

26 EFFECTS OF CHANGES TO THE ENVIRONMENT

26.1 Effects of Changes to the Environment on Aboriginal People

26.1.1 Introduction

This section of the EIS/Application summarizes the effects of changes to the environment on Aboriginal people caused by the Project; in particular, changes to the following environmental components are summarized:

- Health
- Socio-economic conditions
- Archaeology and heritage resources
- Current use of lands and resources for traditional purposes.

26.1.2 Health

As described in detail in Section 19, Human and Ecological Health, PNW LNG concludes that the Project will not result in significant residual effects on human and ecological receptors. Its contribution to cumulative health risks, in combination with other projects and activities, are also anticipated to be not significant.

The analysis in Section 19 includes analysis of project-related effects on things other than the "environment" as defined in CEAA 2012 (such as increased project-related ambient light) and effects on the "environment" as defined in CEAA 2012 that may, in turn, affect Aboriginal health. For example, increased project-related exposure of harvested marine species to contaminated sediments could result in changes to the health of those Aboriginal people who consume affected species.

Consultation with Aboriginal groups identified dredging activities as a potential concern because Aboriginal people who live in the Prince Rupert Harbour area consume locally harvested seafood. In response, the spatial boundaries for the assessment in Section 19 were drawn to include areas that are important for traditional land and resource use. Section 19 also includes consideration of traditional activities such as the gathering and consumption of country foods important for nutritional health. In addition, the Human and Ecological Health RAA is based on the RAA for the Air Quality assessment: a 50 km x 50 km area centred on the facility.

As described in Section 19, PNW LNG concludes that project-related concentrations of criteria air contaminants will remain well below the regulatory thresholds for human health effects. In addition, residual effects on human and ecological health from project-related changes in polychlorinated dibenzo-p-dioxin and furan ("PCDD/F") concentrations in marine species tissues are not significant. The Project is not expected to introduce additional PCDD/Fs into the environment and existing levels in the sediment and marine tissues are below applicable health-based guidelines. Dredging in the Materials Offloading Facility and marine terminal berth areas will remove the majority of surface sediments containing PCDD/Fs while exposing underlying clean sediments.

26.1.3 Socio-Economic Conditions

As described in detail in Section 18, Community Health and Well-Being, direct effects on Aboriginal socio-economic conditions are anticipated to be not significant. While socio-economic effects associated with the Project are expected to act cumulatively with past, current, and reasonably foreseeable future projects in the RAA, these effects are not expected to result in unacceptable changes to the social determinants of health, physical and mental conditions, recreational opportunities or diet and nutrition. They will not directly or indirectly place increased demands on community and health services or infrastructure that exceed current capacity such that standards of service are routinely and persistently reduced below current levels for an extended period of time.

Information from Aboriginal communities was collected from existing traditional knowledge/traditional land use studies and secondary data sources. PNW LNG continues to request information from these communities. PNW LNG's assessment includes consideration of project-related effects on the environment that may affect Aboriginal community health and well-being.

The Project's direct and cumulative effects on community health and well-being (including effects on Aboriginal community health and well-being) are based on consideration of:

- Social determinants of health
- Physical and mental health
- Recreational opportunities
- Community cohesion/resilience
- Health infrastructure and services.

The analysis in Section 18 of potential project-related effects on the Community Health and Well-Being VC includes those effects that are not effects on the "environment" as defined in CEAA 2012 (e.g., effects on health infrastructure due to increased project-related demand) and effects on the "environment" as defined in CEAA 2012 that may, in turn, affect Aboriginal socio-economic conditions. For example, project-related removal of traditional use vegetation could result in changes in Aboriginal diet and nutrition.

26.1.4 Archaeology and Heritage Resources

Section 20, Archaeology and Heritage Resources, describes mitigation measures required by the regulatory authority and established in accordance with agreements developed through First Nations consultation. PNW LNG has determined that, given mitigation, residual effects on CMTs and/or other Aboriginal archaeological and heritage resources will be not significant because there will be no unmitigated project-related disturbance or destruction of heritage resources.

