect to question 8 - Community Liaison Committee, it would be our intent to assemble all the references to the CLC and then to provide some clarification as to how the CLC will be linked to management decision making - through the adaptive management strategy. Again, we believe this would be a 500 page document.

In the interests of timing, perhaps we could forward the responses to the 7 questions referred to in 1 above in the next few days and await further clarification on questions 7 and 8.

Regards,
Paul Buxton

Panel Information Requests – February 27, 2007

1. PROJECT DESCRIPTION

Several new elements have recently been added to the Project Description.

a) Temporary Rock Storage Area

During the construction phase the levelling of the Processing Area will generate ~1,140,000 cubic metres of rock material of which ~400,000 cubic metres will go to the temporary rock storage area. An additional ~375,000 cubic metres is to be stored on-site or shipped as rip-rap.

- *Provide the location of this second temporary rock storage area, showing its footprint and the environmental control structures associated with it.*

- *If additional material is to be shipped as rip-rap, explain how this is possible before the Processing Area has been completed. Will the ship loader and its associated equipment be capable of handling rip rap? Will this material be washed? Will some of this material be shipped by road?*

- *According to the plans provided, the primary rock storage has a footprint of ~8 ha and will have a height of ~40 metres. It will almost assuredly cover the natural drainage that maintains the coastal bog. Explain how adequate flow will be maintained to the bog.*

RESPONSE

The second temporary rock storage area for the approximate 375,000m^3 of rock would be located on-site within the proposed sediment disposal area. The footprint of the second temporary rock storage area would be the same as shown for the sediment disposal area on Plan OP1-R1 and Figure OD-2 & SD-2 contained in the revised Project Description (RPD). The area of the second temporary rock storage area is approximately 8 ha. This area would be used for temporary rock storage until the processing plant is functional. Rock temporarily stored in Sediment Cell 1 would be processed first to accommodate sediment disposal as the plant begins operation for shipment. The environmental control structures shown on Plan OP1-R1 and Figure OD-2 & SD-2, except for the cell divider berm would provide containment.

The use of the sediment disposal area for temporary rock storage should eliminate the necessity for shipment of rip-rap. Should it become necessary or considered desirable to ship some of this material as rip-rap, it would be crushed in a small, portable cruising plant and screened to a maximum size of 8" to a minimum size of 2" with an average size of 5". The

ship loader as designed can comfortably handle this material without modification. It is not anticipated that any of this material will be washed or shipped by road.

The primary temporary rock storage area has an approximate area of 8 ha as shown on Plan OP1-R1 and Figure IR8-1 contained in the RPD. Figure IR8-1 indicates a pipe to be installed to maintain surface water flow to the coastal bog. Further, in response to comments received on the EIS, more definition of how an adequate surface water supply would be maintained to the coastal bog is presented. This is shown graphically on Plan IR2-RPD and Figure IR2-RPD of the Response Document. Further narrative description is contained in response to WP1452 – Joint Review Panel, section 9.2.2 – Aquatic Ecology – On-site Freshwater, pages 2-4, in Volume III of the Response Document. It is Bilcon's intent to maintain appropriate flow into the coastal bog during construction of the primary temporary rock storage area and during construction of sediment pond until watershed reclamation is complete and functional.

b) Sediment Ponds

The consultant's report (CRA) states that the proposed sediment pond configuration will not be able to accommodate the 100 year maximum 24 hr storm event or the 100 year maximum 5 day event.

Provide specific quantitative information on how this problem will be addressed:

- *If emergency drawdown is part of the solution, provide information on the anticipated volume of such releases, the amount of sediment involved, and the environmental effects on the near shore marine environment. Evaluate the effect of such a release on the constructed wetland. Provide estimates of the time needed to complete the necessary emergency drawdown.*

- *If the berm height is to be extended beyond that currently specified, provide the maximum height and a cross-section of its construction, as well as an expert evaluation of its stability.*

- *If the depth of the ponds, below grade, is to be increased, provide definitive information on their construction and how groundwater interaction will be avoided.*

- *If additional sediment ponds are to be constructed, provide their location and capacity.*

RESPONSE

Panel Information Requests – February 27, 2007

Reference is made to pages 11 – 15 of Conestoga – Rovers & Associates (CRA) report entitled "Surface Water Information Summary, Whites Point Quarry, Little River, Digby County, Nova Scotia" February 2007 Ref. No. 821191D(2). The proposed 4m deep sediment ponds have the capacity to accommodate either a 100 year maximum 24 hour storm event or a 100 year maximum 5 day event. Considering the area (9.6 ha) of ponds 1-5, a 1.9m depth of storage would be required to accommodate a 100 year maximum 24 hour storm event or a 2.8m depth of storage required for a 100 year maximum 5 day event. This storage could be realized in addition to the proposed 1m depth allocated for sediment storage in these ponds.

In order to maximize water storage capacity in the ponds, a sediment forebay is proposed as recommended by CRA – see Response to Environment Canada's comment Item #15 paragraph 9.2.1 Terrestrial Ecology. A small sediment forebay is proposed for pond 5. The sediment forebay would be located where the quarry drainage channel outfalls into sediment pond 5. This sediment forebay would be designed to accommodate the 10,300m^3 per year of sediment estimated from the quarry operations. Proposed size of the forebay is approximately 25m x 30m x 4m deep and would require clean-out 4 times per year. The forebay is expected to accommodate a large percentage of the total sediment production and more importantly eliminate the need for the 1m depth previously allocated for sediment storage in ponds 1-5. By reallocating the 1m deep sediment storage, greater water holding capacity will be achieved, thereby reducing the frequency of any required drawdown and volume of water to be discharged into the constructed wetland if a major rainfall event is forecast. By reallocating the 1m sediment storage depth to water storage, the above 100 year storm events could be accommodated under the annual average 0.9m water depth storage without any drawdown.

At various times of the year, monthly average water depth in the ponds will exceed the average 0.9m yearly water depth. During average excess water supply conditions – e.g. January through June, the quarry operating water depth is planned at 2.5m and dependent upon outflow elevation. This is based on the net inflow and demand from the water budget analysis (CRA 2007). During average deficit water supply conditions – e.g. July through October, the quarry operating water depth could be drawn down as necessary for wash water demand and may drop to a low of 1.7m in October.

A 100 year maximum 24 hour rainfall event would generate 125 mm of rainfall. Approximately 70 mm of the 125 mm event could normally be accommodated under the proposed operating schedule during excess supply conditions. The 70 mm of rainfall could be accommodated in a 1m storage depth with .5m freeboard remaining. This means under normal operating conditions of 2.5m depth during excess water supply conditions, the ponds would have to be drawn down approximately .9m if a 125 mm, 100 year maximum 24 hour rainfall event is forecast. During average deficit months with an operating water level of greater than 1.7m, a 100 year maximum 24 hour rainfall event could be stored assuming

some freeboard is utilized. It should be noted that monthly extreme 24 hour rainfall events are generally less than 100 mm and would necessitate limited, less than a 30 mm drawdown during excess water conditions.

It should be noted that during 30 years of data (1971 – 2000) at the Weymouth North weather station one major storm with an extreme rainfall over the 100 year maximum 24 hour event of 125 mm was recorded. This event occurred on June 13, 1968. This event would have occurred when the ponds would be operating during excess water supply conditions. Also, upon review of 126 years of combined data from two Yarmouth weather stations, the most frequent month of occurrence for a 100 year maximum 24 hour event was August and for a 100 year maximum 5 day event was October. Both of these events would have occurred when the ponds would be operating during deficit water supply conditions.

Forecasting of major storm events, especially infrequent 100 year maximum 24 hour rainfall events, can be quite accurately forecast in an Environment Canada 5 day forecast. If a major storm is forecast, the necessary drawdown based on the existing pond levels would begin at least 72 hours prior to the event.

A water depth measuring board would be placed in each pond in order to monitor water depths throughout the year. For example, if the operating level is 2.5m and a major 100 year storm is forecast, the ponds would be drawdown .9m to accommodate the anticipated rainfall.

Based on the lumped average analysis and assuming water level varies in the ponds from 1.7m during deficit conditions and 2.5m during excess water supply conditions, 7,500 and 86,000m^3 would have to be discharged respectively to ensure adequate storage is available for the 100 year 24 hour storm volume expected. Assuming the range of cubic metres above to be discharged into the constructed wetland, the flow rate would range from 462 gpm to 5,280 gpm for a 72 hour draw down period.

It should be realized that the exact amount of available storage in the ponds, and the exact amount of draw down required will vary on any given day.

Environmental considerations regarding the above procedures include the following:

a. Construction of the sediment forebay will practically eliminate the proposed clean-out of sediment ponds 1 – 5. These ponds will not under-go periodic disturbance caused by clean-out operations and be allowed to mature providing a more productive and diverse pond habitat.
b. Any required drawdown discharge, in the event a major storm is forecast, will be drawn from the surface area of sediment pond 1 first which contains the least suspended sediments.

c. Rock check dams are proposed in the constructed wetland to reduce the velocity of any discharge flow.
d. Continuous monitoring of total suspended sediments, pH, and flow is proposed at the outfall of the constructed wetland. This will provide a basis for development of any adaptive management procedures or additional mitigation measures if drawdown releases approach permitted thresholds.

Bilcon intends to follow the above operational procedures in the event a 100 year maximum 24 hour rainfall event is forecast. Considering the above design considerations, the height of the proposed berms remain as previously indicated and the proposed depth of the ponds remain as previously indicated in the EIS, Revised Project Description, and the Panel Response Documents.

2. COASTAL CONDITIONS

The Project and its marine facilities are located on an exposed, unprotected coastline. Extremes of wind, waves, currents, tides and storms surges, as well as their change with climate change over the next 50 years, need to be considered. Evaluate the possible impacts of these extremes on:

- *The integrity of the ship loading facility*
- *The risks involved in docking and mooring a large bulk carrier*
- *The integrity of the environmental structures (constructed wetland, sediment ponds & environmental protection zone) which lie partially or completely beneath the current 10 m contour*

Such data must be available prior to the engineering phase, consistent with the methodology and its importance, already stressed by the Proponent. In addition, the Panel, Environment Canada, Natural Resources, and Partnership for Sustainable Development are on record supporting the view that this information is vital at this stage.

Similarly, the Panel requires site-specific information on normal and seasonal variations in coastal oceanographic conditions, including tides, tidal currents etc. This information is required to evaluate properly potential impacts arising from

- *Normal and accidental sediment releases*
- *Normal and emergency water releases*
- *Probable dispersion patterns*
- *Marine accidents malfunctions and their clean-up during "normal" and extreme conditions*

RESPONSE

Introduction

A Panel information request has been received seeking additional information on the impact of extreme environmental loads on:

- The integrity of the ship loading facility;
- The risks involved in docking and mooring a large bulk carrier;
- The integrity of the environmental structures (constructed wetland, sediment ponds & environmental protection zone) that lie partially or completely beneath the current 10 m contour.

In addition, the Panel has requested site-specific oceanographic information that would enable evaluation of:

- Normal and accidental sediment releases
- Normal and emergency water releases
- Probable dispersion patterns
- Marine accidents malfunctions and their clean-up during "normal" and extreme conditions

General Response

For the most part, the additional information requested by the Panel is typically generated as part of a project's design phase, not the planning phase. Bilcon therefore made the following statement in its response to Item #7 Environment Canada (in Section 7: Revised Project Description, p. 149, February 9th, 2007): "the contractual course of design development would have the requested analyses done by the engineering team undertaking the design of the maritime structures. Realizing that design and construction contracts for the facility will not be awarded until the project receives approvals from environmental authorities, the specific analyses requested are not deliverable at this time."

The oceanographic conditions in the general area of the Project site have been reviewed and presented in Section 9.1.7 (Physical Oceanography) of the EIS (Volume VI). Additional information on oceanographic conditions has been provided in Bilcon's responses to the Panel's Information Requests WP 1452 (in Section 9.1.5 Marine Environments and Physical Oceanography, p. 2, February 9th, 2007). From the information provided Bilcon concludes that the environmental conditions at the Project site do not pose any significant engineering challenges for the design and operation of the proposed docking facility.

The course of project development would have the detailed design work follow an approval in principle from authorities having jurisdiction over the work. The design of the fixed coastal structures at Whites Point will follow a program of study that will provide the site-

specific data requested by the Panel together with any additional input parameters needed for the design. The anticipated pre-design study program relevant to the Panel's request has been outlined in Bilcon's response to Item #7 Transport Canada (in Section 7: Revised Project Description, p. 149, February 9th, 2007). With this, Bilcon is of the opinion that for environmental assessment purposes, it has adequately characterized the existing environment and outlined the next steps that will be undertaken and ensure that the ship loading facility will be designed in compliance with all regulatory and engineering standards and guidelines.

In other areas of Canada projects proceed on this basis with a project approval in principle having 'subject to' clauses to cover the possibilities that data acquisition or risk analyses reveal an issue requiring resolution to the satisfaction of authorities. For example, the Environmental Assessment for the proposed Keltic Petrochemicals Inc. LNG and Petrochemical Plant Facilities received approval based on the Minister's review of the conceptual project design. The approval is subject to conditions such as the additional collection of baseline data for receiving waters and the modeling of their assimilative capacity (approval of 14 March, 2007 pursuant to Section 26 of the NS Environmental Assessment Regulations; http://www.gov.ns.ca/enla/ea/kelticpetro.asp).

The facility planning, design, environmental data acquisition and risk analyses are integrated activities. The responsibility for this work is in the hands of registered professional engineering and environmental specialists working pursuant to statute law including the Engineers Act of Nova Scotia, Canada Shipping Act and many provincial and federal regulations. The professionals undertaking the work will follow best practices for maritime facility design and operational planning on this project.

Integrity of the Ship Loading Facility

It is assumed that "integrity of the ship loading facility" implies the ability of the fixed maritime structures and attendant materials handling equipment to resist environmental and operational loads of a prescribed frequency and intensity. Environmental and operational loads for maritime structures are well understood and methods for determining their magnitude are prescribed in design codes and standards.

At Whites Point, the marine environmental design criteria that will be considered for the structural integrity of the ship loading facility will include wind speed and direction, wave height, period and direction, current speed and direction as a function of depth, frequency and track of extra tropical storms and impact from sea ice and floating debris.

Operational loads that will be considered for the design and analyses required to specify facilities with structural integrity will include forces developed by ship berthing and forces

developed on a berthed vessel by wind, waves and current on the ship fender system and the ship's mooring lines.

The detailed and site-specific environmental data required for this design and engineering work will be obtained through data collection from existing sources and, to the extent necessary, monitoring at the site as outlined in Bilcon's response to Environment Canada (Item #7, Project Description, p 149, February 9th, 2007). Further, Bilcon's engineering team will consult with marine construction contractors as part of the design development process. This is standard practice and done to obtain construction-relevant local knowledge and to ensure that construction work is executable in an efficient and timely manner given the seasonal variation of marine weather.

Design professionals will employ best practices and latest methods in planning and designing a ship loading facility that will have physical integrity to resist all normal and operational load cases.

