



Application to Amend
Environmental Assessment
Certificate #E23 01 and the
Impact Assessment Act
Decision Statement for the
Cedar LNG Project

Prepared by:

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Project: 123222394

Revision: 0

Prepared for:

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Executive Summary

Cedar LNG Partners LP, by its general partner Cedar LNG Partners (GP) Ltd. (Cedar), a Haisla Nation-led partnership with Pembina Pipeline Corporation, is constructing a liquefied natural gas (LNG) export facility within the District of Kitimat, British Columbia (BC) (the Project). The Project underwent an environmental assessment from 2019 to 2023 and received an environmental assessment certificate (EAC) under BC's *Environmental Assessment Act* (EAC #23-01) and a positive Decision Statement under Canada's *Impact Assessment Act* (reference number 80208) in March 2023.

Since the conclusion of the federal and provincial environmental assessment processes, Cedar has advanced the Project design, refined the capital costs, made a positive final investment decision and commenced construction in July 2024. The advancement of the Project design has resulted in the selection of a catenary mooring system for the floating liquefied natural gas (FLNG) facility and the following proposed changes to the Project:

- Add the option to relocate the 8.5-kilometre (km) long, 287 kilovolt (kV) transmission line from the original Transmission Line Corridor between the Minette BC Hydro Substation and the Marine Terminal Area, downslope toward Douglas Channel, and to increase its right-of-way from 45 metres (m) to 90 m (referred to as the alternative transmission line)
- Add a new 2.8 km long, 25 kV distribution powerline line along the Bish Creek Forest Service Road (FSR) to the Marine Terminal Area
- Expand the Marine Terminal Area to encompass the mooring lines and anchors for the FLNG facility's catenary mooring system.

With submission of this amendment application, Cedar is requesting that the Certified Project Description in Schedule A of EAC #E23-01 and the Description of the Designated Project in Schedule 1 of the *Impact Assessment Act* Decision Statement are amended to reflect the proposed changes to the Project. The objective of this amendment is to provide Cedar with the flexibility to quickly and efficiently execute the Project once design options are finalized, while continuing to responsibly manage potential adverse environmental and socioeconomic effects.

Table ES.1 and Table ES.2 outline the requested changes and provide rationale for the changes in Schedule A to EAC #23-01 and Schedule 1 to the Decision Statement, respectively.



TABLE ES.1 ORIGINAL AND REVISED SCHEDULE A CERTIFIED PROJECT DESCRIPTION AND RATIONALE

Original Wording	Proposed Changes	Rationale
<p>1.3 The Project components consist of:</p> <p>a) The Facility Area (which contains the floating liquefied natural gas (FLNG) facility, the marine terminal and supporting infrastructure), is up to 88 hectares in area and located within District Lot 99, a portion of the adjacent water lot (Lot A District Lot 5469) and an area of submerged Crown land (Figure 2);</p> <p>b) A transmission line within the Transmission Line Corridor, from BC Hydro's Minette Substation to the Facility Area as shown in Figure 2 and described below in sections 3.4 and 3.5; and</p> <p>c) Shipping of LNG along the Marine Shipping Route from the FLNG facility to the Triple Island Pilot Boarding Station, as shown in Figure 3.</p>	<p>1.3 The Project components consist of:</p> <p>a) The Facility Area (which contains the floating liquefied natural gas (FLNG) facility, the marine terminal and supporting infrastructure), is up to 88 <u>330</u> hectares in area and located within District Lot 99, a portion of the two <u>two</u> adjacent water lots (Lot A both water lots are within District Lot 5469) and an area of submerged Crown land (Figure 2);</p> <p>b) A transmission line within <u>one of two route options for</u> the Transmission Line Corridor, from BC Hydro's Minette Substation to the Facility Area as shown in Figure 2 and described below in sections 3.4 and 3.5; and</p> <p>c) Shipping of LNG along the Marine Shipping Route from the FLNG facility to the Triple Island Pilot Boarding Station, as shown in Figure 3-; <u>and</u></p> <p><u>d) A distribution powerline along the Bish Creek Forest Service Road to the Facility Area.</u></p>	<p>The selection of a catenary mooring system for the FLNG requires an extension of the Marine Terminal Area to accommodate the mooring lines and anchors for the mooring system. This will increase the total Facility Area to 330 hectares (ha), of which the Marine Terminal Area will be 277 ha. There will be no change in the land based portion of the Facility Area.</p> <p>The distribution powerline is a new Project component that will provide hydroelectric power and communications during construction and operation. It will require a separate right-of-way along Bish Creek FSR.</p>
<p>2.1 Temporary work areas within the Facility Area, Transmission Line Corridor or on private property that are required only for Construction include:...</p>	<p>2.1 Temporary work areas within the Facility Area, Transmission Line Corridor, <u>distribution powerline right-of-way</u>, or on private property that are required only for Construction include:...</p>	<p>The distribution powerline is a new Project component that will provide hydroelectric power and communications to the Facility Area during construction and operation. It will require a separate right-of-way along Bish Creek FSR. Temporary components may be required to support construction of the distribution powerline.</p>
<p>2.3 c) Site preparation, clearing of the right-of-way, installation of the transmission line and access roads identified in sections 3.4, 3.5 and 3.6;</p>	<p>2.3 c) Site preparation, clearing of the right-of-way, installation of the transmission line, <u>distribution powerline</u>, and access roads identified in sections 3.4, 3.5 and, 3.6 <u>and</u> 3.7;</p>	<p>The distribution powerline is a new Project component that will require a separate right-of-way along Bish Creek FSR.</p>



Original Wording	Proposed Changes	Rationale
<p>3.5 The transmission line right-of-way is up to 45 metres wide, except in the case of danger tree removal, and is within the Transmission Line Corridor (within one of the two options for the northern end of the transmission line), as shown in Figure 2.</p>	<p>3.5 The <u>base</u> transmission line right-of-way is up to 45 metres wide, except in the case of danger tree removal, and is within the <u>base</u> Transmission Line Corridor (within one of the two options for the northern end of the transmission line), as shown in Figure 2.</p> <p><u>The alternative transmission line right-of-way is up to 90 metres wide, except in the case of danger tree removal, and is within the alternative Transmission Line Corridor, as shown in Figure 2.</u></p>	<p>If the transmission line is rerouted to the new alignment, a 90 meter (m) wide right-of-way would be needed to accommodate safety and operability requirements.</p>
	<p><u>Distribution Powerline</u></p> <p><u>3.7 A 2.8 km long, 25 kV distribution powerline line will run along the Bish Creek Forest Service Road to the Facility Area. The distribution powerline right-of-way is up to 15 m wide, except in the case if danger tree removal.</u></p>	<p>The distribution powerline is a new Project component and will require a separate right-of-way along Bish Creek FSR.</p>
<p>Figure 2</p>	<p>Figure 2</p>	<p>Figure 2, as approved in EAC #23-01 requires an update to show:</p> <ol style="list-style-type: none"> 1) the option to relocate the transmission line (the alternative transmission line); 2) the extension of the Marine Terminal Area to include the area for the mooring lines and anchors for the catenary mooring system; and 3) the new distribution powerline right-of-way.

Note:

Proposed new text is underlined and text to be removed is shown in strikethrough text.

**TABLE ES.2 ORIGINAL AND REVISED SCHEDULE 1 DECISION STATEMENT DESCRIPTION AND RATIONALE**

Original Wording	Proposed Changes	Rationale
<p>The floating LNG facility and marine terminal (and supporting infrastructures) will be located within the Facility Area (Figure 2), which will be located within District Lot 99, a portion of the adjacent water lot (Lot A District Lot 5469) and an area of submerged Crown land. These areas will be up to 88 hectares. The transmission line will be located within the Transmission Line Corridor, running from BC Hydro's Minette Substation to the Facility Area (Figure 2).</p>	<p>The floating LNG facility and marine terminal (and supporting infrastructures) will be located within the Facility Area (Figure 2), which will be located within District Lot 99, a portion of the two adjacent water lots (Lot A <u>both water lots</u> <u>are within</u> District Lot 5469) and an area of submerged Crown land. These areas will be up to 88 <u>330</u> hectares. The transmission line will be located within <u>one of two route options for</u> the Transmission Line Corridor, running from BC Hydro's Minette Substation to the Facility Area (Figure 2).</p>	<p>The selection of a catenary mooring system for the FLNG requires an extension of the Marine Terminal Area to accommodate the mooring lines and anchors for the mooring system. This will increase the total Facility Area to 330 ha, of which the Marine Terminal Area will be 277 ha. There will be no change in the land based portion of the Facility Area.</p>
<p>Construction</p> <p>Construction will require the following temporary components within the Facility Area, Transmission Line Corridor or on private property:</p>	<p>Construction</p> <p>Construction will require the following temporary components within the Facility Area, Transmission Line Corridor, <u>distribution powerline right-of-way</u>, or on private property:</p>	<p>The distribution powerline is a new Project component that will provide hydroelectric power and communications to the Facility Area during construction and operation. It will require a separate right-of-way along Bish Creek FSR. Temporary components may be required to support construction of the distribution powerline.</p>
<p>Construction will require undertaking the following physical activities:</p> <ul style="list-style-type: none"> • site preparation and construction of the marine terminal and supporting infrastructure; • connection, start-up and commissioning of the floating LNG facility (to be constructed outside Canada and subsequently transported to the Facility Area); • site preparation, clearing of the right-of-way, installation of the transmission line and access roads; and • shipping of construction materials, including the floating LNG facility. 	<p>Construction will require undertaking the following physical activities:</p> <ul style="list-style-type: none"> • site preparation and construction of the marine terminal and supporting infrastructure; • connection, start-up and commissioning of the floating LNG facility (to be constructed outside Canada and subsequently transported to the Facility Area); • site preparation, clearing of the <u>rights-of-way</u>, installation of the <u>transmission line and distribution powerline</u> and access roads; and • shipping of construction materials, including the floating LNG facility. 	<p>The distribution powerline is a new Project component and will require a separate right-of-way along Bish Creek FSR.</p>



Original Wording	Proposed Changes	Rationale
<p>Transmission Line</p> <p>3.4 Electricity is supplied to the Project by an up to 8.5 km long, up to 287 kilovolt, power transmission line between BC Hydro’s Minette Substation and the substation within the Facility Area.</p> <p>3.5 The transmission line right-of-way is up to 45 metres wide, except in the case of danger tree removal, and is within the Transmission Line Corridor (within one of the two options for the northern end of the transmission line), as shown in Figure 2.</p>	<p>Transmission Line</p> <p>3.4 Electricity is supplied to the Project by an up to 8.5 km long, up to 287 kilovolt, power transmission line <u>within one of two route options</u> between BC Hydro’s Minette Substation and the substation within the Facility Area.</p> <p>3.5 The <u>base</u> transmission line right-of-way is up to 45 metres wide, except in the case of danger tree removal, and is within the <u>base</u> Transmission Line Corridor (within one of the two options for the northern end of the transmission line), as shown in Figure 2.</p> <p><u>The alternative transmission line right-of-way is up to 90 metres wide, except in the case of danger tree removal, and is within Option 2 Transmission Line Corridor, as shown in Figure 2.</u></p>	<p>If the transmission line is rerouted to the new alignment, a 90 m wide right-of-way would be needed to accommodate safety and operational requirements.</p>
<p>NA</p>	<p><u>Distribution Powerline</u></p> <p><u>3.7 A 2.8 km long, 25 kV distribution powerline line will run along the Bish Creek Forest Service Road to the Facility Area. The distribution powerline right-of-way is up to 15 m wide.</u></p>	<p>The distribution powerline is a new Project component and will require a separate right-of-way along Bish Creek FSR.</p>
<p>Figure 2</p>	<p>Figure 2</p>	<p>Figure 2, as approved in the Decision Statement requires an update to show:</p> <ol style="list-style-type: none"> 1) the option to relocate the transmission line (the alternative transmission line); 2) the extension of the Marine Terminal Area to include the area for the mooring lines and anchors for the catenary mooring system; and 3) the new distribution powerline right-of-way.

Note:

Proposed new text is underlined and text to be removed is shown in strikethrough text.



This amendment application follows the environmental assessment process by identifying the following:

- Potential interactions of the proposed changes with valued components
- Mechanisms for interactions with valued components
- Potential positive and negative effects, and mitigation measures to reduce potential negative effects
- Characterizing effects of the proposed changes compared to the Assessment Report (EAO 2022)
- Providing a description of risk and uncertainties associated with the characterization of residual effects

A cumulative effects assessment is conducted if the proposed changes adversely alter the characterization of residual effects from the Assessment Report (e.g., a residual effect changes from being low magnitude to moderate magnitude or from being reversible to being irreversible).

An assessment of the proposed changes on Indigenous interests and other section 25 matters of the *Environmental Assessment Act* is also provided.

Due to the general nature of the proposed works being unchanged, the mitigation measures already recommended by both the Construction Environmental Management Plan and the original EAC Application remain appropriate for the amendment, with no new effects or pathway of effects being introduced that would necessitate additional mitigation measures.

With the exception of a reduction in the residual effects to old forests, no changes to the Assessment Report's residual effects characterization are anticipated based on the changes contained in this amendment application. There is a reduced direction and magnitude of residual effects to old forests as the alternative transmission line no longer affects these. In addition, there will be less irreversible changes to wildlife habitat as old forest is no longer affected.

The increased right-of-way width of the alternative transmission line and the addition of the distribution line to the Project will increase greenhouse gas (GHG) emissions from land use change and diesel combustion in off road equipment. The carbon sink impact will also increase. These increased GHG emissions would not be fully offset from the reduction in diesel generator use.

The proposed changes will occur within Haisla Nation territory. The proposed changes do not overlap with Kitselas First Nation, Kitsumkalum First Nation, Gitga'at First Nation, Gitxaala Nation, Metlakatla First Nation, Lax Kw'alaams Band, or Haida Nation territories, nor do they overlap with Métis Nation British Columbia area of interest. Through Cedar's discussions with Indigenous nations, no concerns regarding the changes to the Project have been identified.

Cedar undertook assessments for Haisla Nation as the changes to the Project are located within their territory. Based on the findings for relevant valued components set out in Section 7.0 of this amendment application, and feedback received from Haisla Nation on the proposed changes and the identified mitigation measures, Cedar has concluded the proposed changes does not alter the characterization of residual effects on Haisla Nation interests as described in the conclusions of the Assessment Report. Potential effects to the valued components assessed in Section 7.0 can be mitigated, and no changes were predicted relative to the conclusions of the Assessment Report.

Cedar is committed to continuing to engage with Indigenous nations throughout the review of this amendment application and subsequent permitting. Cedar will respond to questions as they arise and consider inputs received during engagement activities as part of Project construction and operation.



The amendment is anticipated to have similar interactions with past, present, and reasonably foreseeable projects and activities when compared to the EAC Application. As such, cumulative effects on the valued components that interact with the amendment are predicted to be consistent with the Assessment Report, and the characterizations presented in the Assessment Report remain valid.

List of Abbreviations

BC	British Columbia
BCER	British Columbia Energy Regulator
BMPs	best management practices
CDC	Conservation Data Centre
Cedar	Cedar LNG Partners (GP) Ltd.
CEMP	Construction Environmental Management Plan
CMT	culturally modified tree
COSEWIC	Committee on the Status of Endangered Species in Canada
CPD	Certified Project Description
EAC	Environmental Assessment Certificate
EAO	Environmental Assessment Office
EAC Application	Application for an Environmental Assessment Certificate
FLNG	floating liquefied natural gas
FSR	Forest Service Road
GHG	greenhouse gas
ha	hectare
HADD	harmful alteration, disruption, or destruction of fish habitat
IAAC	Impact Assessment Agency of Canada
km	kilometre
kV	kilovolt
LAA	local assessment area
LNG	liquefied natural gas



LRMP	Land and Resource Management Plan
m	metre
m ²	square metre
m ³	cubic metre
MOF	Ministry of Forests
OCP	Official Community Plan
RAA	regional assessment area
ROV	remotely operated vehicle
SARA	<i>Species at Risk Act</i>
TAC	Technical Advisory Committee
TDR	technical data report
TSS	total suspended solids
WMU	Wildlife Management Unit



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Appendix A: Vegetation Technical Memo

Appendix B: Wildlife Technical Memo

Appendix C: Freshwater Fish Technical Report

Appendix D: Marine 2024 ROV Survey Results

Appendix E: Heritage – 2020-0113: Interim Report – Archaeological Impact Assessment of the 2024
Alternative Transmission Line and Distribution Powerline Corridor



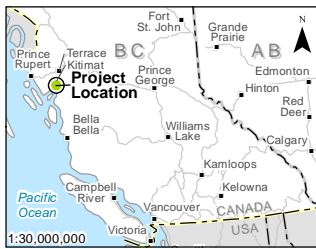
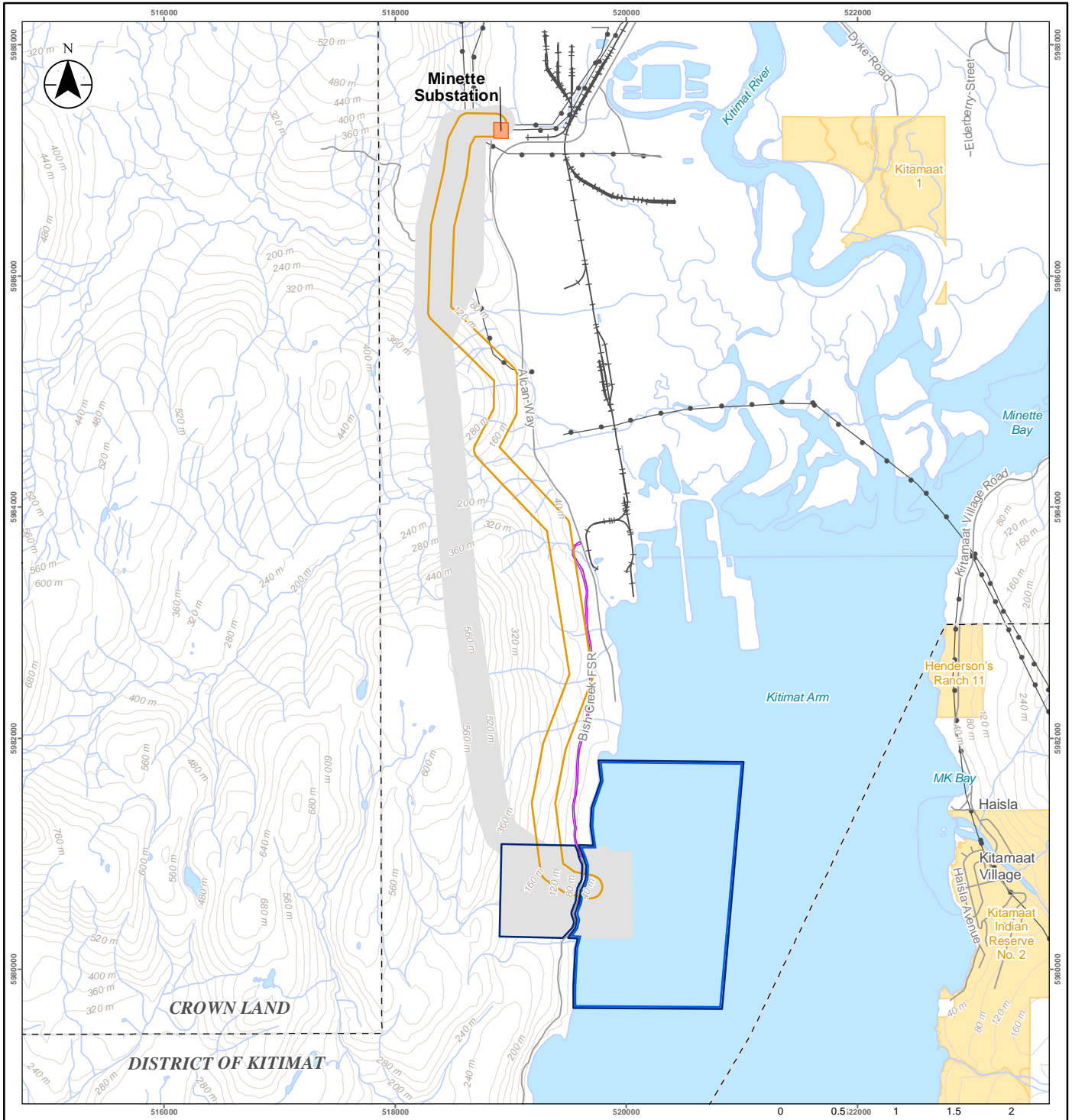
1.0 Introduction

Cedar LNG Partners LP, by its general partner Cedar LNG Partners (GP) Ltd. (Cedar), a Haisla Nation-led partnership with Pembina Pipeline Corporation, is constructing a liquefied natural gas (LNG) export facility within the District of Kitimat, British Columbia (BC) (the Project). The Project underwent an environmental assessment from 2019 to 2023 and received an environmental assessment certificate (EAC) under BC's *Environmental Assessment Act* (EAC #23-01) and a positive Decision Statement under Canada's *Impact Assessment Act* (reference number 80208) in March 2023. The Project commenced construction in July 2024.

Since the conclusion of the federal and provincial environmental assessment processes, Cedar has advanced the Project design, refined the capital costs, and made a positive final investment decision. This work has resulted in the selection of a catenary mooring system for the floating liquefied natural gas (FLNG) facility, refinement of the Project's layout, and identified opportunities to reduce the environmental impacts. The proposed changes all align with Haisla Nation values and priorities of promoting environmental responsibility and sustainable development, while minimizing impacts on land and water.

In consideration of the advancement of the project planning and design, Cedar is requesting that the Certified Project Description (CPD) in Schedule A of EAC #E23-01 and the Description of the Designated Project in Schedule 1 of the *Impact Assessment Act* Decision Statement are amended to reflect the changes described in this application.

This application is the first request to amend EAC #E23-01 (Amendment #1) and *Impact Assessment Act* Decision Statement. It has been structured to address all requirements of both the provincial and federal environmental legislation and is consistent with the original scope of assessment as specified in the approved Application Information Requirements. It includes an overview of the proposed changes and the rationale for the requested amendment (Section 2.0), an assessment of potential changes to effects on valued components (Section 7.0) and Indigenous Interests (i.e., Indigenous rights, including title and treaty rights) associated with this amendment application (Section 8.0), and consideration of the other matters specified in section 25 of the *Environmental Assessment Act* (Section 9.0). This fully addresses all requirements of the *Impact Assessment Act*.



Notes
 1. Coordinate System: NAD 1983 UTM Zone 9N
 2. Data Sources: DataBC, Government of British Columbia; Natural Resources Canada; Canadian Hydrographic Service

- Road
- +— Railway
- Transmission Line
- Topographic Contour (40 m)
- Waterbody
- Reserve Land
- District of Kitimat
- Municipal Boundary
- Minette Substation
- Facility Area
- Marine Terminal Area
- Distribution Powerline
- Alternative Transmission Line Corridor
- Certified Project Area



Project Location: Kitimat, British Columbia
 Project Number: 123222394
 Prepared by: TCARDINAL on 20240814
 Discipline Review by: IQURESHI on 20240819
 OR by: GFELTHAM on 20240828

Client/Project/Report: Cedar LNG Partners LP
 Cedar LNG Project
 Environmental Assessment Amendment

Figure No.: **1.1**
 Title: **Project Overview**

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2.0 Proposed Changes and Rationale

This amendment application is for the following proposed changes to the Project:

- Add the option to relocate the 8.5-kilometre (km) long, 287 kilovolt (kV) transmission line from the original Transmission Line Corridor between the Minette BC Hydro Substation and the Marine Terminal Area, downslope toward Douglas Channel, and to increase its right-of-way from 45 metres (m) to 90 m (referred to as the alternative transmission line)
- Add a new 2.8 km long, 25 kV distribution powerline line along the Bish Creek Forest Service Road (FSR) to the Marine Terminal Area
- Expand the Marine Terminal Area to encompass the mooring lines and anchors for the FLNG facility's catenary mooring system.

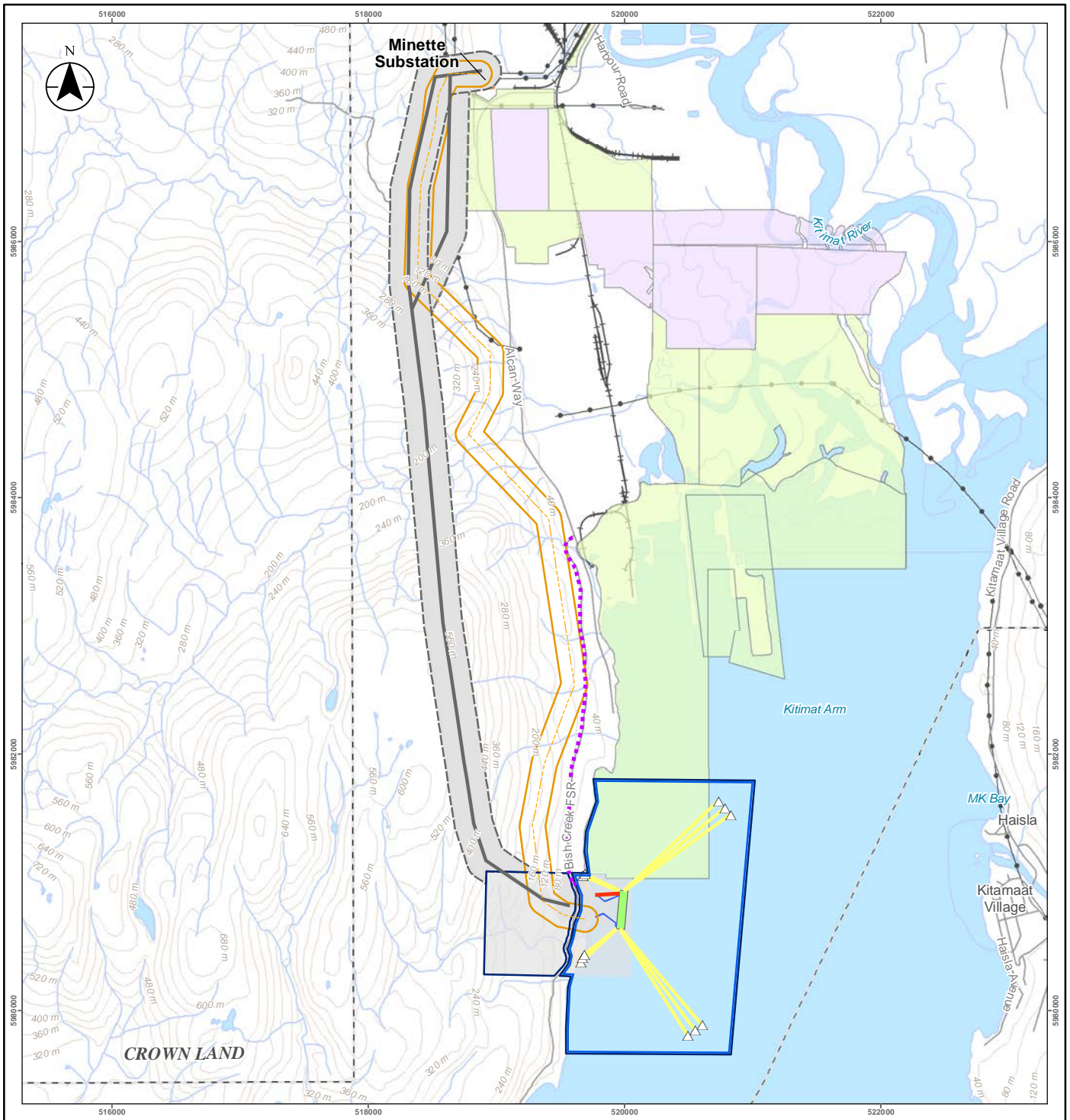
The locations of these changes are shown on Figure 2.1, and Table 2.1 provides a summary of the differences in the physical characteristics of the Project's components as described in the original EAC Application (Cedar 2022a) and the Assessment Report (Environmental Assessment Office [EAO] 2022) and this amendment application, including benefits of the Project. A summary of requested changes to the language provided in the Schedule A of the EAC and Schedule 1 of the Decision Statement are provided in Section 10.0.

Cedar assessed the alternative means of carrying out the Project within their EAC Application and the outcomes of the assessment are reflected in the Assessment Report and this amendment application. The amendment application expands on the alternative means considered in the Assessment Report. The amendment application considered a second alternative route for the transmission line which moved the transmission line out of crown tenured land to mainly private land. The Assessment Report considered diesel generators as a power supply option while the amendment application includes the addition of a distribution powerline that will provide hydroelectric power and communication during construction and operation. Where applicable, the valued components discuss the potential effects from the Assessment Report versus the alternative means of carrying out the Project considered in this amendment application.

Both a strut mooring system and catenary mooring system were considered in the Assessment Report. A strut mooring system requires specialized equipment and complex installation procedures whereas a catenary mooring system is simpler to install. Installation of the catenary mooring lines, anchors, dynamic gas risers, and floating access can be significantly complete prior to the FLNG arrival on-site. The catenary mooring system has a reduced installation time in comparison to the strut mooring system, which will reduce the disturbance time to marine users in the vicinity. A design review in January 2023 prompted the initiation of a pre-Front End Engineering Design level design effort, which subsequently led to multiple risk workshops and the onboarding of a third party to complete a risk evaluation and recommendations. The outcome of various risk exercises recommended that Cedar advance with the catenary mooring system as the catenary mooring system carries significantly less risk of potential delays during the FLNG hook-up operation, which is when large marine-based equipment will be on-site.

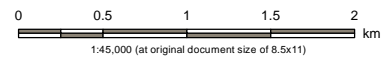


While this amendment includes proposed changes that are related to the mooring system for the FLNG facility, the catenary mooring system is considered in the Assessment Report and therefore this amendment application focuses on the effects that extend beyond the originally contemplated Marine Terminal Area. With respect to mooring system infrastructure within the originally proposed Marine Terminal Area, the proposed changes to the Project do not alter the assessment or findings of the Assessment Report.



