
To: Catherine Ponsford, Project Manager
Canadian Environmental Assessment Agency
File: 123220020

From: Mike Lambert, Head, Environmental and Regulatory Affairs
Pacific NorthWest LNG
Date: November 10, 2015

Reference: June 2, 2015 Letter—Annex III—Outstanding Information from Information Request #2 |

This letter responds to the request for additional information received from the Canadian Environmental Assessment Agency (the Agency) on June 2, 2015. The structure of this response follows the specific information requests set out in Annex III of the Agency's June 2, 2015 letter to Pacific Northwest LNG.

QUESTION #1: EFFECTS ON CURRENT USE OF ABORIGINAL FISHERIES FOR TRADITIONAL PURPOSES

Issue and Information Requested: The Agency requested that the information received from Aboriginal groups on Traditional Knowledge/Traditional Use be incorporated into the environmental assessment in order to effectively support a conclusion regarding environmental effects of the Project on the current use of lands and resources for traditional purposes. The Agency's analysis is informed by effects to resources, such as fish and fish habitat on Flora Bank. This information is critical given the importance of Flora Bank to Aboriginal groups.

Information provided: The proponent's assessment of effects on current use of lands and resources for traditional purposes is based on limited information on fish and fish habitat.

Remaining information: The Agency requires that information provided in response to this letter must include assessment of the Project's effects on current use of lands and resources for traditional purposes.

RESPONSE TO QUESTION #1: CURRENT USE OF ABORIGINAL FISHERIES FOR TRADITIONAL PURPOSES

This response updates the assessment of potential adverse effects of the Pacific Northwest LNG project (the Project) on current use of lands and resources for traditional purposes. The analysis is based on:

- Updated assessment of effects on fish and fish habitat due to sediment transport and hydrodynamic changes resulting from construction and presence of the jetty and berth
- Additional information on fish presence on and adjacent to Flora Bank
- Additional information about alternative suitable habitat for marine mammals
- Additional information on the effects of dredged material disposal on land.

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In Appendix B of the Addendum to the Environmental Impact Statement (EIS Addendum), PNW LNG identified four pathways for potential adverse effects on current use of land and resources for traditional purposes. These were changes in:

1. Access to lands, waters, and resources for traditional purposes
2. Quantity of lands, waters, and resources currently used for traditional purposes
3. Quality of lands, waters, and resources currently used for traditional purposes
4. Sensory environment for current Aboriginal uses

Of these pathways, the new information only potentially affects the pathways “quantity of lands, waters, and resources currently used for traditional purposes” and “access to lands, waters, and resources for traditional purposes”. The new information is not expected to change the previously submitted assessment and conclusions regarding effects to: “quality of lands, waters, and resources for traditional purposes” nor “sensory environment for current Aboriginal use”. Table 1 provides a rationale for which effects pathways were assessed further.

Table 1 Rationale for Further Assessment

Pathways	Rationale for inclusion/exclusion from further assessment
Quantity of lands, waters, and resources for traditional peoples	Included. Refined 3D modelling and new marine resource information may indicate changes to relative abundance and geographic distribution of marine resources.
Quality of lands, waters, and resources for traditional peoples	Excluded. Refined 3D modelling and new marine resource information will not change previous assessment of project effects to resource quality or potential contamination of country foods.
Sensory environment for current Aboriginal use	Excluded. Refined 3D modelling and new marine resource information will not affect the measurable parameters used to assess sensory environment (acoustic quality, air quality, light quality, visual quality, and human presence).
Access to lands, waters and resources for traditional purposes	Included. Refined 3D modelling and new marine resource information may indicate change in effects to Aboriginal access to traditional resources.

Predicted Residual Effects on the access to lands, waters and resources for traditional purposes

As described in Table 21-6 and Table 21-7 of the EIS Addendum, Project components and activities related to marine construction could potentially interact with access to lands, waters, and resources for traditional uses by Aboriginal people. The assessment of potential adverse effects on the access to lands, waters, and resources for traditional uses considered the trestle location and construction activities. Further, the potential effects of project marine infrastructure to navigation were addressed in Section 15 of the EIS Addendum.