The Risks Involved in Docking and Mooring a Large Bulk Carrier

In response to the Panel's request on Section 11.2 of the EIS (WP 1452), Bilcon generated additional information concerning accident and malfunction scenarios, potential effects, mitigation measures, and the likelihood and significance of residual effects (Response to WP 1452 on Section 11.2 Accidents and Malfunctions; in Section 11.0 Environmental Management, p.3, Feb 9th 2007). The accidents and malfunctions analysis identified seven scenarios for the marine environment including the possible collision of a vessel with the proposed dock. The analysis involved a screening exercise with the result that the scenario of a vessel colliding with the dock was screened from further consideration as it was deemed to fall into a category of scenarios with one or more of the following characteristics:

- Substances involved are commonly used, their characteristics are well known;
- Quantities of released contaminants are small;
- Adverse effects remain localized and are reversible;
- Circumstances are generally well understood;
- Proven technologies are available for effective containment, clean up and remediation; and
- Project-specific operation, environmental management and contingency plans have proven to provide adequate and effective management tools.

The screening concluded that the potential for adverse environmental effects would be low based on the following considerations:

- Except in the case of a total vessel break up, no materials will be discharged.
- With the use of with double-hulled vessel, the exterior hull can be ruptured without jeopardizing the integrity of safe vessel operations.

- Discharge of vessel cargo (basalt rock aggregate) is not likely.
- Vessel fuel tanks are positioned in safe locations within the interior of the ship. In any event, the bunker 'C" product requires heating to allow the fuel to be moved. In the worst case event of the vessel sinking, the bunker "C' would stay contained within the fuel tanks. The cool water temperature would not permit the bunker 'C' to migrate far, if at all.
- The Marine Diesel Oil (MDO- Petroleum Distillate Fuel) would flow in the case of a tank rupture. In the worst-case scenario, 100 tons of the MDO fuel would be discharged to the environment. In calm seas this can be contained by booms and collected by absorbent materials. In the more likely case of rough seas causing the hypothetical accident, dispersal of the MDO would be extensive particularly in the wave zone near the shoreline. The MDO like all diesel fuel oils will evaporate quickly. The spilled material and any contaminated materials may be hazardous to animal/aquatic life.

Further, the screening decision took into account the implementation of the following mitigation measures and commitments:

- Engage only reputable ship charter operators using in-class vessels.
- Operate and maintain owned vessels to the highest standards of seaworthiness and officer and crew training.
- Enforce strict communications, approach speed and docking procedures.
- As part of the contract conditions, Bilcon will require vessel owners/operators to maintain and enforce spill prevention and emergency plans (Shipboard Oil Pollution Prevention Plan - see example provided in Addendum 4, page 36, EIS, Vol. VII, Section 11.2)
- Environmental Management Plans (EMPs) will be developed and implemented specifically for the quarry's marine terminal. These will include spill prevention and emergency response protocols (see example Spill Prevention Control and Countermeasure (SPCC) Plan provided in Addendum 4 on page 36, EIS, Vol. VII, Section 11.2).
- If MDO is spilled or leaked, actions specified in the emergency response protocols will involve: containment of spill. Removal of all ignition sources and stoppage of flow of spill. In natural environments, seek advice from ecologists. Evacuate all non-essential personnel. Use proper protective equipment. Pads/absorbent material can be used. Comply with all applicable laws. The spilled material and any contaminated materials may be hazardous to animal/aquatic life.
- Potential Treatment and disposal methods include land farming, incineration and land disposal, if permitted.

The EA conclusion that this accident scenario does not result in significant adverse environmental effects is based on the following additional considerations:

Bulk carriers proposed for the trade out of White's Point Quarry will be of Panamax class. Ships of this size typically have beam widths up to 32 metres and lengths up to 240 metres. Displacement tonnages of the vessels are typically in the 60,000 to 75,000 tonne range. These large, modern vessels are equipped with advanced communications, radar, weather forecasting, and sophisticated navigational equipment operated by certified and experienced personnel and do not present a significant hazard for accidental dock collision and or grounding. The navigation route between main shipping channel and quarry terminal is without particular obstacles or other navigational issues. The berthing and mooring of a bulk carrier is a routine practice at port facilities noting that there are hundreds of such berthings every day world wide. Due to the highly valuable shipping assets involved, costly clean up fees and possibly fines for environmental accidents ships are operated with high levels of care and prudence.

At the moment, the Project site is outside any compulsory pilotage area. It is anticipated that the Atlantic Pilotage Authority will assess Bilcon's proposal. This assessment will determine if the area should be a compulsory pilotage area. If not, the assessment will determine on what conditions, if any, vessels will be permitted to proceed to the Project site. If required, a pilot will be involved providing navigation advice to the master of the vessel for the purpose of safely directing and controlling the movement of the vessel through near-shore and inshore waters. This pilotage would minimize risks involved in navigating to and docking and mooring vessels at the quarry site.

Only the most severe weather conditions would interfere with ship operations. In instances when weather is severe and deemed to pose a risk, it is normal for those in control of the vessel to stand off the berth until favourable conditions occur. Certainly, there would be no reason to berth because ship loading may not occur, noting that the materials handling systems for ship loading will likely be inoperable in high winds.

As mentioned above, as a precautionary measure, environmental management plans including emergency response and clean up protocols will be developed for the terminal. In addition, Bilcon will require as part of its contract conditions that vessel owners/operators maintain and enforce spill prevention and emergency plans.

The integrity of the environmental structures (constructed wetland, sediment ponds & environmental protection zone) which lie partially or completely beneath the current 10 m contour.

The environmental structures proposed at the quarry site including the constructed wetland, sediment ponds, and the environmental protection zone that are within the nearshore or foreshore marine environment will be designed taking the oceanographic data and modeling results into account that will be generated during the detailed design and engineering for the dock facility. Erosion protection and flood proofing of those portions of the Project site located along the Bay of Fundy coastline will be engineered based on these data and in accordance with applicable standards and regulations. As mentioned in our general response, these design studies will be awarded once the project receives approvals from environmental authorities. It is envisaged that the design and engineering of the environmental structures will consider the same parameters as the dock designs including wind, wave, current, and littoral processes. Responsibility for the integrity of the coastal structures will be with registered professional engineering specialists working pursuant to statute law including the Engineers Act of Nova Scotia, and all applicable provincial and federal regulations, and best practices for environmental facility design and operation planning in coastal environments.

Site specific information on normal and seasonal variations in coastal oceanographic conditions

For the reasons stated in Bilcon's general response, data on normal and seasonal variations in coastal oceanographic conditions are scheduled to be generated during the detailed design stage. In the absence of such data, Bilcon has evaluated the risks associated with a number of malfunctions and accident scenarios and has developed mitigation and environmental management (including emergency response planning) procedures. Bilcon believes that this information demonstrates that the implementation and operation of the Project is not likely to cause any significant adverse environmental effects. Key considerations related to the specific scenarios listed by the Panel are discussed below.

Normal and accidental sediment releases

The sediment ponds and their function have been described in the Revised Project Description (Section 7: Revised Project Description, p. 77, February 9th, 2007). The ponds will be sized to reduce sediment levels at the final discharge point to acceptable levels under normal operating conditions. As a precautionary measure, additional safeguards have been built into the system to avoid and minimize accidental sediment releases. This includes the provision of water and storage capacity beyond industry standards and an artificial wetland downstream of the pond system for additional retention and "polishing". A control mechanism at the outlet structure will ensure that the discharges can be stopped in case of

any malfunctioning in the ponds. Further, it is proposed that all outflows from sediment retention ponds be sampled weekly for suspended solids and ph and semi-annually for dissolved copper, which is of most concern due to the naturally high copper content of the local basalt rock.

Accidental sediment releases could occur as a result of a breach in the containment berms of the ponds. This scenario of a breach in the berm system at the sediment ponds has been discussed in Bilcon's response to the Panel's information request on the Section 11.2 of the EIS (WP 1452 on 11.2 Accidents and Malfunctions; in Section 11.0 Environmental Management, p.3, Feb 9th 2007). The assessment concluded that such a scenario is very unlikely given the proposed mitigation, management and monitoring measures.

Sediment releases as a result of Bay of Fundy storm surges that could flood a portion of the Project site are also unlikely to occur. As mentioned above, erosion protection and flood proofing of those portions of the Project site located along the Bay of Fundy coastline will be engineered based on site specific oceanographic data and modeling and in accordance with all standards, regulations, and safeguards applicable to facility design and operational planning in coastal environments.

Normal and emergency water releases

With the exception of infrequent releases of storm water collected in the sediment ponds, there will be no other water releases since the quarry will be operating on the basis of a closed loop water system. Emergency water releases are considered an extremely rare event. The ponds will be sized to provide storage capacity beyond industry standards so that emergency water releases would be an extremely rare event. Sediment removal from the ponds will be prescribed in the operational plans for the pond system. The Environmental Management Plan will further prescribe circumstances and approaches to emergency water releases.

Probable dispersion patterns

An analytical assessment of the dispersion of turbidity in a coastal environment can be done using computers. Marine environmental data acquired for engineering purposes will be made available for any modeling of turbidity dispersion undertaken, if considered necessary. As mentioned in the paragraphs above, due to a number of built in environmental protection designs and management features any emergency discharges of water and sediments is an extremely unlikely event. Any turbid water from the upland will be fresh water so if discharged to the sea, this will disperse generally on the surface since the fresh water can be expected to have a slightly lower density than the receiving seawater. Coastal winds and

currents will generally disperse turbidity parallel to the coastal until mixing with non turbid seawater decreases the concentration below the point of detectability.

Marine accidents malfunctions and their clean-up during "normal" and extreme conditions

In response to the Panel's request on Section 11.2 of the EIS (WP 1452), Bilcon generated additional information concerning accident and malfunction scenarios, potential effects, mitigation measures, and the likelihood and significance of residual effects. (Response to WP 1452 on Section 11.2 Accidents and Malfunctions; in Section 11.0 Environmental Management, p.3, Feb 9th 2007) . The accidents and malfunctions analysis identified seven scenarios for the marine environment, some of which involve the potential for oil and fuel spills and discharge of cargo (basalt rock). One scenario addresses the failure of proper exchange of ballast water. All of the scenarios were considered events that are very unlikely to occur and unlikely to cause significant environmental effects given the types of vessel and fuel amounts involved, the proposed operational plans, mitigation measures and emergency response planning (see also discussion above on "*Risks Involved in Docking and Mooring a Large Bulk Carrier*".

Site-specific marine environmental data (e.g., drift patterns) acquired for engineering purposes during the detailed design phase will be used in the preparation of the site-specific operation and environmental management plans (including emergency response and clean up plans).

3. COPPER CONTENT

The average copper content of the of the Upper Flow basalt unit will determine the copper content of aggregate washing residues that will be pumped into the sediment storage area, and, to a large extent, the sediments deposited in the sediment ponds. To date, six samples from the site have been analyzed that show a range from 27 to 230 mg/kg, a mean value of 101 mg/kg, and a large standard deviation of +/- 75 mg/kg. This average exceeds Canadian soil quality guidelines for agricultural, residential/parkland and commercial/industrial uses. The ISQG for marine sediments is 18.7 mg/kg and Bay of Fundy sediments average 19 mg/kg.

Since the Proponent proposes to spread this material for reclamation, and since unknown amounts of it may be released into the near shore marine environment during an emergency release of water from the sediment ponds, statistically greater robustness of the average copper concentration is required. Runoff from the reclaimed areas will not be bermed: an assessment of the environmental impact of elevated copper levels in the reclamation soil should be provided.

RESPONSE

Geochemistry of the Beaver River Till – Basalt Till Facies was conducted by the Province of Nova Scotia – Department of Mines and Energy, 1982. One site investigated was on the Whites Point quarry site, designated 341A, and another site nearby at Whale Cove, designated 342A, indicated 80ppm and 107ppm copper content respectively. Geochemical Summary Statistics for the Beaver River Till – Basalt Till Facies based on five regional samples are presented in Chapter 9.1.4 – Surficial Geology and Soils, pages 32 and 33 of the EIS. Copper values ranged from 80ppm to 218ppm with a mean of 131ppm. (NS-Department of Mines and Energy 1982). It should be noted that the lowest naturally occurring copper background exceeds Canadian Soil Quality Guidelines (CCME, 2006a) for agricultural and residential/parkland (63mg/kg) land uses. Commercial/industrial land use guidelines are 91mg/kg.

To simulate the copper concentration resulting in aggregate washing residues that will be deposited in the sediment disposal area and subsequently used during the site reclamation process, Bilcon had six samples from the on-site geologic cores crushed to similar consistency as the sediments from the aggregate washing. Laboratory analysis indicated a range of 27 to 230 mg/kg of copper and a mean value of 101 mg/kg. It should be noted that these results compare reasonably with the regional geochemical analysis conducted by the Nova Scotia Department of Mines and Energy. These results for the Upper Flow Unit also exceed the Canadian Soil Quality Guidelines as did the surficial geology results. It could therefore be concluded that the Whites Point site has higher levels of naturally occurring copper than the guidelines.

Per the most recent version of the protocol by which the Soil Quality Guidelines were derived (CCME, 2006b):

"The Canadian Soil Quality Guidelines are intended to be used for assessing in-place contaminants in soil. They are not intended for evaluating the quality of soil amendments (e.g., compost, synthetic fertilizers, manures, etc.) and are not directly comparable to quality criteria for these types of materials. It is also not recommended that the soil quality guidelines be used for waste management of fill materials (e.g., slags, foundry sands, mining wastes, etc.). Use of the soil quality guidelines for anything other than their intended purpose should only be done with great care and an understanding of the guideline development process and its relevance to the proposed use."

The protocol also advises:

"Where applicable, the SQGF[1] should also be compared to an acceptable geological (nonanthropogenic) background soil concentration to ensure the final value is not below background levels. The natural background concentration should represent a concentration that is typical of most unimpacted soils in Canada. Where the SQGF is below the accepted geological background soil concentration, SQGTG recommends that the accepted background concentration replace the SQGF generated using this protocol. It should be noted that although the SQGF may be above natural background soil concentrations that are typical of most soils in Canada, there may be specific locations with unusually high natural background concentrations that still exceed the guidelines. In these cases, jurisdictions have the option to set site-specific guidelines that consider the unique geological characteristics of the particular locations."

In many instances, copper concentrations exceed the Soil Quality Guidelines for the indicated land-use categories. However, the protocol and derivation of the guideline must be considered. In this case, the established guideline derivation is quite clear regarding background elevations, especially for copper and zinc, when guidelines are exceeded. If the guideline is exceeded, the accepted background concentration becomes the guideline.

The above rationale is commonly used in water, soil and sediment guideline applications.

It should also be noted that different organisms have different tolerances and optimum copper requirements. Over many years, organisms on the proposed quarry site and in the adjacent marine environment have existed with these naturally occurring copper levels and have (1) adapted and/or acclimated to the higher levels, (2) physiologically regulated copper, or (3) never truly been exposed due to constraints on the bioavailability of copper in the environment. Some organisms in the marine environment such as rock weed, lobster, periwinkle, etc. apparently can thrive under these conditions.

The reclamation procedures as stated in the EIS (7.10 Decommissioning and Reclamation Phase, Pp 51-52) will minimize runoff and copper bioavailability. Stockpiled organics and sediments will be mixed and spread on the area to be reclaimed. The reclamation soil will be amended with agricultural limestone and fertilizer. After incorporation of the required soil amendments, hydro-seeding and selected planting/reforestation will be conducted. An erosion control mix of native grasses and legumes will be seeded and natural regeneration will be allowed to occur. Areas with suitable soil depth will be reforested. Runoff will be minimized through these re-vegetation procedures.