Notes
 1. Coordinate System: NAD 1983 UTM Zone 9N
 2. Data Sources: DataBC, Government of British Columbia; Natural Resources Canada; Canadian Hydrographic Service

- Road
- +— Railway
- Transmission Line
- Topographic Contour (40 m)
- Waterbody
- District of Kitimat Municipal Boundary
- Minette Substation
- Rio Tinto Alcan Lands
- Leases/Easements/Other
- Owned Lot
- △ Catenary Mooring Anchor
- Distribution Powerline
- Alternative Transmission Line
- Dynamic Riser
- Floating Access
- Mooring Line
- FLNG
- Access
- Marine Terminal Area
- Facility Area
- Alternative Transmission Line Corridor
- Certified Project Area
- Approved Transmission Line Corridor
- Approved Transmission Line



Project Location: Kitimat, British Columbia
 Project Number: 123222394
 Prepared by: TCARDINAL on 20240809
 requested by: IOURESHI on 20240809
 Reviewed by: GFELTHAM on 20240828

Client/Project/Report: Cedar LNG Partners LP
 Cedar LNG Project
 EA Amendment

Figure No. **2.1**
 Title

Project Components

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TABLE 2.1 SUMMARY OF CHANGES IN PROJECT

Project Component	Description of Requested Changes and Rationale	Benefits	Physical Characteristics	
			Certified Project Description and Decision Statement	Amendment Application
Alternative Transmission Line	<p>The CPD within the EAC and the Designated Project description in the Decision Statement includes an 8.5 km long, 287 kV transmission line will be constructed between BC Hydro's Minette Substation and the substation within the Facility Area to supply power to the Project. The associated right-of-way will be up to 45 m wide, except in the case of danger tree removal, within a 300 m wide Transmission Line Corridor.</p> <p>Cedar is requesting an amendment to the CPD pursuant to section 32(1) of the provincial <i>Environmental Assessment Act</i> and amendment to the Decision Statement pursuant to section 68(1) of the <i>Impact Assessment Act</i> to add the option to relocate the transmission line from the original alignment on Crown land downslope on majority private land to an alignment near the base and toe of the mountainside. The right-of-way would increase to 90 m and voltage (287 kV) would remain unchanged. A 90 m wide right-of-way would be needed to accommodate safety and operability requirements. The right-of-way would cover approximately 69 ha.</p>	<p>Vegetation Resources: The alternative transmission line right-of-way is within an area of previously harvested forest. Old forest is avoided, and there is a reduction to the area of ecological communities at risk and wetlands that would be subject to disturbance or a potential indirect change in condition.</p> <p>Wildlife: Avoids interaction with marbled murrelet nesting habitat. Avoids old forest habitat that supports various wildlife species at risk.</p> <p>Land and Resource Use: Transmission line relocated from Crown land onto majority private land; transmission line will move from going straight up to the top of the mountain to be routed lower on the slope adjacent to an existing pipeline; the relocated transmission line option would move out of old forest to secondary growth forest that has been previously logged.</p>	<p>8.5 km long, 287 kV</p> <p>45 m wide right-of-way (except in the case of danger tree removal)</p> <p>32.5 ha clearing</p> <p>Within a 300 m wide corridor</p>	<p>As per the CPD and Decision Statement</p> <p>or</p> <p>8.5 km long, 287 kV</p> <p>90 m wide right-of-way (except in the case of danger tree removal)</p> <p>69 ha clearing</p> <p>Within a 200 m wide corridor</p>
Expanded Marine Terminal Area	<p>The Project includes a Marine Terminal Area with a mooring system for the FLNG facility. The Assessment Report considered both a strut mooring system and a catenary mooring system.</p> <p>Project design has advanced and a catenary mooring system has been selected based on constructability, technical and cost considerations. This amendment addresses the mooring lines and anchors for the catenary mooring system which extend beyond the limits of the Certified Project Area in the EAC and the approved area in the Decision Statement, and therefore an amendment to expand the boundary of the Certified Project Area and approved area in the Decision Statement is necessary.</p>	<p>Marine Resources: The mooring lines and anchors that extend outside of the Certified Project Area in the EAC will provide hard surfaces that will be colonized by marine organisms in the subtidal zone. The mooring lines and anchors will provide structure in an area with little habitat complexity.</p> <p>Marine Use: A strut mooring system requires specialized equipment and complex installation procedures; a catenary mooring system is simpler to install and will result in reduced installation time and reduced disturbance time to marine users in the vicinity.</p>	<p>A mooring system to connect the FLNG facility to shore</p> <p>Marine Terminal Area is 35.8 ha</p>	<p>Expand boundary of the CPD and Decision Statement to include mooring lines and anchors for the FLNG facility</p> <p>Marine Terminal Area is 277.3 ha</p> <p>See Figure 2.1</p>
Distribution Powerline	<p>A new distribution powerline along the Bish Creek FSR to the Facility Area is proposed to provide hydroelectric power and communication during construction and operation.</p> <p>The 2.8 km long, 25 kV distribution powerline line will run along the Bish Creek FSR to the Facility Area. The right-of-way would cover approximately 4.25 ha.</p>	<p>Air Quality: The distribution powerline will reduce diesel and gasoline use in generators thereby resulting in less air contaminants and GHG emissions. However, the additional footprint will require additional equipment for clearing and constructing the distribution powerline.</p> <p>Acoustics: The distribution powerline will replace generators thereby resulting in noise level reductions.</p> <p>Land and Resource Use: The distribution powerline will be developed within or adjacent to an existing disturbed FSR right-of-way.</p>	<p>Not included</p>	<p>2.8 km long, 25 kV</p> <p>15 m wide right-of-way (except in the case of danger tree removal)</p> <p>Up to 4.25 ha of clearing</p>



3.0 Applicable Licenses, Permits and Approvals

The list of federal and provincial licenses, permits and approvals outlined in the Joint Permitting / Regulatory Coordination Plan developed for the Project by the Impact Assessment Agency of Canada and the EAO (Impact Assessment Agency of Canada [IAAC] and EAO 2022) was reviewed. Aside from the amendment to EAC #E23-01 and the federal Decision Statement, Cedar will also require a Road Use permit from the Ministry of Forests (MOF) to construct the distribution powerline within the Bish Creek FSR right-of-way, amendments to permits under the British Columbia Energy Regulator (BCER), and changes to Crown land tenures for the alternative transmission line. The proposed alternative transmission line will be routed more onto private property off from provincial Crown land, thereby reducing the potential effects on tenured land and resource use.

Cedar will submit an application to the BCER to amend the LNG facility permit (Application Determination [AD] #100115227) to include changes to the mooring system and subsequent footprint changes, and Cedar is preparing this application. Cedar will also submit an application to the BCER to amend the transmission line, consistent with the amendment to EAC #E23-01 (AD#100115339) and Cedar is preparing this application. Various energy resource activity road permits granted by the BCER will also require amendment (AD#100117153, 100117155, 100117154) to align with the alternative transmission line alignment, and Cedar is also preparing these applications.

The proposed changes will require the following agreements with neighbouring landowners:

- The new boundary for the Marine Terminal Area overlaps Rio Tinto's water lot by 71.5 ha. Cedar is in discussions with Rio Tinto, and an agreement between Cedar and Rio Tinto will be secured before any infrastructure is placed on Rio Tinto's water lot.
- The alternative Transmission Line Corridor will be on a mixture of land ownership, with 44 ha on private land owned by Rio Tinto and a Haisla Nation company, and 28 ha on provincial Crown land. Rio Tinto has signed a letter of support for the alternative transmission line corridor, and an agreement between Cedar and Rio Tinto will be secured in advance of construction. A land agreement is already in place with the Haisla Nation company.
- Danger tree removal for the distribution powerline may extend on to private land owned by Rio Tinto. Cedar is in discussions with Rio Tinto, and an agreement between Cedar and Rio Tinto will be secured before any tree removal occurs.



4.0 Summary of Engagement

In advance of submission of this amendment application, Cedar has been engaging with Indigenous nations and affected landowners. None of the parties engaged have raised concerns regarding the changes to the Project included in this amendment application. Cedar will also engage with Kitimat community groups following submission of the amendment application and will provide a summary of that engagement to the EAO and IAAC.

4.1 Indigenous Nation Engagement

Cedar began engaging with Indigenous nations regarding the changes to the Project included in this amendment application in July 2024. Each of the Indigenous nations engaged through the environmental assessment process has been provided with information regarding the changes, and Cedar has offered a meeting to provide additional information regarding the changes. Specific engagement with each of the Nations is summarized below. Through our discussions with Indigenous nations, no concerns regarding the changes to the Project have been identified.

Cedar is committed to continuing to engage with Indigenous nations throughout the review of this amendment application and subsequent permitting. Cedar will respond to questions as they arise and consider inputs received during engagement activities as part of Project construction and operation.

Haisla Nation

As majority owners of the Project, Haisla Nation is included in all decisions regarding the Project, and the alternative transmission line corridor was driven by Haisla Nation's requirement that the Cedar team continue to look for ways to reduce Project-related effects within Haisla territory as the Project is constructed and operated. In addition, Cedar meets regularly with Haisla Nation to discuss environmental and permitting aspects of the Project. The bullets below summarize engagement specific to this amendment application.

- July 19, 2024 – Cedar shared an update regarding the amendment application with Haisla Nation. They noted that Haisla Nation was aware of the proposed changes to the Project but offered a meeting analogous to those being undertaken with other Nations.
- September 5, 2024 – Cedar requested to provide an update on the amendment application during the next regular meeting.
- September 20, 2024 – Cedar sent Haisla Nation a draft copy of this amendment application for review.
- September 26, 2024 – Cedar met with Haisla Nation to provide an overview of the amendment application, including the schedule.
- September 26, 2024 – Cedar provided a copy of the presentation to Haisla Nation for review.

**Kitselas First Nation**

- July 19, 2024 – Cedar sent a Project update email to Kitselas First Nation, which included that an EAC amendment may be required and requested a meeting time to provide an update.
- July 29, 2024 – Cedar met with Kitselas First Nation and provided a brief overview of the scope of this amendment application.
- September 6, 2024 – Cedar emailed Kitselas First Nation to provide an update regarding this amendment application and request a meeting.
- September 16, 2024 – Cedar emailed Kitselas First Nation a presentation summarizing this amendment application.
- September 17, 2024 – Cedar met with Kitselas First Nation to provide additional information regarding the planned changes to the Project and the anticipated changes to Project-related effects. No areas of concern were identified at the meeting.

Kitsumkalum First Nation

- July 19, 2024 – Cedar sent a Project update email to Kitsumkalum First Nation, which included that an EAC amendment may be required and requested a meeting time to provide an update.
- July 2024 – Cedar and Kitsumkalum First Nation decided not to have an initial meeting regarding the amendment application and to delay meeting until Cedar had certainty around the scope of the amendment.
- September 6, 2024 – Cedar emailed Kitsumkalum First Nation to provide an update regarding this amendment application and request a meeting.
- September 16, 2024 – Cedar emailed Kitsumkalum First Nation a copy of the presentation summarizing this amendment application.
- September 17, 2024 – Cedar met with Kitsumkalum First Nation to provide additional information regarding the planned changes to the Project and the anticipated changes to Project-related effects. No areas of concern were identified at the meeting.

Gitga'at First Nation

- July 19, 2024 – Cedar sent a Project update email to Gitga'at First Nation, which included that an EAC amendment may be required and requested a meeting time to provide an update.
- July 23, 2024 – Cedar provided a brief overview of the changes to the Project as part of a meeting on another topic.
- September 6, 2024 – Cedar emailed Gitga'at First Nation to provide an update regarding this amendment application and request a meeting.
- September 18, 2024 – Cedar emailed Gitga'at First Nation a copy of the presentation summarizing this amendment application. Cedar offered to meet with Gitga'at virtually or in Prince Rupert.

**Gitxaala Nation**

- July 19, 2024 – Cedar sent a Project update email to Gitxaala Nation, which included that an EAC amendment may be required and requested a meeting time to provide an update.
- July 23, 2024 – Cedar provided a brief overview of the changes to the Project as part of a meeting on another topic.
- September 6, 2024 – Cedar emailed Gitxaala Nation to provide an update regarding this amendment application and request a meeting.
- September 9, 2024 – Gitxaala Nation noted they didn't have availability prior to Cedar's planned submission of the amendment application and requested that materials be sent via email.
- September 9, 2024 – Cedar responded they would send a presentation via email once it was complete and that they were available to answer any questions. Cedar also noted that engagement would continue following submission of the amendment application.
- September 18, 2024 – Cedar emailed Gitxaala Nation a copy of the presentation summarizing this amendment application. Cedar offered to respond to any questions by telephone or to meet with Gitxaala Nation in Prince Rupert.
- September 24, 2024 – Gitxaala Nation emailed questions regarding restrictions to marine use within the expanded Marine Terminal Area.
- September 25, 2024 – Cedar responded that the expanded Marine Terminal Area is where Project components, including the mooring lines and anchors, can be placed. Restrictions in marine use would be driven by safety studies for the FLNG facility and would not be materially affected by the mooring system.
- September 26, 2024 – Gitxaala Nation emailed a question regarding whether baseline marine surveys had been undertaken to support the amendment application.
- September 26, 2024 – Cedar responded they completed an underwater remotely operated vehicle (ROV) survey of the areas where the mooring lines and anchors will be located to supplement the previous baseline work. These surveys confirmed the habitat is typical of Kitimat Arm/ Douglas Channel.

Metlakatla First Nation

- July 19, 2024 – Cedar sent a Project update email to Metlakatla First Nation, which included that an EAC amendment may be required and requested a meeting time to provide an update.
- September 6, 2024 – Cedar emailed Metlakatla First Nation to provide an update regarding this amendment application and request a meeting.
- September 18, 2024 – Cedar emailed Metlakatla First Nation a copy of the presentation summarizing this amendment application. Cedar offered to respond to any questions or to meet with Metlakatla First Nation in Prince Rupert.

**Lax Kw'alaams Band**

- July 19, 2024 – Cedar sent a Project update email to Lax Kw'alaams Band, which included that an EAC amendment may be required and requested a meeting time to provide an update.
- September 6, 2024 – Cedar emailed Lax Kw'alaams Band to provide an update regarding this amendment application and request a meeting.
- September 9, 2024 - Lax Kw'alaams Band requested a map showing the changes to the Project.
- September 9, 2024 – Cedar responded they were in the process of getting figures produced and would share with Lax Kw'alaams Band as soon as possible.
- September 18, 2024 – Cedar emailed Lax Kw'alaams Band a copy of the presentation summarizing this amendment application (including a figure of the changes to the Project). Cedar offered to respond to any questions by telephone or to meet with Lax Kw'alaams in Prince Rupert.

Métis Nation BC

- July 19, 2024 – Cedar sent a Project update email to Métis Nation BC, which included that an EAC amendment may be required and requested a meeting time to provide an update.
- August 20, 2024 – Cedar met with Métis Nation BC and provided a brief overview of the scope of this amendment application.
- September 6, 2024 – Cedar emailed Métis Nation BC to provide an update regarding this amendment application and request a meeting.
- September 16, 2024 – Cedar emailed Métis Nation BC a presentation summarizing this amendment application.
- September 17, 2024 – Cedar met with Métis Nation BC to provide additional information regarding the planned changes to the Project and the anticipated changes to Project-related effects. No areas of concern were identified at the meeting.

Haida Nation

- July 19, 2024 – Cedar sent a Project update email to Haida Nation, which included that an EAC amendment may be required and requested a meeting time to provide an update.
- September 6, 2024 – Cedar emailed Haida Nation to provide an update regarding this amendment application and request a meeting.
- September 18, 2024 – Cedar emailed Haida Nation a copy of the presentation summarizing this amendment application. Cedar reiterated the offer to meet with Haida Nation.



4.2 Landowner Consultation

As noted in Section 3.0, Project components included in this amendment application overlap with private property owned by a Haisla Nation company and Rio Tinto.

Rio Tinto has signed a letter of support for the alternative transmission line corridor, and an agreement between Cedar and Rio Tinto will be secured in advance of construction. Cedar is also in discussions with Rio Tinto regarding placing the anchors within their water lot and danger tree removal along the distribution powerline right-of-way. An agreement will be secured in advance of those activities.



5.0 Amendment Processes

5.1 Environmental Assessment Act

An amendment is any modification to an existing Certificate or Exemption Order, including to the CPD or Table of Conditions, or equivalent documents (EAO 2024). Amending the EAC requires the assessment of potential changes to effects of a project on Indigenous nations and their constitutional rights and interests, and the consideration of the assessment matters presented in section 25 of the *Environmental Assessment Act*. Based on the *Environmental Assessment Certificate and the Amendments to Environmental Assessment Certificates and Exemption Orders – Guidance for Holders* (EAO 2024), it is Cedar’s opinion the amendment falls within the “typical amendment” category as the proposed changes to the Project will be material but limited in nature.

Upon submission of the amendment application, the EAO will accept the amendment application by issuing a confirmation letter to Cedar. Once the amendment application is deemed complete and accepted by the EAO, the EAO will work collaboratively with participating Indigenous nations and Technical Advisory Committee (TAC) members to identify information requirements and develop a work plan, as appropriate, and provide estimates of the time to complete the technical review of the amendment application (EAO 2020a).

During the technical review of the amendment application, Cedar will track and provide responses to issues and concerns raised by TAC members regarding the amendment application. If required, Cedar will also provide supplemental materials and complete supplementary information requirements for the EAO’s and TAC’s review. The EAO will then prepare a draft amendment application report that will include revised or new conditions as necessary, and that would be reviewed by EAO Compliance, members of the TAC, and Cedar. Upon completion of the review, the amendment assessment report and the conditions will be finalized and referred to the EAO’s Executive Director for a decision on whether to issue the amendment (EAO 2024).

5.2 Impact Assessment Act

Section 68(1) of the *Impact Assessment Act* allows the Minister of Environment and Climate Change Canada to amend a decision statement, including to add or remove a condition, to amend any condition or to modify the designated project’s description. While there are restrictions of changes to conditions set out in the *Impact Assessment Act*, there are no such restrictions on modifications to a project’s description. There are no published guidelines on the information to be provided in an application to amend a decision statement and therefore the information requirements set out for the provincial amendment process is followed here.

Due to the differences between the amendment processes of the *Impact Assessment Act* and *Environmental Assessment Act*, the reviews cannot be harmonized.

6.0 Required Assessment Matters Under Section 25 of *Environmental Assessment Act*

Section 25 of the *Environmental Assessment Act* requires every assessment to: (1) assess the effects of a project on the rights and interests of Indigenous nations; and, (2) consider a number of matters (a through k in Table 6.1) in every assessment. Table 6.1 provides a summary of how these matters are approached in this amendment application.

As summarized in Table 6.1, this amendment application provides an assessment of potential effects of the proposed changes to the Project on valued components (Section 7.0). Interactions with Indigenous interests that were assessed in the application were reviewed to determine whether there would be additional effects to Indigenous interests as a result of the proposed changes (Section 8.0). Finally, the proposed changes were assessed in relation to other matters specified in section 25 of the *Environmental Assessment Act* (Section 9.0). The amendment application takes into consideration all matters identified in section 25 of the *Environmental Assessment Act*.

TABLE 6.1 SCREENING OF SECTION 25 MATTERS

Section	Assessment Matter	Considered Further (Yes/No)	Approach
25(1)	The effects of the project on Indigenous nations and rights recognized and affirmed by section 35 of the <i>Constitution Act, 1982</i>	Yes	<p>Cedar undertook assessments for Haisla Nation as the changes to the Project are located within their territory.</p> <p>The Assessment Report concluded the Project would result in residual effects on Haisla Nation harvesting rights, use and integrity of sacred and culturally important sites and landscape features, governance, and health and wellbeing.</p> <p>No changes are anticipated for potential effects on the marine environment, or the terrestrial environment beyond those described in the Assessment Report. As a result, the effects on Indigenous nations and rights under section 35 of the <i>Constitution Act, 1982</i> are consistent with the effects identified in the Section 8 of the Assessment Report, and the conclusions as presented in the Assessment Report remain unchanged. Please refer to Section 8.0 of this amendment application for more detail.</p> <p>Lax Kw'alaams Band, Metlakatla First Nation Gitga'at First Nation, Gitxaala Nation, Kitselas First Nation, Kitsumkalum First Nation and Haida Nation territories and Métis Nation British Columbia areas of interest are not overlapped by the proposed changes. Descriptions of the territorial lands and waters of the Indigenous nations is provided in the EAC Application.</p>



Section	Assessment Matter	Considered Further (Yes/No)	Approach
			<p>Although an assessment of effects on Lax Kw'alaams Band, Metlakatla First Nation, Gitga'at First Nation, Gitxaala Nation, Kitselas First Nation, Kitsumkalum First Nation, Haida Nation and Métis Nation British Columbia interests relative to the changes were not undertaken, each Indigenous nation was engaged regarding the planned changes to the Project and the anticipated changes to Project-related effects (see Section 4.1). Through Cedar's discussions with Indigenous nations, no concerns regarding the changes to the Project have been identified.</p> <p>Cedar is committed to continuing to engage with Indigenous nations throughout the review of this amendment application and subsequent permitting. Cedar will respond to questions as they arise and consider inputs received during engagement activities as part of Project construction and operation.</p>
25(2)(a)	Positive and negative direct and indirect effects of the reviewable project, including environmental, economic, social, cultural and health effects and adverse cumulative effects	Yes	Section 7.0 of this amendment application provides consideration of potential changes to environmental, economic, social, cultural or health effects associated with the proposed changes.
25(2)(b)	Risks and uncertainties associated with those effects, including the results of any interaction between effects	Yes	Section 7.0 and 8.0 of this amendment application provide additional confidence regarding outstanding risks and uncertainties of the amendment application predictions.
25(2)(c)	Risks of malfunctions or accidents	No	Section 9 of the EAC Application and Section 6.1 of the Assessment Report included an assessment of malfunctions and accidents. There are no changes to the products being held or transferred, and there are Canadian engineering design standards for all infrastructure that will be built or installed on site. Risks of malfunctions or accidents for the new distribution powerline are consistent with those included for the transmission line. Therefore, there is no change to the risk of accidents or malfunctions. The proposed changes will not lead to additional risks of malfunctions or accidents from those previously assessed; as such, these matters will not be considered further in this application.



Section	Assessment Matter	Considered Further (Yes/No)	Approach
25(2)(d)	Disproportionate effects on distinct human populations, including populations identified by gender	No	The EAO incorporated consideration of the potential for disproportionate effects throughout the Assessment Report, where effects on human populations are assessed. Given the negligible change in construction worker numbers, disproportionate effects on distinct human populations, including human populations identified by gender are negligible. The valued components affected by changes in human population, including human health, infrastructure and services, and employment and economy are not carried forward in this amendment application.
25(2)(e)	Effects on biophysical factors that support ecosystem function	No	This was addressed for the Project in Section 21 of the EAC Application and Section 6.6 of the Assessment Report. As described in Section 7.0, the proposed changes will not result in a change in potential effects on biophysical factors that support ecosystem function and therefore they are not considered further.
25(2)(f)	Effects on current and future generations	No	The proposed changes will not change the number of construction workers compared to what was included in the EAC Application and Assessment Report.
25(2)(g)	Consistency with any land-use plan of the government or an Indigenous nation if the plan is relevant to the assessment and to any assessment conducted under Section 35 or 73	Yes	Section 7.8 considers the proposed changes as they may affect land and resource use and land use plans. The changes do not overlap any new land use plans, or any new plans developed since the EAC Application and Assessment Report. The changes remain consistent with established land use plans.
25(2)(h)	Greenhouse gas emissions, including the potential effects on the province being able to meet its targets under the <i>Greenhouse Gas Reduction Targets Act</i> (now called the <i>Climate Change Accountability Act</i> , 2018)	Yes	Section 9.0 of this amendment application provides as an updated estimate of greenhouse gas emissions based on the additional clearing associated with the alternative transmission line and changes to diesel combustion associated with the distribution powerline during construction.



Section	Assessment Matter	Considered Further (Yes/No)	Approach
25(2)(i)	Alternative means of carrying out the project that are technically and economically feasible, including through the use of the best available technologies, and the potential effects, risks and uncertainties of those alternative	Yes	Cedar assessed the alternative means of carrying out the Project within their EAC Application and the outcomes of the assessment are reflected in the Assessment Report. The amendment application expands on the alternative means considered in the Assessment Report as described in Section 2.0. This amendment proposes changes to the location of the transmission line and a new distribution powerline. The proposed changes to the Project are altering the project components and therefore they are carried forward in this amendment application.
25(2)(j)	Potential changes to the reviewable project that may be caused by the environment	No	Section 10 of the EAC Application assessed effects of the environment on the Project. It included the transmission line and the mooring system in the geographic extent of the assessment and addressed potential effects of the environment (e.g., seismic events and tsunamis) on the marine and terrestrial infrastructure. Project infrastructure design and final routing will integrate site-specific data to manage potential effects from environmental constraints.
25(2)(k)	Other prescribed matters	n/a	n/a

7.0 Valued Components Assessment

7.1 Identification of Potential Interactions with Proposed Changes

The following sections provide an analysis of the effects of each proposed change to the Project and whether they alter the conclusions of the Assessment Report. This analysis specifically considered whether the proposed changes would induce any new effects, whether they would alter the characterization of the predicted effects (e.g., a change in the magnitude of an effects), or whether any new mitigation measures are needed to prevent a change in the characterization of the effects in the Assessment Report.

Potential interactions the proposed changes could have with each of the valued components considered in the Assessment Report have been assessed here. Table 7.1.1 outlines the potential interactions between the valued components as defined in the Assessment Report and the proposed physical changes as a result of this amendment application. Rationale for the interactions is described for each valued component in Table 7.1.2.

TABLE 7.1.1 POTENTIAL INTERACTIONS WITH VALUED COMPONENTS

Valued Components	Alternative Transmission Line	Expand Marine Terminal Area to Include the Mooring Lines and Anchors for the Catenary Mooring System	New Distribution Powerline
Air Quality	1	0	1
Acoustics	2	0	2
Vegetation Resources	2	0	2
Wildlife	2	0	2
Freshwater Fish	2	0	2
Marine Resources	0	2	0
Employment and Economy	0	0	0
Land and Resource Use	2	0	2
Marine Use	0	2	0
Infrastructure and Services	0	0	1
Heritage	2	0	2
Human Health	1	0	1

Notes:

0 = No valued component interaction; no further consideration warranted. Rationale is provided in Table 7.1.2.

1 = Negligible change relative to the potential effects previously assessed; can be appropriately managed via existing mitigation measures and commitments; rationale for exclusion from further assessment discussed in Table 7.1.2.

2 = Potential interaction with potential to result in changes to previously assessed effects or application of new mitigation or management measures; warrants further consideration and carried forward in the amendment application, as outlined in Table 7.1.2.

TABLE 7.1.2 VALUED COMPONENTS TO BE INCLUDED/EXCLUDED IN THE AMENDMENT APPLICATION

Valued Component	Interaction Identified	Carried Forward for Further Assessment	Rationale for Inclusion or Exclusion
Air Quality	Negligible change	Excluded from further assessment	<ul style="list-style-type: none"> The focus of the EAC Application was on operation emissions while acknowledging construction emissions. Air emissions of nitrogen dioxide, sulphur dioxide, fine particulate matter, and carbon monoxide are expected for the construction phase of the Project, including the proposed changes. The increase in the alternative transmission line right-of-way will increase emissions from burning land clearing debris. The addition of the distribution powerline will reduce the need of diesel power generators on-site during construction resulting in a reduction in construction emissions. Construction is expected to be intermittent and short-term therefore it is expected that effects will be less than the operation phase. This is still true for the addition of the amendment components. On this basis there is no change to the assessment of effects on air quality that was conducted for the Assessment Report.
Acoustics	Potential	Carried forward for further assessment	<ul style="list-style-type: none"> Noise emissions were calculated for construction of the Project, including the proposed changes. The alternative transmission line will increase the noise level at receptors close to the alternative transmission line. Similarly, the addition of the distribution powerline will increase the noise level at receptors close to the distribution powerline.
	No	Excluded from further assessment	<ul style="list-style-type: none"> While the mooring lines and anchors for the FLNG's catenary mooring system extend beyond the limits of the CPD in the EAC, the usage of marine construction vessels has been accounted for in the EAC noise assessment. As marine construction vessels are relatively low noise emitters and this has been considered in the Assessment Report, the installation of the mooring lines and anchors is not carried forward for assessment.
Vegetation Resources	Potential	Carried forward for further assessment	<ul style="list-style-type: none"> The alternative transmission line and distribution powerline have the potential to interact with vegetation resources through construction activities such as vegetation clearing, soil grubbing and site preparation.
	No	Excluded from further assessment	<ul style="list-style-type: none"> The expanded Marine Terminal Area to accommodate the catenary mooring system does not interact with vegetation.
Wildlife	Potential	Carried forward for further assessment	<ul style="list-style-type: none"> Effects of the alternative transmission line and the new distribution powerline on terrestrial wildlife habitat availability have the potential to result in changes to previously assessed effects and therefore, carried forward for further assessment.
	No	Excluded from further assessment	<ul style="list-style-type: none"> Potential effects on marine birds that may occur during placement of the mooring lines and anchors for the catenary mooring system within the expanded Marine Terminal Area can be appropriately managed via existing mitigation measures and commitments; therefore, it is not carried forward for further assessment. Effects of the alternative transmission line and the distribution powerline on terrestrial wildlife movement and mortality risk can be appropriately managed via existing mitigation measures and commitments and therefore, not carried forward for further assessment.
Freshwater Fish	Potential	Carried forward for further assessment	<ul style="list-style-type: none"> The alternative transmission line and the distribution powerline both have the potential to interact with freshwater fish and their habitat through construction activities such as riparian clearing.
	No	Excluded from further assessment	<ul style="list-style-type: none"> Freshwater fish and their habitat do not interact with the expanded Marine Terminal Area for the associated changes to mooring.
Marine Resources	Potential	Carried forward for further assessment	<ul style="list-style-type: none"> The mooring lines and anchors to the eastern side of the FLNG will interact with fish habitat, and therefore are included in the amendment application.
Employment and Economy	No	Excluded from further assessment	<ul style="list-style-type: none"> There are no interactions identified between the proposed changes to the Project and employment and economy. Capital costs are anticipated to remain within the range described in Section 2.3 of the Assessment Report (\$1.8 billion to \$3.0 billion); therefore, there are no changes to the effects on regional economy as outlined in Section 2.3 of the Assessment Report. The construction workforce is anticipated to remain within the range described in Section 7.8 of the EAC Application (average: 230 - 315; peak: 350 - 500); therefore, there are no changes to the effects on regional employment as outlined in Section 2.3 of the Assessment Report. There are no changes to business and contracting opportunities as a result of the proposed changes. With the implementation of mitigation measures outlined in the Assessment Report, residual effects on employment and economy are predicted to be predominantly positive.

