

**Questions Concerning the Environmental Screening for Harbour
Development (Breakwater, Floating Docks, Dredging and Service Area) at
Tiverton, Digby County, Nova Scotia**

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Issue A5:

1. **The Environmental Screening for Harbour Development (Breakwater, Floating Docks, Dredging, and Service Area) at Tiverton, Digby County, Nova Scotia** states *an additional infill of rock will extend along the shoreline for a length of approximately 120m*. Is this infill of rock included in the 9500 m² area for the breakwater? If not, please indicate what the area of 120m infill will be?

Text for Issue A5 will be revised and will more clearly explain the components (including your above question related to the "*additional infill of rock extending along the shoreline for a length of approximately 120m*"). The Letter of Intent that has been finalized also includes a revised project description.

I have removed reference to "9500 m²" from this section because it was only a rough estimate from preliminary stages of the project and was included in the Federal Coordination Request text that was circulated to departments earlier on. As you know, we have CAD drawings (appended and referred to in the MHCP) that have been able to provide accurate square meters of different components of the harbour development. Those accurate square meters are included in other sections of the CEAA where the information is more relevant (i.e. B9 – Alteration of Bottom Substrate, B10 – Disruption of Aquatic Environment – effects on aquatic vegetation, and B11 – Disruption of Aquatic Environment – effects on fauna).

Revised text for Issue A5:

The proposed harbour development project will be broken into three phases with construction scheduled over five years. Project components are listed below (refer to Figure 4 for plan of proposed harbour development and Figure 5 for cross-sections and details:

- *(Phase I) - Construction of breakwater and installation of 7 floating docks;*
- *(Phase II) - Dredging of the basin (including blasting of Class A material within the basin), installation of remaining floating docks and construction of service/parking area; and*
- *(Phase III) - Construction of marginal wharf connected to the Provincial ferry wharf.*

The first phase of the proposed project is the construction of an armourstone breakwater and the installation of 7 floating docks. The breakwater will extend 149 m east and then 69 m southward. The length of the proposed breakwater is

approximately 213 meters. The breakwater will be 5 meters wide at the crest and approximately 50 meters wide at the base, depending on water depth.

The breakwater will be constructed of clean rock obtained from an approved quarry, and will consist of a 0.2 – 100 kg core stone surrounded by 2 layers of 200 - 800 kg filter stone, 1.5 meters thick. The north side (seaside and crest) will be protected with 2 layers of 8-10 tonne armourstone and a single layer of 6-8 tonne armourstone will protect the south side. Approximately 40,000 tonnes of armourstone, 25,000 tonnes of filter stone and 93,000 tonnes of core stone will be used in the construction of the breakwater. No dredging or blasting of Class A material (rock) within the new basin will be conducted in this phase. Seven floating docks will be installed, connected with an access ramp and secured to the breakwater with strong arms. Armourstone protection will extend along the shoreline for a length of approximately 120 meters to protect the neighbouring property (in agreement with the property owner). The rock will be placed above the high water mark.

The second phase of the proposed project is dredging of the basin (including blasting of Class A material within the basin), the installation of remaining floating docks, and the construction of the service/parking area. Dredging is required in the new basin to attain a depth of 2.0 meters below present Chart Datum. An excavator will be used in the proposed land-based dredging. The anticipated dredge volume is approximately 10,000 cubic meters. Approximately 6000 cubic meters of the total dredge volume is anticipated to be Class A material (or rock) and approximately 4000 cubic meters of the total dredge volume is anticipated to be Class B material. Dredging of the new basin will consist of blasting of bedrock bottom to attain desired dredge depth. The dredge material will be used to form the proposed service/parking area (also proposed to be constructed in Phase II).

The six remaining floating docks will be installed, attached with strong arms that will be secured to concrete anchors within the service/parking area and connected with an access ramp. The floating docks will allow for maximum berthing capacity of 32 vessels in the proposed basin.

The proposed service/parking area will extend along the shoreline of the new basin (approximately 120 m). This infill (service/parking area) will be constructed of dredged material and rock fill and two layers of 500-1000 kg filter stone at a 1:25 to 1.0 slope. This service/parking area will provide parking space for up to 70 vehicles. Any remaining dredge material that cannot be utilized in the construction of the service/parking area will be disposed on land at a disposal site suggested by the Contractor, and approved by the Nova Scotia Department of Environment and Labour (NSDEL).

The final phase (Phase III) of the project involves the construction of a marginal wharf connected to the Provincial Ferry wharf. A marginal wharf will be constructed of timber piles tied into the existing Provincial Ferry wharf, and will serve as

additional service area for loading and unloading. The marginal wharf will be finished with a concrete deck.