[1] SQGF = final soil quality guideline

The copper content of the combined soil materials will be significantly lower than that of the sediments. The Site soils have a high organic carbon content of 18% (EIS, 9.1.4.2 Analyses, pp. 34) and addition of limestone will raise the pH, both factors that will further reduce copper bioavailability.

Bilcon contends that the use of soils derived from on-site sediments for reclamation purposes is appropriate. The intent of reclamation is to return the landscape to support a native plant community. The use of a soil derived from on-site materials will simulate the native soil and be conducive for native soil organisms. After reclamation, runoff into the marine environment including nutrients, trace elements, sediments and detritus should approach pre-project conditions. This adheres to the objective of an ecosystem approach.

Bilcon believes it is complying with the intent of an environmental assessment to determine effects of the proposed project and activities on the natural and human environments and that the level of investigation of copper to date exceeds investigation efforts for similar rock quarries. At this time, Bilcon believes further investigation regarding copper is excessive and unwarranted. If the Panel deems a greater level of statistical sampling is required to determine the "accepted" background copper concentrations for this quarry site, Bilcon will conduct further investigations during the industrial permitting phase of the project.

4. WATER TABLE/HYDROGEOLOGY

In the Revised Project Proposal figures IR8-1 to IR8-7 present vertical sections through the proposed quarry at different stages of its development. Each figure shows the water table. The response to the Panel's Information Request (WP 1452) states "the well monitoring data collected since September 2005 reinforces this position and Figures IR8-1 to IR8-7 reflect the location of the water table based on all the data collected."

The Panel does not interpret the CRA report as supporting the extrapolations provided in the sections, and requires details on the method the Proponent has used to extrapolate the measurements. Confirmation of the validity of the extrapolations is required.

Only two drilled wells (NS-02-04 & MW-2) at the margins of the proposed quarry area in the first 15 years yield any water table data (MW-6 is compromised and unreliable). The Panel requires more reliable and relevant hydrogeologic data for this area to evaluate the impact of the quarrying and the effectiveness of proposed mitigative measures.

RESPONSE

Please see response to question #5, Groundwater Divide.

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5. GROUND WATER DIVIDE

The CRA report concludes that the topographic (surface water) divide does not coincide with the groundwater divide. The Panel's IR requested the Proponent to "delineate the groundwater divide. If the two do not coincide, re-evaluate the effects on the mining plan and the wells on adjacent properties."
The Proponent is asked to fully address the previous IR in view of the new data provided by CRA.

RESPONSE

In this preliminary model it was assumed that infiltrating precipitation w Jacques Whitford Environment Limited (JWEL) in 2002 developed a preliminary hydrogeologic model for the Whites Point site as the sole source of ground water recharge for the bedrock aquifer. This model assumed that precipitation infiltrates the overburden where it is temporarily stored then slowly released to the bedrock aquifer. The recharge area was considered to approximately coincide with the topographic high for the site and the groundwater was assumed to flow downwards to the southeast and northwest away from the topographic high.

The inferred outcrop of the columnar base of the UFU (upper flow unit) and the UFU- MFU (middle flow unit) contact on the southern flank of the subject property was considered a groundwater discharge in this preliminary model where springs would be expected to occur. Subsequent to this preliminary review by JWEL, Mineral Valuation & Capital Inc (MVCI 2005) with the assistance of Dr. Dan Kontak of the Nova Scotia Department of Natural Resources carried out an extensive on-site investigation and established the location of the UFU and MFU contact. This contact zone is shown on Map 2R1 in Chapter 2 of Bilcon's responses to comments on the EIS. Further in 2005, under the supervision of MVCI, 6 new monitoring wells were drilled to provide further information. In 2006 Conestoga Rovers and Associates (CRA) was contracted to carry out further field investigations in order to answer questions arising from the EIS. CRA provided a revised conceptual hydrogeologic model which assumes that groundwater recharge occurs along the outcrop of the columnar base of the UFU and the UFU-MFU contact. In this conceptual model the water table is interpreted to roughly follow the UFU-MFU contact until, at some point, surface water in the Bay of Fundy influences the groundwater and causes the water table to flatten.

The conceptual hydrogeologic model for the property has been summarized by CRA (2007) as follows:

"Groundwater recharge occurs mainly along the southwest flank of the topographic high on the subject property, as a result of precipitation infiltrating via the columnar base of the UFU and the UFU-MFU contact.

The infiltrating groundwater flows along the path of this contact, or within the MFU (following the dip of the UFU), towards the northeast, in the direction of the Bay of Fundy. Eventually, the influence of the Bay of Fundy results in a flattening of the water table close to the Bay of Fundy and the groundwater moves laterally into the UFU (this suggests some connectivity between the UFU and MFU, at least near the Bay of Fundy.

Lesser recharge occurs along the topographic high and on the northeast flank via precipitation infiltrating into the overburden deposits. Some of this water may be released back to the atmosphere via evaporation and transpiration. Additionally, groundwater flow may occur within the overburden and/or along the overburden-bedrock contact and eventually be discharged to the Bay of Fundy. Limited quantities of the water from the overburden may also migrate downward vertically into the UFU, via local fractures. The latter would be expected to be limited to minor quantities of water due to the massive and impermeable nature of the UFU. If this process is occurring, the water would be expected to eventually reach the columnar base of the UFU and migrate along the UFU-MFU contact as described above.

Discharge would be occurring at the base of the northeast flank of the mountain, either as springs, local surface water expressions or the direct discharge of groundwater to the surface water. Due to the limited number of springs and surface water systems in this area, direct discharge to the surface water is anticipated to represent the major groundwater discharges process".

With respect to the effects on the mining plan as a result of the probable non coincidence of the topographic divide and the groundwater divide, Bilcon notes the following:

1. It is Bilcon's intent to only quarry the UFU since in general terms the rock in the MFU is unsuitable. A cap of the UFU will be left in place over the MFU contact zone.

2. Since the groundwater table is interpreted to roughly follow the UFU-MFU contact, Bilcon does not anticipate intersecting the water table.

3. See also Hansen 2006 "The Proponent does not intend to quarry the MFU, only the UFU. If the Proponent is successful in avoiding the MFU, there is no hydrogeologic reason to believe that this quarry will have significant impacts on the Little River Watershed south of the quarry even though there is a small geologic inter-basin transfer occurring".

With respect to the effect on wells on adjacent properties due to the probable non coincidence of topographic divide with the groundwater divide, Bilcon notes the following:

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1. All drilled wells on adjacent properties identified in the Nova Scotia Department of Environment and Labour's well database and the preconstruction domestic water well survey (CRA 2006) are drilled below the outcrop of the MFU.

2. Bilcon has stated in previous submissions that it is unlikely that quarry operations on the west side of the topographic divide would affect drilled wells on the east side of the topographic divide. The shift of the groundwater divide to the southeast of the location postulated by JWEL, if anything, decreases the risk of an effect to drilled wells on the adjacent properties.

3. Notwithstanding the data gathered and its interpretation, Bilcon has stated unequivocally that it will replace at its sole cost and without litigation any drilled well affected as to quality or quantity within 800 metres of the active quarry area.

In view of the above Bilcon believes that the precise location of the groundwater divide is of academic interest only.

Bilcon assumes that in its application for industrial approval, the Nova Scotia Department of Environment and Labour will determine the level of monitoring required and also the specific arrangements via bonds or cash deposits to ensure that Bilcon's commitment to compensation is secured by financial instruments.

Bilcon would also make further reference to the high degree of vandalism to which Bilcon has been subjected by its opponents during the past five years. Bilcon drilled four core holes, to establish the quality of the rock, which were also anticipated to be used as water monitoring wells - two of these were vandalized in 2002 to the extent that they could no longer be used as monitoring wells.

In order to provide further information to the Panel, Bilcon drilled six additional monitoring wells in 2005. Several of these wells were immediately vandalized and two including MW6 can no longer be used. These acts of vandalism were not childish pranks but were deliberate attacks by adults with heavy equipment to destroy data being prepared for the Panel. The Panel should understand that it is impossible for Bilcon to provide 24 hour security on monitoring wells over such a large area. It is Bilcon's intent to secure the site with fencing at the industrial approval stage. The Panel should also be aware that vandalism was not limited to Bilcon's monitoring wells, but was extended to fencing, environmental control structures, signage, vehicles etc.

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6. FISHING

The Proponent should rectify the omission of information previously requested regarding herring: their distribution and related fishing activities.

RESPONSE

The Atlantic herring (*Clupea harengus*) is an important commercial and ecological fish species of the Gulf of Maine and Bay of Fundy. Herring are a schooling, pelagic (open water) species ranging into nearshore waters of coastal New Brunswick and Nova Scotia. The outer Bay of Fundy provides habitat for herring adjacent to the proposed Whites Point quarry site.

Atlantic herring are fully marine and migrate over great distances to feed and spawn in coastal and offshore spawning grounds. In late summer and early fall, herring aggregate into massive schools and move into coastal waters at various locations in the Gulf of Maine to spawn. The primary spawning grounds for Gulf of Maine herring are in coastal waters concentrated on the Trinity Ledge and Lurcher Shoals off southwestern Nova Scotia near Yarmouth. In the Gulf of Maine, spawning progresses in general from north to south, commencing in the Bay of Fundy and eastern Maine waters in late July or early August and as late as November. Spawning takes place in relatively warm (approximate 10 – 5° C) in salty water. Herring larvae are found throughout the Gulf of Maine and in nearshore waters along the Bay of Fundy coastline. In the spring, the larvae metamorphose into juvenile herring. The young herring now termed "brit" migrate shoreward in dense schools near the surface. Herring that spawn on the southwest coast of Nova Scotia winter in Chedabucto Bay in northern Nova Scotia.

Ecologically, herring's principal food is tiny planktonic (drifting) crustaceans, such as copepods and euphausids. They also consume larvae, eggs, and other organism which are small and can enter their mouths and are primarily particulate feeders ("bite" feeders). Herring are the prey of a number of open-sea predators such as cod, tuna, sharks, dogfish, squid, seabirds, seals and whales. Fishing is the most significant cause of mortality and depending on the stock, between 10 and 50 per cent of the stock are captured each year.

Behaviorally, light, both direct and indirect plays an important role in the lives of fish. The visual organs function during swimming orientation, towards prey, to elude predators, recognizing other individuals of the same species in a school or avoidance of immobile objects. Additionally, light influences a fish's metabolism, maturation, behaviour, and colouration. Light penetration in the water column is dependent on the colour of the light with the longer wavelengths (red, orange, etc.) being absorbed in the first metre of depth while violet light penetrates much deeper. For example, aggregations of brit herring enter shallow bays and inlets where they migrate vertically in the water column in response to light

cycles. They are dispersed throughout the water column during the day and collect in surface waters at night to feed on zooplankton prey.

Locomotor activity of juvenile herring are strongly governed by daily changes in illumination. Peak activity generally occurs after sunrise and before sunset. Maximum locomotor activity takes place at an illumination of about 100 metre-candles, a level close to the natural illumination at the water surface at sunset. Since the locomotor activity of herring is governed by daily changes in illumination, any change in illumination affecting their habitat could result in behavioural changes. Since herring are a surface schooling fish, their susceptibility to changes in illumination are more likely than in mid water column or bottom fishes.

Historically, during the 1950's and 1960's, most Canadian herring were reduced to fish meal or oil. As some world herring stocks declined in the 1970's, demand and price for herring as a food rose, including a Japanese roe market as well as for lobster bait. Prior to the mid 1960's, herring were caught using gillnets, traps or in weirs. In particular, Bay of Fundy weirs have always caught juvenile fish during their summer feeding. During this time, a small fleet of purse seiners operated in the Bay of Fundy. Between 1965 and 1972, catches increased rapidly due to the introduction of a fleet of large purse seiners in the Bay of Fundy. Most of the herring caught in the southwest fishery was caught by purse seiners from 1960 until 1980. As stocks declined, the gillnet and weir fishery became less productive. This is evident in the area of Whites Point where the coastal nearshore weir and gillnet herring fishery has also declined. One active weir remains on the Bay of Fundy side of Digby Neck today. In 1970, the total catch of southwest Nova Scotia stock, excluding the New Brunswick Bay of Fundy fishery for juveniles reached nearly 190,000 t. The catch declined to about 85,000 t per year in 1981 and 1982. The New Brunswick Bay of Fundy fishery which exploits herring schools from several neighbouring stocks is the home of the oldest purse seine fishing and sardine canning industry.

As indicated in a July 30, 2006 letter to the Panel, Connors Bros., A Division of Clover Leaf Seafoods and a primary fisher and processor of herring in New Brunswick and for Nova Scotia herring, indicated the importance of the habitat for herring from Brier Island to Digby. Even though only one active weir remains on the Bay of Fundy in this area, it supplies close to 2,000 mt to Connors Bros. annually. Connors Bros. purse seine fleet has been in existence for many decades and in many years catch close to 50% of their requirement for herring has been taken in this area (Hooper 2006). The manager of Connors Bros. estimated the landed value of herring from the immediate area of Digby Neck presently at between 1 to 2 million dollars per year (Bull 2007). Vessels from Yarmouth also fish this area frequently.

Bilcon recognizes the importance of the herring fishery interprovincially and at the local level in the Bay of Fundy. Throughout the EIS and subsequent documents, mitigation measures have been proposed and are summarized below.

a. Design of the marine terminal allows relatively unobstructed nearshore water flow and pelagic fish passage. Migration routes of pelagic fish such as herring should not be altered.

b. Construction of the marine terminal will result in minimal alteration on marine habitat. These effects have been compensated for in the proposed Fish Habitat Compensation Plan which considers both bottom and pelagic fish habitat.

c. No in water blasting is proposed and all on land blasting will be conducted in accordance with the Department of Fisheries and Oceans "Guidelines for the Use of Explosives in or Near Canadian Fisheries Waters".

d. Lighting that could effect the marine environment will be kept to the minimum as required for marine safety. Scheduling of ship loading is proposed for daylight hours and to occur once per week. Precautions will be taken to avoid direct illumination from lighting shinning on the water surface.

e. On land lighting will be limited to the quarry operating times of 0600 – 2200 hours and will be turned off during night time from 2200 – 0600.

7. BLASTING

Information on blasting is widely dispersed throughout the materials provided. Some inconsistencies have been discovered. In order to properly understand blasting issues as well as to assure currency of information, the Panel requests that the Proponent consolidate all the material on the assessment of blasting into a single document. This document should include, among other concerns, the following topics:

- *known effects of blasting on relevant marine and terrestrial organisms*
- *blasting parameters during construction and production phases (averages and degree of variability)*
- *climatic conditions (fog, rain, snow, thermal inversions, ambient light) under which blasting will not occur and quantification of these conditions (also previously requested by DFO, Environment Canada, & the Panel)*

- *wildlife restrictions on blasting and specific information on their implementation*
- *physical environmental effects monitoring; marine and terrestrial*
- *biologic environmental effects monitoring; marine and terrestrial*
- *nature and monitoring of the initial test blast, refinement of the predictive impact model, duration and of model verification phase, role of the model*
- *mitigation measures related to blasting*
- *listing of conditions imposed by blasting regulations (provincial, federal)*

RESPONSE
To be answered at a later date.