As described in Section 15.3.1.2 of the EIS Addendum, hydrodynamic modelling and sedimentation analysis determined that potential changes to sediment deposition resulting from placement of project marine infrastructure were limited in magnitude and spatial extent and not expected to affect navigation. Recent Deflt3D and MORPHO modelling indicates that sediment erosion and

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deposition effects are less than previously predicted. There will be localized changes in currents near the anchor and tower blocks and gradual changes in bedform in the immediate vicinity of the marine structures. Erosion and deposition would occur within tens of metres of the anchor and tower blocks. This modelling analysis did not include erosion protection around the marine structures, or refinements in the engineering designs of the tower and anchor blocks. With the erosion protection in-place and updated designs, the actual extent of erosion and the subsequent deposition would be smaller.

Based on these results, the conclusions reached in Section 15 of the EIS Addendum that changes to sediment deposition resulting from placement of project marine infrastructure will not affect navigation remain valid. As no adverse effects to navigation are predicted, there would neither be any directly related adverse effects to access to lands, waters and resources for traditional purposes.

Predicted Residual Effects on Quantity of Fish Currently Harvested for Traditional Purposes

As described in Table 21-6 and Table 21-7 of the EIS Addendum, Project components and activities related to fish and fish habitat could potentially affect the quantity (relative abundance and geographic distribution) of fish harvested by Aboriginal people. The assessment of potential adverse effects on the quantity of fish currently harvested for traditional purposes presented in the EIS Addendum drew from the conclusions of the fish and fish habitat assessment within Appendix A of the EIS Addendum (Marine Resources). The Marine Resources effects assessment considered:

- Change in sediment or water quality
- Change in fish habitat
- Direct mortality or physical injury to fish or marine mammals
- Change in behaviour of fish or marine mammals

The assessment concluded that residual effects from changes in sediment or water quality, mortality or physical injury to fish or marine mammals, and behaviour of fish or marine mammals would not affect local or regional fish populations.

Tables 13-10 and 13-11 of Appendix A of the EIS Addendum identified less than 7 ha of temporary alteration, permanent alteration, and loss of fish habitats associated with the marine terminal (i.e., the suspension bridge, trestle and LNG carrier berth). Of this, 1.44 ha was deemed to be serious harm to fish that required authorization under paragraph 35(2)(b) of the *Fisheries Act* and offsetting measures were outlined to meet DFO's goal of maintaining or improving the productivity of commercial, recreational and Aboriginal fisheries associated with the fish species that utilize Flora Bank and the adjacent habitats. Further, none of the identified serious harm was associated with the loss of eelgrass.

The new information that has become available since submission of the December 2014 EIS Addendum includes: (i) further hydrodynamic modelling results; and (ii) data from fish and fish habitat surveys completed between December 2014 and June 2015. From this additional work, the following pathways for potential effects on fish and fish habitat were considered:

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- Direct harmful alteration or loss of fish habitat on Agnew Bank from construction of the infrastructure and placement of scour protection and/or armouring of suspension bridge substructures, trestle pipe pile bents and the berths for erosion control
- Potential for indirect harmful alteration or loss of eelgrass due to induced erosion and/or deposition on Flora Bank
- Potential for an increase in total suspended solids (TSS) that may directly affect fish or limit a fish's ability to feed
- Potential for a material increase in currents around the tower and west anchor blocks that affects the ability of CRA species to move through the water and use the habitat

To understand the potential changes to Agnew and Flora banks that may be induced by the marine infrastructure, PNW LNG has undertaken a series of modelling efforts. Modelling included scenarios that represent typical daily conditions, key seasonal periods (stormier winter months, the Skeena River freshet season) and extreme (large and infrequent) storm events (including 50- and 100- year return period events). Delft3D and MORPHO modellings was used to understand the potential changes over Flora Bank as a whole and changes in the immediate vicinity of the marine structures.

Modelling without the proposed marine infrastructure shows tidal currents on Flora Bank are generally mild (typically less than 0.25 m/s [5 knots]) and significant wave heights are typically less than 0.3 – 0.5 m. Sand on Flora Bank is typically mobilized by currents over 0.3 m/s, or significant wave action. Most periods where this occurs are of relatively low duration. Combined with the large, flat extent of Flora Bank, sediment transport distances are limited. Relatively little material is transported off Flora Bank, making it dynamic but very stable.