Valued Component	Interaction Identified	Carried Forward for Further Assessment	Rationale for Inclusion or Exclusion
Land and Resource Use	Potential	Carried forward for further assessment	<ul style="list-style-type: none"> The alternative transmission line on a widened right-of-way and distribution powerline along an existing FSR have the potential to interact with land and resource use. The proposed changes to the Project will require rights-of-way on private property and therefore may change the effects to tenured land and resource use (moving more from Crown land to private land) and non-tenured land and resource use. Potential adverse effects to land and resource use can be appropriately managed via existing mitigation measures (e.g., the Construction Environmental Management Plan (CEMP), Socioeconomic Management Plan).
	No	Excluded from further assessment	<ul style="list-style-type: none"> The proposed changes to the Marine Terminal Area (i.e., mooring lines and anchors for the mooring system) will not result in interaction with land and resource use. The proposed changes to the Marine Terminal Area are addressed in marine use.
Marine Use	Potential	Carried forward for further assessment	<ul style="list-style-type: none"> The expansion of the Marine Terminal Area to accommodate the mooring lines and anchors for the catenary mooring system will result in a potential interaction that could result in changes to previously assessed effects or require the application of new mitigation or management measures. Cedar may be required to expand its existing Crown land tenure to accommodate the mooring lines and anchors. The expansion of the Marine Terminal Area will not change the marine shipping route, nor will it involve changes to the number or type of marine vessels to be used during construction and operation. Potential adverse effects to marine use warrants further consideration and is carried forward in the amendment application.
	No	Excluded from further assessment	<ul style="list-style-type: none"> The alternative transmission line and distribution powerline will not result in interactions between the proposed changes to the Project and marine use as the Project activities will occur on land. There are no anticipated changes to marine navigation, marine fisheries, and other uses, as a result of the alternative transmission line or distribution powerline, as outlined in the Assessment Report. The proposed changes to the alternative transmission line and distribution powerline are addressed in land and resource use.
Infrastructure and Services	No	Excluded from further assessment	<ul style="list-style-type: none"> The alternative transmission line, expansion of the Marine Terminal Area to accommodate the mooring lines and anchors for the catenary mooring system, and the distribution powerline will not result in interactions between the proposed changes to the Project and infrastructure and services. There are no anticipated changes to infrastructure and services, accommodation availability, and transportation infrastructure, as outlined in the Assessment Report. The proposed changes to the Project will not result in a change in the number of workers required for all phases of the Project; the local hiring and procurement policy; the infrastructure and services that Project workers may access; the workforce accommodation strategy; or the volume of traffic or type of vehicles required. Potential adverse effects to infrastructure and services can be appropriately managed via existing mitigation measures (e.g., the Socioeconomic Management Plan). As per the rationale provided, infrastructure and services will not be carried forward in the amendment application.
Heritage	Potential	Carried forward for further assessment	<ul style="list-style-type: none"> The alternative transmission line and distribution powerline will require vegetation removal and machine levelling activities during construction with the potential to impact heritage resources where present. Heritage resources with the potential to pre-date 1846 are protected from destruction under the <i>Heritage Conservation Act</i> in BC.
	No	Excluded from further assessment	<ul style="list-style-type: none"> The Marine Terminal Area did not have any recorded submerged archaeological sites or shipwreck sites in this area of the Douglas Channel. The terrain of the sea floor is rocky, uneven and steeply sloping with low profile sandy bay areas. Based on the background review of sea level changes in the Douglas Channel area, the environment in which the mooring system anchors will be located unlikely to contain submerged paleoshorelines or landscape capable of containing archaeological evidence of past land use. The Marine Terminal Area mooring system anchor locations are assessed as having low archaeological potential and therefore not be carried forward in the amendment application.

Valued Component	Interaction Identified	Carried Forward for Further Assessment	Rationale for Inclusion or Exclusion
Human Health	Negligible change	Excluded from further assessment	<ul style="list-style-type: none"> As described in the air quality valued component, the alternative transmission line and the distribution powerline would result in increased air emissions from land clearing activities during construction. The distribution powerline would also result in lower diesel emissions at the Marine Terminal Area during construction by replacing diesel generators with electricity. Overall, these changes in air emissions are limited and do not require further assessment related to human health. The EAC Application addressed construction emissions qualitatively because they were low relative to the operation phase. Under the changes associated with the amendment application, construction emissions will remain in the same general range that is low relative to the operation phase. Therefore, further assessment of human health in the context of air quality effects is not recommended. The change in the mooring and anchoring system for the FLNG facility does not result in a change to human health. The EAC Application had identified no project-related chemical contaminants from marine construction and operation activities that could bioaccumulate in locally harvested seafood. Marine sediment samples taken in the vicinity of the Project also show no existing chemical contamination. The absence of detectable marine sediment contamination suggests that sediment disturbance from construction activities related to the mooring system has limited to no potential to contaminate locally harvested seafood. This means there is no interaction with human health in the context of potential seafood contamination. As described under the acoustic valued component, the changes associated with the amendment application will result in minor changes to noise levels relative to those described in the EAC Application and Assessment Report. However, the overall magnitude and duration of the noise effects remain the same. Construction of the alternative transmission line, the distribution powerline, and catenary mooring system does not include activities with greater noise levels than what was considered in the EAC Application and Assessment Report. While the changes in the amendment application have an interaction with human health related to annoyance from noise, the health risk is expected to remain limited such that existing proposed acoustic mitigations will be effective. Therefore, further assessment of human health in the context of noise effects is not recommended.

7.2 Valued Component Assessment Methods

The amendment application identifies valued component previously assessed in the Assessment Report that have the potential to interact with the proposed changes to the Project (Section 7.1). Table 7.1.2 identifies valued components, their potential interactions with the Project and rationale for their inclusion or exclusion as valued components in the amendment application. Where there is the potential for proposed changes to interact with a valued component, these interactions are carried forward in the assessment. The assessment will evaluate whether the proposed changes will change the residual or cumulative effects and conclusions presented in the Assessment Report. The effects assessment follows the approach outlined in the EAO's Effects Assessment Policy (EAO 2020b).

The effects assessment evaluates the following:

- **Mechanism:** a description of how the proposed changes could result in interactions with the valued components
- **Mitigation:** identification of mitigation measures to reduce or eliminate potential negative effects of the proposed changes
- **Characterization of Effects:** a description of if and how the proposed changes alter the characterization of effects set out in the Assessment Report
- **Risks and uncertainties:** a description of risks and uncertainties, including the likelihood of positive or adverse residual effects, and results of any interaction between effects will be provided. The level of confidence and potential need for additional risk analysis in case of uncertainty is stated

For cumulative effects to occur, there must be residual adverse environmental effect and a spatial and temporal overlap of adverse effects from past, present, and reasonably foreseeable projects and activities. For each valued component carried forward in the amendment application, a cumulative effects assessment will be conducted if the proposed changes adversely alter the characterization of residual effects from the Assessment Report (e.g., a residual effect changes from being low magnitude to moderate magnitude or from being reversible to being irreversible). Reasonably foreseeable projects and activities are those that: (a) have been publicly announced with a defined project execution period and with sufficient project details that they can be included in the assessment; (b) are currently undergoing an environmental assessment; or (c) are in a permitting process.

7.3 Acoustics

The proposed changes in this amendment application alter the impacts to the environment that were considered in the EAC Application and the Assessment Report. Table 7.3.1 provides a side-by-side comparison of the impacts from the Project, as described in the CPD, and potential effects from the Assessment Report versus what is considered in this amendment application for acoustics. A description of the existing conditions that influence the assessment for the proposed changes to the Project is provided below, followed by the effects assessment.

TABLE 7.3.1 SUMMARY COMPARISON IMPACTS AND POTENTIAL EFFECTS FOR ACOUSTICS

Impact & Effect	Assessment Report	Amendment Application
Impacts	<ul style="list-style-type: none"> Transmission line corridor 	<ul style="list-style-type: none"> Alternative transmission line New distribution powerline
Potential Effects	<ul style="list-style-type: none"> Increase in noise level at noise sensitive receptors 	<ul style="list-style-type: none"> Increase in noise level at noise sensitive receptors

7.3.1 Existing Conditions

The baseline sound level represents the existing acoustic environment within the local assessment area (LAA) and regional assessment area (RAA) of 3 km in all directions from the Project footprint and can vary between noise-sensitive receptors depending on their location. There have been no changes in the baseline sound levels for receptors in this amendment application remain the same as the values considered by the EAO in its Assessment Report. The noise sensitive receptor locations listed in Table 7.3.2.

TABLE 7.3.2 NOISE SENSITIVE RECEPTORS IN THE VICINITY OF THE FACILITY AREA

Receptor ID	Name	Description ¹	Universal Transverse Mercator (UTM) ² Coordinates (m)		Approximate Distance (km) from Facility Area	Approximate Distance (km) from Transmission or Distribution line
			Easting	Northing		
R01	Kitamaat Village childcare centre	Daycare center	523066	5980755	3.0	--
R02	Kitamaat Village school	School	523151	5980707	3.1 ³	--
R03	Kitamaat Village church	Place of worship	522957	5980687	3.1 ³	--
R04	Kitamaat Village Health Centre	Hospital	523179	5980675	3.1	--



Receptor ID	Name	Description ¹	Universal Transverse Mercator (UTM) ² Coordinates (m)		Approximate Distance (km) from Facility Area	Approximate Distance (km) from Transmission or Distribution line
			Easting	Northing		
R13	Kitamaat Village residence 1	Residential noise sensitive receptor	522774	5979712	2.8	--
R14	Kitamaat Village residence 2		522934	5980462	2.9	--
R15	Kitamaat Village residence 3		522869	5981030	2.8	--
R16	Kitamaat Village Residence 4 (Haisla)		523078	5981322	3.0	--
R24	Haisla Recovery Centre	Hospital	522881	5980891	2.8	--
R26	SW dockyard	Traditional land use area, active and passive recreation areas	519911	5982474	1.4	0.2
R27	Half Moon Bay		519840	5981852	1.0	0.2
R28	Kitimat Service Area		520279	5989605	--	2.6
L1 ³	Assessment Location	OGC noise guideline (1.5 km criteria boundary)	519106	5978779	1.5	--

Notes:

¹ The identified noise sensitive receptors are based on the definitions provided in the BCER noise guideline (residential noise sensitive receptors only) and the Health Canada guidance (noise sensitive receptors beyond just residential receptors)

² Coordinate system: NAD 1983 UTM Zone 9

³ Assessment location represents the highest noise effects along the 1.5 km criteria boundary

--" outside the LAA/RAA, distance more than 4 km from Facility Area or transmission line

7.3.2 Potential Effects and Mitigation Measures

The distance between noise-generating construction activities and a receptor directly influences the noise levels experienced at that location. The proposed alternative transmission line is closer to all receptors considered in the EAC Application, resulting in higher construction noise compared to approved transmission line. Similarly, the construction of the distribution powerline and related activities will increase noise levels for receptors near the distribution powerline during construction (see Table 7.3.3).

The noise level at all receptors is predicted to remain in compliance with the applicable noise thresholds, whether construction occurs along the approved transmission line alignment or the alternative alignment, and with the addition of the new distribution powerline. During the construction phase, the highest noise increase due to construction activities is at receptor R27 on the Bish Creek FSR, approximately 250 m from the distribution powerline. The predicted L_{dn} value will increase from 59.0 dBA to 59.3 dBA. The change in percent highly annoyed (%HA) is 5.9 % at R27, below the threshold of 6.5 %. The predicted L_{dn} value and the change in %HA for the receptor in Kitimat Village remains unchanged.

The mitigation measures identified in the EAC Application are still applicable to this amendment application. No new mitigation measures are required.

TABLE 7.3.3 SUMMARY OF POTENTIAL EFFECTS AND MITIGATION MEASURES – ACOUSTIC ENVIRONMENT

Proposed Amendment Component	Project Phase	Change in Proposed Works or Activities	Change in Potential Effects	Change in Mitigation or Enhancement Measures	Change in Mitigation or Enhancement Measures Success Rating
Alternative transmission line	Construction	Yes	No change in potential effects to noise levels at noise sensitive receptors	No change	No change
Distribution powerline	Construction	Yes	No change in potential effects to noise levels at noise sensitive receptors	No change	No change

7.3.3 Changes to Characterization of Residual Effects

Noise effects from construction of the alternative transmission line and distribution powerline were assessed for this amendment application. The Assessment Report concluded that Project effects on the acoustic environment are predicted to be not significant. The characterization of residual effects for the amendment application is unchanged from the Assessment Report and is summarized in Table 7.3.4.

TABLE 7.3.4 CHANGES TO ASSESSMENT REPORT CHARACTERIZATION OF RESIDUAL EFFECTS – ACOUSTICS

Characterization of Residual Effects from the Assessment Report			Changes to the Residual Effects Characterization
Criteria	Assessment Rating	Rationale	
<i>Context</i>	<i>Moderate</i>	<i>Existing noise levels are not above OGC and Health Canada Guidelines. However, ambient sound levels in the Indigenous residential areas, combined with present projects, make this area sensitive to noise additions.</i>	No change
<i>Direction and Magnitude</i>	<i>Adverse and Low</i>	<i>Noise will be elevated within the LAA and RAA, with noise effects being greater closer to the Project than those from far away. For instance, Kitamaat Village 1 and 2 have the closest approximate distance to the Project. However, the change in %HA between total project sound and baseline is <6.5% at all Receptor IDs and application noise levels are all less than the PSLs under the OGC guidelines. During construction the projected daytime sound for the Kitamaat Village Residences are between 45-50 dB, while during operations, the Projected daytime sound for these residences will decrease to about 30-35 dB.</i>	No change
<i>Extent</i>	<i>Local/Regional (LAA and RAA are the same area)</i>	<i>Residual effects to acoustic environment will not extend beyond the RAA. Noise decreases with distance from the noise source. Noise at a distance greater than 3 km from the FLNG facility and transmission would attenuate to a level that is below the ambient sound level.</i>	No Change.
<i>Duration</i>	<i>Long-Term</i>	<i>The residual effects will last for the duration of the Project and in all project phases: Construction, operation, and decommissioning.</i>	No change
<i>Frequency</i>	<i>Continuous</i>	<i>While construction noises are planned to only take place during the day (0700 to 2200 h), during the operation phase, project noise will occur 24 hrs a day.</i>	No change
<i>Reversibility</i>	<i>Reversible</i>	<i>Effects will cease upon completion of all project phases.</i>	No change
<i>Affected Population</i>	<i>Disproportionate</i>	<i>While noise levels will increase the closer to the Project, residential populations are no closer than 2.7 km from the facility boundary. However, the potential effect would disproportionately be experienced by Haisla Nation Communities due to proximity to the Project.</i>	No change



Characterization of Residual Effects from the Assessment Report			Changes to the Residual Effects Characterization
Criteria	Assessment Rating	Rationale	
<i>Risk (likelihood and consequence)</i>	<i>Likelihood: high likelihood of acoustic effects during construction and operations.</i>	<i>Consequence: moderate consequence based on the low magnitude extending throughout the RAA.</i>	No change
		<i>Risk: based on the high likelihood and moderate consequence of residual effects to the acoustic environment, it was determined that there would be a moderate level of risk.</i>	
<i>Uncertainty</i>	<i>Uncertainty in acoustic effects at the facility is considered to be moderate. The EAO has a moderate level of confidence in the residual effects characterizations presented here, based on the acoustic modelling completed, the approach to establishing baseline conditions, the feedback received from the Working Group during the EA, and the proposed federal Mitigation Measures and provincial conditions (including a Follow-up Program for noise).</i>		No change
<i>Significance</i>	<i>In consideration of the above analysis and proposed conditions and federal Mitigation Measures, the EAO concludes that the Project would not have significant adverse residual effects on the acoustics VC in the Facility Area. Acoustic effects would not exceed Health Canada guidelines and effects would be fully reversible follow decommissioning of the Project.</i>		While this characterization is the responsibility of the EAO and IAAC, it is Cedar's opinion there is no change.

Note:

The text in italics is from the Assessment Report for the Cedar LNG Project (EAO 2022).

7.3.4 Cumulative Effects Assessment

Cumulative effects on the acoustic environment follows the same general process as described in the EAC Application.

Noise emissions associated with construction of the alternative transmission line and distribution powerline are expected to be transient in nature and only occur for short intervals. As a result, construction-related residual effects are not expected to act cumulatively with the effects of other past, present, and reasonably foreseeable future projects or physical activities within the RAA. Therefore, an assessment of the potential incremental contribution of construction noise to cumulative effects on the acoustic environment is not warranted. Construction-related cumulative effects on the acoustic environment will be short-term in duration and ambient sound levels would return at the conclusion of construction in a given area.

The Assessment Report determined that adverse cumulative effects related to the acoustic environment were not anticipated. The proposed changes are anticipated to have same interaction with past, present, and reasonably foreseeable projects and activities reported in the Assessment Report; there are no new proposed projects in the portion of the RAA that would be affected by construction noise. As such cumulative effects on acoustic environment because of the proposed changes are predicted to be consistent with the EAO's assessment and the characterization presented in the Assessment Report is anticipated to remain valid.

7.3.5 Risk and Uncertainties

The noise assessment prediction accuracy is predicted to be an overestimate quantitatively or qualitatively and remains the same as information presented in the Assessment Report.

7.3.6 Adaptive Management and Monitoring Measures

The proposed changes will not result in any change to the adaptive management and monitoring measures committed for the Project. Prior to construction in relation to the acoustic environment, Cedar will obtain all necessary approvals for works and will implement any monitoring and reporting required by conditions of approval. To verify compliance of the Project with conditions of Project approvals, Cedar has captured the environmental management and monitoring measures commitments in the CEMP (Cedar 2024).

7.4 Vegetation Resources

The proposed changes in this amendment application alter the impacts to the environment that were considered in the EAC Application and the Assessment Report. Table 7.4.1 provides a side-by-side comparison of the impacts from the Project, as described in the CPD, and potential effects from the Assessment Report versus what is considered in this amendment application for vegetation resources. This presents a “worst case” scenario as it assumes the alternative transmission line with its wider right-of-way would be built as well as assumes the entire right-of-way will be cleared. A description of the existing conditions that influence the assessment for the proposed changes to the Project is provided below, followed by the effects assessment.

TABLE 7.4.1 SUMMARY COMPARISON IMPACTS AND POTENTIAL EFFECTS FOR VEGETATION RESOURCES

Impact & Effect	Assessment Report	Amendment Application
Impacts	Plant species of interest <ul style="list-style-type: none"> No plant species at risk affected Ecological communities of interest <ul style="list-style-type: none"> 40.8 ha total vegetation clearing 3.8 ha of reduction in abundance of blue-listed communities 23.6 ha of potential reduction of condition of blue-listed communities within the marine terminal LAA 12.3 ha of reduction in abundance of old forest 75 ha of potential reduction in condition of old forest within the marine terminal LAA Wetland functions <ul style="list-style-type: none"> 0.6 ha of cleared wetland 6.8 ha of reduced wetland function 	Plant species of interest <ul style="list-style-type: none"> No plant species at risk affected Ecological communities of interest <ul style="list-style-type: none"> 70.2 ha total vegetation clearing 1.4 ha of reduction in abundance of blue-listed communities 13.6 ha of potential reduction of condition of blue-listed communities within the marine terminal LAA¹ No reduction in abundance of old forest No potential reduction in condition of old forest within the marine terminal LAA Wetland functions <ul style="list-style-type: none"> 0.1 ha of cleared wetland 1.6 ha of reduced wetland function
Potential Effects	<ul style="list-style-type: none"> Change in abundance of plant species of interest Change in abundance or condition on ecological communities of interest Change in wetland functions Change in native vegetation health and diversity due to air emissions 	<ul style="list-style-type: none"> Change in abundance of plant species of interest Change in abundance or condition on ecological communities of interest Change in wetland functions Change in native vegetation health and diversity due to air emissions

¹ The **marine terminal LAA** is 281.5 ha and includes the areas anticipated to be disturbed within the Facility Area and transmission line corridor (termed project footprint; as described above) plus a 120 m buffer.



7.4.1 Existing Conditions

Clearing of the Marine Terminal Area has commenced since the Assessment Report was issued. No other new developments or activities have been identified. There are changes in location and right-of-way width for the alternative transmission line and the addition of the distribution powerline that alter the vegetation resources affected (Appendix A). The method by which the modified marine terminal LAA was determined is the same as for the original marine terminal LAA, covering the proposed footprint as well as a 20 m buffer. However, because the area of the proposed footprint has increased when compared to the EAC Application, the modified marine terminal LAA now covers a larger area. Because of the eastward shift of the alternative transmission line location and the distribution powerline, much of the LAA has also shifted to the east to match. The alternative transmission line field studies completed in 2024 (Appendix A) have confirmed the conditions within the modified marine terminal LAA. While the general environment remains the same when compared to the original marine terminal LAA, the modified marine terminal LAA has the following characteristics:

- Located exclusively within the coastal western hemlock submontane very wet maritime subzone submontane variant (compared to the original being located within the submontane and montane variant) due to being at a lower elevation
- Contains more total vegetated area (253.4 ha compared to the original 246.7 ha; a 3% increase)
- Located within previously harvested area now covered by young forest or dense pole-sapling forest (compared to the original containing mostly old and mature forest)
- No longer contains old forest (0 ha compared to the original 75.0 ha; a 100% reduction)
- Contains less blue-listed forest (27.4 ha compared to the original 12.3 ha; a 55% reduction)
- Contains less wetland (1.7 ha compared the original 7.4 ha; a 77% reduction)
- Now contains a trace quantity of blue-listed wetland (<0.1 ha)

There are no changes in the number of or status of plant species or ecological communities at risk found within the modified marine terminal LAA (Appendix A). In addition, no new development or activities have occurred or been identified within the original nor the modified marine terminal LAA since the EAC and Decision Statement were issued. No changes are expected for existing conditions to native vegetation health and diversity due to air emissions effects within the modified marine terminal LAA.

7.4.2 Potential Effects and Mitigation Measures

The Assessment Report considered four potential effects on vegetation resources in relation to changes in abundance of plant species of interest (plant species at risk, traditional use plants, invasive plants), abundance or condition of ecological communities of interest (ecological communities at risk, old forest), wetland functions, and native vegetation health and diversity due to air emissions effects (see Table 7.4.2). No new effects pathways were identified for the amendment application.



Approved mitigation measures to address potential effects are presented in the Project’s CEMP. The existing mitigation measures are sufficient for managing adverse effects of the proposed amendment components and no additional mitigation is proposed. Assuming the alternative transmission line alignment is utilized, mitigation relating to old forest will no longer be necessary because there is no old forest present within the modified marine terminal LAA, therefore no potential for it to be affected by the Project.

TABLE 7.4.2 SUMMARY OF POTENTIAL EFFECTS AND MITIGATION MEASURES – VEGETATION RESOURCES

Proposed Amendment Component	Project Phase	Change in Proposed Works or Activities	Change in Potential Effects	Change in Mitigation or Enhancement Measures	Change in Mitigation or Enhancement Measures Success Rating
Alternative transmission line	Construction	Yes	Yes, change in potential effects to species of interest; area of potential loss of traditional use species has been increased.	No change	No change
			Yes, change in potential effects to ecological communities of interest; blue-listed communities with the potential to experience a negative change in condition have been reduced and old forest no longer has the potential to be affected	Old forest mitigation no longer required	No change
			Yes, change in potential effects to wetland functions; area of wetlands has been reduced	No change	No change
			No change in potential effects to air emissions	No change	No change



Proposed Amendment Component	Project Phase	Change in Proposed Works or Activities	Change in Potential Effects	Change in Mitigation or Enhancement Measures	Change in Mitigation or Enhancement Measures Success Rating
New distribution powerline	Construction	Yes	Yes, change in potential effects to species of interest; area of potential loss of traditional use species has been increased	No change	No change
			Yes, change in potential effects to blue listed ecological communities; total area of blue listed ecological communities has been reduced.,	No change	No change
			No wetlands affected	No change	No change
			No change in potential effects to air emissions	No change	No change

7.4.3 Changes to Characterization of Residual Effects

Predicted effects on vegetation resources and the residual effects characterization ratings presented in the Assessment Report are unchanged as a result of the amendment. A detailed comparison of the Assessment Report conclusions and amendment residual effects is presented below and in Table 7.4.3.

The extent, duration, frequency, and reversibility of the effects for the amendment are unchanged because the approach to construction and pathways of effects (i.e., vegetation clearing) are the same as used in the EAC Application. The context of the residual effects is unchanged by the alternative transmission line and addition of the distribution powerline because the marine terminal RAA is essentially the same for the amendment application as for the EAC Application.

There will be an increased area of vegetation clearing for the amendment compared to the amount predicted in the EAC Application and considered in the Assessment Report, as shown in Table 7.4.1. However, most of the changes associated with the alternative transmission line and addition of the distribution powerline are net neutral or positive from the standpoint of the vegetation resources measurable parameters.



Effects on plant species of interest are unchanged. No plant species at risk are predicted to be affected by the amendment (none were observed during additional rare plant surveys in 2024) and none were observed in the EAC Application. Though traditional use plant species occur throughout the marine terminal LAA, they are tree, shrub or herb species which are expected to persist throughout most of the disturbance footprint following construction, as most of the disturbance to vegetation associated with the Project is in the form of tree clearing. While one invasive plant species, bull thistle (*Cirsium vulgare*), was observed within the modified marine terminal LAA during 2024 surveys, this species had already been noted as potentially present, as it was known to occur within the marine terminal RAA.

The alternative transmission line no longer affects old forest, avoiding the 12.3 ha of old forest loss for the approved transmission line, as well as the 75 ha potentially affected by edge effects. Disturbance to blue-listed ecosystems and wetlands has been reduced by 64% and 80%, respectively. The area of blue-listed ecosystems with the potential to experience a negative change in condition has been reduced by 42%, while the area of wetland with the potential to experience a negative change in condition has been reduced by 77%.

Despite the increase of vegetation clearing area, the magnitude characterization remains “adverse and low” for all potential effects. The magnitude of effects to old forest (as one of two measurable parameters of ecological communities of interest) decreases from “adverse and low” to “no measurable change”.