8. COMMUNITY LIAISON COMMITTEE

The role of the CLC remains unclear to the Panel. Material referring to the role of the CLC is distributed throughout the reports received. Consolidate information on the CLC from various documents. Clarify the way in which the activities of the CLC will be linked to management decision-making through the adaptive management strategy.

RESPONSE
To be answered at a later date.

9. REFERENCES

The Panel notes that in recent documents many statements are made and conclusions drawn without proper documentation of the evidentiary sources. Provide a complete and consolidated list of references for the sources used throughout the material.

RESPONSE

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Personal Communication

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7. BLASTING

Information on blasting is widely dispersed throughout the materials provided. Some inconsistencies have been discovered. In order to properly understand blasting issues as well as to assure currency of information, the Panel requests that the Proponent consolidate all the material on the assessment of blasting into a single document. This document should include, among other concerns, the following topics:

- *known effects of blasting on relevant marine and terrestrial organisms*
- *blasting parameters during construction and production phases (averages and degree of variability)*
- *climatic conditions (fog, rain, snow, thermal inversions, ambient light) under which blasting will not occur and quantification of these conditions (also previously requested by DFO, Environment Canada, & the Panel)*
- *wildlife restrictions on blasting and specific information on their implementation*
- *physical environmental effects monitoring; marine and terrestrial*
- *biologic environmental effects monitoring; marine and terrestrial*
- *nature and monitoring of the initial test blast, refinement of the predictive impact model, duration and of model verification phase, role of the model*
- *mitigation measures related to blasting*
- *listing of conditions imposed by blasting regulations (provincial, federal)*

RESPONSE

Blasting is a routine activity associated with the quarry operation that has the potential to interact with a number of VECs, including many of the socio-economic, terrestrial and aquatic environments. In accordance with the EA Guidelines and standard practice in EAs, the EIS has been organized by VEC. Where applicable, for each VEC the effects of blasting have been analyzed, mitigation measures developed, and the residual effects evaluated. Another approach may have been the organization of the text by Project activity such as blasting, shipping, vegetation clearing, etc. Bilcon did not follow this approach in order to comply with the TOR.

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In response to the Panel's request, to consolidate the material on the assessment of blasting into a single document, Bilcon has followed two approaches. All text from the EIS and all Information Requests (Panel, government agencies, interest groups and general public) that discuss "blasting" have been extracted from the EIS and Bilcon's response document of February 9th, 2007 and consolidated into one document. An electronic copy of this document will be provided to the Panel under separate cover at the Panel's request. In its second approach, Bilcon has assembled the following text on the issues for which the Panel requested additional information:

- Known effects of blasting on marine and terrestrial organisms;
- Blasting parameters;
- Climatic conditions;
- Wildlife restrictions;
- Physical environmental effects monitoring;
- Biologic environmental effects monitoring;
- Nature and monitoring of the initial test blast;
- Mitigation measures; and
- Conditions imposed by blasting regulations.

The paragraphs below briefly summarize key information on each one of these issues.

1 Known effects of blasting on marine and terrestrial organisms

The proposed blasting activities have the potential for affecting a number of VECs. Table 1, presented at the end of this response text lists the VECs for which a potential for direct effects has been identified. Table 2 below provides references to discussions of effects on marine and terrestrial organisms. The EIS provides extensive information on these issues. Rather than repeating the information, a bullet point listing of the effects addressed in the EIS is provided below.

Table 2:
Discussion of Effects of Blasting on Terrestrial and Aquatic Organisms in the EIS

VEC	Discussed in EIS Volume and Section	Page	Comments
Terrestrial Ecology			
Wildlife including resident birds, mammals, reptiles	Volume VI; Section 9.2.1.2 (Analyses)	Page 31	Some startle behaviour can be expected in wildlife using habitat adjacent to quarry property; no further discussion of specific blasting

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VEC	Discussed in EIS Volume and Section	Page	Comments
			effects on wildlife due to: • Infrequent occurrence (about one explosion every one to two weeks); • Short duration (less than 1 second); and • Location (within cleared quarry zone)
Migratory birds	Volume VI; Section 9.2.1.1.1.3 (Flora and Fauna)	Page 25 (Migratory Birds); Page 26 (Migratory Land Birds at Risk);	Some startle behaviour can be expected in migratory birds using habitat adjacent to quarry property; further discussion of specific blasting effects on migratory birds for same reasons as listed above.
Aquatic Ecology - Freshwater			
Fish habitat and species	Volume VI; Section 9.2.2 (Aquatic Ecology – On-site Freshwater)	Page 43	No specific discussion of blasting effects on freshwater fish due to: • Lack of freshwater fish habitat on-site • General discussion of sudden changes in hydrostatic pressures on fish covered under Section 9.2.9.1
Aquatic Ecology – Marine			
Marine fish habitat and species	Volume VI; Section 9.2.9 (Fish Habitat); Section 9.2.9.1	Page 112	General discussion of effects of sudden changes in hydrostatic pressures on fish (valid for marine and freshwater): • Lethal damage • Sub-lethal damage • Damage to incubating eggs • Behavioural changes
Marine mammals	Volume VI; Section 9.2.11 (Blasting – Marine Mammals); 9.2.11.1 (Research); 9.2.11.2 (Analysis) – Marine Mammals)Blasting – Marine Mammals)	Page 118 Page 121 Page 122	• Possible lethal effects • Auditory damage • Behaviour changes

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VEC	Discussed in EIS Volume and Section	Page	Comments
Lobster	Volume VI; Section 9.2.10 (Blasting – American Lobster) Section 9.2.10.1 (Research); 9.2.10.2 (Analysis)	Page 115	• Behaviour changes • Production of triploid eggs
Waterbirds	Volume VI; Section 9.2.12 (Blasting - Waterbirds)	Page 126	• Physiological effects on auditory system • Other physical damage (ear drum rupture; lung haemorrhage, liver and kidney damage)
Marine Species at Risk (marine fish, marine mammals, marine reptiles)	Volume VI; Section 9.2.5 (Fish – Endangered); Section 9.2.5.2 (Analysis) ; Section 9.2.5.5 (Impact Statements; IBOF Salmon – Blasting);	Page 98	Focus of discussion is on understanding of iBoF migration and avoidance of interaction with Project; Discussion on effects of sudden changes in hydrostatic pressures on fish in Section 9.2.9 (Fish Habitat) equally apply;
	9.2.11 (Blasting – Marine Mammals); 9.2.11.1 (Research); 9.2.11.2 (Analysis) – Marine Mammals)Blasting – Marine Mammals)	Page 118 Page 121 Page 122	Statements on Marine mammals equally apply.
	9.2.8 (Marine Reptiles – Endangered Species); 9.2.8.1 (Research); 9.2.8.2 (Analysis)	Page 109 Page 110	No information exists on effects of blasting on marine reptiles; text focuses on discussion of potential for Project activities to contribute to known threat factors

2 Blasting parameters

The size and configuration of the blast holes and weight of explosives will vary depending on

- Type of explosive used;
- Production requirements;
- Time of year;
- Proximity to Bay of Fundy;

- Proposed set backs from:
  - Fish habitat;
  - Marine waterfowl;
  - Marine mammals;
  - Marine species at risk; and
  - Adjacent residences.

Blast geometry will vary depending on production and site location. Pre-blast surveys will be conducted in accordance with the requirements set forth by NSDEL (see also discussion under Item 6 below). Blasting will not be conducted during specific atmospheric conditions (see discussion under Item 3 below).

3 Climatic conditions

Blasting is not proposed:

- During precipitation (rain or snow) events;
- During the presence of blast-site fog conditions;
- Between the hours of 1600 and 1100; and
- If a thermal atmospheric inversion is present at the site as identified by Environment Canada Weather Service.

Bilcon is not aware of any accepted quantitative criteria/thresholds regarding climatic conditions versus blasting. Bilcon intends to employ certified, licensed blasters to conduct blasting activities at the Whites Point quarry. Industry blasters generally rely on qualitative data from both primary (on-site) observation and secondary (weather service) data to decide whether or not to blast under prevailing climatic conditions. This approach adheres to normal industry practice and relies on qualitative professional judgement. Professional judgement is recognized as an accepted practice in environmental decision making especially when accepted thresholds do not exist.

Further, Bilcon intends to adhere to the proposed performance guideline criteria established by the NSDEL and DFO for blast concussion and ground vibration. As prescribed by the blasting protocol, each blasting event will be recorded. This will include a record of climatic conditions and of the blast design. These records, together with monitoring of sound levels and ground vibration at the site perimeter and various under water locations will build a data base, which will help to determine the site-specific relationship between weather conditions and effect levels. The database will provide information upon which to refine and base future blasting activities.

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4 Wildlife restrictions

Wildlife restrictions on blasting have been proposed for:

- Marine mammals (Whales, porpoise and dolphins, seals);
- Marine species at risk (fin, blue or North Atlantic right whales, iBoF salmon, Leatherback Turtle); and
- Waterbirds (marine).

Specifics are listed in Table 1 in context of mitigation and monitoring measures.

5 Physical and biologic environmental effects monitoring

A comprehensive monitoring program has been proposed to verify the predicted effect levels and to confirm the effectiveness of the proposed mitigation measures (Bilcon's response document of February 9th 2007, Section 11.0 Environmental Management Table 1: Follow-up and Monitoring Programs – Summary, p.48ff). A summary of the proposed monitoring directly relevant to blasting is presented below in Table 1

6 Nature and monitoring of the initial test blast

Bilcon intends to conduct and monitor an initial test blast. The parameters of the initial blast would be the same as those modeled. Four monitoring locations from the detonation site are proposed in the marine environment.

- In the tidal zone at the waters edge (high tide)
- In the near-shore waters 118m from the detonation site
- In the near-shore waters 164m from the detonation site, and
- In off-shore waters at the edge of the North Atlantic right whale conservation area

Three monitoring locations from the detonation site are proposed in the terrestrial environment:

- At the nearest residence;
- Adjacent to the quarry property line; and
- On-shore at Whites Point.

The intent of conducting and monitoring the initial blast is to determine the accuracy of the predictive models using actual site conditions. Based on actual site monitoring results,

refinements of inputs into the mathematical models would be made. These refinements would be used as a basis for future blast designs.

Bilcon proposes a one-year (four season) marine environment verification period to be conducted during quarry site preparation and construction. Bilcon's research and monitoring commitment for the one-year verification period follows (as presented in Bilcon's response document (February 9th 2007, Section 9.1.7 Noise and Vibration, p.16):

1) If the results from the initial blast monitoring validate the predicted results, Bilcon proposes calibrated blast sound measures in near and far field locations during the first year of construction.

    - Measure the underwater blast sound levels at the edge of the tidal zone, and at 170m, 500m, 1000m, 2500m and at the margin of the right whale conservation area. This monitoring would be conducted during the first year of construction over 4 seasons.
    - Schedule the first blasting shot prior to or after right whales are expected to be present.
    - Marine mammal monitoring by trained observers should occur prior to and during blasting, as proposed, but the observer should use at least 7x50 binocular on a pedestal to ensure the ability to better detect marine mammals at greater distances.

2) Visual observation of seal behaviour before, during, and after construction blasting – especially of seal aggregations, i.e., during seal pupping.

3) Testing of effectiveness of visual observations methods at 2500m from the blast site including determination of the average site visibility conditions.

4) Consideration of opportunities to link up with other research initiatives, e.g., university research

A similar one-year (four season) terrestrial verification period is proposed to verify application of the terrestrial predictive model.

The role of the model is to confirm the effectiveness of the proposed mitigation measures and to provide data for future blast designs. Specifically, by confirming the degree of accuracy of the DFO and the CONWEP models using actual on-site blast monitoring. If on-site blast monitoring verifies the accuracy of the models, this data would be used as a basis for future blast designs. If data indicates mitigation measures are not as effective as expected, adaptive management options would then be considered.

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7 Mitigation measures

A series of mitigation measures have been developed for implementation during the construction, operation and decommissioning/abandonment phase of the Project. These mitigation measures have been presented in Bilcon's response document of February 9th 2007 (Section 11.0 Environmental Management Table 1: Follow-up and Monitoring Programs – Summary, p.48ff). A summary of the proposed mitigation directly relevant to blasting is presented below in Table 1.

8 Conditions imposed by blasting regulations

Regulations and guidelines that are directly relevant to the use of explosives near fisheries include:

- Wright, D.G., and G.E. Hopky.1998. Guidelines for the Use of Explosives in or Near Canadian Fisheries Waters (prepared for Canadian Department of Fisheries and Oceans); and
- NSDEL. 1999. Pit and Quarry Guidelines.

Bilcon is committed to operate the Whites Point Quarry in accordance with the provisions and guidelines established by these documents. Table 3 outlines key requirements/ conditions together with information on how Bilcon proposes to meet these stipulations.

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Table 3:
Summary – Relevant Key Requirements of Provincial and Federal Conditions Pertaining to the Use of Explosive

Guideline	Key Requirements/ Recommendations/ Condition	Bilcon Proposal
Guidelines for Use of Explosives in or Near Canadian Fisheries Waters		
Separation distances	No explosives to be detonated within 500m of any marine mammal	Bilcon will use a separation distance of 2500m for marine mammals at risk and 500m for all other marine mammals; initial blast monitoring and model verifications will be used to adjust the distances if required.
Peak particle velocity	No explosive is to be detonated that produces, or is likely to produce a peak particle velocity greater than 13mm/s-1 in a spawning bed during the period of egg incubation.	The CONWEP Model predicts 13mm/sec at a range of 73 m, 4.9 mm/sec at a range of 118 m, and 2.5 mm/sec at a range of 164 m.
Instantaneous pressure change	Maximum 100 kPa in nearest water column	CONWEP model predictions: 25 kPa in nearest water column; initial blast monitoring and model verifications will be used to adjust the blast design if required.
Nova Scotia Pit and Quarry Guidelines		
Separation distances for quarry operations	No person responsible for the operation of a quarry shall permit any blasting on site to exceed the following limits: A. 30 m of the boundary of the public or common highway unless the person has written consent from the Department of Transportation and Public Works; B. 30 m of the bank of any water course or the ordinary high water mark; C. 800 m of the foundation or base of a structure	Included in Project design

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Guideline	Key Requirements/ Recommendations/ Condition	Bilcon Proposal
	located off site. Structure includes but is not limited to a private home, a cottage, an apartment building, a school, a church, a commercial building, a treatment facility associated with the treatment of municipal sewage, industrial or landfill effluent, an industrial building or structure, a hospital, nursing home etc.* D. 15 m of the property boundary when a structure on the abutting property is not involved. *NOTE: the separation distance is measured from the working face and point of blast to the foundation or base of the structure. This distance can be reduced with written consent from all individuals owning structures within 800m.	
Blasting	Concussion (Air Blast) 128 dBA within 7m of nearest structure not located on the property where the blasting occurs or other locations as directed by the Minister or Administrator.	Blast design to ensure that levels of concussion remain well within guideline; Initial blast monitoring will be used to adjust the blast design if required.
	Ground Vibration 0.5 in./sec. (12.5mm/s) Peak Particle Velocity measured below grade or less than 1 m above grade in any part of the nearest structure not located on the property where the blasting occurs.	Blast design to ensure that levels of ground vibration remain well within guideline; Initial blast monitoring will be used to adjust the blast design if required.
	Monitoring of concussion and ground vibration.	Included in monitoring program.
	No blasting on Sunday, on a statutory holiday prescribed by the Province, or on any day between 1800 hours and 0800 hours.	Blasting to be limited to 1100 and 1600 hours.
	Technical blast design prepared by a qualified person who ensures that ground vibration and air concussion limits (see above) are met.	Bilcon will contract certified, licensed blaster.
	Pre-blast survey of all structures within 800m of point of blast.	Included in project design.

