

Marine Transport

Woodfibre LNG Limited is of the view that safety is the number one priority, and will work to ensure the safe, shared use of Howe Sound. **Section 7.3 Marine Transport** of the Application presents an assessment of the marine transport component of the Project in Howe Sound. The assessment concludes that the volume of vessel traffic generated by the Project during construction and operation is expected to be relatively low compared with the current and historical volumes of traffic in Howe Sound. With mitigation measures in place, residual effects to commercial transport, marine fisheries, and recreational and tourism activities due to Project construction and operation are not likely to be significant.

The LNG carriers destined for the Woodfibre LNG terminal will travel along existing commercial shipping lanes and will be piloted by two BC Coast Pilots. The Pilots will decide whether the conditions are right for the LNG carriers to enter Howe Sound. The LNG carriers and accompanying tugboats will travel at 8 to 10 knots in Howe Sound.

VESSEL WAKE ASSESSMENT

A vessel wake assessment was undertaken as part of the Project assessment (**Section 7.3.3.2.1 Potential Interactions**). Predictions of wake from a vessel are based on a proven formula, in which the wake height is primarily influenced by the speed of the vessel. With the reductions in speed in Howe Sound (to less than 10 knots), it is estimated that the wake generated by the LNG carriers in normal conditions would be less than 10 centimetres high at 50 metres from the carrier. This is lower than the wind-generated waves that are typical in Howe Sound. Also, any wake generated by an LNG carrier along the shipping route will diminish in size the further it travels away from the LNG carrier, and will not be noticeable at the shoreline, given the naturally occurring wind-generated waves in Howe Sound. Based on this analysis, potential wake effects of the Project are considered negligible.

The upland portion of the Project area will be fenced, and a control zone will be established around the marine portion of the Project area. The objective of the marine control zone is to protect public safety.



Woodfibre LNG Limited will complete a voluntary Transport Canada Technical Review Process of Marine Terminal Systems and Transshipment Sites (known as TERMPOL). This review will include a comprehensive risk assessment to identify steps to ensure the safety of vessel transits from the Woodfibre LNG terminal to the open ocean. The TERMPOL review will provide recommendations to improve safety and minimize risk, as well as detailed safety procedures and emergency response plans. Woodfibre LNG Limited has committed to implementing the recommendations of the TERMPOL review to the Project design and operation.

Subject to the recommendations of Transport Canada's TERMPOL Review Committee, Woodfibre LNG will deploy at least three tugboats, at least one of which will be tethered, to provide a *dynamic safety awareness zone* for recreational and pleasure craft around the LNG carrier during its transit within Howe Sound. This *dynamic safety awareness zone* would extend up to 50 m on either side of the vessel and would move with the LNG carrier. This tugboat arrangement also serves as an emergency provision to address contingencies that may require the carrier to stop or engage in manoeuvres on very short notice. This tug arrangement enables the LNG carrier to proceed at minimum speeds and be stopped or manoeuvred at any time. Minimum manoeuvring speed for an LNG carrier varies between 3 to 5 knots.

There is no regulation that requires an exclusion zone around LNG carriers in Canada. Boaters and marine recreation users will be expected to navigate in the vicinity of LNG carriers and Project tugboats in the same manner as they navigate in the vicinity of other large vessel traffic in Howe Sound.

DID YOU KNOW?

- Siting of the Woodfibre LNG facility complies in every way with the guidance of the Society of International Gas Tanker & Terminal Operators (SIGTTO) since the site is not in a narrow waterway.
- BC Coast Pilots has told Woodfibre LNG Limited that they do not consider Howe Sound to be a narrow waterway. This is because Howe Sound is generally a mile or more wide and has a minimum channel width of 0.8 nautical miles (or 1,440 m). It also has few outlined navigational hazards. The BC Coast Pilots are responsible for piloting all large commercial ships in transit in BC waters.
- Transport Canada's TERMPOL describes a one-way narrow channel as a body of navigable water that is less wide than four times a vessel's beam. It describes a two-way narrow channel as one that is less than seven times a vessel's beam. The LNG carriers that would be calling in at the Woodfibre LNG terminal will have a 45 m beam. This means that the minimum width for a one-way channel for the LNG carriers would be 180 m wide and a two-way channel would be 315 m wide.
- In the United States, the US 5th Circuit Court, has specified in its judgments that under Rule 9 of the International Regulations for Preventing Collisions at Sea (COLREGS) and the U.S. Inland Navigation Rules, a narrow channel is 1000 feet (305 m) wide, while other court judgments have considered a narrow channel to be any body of water having a width that is less than 1060% of the beam of the vessel (or 488 m for LNG carriers, which would service the Woodfibre terminal).

In addition to following best management practices in Project design and operation Woodfibre LNG Limited has proposed further mitigation measures to reduce potential effects of the Project. Proposed mitigation to reduce Project-related interactions with marine traffic and increase marine safety include the following:

Implement TERMPOL Recommendations: Woodfibre LNG Limited will continue to participate in Transport Canada's voluntary shipping and navigational risk assessment TERMPOL review process. Recommendations from the TERMPOL Review Committee will be integrated into the Project design and operating procedures.

Marine Transport Management Plan: Woodfibre LNG Limited will prepare and implement a marine transport management plan prior to construction activities or as outlined through TERMPOL. This plan will outline measures to ensure all vessel traffic is aware of Project activities.

Use Aids to Navigation: Woodfibre LNG Limited will install aids and navigational lights based on recommendations following the *Navigation Protection Act* permitting process.

Compliance with Maritime Regulations and Legislation: Woodfibre LNG Limited will conduct Project shipping and transportation of passengers in accordance with the requirements of the *Canada Shipping Act*, in compliance with the Canadian Coast Guard and the Pacific Pilotage Authority.

Consult with BC Ferries and Squamish Terminals: Woodfibre LNG Limited commits to further consult with BC Ferries and Squamish Terminals regarding potential interference, vessel routes, and current operating practices.

Limits to Transit in Poor Weather: Woodfibre LNG Limited will ensure that any transits in poor weather will be at the approval of BC Coast Pilots. Limits on weather and conditions, including wind speeds, waves, and traffic will be placed following studies conducted as part of TERMPOL and through consultation with Pacific Pilotage Authority.

Communication of LNG carrier with Canadian Coast Guard Marine Communications and Traffic Services (MCTS): Woodfibre LNG Limited will ensure that LNG carriers will request clearance from the Canadian Coast Guard MCTS prior to entering, moving within, and departing Howe Sound. MCTS will communicate and monitor movements along the entire shipping route.

Consultation with Recreational Stakeholder Groups in Howe Sound: Woodfibre LNG Limited commits to further consultation with recreational stakeholder groups in Howe Sound to identify areas of concerns and, where practicable, to identify additional mitigation that can be implemented to reduce effects.