TABLE 7.4.3 CHANGES TO ASSESSMENT REPORT CHARACTERIZATION OF RESIDUAL EFFECTS – VEGETATION

Characterization of Residual Effects from the Assessment Report			Changes to the Residual Effects Characterization
Criteria	Assessment Rating	Rationale	
Context	Low	<i>Resiliency is low due to existing industrial projects and historical logging in the marine terminal RAA, which have reduced the abundance and distribution of traditional use plant species, ecological communities of interest and wetland functions while increasing pollutants. Ecological communities at risk face forest harvesting and climate change threats on the provincial scale. Each new project with air emissions increases effects on native vegetation health and diversity. Lichen communities are particularly vulnerable to acidifying emissions and lichen richness has been affected in the air emissions RAA. Soils which have not currently exceeded the critical load of acid or nitrogen deposition are vulnerable to further inputs.</i>	No change



Characterization of Residual Effects from the Assessment Report			Changes to the Residual Effects Characterization
Criteria	Assessment Rating	Rationale	
Direction and Magnitude	Adverse and Low	<p><i>With the proposed Mitigation Measures in place, Cedar LNG is anticipated to have low magnitude adverse residual effects associated with the marine terminal and supporting infrastructure and transmission line.</i></p> <p>Plant species of interest: <i>Loss of TU plants and potential increase in invasive plant species are predicted to be low in magnitude because losses of TU plant species from the Project footprint are not anticipated to affect the viability of the species in the marine terminal RAA. Impacts of invasive species are anticipated to be reduced to a manageable level through management and Mitigation Measures.</i></p> <p>Ecological communities of interest: <i>Low magnitude reductions in blue listed upland forest communities, blue-listed ecological communities and the extent of old forest are predicted. A measurable change in abundance from existing conditions of ecological communities at risk is predicted, although the regional community's extent is considered sufficient to sustain the affected communities without active management. The change in abundance occurs primarily in the Facility footprint during construction. With the proposed mitigations, the potential for change in condition of ecological communities at risk due to edge effects to extend into the marine terminal LAA is low at all phases.</i></p> <p>Wetland functions: <i>The change in wetland functions is low in magnitude and the potential for edge effects on wetland functions outside of the Project footprint is low. A half hectare of wetland is predicted to be lost during the lifetime of the Project and reclaimed; 0.1 ha is expected to be permanently lost. An additional 6.8 ha of wetlands may be subject to edge effects that reduce wetland functions. The regional wetland functions are predicted to be sufficient to sustain the affected communities without active management. The change in wetland functions will be measurable in the Project footprint. There is low potential for edge effects to wetland functions outside of the Project footprint with the proposed Mitigation Measures in place. The affected wetland ecosystems are ranked as secure (yellow-listed) in the province.</i></p> <p>Air emissions effects: <i>The incremental effects of the Project include an increase from baseline in the vegetated area exceeding sulphur dioxide empirical critical level (1 percent), acid deposition calculated critical loads (2 percent), nitrogen deposition calculated critical loads (0 percent) and nitrogen deposition empirical critical load (26 percent). Of the 171.4 ha exceeding the nitrogen deposition empirical critical load, 31.1 ha is within estuarine communities (saltmarsh), which has a much higher empirical critical load (63 kg/ha/yr) than the general 4 kg/ha/yr threshold used in the assessment.</i></p>	<p>No change for most effects assessed. Reduced direction and magnitude for old forest as this will no longer be affected.</p>



Characterization of Residual Effects from the Assessment Report			Changes to the Residual Effects Characterization
Criteria	Assessment Rating	Rationale	
<i>Extent</i>	<i>Local</i>	<i>Residual effects will extend into the Project footprint and LAA.</i>	No change
<i>Duration</i>	<i>Permanent</i>	<p>Plant species of interest: <i>The transmission line right-of-way will revegetate once this project component is decommissioned, therefore revegetation to existing or near existing conditions will extend beyond the duration of the Project.</i></p> <p>Ecological communities of interest: <i>Once the transmission line is decommissioned, it will take a minimum of 50 years for the plant assemblage to make up the ecological communities at risk, which is considered a permanent effect.</i></p> <p>Wetland functions: <i>The less than 0.1 ha of wetland occurring in the proposed marine terminal footprint may not be reclaimed at the end of project life. The remaining 0.5 ha of wetland will take at least 50 years or more for the bogs to regenerate trees of a similar structure in the wetland. This is considered a permanent effect.</i></p> <p>Air emissions effects: <i>The residual changes in native vegetation health and diversity due to nitrogen deposition, eutrophication and acidification are predicted to be permanent. The decrease of sulphur dioxide deposition is associated with the recovery of lichen communities, that ranges in time from years to decades.</i></p>	No change
<i>Reversibility</i>	<i>Reversible /Irreversible</i>	<i>The residual effect for plant species of interest is reversible for the transmission line right-of-way but irreversible for the other project components because decommissioning follows planning for future use of the Project Area. Old forest losses, loss of ecological communities at risk and loss of wetland area and function are considered irreversible due to the duration of time required to reverse these effects. The residual change in native vegetation health and diversity due to nitrogen deposition is considered reversible once emissions cease.</i>	No change for most effects assessed except old forest is no longer affected.
<i>Frequency</i>	<i>Continuous</i>	<i>The residual effect occurs in a single event (during construction) for the loss of TU plants and an irregular frequency (edge effects) for the increase in invasive plants in all phases. The residual changes in native vegetation health and diversity due to nitrogen deposition, sulphur dioxide emissions and project-related acid deposition and subsequent soil acidification are predicted to be continuous during operations. Though no additional vegetated ecological communities will be affected by eutrophication exceedances due to project emissions, the Project will bring soils in the LAA closer to the eutrophication critical load. The residual change is projected to be continuous during operation.</i>	No change

Characterization of Residual Effects from the Assessment Report			Changes to the Residual Effects Characterization
Criteria	Assessment Rating	Rationale	
<i>Risk (likelihood and consequence)</i>		<p><i>Likelihood: Three residual adverse effects have a high likelihood: reduced abundance of traditional use plants in the marine terminal LAA; change in ecological communities of interest in the Project footprint (none from the marine terminal); and change in wetland functions in the Project footprint (extent is uncertain due to potential wetland avoidance in the transmission line and for wetland functions to remain intact). There is a medium likelihood that a decline in the vegetation health and diversity will occur from sulphur dioxide atmospheric concentrations and acid deposition in the emissions LAA and there is uncertainty as to how native vegetation will respond in the operation timeframe.</i></p> <p><i>Consequence: Although measurable changes in plants and ecological communities of interest, wetland functions and native vegetation health and diversity are predicted due to air emissions from existing conditions, the regional extent of these parameters is sufficient to sustain the affected species and communities without active management. Therefore, the consequence is considered minor.</i></p> <p><i>Risk: Based on the medium to high likelihood and minor consequence of residual effects on vegetation resources, the risk level would be low.</i></p>	No change
<i>Uncertainty</i>		<p><i>Air emissions: Although there is high confidence in the reliability of site specific and regional information, there is moderate confidence given the uncertainty of the actual vegetation responses to air emissions over the operation phase. The risk and uncertainty are likely overestimated for the change in native vegetation health and diversity due to acid deposition and potential acidification because modelling incorporates conservative assumptions, both in the dispersion modelling and in the calculated critical loads. Modelling incorporates conservative assumptions, both in the dispersion modelling and in the calculated critical loads, also leading to the likely overestimation of effects.</i></p> <p><i>Overall uncertainty regarding residual effects on vegetation resources is low. There is a good understanding of the cause-effect relationship between the Project and the VC and sufficient data is available to support the conclusions on the maximum extent of potential effects considered here.</i></p>	No change
<i>Significance</i>		<p><i>The EAO predicts that adverse residual effect on vegetation resources would not be significant because effects are low magnitude and following the application of avoidance and Mitigation Measures, the long-term viability of plants and ecological communities of interest, including those of cultural or traditional importance, will persist in the marine terminal RAA and there will be no loss of wetland functions of ecologically important wetland.</i></p>	While this characterization is the responsibility of the EAO and IAAC, it is Cedar's opinion there is no change

Note:

The text in italics was copied from the Assessment Report for the Cedar LNG Project (EAO 2022).



7.4.4 Cumulative Effects Assessment

Cumulative effects on vegetation resources for the proposed changes outlined in the amendment application are predicted to be of similar nature as for the approved Project as presented in the Assessment Report.

There are no new projects or activities in the portion of the RAA that would be affected by clearing activities and therefore the proposed changes are anticipated to have similar interaction with past, present, and reasonably foreseeable projects and activities when compared to the EAC Application and Assessment Report. As such, cumulative effects on vegetation resources are predicted to be consistent with the Assessment Report for the amendment application, and the characterization of cumulative effects remains valid.

7.4.5 Risk and Uncertainties

Overall uncertainty regarding residual effects on vegetation resources remains low, similar to that of the Assessment Report. There remains a good understanding of the cause-effect relationship between the Project and vegetation resources and sufficient data remains available to support the conclusions on the maximum extent of potential effects considered.

7.4.6 Adaptive Management and Monitoring Measures

No new potential effects or mitigation measures are recommended as a result of this amendment application, therefore adaptive management and monitoring measures are also not recommended to change and are sufficient for the amendment application.

7.5 Wildlife

The proposed changes in this amendment application alter the impacts to the environment that were considered in the EAC Application and the Assessment Report. Table 7.5.1 provides a side-by-side comparison of the impacts from the Project, as described in the CPD, and potential effects from the Assessment Report versus what is considered in this amendment application for wildlife. A description of the existing conditions that influence the assessment for the proposed changes to the Project is provided below, followed by the effects assessment.²

TABLE 7.5.1 SUMMARY COMPARISON IMPACTS AND POTENTIAL EFFECTS FOR WILDLIFE

Impact & Effect	Assessment Report	Amendment Application
Impacts	Coastal tailed frog: several watercourses, of which four confirmed occupied, that intersect the transmission line, facility clearing, and access roads	Coastal tailed frog – in addition to watercourses that intersect the facility clearing and access roads, four watercourses that support coastal tailed frog only intersect the distribution powerline and/or alternative transmission line
	Grizzly bear, moose, marten, marbled murrelet, bats, old forest songbirds, young forest songbirds, western toad wildlife habitat availability – alteration and loss of habitat; see Section 7.5.2 (Table 7.5.3) for details	Grizzly bear, moose, marten, marbled murrelet, bats, old forest songbirds, young forest songbirds, western toad wildlife habitat availability – changes in alteration and loss of habitat; see Section 7.5.2 (Table 7.5.3) for details
	Terrestrial wildlife – change in movement and mortality risk due to construction and project infrastructure	Terrestrial wildlife – no effects on change in movement and mortality risk due to construction and project infrastructure
	Marine birds – sensory disturbance, change in movement, and change in mortality risk due to marine infrastructure and shipping	Marine birds – no effects as no additional interaction with shipping, infrastructure, or lighting; no effect on terrestrial habitat.
Potential Effects	Change in Habitat Change in Movement Change in Mortality	Change in Habitat Change in Movement Change in Mortality

7.5.1 Existing Conditions

Existing conditions in the marine terminal and marine shipping RAAs have changed from conditions described in the Assessment Report. Since November 2022, there has been a change in number and status of species of conservation concern. Three additional bat species and one additional bird species are now species of conservation concern, and three bird species of conservation concern have had changes in their provincial and/or federal status (Table 7.5.2).

Clearing of the Marine Terminal Area has commenced since the Assessment Report was issued. No other new development or activities have occurred or been identified.

² The 2024 wildlife survey to address gaps in field survey coverage for bat roosts and pileated woodpecker (*Dryocopus pileatus*) nest cavities (Appendix B) supports the characterization of existing conditions but does not have substantive influence on the effects assessment.

TABLE 7.5.2 SUMMARY OF CHANGES IN SPECIES OF CONSERVATION CONCERN – WILDLIFE

Species	Scientific Name	Assessment Report		Amendment Application	
		BC (CDC)	Canada	BC (CDC) ¹	Canada
Hoary bat	<i>Lasiurus cinereus</i>	Not reported	Not reported	Blue	Endangered (COSEWIC) ²
Silver-haired bat	<i>Lasionycteris noctivagans</i>	Not reported	Not reported	Yellow	Endangered (COSEWIC) ²
Yuma myotis	<i>Myotis yumanensis</i>	Not reported	Not reported	Blue	Not assessed
Olive-sided flycatcher	<i>Contopus cooperi</i>	Blue	Threatened, Schedule 1	Yellow	Special Concern, Schedule 1 ³
Barn swallow	<i>Hirundo rustica</i>	Blue	Threatened, Schedule 1	Yellow	Threatened, Schedule 1 ³
Common nighthawk	<i>Chordeiles minor</i>	Yellow	Threatened, Schedule 1	Blue	Special Concern, Schedule 1 ³
Killdeer	<i>Charadrius vociferus</i>	Not reported	Not reported	Blue	Not assessed

Notes:

¹ CDC (Conservation Data Centre). BC Species and Ecosystems Explorer. BC Ministry of Environment, Victoria, B.C. <https://a100.gov.bc.ca/pub/eswp/>. Accessed August 13, 2024.

² COSEWIC (Committee on the Status of Endangered Species in Canada). COSEWIC wildlife species assessments, May 2023. <https://www.cosewic.ca/index.php/en/assessment-process/detailed-version-may-2023.html>.

³ Government of Canada. List of Wildlife Species at Risk, Schedule 1. <https://laws.justice.gc.ca/eng/acts/s-15.3/page-10.html>. Accessed August 13, 2024.

The marine terminal LAA has been expanded by 31.7 ha to support this amendment application. The modified marine terminal LAA extends east toward the marine environment where the proposed distribution line occurs just outside of the original marine terminal LAA along the Bish Creek FSR. The alternative transmission line right-of-way occurs inside the original marine terminal LAA; therefore, no further modifications were required. With the modified marine terminal LAA, existing conditions are changed from the marine terminal LAA in the Assessment Report in the following ways:

- The modified area is comprised of 15.1 ha pole sapling and young forest, 0.9 ha shrub, and the remaining 15.7 ha anthropogenic disturbances (roads, railway, industrial).
- Pole sapling and young forest within the new area provides effective (i.e., moderate and high) suitable habitat for young forest songbird community and potentially overwintering western toad.
- The modified area does not provide effective (i.e., moderate or high) suitable habitat for grizzly bear, moose, American marten, marbled murrelet, bats, old forest songbird community, or western toad breeding. However, potential bat roosts and western toad breeding sites were identified within the modified marine terminal LAA (see Appendix B) that occur outside of effective suitable habitat.
- The modified area overlaps the same watercourses that support coastal tailed frog as considered in the Assessment Report marine terminal LAA.



Existing conditions of wildlife movement and mortality risk within the modified marine terminal LAA are not changed from the marine terminal LAA in the Assessment Report.

7.5.2 Potential Effects and Mitigation Measures

The alternative location and wider transmission line right-of-way and the addition of the distribution powerline are predicted to result in the following changes in habitat (Table 7.5.3):

- Habitat availability for grizzly bear spring and fall feeding and moose winter feeding changes from a predicted loss (Assessment Report) to a predicted increase. This is due to an increase in the right-of-way width of the alternative transmission line that is predicted to provide forage within the footprint once construction is complete. Approximately 62 ha (that is, 35 ha more than the original transmission line location and width) will become available as moderate suitability feeding habitat for grizzly bear and moose following construction of the alternative transmission line right-of-way; during construction this area will not be suitable as feeding habitat for grizzly bear or moose.
- The reduction in habitat availability for moose winter shelter, marten living, bats roosting and foraging, and old forest songbird community is predicted to be less than for the approved transmission line.
- The reduction in western toad overwintering habitat availability is predicted to be slightly greater than for the approved transmission line.
- There is no change in the potential effect on mapped western toad breeding habitat availability. However, western toad potential breeding sites were identified in June 2024 (see Appendix B) outside of mapped habitat availability (i.e., habitat availability is based on terrestrial ecosystem mapping). These potential breeding sites are in ephemeral pools and non-classified waterbodies such as road ditches.
- The availability of marbled murrelet nesting habitat will change from a predicted loss (Assessment Report) to no loss. This is due to the relocation of the alternative transmission line downslope and out of marbled murrelet suitable habitat and federally delineated polygons where biophysical attributes of critical habitat may be present.
- Young forest songbird community nesting habitat availability changes from a predicted loss of 9.1% (Assessment Report) to a predicted loss of 25.4% of what is available within the marine terminal LAA. This is due to the relocation and increase in width of the alternative transmission line and the addition of the distribution powerline, both of which intersect pole/sapling and young forest along the lower slope of the marine terminal LAA. The potential effect is overestimated because this songbird community is adapted to early seral, recovering forest conditions and some young forest songbird species are expected to use recovering and maintained early seral habitat within the alternative transmission line right-of-way following construction. Also, this songbird community does not include species of conservation concern.

TABLE 7.5.3 CHANGES IN HABITAT AVAILABILITY

Habitat Type	Assessment Report		Amendment Application	
	Change in Habitat (ha)	Change in Availability within LAA (%)	Change in Habitat (ha)	Change in Availability within LAA (%)
Grizzly bear spring feeding	-16.5	-2.3	+32.7*	+4.5
Grizzly bear fall feeding	-74.1	-10.1	+23.0*	+3.2
Moose winter feeding	-12.8	-1.6	+54.3*	+6.8
Moose winter shelter	-21.3	-2.9	-4.9	-0.7
Marten living	-92.2	-12.6	-9.3	-1.3
Marbled murrelet nesting	-6.7	n/a	0.0	0.0
Bats roosting	-16.8	-2.6	-0.2	-0.0
Bats foraging	-0.6	-0.9	-0.1	-0.6
Old forest songbirds	-16.8	-2.6	-0.2	-0.0
Young forest songbirds	-23.8	-9.1	-70.6	-25.4
Western toad overwintering	-40.0	-2.9	-47.4	-3.4
Western toad breeding	-0.1	-0.2	-0.1	-0.2

Note:

The metrics include approximately 35 ha that will become available moderate suitability feeding habitat for grizzly bear and moose following construction of the alternative transmission line right-of-way; during construction this area will not be suitable feeding habitat for grizzly bear or moose. These models are consistent with those developed in the EAC Application.

Additionally, four watercourses are known to support coastal tailed frog and intersect the Project components. In addition, eight watercourses have high suitability habitat for coastal tailed frog, but surveys have not confirmed their presence. This is a change from 'several' indicated in the Assessment Report. The alternative transmission line and the new distribution line may result in an increase in loss of riparian areas during construction; however, riparian clearing, and in-stream works will be avoided to the extent practicable for the construction of the alternative transmission line and distribution powerline by setting transmission line structures and distribution line poles outside the riparian area.

The alternative transmission line and the addition of the distribution powerline are not predicted to result in changes in habitat (i.e., through sensory disturbance) for marine birds as there will be no additional interaction with shipping, infrastructure, or lighting, and no effects on terrestrial habitat.

The alternative transmission line and the addition of the distribution powerline is not predicted to result in changes in potential effects on wildlife movement or mortality risk. A summary of potential effects of the proposed amendment components on habitat, movement, and mortality risk is provided in Table 7.5.4.

TABLE 7.5.4 SUMMARY OF POTENTIAL EFFECTS AND MITIGATION MEASURES – WILDLIFE

Proposed Amendment Component	Project Phase	Change in Proposed Works or Activities	Change in Potential Effects	Change in Mitigation or Enhancement Measures	Change in Mitigation or Enhancement Measures Success Rating
Alternative transmission line	Construction	Yes	Potential effects on habitat availability are predicted to be less than what was considered in the Assessment Report	No change	No change
			No change to potential effects to movement	No change	No change
			No change to potential effects to mortality risk	No change	No change
Distribution powerline	Construction	Yes	Potential effects on habitat availability are predicted to be overall less than what was predicted in the Assessment Report	No change	No change
			No change to potential effects to movement	No change	No change
			No change to potential effects to mortality risk	No change	No change

The potential effects of the proposed changes on habitat are predicted to be an overestimate quantitatively because wildlife habitat suitability modeling assumes that a 90-m wide right-of-way will be fully cleared of trees and shrubs for the alternative transmission line. The actual width of the right-of-way is expected to be less and clearing of short vegetation (e.g., small trees and shrubs) may not be needed or they will regrow over time.

In the EAC Application and as reported in Assessment Report, the wildlife habitat suitability models were developed for the operation phase, not construction. For the proposed changes, the alternative transmission line and distribution powerline are predicted to provide no to little value as feeding habitat for grizzly bear and moose during construction, but they will provide moderate suitability habitat value once construction is complete. Positive values for grizzly bear and moose feeding habitat availability reflect this (Table 7.5.3).

Mitigation measures described in the CEMP for wildlife are sufficient for managing adverse effects of the proposed changes on habitat, movement, and mortality risk. No change in mitigation or enhancement measures is proposed (Table 7.5.4).

7.5.3 Changes to Characterization of Residual Effects

The alternative transmission line and the addition of the distribution powerline are predicted to result in no changes to the overall characterization of the residual effects on habitat, movement, and mortality risk for wildlife valued component as presented in the Assessment Report (Table 7.5.5). There are minor changes to the context, change in habitat direction and magnitude, and change in habitat reversibility criteria (Table 7.5.5); however, these do not affect the overall characterization of the residual effects on habitat.

TABLE 7.5.5 CHANGES TO ASSESSMENT REPORT CHARACTERIZATION OF RESIDUAL EFFECTS – WILDLIFE

Characterization of Residual Effects from the Assessment Report			Changes to the Residual Effects Characterization
Criteria	Assessment Rating	Rationale	
Context	Low to Moderate	<p><i>The Marine Terminal RAA has been subject to a variety of human disturbances associated with past and present industrial operation since the 1950s. Wildlife may be sensitive to any further degradation in environmental quality. According to provincial data and Indigenous knowledge studies, 25 species of terrestrial mammal have been detected in the Kitimat area and five are species of conservation concern (Table 17). Other species are used by Indigenous nations for traditional, subsistence, and cultural and spiritual values. Indigenous nations have reported the importance of wildlife species for traditional use including hunting and trapping and as keystone species.</i></p> <p><i>The Application identified that 15 bird species of conservation concern (Table 17) are likely to occur within the Marine Terminal and Marine Shipping RAAs. Geese, ducks, and swans were recorded as culturally important birds harvested by Indigenous nations. While the Marine Shipping Route is currently relatively undisturbed by anthropogenic effects, it is also considered highly sensitive to any negative impacts on wildlife (marine birds) due to the potential for changes to negatively impact cultural, harvesting, and other traditional practices of Indigenous nations.</i></p>	<p>No change</p> <p>Based on new information, 25 terrestrial mammal species have been detected in the Kitimat area, of which eight are species of conservation concern.</p> <p>There are now 16 bird species of conservation concern.</p>
Direction and Magnitude	Habitat: Adverse and Moderate	<p>Habitat: Project activities during construction (such as: site preparation and clearing, alteration of shoreline and intertidal habitat), operation (such as: indirect loss or alteration of habitat effectiveness through sensory disturbance and traffic), and decommissioning (such as removal of the FLNG facility and onshore infrastructure) result in direct and indirect loss of habitat but is not expected to exceed the resilience and adaptability limits of the environment or affect wildlife populations.</p>	<p>No change</p> <p>However, the magnitude of effect on old forest associated species (e.g., marbled murrelet, bats, marten, old forest songbirds) is reduced because old forest will no longer be affected</p>



Characterization of Residual Effects from the Assessment Report			Changes to the Residual Effects Characterization
Criteria	Assessment Rating	Rationale	
Direction and Magnitude (cont'd)	Movement: Adverse and Low to Moderate	Movement: The presence of the fence would pose a barrier to movement for some species and not others. In either case, effects are unlikely to affect the sustainability of regional wildlife populations or exceed the resilience and adaptability limits of the environment. Effects from the transmission line are expected to be low as wildlife could still use this area.	No change
	Mortality Risk: Adverse and Low to Moderate	Mortality Risk: The residual effects are expected to be low to moderate for the Project phases. The effect pathways identified for a change in mortality risk include physical destruction of key habitat features and accidental mortality (through project lighting, increased linear feature density, vehicle-wildlife collisions and wildlife-human contact), These may result in unintentional mortality if the affected feature is active (such as nests) or occupied (such as dens).	
Extent	Habitat: Local	Habitat: Project activities during construction, (that is, direct removal or alteration of vegetation, vegetated beachland, and intertidal habitat), operation (that is, sensory disturbance and vehicle traffic), and decommissioning (such as marine transport of decommissioned infrastructure) are expected to change wildlife habitat, directly and indirectly within the LAA. Residual effects will extend to the Project area and LAA.	No change
	Movement: Local for physical barriers and regional for effects on corridors	Movement: Site preparation and clearing, construction of land- and marine-based infrastructure, and vehicle traffic may result in alteration or impediment of movement. Marine vessel traffic and sensory disturbance associated with marine-based infrastructure may affect marine bird movement. Residual effects are expected to extend to the LAA and RAA.	
	Injury or Mortality: Local and regional	Injury or Mortality: Physical destruction of key habitat features (such as site preparation and clearing, facility, infrastructure maintenance during operation, and decommissioning of land-based and marine-based facilities) may result in accidental mortality. The residual effects are expected to extend to the LAA and RAA.	
Duration	Long-term to permanent	The effects of direct habitat loss would persist in the long term until the Project is decommissioned and habitat regenerates and, therefore, could be considered effectively permanent because some types of habitat (such as forest) may never regain its former characteristics. The residual effects on wildlife from movement and mortality would be long-term over the life of the Project.	No change



Characterization of Residual Effects from the Assessment Report			Changes to the Residual Effects Characterization
Criteria	Assessment Rating	Rationale	
Reversibility	Habitat: Irreversible / Reversible	Habitat: Residual effects to old growth forest habitat or areas that may not be reclaimed following decommissioning (because of lease requirements) are considered irreversible as habitat loss may never regain its former characteristics. Other habitat effects (such as lighting) would be reversible following decommissioning of the Project.	No change However, old forest will no longer be affected
	Movement: Reversible	Movement: Potential residual effects associated with movement from the described Project activities are considered reversible following decommissioning and removal of barriers to movement.	No change
	Mortality Risk: Reversible	Mortality Risk: While single mortality events are by nature irreversible, the risk to mortality and effects on species would be reversible once Project activities affecting mortality risk cease (for example: Project lighting and wildlife-vehicle collisions).	No change
Frequency	Habitat: Infrequent and continuous	Habitat: Direct habitat effects would be infrequent during construction (such as site clearing/preparation) and decommissioning (for example: vehicle traffic or decommissioning of infrastructure and marine transport of decommissioned infrastructure). Effects of sensory disturbance would be continuous through construction and operations of the facility.	No change
	Movement: Continuous	Movement: Residual effects would occur at a continuous event during all Project phases.	No change
	Mortality Risk: Infrequent and continuous	Mortality Risk: Effects of mortality risk are considered to be infrequent and continuous.	No change
Risk (likelihood and consequences)	<p>Likelihood – High likelihood of residual effects on wildlife during all Project phases due to unavoidable habitat loss and sensory disturbance associated with described activities.</p> <p>Consequence – Low to moderate consequence based on the magnitude of effects on wildlife and through application of Mitigation Measures.</p> <p>Risk – Based on the likelihood and consequence of residual effects on wildlife it was determined that there would be a moderate level of risk.</p>	No change	
Uncertainty	The uncertainty in effects to the wildlife VC is considered to be moderate. The EAO has a low to moderate level of confidence in the residual effects characterizations presented here based on the data provided (that is, project-specific surveys and habitat suitability models), the approach to establishing baseline conditions, the feedback received from the Working Group during the EA, and the proposed federal Mitigation Measures and provincial conditions.		No change

Characterization of Residual Effects from the Assessment Report			Changes to the Residual Effects Characterization
Criteria	Assessment Rating	Rationale	
<i>Significance</i>	<i>In consideration of the above analysis, proposed provincial conditions and federal Mitigation Measures that would be implemented, and the magnitude and extent of effects, the EAO concludes that Cedar LNG would not have significant residual effects on wildlife.</i>		While this characterization is the responsibility of the EAO and IAAC, it is Cedar's opinion there is no change

Note:

The text in italics was copied from the Assessment Report for the Cedar LNG Project (EAO 2022).

7.5.4 Cumulative Effects Assessment

Cumulative effects on wildlife are predicted to be of lower magnitude with the proposed changes outlined in this amendment application, relative to the approved Project, as a result of:

- Avoiding the old forest that overlapped the approved transmission line
- Locating the distribution powerline contiguous with and partly within cleared areas of the existing Bish Creek FSR

As such, the contribution of the proposed changes to cumulative effects on wildlife is predicted to be consistent with the predictions and characterization the Assessment Report and the conclusions of the Assessment Report remain valid.

7.5.5 Risk and Uncertainties

Risk and uncertainty regarding residual effects of the proposed changes and cumulative effects has not changed from the Assessment Report. The level of risk is moderate because likelihood of residual effects on wildlife is high, and consequence is low based on the magnitude of effects and overall reduction in effects on species of conservation concern. Uncertainty is moderate because the level of confidence is moderate in the wildlife habitat suitability models and the size of the footprint of the alternative transmission line. Actual effects of the proposed changes on wildlife are expected to be lower than predicted and a wildlife follow-up program will be implemented to verify the accuracy of the effects assessment and determine the effectiveness of the proposed mitigation measures.

7.5.6 Adaptive Management and Monitoring Measures

No new potential effects or mitigation measures are recommended for the proposed changes; therefore, no new adaptive management and monitoring measures are recommended. The adaptive management and monitoring measures presented in the CEMP and the wildlife follow-up program are sufficient to mitigate and verify the potential effects of the changes requested in this amendment application.

7.6 Freshwater Fish

The proposed changes in this amendment application alter the impacts to the environment that were considered in the EAC Application and the Assessment Report. Table 7.6.1 provides a side-by-side comparison of the impacts from the Project, as described in the CPD, and potential effects from the Assessment Report versus proposed changes in this amendment application for Freshwater Fish. A description of the existing conditions that influence the assessment for the proposed changes to the Project is provided below, followed by the effects assessment.

TABLE 7.6.1 SUMMARY COMPARISON IMPACTS AND POTENTIAL EFFECTS FOR FRESHWATER FISH

Impact & Effect	Assessment Report	Amendment Application
Impacts	<ul style="list-style-type: none"> • Crossings associated with the transmission line include three fish bearing watercourses (Anderson Creek, Moore Creek and tributary to Beaver Creek) and 11 non-fish bearing watercourses • Riparian clearing of approximately 1.5 hectare (ha) for fish bearing watercourses for the transmission line 	<ul style="list-style-type: none"> • The alternative transmission line will cross four fish bearing watercourses (Anderson Creek, Moore Creek, tributary to Beaver Creek, and tributary to Douglas Channel) and 25 non-fish bearing watercourses • The distribution powerline will cross one fish bearing and eight non-fish bearing watercourses. • Riparian clearing of approximately 4.1 ha for fish bearing watercourses for the alternative transmission line • Riparian clearing of approximately 0.2 ha for fish bearing watercourses for the distribution powerline
Potential Effects	<ul style="list-style-type: none"> • Changes to water quality • Changes to fish habitat • Changes to fish health and/or mortality risk 	<ul style="list-style-type: none"> • Changes to water quality • Changes to fish habitat • Changes to fish health and/or mortality risk

7.6.1 Existing Conditions

Existing conditions for freshwater fish were reported in the EAC Application and included a desktop review, Indigenous Knowledge, and fish and fish habitat field assessments completed in 2019 and 2021. The methods and results of the assessment of existing conditions is available in Sections 6.0 and 7.6 of the EAC Application. To evaluate the existing conditions for the amendment application, the information in the original EAC Application was reviewed for applicability to the alternative transmission line and the new distribution powerline. Data gaps that were identified were addressed through additional fish and fish habitat field assessments, which were completed in June 2024. A summary of the watercourse crossings for the amendment application and 2024 field work results are provided in Appendix C of this document.



The freshwater fish RAA remains the same as in the EAC Application and includes the full watershed of each watercourse that interacts with the Project footprint: Beaver Creek, Anderson Creek, and Moore Creek and unnamed tributaries to Douglas Channel Appendix C). The definition of the freshwater fish LAA is the same as in the EAC Application and includes the Project footprint plus up to 100 m upstream and 300 m downstream from potentially affected watercourses and riparian habitat (Appendix C). The freshwater fish LAA extends up to 1 km downstream of potentially affected habitat in Moore Creek and Anderson Creek. The LAA boundary has shifted closer to Douglas Channel with the alternative transmission line and distribution powerline addition (Appendix C); however, the Project footprint interacts with the same watersheds in both the amendment application and the EAC Application.

As the watersheds are the same for the amendment application as they were for the EAC Application, there is no change in the fish species or aquatic species at risk with the potential to interact with the Project. Sixteen fish species have been documented within watersheds intersected by the Project RAA, as summarized in Appendix C. Most observations of these fish species were recorded from the low gradient, lower reaches of Beaver Creek, Anderson Creek, and Moore Creek (Government of BC 2024).

Within the RAA, watercourses flow east from mountain slopes into Douglas Channel. Creeks flowing under the Bish Creek FSR have vertical drops and steep gradients (greater than 20%) that limit upstream fish passage. In addition, most unnamed watercourses flowing along the western side of Douglas Channel are dry in summer or have additional barriers to fish passage downstream of Bish Creek FSR (Appendix C). The shift of the transmission line footprint to lower slopes closer to the Douglas Channel results in interactions with more watercourses.

There are 38 mapped watercourses crossed by the alternative transmission line: four fish bearing (two S2 and two S3)³ and 27 non-fish bearing (three S5 and 24 S6)⁴ watercourses, and seven non-classified drainages (Appendix C). The fish bearing watercourses intersected by the alternative transmission line include a tributary to Beaver Creek (T-0.12-2; S3), Anderson Creek (T-03; S2), Moore Creek (T-11; S2) and tributary to Douglas Channel (T-14; S3). Anderson Creek and Moore Creek are watercourses that provide good quality fish habitat and support populations of anadromous and resident fish. However, these creeks only provide habitat for resident fish at the alternative transmission line as both have barriers to anadromous fish downstream of the alternative transmission line: the barrier on Anderson Creek is a 30 m falls located approximately 2 km upstream from the ocean; the barrier on Moore Creek is a 40 m high falls located approximately 1.2 km upstream from the ocean.