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Guideline	Key Requirements/ Recommendations/ Condition	Bilcon Proposal
	No blasting if thermal inversion is anticipated.	Included in Blasting Protocol; responsibility of implementation with contracted blaster.

Table 1: Blasting – Environmental Effects, Mitigation, Monitoring

	Relevant VECs Mitigation and Monitoring Measures	Socio-Economic – Property Value; Quality of Life	Noise and Vibration	Terrestrial Ecology Migratory birds	Aquatic Ecology - Freshwater Fish habitat and species	Aquatic Ecology – Marine				
						Fish habitat and species	Marine mammals	Lobster	Waterbirds	Marine Species at Risk
1	**Blast frequency and design:**									
	• Infrequent blast frequency: approximately once every two weeks during production for a duration of less than one second per blast event	•	•	•	•	•	•	•	•	•
	•									
2	**Consideration of Climatic conditions:**									
	• To minimize sound propagation blasting will not be conducted during times of o thermal inversion o foggy, cloudy or overcast days	•	•	•			•		•	•
3	**Set back distances:**									
	• No blasting within 800 m of residential structures not located on quarry property without written permission of the property owner	•								
	• Adherence to 3x designated setback indicated in "Guidelines for the Use of Explosives in or Near Canadian Fisheries Waters" from the blast to fish habitat during times of the year when inner Bay of Fundy Atlantic salmon could be present in these coastal waters (May to October)									•
	• Blasting as close to low tide as possible to maximize setback distance					•	•	•	•	•
	• No blasting if **marine mammal species at risk** (fin, blue or North Atlantic right whales) observed within 2500m of the detonation site						•			•
	• No blasting if **marine mammals** (whales, porpoise or dolphins) are observed within 500m of the detonation site						•			
	• No blasting if **seals** are observed within 170m of the detonation site						•			
	• No blasting if **water birds** are observed within 170m of the detonation site								•	

	Relevant VECs Mitigation and Monitoring Measures	Socio-Economic – Property Value; Quality of Life	Noise and Vibration	Terrestrial Ecology Migratory birds	Aquatic Ecology - Freshwater Fish habitat and species	Aquatic Ecology – Marine				
						Fish habitat and species	Marine mammals	Lobster	Waterbirds	Marine Species at Risk
	• No blasting if **Leatherback turtle** is observed within 2500m of the detonation site									•
4	**General noise abatement**									
	• Maintenance of a 30m wide (minimum width) vegetated environmental preservation zone around the quarry perimeter to further reduce sound levels by absorption	•	•	•			•		•	•
5	**Compliance with Regulatory Guidelines and Bilcon Protocols**									
	• Noise and vibration from blasting will meet the requirements set forth in the NSDEL "Pit and Quarry Guidelines"	•	•	•	•	•	•	•	•	•
	• Bilcon of Nova Scotia Corporation's Blasting Protocol	•	•	•	•	•	•	•	•	•
	• DFO Guideline for the Use of Explosives in or Near Canadian Fisheries Waters		•		•	•	•	•	•	•
6	**Other**									
	• Application of passive acoustic technology for marine mammal detection and / or deterring devices (if proven and approved by DFO)						•			•
	• Consideration of new information on the protection of Species at Risk (e.g., results of Allowable Harm Assessment for right whale; recovery strategy for iBoF salmon) throughout the life of the Project; implementation into management if feasible									•
	• Regular consultation with regulatory agencies to ensure Project remains in compliance with SARA									•
	• Periodic training of marine mammal observer (s)						•		•	•
	• Coordination during initial and subsequent one year monitoring phase with DFO on details of monitoring program for CONWEP model verification and finalization of safety zone distances					•	•	•	•	•

	Relevant VECs **Mitigation and Monitoring Measures**	**Socio-Economic** – Property Value; Quality of Life	**Noise and Vibration**	**Terrestrial Ecology** Migratory birds	**Aquatic Ecology - Freshwater** Fish habitat and species	**Aquatic Ecology – Marine**				
						Fish habitat and species	Marine mammals	Lobster	Waterbirds	Marine Species at Risk
	• Discussion of need and options for adjustment of operation and mitigation approaches with CLC, if blasting-related issues are identified	•	•	•	•	•	•	•	•	•
7	**Monitoring**									
	• Concussion and ground vibration levels at site perimeter	•	•	•						
	• Sound levels at site perimeter	•	•	•						
	• Underwater blast sound levels (CONWEP model verification)					•	•	•		•
	• Underwater background noise and vessel arrival noise levels for assessment of cumulative effects with blasting					•	•	•		•
	• Recording of visual observations: fog, cloud cover, ceiling, visibility; recording of EC weather service predictions for presence of inversion	•	•				•		•	•
	• Testing of effectiveness of observation methods; adjustment of work boat usage if required						•		•	•
	• Monitoring of an initial blast is proposed to verify modeling procedures with results from this initial blast being used to further define mitigative setback distances from the detonation to a marine mammal									
	• Monitoring of complaint records (complaints from residents)	•	•							
	• Marine mammal behaviour in particular observation of seal colony (incl. video documentation) in consultation with DFO						•			•
	• Presence of marine mammals and Leatherback turtle prior to blasting: o Routine inspection **from work boat** within 2500 m of project site during morning hours of blast event o Inspection **from work boat** within 2500 m of project site before blasting event during times of poor visibility (rough waters)						•			•

	Relevant VECs **Mitigation and Monitoring Measures**	**Socio-Economic** – Property Value; Quality of Life	**Noise and Vibration**	**Terrestrial Ecology** Migratory birds	**Aquatic Ecology - Freshwater** Fish habitat and species	**Aquatic Ecology – Marine**				
						Fish habitat and species	Marine mammals	Lobster	Waterbirds	Marine Species at Risk
	○ One hour before blasting event **from observation station on ship loader**									
	• Whale sightings as reported by Fundy Traffic and others (e.g., tour boat operators						•			•
	• Monitoring/auditing of Bilcon staff education and training related to the blasting protocol and associated environmental mitigation measures	•	•	•	•	•	•	•	•	•

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8. COMMUNITY LIAISON COMMITTEE

The role of the CLC remains unclear to the Panel. Material referring to the role of the CLC is distributed throughout the reports received. Consolidate the information on the CLC from various documents. Clarify the way in which the activities of the CLC will be linked to management decision-making through the adaptive management strategy.

RESPONSE

In response to the Panels request for consolidated information on the role of the CLC, Table 1 (below) has been generated. The table provides a description of such aspects as the CLC's objectives, role, membership, and link to other management tools and activities of the proposed Project. The information has been compiled from the various sections of the EIS Report as well as responses provided by Bilcon to previous Information Requests (February 9th, 2007). Supplementary new information is also included in order to further clarify Bilcon's vision for the CLC and Bilcon's commitment to on-going dialogue, public involvement and transparency throughout all Project phases.

It is of note that the following will serve as a draft Terms of Reference for the establishment and operation of the CLC. Finalizing the TOR will occur during the early stages of the CLC's work and will involve consultation and input from the CLC itself.

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Table 1: Community Liaison Committee (CLC)

#	Issues	Description	Documented in

	Objectives	The CLC is intended to be an on-going advisory body to Bilcon as the quarry operator and to provide a mechanism for Bilcon to:
		• Provide an ongoing opportunity for consultation between Bilcon and the residents of the area potentially affected by the Project on the
		  o Final design;
		  o Construction;
		  o Operation; and
		  o Decommissioning and abandonment.
		• Consult with the residents of the area on
		  o Issues related to the potential, actual and perceived environmental effects of the Project during the various project phases;
		  o The effectiveness of the mitigation measures;
		  o Options for adjustments of mitigation measures and environmental management practices (if required).
		• Present monitoring reports and results of environmental audits to the public and to discuss options for improvement.
		• Establish a forum for ongoing dialogue between the quarry operator and area representatives for consideration of any issues of public concern.
		• Ensure that the community is made aware of the effectiveness of mitigation measures.
			EIS, Section 11.0.1 p.4; and Bilcon response to WP 1452 Joint Review Panel IR on 8.2 Public Consultation p.3

	Members	• Members of the CLC will be chosen from individuals or groups representing the geographic area which may be impacted by the Project. • Representatives of the community will include but not be limited to the following groups and should consist of no less than ten and no more than 16	Bilcon response to WP 1452 Joint Review Panel IR on 8.2 Public

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#	Issues	Description	Documented in
		members with an equal representation of men and woman: o Local government o Education o Business o Environment o Social and community welfare o Safety and protection o Fishing industry o Tourism industry o Immediate neighborhood o Youth o Senior citizens • Bilcon in consultation with the CLC may decide to select additional members. • Individuals will be appointed for a three-year term.	Consultation p.3
	Selection of Members	• Members will be appointed by an independent body consisting of three representatives: one from Bilcon, one from the Municipality of the District of Digby and one from the Digby and Area Board of Trade.	Bilcon response to WP 1452 Joint Review Panel IR on 8.2 Public Consultation p.2
	Chairperson	• The selection of the chairperson will be Bilcon's responsibility. This may be achieved through o An election by CLC members, o The appointment of Co-chairs, o The selection of an impartial third party, or through another process chosen by Bilcon.	
	TOR	• The final TOR will be established in consultation with the CLC during the first meetings. • The mandate and membership of the Committee will be reviewed by the CLC on an annual basis. • The CLC may choose to establish additional terms of reference that address specific issues of interest to the community.	

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#	Issues	Description	Documented in
	Frequency of Meetings	• Meetings will be held at a minimum of once a month upon Project approval and no less than four times a year once operational. • One of the meetings must be held with local residents on an annual basis (Community Forum).	Bilcon response to WP 1452 Joint Review Panel IR on 8.2 Public Consultation p.3
	Meeting Place	• Bilcon will be responsible for the provision of meeting space.	
	Community Forums	• The CLC will hold one public meeting with local residents per year. Objectives of this meeting will be to : o Report on the work of the CLC; o Solicit input from the general public on the Project's environmental performance; and o Identify and discuss other issues of concern that the public would like the CLC to address.	Bilcon response to WP 1452 Joint Review Panel IR on 8.2 Public Consultation p.4
	Communication/ Reporting/ Transparency/ Disclosure/ Information Dissemination	• As part of the TOR, the Committee will ensure that the views of the Committee are made available to the public in an appropriate manner. This could include the posting of minutes in a public place near or at the quarry site, in a public space in the community (e.g., library), the provision of minutes to interested parties via mail outs or e-mail, or the posting of the minutes on Bilcon's web site. • The Committee will be made known to the residents and the community at large; the notification will include a list of Committee members. • Bilcon will be responsible for copying of minutes and the dissemination of copies to regulatory agencies and other interested parties; if applicable, this will include minutes of the annual meeting (Community Forum) and an annual report.	Bilcon response to WP 1452 Joint Review Panel IR on 8.2 Public Consultation p.4
	Monitoring of Consultation	• Bilcon will monitor all public consultation activities; this includes the monitoring of the CLC	Bilcon response to

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#	Issues	Description	Documented in
	Activities	with respect to: o Meetings; o Participation; o Issues raised and discussed; o Complaints/grievances by CLC members or brought to attention of CLC; o Monitoring report reviews; o Adjustments of mitigation or environmental management procedures; and o CLC information dissemination (e.g., meeting minutes, annual reports).	WP 1452 Joint Review Panel IR on 8.2 Public Consultation p.4
	Conflict resolution	• Purpose of the CLC is to avoid conflicts through early discussion of issues and concerns among CLC members, Bilcon management representatives, and members of the public and to arrive at mutually agreeable solutions. • For issues that are not resolved through the routine involvement of the CLC, Bilcon's public grievance procedure will be applied. This procedure outlines options for reporting of a grievance, the actual grievance procedures (i.e., steps undertaken to acknowledge, register, process, and resolve the grievance), and assurance of confidentiality and anonymity.	Bilcon response to WP 1452 Joint Review Panel IR on 8.2 Public Consultation p.4
	Link to Issues Management System	• Objective of the Issues Management System is to ensure that issues related to the environmental performance of the quarry operation are registered, brought to the attention of the responsible manager, and that appropriate follow up action (if required) is implemented within an adequate time frame. • Bilcon's Issues Management System represents an electronic data base that records environmental issues and concerns raised; the group or individual raising the issue; the date the issue was brought to the attention of Bilcon/the CLC; the required follow-up and its implementation. • The role of the CLC with respect to the Issues Management System is to contribute to the	Discussion of IMS: EIS, Section 8.2; p.14

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#	Issues	Description	Documented in
		identification and recording of issues, tracking adequate responses and ensuring follow up activities. • It is envisaged that the Issues Management System will be managed by Bilcon with the CLC routinely reviewing the issues list and the status and type of response/ follow-up activities.	
	Link to Adaptive Management Process	• Adaptive management has been defined by Bilcon as "*a systematic approach for improving environmental management and building knowledge by learning from management outcomes*". • The role of the CLC in the Adaptive Management Process is to critically review the project operation, identify issues and concerns and to participate in identifying and implementing approaches to improved environmental management. • Environmental audits, monitoring reports, and issues identified by the general public and/or the CLC will be the basis for a critical review of the effectiveness of the environmental management and the Project's environmental performance. • Non-compliance with regulatory standards and permits will be immediately investigated by Bilcon. In consultation with the CLC, adjustments to the operation and /or environmental management will be developed and implemented (= adaptive management process). • Similarly, complaints and issues and concerns raised with respect to the Project's general environmental performance will be investigated. In consultation with the CLC, options for adjustments to the operation and /or environmental management will be explored and implemented (= adaptive management process) to the extent practical.	
	Link with Communications	• The CLC represents a key component within the Project's overall Communications Plan in that it	

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#	Issues	Description	Documented in
	Plan	provides the implementation mechanism for on-going dialogue with the community and for conflict prevention and resolution. (See objectives of CLC stated above). • Bilcon will review its Communications Plan with the CLC and obtain input on its components, activities, and implementation; this includes a discussion as to what degree the CLC should be involved in individual activities. As such, the CLC is both, an implementation mechanism for communications and a means for shaping the content of the Communications Plan. • Other activities and tools addressed in the Communications Plan involve: o Media relations/ press releases o Community involvement o Corporate web site o Annual Reports o Environmental auditing reports o Monitoring reports o Special events (open house events; guided site tours) o On-going dialogue with First Nations	

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1. PROJECT DESCRIPTION

Several new elements have recently been added to the Project Description.

a) Temporary Rock Storage Area

During the construction phase the levelling of the Processing Area will generate ~1,140,000 cubic metres of rock material of which ~400,000 cubic metres will go to the temporary rock storage area. An additional ~375,000 cubic metres is to be stored on-site or shipped as rip-rap.