Project-specific and previously completed archaeological studies on Lelu Island indicate that 558 features (e.g., stripped bark, cut marks, notching, undercutting, removed planks) are recorded on more than 430 individual CMTs on Lelu Island. Clearing of vegetation from the PDA prior to grading and construction for the Project will result in the destruction, removal or disturbance of all CMTs within the PDA. Section 20 describes mitigation measures for CMTs that must be disturbed as well as a chance find protocol document to be used in the event that unrecorded CMTs are encountered. Other mitigation measures include completion of systematic data recovery studies and/or archaeological monitoring where necessary to prevent loss of cultural information. PNW LNG

encourages interested Aboriginal groups to provide more information on the importance of individual sites and appropriate mitigation steps.

Section 20, Archaeology and Heritage Resources, includes effects on things other than the “environment” as defined in CEAA 2012 (such as the inadvertent destruction of an artifact by project digging equipment), and effects on the “environment” as defined in CEAA 2012 that may, in turn, affect Aboriginal archaeological and heritage resources (e.g., the cutting of trees that also are identified as CMTs).

26.1.5 Current Use of Lands and Resources for Traditional Purposes by Aboriginal People

Section 21, Current Use of Land and Resources for Traditional Purposes, concludes that, with planned mitigation in place, the Project will have residual adverse effects on the VC that, in total, can be characterized as moderate in magnitude. Adverse residual effects are mostly localized to Lelu Island and in the waters immediately surrounding it, with certain effects (e.g., acoustic effects, light and other visual effects) extending out into the LAA. Most relevant effects will be for the medium term and will occur continuously during the construction and operations phases. Some effects are expected to be permanent (lasting longer than a human generation, considered to be 20 years).

The conclusions in Section 21 regarding residual effects on the Current Use of Land and Resources for Traditional Purposes apply to those residual effects that may affect aspects of the broader environment that are not included in the definition of the “environment” under CEAA 2012 (e.g., project-related interference with components of the socio-economic environment), and effects on the “environment” that, in turn, may affect the current use of land and resources for traditional purposes by Aboriginal people (e.g., adverse effects on harvested species).

26.2 Effects of Changes to the Environment that are Directly Linked or Necessarily Incidental to Federal Decisions

This section of the EIS/Application describes the effects of changes to the environmental directly linked or necessarily incidental to federal decisions, as summarized in Section 25, if they result in a change to:

- Health and socio-economic conditions
- Physical and cultural heritage
- Any structure, site or thing that is of historical, archaeological, paleontological or architectural significance.

Table 26-1 summarizes the changes to the environment that are linked to federal decisions on the Project which are required under the *Fisheries Act*, the *Canadian Environmental Protection Act*, *Navigable Waters Protection Act*, and *Canada Marine Act*.

Table 26-1: Summary of Changes to the Environment - Linked to Federal Legislation

Federal Decision	Changes (Potential Effects)
<i>Fisheries Act</i> section 35 (2)(b) application for authorization	<ul style="list-style-type: none"> ▪ Change in fish habitat ▪ Direct mortality or physical injury to fish or marine mammals ▪ Change in behaviour of fish or marine mammals
<i>Canadian Environmental Protection Act</i> section 124 permit	<ul style="list-style-type: none"> ▪ Change in criteria air contaminant concentrations ▪ Change in sediment or water quality sea permit
<i>Navigable Waters Protection Act</i> approval section 5 approval	<ul style="list-style-type: none"> ▪ Interference with navigation ▪ Effects of increased vessel traffic on fishing, public recreation and marine use
<i>Canada Marine Act</i> section 8 land lease under Letters Patent	<ul style="list-style-type: none"> ▪ Change in visual quality ▪ Change in community health and well-being ▪ Change in current use of lands and resources for traditional purposes ▪ Effects of increased vessel traffic on fishing, public recreation and marine use

26.2.1 *Fisheries Act*

With respect to the authorizations required under the *Fisheries Act*, the residual effects are anticipated to be not significant on health conditions; physical and cultural heritage; or any structure, site or thing that is of historical, archaeological, paleontological or architectural significance.

Residual effects on socio-economic conditions may occur from the following changes, relevant to authorizations required under the *Fisheries Act*:

- Change in fish habitat (see Sections 12 and 13)
- Increased freshwater fish mortality risk (see Section 12)
- Direct mortality or physical injury to marine fish and mammals (see Section 13)
- Change in behaviour of marine fish or marine mammals (see Section 13).

These changes may potentially alter socio-economic conditions related to commercial, recreational and Aboriginal fishing (Section 15).