Nine mapped watercourses are crossed by the distribution powerline; one fish bearing (unnamed tributary to Douglas Channel; S3) and eight non-fish bearing watercourses (two S5 and six S6; Appendix C). The unnamed tributary to Douglas Channel (DL-14) is considered to have good rearing habitat, moderate spawning habitat, and poor overwintering and migration potential.

³ Stream riparian classes according to the Environmental Protection and Management Regulation and Environmental Protection and Management Guideline (BCER 2023); Fish bearing watercourses - S2 are 5 m to 20 m wide and S3 are 1.5 m to 5 m wide.

⁴ Non-fish bearing watercourses - S5 are ≥ 3 m wide and S6 < 3 m wide



7.6.2 Potential Effects and Mitigation Measures

The Assessment Report considered four potential effects on freshwater fish in relation to changes in water quality, fish habitat, fish health and/or mortality risk, and effects on freshwater aquatic species, as defined in the *Species at Risk Act*, as required under the *Impact Assessment Act*. No new effects pathways were identified for the amendment.

As discussed in the Assessment Report, Cedar integrated key design decisions that help reduce potential effects on freshwater fish, including:

- Limiting interactions with freshwater surface waters by locating the gas-treatment, LNG production and LNG storage in the FLNG facility
- Reducing vegetation removal and riparian clearing by having large spans between transmission line towers for the crossings of Moore and Anderson creeks
- Electrifying the Project to reduce potential acidifying and eutrophying emissions

These avoidance measures also apply to the amendment application, including reduced clearing through Anderson Creek and Moore Creek riparian areas. Riparian clearing by watercourse is provided in Appendix C.

The CEMP describes best management practices (BMPs), mitigation measures, and monitoring requirements that will be implemented during Project construction to avoid or reduce potential adverse effects of Project activities on surface water quality, fish habitat, and fish health and mortality risk. The measures outlined in the CEMP also apply to the amendment; no additional mitigation measures have been identified for freshwater fish. A summary of potential effects of the proposed amendment components on water quality, fish habitat and fish health and/or mortality risk is provided in Table 7.6.2.

TABLE 7.6.2 SUMMARY OF POTENTIAL EFFECTS AND MITIGATION MEASURES – FRESHWATER FISH

Proposed Amendment Component	Project Phase	Change in Proposed Works or Activities	Change in Potential Effects	Change in Mitigation or Enhancement Measures	Change in Mitigation or Enhancement Measures Success Rating
Alternative transmission line	Construction	Yes	No change in potential effects to water quality, fish habitat, and fish health and/or mortality risk	No change	No change
Distribution powerline	Construction	Yes	No change in potential effects to water quality, fish habitat, and fish health and/or mortality risk	No change	No change



7.6.3 Changes to Characterization of Residual Effects

Predicted effects on freshwater fish and the residual effects conclusions presented in the Assessment Report are unchanged as a result of the amendment application. The Assessment Report concluded the Project would result in the following residual adverse effects on freshwater fish, after considering mitigation measures:

- Changes in water quality including:
 - Increased levels of total suspended solids (TSS) in streams due to site preparation, clearing and construction
 - Deposition of sulphur and nitrogen compounds in lake areas and streams due to operational emissions
- Changes in fish habitat from riparian clearing which would include:
 - Increases in TSS from soil erosion
 - Changes in fish cover and shading
 - Changes in fish health/mortality due to the above changes in water quality and fish habitat removal/alteration

Potential residual effects of the proposed changes in this amendment on freshwater fish are predicted to be consistent with the findings within the Assessment Report. The extent, duration, frequency, and reversibility of the effects for the amendment are unchanged because the approach to construction and resulting pathways of effects (i.e., riparian clearing and associated changes to fish habitat) are the same as proposed in the EAC Application and considered in the Assessment Report.

The context of the residual effects is unchanged by the alternative transmission line and addition of the distribution powerline because the watersheds are the same for the amendment as they were for the EAC Application; there is no change in the type of aquatic habitat, fish species, or aquatic species at risk with the potential to interact with the Project.

There will be an increase in total riparian clearing for the proposed changes, as shown in Table 7.6.1. The change in the alternative transmission line route location and the addition of the distribution powerline results in additional crossings of a fish bearing watercourse (an unnamed tributary to Douglas Channel, referred to as T-14 and DL-14, respectively) (Appendix C). Riparian clearing around fish bearing watercourses will increase by approximately 2.8 ha compared to the EAC Application (predicted as 1.5 ha for the approved transmission line and 4.3 ha for the amendment). Riparian clearing for the amendment is approximately 4.1 ha and 0.2 ha around fish bearing watercourses for the alternative transmission line and distribution powerline, respectively. As noted in the Assessment Report, riparian clearing around the most important fish-bearing watercourses was avoided for Anderson Creek and reduced by design to 1.0 ha for Moore Creek for the approved transmission line. For the amendment, clearing for Anderson and Moore creeks has also been reduced through design and will be approximately 0.4 and 0.2 ha, respectively (Appendix C). Despite the increase in riparian clearing values for some of the other watercourses, this residual effect would still be characterized as adverse and low in magnitude because it is not predicted to affect the sustainability and productivity of fish populations.

A detailed comparison of the Assessment Report conclusions and amendment residual effects is presented below in Table 7.6.3.

TABLE 7.6.3 CHANGES TO ASSESSMENT REPORT CHARACTERIZATION OF RESIDUAL EFFECTS – FRESHWATER FISH

Characterization of Residual Effects from the Assessment Report			Changes to the Residual Effects Characterization
Criteria	Assessment Rating	Rationale	
Context	Water Quality: Low to Moderate	Water Quality: Water quality is considered to have low to moderate resiliency because existing conditions show a moderate to high sensitivity to acidification inputs in waterbodies. Water temperature and pH was within optimal range for fish.	No change However, the alternative transmission line will now cross four fish bearing watercourses and 27 non-fish bearing watercourses. The proposed distribution line will cross one fish bearing and eight non fish bearing watercourses.
	Fish Habitat: Moderate	Fish Habitat: Of the watercourses along the proposed transmission line right-of-way, 3 were fish bearing and 11 were not. Fish habitat is considered to have moderate resiliency because existing fish habitat quality in the fish-bearing watercourses within the LSA ranged from poor to good. In general, spawning quality was moderate at the assessed fish-bearing watercourses while migration was poor due to observed barriers to fish passage.	
	Fish Health / Mortality: Moderate	Fish Health/Mortality: None of the 16 fish species present in the RAA are listed under SARA. However, oolichan have been documented in Moore Creek and the Central Pacific Coast population of oolichan are considered endangered under COSEWIC and listed as special concern provincially. Cutthroat trout is also listed as special concern provincially. These occurrences are downstream of the transmission line right of way.	
Direction and Magnitude	Adverse and Low	Clearing, grading and construction and removal of land-based infrastructure is expected to have adverse effects on water quality, and therefore, potentially effect fish health and mortality. However, during construction, TSS is expected to stay within the Land Development guidelines, and BCWQG-FAL. Additionally, with implementation of mitigation strategies and BMPs, the magnitude of these effects should be localized and low. Effects from clearing of riparian habitat may also lead to alteration of instream habitat (cover, nutrients, shading). These would be mitigated by limiting clearing to the extent possible and delineating clearing boundaries prior to site preparation.	No change
Extent	Local	Residual effects will be localized to the LAA.	No change
Duration	Medium-term	Residual effects will be present during the construction and decommission phases.	No change
Frequency	Infrequent	Effects from clearing, grading and construction and subsequent removal of the land-based infrastructure will be irregular events during construction and decommissioning.	No change



Characterization of Residual Effects from the Assessment Report			Changes to the Residual Effects Characterization
Criteria	Assessment Rating	Rationale	
<i>Reversibility</i>	<i>Reversible</i>	<i>Potential adverse effects due to increased total suspended solids (TSS) from the described project activities will be reversible upon the completion of the construction and decommissioning Project phases.</i>	No change
<i>Risk (likelihood and consequence)</i>	<i>Likelihood – Medium likelihood of residual effects to fish health, and habitat during construction and decommissioning activities. Consequence – Moderate consequence based on the magnitude of effects being localized and mitigated by BMPs. Risk – Based on the medium likelihood and moderate consequence of residual effects to fish habitat and health it was determined that there would be a moderate level of risk.</i>		No change
<i>Uncertainty</i>	<i>Uncertainty associated with residual effects to freshwater fish is considered to be low. The EAO has a high level of confidence in the characterization of residual effects, based on the proven effectiveness of Mitigation Measures that will be used following industry standard operating procedures and best management practices that include erosion and sediment controls. Such proven avoidance and Mitigation Measures include electrification of the Project to reduce potential acidifying emissions, no instream works or water withdrawals in fish-bearing watercourses, and large spans between transmission lines to reduce riparian clearing.</i>		No change
<i>Significance</i>	<i>In consideration of the above analysis of effects, the proven effectiveness of standard Mitigation Measures that will be utilized, and reversibility of the effects, the EAO concludes that the Project would not have significant adverse residual effects on the freshwater fish VC.</i>		While this characterization is the responsibility of the EAO and IAAC, it is Cedar's opinion there is no change

Notes:

The text in italics was copied from the Assessment Report for the Cedar LNG Project (EAO 2022)

BCWQG-FAL = British Columbia Water Quality Guidelines for Freshwater Aquatic Life; BMPs = best management practices; LAA= local assessment area; LSA=local study area; RAA = regional assessment area; EAO = British Columbia Environmental Assessment Office; TSS=total suspended solids; VC = valued component

7.6.4 Cumulative Effects Assessment

Cumulative effects on freshwater fish are predicted to be of similar nature but higher with the proposed changes outlined in the amendment application than for the approved Project as presented in the EAC Application and Assessment Report due to increased riparian clearing.

The proposed changes are anticipated to have similar interaction with past, present, and reasonably foreseeable projects and activities when compared to the EAC Application. As such, cumulative effects on freshwater fish are predicted to be consistent with the Assessment Report for the amendment, and the characterization presented in the EAC Application is anticipated to remain valid.



7.6.5 Risk and Uncertainties

Uncertainty and risks associated with residual effects to freshwater fish were rated as low in the Assessment Report for the EAC Application and remain so with the proposed amendments. Comprehensive baseline studies and strong experience building powerlines provide a high level of confidence in the characterization of the residual effects and the Project's proposed mitigation measures are proven to be effective (EAO 2022). To build on the information available in the EAC Application, additional fieldwork was completed in 2024 to assess the amendment's change in footprint, which further reduces uncertainties. Use of industry standard BMPs to avoid or mitigate potential effects to freshwater fish is still expected to reduce the risk of adverse effects on freshwater fish.

7.6.6 Adaptive Management and Monitoring Measures

Before starting construction affecting freshwater streams, Cedar will obtain all necessary approvals for works and will implement any monitoring and reporting required by conditions of approval. To verify compliance of the Project with conditions of Project approvals, Cedar has captured the environmental management and monitoring measures commitments in the CEMP (Cedar 2024a). The CEMP describes BMPs and mitigation measures that will be implemented during construction of the Project to avoid or reduce potential adverse effects of Project activities on surface water quality, fish habitat, and fish health and mortality risk. The CEMP will outline any monitoring and reporting requirements established by permit conditions and industry best practices.

7.7 Marine Resources

The proposed changes in this amendment application alter the impacts to the environment that were considered in preparation of the Assessment Report. Table 7.7.1 provides a side-by-side comparison of the impacts from the Project, as described in the CPD, and potential effects from the Assessment Report versus what is considered in this amendment application for marine resources. The primary change associated with this amendment is the requirement for a larger Marine Terminal Area to accommodate the mooring lines and anchors associated with a catenary mooring system on the eastern side of the FLNG (Figure 2.1). A description of the existing conditions that influence the assessment for the proposed changes to the Project is provided below, followed by the effects assessment.

TABLE 7.7.1 SUMMARY COMPARISON IMPACTS AND POTENTIAL EFFECTS FOR MARINE RESOURCES

Impact & Effect	Assessment Report	Amendment Application
Impacts	<ul style="list-style-type: none"> FLNG Mooring System within approved marine water lot 	<ul style="list-style-type: none"> FLNG Mooring System within an expanded Marine Terminal Area and adjacent water lot (to accommodate mooring lines and anchors)
Potential Effects	<ul style="list-style-type: none"> Change in habitat Change in water quality Change in behavior of fish or marine mammals caused by sensory disturbance Change in fish or marine mammal injury or mortality risk 	<ul style="list-style-type: none"> Change in habitat Change in water quality Change in behavior of fish or marine mammals caused by sensory disturbance Change in fish or marine mammal injury or mortality risk

7.7.1 Existing Conditions

The catenary mooring system is within the LAA established for the EAC Application and Assessment Report. While the majority of the catenary mooring system is within the approved marine water lot, advancements in Project design have now determined that a portion of the eastern mooring lines and anchors need to be located outside of the approved Marine Terminal Area. To accommodate these structures the Marine Terminal Area will need to be expanded by 241.5 ha to allow Cedar to continue design and have some flexibility with anchor locations (Appendix D).

Studies completed to support the EAC Application included water quality, intertidal, and subtidal surveys. A detailed description of the existing conditions for marine resources in this area can be found in the Marine Resource Technical Data Report (TDR; Cedar 2022a). Since the submission of the EAC Application, additional water quality and subtidal field surveys have been completed to support the amendment application and future permitting requirements.

Cedar has completed four seasons of water quality monitoring within the RAA and LAA between 2022-2024. A 5-in-30 sampling regime was followed, where five samples from each of the six water quality sites were collected within a period of 30 days, as outlined in BC's Marine Monitoring Guidance (LGL and BC ENV 2019). In situ water profiles were also collected during each of the four baseline 5-in-30 sampling events at each water quality station using a water quality multiparameter metre (e.g., YSI EXO2 sonde) and recorded temperature, dissolved oxygen, oxidation reduction potential, pH, specific conductivity, and turbidity throughout the water column. Results of this sampling will be used to support fulfillment of the federal follow up program requirements of the Project's Decision Statement



under the *Impact Assessment Act* and will support waste discharge permitting under the *Environmental Management Act* (Appendix D).

To supplement the intertidal and subtidal surveys completed for the environmental assessment, a two-day subtidal fish and fish habitat survey was conducted in May 2024 using a Deep Trekker Pivot ROV (Appendix D). The ROV was flown along 13 transects just above the seafloor near the proposed mooring line and anchor locations collecting video footage and still photos. The video was analyzed for substrates/habitats present as well as the species utilizing this area. Substrates within the expanded Marine Terminal Area consisted primarily of fine, soft, muddy materials. Commonly observed species included humpback shrimp (*Pandalus hypinotus*), squat lobster (*Munida quadrispina*), tanner crab (*Chinonocetes bairdi*), crimson anemone (*Cribrinopsis fernaldi*), flatfish (Family *Pleauronectidae*), and eelpout (*Lycodes spp.*). No species of conservation concern were observed (Appendix D).

Results from both the water quality sampling and ROV survey were consistent with the conditions presented and reported in the Technical Data Report (Cedar 2022a).

7.7.2 Potential Effects and Mitigation Measures

The Assessment Report considered four potential effects on marine resources: 1) changes in habitat; 2) changes in water quality; 3) changes in behaviour of fish or marine mammals caused by sensory disturbance; and 4) change in fish or marine mammal injury or mortality risk. No new potential effects to marine resources are anticipated as a result of the catenary mooring system included in this amendment. As such, the four originally assessed potential effects will be carried forward.

Components of construction have the potential to result in changes in habitat which may affect marine fish. The catenary mooring system will require a larger Marine Terminal Area to accommodate the associated mooring lines and anchors on the eastern side of the FLNG. Gravity based anchors are planned to be used; however if geotechnical investigations find that sediment is too soft, then suction piles would be installed as the anchor. The number and size of the anchors will be determined during detailed design. The mooring lines will extend through the modified Marine Terminal Area and attach to up to eight anchors on the seafloor. The exposed portions of mooring line will provide hard surfaces available for colonization by marine organisms. Anchors will be placed on the seafloor at a depth of approximately 160 m. The areas where the anchors will be placed are comprised of soft sediments, dominated by silts and sands. The anchors will be lowered into place and rest on the seafloor where they will provide hard surfaces and structure available for colonization by marine organisms in an area with little habitat complexity. The soft sediments habitats are common in this area, with over 25 km² of similar habitat within the Kitimat Arm (north of Kildala Arm) and are not designated as critical habitats for species at risk (Appendix D).

Construction activities also have the potential to result in temporary changes to water quality which may affect marine fish. During the placement of the mooring lines and anchors on the soft sediment of the seafloor, small, localized increases in TSS may occur. These structures will be lowered slowly from construction vessels and placed in the specific locations required by the engineering specifications and as a result disturbance of the seabed is expected to be minor. Any temporary increase in suspended sediments as a result of the installation of the catenary mooring system are anticipated to be minor and highly localized. Disturbed sediments are generally anticipated to settle out of suspension near the source but may be carried further during large tidal exchanges (i.e., times of increased current velocity). Mixing



and dispersion as a result of currents will mitigate any potential impacts to marine resources by actively diluting TSS concentrations. No impacts to marine fish, invertebrates or marine habitat forming structures (e.g., sponges or corals) is anticipated as a result of increased TSS during the installation of the catenary mooring system.

Construction activities have the potential to result in changes in behaviour of fish or marine mammals caused by sensory disturbance. A vessel will be used to place the mooring lines and anchors on the seafloor and will generate underwater noise as the engines position the vessel during installation. No additional noise beyond what was originally assessed is anticipated. If behavioural disturbance does occur and fish or marine mammals are temporarily displaced, similar habitats are available throughout the local area in Kitimat Arm, and they will be freely available to move into them. No unique habitats or important feeding areas are known to exist within the expanded Marine Terminal Area.

Finally, the potential for the installation of the catenary mooring system to result in changes in fish or marine mammal injury or mortality risk due to the placement of the mooring lines and anchors was assessed. The placement of the mooring lines and anchors is not anticipated to affect marine mammals but may have minor impacts on fish (including invertebrates). Impacts to fish would be primarily associated with slow moving or sessile organisms (e.g., crabs, bivalves, sea cucumbers) that do not have the ability to move out of the way when the anchors are lowered to the seafloor. Motile organisms (primarily fish) are expected to move out of the impacted area given the slow speed of placement on the seafloor. While some mortality (primarily invertebrate species) may occur as a result of the installation of the catenary mooring system, based on the relatively low density of species observations on the ROV survey in the area the numbers are expected to be low (Appendix D). No species at risk are expected to be injured or killed.

The amendment will adhere to existing mitigation measures, as described in the CEMP for the Project (Cedar 2024a). A summary of potential effects of the proposed changes on change in habitat, change in water quality and change in behavior of fish or marine mammals caused by sensory disturbance is provided in Table 7.7.2.

TABLE 7.7.2 SUMMARY OF POTENTIAL EFFECTS AND MITIGATION MEASURES – MARINE RESOURCES

Proposed Amendment Component	Project Phase	Change in Proposed Works or Activities	Change in Potential Effects	Change in Mitigation or Enhancement Measures	Change in Mitigation or Enhancement Measures Success Rating
Expanded Marine Terminal Area	Construction	Yes	No change in potential effects to habitat, water quality, behavior of fish or marine mammals caused by sensory disturbance, and fish or marine mammal injury or mortality risk	No change	No change



7.7.3 Changes to Characterization of Residual Effects

The EAO Assessment concluded that Cedar LNG would result in the following residual adverse effects to marine resources:

- Change in habitat
- Change in water quality
- Change in behaviour of fish or marine mammals
- Change in fish or marine mammal injury or mortality risk.

No changes to the Assessment Report's residual effects characterization are anticipated based on the changes contained in this amendment. This conclusion is based on a review of baseline information from the Assessment Report, additional (2024) fieldwork conducted by Cedar in support of the amendment, and existing mitigation measures as described in the CEMP (Cedar 2024a).

Cedar submitted a Request for Review to DFO that described the changes to the Project that affect marine fish and fish habitat. The response from DFO will confirm whether or not the proposed catenary mooring system will result in a harmful alteration, disruption or destruction of fish habitat (HADD) and whether a paragraph 35(2)(b) *Fisheries Act* authorization is required. Cedar does not believe the proposed changes will result in a HADD but if DFO determines that an authorization is required, Cedar will develop a fish habitat offset plan for the effects to fish habitat as part of its application to prevent any loss of fish habitat productivity.

A detailed comparison of conclusions from the Assessment Report and proposed amendment residual effects is presented below in Table 7.7.3.

TABLE 7.7.3 CHANGES TO ASSESSMENT REPORT CHARACTERIZATION OF RESIDUAL EFFECTS – MARINE RESOURCES

Characterization of Residual Effects from the Assessment Report ⁵			Changes to the Residual Effects Characterization
Criteria	Assessment Rating	Rationale	
<i>Context</i>	<i>Low to Moderate</i>	<i>The Marine Terminal RAA has been subject to a variety of human disturbances associated with past and present industrial operation since the 1950s, including the Rio Tinto aluminum smelter and the Eurocan pulp and paper mill (discharges from the mill entered the Marine Terminal RAA from the Kitimat River), a methanol plant, the municipal wastewater treatment plant, which discharges effluent into the lower Kitimat River, and log storage and handling facilities. Marine resources may be sensitive to any further degradation in environmental quality. The Marine Shipping Route is a nursery area for Pacific salmon and herring, feeding grounds for marine mammals, and is characterized by abundant benthic invertebrate stocks. The Queen Charlotte Sound Ecoregion is characterized by a wide shelf with water depths typically greater than 200 m. The Dixon Entrance Ecoregion is characterized by deep waters and strong freshwater influence from the mainland river runoff. It serves as a migration corridor for salmon, and nursery areas for juvenile fish and invertebrates. While the Marine Shipping Route is currently relatively undisturbed by anthropogenic effects, it is also considered highly sensitive to any decreases in marine resources quality due to the potential for changes to negatively impact cultural, harvesting, and other traditional practices of Indigenous nations.</i>	No change
<i>Direction and Magnitude</i>	Water Quality: <i>Adverse and Low</i>	Water Quality: <i>project activities during construction (such as marine pile installation), operations (such as liquefaction of natural gas) and decommissioning (such as dismantling of marine infrastructure) are expected to have adverse effects on water quality thus impacting fish health and mortality.</i>	Habitat: The Marine Terminal Area will be expanded by 241.5 ha. Total area of habitat affected may change but this is not expected to result in a HADD of fish habitat.
	Habitat: <i>Adverse and Moderate</i>	Habitat: <i>total area of habitat loss is expected to be 47 m² during construction. Further a maximum impact of 1,973 m² of intertidal habitat affected by shoreline riprap armouring is anticipated. Effects on marine plants specifically would be low because there would be little, if any, interaction with marine vegetation. The marine terminal has been designed to minimize any interaction with marine habitats. The strut mooring system for the FLNG has a very small footprint in the marine environment, with all potential impacts just below the higher-high tide level. Effects from shipping wake would also be limited.</i>	

⁵ The text in italics was copied from the Assessment Report for the Cedar LNG Project (EAO 2022)



Characterization of Residual Effects from the Assessment Report ⁵			Changes to the Residual Effects Characterization
Criteria	Assessment Rating	Rationale	
Direction and Magnitude (cont'd)	Behavior: Adverse and Moderate	Behaviour: underwater noise and artificial light are expected to affect marine mammals and fish during construction, operation, and decommissioning activities at varying levels. Underwater noise levels from shipping may exceed the 120 dB re 1 µPa rms sound pressure levels (SPL) threshold for behavioural effects from continuous noise.	
	Injury or Mortality: Adverse and Moderate	Injury or Mortality: some mortality of marine organisms is expected during all project phases from burial or crushing of organisms during construction of the FLNG facility and seawater intake and outfall pipes. Marine mammals could also be injured or killed by vessel strikes. Based on the resilience of species, habitat availability, and the uniqueness of habitat affected, the effect from injury and mortality could result in a demonstrable change but would not be expected to alter the nature of the marine resources that could exceed resilience and adaptability limits of the natural environment. The Project is not predicted to threaten the long-term persistence or viability of species of management concern, or species of cultural or traditional importance.	
Extent	Site-specific/ Regional	<p>Predicted effects will extend to marine resources as follows:</p> <p>Water Quality: Site-specific</p> <p>Habitat: Site-specific and LAA</p> <p>Behaviour: RAA</p> <p>Injury or Mortality: Site-specific for the FLNG and regional for the Marine Shipping Route</p>	No change
Duration	Long-term	The residual effects on marine resources from the described project activities are long-term and will last for the duration of the project.	No change
Reversibility	Water Quality and Behaviour: Reversible	Water Quality and Behaviour: the residual effects are reversible upon completion of physical work or when activity causing disturbance has ceased.	No change
	Habitat: Irreversible	Habitat: residual effects are irreversible as construction (site preparation/clearing) has the potential to permanently alter or destroy marine habitat or be of long enough duration to be effectively permanent.	
	Change in Injury or Mortality: Reversible	Injury or mortality: While the mortality of individual is by nature permanent, effects on populations would be considered reversible when the cause of mortality ceases (such as completion of marine terminal construction or ceasing of marine shipping).	

Characterization of Residual Effects from the Assessment Report ⁵			Changes to the Residual Effects Characterization
Criteria	Assessment Rating	Rationale	
Frequency	Change in Water Quality: Infrequent to Regular	Water Quality: residual effects would occur at an irregular event frequency during construction and decommissioning and regularly during operation.	No change
	Change in Habitat: Infrequent	Habitat: residual effects are infrequent as they occur once during clearing/site preparation during construction and decommissioning of marine infrastructure.	
	Change in Behaviour: Infrequent and Regular	Behaviour: changes with noise are anticipated to occur as irregular events while changes with light are expected to occur as multiple regular events until removed.	
	Change in Injury or Mortality: Infrequent and continuous	Injury or Mortality: Effects from the operation of the FLNG would be continuous while effects from marine shipping, construction, and operation of the FLNG would be irregular events.	
Risk (likelihood and consequences)	<p>Likelihood – medium likelihood of residual effects to water quality during all project phases and a medium likelihood of effects to habitat during construction (preparation/clearing) and decommissioning activities. Mitigation measures, including permitting requirements and the marine resources Follow-up Program provide assurance that effects to water quality will be managed. There is a moderate to high likelihood of effects to behaviour with each project phase, but uncertainty related to actual marine mammals and fishes’ responses to anthropogenic factors (such as noise and light) exists due to the limited research available. There is a high likelihood of residual effects to injury/mortality as mortality is expected during all project phases. Given the nature of project activities associated with construction, operation, and decommissioning, some mortality of marine organisms is expected during all project phases.</p> <p>Consequence – moderate consequence based on the magnitude of effects which may alter marine resources but are expected to remain below a level of effect that could exceed the resilience and adaptability limits of the natural environment and are reduced through Mitigation Measures and best practice management practices.</p> <p>Risk – based on the likelihood and consequence of residual effects to marine resources it was determined that there would be a moderate level of risk.</p>		No change
Uncertainty	<p>Uncertainty for water quality is considered to be moderate. The EAO has moderate confidence in the residual effects characterizations, based on the type of discharges associated with the Project and the proposed provincial conditions, federal Mitigation Measures and provincial permitting process.</p> <p>Uncertainty for habitat is considered to be moderate. The EAO has moderate confidence in the residual effects characterizations based on the known features of the site, the size of the project and type of habitat impacts associated with its construction and decommissioning.</p> <p>Uncertainty for behavioural effects and mortality are considered to be moderate. The EAO holds this view as behavioural impacts are difficult to predict with confidence and mortality events (particularly vessel strikes), while infrequent, can be difficult to predict.</p>		No change



Characterization of Residual Effects from the Assessment Report ⁵			Changes to the Residual Effects Characterization
Criteria	Assessment Rating	Rationale	
Significance		<i>In consideration of the above analysis, erosion and sediment controls, Mitigation Measures that will be implemented, the magnitude of effects being localized and infrequent, and the partial reversibility of these effects, the EAO concludes that Cedar LNG would not have significant residual effects on the marine resources VC.</i>	While this characterization is the responsibility of the EAO and IAAC, it is Cedar's opinion there is no change

Notes:

The text in italics was copied from the Assessment Report for the Cedar LNG Project (EAO 2022)

7.7.4 Cumulative Effects Assessment

The proposed changes included in this amendment do not change the characterization of residual effects described in the Assessment Report. The proposed changes are anticipated to have the same interaction with past, present, and reasonably foreseeable projects and activities compared to the EAC Application. As noted above, Cedar has submitted a Request for Review to DFO to obtain a determination on whether or not the proposed changes outlined in this amendment application will result in a HADD of fish habitat. If DFO determines that a HADD will occur, a fish habitat offset plan will be prepared to counteract any effects on fish habitat productivity. As such, cumulative effects on marine resources as a result of the amendment application are predicted to be consistent with the Assessment Report and the characterization presented in the EAC Application.

7.7.5 Risk and Uncertainties

Since receiving the Assessment Report, Cedar has conducted additional baseline water quality sampling throughout the LAA, conducted subtidal fish and fish habitat ROV surveys along the seafloor near the proposed anchor locations and mooring line footprints, and have updated engineered drawings on construction methods. The information and data gathered throughout these studies have served to decrease the risks and uncertainties associated with the Project while increasing confidence in the potential effects predictions.

7.7.6 Adaptive Management and Monitoring Measures

A Marine Follow-up Program (Cedar 2024d) and CEMP (Cedar 2024a) have already been developed for the Project. The measures contained in these documents are believed to adequately address the required adaptive management and monitoring measures. No new marine adaptive management or monitoring measures are proposed.

7.8 Land and Resource Use

The proposed changes in this amendment application alter the impacts to land and resource uses that were considered in the Assessment Report. Table 7.8.1 provides a side-by-side comparison of the impacts from the Project, as described in the CPD, and potential effects from the Assessment Report versus what is considered in this amendment application for land and resource use. A description of the existing conditions that influence the assessment of potential effects on land and resource use for the proposed changes to the Project is provided below, followed by the effects assessment.