2. What are the dimensions of the access ramp?

There are two proposed access ramps (one to serve each set of seven docks). The access ramps will allow pedestrian access from the top of the breakwater or from the parking/service area to the deck of the floating docks.

Based on scale plan drawings (which you will receive copies of), the access ramp from the breakwater will measure approximately 12 m long and 1.3 m wide, and the access ramp from the parking/service area will measure approximately 8 m long and 1.3 m wide.

3. **The Environmental Screening for Harbour Development (Breakwater, Floating Docks, Dredging, and Service Area) at Tiverton, Digby County, Nova Scotia** indicates that the construction of the parking area will be completed prior to March 31, 2006. In addition, the document states that the dredge material will be disposed of on land to form the proposed parking area. Considering the plans to use dredged material to infill the parking area, could you clarify the phases of this project?

The revised text for Issue A5 should clarify the three phases and the proposed activities within those phases (see answer to Question #1). The parking/service area is proposed to be constructed in Phase II (along with the dredging and blasting within the basin, and installation of floating docks) with completion prior to March 31, 2006. The dredging and blasting activity and the construction of the service area are proposed to occur within the same phase (occur concurrently) to allow for the usage of dredged material within the parking/service area.

Revised text for Issue A6:

Phase I of the proposed project is the construction of the armourstone breakwater and installation of 7 floating docks. The tentative construction schedule for the armourstone breakwater is a start date of February 2004 and a completion date of August 2004.

Phase II of the proposed project is dredging of the basin (including blasting of Class A material within the basin, the installation of remaining floating docks and construction of the service/parking area. This phase will begin during 2005 with completion by March 31, 2006. Dredging of the basin (including blasting of Class A material within the basin) will likely require 1.5 – 2 months to complete.

Phase III of the project involves the construction of a marginal wharf connected to the Provincial Ferry wharf. This phase of construction would begin within the 2006/07 fiscal year (between April 1, 2006 and March 31, 2007) and continue into the 2007/08 fiscal year (between April 1, 2007 and March 31, 2008) or be completed

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within either fiscal year alone. Construction would be scheduled to avoid sensitive periods within the environment.

4. **The Environmental Screening for Harbour Development (Breakwater, Floating Docks, Dredging, and Service Area) at Tiverton, Digby County, Nova Scotia** states that *minor dredging in the vicinity of the future floating docks (along the first leg of the breakwater) may consist of blasting of bedrock bottom.* Does the total volume of area to be dredged include the minor dredging activities that may occur.

Minor dredging was originally proposed in the Environmental Screening because it was identified as a logistic activity in the construction of the breakwater to save effort and money for future phases (Phase II specifically in the installation of the floating docks). As the project has evolved and components are revised, particularly the orientation of the floating docks, the proposed minor dredging is no longer required. Any dredging is proposed for Phase II only. Any dredging or blasting of Class A material (rock) within the new basin (including any minor dredging originally proposed) will **not** be conducted in Phase I.

For your information, as originally proposed, the minor dredging that was anticipated to be conducted in Phase 1 (which is no longer the case) was included in the preparation of the total dredge volume (originally 13,000 cubic meters). This total has been revised (and is stated in the revised text for Issue A5 – see Question #1) to be 10,000 cubic meters.

5. Will the area, in which the breakwater will be constructed, be dredged? If so, is it included in the total area to be dredged? Will blasting be required to dredge the breakwater area (if applicable)?

The area in which the breakwater will be constructed will not be dredged or blasted. Dredging in this area would only lower the harbour bottom elevation resulting in more rock being required to construct the breakwater (which is unfavourable from a cost or engineering perspective). The breakwater will be constructed from the existing harbour elevation upwards.

6. If blasting is required for any phase of the project what type of mitigation measures will be implemented to protect species at risk and species of special concern that may be associated with the proposed area (i.e. Atlantic salmon, North Atlantic Right Whale and Cod)?

Relevant sections of the CEAA Screening will be revised to address any potential effects on species at risk and species of special concern (i.e. Atlantic salmon, North Atlantic Right Whale and Cod).