- *Provide the location of this second temporary rock storage area, showing its footprint and the environmental control structures associated with it.*

- *If additional material is to be shipped as rip-rap, explain how this is possible before the Processing Area has been completed. Will the ship loader and its associated equipment be capable of handling rip rap? Will this material be washed? Will some of this material be shipped by road?*

- *According to the plans provided, the primary rock storage has a footprint of ~8 ha and will have a height of ~40 metres. It will almost assuredly cover the natural drainage that maintains the coastal bog. Explain how adequate flow will be maintained to the bog.*

RESPONSE

The second temporary rock storage area for the approximate 375,000m^3 of rock would be located on-site within the proposed sediment disposal area. The footprint of the second temporary rock storage area would be the same as shown for the sediment disposal area on Plan OP1-R1 and Figure OD-2 & SD-2 contained in the revised Project Description (RPD). The area of the second temporary rock storage area is approximately 8 ha. This area would be used for temporary rock storage until the processing plant is functional. Rock temporarily stored in Sediment Cell 1 would be processed first to accommodate sediment disposal as the plant begins operation for shipment. The environmental control structures shown on Plan OP1-R1 and Figure OD-2 & SD-2, except for the cell divider berm would provide containment.

The use of the sediment disposal area for temporary rock storage should eliminate the necessity for shipment of rip-rap. Should it become necessary or considered desirable to ship some of this material as rip-rap, it would be crushed in a small, portable cruising plant and screened to a maximum size of 8" to a minimum size of 2" with an average size of 5". The

ship loader as designed can comfortably handle this material without modification. It is not anticipated that any of this material will be washed or shipped by road.

The primary temporary rock storage area has an approximate area of 8 ha as shown on Plan OP1-R1 and Figure IR8-1 contained in the RPD. Figure IR8-1 indicates a pipe to be installed to maintain surface water flow to the coastal bog. Further, in response to comments received on the EIS, more definition of how an adequate surface water supply would be maintained to the coastal bog is presented. This is shown graphically on Plan IR2-RPD and Figure IR2-RPD of the Response Document. Further narrative description is contained in response to WP1452 – Joint Review Panel, section 9.2.2 – Aquatic Ecology – On-site Freshwater, pages 2-4, in Volume III of the Response Document. It is Bilcon's intent to maintain appropriate flow into the coastal bog during construction of the primary temporary rock storage area and during construction of sediment pond until watershed reclamation is complete and functional.

b) Sediment Ponds

The consultant's report (CRA) states that the proposed sediment pond configuration will not be able to accommodate the 100 year maximum 24 hr storm event or the 100 year maximum 5 day event.

Provide specific quantitative information on how this problem will be addressed:

- *If emergency drawdown is part of the solution, provide information on the anticipated volume of such releases, the amount of sediment involved, and the environmental effects on the near shore marine environment. Evaluate the effect of such a release on the constructed wetland. Provide estimates of the time needed to complete the necessary emergency drawdown.*

- *If the berm height is to be extended beyond that currently specified, provide the maximum height and a cross-section of its construction, as well as an expert evaluation of its stability.*

- *If the depth of the ponds, below grade, is to be increased, provide definitive information on their construction and how groundwater interaction will be avoided.*

- *If additional sediment ponds are to be constructed, provide their location and capacity.*

RESPONSE

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Reference is made to pages 11 – 15 of Conestoga – Rovers & Associates (CRA) report entitled "Surface Water Information Summary, Whites Point Quarry, Little River, Digby County, Nova Scotia" February 2007 Ref. No. 821191D(2). The proposed 4m deep sediment ponds have the capacity to accommodate either a 100 year maximum 24 hour storm event or a 100 year maximum 5 day event. Considering the area (9.6 ha) of ponds 1-5, a 1.9m depth of storage would be required to accommodate a 100 year maximum 24 hour storm event or a 2.8m depth of storage required for a 100 year maximum 5 day event. This storage could be realized in addition to the proposed 1m depth allocated for sediment storage in these ponds.

In order to maximize water storage capacity in the ponds, a sediment forebay is proposed as recommended by CRA – see Response to Environment Canada's comment Item #15 paragraph 9.2.1 Terrestrial Ecology. A small sediment forebay is proposed for pond 5. The sediment forebay would be located where the quarry drainage channel outfalls into sediment pond 5. This sediment forebay would be designed to accommodate the 10,300m^3 per year of sediment estimated from the quarry operations. Proposed size of the forebay is approximately 25m x 30m x 4m deep and would require clean-out 4 times per year. The forebay is expected to accommodate a large percentage of the total sediment production and more importantly eliminate the need for the 1m depth previously allocated for sediment storage in ponds 1-5. By reallocating the 1m deep sediment storage, greater water holding capacity will be achieved, thereby reducing the frequency of any required drawdown and volume of water to be discharged into the constructed wetland if a major rainfall event is forecast. By reallocating the 1m sediment storage depth to water storage, the above 100 year storm events could be accommodated under the annual average 0.9m water depth storage without any drawdown.

At various times of the year, monthly average water depth in the ponds will exceed the average 0.9m yearly water depth. During average excess water supply conditions – e.g. January through June, the quarry operating water depth is planned at 2.5m and dependent upon outflow elevation. This is based on the net inflow and demand from the water budget analysis (CRA 2007). During average deficit water supply conditions – e.g. July through October, the quarry operating water depth could be drawn down as necessary for wash water demand and may drop to a low of 1.7m in October.

A 100 year maximum 24 hour rainfall event would generate 125 mm of rainfall. Approximately 70 mm of the 125 mm event could normally be accommodated under the proposed operating schedule during excess supply conditions. The 70 mm of rainfall could be accommodated in a 1m storage depth with .5m freeboard remaining. This means under normal operating conditions of 2.5m depth during excess water supply conditions, the ponds would have to be drawn down approximately .9m if a 125 mm, 100 year maximum 24 hour rainfall event is forecast. During average deficit months with an operating water level of greater than 1.7m, a 100 year maximum 24 hour rainfall event could be stored assuming

some freeboard is utilized. It should be noted that monthly extreme 24 hour rainfall events are generally less than 100 mm and would necessitate limited, less than a 30 mm drawdown during excess water conditions.

It should be noted that during 30 years of data (1971 – 2000) at the Weymouth North weather station one major storm with an extreme rainfall over the 100 year maximum 24 hour event of 125 mm was recorded. This event occurred on June 13, 1968. This event would have occurred when the ponds would be operating during excess water supply conditions. Also, upon review of 126 years of combined data from two Yarmouth weather stations, the most frequent month of occurrence for a 100 year maximum 24 hour event was August and for a 100 year maximum 5 day event was October. Both of these events would have occurred when the ponds would be operating during deficit water supply conditions.

Forecasting of major storm events, especially infrequent 100 year maximum 24 hour rainfall events, can be quite accurately forecast in an Environment Canada 5 day forecast. If a major storm is forecast, the necessary drawdown based on the existing pond levels would begin at least 72 hours prior to the event.

A water depth measuring board would be placed in each pond in order to monitor water depths throughout the year. For example, if the operating level is 2.5m and a major 100 year storm is forecast, the ponds would be drawdown .9m to accommodate the anticipated rainfall.

Based on the lumped average analysis and assuming water level varies in the ponds from 1.7m during deficit conditions and 2.5m during excess water supply conditions, 7,500 and 86,000m^3 would have to be discharged respectively to ensure adequate storage is available for the 100 year 24 hour storm volume expected. Assuming the range of cubic metres above to be discharged into the constructed wetland, the flow rate would range from 462 gpm to 5,280 gpm for a 72 hour draw down period.

It should be realized that the exact amount of available storage in the ponds, and the exact amount of draw down required will vary on any given day.

Environmental considerations regarding the above procedures include the following:

a. Construction of the sediment forebay will practically eliminate the proposed clean-out of sediment ponds 1 – 5. These ponds will not under-go periodic disturbance caused by clean-out operations and be allowed to mature providing a more productive and diverse pond habitat.
b. Any required drawdown discharge, in the event a major storm is forecast, will be drawn from the surface area of sediment pond 1 first which contains the least suspended sediments.

c. Rock check dams are proposed in the constructed wetland to reduce the velocity of any discharge flow.
d. Continuous monitoring of total suspended sediments, pH, and flow is proposed at the outfall of the constructed wetland. This will provide a basis for development of any adaptive management procedures or additional mitigation measures if drawdown releases approach permitted thresholds.

Bilcon intends to follow the above operational procedures in the event a 100 year maximum 24 hour rainfall event is forecast. Considering the above design considerations, the height of the proposed berms remain as previously indicated and the proposed depth of the ponds remain as previously indicated in the EIS, Revised Project Description, and the Panel Response Documents.

2. COASTAL CONDITIONS

The Project and its marine facilities are located on an exposed, unprotected coastline. Extremes of wind, waves, currents, tides and storms surges, as well as their change with climate change over the next 50 years, need to be considered. Evaluate the possible impacts of these extremes on:

- *The integrity of the ship loading facility*
- *The risks involved in docking and mooring a large bulk carrier*
- *The integrity of the environmental structures (constructed wetland, sediment ponds & environmental protection zone) which lie partially or completely beneath the current 10 m contour*

Such data must be available prior to the engineering phase, consistent with the methodology and its importance, already stressed by the Proponent. In addition, the Panel, Environment Canada, Natural Resources, and Partnership for Sustainable Development are on record supporting the view that this information is vital at this stage.

Similarly, the Panel requires site-specific information on normal and seasonal variations in coastal oceanographic conditions, including tides, tidal currents etc. This information is required to evaluate properly potential impacts arising from

- *Normal and accidental sediment releases*
- *Normal and emergency water releases*
- *Probable dispersion patterns*
- *Marine accidents malfunctions and their clean-up during "normal" and extreme conditions*

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RESPONSE

Introduction

A Panel information request has been received seeking additional information on the impact of extreme environmental loads on:

- The integrity of the ship loading facility;
- The risks involved in docking and mooring a large bulk carrier;
- The integrity of the environmental structures (constructed wetland, sediment ponds & environmental protection zone) that lie partially or completely beneath the current 10 m contour.

In addition, the Panel has requested site-specific oceanographic information that would enable evaluation of:

- Normal and accidental sediment releases
- Normal and emergency water releases
- Probable dispersion patterns
- Marine accidents malfunctions and their clean-up during "normal" and extreme conditions

General Response

For the most part, the additional information requested by the Panel is typically generated as part of a project's design phase, not the planning phase. Bilcon therefore made the following statement in its response to Item #7 Environment Canada (in Section 7: Revised Project Description, p. 149, February 9th, 2007): "the contractual course of design development would have the requested analyses done by the engineering team undertaking the design of the maritime structures. Realizing that design and construction contracts for the facility will not be awarded until the project receives approvals from environmental authorities, the specific analyses requested are not deliverable at this time."

The oceanographic conditions in the general area of the Project site have been reviewed and presented in Section 9.1.7 (Physical Oceanography) of the EIS (Volume VI). Additional information on oceanographic conditions has been provided in Bilcon's responses to the Panel's Information Requests WP 1452 (in Section 9.1.5 Marine Environments and Physical Oceanography, p. 2, February 9th, 2007). From the information provided Bilcon concludes that the environmental conditions at the Project site do not pose any significant engineering challenges for the design and operation of the proposed docking facility.

The course of project development would have the detailed design work follow an approval in principle from authorities having jurisdiction over the work. The design of the fixed coastal structures at Whites Point will follow a program of study that will provide the site-

specific data requested by the Panel together with any additional input parameters needed for the design. The anticipated pre-design study program relevant to the Panel's request has been outlined in Bilcon's response to Item #7 Transport Canada (in Section 7: Revised Project Description, p. 149, February 9th, 2007). With this, Bilcon is of the opinion that for environmental assessment purposes, it has adequately characterized the existing environment and outlined the next steps that will be undertaken and ensure that the ship loading facility will be designed in compliance with all regulatory and engineering standards and guidelines.

In other areas of Canada projects proceed on this basis with a project approval in principle having 'subject to' clauses to cover the possibilities that data acquisition or risk analyses reveal an issue requiring resolution to the satisfaction of authorities. For example, the Environmental Assessment for the proposed Keltic Petrochemicals Inc. LNG and Petrochemical Plant Facilities received approval based on the Minister's review of the conceptual project design. The approval is subject to conditions such as the additional collection of baseline data for receiving waters and the modeling of their assimilative capacity (approval of 14 March, 2007 pursuant to Section 26 of the NS Environmental Assessment Regulations; http://www.gov.ns.ca/enla/ea/kelticpetro.asp).

The facility planning, design, environmental data acquisition and risk analyses are integrated activities. The responsibility for this work is in the hands of registered professional engineering and environmental specialists working pursuant to statute law including the Engineers Act of Nova Scotia, Canada Shipping Act and many provincial and federal regulations. The professionals undertaking the work will follow best practices for maritime facility design and operational planning on this project.

Integrity of the Ship Loading Facility

It is assumed that "integrity of the ship loading facility" implies the ability of the fixed maritime structures and attendant materials handling equipment to resist environmental and operational loads of a prescribed frequency and intensity. Environmental and operational loads for maritime structures are well understood and methods for determining their magnitude are prescribed in design codes and standards.

At Whites Point, the marine environmental design criteria that will be considered for the structural integrity of the ship loading facility will include wind speed and direction, wave height, period and direction, current speed and direction as a function of depth, frequency and track of extra tropical storms and impact from sea ice and floating debris.

Operational loads that will be considered for the design and analyses required to specify facilities with structural integrity will include forces developed by ship berthing and forces

developed on a berthed vessel by wind, waves and current on the ship fender system and the ship's mooring lines.

The detailed and site-specific environmental data required for this design and engineering work will be obtained through data collection from existing sources and, to the extent necessary, monitoring at the site as outlined in Bilcon's response to Environment Canada (Item #7, Project Description, p 149, February 9th, 2007). Further, Bilcon's engineering team will consult with marine construction contractors as part of the design development process. This is standard practice and done to obtain construction-relevant local knowledge and to ensure that construction work is executable in an efficient and timely manner given the seasonal variation of marine weather.

Design professionals will employ best practices and latest methods in planning and designing a ship loading facility that will have physical integrity to resist all normal and operational load cases.

The Risks Involved in Docking and Mooring a Large Bulk Carrier

In response to the Panel's request on Section 11.2 of the EIS (WP 1452), Bilcon generated additional information concerning accident and malfunction scenarios, potential effects, mitigation measures, and the likelihood and significance of residual effects (Response to WP 1452 on Section 11.2 Accidents and Malfunctions; in Section 11.0 Environmental Management, p.3, Feb 9th 2007). The accidents and malfunctions analysis identified seven scenarios for the marine environment including the possible collision of a vessel with the proposed dock. The analysis involved a screening exercise with the result that the scenario of a vessel colliding with the dock was screened from further consideration as it was deemed to fall into a category of scenarios with one or more of the following characteristics:

- Substances involved are commonly used, their characteristics are well known;
- Quantities of released contaminants are small;
- Adverse effects remain localized and are reversible;
- Circumstances are generally well understood;
- Proven technologies are available for effective containment, clean up and remediation; and
- Project-specific operation, environmental management and contingency plans have proven to provide adequate and effective management tools.