Residual effects (loss from infilling) on freshwater fish habitat are anticipated to be not significant because of existing marginal habitat quality and the implementation of habitat offsetting (see Section 12 and Appendix K). Increased fish mortality risk in freshwater habitat is also expected to be not significant because only two small watercourses on Lelu Island are classified as fish streams, and mitigation through the Fish Habitat Offsetting Strategy is expected to be effective (see Section 12 and Appendix K).

Changes in marine fish habitat will be offset (Appendix K) and, therefore, residual effects are expected to be not significant (see Section 13). Direct mortality or physical injury to fish and marine mammals and changes to behaviour of fish and marine mammals in the marine environment could result from project construction activities (e.g., pile-driving, blasting and dredging) and operations activities (i.e., shipping and berthing). However, residual effects from these activities will not affect the viability of local populations and are, therefore, anticipated to be not significant (see Section 13).

26.2.2 Canadian Environmental Protection Act

With respect to the permits required under the *Canadian Environmental Protection Act*, the residual effects are anticipated to be not significant on health conditions; physical and cultural heritage; or any structure, site or thing that is of historical, archaeological, paleontological or architectural significance.

Residual effects on health conditions may occur from the following changes, relevant to the disposal at sea permit application under the *Canadian Environmental Protection Act*:

- Change in criteria air contaminant concentrations (see Section 6)
- Change in marine sediment or water quality (see Section 13).

Residual effects from changes to human and ecological health (due to changes in air quality) are anticipated to be not significant because the concentrations of CACs remain well below the regulatory thresholds (see Section 19).

Changes in marine sediment and water quality could result from project construction activities (e.g., dredging, pile driving and sediment disposal). Because the residual effects from these activities are limited to short-term guideline exceedances and restricted to within the immediate vicinity of the dredge and disposal sites, residual effects are anticipated to be not significant (see Sections 19 and 13).

26.2.3 Navigable Waters Protection Act

With respect to the approvals required under the *Navigable Waters Protection Act*, residual effects are anticipated to be not significant on health conditions; physical and cultural heritage; or on any structure, site or thing that is of historical, archaeological, paleontological or architectural significance.

Residual effects on socio-economic conditions may occur from the following changes, relevant to authorizations required under the *Navigable Waters Protection Act*.

- Interference with navigation (see Section 15)
- Effects of increased vessel traffic on fishing, public recreation and marine use (see Section 15).

These changes may potentially alter socio-economic conditions related to commercial, recreational, industrial and traditional uses of the marine resources near Lelu Island.

Residual effects related to interference with navigation from additional restrictions (in addition to current restrictions) on movement of vessels could result from project construction and operations activities. However, PNW LNG will maintain accessibility to marine areas of high importance.

Therefore, residual effects are anticipated to be not significant (see Section 15).

Residual effects of increased vessel traffic from the Project on fishing, public recreation and marine use are anticipated to be not significant because these residual effects will be contained within the LAA and will not cause permanent impairment to marine resource uses, including recreational activities.

26.2.4 *Canada Marine Act*

With particular reference to the issuance of the land lease required under the *Canada Marine Act* for construction and operation of the Project (not including other approvals that may be required under the *Canada Marine Act*), residual effects are anticipated to be not significant on health conditions, physical and cultural heritage; or any structure, site or thing that is of historical, archaeological, paleontological or architectural significance. Residual effects on socio-economic conditions may occur from the following changes relevant to visual quality under the *Canada Marine Act*:

- Change in visual quality
- Change in community health and well-being
- Changes to current use of lands and resources for traditional purposes by Aboriginal peoples.

Project activities on land and water (for both construction and operations) will cause residual effects on change in visual quality through the alteration of topography and vegetation patterns. However, these effects will be confined to the LAA and, while some may object to the change in viewscape, the community is supportive of the PRPA Land Use Management Plan, which includes LNG development on Lelu Island, resulting in residual effects, which are anticipated to be not significant (see Section 17).

Residual effects on community health and well-being from onshore site preparation will change recreational opportunities, social determinants of health, physical and mental health conditions, housing availability and health infrastructure and services. However, PNW LNG will implement mitigation measures, which will allow for increased prosperity, training and educational opportunities to the region; so, residual effects are anticipated to be not significant (see Section 18).

Residual effects on current use of lands and resources for traditional purposes from construction, operations and decommissioning activities may alter the populations of harvested species, traditional use locations, access routes and the experience of using land and resources for traditional purposes. However, with mitigation and habitat compensation measures in place, the residual effects of the Project will be not significant (see Section 21).