Delft3D modelling with the marine infrastructure indicates that the structures have a limited effect on background conditions, and show a mild attenuating effect on the predicted erosion and deposition pattern. Sediment erosion and deposition effects are less than previously predicted. MORPHO modelling shows that there will be localized changes in currents near the anchor and tower blocks (current velocities will be of the same order as elsewhere on Flora Bank). These changes in current would result in increases in TSS and gradual changes in bedform within tens of metres of the anchor and tower blocks. TSS increases would be local, transient and of limited magnitude. This modelling analysis did not include erosion protection around the marine structures, or refinements in the engineering designs of the tower and anchor blocks. With the erosion protection in-place and updated designs, changes in current and TSS, and the actual extent of erosion and the subsequent deposition would be smaller.

A spatial analysis of the zones of erosion (without armouring) and subsequent deposition indicates that neither the existing eelgrass on Flora Bank nor any areas that supported eelgrass in 2007, 2009, 2011, 2014 or 2015 would experience 5 cm or more of erosion or deposition. Further, most major storm events in the Prince Rupert area which drive sediment transport occur during winter months when eelgrass is dormant.

Based on this information, potential changes in erosion and deposition from the presence of the marine structures is not predicted to affect the current or future distribution or health of eelgrass on Flora Bank. The permanent alteration or loss of fish habitats that are predicted to be harmful to

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fisheries are limited to impacts from the footprints of the tower block, anchor block, piles and the associated armouring for erosion protection.

From this analysis, precautionary estimates of permanent loss or alteration of fish habitat resulting from marine works are the same or less than previously assessed. This includes:

- Permanent loss or alteration of 8,630 m² of eelgrass / brown algae habitats at the material offloading facility(MOF)
- Permanent loss or alteration of 21,505 m² of crab/flatfish habitat associated with the marine terminal
- No permanent loss or alteration of intertidal eelgrass habitat on Flora Bank

PNW LNG has identified a range of fish habitat offset measures that would maintain and enhance the local fish habitat that support commercial, recreational and Aboriginal fisheries. These offset measures include habitat enhancements around the perimeter of Lelu Island and shoreline clean-up works. The identified habitat enhancement opportunities exceed the anticipated impacts and therefore no residual adverse effects on fish or fish habitats (or the ongoing productivity of the fisheries they support) are predicted. Potential offsetting measures include:

- 10,000 m² of intertidal brown algae
- 28,000 m² of intertidal soft sediment
- 30,000 m² of intertidal soft sediment / cobble
- 20,000 m² of intertidal eelgrass

Combined, these offsetting measures will support and enhance the sustainability and ongoing productivity of fish that are part of or support fisheries.

In the EIS Addendum, PNW LNG concluded that the Project would result in a negligible reduction in the quantity (relative abundance and geographic distribution) of fish currently harvested by Aboriginal people. The EIS Addendum contains a complete list of these species. This conclusion incorporated information on the demonstrated effectiveness of the proposed mitigation measures and the implementation of fish habitat offsetting measures. As described in section 21.6.5.1.4, of the EIS Addendum, given the predicted localized and short term nature of the expected changes in abundance and geographic distribution of harvested fish species, PNW LNG concluded that it was unlikely that the Project would adversely affect success rates for Aboriginal traditional harvesters.

The new information that has come available since December 2014 confirms the fish species that utilize Flora and Agnew banks, and provides precautionary estimates on habitats that will be permanently altered or lost. This has allowed for improved fish habitat offset planning and increases PNW LNG's confidence in its original prediction (as set out in detail in the EIS Addendum) that the Project would result in a negligible reduction in the quantity (relative abundance and geographic distribution) of fish currently harvested by Aboriginal people.

SIGNIFICANCE

In Sections 21.6.8.1.2 (Metlakatla First Nation), section 21.7.8.1.2 (Lax Kw'alaams First Nation), 21.8.8.1.2 (Gitxaala Nation), 21.9.8.1.2 (Kitsumkalum First Nation), 21.10.8.2.2 (K'itselas First Nation),

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21.11.8.1.2 (Gitga'at) of the EIS Addendum, PNW LNG assessed the significance of predicted Project effects on the current traditional fishing practices of the Metlakatla First Nation, Lax Kw'alaams First Nation, Gitxaala Nation, Kitsumkalum First Nation, Kitselas First Nation and Gitga'at First Nation.