TABLE 7.8.1 SUMMARY COMPARISON IMPACTS AND POTENTIAL EFFECTS FOR LAND AND RESOURCE USE

Impact & Effect	Assessment Report	Amendment Application
Impacts	<ul style="list-style-type: none"> • Transmission line corridor 	<ul style="list-style-type: none"> • Alternative transmission line • New distribution powerline
Potential Effects	<ul style="list-style-type: none"> • Change in private property and tenured land use • Change in non-tenured land use 	<ul style="list-style-type: none"> • Change in private property and tenured land use • Change in non-tenured land use

7.8.1 Existing Conditions

There are no changes to the LAA and RAA for land and resource use. The alternative transmission line and distribution powerline are within the land and resource use LAA as described in the EAC Application (Cedar 2022a) and the Assessment Report (EAO 2022). A description of the existing conditions for land and resource use in the LAA can be found in Section 7.9 Land and Resource Use of the EAC Application.

7.8.2 Potential Effects and Mitigation Measures

Mitigation measures proposed are effective for addressing effects on land and resource use, as noted in the EAC Application and current environmental conditions. This amendment is based on professional judgement in consideration of standard design codes and practices and industry standards. Regulations, industry standards, or best practices have been cited where applicable to justify the selection. Industry standard mitigation measures include the posting of warning signs, application of noise mitigation measures (i.e., reduced idling), implementation of traffic control measures, and adherence to conditions related to clearing.

Mitigation measures identified in the EAC Application (Sections 7.9.7.2 and 7.9.7.3 in Cedar 2022a) to address potential effects on land and resource use and associated management plans (i.e., CEMP, and Socioeconomic Management Plan [Cedar 2024b]) that are applicable to change in land and resource use are expected to be applicable to the amendment. No change in mitigation measures is proposed for the amendment (Table 7.8.2).

TABLE 7.8.2 SUMMARY OF POTENTIAL EFFECTS AND MITIGATION MEASURES – LAND AND RESOURCE USE

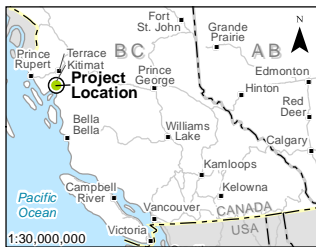
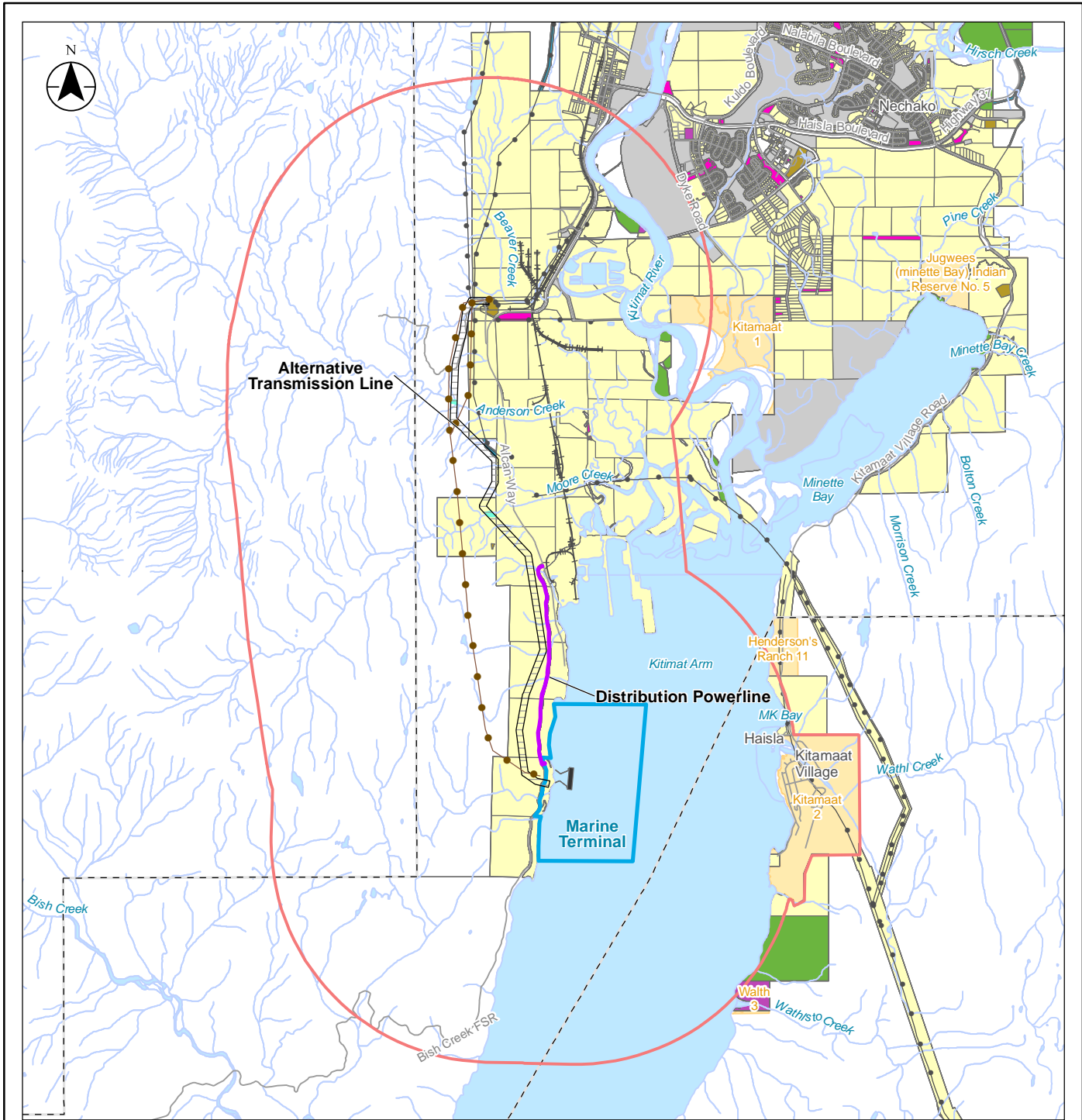
Proposed Amendment Component	Project Phase	Change in Proposed Works or Activities	Change in Potential Effects	Change in Mitigation or Enhancement Measures	Change in Mitigation or Enhancement Measures Success Rating
Alternative transmission line	Construction	Yes	Change in potential effects to private property and tenured land use and in non-tenured land use; shifting the alternative transmission line more onto private property off Crown land will reduce potential effects	No change	No change
Distribution powerline	Construction	Yes	Change in potential effects to private property and tenured land use and in non-tenured land use; danger tree removal along the distribution powerline may extend onto private property	No change	No change

7.8.3 Changes to Characterization of Residual Effects

The alternative transmission line is 8.5 km in length on a widened right-of-way (i.e., 90 m) and approximately 69 ha of land will be required to be cleared. This is an increase from the original identified disturbed area (i.e., 35 ha) for the alternative transmission line corridor. The alternative transmission line will be located on a mixture of land ownership, with 44 ha on private property and 28 ha on provincial Crown land (Figure 7.8.1).

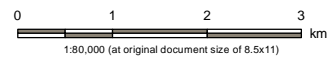
The addition of the distribution powerline will be located along the Bish Creek FSR. The length of the distribution powerline is 2.8 km on a 15 m wide right-of-way. Approximately 4 ha of clearing will be required for the distribution powerline, all on the east side of the Bish Creek FSR. The majority of the distribution powerline right-of-way will be located within the Bish Creek FSR right-of-way; however, some danger tree removal may extend onto private property.

As described in Section 3.0, Cedar will enter into commercial agreements for use of the private land in advance of construction of the alternative transmission line and new distribution powerline.



Notes
 1. Coordinate System: NAD 1983 UTM Zone 9N
 2. Data Sources: DataBC, Government of British Columbia; Natural Resources Canada; Canadian Hydrographic Service

- Road
- +— Railway
- Transmission Line
- Waterbody
- Reserve Land
- Local Greenspace
- - - District of Kitimat
- - - Municipal Boundary
- Project Components
- Distribution Powerline
- Alternative Transmission Line
- Marine Terminal Area
- FLNG
- Transmission Line (EAC Application)
- Land and Resources**
- Local Assessment Area
- Property Ownership**
- Crown Agency
- Crown Provincial
- Federal
- Municipal
- None
- Private
- Unknown
- Unsurveyed Crown Land



Project Location: Kitimat, British Columbia
 Project Number: 123222394
 Prepared by: TCARDINAL on 20240809
 Discipline Review by: BKRAWCHUK on 20240809
 Review by: GFELTHAM on 20240828

Client/Project/Report: Cedar LNG Partners LP
 Cedar LNG Project
 Environmental Assessment Amendment

Figure No.

7.8.1

Title
Land Ownership

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7.8.3.1 PRIVATE PROPERTY AND TENURED LAND AND RESOURCE USE

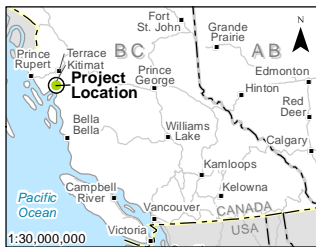
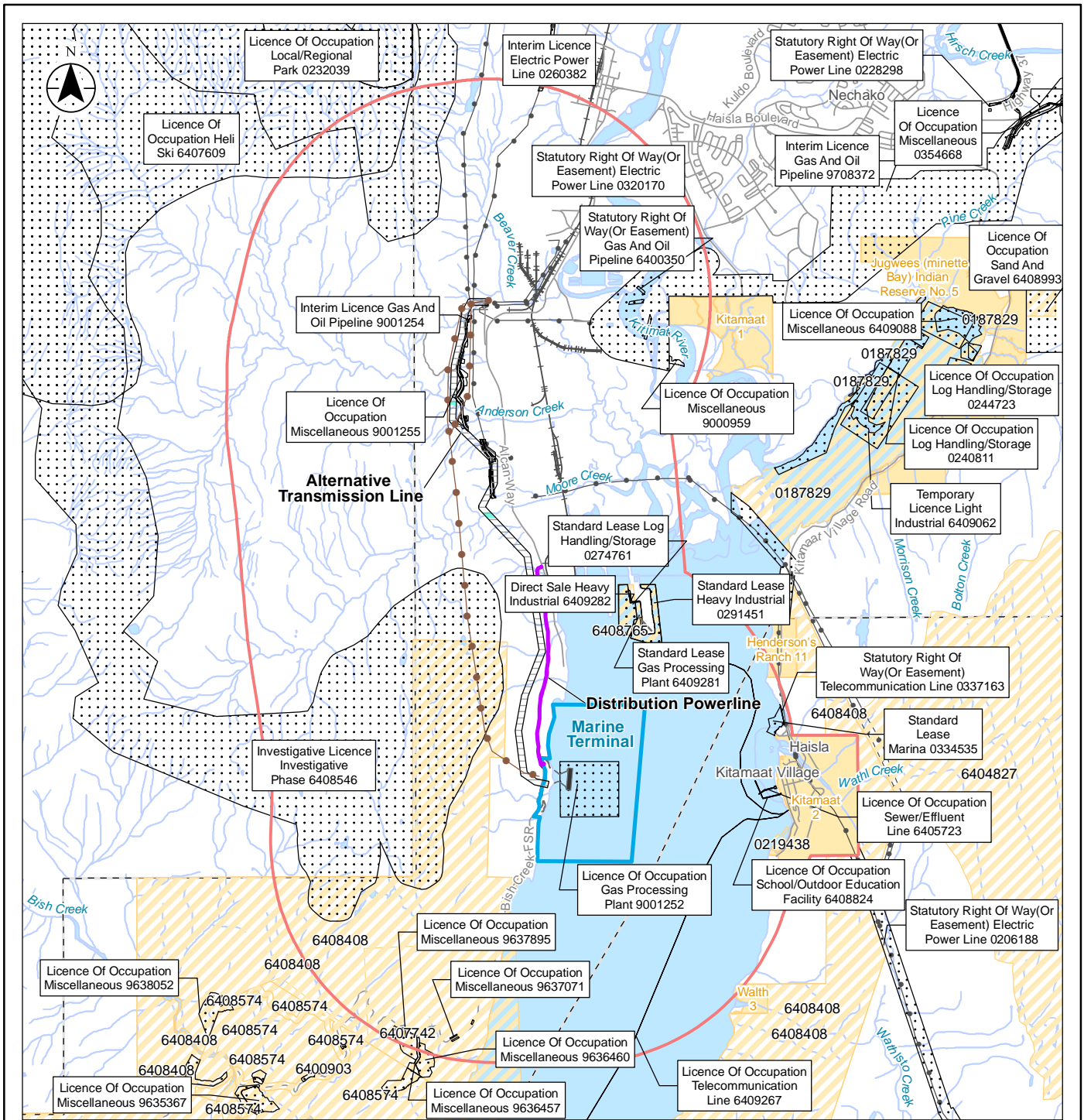
The alternative transmission line and distribution powerline are in the District of Kitimat. The altered Project footprint is within the Kalum Land and Resource Management Plan (LRMP) and partially overlaps the District of Kitimat Official Community Plan (OCP). Policies of the Kalum LRMP and Sustainable Resource Management Plan do not preclude development subject to the implementation of defined mitigation measures and obtaining appropriate permits. No conflict with resource development policy is anticipated for the amendment application. Current land use designation of the altered Project footprint lands is "Industrial" under the applicable District of Kitimat OCP and is zoned for manufacturing and forestry under the applicable Municipal Code By-law. No rezoning of land encompassed by the amendment components is required for development.

The amendment components do not overlap with other existing designated lands (e.g., provincial parks, ecological reserves, conservancy areas, or protected areas). The construction phase will not affect provincial Crown land forest in the Kitimat Timber Supply Area. Nine Crown land tenures consisting of three licences (e.g., licence of occupation - industrial) for miscellaneous use and six rights-of-way (e.g., interim licence - utility) for gas and oil pipeline and transmission line are encompassed by the alternative transmission line and distribution powerline footprint (Figure 7.8.2). Cedar will continue to engage with tenure holders in the LAA with respect to mitigation measures to reduce potential effects.

Forestry tenure encompassed by the amendment components consists of forest harvest authority tenures (Figure 7.8.3). Land clearing for the amendment components will remove a portion of forest cover from the land base, totalling approximately 73 ha (i.e., alternative transmission line and distribution powerline) as compared to 35 ha proposed to be cleared for the approved transmission line. This area is outside the Tree Farm Licence #41 in the LAA. The alternative transmission line and distribution powerline will be constructed to limit possible disturbance and annoyance effects associated with noise generation. Cedar will make an application for a tenure for the alternative transmission line and distribution powerline. The proposed changes do not overlap with First Nation managed forest licence areas, legally declared old growth management areas, forest reserves, or Forest Recreation Sites.

The alternative transmission line and distribution powerline are located within Wildlife Management Unit (WMU) 6-11 (Region 6-Skeena) within the North Coast game management zone (6b). One guide/outfitting certificate area and one trapline area are encompassed by both the alternative transmission line and distribution powerline (Figure 7.8.4) These are the same guide/outfitting certificate area and trapline area that were overlapped by the transmission line considered in the EAC Application and Assessment Report. Cedar will continue to engage with the affected guide outfitter and trapper as part of ongoing consultation and engagement to discuss mitigation measures to reduce potential project effects. The residual effects remain small for both the affected guide outfitter and trapper from the amended Project footprint.

Oil and gas tenures and mineral tenures will not be affected by the amended Project footprint. In addition, no water licence works are overlapped by the amended Project footprint (Figure 7.8.5).



Notes
 1. Coordinate System: NAD 1983 UTM Zone 9N
 2. Data Sources: DataBC, Government of British Columbia; Natural Resources Canada; Canadian Hydrographic Service

- Road
- Railway
- Transmission Line
- Waterbody
- Reserve Land
- Local Greenspace
- District of Kitimaat
- Municipal Boundary
- Project Components**
- Distribution Powerline
- Alternative Transmission Line
- Marine Terminal Area
- FLNG
- Transmission Line (EAC Application)
- Land and Resources**
- Local Assessment Area
- Crown Reserve Notations
- Crown Tenure



Project Location: Kitimaat, British Columbia
 Project Number: 123222394
 Prepared by: TCARDINAL on 20240809
 Discipline Review by: BKRAWCHUK on 20240809
 Review by: GFELTHAM on 20240828

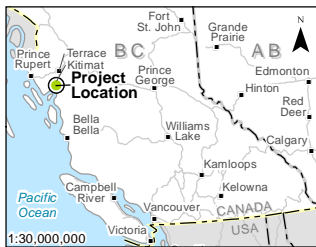
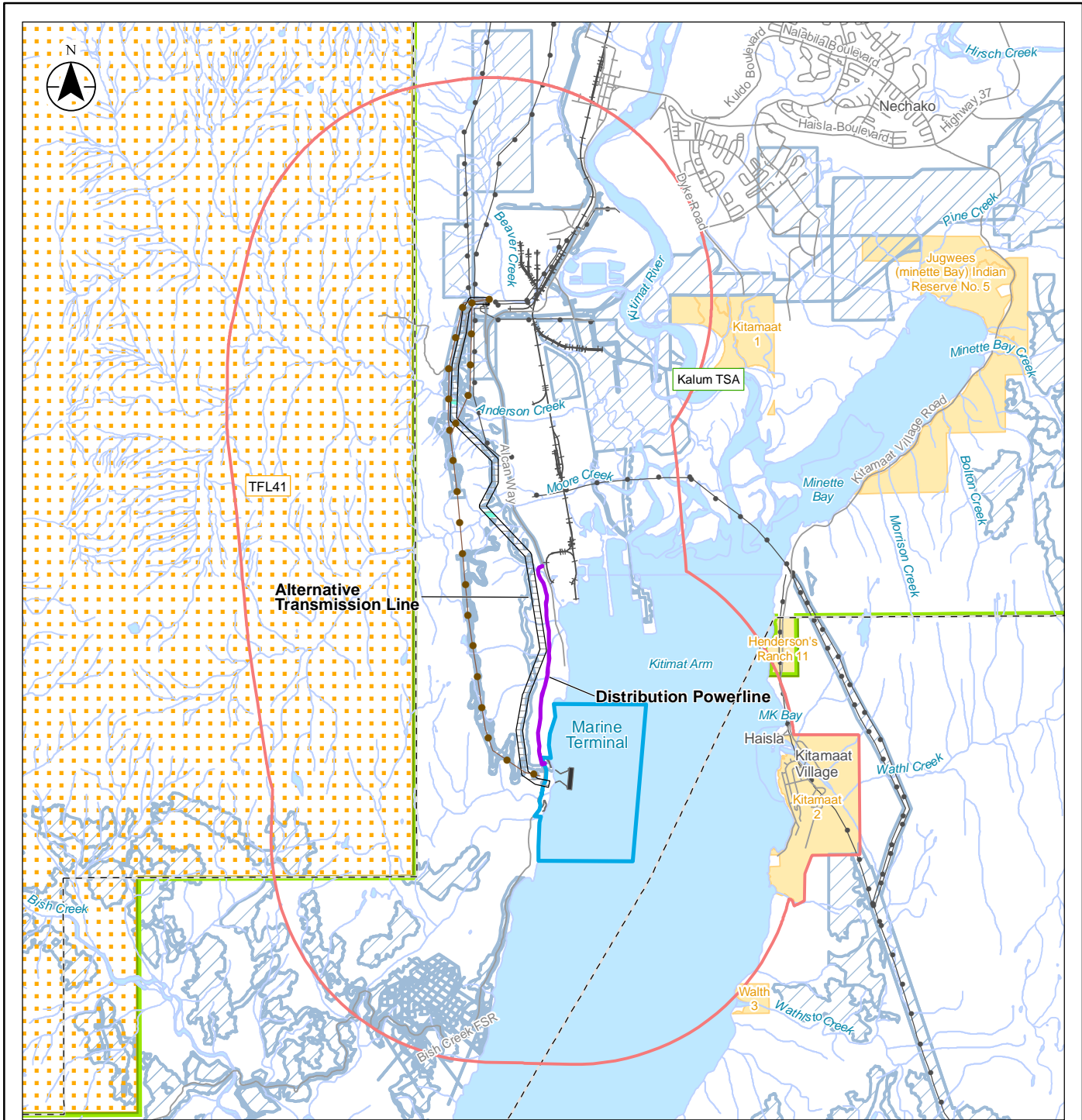
Client/Project/Report: Cedar LNG Partners LP
 Cedar LNG Project
 Environmental Assessment Amendment

Figure No.

7.8.2

Title
Crown Tenures

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Notes
 1. Coordinate System: NAD 1983 UTM Zone 9N
 2. Data Sources: DataBC, Government of British Columbia; Natural Resources Canada; Canadian Hydrographic Service

- Road
- +— Railway
- Transmission Line
- Waterbody
- Reserve Land
- Local Greenspace
- District of Kitimat
- Municipal Boundary
- Project Components**
- Distribution Powerline
- Alternative Transmission Line
- Marine Terminal Area
- FLNG
- Transmission Line (EAC Application)
- Land and Resources**
- Local Assessment Area
- Harvesting Authority
- Timber Supply Area
- Tree Farm License



Project Location: Kitimat, British Columbia
 Project Number 123222394
 Prepared by TCARDINAL on 20240809
 Discipline Review by BKRAWCHUK on 20240809
 Review by GFELTHAM on 20240828

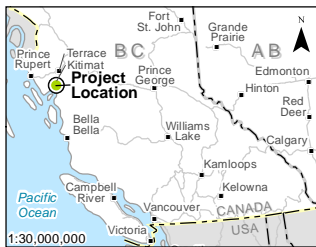
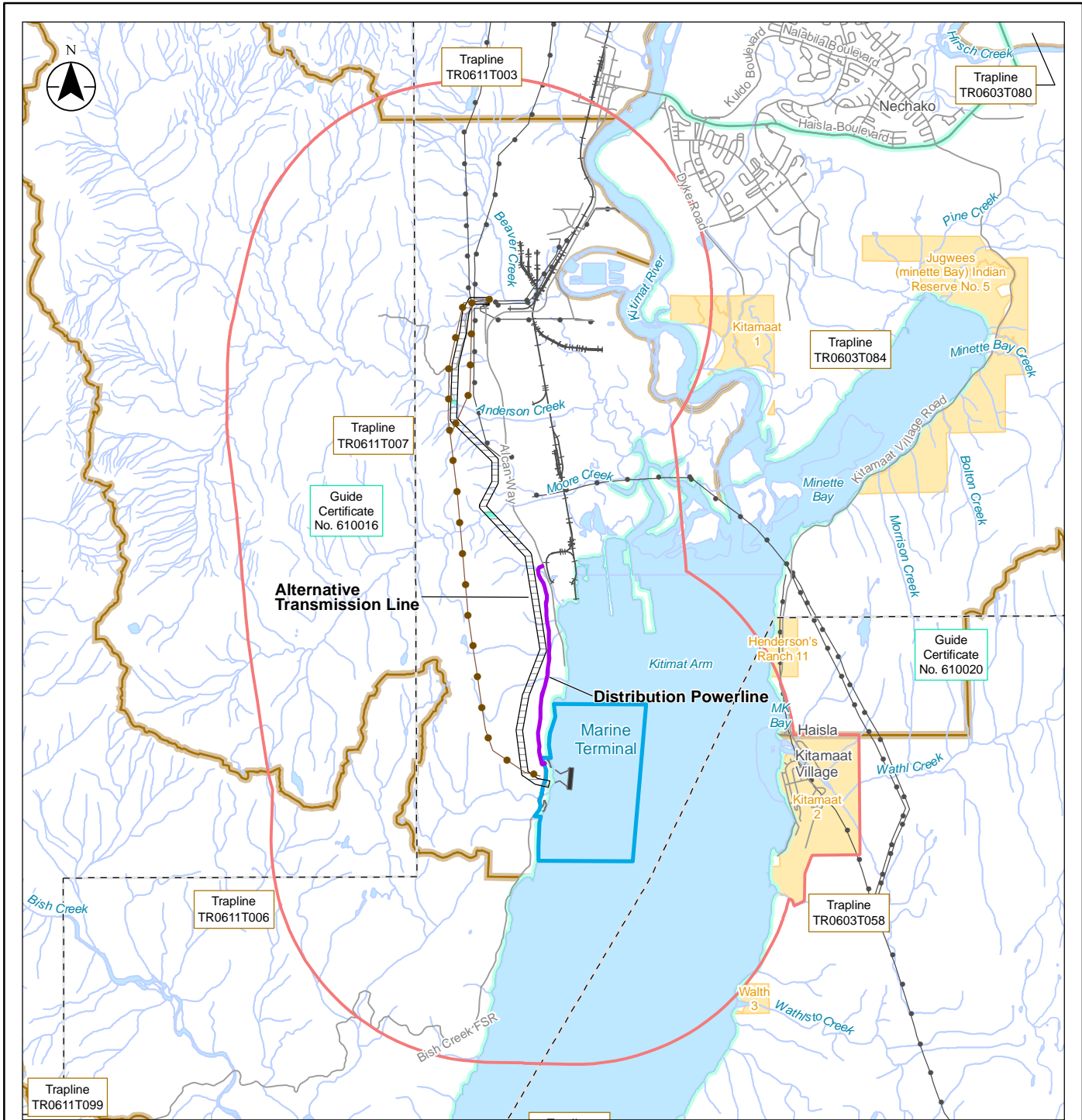
Client/Project/Report
 Cedar LNG Partners LP
 Cedar LNG Project
 Environmental Assessment Amendment

Figure No.

7.8.3

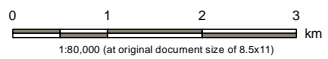
Title
Forestry Tenure

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Notes
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 2. Data Sources: DataBC, Government of British Columbia; Natural Resources Canada; Canadian Hydrographic Service
 3. * If data not shown area is larger than the map frame

- Road
- +— Railway
- Transmission Line
- Waterbody
- Reserve Land
- Local Greenspace
- District of Kitimat
- Municipal Boundary
- Project Components**
- Distribution Powerline
- Alternative Transmission Line
- Marine Terminal Area
- FLNG
- Transmission Line (EAC Application)
- Land and Resources**
- Local Assessment Area
- Guide Outfitter Area Boundary*
- Trapline Area*



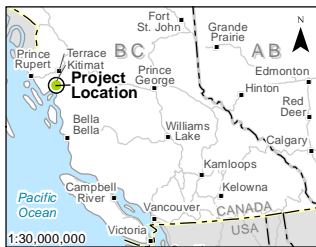
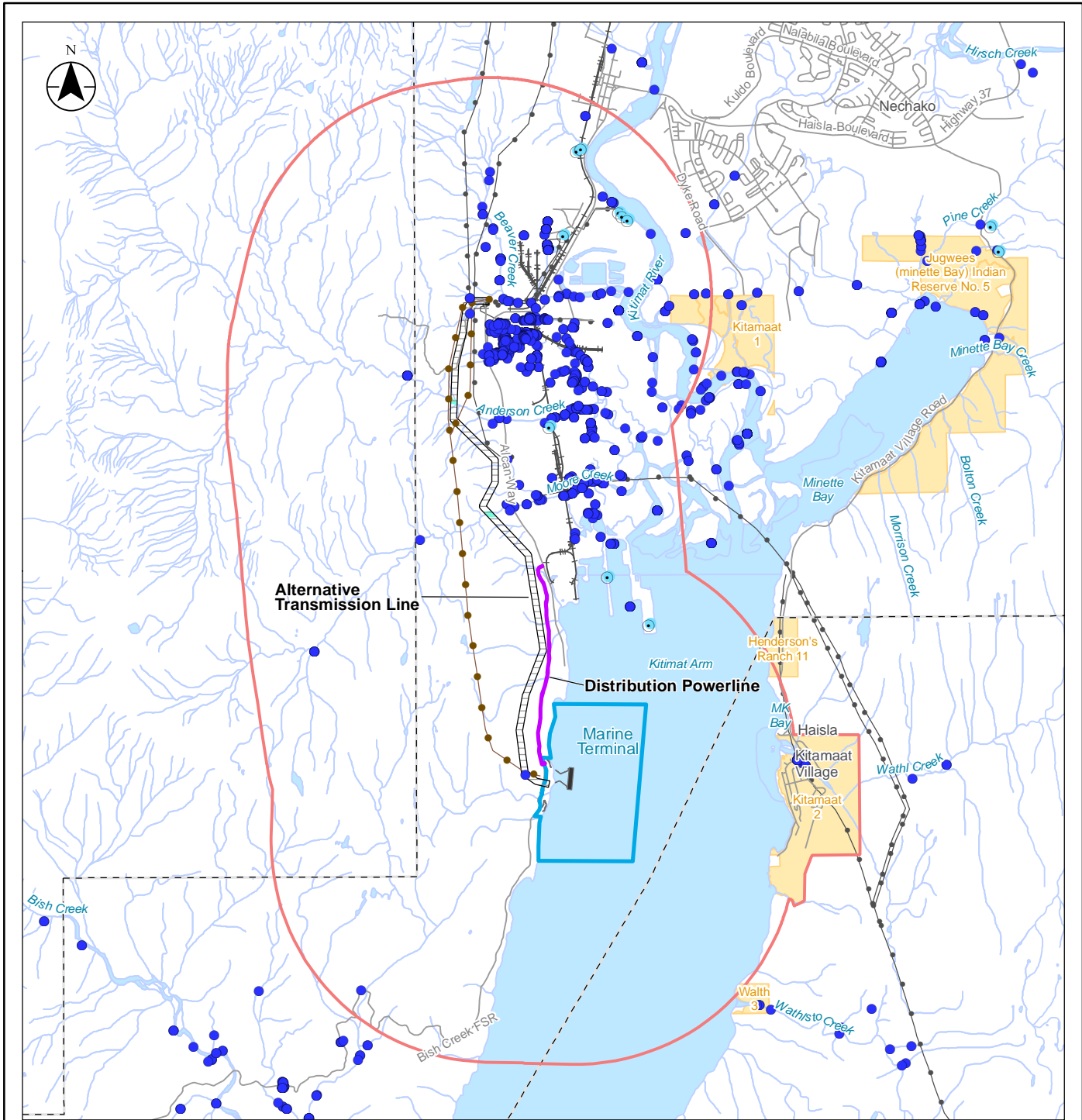
Project Location: Kitimat, British Columbia
 Project Number: 123222394
 Prepared by: TCARDINAL on 20240809
 Discipline Review by: BKRAWCHUK on 20240809
 Review by: GFELTHAM on 20240828

Client/Project/Report: Cedar LNG Partners LP
 Cedar LNG Project
 Environmental Assessment Amendment

Figure No.: **7.8.4**

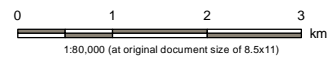
Title: **Wildlife Guiding and Trapping**

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Notes
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 2. Data Sources: DataBC, Government of British Columbia; Natural Resources Canada; Canadian Hydrographic Service
 3. * If data not shown area is larger than the map frame

- Road
- +— Railway
- Transmission Line
- Waterbody
- Reserve Land
- Local Greenspace
- District of Kitimat
- Municipal Boundary
- Project Components**
- Distribution Powerline
- Alternative Transmission Line
- Marine Terminal Area
- FLNG
- Transmission Line (EAC Application)
- Land and Resources**
- Local Assessment Area
- Fish Observation
- Water Licenced Works Point



Project Location: Kitimat, British Columbia
 Project Number: 123222394
 Prepared by: TCARDINAL on 20240809
 Discipline Review by: BKRAWCHUK on 20240809
 Review by: GFELTHAM on 20240828

Client/Project/Report: Cedar LNG Partners LP
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 Environmental Assessment Amendment

Figure No.: **7.8.5**

Title: **Fish and Water Licenses**

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A large proportion of the proposed alternative transmission line will be located on private property rather than provincial Crown land, thereby reducing the potential effects on tenured land and resource use. Cedar has had discussions with the private landowners who are now in support of construction of the alternative transmission line on their lands.