Mitigation measures specific to blasting in the water may include (i.e. this will be finalized in the future Final version of the CEAA Screening):

- Blasting will be scheduled to avoid potential migration windows within Petit Passage. *Important point here is that any specific migration window to be avoided must be confirmed. PWGSC on behalf of DFO-SCH asks for DFO-Habitat's expert opinion on this matter, (i.e. this may be the Spring season as per January 14, 2004 phone conversation with Thomas Wheaton (A/Area Habitat Coordinator) – in attendance Gary Hubbard (DFO-SCH), Benson Milner (DFO-SCH) and Rosalia Galante (PWGSC);
- Installation of a silt curtain across the entrance to the constructed breakwater (between the Provincial Ferry Wharf and the newly constructed breakwater) to eliminate the movement of fish into the basin;
- A predictive analysis of the proposed blast will be conducted to assess the zone of influence of blasting activities;
- All temporary magazines for explosive storage will have a Temporary Magazine License;
- If explosives are to be stored on-site, explosives and blasting caps will be stored in separate magazines on-site; and
- Blasting activities will be done in a manner that ensures that the number and magnitude of explosions are limited to which is absolutely necessary.

7. The Environmental Screening for Harbour Development (Breakwater, Floating Docks, Dredging, and Service Area) at Tiverton, Digby County, Nova Scotia states *Remaining dredge material that cannot be utilised in the construction of the parking area will be disposed on land at a Provincially approved site.* Due to the high levels of boron, will disposal on land still be permitted?

Disposal of the dredged material on land is not anticipated to be a problem. The marine sediment samples collected were compared to the CCME Soil Quality Guidelines, NSDOEL Schedule A Guidelines for Land Based Disposal of Marine Sediments and the Atlantic PIRI Tier A Tables for petroleum hydrocarbons.

The sample result of >11 mg/kg for Boron is higher than the CCME Soil Quality Guideline recommended value for 2 mg/kg for Agricultural areas. The Provincial approval process most certainly would allow for the disposal of this material on Residential/Parkland or Commercial/Industrial categories of land disposal. Not meeting the disposal category for "Agricultural areas" does not substantially limit the Contractor in finding an acceptable disposal site.

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Issue A7:

The Environmental Screening for Harbour Development (Breakwater, Floating Docks, Dredging, and Service Area) at Tiverton, Digby County, Nova Scotia states *Lobster are stored in lobster cars from the end of November up to the end of June at the existing Tiverton SCH facility.*

1. Identify the location of the lobster cars in relation to the proposed project activities?

The lobster cars are located near the existing SCH facility (Fishermen's Wharf) which is located immediately south of the Provincial Ferry wharf. The lobster cars are positioned on the south side of the Fishermen's Wharf.

2. Could any phase of this project potentially interfere with the storage of lobster in the lobster holding facilities. If so, have local fishers or fisher associations been contacted regarding this issue? Identify plans the proponent plans to implement to mitigate the effects this project may have on storage of lobster in the lobster holding facilities.

The proposed project is not expected to affect the storage of lobster considering two existing structures (the Provincial Ferry wharf and the existing SCH facility - Fishermen's Wharf) extend out into the waters of Petit Passage and act as physical barriers between the proposed project site and the stored lobster location.

Consultation with the Harbour Authority of Tiverton (President, Wayne Outhouse 902-839-2781) was conducted on June 26, 2003. Wayne Outhouse is referenced in the CEAA Screening in Issue E1 (within the "Persons Consulted" section). No issues related to lobster storage were identified in consultation with the Harbour Authority (representing the users of the SCH facility).

Issue B9:

1. *DFO-HMB has determined that this project could result in a HADD to fish habitat requiring an Authorization under Section 35(2) of the Fisheries Act.*

Please rephrase this statement:

DFO-HMB, Area Habitat Co-ordinator, Thomas Wheaton has determined that this project will result in a HADD to fish habitat requiring an Authorization under Section 35(2) of the Fisheries Act.

Final CEAA Screening will reflect this change.

2. *A Marine Habitat Compensation Plan (MHCP) was developed in co-ordination with DFO-HMB. Please rephrase this statement considering DFO-HMB did not aid in the development of the compensation plan.*

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The Marine Habitat Compensation Plan (MHCP) will be removed from the Final CEAA Screening and replaced with the Letter of Intent.

Issue B17:

1. In the response for B17 it states *any equipment working in or over the marine environment is to be free from hydrocarbon based fluids...* please rephrase this to state: *any equipment working in or over the marine environment is to be free from leaking hydrocarbon based fluids.*

Final CEAA Screening will reflect this change.