PNW LNG predicted that Project effects on fishing practices would not be significant, with low magnitude and generally reversible residual effects on the traditional fishing practices of these Aboriginal groups. PNW LNG concluded that the Project would result in little discernable change in the fishing practices of members of the affected Aboriginal groups.

As described above, the refined 3D modelling and the new fish and fish habitat information indicates that adverse effects on fish and fish habitat are the same or lower than previously estimated. This confirms original predictions regarding potential adverse effects, including cumulative effects, of the Project on the quantity of fish currently harvested by Aboriginal groups for traditional purposes. It also confirms PNW LNG's original conclusions regarding the significance of potential adverse effects of the Project on the current use of land and resources for traditional purposes by Aboriginal people.

MARINE MAMMALS

Data on marine mammal species presence, relative abundance, timing and spatial distribution in the project development area (PDA) and local assessment area (LAA) are currently being collected by the marine mammal field program to help identify habitat use. Results of surveys completed between November 2014 and June 2015 provide a greater understanding of these factors. Although specific fine-scale prey distributional data are limited, it is expected that marine mammal presence in an area indicates prey presence as well as suitable habitat in that area.

It is anticipated that individual marine mammals in the LAA may exhibit localized behavioural change in the LAA for the duration of the construction phase of the Project and for short periods of time (i.e., 30 minutes to two hours) during shipping and berthing. These effects are not likely to result in mortality to species at risk and are not expected to affect population viability of any marine species, especially given the large geographic ranges of those species likely to be affected. Suitable alternative habitat has been identified for marine mammal species present within the LAA in the event of short-term small-scale displacement. It is anticipated that the availability of alternative suitable habitat will reduce the potential for short-term avoidance effects as a result of Project activities.

The updated information provided regarding alternative suitable habitat for marine mammals supports the conclusions made by PNW LNG in the EIS Addendum. As the updated information remains the same as that provided in the EIS Addendum, PNW LNG is confident that the conclusions reached in the EIS Addendum specific to Aboriginal use of marine mammals remains the same.

MATERIAL DISPOSAL ON LAND

Less than 200,000 m³ of sediment will be dredged from the MOF. The surficial 1 m of material, containing the levels of dioxins and furans above the Environment Canada guidelines for disposal at sea at a non-dispersive site (approximately 8,000 m³) will be disposed of on Lelu Island. On-land disposal of this sediment will occur within the PDA that will be cleared and leveled for construction

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of the facility. The clearing and development of this area has been previously assessed in EIS Application.

The on-land disposal area will be designed to accommodate placement of wet materials including peat and marine sediments. Water (including run-off and supernatant) from this area will flow through a sediment pond, and into an observation basin for monitoring and testing prior to discharge.

The on-land disposal of the 8,000 m³ of marine sediments will not result in additional effects on Aboriginal current use for traditional purposes. The disposal site is within the proposed facility fence line on Lelu Island and the development of this area has been fully assessed in the EIS Addendum. The on-land disposal of marine sediments in the peat disposal area does not alter the conclusions of the effects assessment on current use of land and resources for tradition purposes that are presented in the EIS Addendum.

CLOSURE

The updated assessment of effects on access to lands, waters, and resources for traditional purposes, and fish and fish habitat (based on the refined 3D modelling), as well as the additional information pertaining to suitable alternative habitats for marine mammals, and the disposal of dredged sediment on Lelu Island, does not result in any new effects, including cumulative effects, on the current use of lands and resources for traditional purposes. Consequently, the residual effects on current use by Metlakatla First Nation, Lax Kw'alaams First Nation, Gitxaala Nation, Kitsumkalum First Nation, Kitselas First Nation and Gitga'at First Nation remain as described in the EIS Addendum.

This letter provides information requested by the Government of Canada. If you have any questions, please contact Pacific NorthWest LNG.

Sincerely,

<Signature Removed>

Mike Lambert
Head, Environmental and Regulatory Affairs
Pacific NorthWest LNG