7.8.3.2 NON-TENURED LAND AND RESOURCE USE

Adverse changes in the access to and availability of recreational areas are expected during Project construction. Direct residual effects will primarily occur along the alternative transmission line right-of-way where vehicle access will be controlled for safety and security reasons. Access restrictions will be put in place for the period of construction and will continue during operation of the cleared alternative transmission line right-of-way. The location of the alternative transmission line right-of-way predominantly on private property rather than provincial Crown land will reduce the potential effects associated with access to non-tenured land and resource use.

Fish occurrence has been recorded at three locations (e.g., wetland, stream) within the area of the alternative transmission line (Figure 7.8.5). Fish species observed consisted of threespine stickleback, Dolly Varden, and rainbow trout. The alternative transmission line crossings of these waterbodies are on private property which would restrict the ability to access the fishery resources along the right-of-way. Project clearing and construction may result in temporary sensory disturbance effects to fish (e.g., construction noise) related to the availability of resources of interest to sport fishers angling in the LAA. The presence of a construction workforce could also lead to increased competition for fish angling resources of interest in the LAA. Work schedules, along with prohibition from fishing, will deter workers from fishing extensively.

The amended Project components overlap five recreation features with low to moderate sensitivity rating and medium recreational value. These are the same recreation features that were overlapped by the transmission line considered in the Assessment Report. Clearing for the alternative transmission line and new distribution powerline will continue to introduce new human alterations to the landscape. The effect of the alterations will produce a change in the existing visual character and quality. However, land disturbance from clearing of the alternative transmission line and distribution powerline remains a small portion of the LAA (0.8%). The placement of the alternative transmission line along the lower slopes adjacent to existing pipeline right-of-way could lessen the appearance on the landscape. This area has also been previously logged. Furthermore, the new distribution powerline will be along the existing Bish Creek FSR. No new lighting emissions are anticipated from the proposed changes at one or more viewpoints (e.g., Kitamaat Village and Kitimat Arm).



7.8.3.3 SUMMARY

The alternative transmission line and a widened right-of-way and the addition of the distribution powerline are anticipated to interact with land and resource use through changes in access to lands and availability of resources throughout construction. The assessment of change in private property and tenured land and resource use considered whether proposed changes would be incompatible with land use plans and zoning. Proposed changes also have the potential to cause disturbance and nuisance effects (e.g., clearing, construction noise, disruption of access). Disturbance effects on resource use considers the reduction in wildlife harvesting success because of construction activities (e.g., noise) on the resource (e.g., guiding and trapping). The proposed changes may affect the use of lands for outdoor recreation through change in access to recreation areas and may disrupt recreational enjoyment due to disturbance (e.g., noise). The assessment of change in non-tenured land and resource use considered whether activities associated with proposed alignments could potentially disrupt the visual landscape and interfere with scenic views. The location of the alternative transmission line predominantly on private land rather than provincial Crown land will reduce the potential effects on tenured and non-tenured land and resource use, relative to development of the transmission line within the approved Transmission Line Corridor.

No new residual effects are expected due to the changes proposed in this amendment. No changes in the magnitude of residual effects on land and resource use identified in the Assessment Report are anticipated due to the amendment components. As stated in the Assessment Report, residual effects are characterized as low to moderate in magnitude and include a change to private property and tenured land and resource use and change to non-tenured land and resource use. In consideration of the predicted effects on land and resource use, the conclusions presented in the Assessment Report remain valid with the proposed changes.

The Assessment Report concluded that project effects on land and resource use are predicted to be not significant. Characterization of residual effects for the proposed amendment components is unchanged from the Assessment Report and are summarized in Table 7.8.3.

**TABLE 7.8.3 CHANGES TO ASSESSMENT REPORT CHARACTERIZATION OF RESIDUAL EFFECTS –
LAND AND RESOURCE USE**

Characterization of Residual Effects from the Assessment Report			Changes to the Residual Effects Characterization
Criteria	Assessment Rating	Rationale	
<i>Context</i>	<i>Moderate</i>	<i>The Facility Area and marine terminal LAA have been disturbed by forestry, mining, infrastructure, and LNG developments. This includes an existing access road (that is, Bish Creek Forest Service Road) that has been upgraded and industrial resource development in Kitimat (that is, Rio Tinto Alcan aluminum smelter and LNG Canada). Land and resource use has moderate resilience due to the availability of alternative land areas for hunting, outfitting, and trapping activities, resource use, and recreation.</i>	No change
<i>Direction and Magnitude</i>	<i>Adverse and Low (private and tenured land use), and Moderate (visual/lighting)</i>	<i>For both private property and tenured land use and non-tenured land use, there will be low magnitude changes as a result of all Project activities. The Facility Area is located on private property and there are no current industrial, commercial, or residential uses in the area. Within the LAA, there are small overlaps with both private and tenured lands; however, Cedar would require approval to build on these lands. While there are various land uses in the RAA, the residual effect to private property and tenured land use during construction and operation is limited to the Project footprint and LAA. The Project footprint overlaps a small proportion of a guiding/outfitting area (0.7 percent) and a trapline area (0.8 percent) and Cedar would engage with these tenure holders to mitigate effects. <i>From a visual and lighting perspective, effects are predicted to be moderate due to the Project being visible from viewpoints at Kitimaat Village as well as from Kitimat Arm and Bish Creek FSR. However, effects are not predicted to be high because the Project will not be visually dominant due to distance and vegetative buffer (that is, around the Facility Area perimeter and along the transmission line right-of way). The Project will increase the amount of industrialized landscape within the LAA but will not change the overall visual character in the LAA, which has already been altered by waterfront developments (such as LNG Canada). Acoustic effects are considered low, as described in Section 5.2: Acoustics of this Report.</i></i>	No change
<i>Extent</i>	<i>Local</i>	<i>Residual effects are expected to be confined to the LAA which includes Kitimaat 1 and 2 Reserve Land, Private Property, Unsurveyed Crown Land, Provincial Crown Land, and Municipal Land.</i>	No change



Characterization of Residual Effects from the Assessment Report			Changes to the Residual Effects Characterization
Criteria	Assessment Rating	Rationale	
<i>Duration</i>	<i>Long-term</i>	<i>Construction residual effects such as access to and availability of recreational areas and limited increased demand for outdoor recreation within the LAA, will be long term and will continue in all Project phases. However, operational effects such as visual effects, lighting, and noise disturbance impacts on tenured and non-tenured land use are expected until decommissioning is complete.</i>	No change
<i>Reversibility</i>	<i>Reversible</i>	<i>Effects on land and resource use are considered reversible upon decommissioning.</i>	No change
<i>Frequency</i>	<i>Continuous</i>	<i>Residual effects associated with noise, light and disruption to resources are expected to be continuous as a result of changes to access and the continual use of equipment and installation of lighting infrastructure.</i>	No change
<i>Risk (likelihood and consequences)</i>	<i>Low</i>	<i>Likelihood: high likelihood of effects based on the known impact of visual, lighting and noise disturbance and known project footprint spatial distribution of land uses. Consequence: minor consequence based on the low to moderate magnitude within the LAA. Risk: based on the high likelihood and minor consequence of residual effects to land and resource use it was determined that there would be a low level of risk.</i>	No change
<i>Uncertainty</i>	<i>Low</i>	<i>Uncertainty is low based on a good understanding of effects on land and resource use of the Project.</i>	No change
<i>Significance</i>	<i>In consideration of the above analysis, EAO concludes that the Project would not have significant adverse residual effects on the land and resource use VC. Residual effects would be localized, and upon the completion of all Project phases, the residual effects are reversible.</i>		While this characterization is the responsibility of the EAO and IAAC, it is Cedar's opinion there is no change

Note:

The text in italics was copied from the Assessment Report for the Cedar LNG Project (EAO 2022).



7.8.4 Cumulative Effects Assessment

A further assessment of potential cumulative environmental effects to land and resource use was not conducted as the proposed changes do not change the characterization of residual effects presented in the Assessment Report. Measures to mitigate potential effects will be in place through continued implementation of existing management plans (i.e., CEMP, Socioeconomic Management Plan) and industry standard mitigation measures. Past and present effects of development on land and resource use were assessed as part of the current conditions (refer to Section 7.8.1).

7.8.5 Risk and Uncertainties

The level of confidence in the predictions for residual effects on land and resource use remains moderate to high. The prediction confidence is based on the information collected as part of the desktop baseline data and understanding of current baseline conditions. GIS data analyses, understanding of amendment activities, locations and described interaction, the known effectiveness of mitigation measures, and experience of the assessment team. The environmental effects mechanisms remain well-understood and applicable mitigation measures in the CEMP and Socioeconomic Management Plan are standard practice for projects involving linear transmission line components and are proven to be effective.

7.8.6 Adaptive Management and Monitoring Measures

There are no additional adaptive management or monitoring measures identified for land and resource use in the amendment application. Cedar has developed a project specific CEMP and associated plans (Cedar 2024a, 2024b), which will be applicable to the proposed changes.

7.9 Marine Use

The proposed changes in this amendment application alter the impacts to use of the marine environment that were considered in the EAC Application and the Assessment Report. Table 7.9.1 provides a side-by-side comparison of the impacts from the Project, as described in the CPD, and potential effects from the Assessment Report versus what is considered in this amendment application for marine use. A description of the existing conditions that influence the assessment for the proposed changes to the Project is provided below, followed by the effects assessment.

TABLE 7.9.1 SUMMARY COMPARISON IMPACTS AND POTENTIAL EFFECTS FOR MARINE USE

Impact & Effect	Assessment Report	Amendment Application
Impacts	<ul style="list-style-type: none"> • Strut mooring system or catenary mooring system within a 109.3 ha water lot 	<ul style="list-style-type: none"> • Catenary mooring system within a revised 277.3 ha Marine Terminal Area
Potential Effects	<ul style="list-style-type: none"> • Change in marine navigation • Change in marine fisheries • Change in other uses 	<ul style="list-style-type: none"> • Change in marine navigation • Change in marine fisheries • Change in other uses

7.9.1 Existing Conditions

The catenary mooring system outlined in Table 2.1 is within the marine use LAA included in the EAC Application and the Assessment Report (Cedar 2022a; EAO 2022). A description of the existing conditions for marine use in the LAA can be found in Section 7.10 Marine Use of the EAC Application.

Large vessels transiting in Kitimat Harbour tend to navigate the centre of the channel (Cedar 2022a). Most of the large vessels in Kitimat Harbour are associated with Rio Tinto and LNG Canada. These vessels utilize the marine shipping routes, travelling to and from their respective marine terminals (LNG Canada 2024). Smaller vessels (e.g., pleasure craft, passenger vessels, tugboats) in Kitimat Harbour tend to navigate closer to the shoreline, where it is more protected (Cedar 2022a). Pleasure craft were also observed in, or close to, Minette Bay or the MK Bay Marina (Cedar 2022a).

7.9.2 Potential Effects and Mitigation Measures

Table 7.9.2 provides a summary of potential effects and mitigation measures.

TABLE 7.9.2 SUMMARY OF POTENTIAL EFFECTS AND MITIGATION MEASURES – MARINE USE

Proposed Amendment Component	Project Phase	Change in Proposed Works or Activities	Change in Potential Effects	Change in Mitigation or Enhancement Measures	Change in Mitigation or Enhancement Measures Success Rating
Expanded Marine Terminal Area	Construction	Yes	No change in potential effects to marine navigation, marine fisheries and other uses	No change	No change

7.9.3 Changes to Characterization of Residual Effects

The mooring lines (i.e., chains) and anchors for the catenary mooring system extend beyond the limits of the Marine Terminal Area that is outlined in the CPD. Cedar will be required to expand its existing Crown land tenure for submerged Crown land to accommodate the changes. The expanded Marine Terminal Area will include an additional in-water area of 2,415,300 m², increasing the Marine Terminal Area to 277.3 ha. The FLNG will be located approximately 170 m off the shoreline at mean water levels, which is approximately 130 m further from the shoreline than the initial mooring position. However, only the mooring lines and anchors on the eastern side of the FLNG will be located outside of the original Marine Terminal Area (Figure 2.1). The proposed design of the expanded Marine Terminal Area extends into a Rio Tinto-owned water lot. Cedar will apply for an extension of its existing Crown land tenure for submerged Crown land to accommodate the amendment.

The mooring lines for the catenary mooring system terminate at a subsea anchor point (approximately 160 m depth). The resulting mooring lines will be located below the keel depth of other marine vessels; therefore, the catenary mooring system is not anticipated to have an additional effect on marine navigation and marine fisheries and other uses. The anchors will be placed on the seafloor. The soft sediments of the seafloor are not critical habitats for fish species that support fisheries or species-at-risk (see Section 7.7 for more information). There are no commercial trawling fisheries that overlap with the expanded Marine Terminal Area.

The proposed amendment will not result in additional vessels, a change in vessel types required, or a change in the marine shipping route. No changes to the characterization of residual effects are anticipated based on information outlined in the Assessment Report and the existing mitigation measures as described in the CEMP (Cedar 2024a). A comparison of the conclusions from the Assessment Report and the amendment application residual effects is presented in Table 7.9.3.

TABLE 7.9.3 CHANGES TO ASSESSMENT REPORT CHARACTERIZATION OF RESIDUAL EFFECTS – MARINE USE

Characterization of Residual Effects from the Assessment Report			Changes to the Residual Effects Characterization
Criteria	Assessment Rating	Rationale	
<i>Context</i>	<i>Medium</i>	<i>The region is currently subject to a variety of large marine vessel traffic (including ferries, cruise ships, fishing boats and commercial shipping vessels); however, current vessel traffic levels are low compared to other parts of B.C. Thus, the Marine Shipping Route has the capacity to accommodate increases in marine shipping traffic from a navigational perspective; however, the Marine Shipping Route is also considered highly sensitive to any changes to marine use due to the potential for Cedar LNG vessel traffic to disrupt cultural, harvesting, and other traditional practices of Indigenous nations. Context is rated medium as a result.</i>	No change
<i>Direction and Magnitude</i>	Marine Navigation: Adverse and low	Marine Navigation: Construction, operation, and decommissioning will result in an increase in new in-water infrastructure in Kitimat Arm and an increase in Project-related vessel traffic along the Marine Shipping Route. Effects from marine shipping are anticipated to impact a small proportion of navigable waters. An interference with the navigational passage of other vessels during all Project phases is not anticipated. During peak construction, barge and Project-related vessel movements could be two movements per week. During operation, 50 LNG vessels or 100 LNG vessel movements are expected annually (approximately two LNG vessel movement per week). This frequency is similar to marine shipping frequency during construction.	No change
	Marine Fisheries and Other Uses: Adverse and moderate	Marine Fisheries and Other Uses: Cedar LNG would result in an increase in vessel traffic, which may affect marine fisheries and other uses as a result of reduced fishing and other marine use opportunities, interference with access to fishing or marine use areas, and a reduced quality of experience due to noise, light and aesthetic effects of LNG vessels. However, these effects are not anticipated to create a change or disruption that widely restricts or degrades present marine uses to a point where they cannot continue at current levels.	
<i>Extent</i>	<i>Regional</i>	<i>Residual effects to marine use are applicable throughout the RAA although effects are expected to impact a small proportion of navigable waters within the RAA and only during the transit time of the vessel in the Marine Shipping Routes.</i>	No change
<i>Duration</i>	<i>Long-term</i>	<i>The residual effects will last the duration of the Project and in all project phases: construction, operation, and decommissioning.</i>	No change



Characterization of Residual Effects from the Assessment Report			Changes to the Residual Effects Characterization
Criteria	Assessment Rating	Rationale	
<i>Reversibility</i>	<i>Reversible</i>	<i>The residual effects on Marine Use will cease upon completion of all Project phases.</i>	No change
<i>Frequency</i>	<i>Regular /Frequent to Continuous</i>	<i>During operation and construction, 50 LNG vessels or 100 LNG vessel movements are anticipated annually (approximately two LNG vessel movement per week). Residual effects to marine use are not anticipated to occur at a specified schedule during construction and decommissioning phases however activities throughout operation are expected to occur continuously and at regular intervals.</i>	No change
<i>Affected Populations</i>	<i>Disproportionate</i>	<i>The increase in large vessel movements may prevent/reduce access to fishing, marine use or shoreline harvesting sites causing Indigenous communities to experience disproportionate effects.</i>	No change
<i>Risk (likelihood and consequences)</i>	<p><i>Likelihood – high likelihood of residual effects to marine use during all Project phases impacting marine navigation and marine fisheries and other uses.</i></p> <p><i>Consequence – moderate consequence based on the magnitude of effects to marine use and through application of Mitigation Measures.</i></p> <p><i>Risk – based on the likelihood and consequence of residual effects to marine use it was determined that there would be a moderate level of risk.</i></p>		No change
<i>Uncertainty</i>	<i>Uncertainty of effects to marine navigation is considered to be low based on a good understanding of the scope and extent of effects. Uncertainty on effects to marine fisheries and other uses is considered moderate based on concerns raised regarding data sources, assessment methods, wake effects and efficacy of Mitigation Measures.</i>		No change
<i>Significance</i>	<i>In consideration of the above analysis, Mitigation Measures that will be implemented, and the extent and reversibility of effects, the EAO concludes that Cedar LNG would not have significant residual effects on the marine use VC.</i>		While this characterization is the responsibility of the EAO and IAAC, it is Cedar's opinion there is no change

Note:

The text in italics was copied from the Assessment Report for the Cedar LNG Project (EAO 2022).



7.9.4 Cumulative Effects Assessment

Cumulative effects on marine use are not predicted to change with the proposed changes outlined in the amendment than for the approved Project as presented in the EAC Application and Assessment Report.

The amendment is anticipated to have the same interaction with past, present, and reasonably foreseeable projects and activities compared to the EAC Application. As such cumulative effects on marine use because of the amendment are predicted to be consistent with the Assessment Report and the characterization presented in the EAC Application is anticipated to remain valid.

7.9.5 Risk and Uncertainties

Since receiving the Assessment Report, Cedar has conducted additional analyses on the mooring system technologies available. The catenary mooring system has been selected based on technical and cost considerations as Project design has progressed since the EAC Application. The additional analyses on the mooring system technologies available have increased the confidence in the predictions made regarding risks and uncertainties associated with the Project.

7.9.6 Adaptive Management and Monitoring Measures

Existing management plans prepared to meet requirements of the EAC and Decision Statement establish adaptive management and monitoring measures that will address potential effects from the amendments outlined in this application. Of relevance to the marine use are:

- The Marine Transportation Management Plan will document measures that Cedar will take to communicate marine activities with Indigenous groups during the construction.
- The Community Feedback Process will describe the process for members of the community to give Cedar feedback on project-related effects as well as the approach that Cedar will implement to document and report on adaptive management measures taken in response to this feedback.
- Additional adaptive management and monitoring measures are addressed in the CEMP (Cedar 2024a).

7.10 Heritage

The proposed changes in this amendment application alter the impacts to the environment that were considered in the EAC Application and the Assessment Report. Table 7.10.1 provides a side-by-side comparison of the impacts from the Project, as described in the CPD, and potential effects from the Assessment Report versus what is considered in this amendment application for heritage. A description of the existing conditions that influence the assessment for the proposed changes to the Project is provided below, followed by the effects assessment.

TABLE 7.10.1 SUMMARY COMPARISON IMPACTS AND POTENTIAL EFFECTS FOR HERITAGE RESOURCES

Impact & Effect	Assessment Report	Amendment Application
Impacts	<ul style="list-style-type: none"> Seven (7) identified archaeological sites within the LAA/RAA. All the sites are comprised of five or fewer pre-1846 culturally modified trees (CMTs). One site (FITe-133) is in direct conflict with Project Component clearing area. 	<ul style="list-style-type: none"> Two (2) additional sites (GaTe-11, GaTe-20) are in direct conflict with Project Component clearing areas. All the sites are comprised of two or fewer pre-1846 CMTs.
Potential Effects	Loss of information about or alteration to site contents or context	Loss of information about or alteration to site contents or context

7.10.1 Existing Conditions

A desktop review of recorded historic places and an in-field archaeological impact assessment (AIA) of the original EAC Application LAA/RAA were completed to determine existing conditions for heritage. The EAC Application identified seven heritage resources (archaeological sites) within the EAC Application LAA/RAA and identified the requirement for additional AIA prior to construction to identify any additional heritage resources. In line with the EAC Application an AIA was completed for the portions of the LAA/RAA not previously subject to archaeological inspection. As a result of an AIA conducted by Stantec (Stantec 2021) under a section 12.2 *Heritage Conservation Act* permit (permit number 2020-0013), two additional archaeological sites (GaTe-20 and GaTe-21) were identified within the LAA after submission of the EAC Application, increasing the total number to nine. Although nine recorded heritage sites are present within the LAA there is only one potential conflict with a recorded heritage site, FITe-133, located within the approved transmission line right-of-way.

As part of the assessment for proposed changes in this amendment application, Stantec conducted a gap analysis to identify any areas not previously surveyed and areas with recorded archaeological sites that may be adversely affected by the alternative transmission line and addition of the distribution powerline. Fieldwork was conducted in June 2024 to complete a heritage survey within the areas identified in the data gap analysis. Additionally, three identified archaeological sites (GaTe-11, GaTe-20 and FITe-133) that may be in conflict with the alternative transmission line were revisited to assess potential Project effects. Two of these sites are new potential effects associated with the alternative transmission line (GaTe-11 and GaTe-20). No identified heritage sites are in conflict with the new distribution powerline right-of-way. The results of this field assessment are presented in Appendix E.



The three identified archaeological sites in conflict consist of one to two CMTs, each considered to predate 1846.

- FITE-133 is comprised of a single bark-stripped CMT historically logged stump
- GaTe-11 consists of two bark-stripped CMTs that are both historically logged stumps
- GaTe-20 is a single standing notched western redcedar

7.10.2 Potential Effects and Mitigation Measures

The Archaeology Branch of the MOF is responsible for managing the threshold of loss to heritage resources in BC. An adverse residual effect on heritage resources is defined as one that results in an unauthorized project-related disturbance to, or destruction of, all or part of a heritage resource site considered by MOF to have heritage value, and that is not mitigated or compensated as required by MOF.

Mitigation measures for heritage including pre-construction avoidance considerations, site alteration and stem-round sampling during construction-related clearing impacts and chance find responses during construction are presented in Section 15 of the CEMP (Cedar 2024a). Cedar commits to fulfilling all requirements for field assessment and mitigation required under the *Heritage Conservation Act* and *Land Act*. With the implementation of project-specific avoidance or effects mitigation of known and chance find heritage resources, the proposed changes to the Project are not anticipated to have residual effects on heritage as a valued component.

A summary of potential effects of the proposed changes on heritage is provided in Table 7.10.2.

TABLE 7.10.2 SUMMARY OF POTENTIAL EFFECTS AND MITIGATION MEASURES – HERITAGE

Proposed Amendment Component	Project Phase	Change in Proposed Works or Activities	Change in Potential Effects	Change in Mitigation or Enhancement Measures	Change in Mitigation or Enhancement Measures Success Rating
Alternative transmission line	Construction	Yes	Yes; two additional sites	No change	No change
Distribution powerline	Construction	Yes	No change; no additional sites	No change	No change



7.10.3 Changes to Characterization of Residual Effects

There are no formal thresholds for determining the value of heritage as a single, comprehensive valued component. Instead, site-specific evaluation is conducted. Although the MOF makes the final determination whether or not the alteration or loss of a heritage resource would represent a significant adverse effect, Cedar has committed to avoidance or mitigation of all known heritage sites and will implement the CEMP chance find procedure should a site be identified during construction.

The *Impact Assessment Act* requires that effects within federal jurisdiction be considered. These include the following effects:

- 2(c) with respect to the Indigenous peoples of Canada, an impact — occurring in Canada and resulting from any change to the environment — on
 - (i) physical and cultural heritage; and
 - (ii) any structure, site or thing that is of historical, archaeological, paleontological or architectural significance

As majority owners of the Project, Haisla Nation is included in all decisions regarding the Project, and the alternative transmission line corridor was driven by Haisla Nation's requirement that the Cedar team continue to look for opportunities to reduce Project-related effects during detailed design. In addition, Cedar meets regularly with Haisla Nation to discuss environmental and permitting aspects of the Project. Haisla Nation has been provided all heritage assessment report deliverables and have reviewed and approved the heritage mitigation and chance find procedures included in the CEMP. The mitigation measures associated with the increase in sites affected from one CMT heritage feature at one identified site to four features at three identified sites has not changed. However, as two of the three heritage sites are historically logged, dead stumps the archaeological significance is assessed as low. For the GaTe-20 CMT feature, viable stem-round samples can be collected to record the age of the heritage site. The Provincial Heritage Register will be updated with the results of site mitigation and sampling results. Haisla Nation has not identified any site-specific concerns related to heritage based on engagement and Indigenous knowledge information and traditional use sites shared with Cedar.

7.10.4 Cumulative Effects Assessment

After implementation of any mitigation measures identified in Section 7.10.2, and engagement with Haisla Nation, no residual Project effects on heritage are anticipated from the proposed changes. Therefore, there is no requirement to consider the potential for cumulative effects. This results in no change from the heritage cumulative effects assessment identified in the Assessment Report.

7.10.5 Risk and Uncertainties

There is a strong understanding of the heritage resources in the vicinity of the Project, including the proposed changes in the amendment application, based on field studies completed for the Project and past projects that have been proposed but did not advance. As a result, the risk to heritage resources is rated low. The prediction confidence in the conclusions for Project residual effects and residual cumulative effects for heritage is high based on Cedar's commitment to follow all regulatory requirements of the *Heritage Conservation Act* and *Land Act*, and to implement a Project-specific CEMP that includes a chance find procedure.



7.10.6 Adaptive Management and Monitoring Measures

While Cedar is confident in the methods and quality of the field studies and data collected during the heritage program under the section 12.2 *Heritage Conservation Act* permit (permit number 2020-0013), there is always potential for a chance find to be identified during construction. Should a chance find occur, the chance find procedure in the Project's CEMP will be implemented. With the implementation of the above-mentioned mitigation, the CEMP, and with consideration that any further regulatory requirements would be met should permits be required, no additional follow-up or monitoring is required for heritage.

8.0 Indigenous Interests

8.1 Scope of the Amendment

Under section 25(1) of the *Environmental Assessment Act (2018)* and section 22(1)(c) of the *Impact Assessment Act*, effects of the Project on Indigenous nations and rights recognized and affirmed by section 35 of the *Constitution Act, 1982* must be assessed. Effects on Indigenous interest was fully considered in the Assessment Report and separate submissions to the ministers were received by the EAO from Kitsumkalum First Nation, Gitxaala Nation and Gitga'at Nation.

The following sections provide an analysis of the effects of each proposed change to the Project and whether they alter the conclusions of the Assessment Report regarding the exercise of Indigenous interests. Indigenous interests, as defined by the EAO, include "interests related to an Indigenous nation and their rights recognized and affirmed by section 35 of the *Constitution Act, 1982*, including Treaty rights and Aboriginal rights and title, that may be impacted by a proposed project" (EAO 2020b). This analysis specifically considered whether the proposed changes would induce any new effects, whether they would alter the characterization of the predicted effects (e.g., a change in the magnitude of an effect), or whether any new mitigation measures are needed to prevent a change in the EAO characterization of the effects.

Table 8.1.1 identifies the Indigenous interests that were presented in the Assessment Report and interactions with the proposed changes. There are no anticipated additional effects to Indigenous interests that were not previously assessed in the EAC Application and the Assessment Report (Cedar 2022a; EAO 2022). Rationale is provided in Table 8.1.1 as to whether the Indigenous interests were included or excluded from this amendment application.

Cedar continues to engage with Haisla Nation, Metlakatla First Nation, Lax Kw'alaams Band, Gitga'at First Nation, Gitxaala Nation, Kitselas First Nation, Kitsumkalum First Nation, Haida Nation and Métis Nation British Columbia. Section 4.0 provides a summary of this engagement as well as the outcomes that have informed the amendment application. Given the feedback shared by potentially affected Indigenous nations to date (Section 4.0) and the predicted interactions of the environmental and social and economic valued components related to Indigenous interests, effects on Haisla Nation interests are anticipated from the proposed changes (as summarized in Table 8.1.1). The assessment of these effects is provided in Section 8.2.