The screening concluded that the potential for adverse environmental effects would be low based on the following considerations:

- Except in the case of a total vessel break up, no materials will be discharged.
- With the use of with double-hulled vessel, the exterior hull can be ruptured without jeopardizing the integrity of safe vessel operations.

- Discharge of vessel cargo (basalt rock aggregate) is not likely.
- Vessel fuel tanks are positioned in safe locations within the interior of the ship. In any event, the bunker 'C" product requires heating to allow the fuel to be moved. In the worst case event of the vessel sinking, the bunker "C' would stay contained within the fuel tanks. The cool water temperature would not permit the bunker 'C' to migrate far, if at all.
- The Marine Diesel Oil (MDO- Petroleum Distillate Fuel) would flow in the case of a tank rupture. In the worst-case scenario, 100 tons of the MDO fuel would be discharged to the environment. In calm seas this can be contained by booms and collected by absorbent materials. In the more likely case of rough seas causing the hypothetical accident, dispersal of the MDO would be extensive particularly in the wave zone near the shoreline. The MDO like all diesel fuel oils will evaporate quickly. The spilled material and any contaminated materials may be hazardous to animal/aquatic life.

Further, the screening decision took into account the implementation of the following mitigation measures and commitments:

- Engage only reputable ship charter operators using in-class vessels.
- Operate and maintain owned vessels to the highest standards of seaworthiness and officer and crew training.
- Enforce strict communications, approach speed and docking procedures.
- As part of the contract conditions, Bilcon will require vessel owners/operators to maintain and enforce spill prevention and emergency plans (Shipboard Oil Pollution Prevention Plan - see example provided in Addendum 4, page 36, EIS, Vol. VII, Section 11.2)
- Environmental Management Plans (EMPs) will be developed and implemented specifically for the quarry's marine terminal. These will include spill prevention and emergency response protocols (see example Spill Prevention Control and Countermeasure (SPCC) Plan provided in Addendum 4 on page 36, EIS, Vol. VII, Section 11.2).
- If MDO is spilled or leaked, actions specified in the emergency response protocols will involve: containment of spill. Removal of all ignition sources and stoppage of flow of spill. In natural environments, seek advice from ecologists. Evacuate all non-essential personnel. Use proper protective equipment. Pads/absorbent material can be used. Comply with all applicable laws. The spilled material and any contaminated materials may be hazardous to animal/aquatic life.
- Potential Treatment and disposal methods include land farming, incineration and land disposal, if permitted.

The EA conclusion that this accident scenario does not result in significant adverse environmental effects is based on the following additional considerations:

Bulk carriers proposed for the trade out of White's Point Quarry will be of Panamax class. Ships of this size typically have beam widths up to 32 metres and lengths up to 240 metres. Displacement tonnages of the vessels are typically in the 60,000 to 75,000 tonne range. These large, modern vessels are equipped with advanced communications, radar, weather forecasting, and sophisticated navigational equipment operated by certified and experienced personnel and do not present a significant hazard for accidental dock collision and or grounding. The navigation route between main shipping channel and quarry terminal is without particular obstacles or other navigational issues. The berthing and mooring of a bulk carrier is a routine practice at port facilities noting that there are hundreds of such berthings every day world wide. Due to the highly valuable shipping assets involved, costly clean up fees and possibly fines for environmental accidents ships are operated with high levels of care and prudence.

At the moment, the Project site is outside any compulsory pilotage area. It is anticipated that the Atlantic Pilotage Authority will assess Bilcon's proposal. This assessment will determine if the area should be a compulsory pilotage area. If not, the assessment will determine on what conditions, if any, vessels will be permitted to proceed to the Project site. If required, a pilot will be involved providing navigation advice to the master of the vessel for the purpose of safely directing and controlling the movement of the vessel through near-shore and inshore waters. This pilotage would minimize risks involved in navigating to and docking and mooring vessels at the quarry site.

Only the most severe weather conditions would interfere with ship operations. In instances when weather is severe and deemed to pose a risk, it is normal for those in control of the vessel to stand off the berth until favourable conditions occur. Certainly, there would be no reason to berth because ship loading may not occur, noting that the materials handling systems for ship loading will likely be inoperable in high winds.

As mentioned above, as a precautionary measure, environmental management plans including emergency response and clean up protocols will be developed for the terminal. In addition, Bilcon will require as part of its contract conditions that vessel owners/operators maintain and enforce spill prevention and emergency plans.

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The integrity of the environmental structures (constructed wetland, sediment ponds & environmental protection zone) which lie partially or completely beneath the current 10 m contour.

The environmental structures proposed at the quarry site including the constructed wetland, sediment ponds, and the environmental protection zone that are within the nearshore or foreshore marine environment will be designed taking the oceanographic data and modeling results into account that will be generated during the detailed design and engineering for the dock facility. Erosion protection and flood proofing of those portions of the Project site located along the Bay of Fundy coastline will be engineered based on these data and in accordance with applicable standards and regulations. As mentioned in our general response, these design studies will be awarded once the project receives approvals from environmental authorities. It is envisaged that the design and engineering of the environmental structures will consider the same parameters as the dock designs including wind, wave, current, and littoral processes. Responsibility for the integrity of the coastal structures will be with registered professional engineering specialists working pursuant to statute law including the Engineers Act of Nova Scotia, and all applicable provincial and federal regulations, and best practices for environmental facility design and operation planning in coastal environments.

Site specific information on normal and seasonal variations in coastal oceanographic conditions

For the reasons stated in Bilcon's general response, data on normal and seasonal variations in coastal oceanographic conditions are scheduled to be generated during the detailed design stage. In the absence of such data, Bilcon has evaluated the risks associated with a number of malfunctions and accident scenarios and has developed mitigation and environmental management (including emergency response planning) procedures. Bilcon believes that this information demonstrates that the implementation and operation of the Project is not likely to cause any significant adverse environmental effects. Key considerations related to the specific scenarios listed by the Panel are discussed below.

Normal and accidental sediment releases

The sediment ponds and their function have been described in the Revised Project Description (Section 7: Revised Project Description, p. 77, February 9th, 2007). The ponds will be sized to reduce sediment levels at the final discharge point to acceptable levels under normal operating conditions. As a precautionary measure, additional safeguards have been built into the system to avoid and minimize accidental sediment releases. This includes the provision of water and storage capacity beyond industry standards and an artificial wetland downstream of the pond system for additional retention and "polishing". A control mechanism at the outlet structure will ensure that the discharges can be stopped in case of

any malfunctioning in the ponds. Further, it is proposed that all outflows from sediment retention ponds be sampled weekly for suspended solids and ph and semi-annually for dissolved copper, which is of most concern due to the naturally high copper content of the local basalt rock.

Accidental sediment releases could occur as a result of a breach in the containment berms of the ponds. This scenario of a breach in the berm system at the sediment ponds has been discussed in Bilcon's response to the Panel's information request on the Section 11.2 of the EIS (WP 1452 on 11.2 Accidents and Malfunctions; in Section 11.0 Environmental Management, p.3, Feb 9th 2007). The assessment concluded that such a scenario is very unlikely given the proposed mitigation, management and monitoring measures.

Sediment releases as a result of Bay of Fundy storm surges that could flood a portion of the Project site are also unlikely to occur. As mentioned above, erosion protection and flood proofing of those portions of the Project site located along the Bay of Fundy coastline will be engineered based on site specific oceanographic data and modeling and in accordance with all standards, regulations, and safeguards applicable to facility design and operational planning in coastal environments.

Normal and emergency water releases

With the exception of infrequent releases of storm water collected in the sediment ponds, there will be no other water releases since the quarry will be operating on the basis of a closed loop water system. Emergency water releases are considered an extremely rare event. The ponds will be sized to provide storage capacity beyond industry standards so that emergency water releases would be an extremely rare event. Sediment removal from the ponds will be prescribed in the operational plans for the pond system. The Environmental Management Plan will further prescribe circumstances and approaches to emergency water releases.

Probable dispersion patterns

An analytical assessment of the dispersion of turbidity in a coastal environment can be done using computers. Marine environmental data acquired for engineering purposes will be made available for any modeling of turbidity dispersion undertaken, if considered necessary. As mentioned in the paragraphs above, due to a number of built in environmental protection designs and management features any emergency discharges of water and sediments is an extremely unlikely event. Any turbid water from the upland will be fresh water so if discharged to the sea, this will disperse generally on the surface since the fresh water can be expected to have a slightly lower density than the receiving seawater. Coastal winds and

currents will generally disperse turbidity parallel to the coastal until mixing with non turbid seawater decreases the concentration below the point of detectability.

Marine accidents malfunctions and their clean-up during "normal" and extreme conditions

In response to the Panel's request on Section 11.2 of the EIS (WP 1452), Bilcon generated additional information concerning accident and malfunction scenarios, potential effects, mitigation measures, and the likelihood and significance of residual effects. (Response to WP 1452 on Section 11.2 Accidents and Malfunctions; in Section 11.0 Environmental Management, p.3, Feb 9th 2007) . The accidents and malfunctions analysis identified seven scenarios for the marine environment, some of which involve the potential for oil and fuel spills and discharge of cargo (basalt rock). One scenario addresses the failure of proper exchange of ballast water. All of the scenarios were considered events that are very unlikely to occur and unlikely to cause significant environmental effects given the types of vessel and fuel amounts involved, the proposed operational plans, mitigation measures and emergency response planning (see also discussion above on "*Risks Involved in Docking and Mooring a Large Bulk Carrier*".

Site-specific marine environmental data (e.g., drift patterns) acquired for engineering purposes during the detailed design phase will be used in the preparation of the site-specific operation and environmental management plans (including emergency response and clean up plans).

3. COPPER CONTENT

The average copper content of the of the Upper Flow basalt unit will determine the copper content of aggregate washing residues that will be pumped into the sediment storage area, and, to a large extent, the sediments deposited in the sediment ponds. To date, six samples from the site have been analyzed that show a range from 27 to 230 mg/kg, a mean value of 101 mg/kg, and a large standard deviation of +/- 75 mg/kg. This average exceeds Canadian soil quality guidelines for agricultural, residential/parkland and commercial/industrial uses. The ISQG for marine sediments is 18.7 mg/kg and Bay of Fundy sediments average 19 mg/kg.

Since the Proponent proposes to spread this material for reclamation, and since unknown amounts of it may be released into the near shore marine environment during an emergency release of water from the sediment ponds, statistically greater robustness of the average copper concentration is required. Runoff from the reclaimed areas will not be bermed: an assessment of the environmental impact of elevated copper levels in the reclamation soil should be provided.

RESPONSE

Geochemistry of the Beaver River Till – Basalt Till Facies was conducted by the Province of Nova Scotia – Department of Mines and Energy, 1982. One site investigated was on the Whites Point quarry site, designated 341A, and another site nearby at Whale Cove, designated 342A, indicated 80ppm and 107ppm copper content respectively. Geochemical Summary Statistics for the Beaver River Till – Basalt Till Facies based on five regional samples are presented in Chapter 9.1.4 – Surficial Geology and Soils, pages 32 and 33 of the EIS. Copper values ranged from 80ppm to 218ppm with a mean of 131ppm. (NS-Department of Mines and Energy 1982). It should be noted that the lowest naturally occurring copper background exceeds Canadian Soil Quality Guidelines (CCME, 2006a) for agricultural and residential/parkland (63mg/kg) land uses. Commercial/industrial land use guidelines are 91mg/kg.

To simulate the copper concentration resulting in aggregate washing residues that will be deposited in the sediment disposal area and subsequently used during the site reclamation process, Bilcon had six samples from the on-site geologic cores crushed to similar consistency as the sediments from the aggregate washing. Laboratory analysis indicated a range of 27 to 230 mg/kg of copper and a mean value of 101 mg/kg. It should be noted that these results compare reasonably with the regional geochemical analysis conducted by the Nova Scotia Department of Mines and Energy. These results for the Upper Flow Unit also exceed the Canadian Soil Quality Guidelines as did the surficial geology results. It could therefore be concluded that the Whites Point site has higher levels of naturally occurring copper than the guidelines.

Per the most recent version of the protocol by which the Soil Quality Guidelines were derived (CCME, 2006b):

"The Canadian Soil Quality Guidelines are intended to be used for assessing in-place contaminants in soil. They are not intended for evaluating the quality of soil amendments (e.g., compost, synthetic fertilizers, manures, etc.) and are not directly comparable to quality criteria for these types of materials. It is also not recommended that the soil quality guidelines be used for waste management of fill materials (e.g., slags, foundry sands, mining wastes, etc.). Use of the soil quality guidelines for anything other than their intended purpose should only be done with great care and an understanding of the guideline development process and its relevance to the proposed use."

The protocol also advises:

"Where applicable, the SQGF[1] should also be compared to an acceptable geological (nonanthropogenic) background soil concentration to ensure the final value is not below background levels. The natural background concentration should represent a concentration that is typical of most unimpacted soils in Canada. Where the SQGF is below the accepted geological background soil concentration, SQGTG recommends that the accepted background concentration replace the SQGF generated using this protocol. It should be noted that although the SQGF may be above natural background soil concentrations that are typical of most soils in Canada, there may be specific locations with unusually high natural background concentrations that still exceed the guidelines. In these cases, jurisdictions have the option to set site-specific guidelines that consider the unique geological characteristics of the particular locations."

In many instances, copper concentrations exceed the Soil Quality Guidelines for the indicated land-use categories. However, the protocol and derivation of the guideline must be considered. In this case, the established guideline derivation is quite clear regarding background elevations, especially for copper and zinc, when guidelines are exceeded. If the guideline is exceeded, the accepted background concentration becomes the guideline.

The above rationale is commonly used in water, soil and sediment guideline applications.

It should also be noted that different organisms have different tolerances and optimum copper requirements. Over many years, organisms on the proposed quarry site and in the adjacent marine environment have existed with these naturally occurring copper levels and have (1) adapted and/or acclimated to the higher levels, (2) physiologically regulated copper, or (3) never truly been exposed due to constraints on the bioavailability of copper in the environment. Some organisms in the marine environment such as rock weed, lobster, periwinkle, etc. apparently can thrive under these conditions.

The reclamation procedures as stated in the EIS (7.10 Decommissioning and Reclamation Phase, Pp 51-52) will minimize runoff and copper bioavailability. Stockpiled organics and sediments will be mixed and spread on the area to be reclaimed. The reclamation soil will be amended with agricultural limestone and fertilizer. After incorporation of the required soil amendments, hydro-seeding and selected planting/reforestation will be conducted. An erosion control mix of native grasses and legumes will be seeded and natural regeneration will be allowed to occur. Areas with suitable soil depth will be reforested. Runoff will be minimized through these re-vegetation procedures.

[1] SQGF = final soil quality guideline

The copper content of the combined soil materials will be significantly lower than that of the sediments. The Site soils have a high organic carbon content of 18% (EIS, 9.1.4.2 Analyses, pp. 34) and addition of limestone will raise the pH, both factors that will further reduce copper bioavailability.

Bilcon contends that the use of soils derived from on-site sediments for reclamation purposes is appropriate. The intent of reclamation is to return the landscape to support a native plant community. The use of a soil derived from on-site materials will simulate the native soil and be conducive for native soil organisms. After reclamation, runoff into the marine environment including nutrients, trace elements, sediments and detritus should approach pre-project conditions. This adheres to the objective of an ecosystem approach.