Additional Considerations

After reviewing the document entitled *Environmental Screening for Harbour Development (Breakwater, floating Docks, Dredging, and Service Area) at Tiverton, Digby County, Nova Scotia*, we found the document to be deficient in the area of oceanography. Please address the following issues:

1. The impacts associated with the installation of a breakwater on tidal range and water velocity in Petit Passage (i.e. flow restrictions)

Paul Davison (Senior Coastal Engineer, PWGSC) was approached on these questions. He was also provided with the report you forwarded:

Seibert, G.H. and M.P.M Reddy. *Petit Passage Tide and Current Survey, 1966.*

There will be no impact on the tide range. This is pre-determined by the hydraulics of the Bay of Fundy/Gulf of Maine as a whole, and the scale of this project is much too small to impact such a widespread area. The breakwater is porous and cannot retain water. Water can percolate through it in much less time than a tide cycle.

Tidal velocities: The maximum tidal current is in the most constricted part of Petit Passage, which is south of the site. The proposed work is located in relatively shallow water in the wider portion of the strait. The 1966 Petit Passage Tide and Current Survey by Seibert and Reddy indicates that the main flood and ebb flows are confined to the deeper portions of the channel, and do not extend all the way in to the shorelines. Instead, there are two shear lines on either side of the flow jet, varying from 10m to 200 m offshore. The water on the shoreward side of the shear lines actually flows counter to the main flow in a series of eddies. The proposed harbour is located in the part of Petit Passage where this reverse flow zone is at its widest.

The new breakwater will not extend sufficiently far from shore to disrupt this flow pattern. The overall impact on Petit Passage will be negligible because the main flow is not being constricted any more than it is now. There will be localized eddying in the vicinity of the new harbour entrance around the times of mid-tide, not exceeding 3 knots (Refer to data for gauge location 4 in Seibert and Reddy). This is already

occurring at the ends of existing wharves in the Passage, and the harbour users are prepared to deal with them.

2. **The potential impacts the increased water velocity and increased tidal range may impose on the ferry operation.**

The NS Dept. of Transportation ferry runs obliquely across the passage, and its trajectory takes it away from the proposed harbour entrance. Any eddying associated with the new breakwater is expected to be sufficiently localized so as not to impinge on the ferry path. In fact, currents in the vessel's approach to the existing Tiverton berth may lessen due to the added sheltering effect of the breakwater, and frictional losses due to its rough surface.

3. **The potential impacts the increased water velocity and increased tidal range may impose on residing property owners.**

Potential impacts from increased water velocity on the residing property owners will be addressed with the addition of shore protection (armourstone) along the residing property (in agreement with the property owner). This protection is described in the revised text for Issue A5 (see Question #1). The rock will be placed above the high water mark.

4. **The effects sediment transport, deposition, and scour associated with the various construction and dredging activities may impose on existing biota within the proposed footprint and surrounding the proposed harbour development area.**

No effects of sediment transport, deposition, and scour associated with the various construction and dredging activities are predicted on existing biota within the proposed footprint and surrounding the proposed harbour development area.

5. (Added question – conference call January 6, 2004 (Thomas Wheaton, Alan Clarke, Gary Hubbard and Rosalia Galante) - **The potential impacts the increased water velocity may impose on pelagic fish and/or larval stages.**

Potential impacts from increased water velocity on pelagic fish and/or larval stages is predicted to be minimal considering any change in water velocity is anticipated to result in negligible overall impact on Petit Passage (with the exception of localized eddying in the vicinity of the new harbour entrance).

Additional Information Required

1. **Scaled drawings of the proposed construction area. This drawing should include the East Ferry side of Petit Passage.**

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Hard copy to be forwarded in the mail.

2. Scaled drawings depicting how the side slope area was determined.

As discussed with DFO-Habitat, these drawings will be submitted at a later date when the compensation plan (MHCP) is prepared and submitted for approval.

3. Explanation as to why fresh water compensation was given preference over any marine compensation works for the Tiverton area.

No longer required, proposed compensation was not accepted.

4. Can DFO- SCH allocate money to community groups to do restoration work on property not owned by the proponent? If not, how will the compensation money be allocated to the Salmon River Salmon Association?

DFO-SCH can allocate money to community groups to do restoration work.

5. Reference should be made in the **Environmental Screening for Harbour Development (Breakwater, Floating Docks, Dredging, and Service Area) at Tiverton, Digby County, Nova Scotia** of how the compensation for the outstanding letter of intent for Tiverton is to be included in the compensation for the proposed Tiverton harbour development project.

This may no longer be required (considering that a Letter of Intent has been prepared and finalized for this proposed project as well, and the Marine Habitat Compensation Plan (MHCP) will be removed from the Final CEAA Screening and replaced with the Letter of Intent).

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