Bilcon believes it is complying with the intent of an environmental assessment to determine effects of the proposed project and activities on the natural and human environments and that the level of investigation of copper to date exceeds investigation efforts for similar rock quarries. At this time, Bilcon believes further investigation regarding copper is excessive and unwarranted. If the Panel deems a greater level of statistical sampling is required to determine the "accepted" background copper concentrations for this quarry site, Bilcon will conduct further investigations during the industrial permitting phase of the project.

4. WATER TABLE/HYDROGEOLOGY

In the Revised Project Proposal figures IR8-1 to IR8-7 present vertical sections through the proposed quarry at different stages of its development. Each figure shows the water table. The response to the Panel's Information Request (WP 1452) states "the well monitoring data collected since September 2005 reinforces this position and Figures IR8-1 to IR8-7 reflect the location of the water table based on all the data collected."

The Panel does not interpret the CRA report as supporting the extrapolations provided in the sections, and requires details on the method the Proponent has used to extrapolate the measurements. Confirmation of the validity of the extrapolations is required.

Only two drilled wells (NS-02-04 & MW-2) at the margins of the proposed quarry area in the first 15 years yield any water table data (MW-6 is compromised and unreliable). The Panel requires more reliable and relevant hydrogeologic data for this area to evaluate the impact of the quarrying and the effectiveness of proposed mitigative measures.

RESPONSE

Please see response to question #5, Groundwater Divide.

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5. GROUND WATER DIVIDE

The CRA report concludes that the topographic (surface water) divide does not coincide with the groundwater divide. The Panel's IR requested the Proponent to "delineate the groundwater divide. If the two do not coincide, re-evaluate the effects on the mining plan and the wells on adjacent properties."
The Proponent is asked to fully address the previous IR in view of the new data provided by CRA.

RESPONSE

In this preliminary model it was assumed that infiltrating precipitation w Jacques Whitford Environment Limited (JWEL) in 2002 developed a preliminary hydrogeologic model for the Whites Point site as the sole source of ground water recharge for the bedrock aquifer. This model assumed that precipitation infiltrates the overburden where it is temporarily stored then slowly released to the bedrock aquifer. The recharge area was considered to approximately coincide with the topographic high for the site and the groundwater was assumed to flow downwards to the southeast and northwest away from the topographic high.

The inferred outcrop of the columnar base of the UFU (upper flow unit) and the UFU- MFU (middle flow unit) contact on the southern flank of the subject property was considered a groundwater discharge in this preliminary model where springs would be expected to occur. Subsequent to this preliminary review by JWEL, Mineral Valuation & Capital Inc (MVCI 2005) with the assistance of Dr. Dan Kontak of the Nova Scotia Department of Natural Resources carried out an extensive on-site investigation and established the location of the UFU and MFU contact. This contact zone is shown on Map 2R1 in Chapter 2 of Bilcon's responses to comments on the EIS. Further in 2005, under the supervision of MVCI, 6 new monitoring wells were drilled to provide further information. In 2006 Conestoga Rovers and Associates (CRA) was contracted to carry out further field investigations in order to answer questions arising from the EIS. CRA provided a revised conceptual hydrogeologic model which assumes that groundwater recharge occurs along the outcrop of the columnar base of the UFU and the UFU-MFU contact. In this conceptual model the water table is interpreted to roughly follow the UFU-MFU contact until, at some point, surface water in the Bay of Fundy influences the groundwater and causes the water table to flatten.

The conceptual hydrogeologic model for the property has been summarized by CRA (2007) as follows:

"Groundwater recharge occurs mainly along the southwest flank of the topographic high on the subject property, as a result of precipitation infiltrating via the columnar base of the UFU and the UFU-MFU contact.

The infiltrating groundwater flows along the path of this contact, or within the MFU (following the dip of the UFU), towards the northeast, in the direction of the Bay of Fundy. Eventually, the influence of the Bay of Fundy results in a flattening of the water table close to the Bay of Fundy and the groundwater moves laterally into the UFU (this suggests some connectivity between the UFU and MFU, at least near the Bay of Fundy.

Lesser recharge occurs along the topographic high and on the northeast flank via precipitation infiltrating into the overburden deposits. Some of this water may be released back to the atmosphere via evaporation and transpiration. Additionally, groundwater flow may occur within the overburden and/or along the overburden-bedrock contact and eventually be discharged to the Bay of Fundy. Limited quantities of the water from the overburden may also migrate downward vertically into the UFU, via local fractures. The latter would be expected to be limited to minor quantities of water due to the massive and impermeable nature of the UFU. If this process is occurring, the water would be expected to eventually reach the columnar base of the UFU and migrate along the UFU-MFU contact as described above.

Discharge would be occurring at the base of the northeast flank of the mountain, either as springs, local surface water expressions or the direct discharge of groundwater to the surface water. Due to the limited number of springs and surface water systems in this area, direct discharge to the surface water is anticipated to represent the major groundwater discharges process".

With respect to the effects on the mining plan as a result of the probable non coincidence of the topographic divide and the groundwater divide, Bilcon notes the following:

1. It is Bilcon's intent to only quarry the UFU since in general terms the rock in the MFU is unsuitable. A cap of the UFU will be left in place over the MFU contact zone.

2. Since the groundwater table is interpreted to roughly follow the UFU-MFU contact, Bilcon does not anticipate intersecting the water table.

3. See also Hansen 2006 "The Proponent does not intend to quarry the MFU, only the UFU. If the Proponent is successful in avoiding the MFU, there is no hydrogeologic reason to believe that this quarry will have significant impacts on the Little River Watershed south of the quarry even though there is a small geologic inter-basin transfer occurring".

With respect to the effect on wells on adjacent properties due to the probable non coincidence of topographic divide with the groundwater divide, Bilcon notes the following:

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1. All drilled wells on adjacent properties identified in the Nova Scotia Department of Environment and Labour's well database and the preconstruction domestic water well survey (CRA 2006) are drilled below the outcrop of the MFU.

2. Bilcon has stated in previous submissions that it is unlikely that quarry operations on the west side of the topographic divide would affect drilled wells on the east side of the topographic divide. The shift of the groundwater divide to the southeast of the location postulated by JWEL, if anything, decreases the risk of an effect to drilled wells on the adjacent properties.

3. Notwithstanding the data gathered and its interpretation, Bilcon has stated unequivocally that it will replace at its sole cost and without litigation any drilled well affected as to quality or quantity within 800 metres of the active quarry area.

In view of the above Bilcon believes that the precise location of the groundwater divide is of academic interest only.

Bilcon assumes that in its application for industrial approval, the Nova Scotia Department of Environment and Labour will determine the level of monitoring required and also the specific arrangements via bonds or cash deposits to ensure that Bilcon's commitment to compensation is secured by financial instruments.

Bilcon would also make further reference to the high degree of vandalism to which Bilcon has been subjected by its opponents during the past five years. Bilcon drilled four core holes, to establish the quality of the rock, which were also anticipated to be used as water monitoring wells - two of these were vandalized in 2002 to the extent that they could no longer be used as monitoring wells.

In order to provide further information to the Panel, Bilcon drilled six additional monitoring wells in 2005. Several of these wells were immediately vandalized and two including MW6 can no longer be used. These acts of vandalism were not childish pranks but were deliberate attacks by adults with heavy equipment to destroy data being prepared for the Panel. The Panel should understand that it is impossible for Bilcon to provide 24 hour security on monitoring wells over such a large area. It is Bilcon's intent to secure the site with fencing at the industrial approval stage. The Panel should also be aware that vandalism was not limited to Bilcon's monitoring wells, but was extended to fencing, environmental control structures, signage, vehicles etc.

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6. FISHING

The Proponent should rectify the omission of information previously requested regarding herring: their distribution and related fishing activities.

RESPONSE

The Atlantic herring (*Clupea harengus*) is an important commercial and ecological fish species of the Gulf of Maine and Bay of Fundy. Herring are a schooling, pelagic (open water) species ranging into nearshore waters of coastal New Brunswick and Nova Scotia. The outer Bay of Fundy provides habitat for herring adjacent to the proposed Whites Point quarry site.

Atlantic herring are fully marine and migrate over great distances to feed and spawn in coastal and offshore spawning grounds. In late summer and early fall, herring aggregate into massive schools and move into coastal waters at various locations in the Gulf of Maine to spawn. The primary spawning grounds for Gulf of Maine herring are in coastal waters concentrated on the Trinity Ledge and Lurcher Shoals off southwestern Nova Scotia near Yarmouth. In the Gulf of Maine, spawning progresses in general from north to south, commencing in the Bay of Fundy and eastern Maine waters in late July or early August and as late as November. Spawning takes place in relatively warm (approximate 10 – 5° C) in salty water. Herring larvae are found throughout the Gulf of Maine and in nearshore waters along the Bay of Fundy coastline. In the spring, the larvae metamorphose into juvenile herring. The young herring now termed "brit" migrate shoreward in dense schools near the surface. Herring that spawn on the southwest coast of Nova Scotia winter in Chedabucto Bay in northern Nova Scotia.

Ecologically, herring's principal food is tiny planktonic (drifting) crustaceans, such as copepods and euphausids. They also consume larvae, eggs, and other organism which are small and can enter their mouths and are primarily particulate feeders ("bite" feeders). Herring are the prey of a number of open-sea predators such as cod, tuna, sharks, dogfish, squid, seabirds, seals and whales. Fishing is the most significant cause of mortality and depending on the stock, between 10 and 50 per cent of the stock are captured each year.

Behaviorally, light, both direct and indirect plays an important role in the lives of fish. The visual organs function during swimming orientation, towards prey, to elude predators, recognizing other individuals of the same species in a school or avoidance of immobile objects. Additionally, light influences a fish's metabolism, maturation, behaviour, and colouration. Light penetration in the water column is dependent on the colour of the light with the longer wavelengths (red, orange, etc.) being absorbed in the first metre of depth while violet light penetrates much deeper. For example, aggregations of brit herring enter shallow bays and inlets where they migrate vertically in the water column in response to light

cycles. They are dispersed throughout the water column during the day and collect in surface waters at night to feed on zooplankton prey.

Locomotor activity of juvenile herring are strongly governed by daily changes in illumination. Peak activity generally occurs after sunrise and before sunset. Maximum locomotor activity takes place at an illumination of about 100 metre-candles, a level close to the natural illumination at the water surface at sunset. Since the locomotor activity of herring is governed by daily changes in illumination, any change in illumination affecting their habitat could result in behavioural changes. Since herring are a surface schooling fish, their susceptibility to changes in illumination are more likely than in mid water column or bottom fishes.

Historically, during the 1950's and 1960's, most Canadian herring were reduced to fish meal or oil. As some world herring stocks declined in the 1970's, demand and price for herring as a food rose, including a Japanese roe market as well as for lobster bait. Prior to the mid 1960's, herring were caught using gillnets, traps or in weirs. In particular, Bay of Fundy weirs have always caught juvenile fish during their summer feeding. During this time, a small fleet of purse seiners operated in the Bay of Fundy. Between 1965 and 1972, catches increased rapidly due to the introduction of a fleet of large purse seiners in the Bay of Fundy. Most of the herring caught in the southwest fishery was caught by purse seiners from 1960 until 1980. As stocks declined, the gillnet and weir fishery became less productive. This is evident in the area of Whites Point where the coastal nearshore weir and gillnet herring fishery has also declined. One active weir remains on the Bay of Fundy side of Digby Neck today. In 1970, the total catch of southwest Nova Scotia stock, excluding the New Brunswick Bay of Fundy fishery for juveniles reached nearly 190,000 t. The catch declined to about 85,000 t per year in 1981 and 1982. The New Brunswick Bay of Fundy fishery which exploits herring schools from several neighbouring stocks is the home of the oldest purse seine fishing and sardine canning industry.

As indicated in a July 30, 2006 letter to the Panel, Connors Bros., A Division of Clover Leaf Seafoods and a primary fisher and processor of herring in New Brunswick and for Nova Scotia herring, indicated the importance of the habitat for herring from Brier Island to Digby. Even though only one active weir remains on the Bay of Fundy in this area, it supplies close to 2,000 mt to Connors Bros. annually. Connors Bros. purse seine fleet has been in existence for many decades and in many years catch close to 50% of their requirement for herring has been taken in this area (Hooper 2006). The manager of Connors Bros. estimated the landed value of herring from the immediate area of Digby Neck presently at between 1 to 2 million dollars per year (Bull 2007). Vessels from Yarmouth also fish this area frequently.

Bilcon recognizes the importance of the herring fishery interprovincially and at the local level in the Bay of Fundy. Throughout the EIS and subsequent documents, mitigation measures have been proposed and are summarized below.

a. Design of the marine terminal allows relatively unobstructed nearshore water flow and pelagic fish passage. Migration routes of pelagic fish such as herring should not be altered.

b. Construction of the marine terminal will result in minimal alteration on marine habitat. These effects have been compensated for in the proposed Fish Habitat Compensation Plan which considers both bottom and pelagic fish habitat.

c. No in water blasting is proposed and all on land blasting will be conducted in accordance with the Department of Fisheries and Oceans "Guidelines for the Use of Explosives in or Near Canadian Fisheries Waters".

d. Lighting that could effect the marine environment will be kept to the minimum as required for marine safety. Scheduling of ship loading is proposed for daylight hours and to occur once per week. Precautions will be taken to avoid direct illumination from lighting shinning on the water surface.

e. On land lighting will be limited to the quarry operating times of 0600 – 2200 hours and will be turned off during night time from 2200 – 0600.

7. BLASTING

Information on blasting is widely dispersed throughout the materials provided. Some inconsistencies have been discovered. In order to properly understand blasting issues as well as to assure currency of information, the Panel requests that the Proponent consolidate all the material on the assessment of blasting into a single document. This document should include, among other concerns, the following topics:

- *known effects of blasting on relevant marine and terrestrial organisms*
- *blasting parameters during construction and production phases (averages and degree of variability)*
- *climatic conditions (fog, rain, snow, thermal inversions, ambient light) under which blasting will not occur and quantification of these conditions (also previously requested by DFO, Environment Canada, & the Panel)*

- *wildlife restrictions on blasting and specific information on their implementation*
- *physical environmental effects monitoring; marine and terrestrial*
- *biologic environmental effects monitoring; marine and terrestrial*
- *nature and monitoring of the initial test blast, refinement of the predictive impact model, duration and of model verification phase, role of the model*
- *mitigation measures related to blasting*
- *listing of conditions imposed by blasting regulations (provincial, federal)*

RESPONSE
To be answered at a later date.

8. COMMUNITY LIAISON COMMITTEE

The role of the CLC remains unclear to the Panel. Material referring to the role of the CLC is distributed throughout the reports received. Consolidate information on the CLC from various documents. Clarify the way in which the activities of the CLC will be linked to management decision-making through the adaptive management strategy.

RESPONSE
To be answered at a later date.

9. REFERENCES

The Panel notes that in recent documents many statements are made and conclusions drawn without proper documentation of the evidentiary sources. Provide a complete and consolidated list of references for the sources used throughout the material.

RESPONSE

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