There are no anticipated new or expanded interactions with the Indigenous interests of Metlakatla First Nation, Lax Kw'alaams Band, Gitga'at First Nation, Gitxaala Nation, Kitselas First Nation, Kitsumkalum First Nation, Haida Nation and Métis Nation British Columbia (as summarized in Table 8.1.1) resulting from the proposed changes. As such, there are also no change in the residual adverse environmental effects with a spatial and temporal overlap of adverse effects from past, present, and reasonably foreseeable projects and activities for Metlakatla First Nation, Lax Kw'alaams Band, Gitga'at First Nation, Gitxaala Nation, Kitselas First Nation, Kitsumkalum First Nation, Haida Nation and Métis Nation British Columbia.



The assessment methodology is consistent with that set out in Section 11.0 of the EAC Application (Cedar 2022b). There are no changes to the LAA and RAA boundaries for the assessment of effects on Haisla Nation interests (Cedar 2022b). The proposed changes to the Project are located within Haisla Nation territory and valued component LAAs as described in the EAC Application (Cedar 2022a, b) and the Assessment Report. The EAC Application included a literature review from publicly available information and project-specific Indigenous knowledge and/or social and economic studies prepared by the Indigenous nations (Cedar 2022b).

TABLE 8.1.1 INDIGENOUS INTERESTS TO BE INCLUDED/EXCLUDED FROM THE AMENDMENT APPLICATION

Indigenous Interest	Conclusion from Assessment Report	Interaction Identified	Assessment Approach	Rationale
Haisla Nation				
Harvesting Rights	Negligible to minor impact on Haisla's ability to harvest in the marine and terrestrial environment.	Yes	Carried forward for assessment	The proposed amendment to the Marine Terminal Area (mooring systems) and the locations of the distribution powerline and the alternative transmission line may result in changes to the effects on terrestrial and marine resources, or access to harvesting areas within Haisla Nation's traditional territory, therefore, impacts on Haisla Nation's Harvesting Rights are anticipated.
Use and Integrity of Sacred and Culturally Important Sites and Landscape Features	Minor impact on Haisla's use and integrity of sacred and culturally important sites and landscape features.	Yes	Carried forward for assessment	The proposed amendment to the Marine Terminal Area (mooring systems) and the locations of the distribution powerline and the alternative transmission line may result in changes to the effects on access and/or the use and integrity of culturally important sites and landscape features within Haisla Nation's traditional territory, therefore, impacts on Haisla's Use and Integrity of Sacred and Culturally Important Sites and Landscape Features are anticipated.
Indigenous Governance	Minor negative impact and a minor positive impact on Haisla's Indigenous governance.	Yes	Carried forward for assessment	The number of people employed on the Project during construction (up to 500 people) will not increase through the proposed changes. No changes to the characterization of residual effects related to changes in regional employment, business and economy, infrastructure, services, accommodation and transportation are expected. The proposed amendment to the Marine Terminal Area (mooring systems) and the locations of the distribution powerline and the alternative transmission line may result in changes to the effects on governance and decision making within Haisla Nation's traditional territory, therefore impacts on Haisla's Indigenous Governance are anticipated.
Indigenous Health and Well-being	Minor negative impact and a minor positive impact on Haisla's Indigenous health and well-being.	Yes	Carried forward for assessment	The proposed amendment to the Marine Terminal Area (mooring systems) and the locations of the distribution powerline and the alternative transmission line may result in changes to the effects on health and wellbeing within Haisla Nation's traditional territory, therefore, impacts on Haisla's Indigenous Health and Wellbeing are anticipated.
Kitselas First Nation				
History	Potential adverse effects of the Project on the Indigenous Interests of Kitselas have been adequately avoided, minimized or otherwise accommodated.	No	Excluded from further assessment	The proposed amendment to the Marine Terminal Area (mooring systems) and the locations of the distribution powerline and the alternative transmission line do not overlap with Kitselas First Nation's territory, therefore there is no additional anticipated impact to Kitselas First Nation's History.
Future		No	Excluded from further assessment	The proposed amendment to the Marine Terminal Area (mooring systems) and the locations of the distribution powerline and the alternative transmission line do not overlap with Kitselas First Nation's territory, therefore there is no additional anticipated impact to Kitselas First Nation's Future.
Lands		No	Excluded from further assessment	The proposed amendment to the Marine Terminal Area (mooring systems) and the locations of the distribution powerline and the alternative transmission line do not overlap with Kitselas First Nation's territory, therefore there is no additional anticipated impact to Kitselas First Nation's Lands.
Authority		No	Excluded from further assessment	The proposed amendment to the Marine Terminal Area (mooring systems) and the locations of the distribution powerline and the alternative transmission line do not overlap with Kitselas First Nation's territory, therefore there is no additional anticipated impact to Kitselas First Nation's Authority.
Community		No	Excluded from further assessment	The number of people employed on the Project during construction (up to 500 people) will not increase through the proposed changes. No changes to the characterization of residual effects related to changes in regional employment, business and economy, infrastructure, services, accommodation and transportation are expected. The proposed amendment to the Marine Terminal Area (mooring systems) and the locations of the distribution powerline and the alternative transmission line do not overlap with Kitselas First Nation's territory, therefore there is no additional anticipated impact to Kitselas First Nation's Community.

Indigenous Interest	Conclusion from Assessment Report	Interaction Identified	Assessment Approach	Rationale
Kitsumkalum First Nation				
Harvesting Rights	Minor on Harvesting Rights.	No	Excluded from further assessment	The proposed amendment to the Marine Terminal Area (mooring systems) and the locations of the distribution powerline and the alternative transmission line do not overlap with Kitsumkalum First Nation's territory, therefore there is no additional anticipated impact to Kitsumkalum First Nation's Harvesting Rights.
Use and Integrity of Sacred and Culturally Important Sites and Landscape Features	Minor on Use and Integrity of sacred and culturally important sites and landscape features.	No	Excluded from further assessment	The proposed amendment to the Marine Terminal Area (mooring systems) and the locations of the distribution powerline and the alternative transmission line do not overlap with Kitsumkalum First Nation's territory, therefore there is no additional anticipated impact to Kitsumkalum First Nation's Use and Integrity of Sacred and Culturally Important Sites and Landscape Features.
Indigenous Governance	Minor negative impact and minor positive impact on Indigenous governance.	No	Excluded from further assessment	The number of people employed on the Project during construction (up to 500 people) will not increase through the proposed changes. No changes to the characterization of residual effects related to changes in regional employment, business and economy, infrastructure, services, accommodation and transportation are expected. The proposed amendment to the Marine Terminal Area (mooring systems) and the locations of the distribution powerline and the alternative transmission line do not overlap with Kitsumkalum First Nation's territory, therefore there is no additional anticipated impact to Kitsumkalum First Nation's Governance.
Indigenous Health and Wellbeing	Minor negative impact and minor positive impact on Indigenous health and well-being.	No	Excluded from further assessment	The proposed amendment to the Marine Terminal Area (mooring systems) and the locations of the distribution powerline and the alternative transmission line do not overlap with Kitsumkalum First Nation's territory, therefore there is no additional anticipated impact to Kitsumkalum First Nation's Health and Wellbeing.
Gitga'at First Nation				
Consumption and Harvesting Rights	Chronic moderate adverse residual and cumulative impacts on Gitga'at's ability to travel in and carry out Indigenous harvesting activities in the marine environment.	No	Excluded from further assessment	The proposed amendment to the Marine Terminal Area (mooring systems) and the locations of the distribution powerline and the alternative transmission line do not overlap with Gitga'at First Nation territory, therefore there is no additional anticipated impact to Gitga'at First Nation's Harvesting Rights.
Use and Integrity of Sacred and Culturally Important Sites and Land and Marine-Scape Features	Long-term moderate impact on Gitga'at's use and integrity of sacred and culturally important sites and land and marinescape features.	No	Excluded from further assessment	The proposed amendment to the Marine Terminal Area (mooring systems) and the locations of the distribution powerline and the alternative transmission line do not overlap with Gitga'at First Nation territory, therefore there is no additional anticipated impact to Gitga'at First Nation's Use and Integrity of Sacred and Culturally Important Sites and Land and Marine-Scape Features.
Governance	Long-term moderate negative impact on Gitga'at's Indigenous governance, self-determination and territorial stewardship	No	Excluded from further assessment	The number of people employed on the Project during construction (up to 500 people) will not increase through the proposed changes. No changes to the characterization of residual effects related to changes in regional employment, business and economy, infrastructure, services, accommodation and transportation are expected. The proposed amendment to the Marine Terminal Area (mooring systems) and the locations of the distribution powerline and the alternative transmission line do not overlap with Gitga'at First Nation territory, therefore there is no additional anticipated impact to Gitga'at First Nation's Governance.
Rights and Title	N/A	No	Excluded from further assessment	The proposed amendment to the Marine Terminal Area (mooring systems) and the locations of the distribution powerline and the alternative transmission line do not overlap with Gitga'at First Nation territory, therefore there is no additional anticipated impact to Gitga'at First Nation's Rights and Title.
Health and Community wellbeing	Overall moderate negative impact and a potentially minor positive impact on some aspects of Gitga'at's Indigenous health and well-being.	No	Excluded from further assessment	The proposed amendment to the Marine Terminal Area (mooring systems) and the locations of the distribution powerline and the alternative transmission line do not overlap with Gitga'at First Nation territory, therefore there is no additional anticipated impact to Gitga'at First Nation's Health and Community Wellbeing.

Indigenous Interest	Conclusion from Assessment Report	Interaction Identified	Assessment Approach	Rationale
Gitxaala Nation				
Governance	Potential adverse effects of the Project on the Indigenous Interests of Gitxaala have been adequately avoided, minimized or otherwise accommodated.	No	Excluded from further assessment	The number of people employed on the Project during construction (up to 500 people) will not increase through the proposed changes. No changes to the characterization of residual effects related to changes in regional employment, business and economy, infrastructure, services, accommodation and transportation are expected. The proposed amendment to the Marine Terminal Area (mooring systems) and the locations of the distribution powerline and the alternative transmission line do not overlap with Gitxaala Nation's territory, therefore there is no additional anticipated impact to Gitxaala Nation's Governance.
Cultural Identity		No	Excluded from further assessment	The proposed amendment to the Marine Terminal Area (mooring systems) and the locations of the distribution powerline and the alternative transmission line do not overlap with Gitxaala Nation's territory, therefore there is no additional anticipated impact to Gitxaala Nation's Cultural Identity.
Harvesting		No	Excluded from further assessment	The proposed amendment to the Marine Terminal Area (mooring systems) and the locations of the distribution powerline and the alternative transmission line do not overlap with Gitxaala Nation's territory, therefore there is no additional anticipated impact to Gitxaala Nation's Harvesting.
Sacred Places		No	Excluded from further assessment	The proposed amendment to the Marine Terminal Area (mooring systems) and the locations of the distribution powerline and the alternative transmission line do not overlap with Gitxaala Nation's territory, therefore there is no additional anticipated impact to Gitxaala Nation's Sacred Places.
Lax Kw'alaams Band and Metlakatla First Nation (Coast Tsimshian Nations)				
Marine Harvesting	Moderate effect on marine harvesting.	No	Excluded from further assessment	The proposed amendment to the Marine Terminal Area (mooring systems) and the locations of the distribution powerline and the alternative transmission line do not overlap with Lax Kw'alaams Band and Metlakatla First Nation's traditional territories, therefore no additional impact to Lax Kw'alaams Band and Metlakatla First Nation's Marine Harvesting is predicted.
Sense of Place	Moderate effect on sense of place.	No	Excluded from further assessment	The proposed amendment to the Marine Terminal Area (mooring systems) and the locations of the distribution powerline and the alternative transmission line do not overlap with Kw'alaams Band and Metlakatla First Nation's traditional territories, therefore no additional impact to Lax Kw'alaams Band and Metlakatla First Nation's Sense of Place is predicted.
Metis Nation British Columbia				
Harvesting	Adequately avoided, minimized or otherwise accommodated.	No	Excluded from further assessment	The proposed amendment to the Marine Terminal Area (mooring systems) and the locations of the distribution powerline and the alternative transmission line do not overlap with Métis Nation British Columbia area of interest, therefore there is no additional anticipated impact to Métis Nation British Columbia Harvesting.
Sacred and Culturally Important Sites and Landscape Features	Negligible to minor impact on Métis use and integrity of sacred and culturally important sites and landscape features.	No	Excluded from further assessment	The proposed amendment to the Marine Terminal Area (mooring systems) and the locations of the distribution powerline and the alternative transmission line do not overlap with Métis Nation British Columbia area of interest, therefore there is no additional anticipated impact to Métis Nation British Columbia Sacred and Culturally Important Sites and Landscape Features.
Haida Nation				
N/A	No effects to Haida within the scope of the environmental assessment of the Project.	No	Excluded from further assessment	The proposed amendment to the Marine Terminal Area (mooring systems) and the locations of the distribution powerline and the alternative transmission line do not overlap with Haida Nation territory, therefore there is no additional anticipated impact to Haida within the scope of the environmental assessment of the Project.



8.2 Haisla Nation

The following sections provide the Indigenous interest assessment for Haisla Nation, including potential effects to Haisla Nation interests, mitigations, and changes to the characterization of residual effects from the Assessment Report or the original EAC Application, as applicable. Existing conditions for Haisla Nation relevant to the amendment have not changed from conditions described in the EAC Application (Cedar 2022b) and the Assessment Report.

8.2.1 Potential Effects and Mitigation

This assessment on Haisla Nation interests considers the predicted effects of the proposed changes to the Project on each of the valued components assessed in the amendment (Section 7.0) and considers how these effects could affect the ability of Haisla Nation to exercise its Indigenous rights. Given the interactions identified in Table 8.1.1, and in consideration of the Assessment Report, potential interactions associated with the proposed changes to the Project include:

- Changes to Harvesting Rights
- Changes to Use and Integrity of Sacred and Culturally Important Sites and Landscape Features
- Changes to Indigenous Governance
- Changes to Indigenous Health and Well-being

This amendment conservatively assumes that construction of the proposed changes to the Project may result in the same or similar potential effects on Haisla Nation interests as those identified in Section 11.0 of the EAC Application (Cedar 2022b) and the Assessment Report. Potential pathways for changes to Haisla Nation interests are therefore the same as those identified in the EAC Application.

Detailed descriptions of the proposed changes to the Project footprint are provided in Section 2.0.

Overall, there will be an increase in vegetation clearing for the amendment compared to the amount estimated in the EAC Application; however, most of the changes associated with the alternative transmission line and addition of the distribution powerline are net neutral or positive from the standpoint of the vegetation resources as effects on plant species of interest are unchanged and no plant species at risk are predicted to be affected by the proposed changes (Section 7.4). Additionally, the majority of areas that will be subject to clearing activities are on private lands, which are currently inaccessible for the exercise of Indigenous rights. Though traditional use plant species occur throughout the marine terminal LAA, they are tree, shrub or herb species which are expected to persist throughout most of the disturbance footprint following construction, as most of the disturbance to vegetation associated with the Project (and the alternative transmission line specifically) is in the form of tree clearing. Further, the alternative transmission line no longer affects old forest, avoiding the 12.3 ha that would have been lost through construction, as well as the 75 ha potentially affected by edge effects. Disturbance to blue-listed ecosystems and wetlands has been reduced by 64% and 80%, respectively. The area of blue-listed ecosystems with the potential to experience a negative change in condition has been reduced by 42%, while the area of wetland with the potential to experience a negative change in condition has been reduced by 77%.



The change in location and width of the alternative transmission line right-of-way and the addition of the distribution line are not predicted to result in a change in direction or magnitude of habitat availability or wildlife movement or mortality risk for species of cultural importance to Haisla Nation (Section 7.5). Mitigation measures described in the CEMP for wildlife are sufficient for managing adverse effects of the proposed changes on wildlife habitat availability, movement, and mortality risk (Cedar 2024a).

Clearing for the alternative transmission line and distribution powerline will continue to introduce new human alterations to the landscape. The effect of the proposed changes is anticipated to produce a change in the existing visual character and quality for Haisla Nation. However, land disturbance from clearing of the alternative transmission line and distribution powerline remains a small portion of the land and resource use LAA (0.8%) (Section 7.8). No new lighting emissions will result from the proposed amendments and therefore viewpoints for Haisla Nation will not change (e.g., Kitamaat Village and Kitimat Arm).

As described in Section 7.6, avoidance measures incorporated into Project design limit or reduce potential effects on freshwater fish species of importance to Haisla Nation. These avoidance measures also apply to the amendment, including reduced clearing through Anderson Creek and Moore Creek riparian areas. No change to the characterizations of residual effects on habitat for freshwater fish, fish species of cultural importance for Haisla Nation, or aquatic species at risk is predicted due to the proposed changes.

The proposed changes to the Project will not result in additional vessels, a change in vessel types required, or a change in the marine shipping route during the construction phase (Section 7.9). Adverse changes in the access to and availability of terrestrial harvesting areas are however expected during Project construction. Direct residual effects will primarily occur along the alternative transmission line right-of-way where vehicle access will be controlled for safety and security reasons. Access restrictions will be put in place for the period of construction and will continue during operation of the cleared alternative transmission line right-of-way, consistent with findings for the Project as currently approved. No changes to the characterization of residual effects are anticipated in relation to Haisla Nation access and travel in the marine or terrestrial environments (e.g., harvesting sites, culturally important sites or landscape features).

No changes to the residual effects characterization in the Assessment Report regarding water quality, marine habitat, marine fish or marine mammal behaviour or fish or marine mammal injury or mortality risk are predicted in relation to the Marine Terminal Area (i.e., catenary mooring system for the FLNG) (Section 7.7).

As described in Section 7.3, the alternative transmission line, distribution powerline, and changes to the mooring system will not result in substantially greater noise levels compared to the EAC Application. While the changes in the amendment have an interaction with human health related to annoyance from noise, the health risk is expected to remain limited such that existing proposed acoustic mitigations will be effective (Table 7.1.2).

Consistent with the results of the Assessment Report, the proposed changes are not predicted to result in residual adverse effects to the Heritage valued component, including physical heritage and archeological, paleontological, or architectural sites or structures, as defined under Sections 2(c)(i) and (iii) of the *Impact Assessment Act* (Section 7.10 Heritage). Through engagement with Haisla Nation, this conclusion is understood to extend to Haisla Nation's use and integrity of sacred and culturally important sites and



landscape features, and in combination with the prediction for no change in access to marine and terrestrial areas, no changes to the characterization of residual effects are anticipated in relation to Haisla Nation culturally important sites or landscape features.

No changes to the characterization of residual effects are anticipated in relation to Haisla Nation governance. The number of people employed on the Project during construction (up to 500 people) will not increase through the proposed changes. No changes to the characterization of residual effects related to changes in regional employment, business and economy, infrastructure, services, accommodation and transportation are expected. As the Project is Haisla owned, the proposed changes are understood to be reflective of Haisla Nation ability to make decisions regarding land and marine use within its traditional territory. This conclusion is supported by the results of Cedar's engagement with Haisla Nation regarding the amendment application (Section 4.0).

No changes are anticipated to the effects, mitigation or enhancement measures, or the mitigation or enhancement measure success ratings for each of the proposed changes to the Project and the effects of those proposed changes on Haisla Nation interests.

8.2.2 Changes to Characterization of Residual Effects

Based on the findings for relevant valued components set out in Section 7.0 of this amendment application, and feedback received from Haisla Nation on the proposed changes and the identified mitigation measures, Cedar has concluded the proposed changes result in no changes to the characterization of residual effects on Haisla Nation interests as described in the conclusions of the Assessment Report. Potential effects to the valued components assessed in Section 7.0 can be mitigated, and no changes were predicted relative to the conclusions of the Assessment Report.

The Assessment Report concluded the potential for adverse effects of the Project on the Indigenous Interests of Haisla Nation had been adequately avoided, minimized or otherwise accommodated. Based on the engagement undertaken with Haisla Nation, characterization of residual effects for the proposed changes remains unchanged from the Assessment Report. A summary of the EAO conclusions relative to the amendment is provided in Table 8.2.1.

TABLE 8.2.1 CHANGES TO ASSESSMENT REPORT CHARACTERIZATION OF RESIDUAL EFFECTS – HAISLA NATION INTERESTS

Characterization of Residual Effects from the Assessment Report			Changes to the Residual Effects Characterization
Criteria	Assessment Rating	Rationale	
Harvesting Rights (Marine and Terrestrial Environments)			
Context	Medium resilience	<p><i>Haisla users along the Marine Shipping Route are considered moderately sensitive to change based on existing conditions and existing impacts to marine harvesting.</i></p> <p><i>Haisla users within the terrestrial area that may be affected by the Project are considered moderately sensitive to change based on existing conditions and existing impacts to terrestrial harvesting.</i></p>	No change



Characterization of Residual Effects from the Assessment Report			Changes to the Residual Effects Characterization
Criteria	Assessment Rating	Rationale	
Magnitude	Low	<p><i>Methods, locations and opportunities: Cedar will result in a low magnitude of residual effect due to minor reduction in preferred marine and terrestrial harvesting locations and minor increase in local population.</i></p> <p><i>Time: Cedar will result in a low magnitude of residual effects to time available for marine harvesting based on frequency of LNG carriers during operations (approximately 50 vessels per year). The frequency of Project-related vessel traffic during construction would be similar.</i></p> <p><i>Cedar will result in a low magnitude of residual effects to time available for terrestrial harvesting based on the increase in hunting and vehicle traffic.</i></p> <p><i>Access: Cedar will result in a low magnitude of residual effects on access to marine harvesting sites based on frequency of LNG carriers.</i></p> <p><i>Cedar will result in a low magnitude of residual effects on access to harvesting sites based on size of the Facility Area (125 hectares [ha]).</i></p> <p><i>Experience: Cedar will result in a low residual effect on experience based on presence of LNG carriers (approximately 50 vessels per year) and the FLNG Facility and the associated noise and lights.</i></p> <p><i>Cedar will result in a low residual effect on experience based on presence of the FLNG Facility and their associated noise and lights, as well as the clearing required for the Facility Area and the transmission line right-of-way (32.5 ha).</i></p> <p><i>Subsistence-based livelihoods and trade: Cedar will result in a low magnitude of residual effects on livelihoods and trade based on the size of the FLNG Facility and frequency of LNG carriers, and based on the size of the Facility Area and transmission line right-of-way.</i></p>	<p>No change</p> <p>However, the following is noted for valued components assessed in the amendment:</p> <ul style="list-style-type: none"> • The area of vegetation clearing will be increased however old forest will no longer be affected (Table 7.4.3). • The magnitude of effect on old forest associated species (e.g., marbled murrelet, bats, marten, old forest songbirds) is reduced because old forest will no longer be affected (Table 7.5.5). • The Marine Terminal Area will be expanded by 241.5 ha (Table 7.7.3).
Extent	Regional	<p><i>The residual effects to harvesting within the marine environment would apply throughout the Marine Terminal Area and Marine Shipping Route.</i></p> <p><i>The residual effects to harvesting within the terrestrial environment would apply throughout the wildlife, vegetation and freshwater fish LAAs.</i></p>	No change
Duration	Long-term	<i>The residual effect to harvesting in the marine and terrestrial environments would persist for the life of Cedar LNG (i.e., 25 to 40 years), which is longer than one generation (i.e., 25 years).</i>	No change
Reversibility	Partially reversible	<i>While the change in marine and terrestrial resources will be reversible following decommissioning, the lifespan of Cedar LNG may result in permanent change to harvesting methods.</i>	No change



Characterization of Residual Effects from the Assessment Report			Changes to the Residual Effects Characterization
Criteria	Assessment Rating	Rationale	
Frequency	Irregular	<p>Residual effects will occur continuously as the Project is located on Haisla territory.</p> <p>The potential residual effect related to marine harvesting would occur at sporadic intervals based on the low volume of marine traffic during 527 Assessment Report November 16, 2022, construction and approximately one LNG vessel visiting the Project every 7-10 days during operations (up to approximately 50 carriers annually).</p>	No change
Affected Populations	Disproportionate	The reduction in marine and terrestrial access may disproportionately affect Haisla members who rely heavily on terrestrial resources for purposes such as food and social.	No change
Uncertainty	Moderate	The effectiveness of Mitigation Measures may be moderate; uncertainty is moderate overall based on uncertainty in the extent of marine shipping effects such as wake, the difficulty in predicting and quantifying experiential effects or choices made by Indigenous marine users. For example, it is uncertain if individual Indigenous users may forgo certain marine or terrestrial uses when faced with potential effects of the Project.	No change
Use and Integrity of Sacred and Culturally Important Sites and Landscape Features			
Context	Medium resilience	Haisla's use and integrity of sacred and culturally important sites and landscape features as an Indigenous Interest in the context of Cedar LNG is considered moderately sensitive to change based on the current projects and volume of marine shipping in the area.	No change
Magnitude	Low	<p>Access and use: Cedar will result in a low magnitude of residual effects to access and use of sites and landscape features. This is due to frequency of LNG carriers (approximately 50 per year) during operations (low magnitude), which is similar to marine shipping frequency during construction, as well as the lack of access to Facility Area during and following completion of construction and associated effects such as increase in traffic.</p> <p>Traditional knowledge: Cedar will result in a low magnitude of residual effects to transfer of traditional knowledge between generations (i.e., 25 years) based on the low magnitude of effects on access and use.</p> <p>Experience: Cedar will result in a low magnitude of residual effects to experience of sites and landscape features based on size of Facility Area, frequency of LNG carriers and the associated noise and light impacts.</p>	No change
Extent	Local	The residual effects would apply throughout the Marine Terminal Area, Facility Area, transmission line right-of-way and Marine Shipping Route.	No change
Duration	Long-term	The residual effect would persist for the life of the Cedar LNG (i.e., 25 to 40 years) which is longer than one generation (i.e., 25 years) and is therefore anticipated to be long-term.	No change

Characterization of Residual Effects from the Assessment Report			Changes to the Residual Effects Characterization
Criteria	Assessment Rating	Rationale	
<i>Reversibility</i>	<i>Irreversible</i>	<i>A change in use and integrity of sacred and culturally important sites and landscape features would be irreversible due to factors such potential effects to sites and landscape features due to construction and the transmission of knowledge between generations (i.e., 25 years).</i>	No change
<i>Frequency</i>	<i>Irregular and Continuous</i>	<i>Marine: The potential residual effect would occur at sporadic intervals, varying by phase and based on low volume of marine traffic during construction and approximately one LNG carrier visiting the Project every 7-10 days during operations (up to approximately 50 carriers annually). Terrestrial: The potential residual effect would occur continuously as the land would be permanently altered following completion of construction.</i>	No change
<i>Affected Populations</i>	<i>Disproportionate</i>	<i>The reduction in marine and terrestrial access may disproportionately affect Haisla members who rely heavily on access and resources for purposes such as ceremonial and spiritual.</i>	No change
<i>Uncertainty</i>	<i>Moderate</i>	<i>The effectiveness of Mitigation Measures may be moderate; uncertainty is moderate overall based on the uncertainty in the extent of marine shipping effects such increase wake and reduction in access to sacred and culturally important sites and landscape features (increase in large vessel movements) and the uncertainty regarding the potential for chance find during construction.</i>	No change
Indigenous Governance			
<i>Context</i>	<i>Medium resilience</i>	<i>Haisla's Indigenous governance has a medium resilience based on the stress that have been experienced from the current projects in the region.</i>	No change
<i>Direction and Magnitude</i>	<i>Low</i>	<i>Decision making: Cedar may result in a low magnitude of positive residual effect to the Indigenous governance's decision making as the Project is a Haisla-led partnership. Resource access and usage: the residual effect to resource access and usage may have a low magnitude of negative residual effect as the size of the Facility Area is relatively small. Employment and economy: the residual effect to Haisla members' employment may result in a combination of positive and negative residual effects. A low magnitude of positive effects will be experienced through increase in local employment opportunities. A low magnitude of negative effects will be experienced due to inequitable ability for subpopulations to participate in employment opportunities.</i>	No change
<i>Extent</i>	<i>Local</i>	<i>Haisla may be impacted by activities overlapping the Marine Shipping Route and the terrestrial activities overlapping their traditional territory (e.g., Facility Area), as well as by employment.</i>	No change
<i>Duration</i>	<i>Long-term</i>	<i>Indigenous governance may be impacted throughout all phases of the Project.</i>	No change



Characterization of Residual Effects from the Assessment Report			Changes to the Residual Effects Characterization
Criteria	Assessment Rating	Rationale	
<i>Reversibility</i>	<i>Irreversible</i>	<i>The various factors that may influence Indigenous governance (e.g., employment, accommodations, marine traffic) will last throughout the lifetime of the Project, which is longer than one generation (i.e., 25 years).</i>	No change
<i>Frequency</i>	<i>Regular</i>	<i>Residual effects may occur continuously as the Project is located on Haisla territory.</i>	No change
<i>Affected Populations</i>	<i>Disproportionate</i>	<i>Residual effects may be disproportionately experienced by subgroups who are already experiencing challenges regarding employment due to external factors (e.g., women, families).</i>	No change
<i>Uncertainty</i>	<i>Moderate</i>	<i>The effectiveness of Mitigation Measures may be moderate; uncertainty is moderate overall based on the uncertainty regarding employment and economy and decision-making including volume of employment throughout the Project's lifetime.</i>	No change
Indigenous Health and Wellbeing			
<i>Context</i>	<i>Low resilience</i>	<i>Haisla's Indigenous health and well-being has a low resilience based on the current conditions in the region that have resulted from the current projects, which do not allow for Haisla's Indigenous health and well-being to easily adapt to additional residual effects.</i>	No change
<i>Direction and Magnitude</i>	<i>Low</i>	<i>Human health: Cedar will result in a low magnitude of residual effect to mental health, primarily due to increase in sensory disturbance and concern for potential accidents and malfunctions. Social determinants of health: Cedar will result in a combination of positive and negative residual effects. A minor magnitude of positive residual effects will be experienced due to increase in employment opportunities and local business opportunities. A low magnitude of negative residual effects to social determinants of health will be experienced due to social, health and cultural effects. Infrastructure and services: Cedar will result in a low magnitude residual effect to Haisla's infrastructure and services with respect to increase in burden on regional healthcare capacity which is already at capacity. In addition, a low to minor residual effect will occur due to increase in local traffic.</i>	No change
<i>Extent</i>	<i>Regional</i>	<i>The Project will have residual effects throughout the region and human health and social determinants of health will be experienced in some manner by Haisla members residing throughout the region.</i>	No change
<i>Duration</i>	<i>Long-term</i>	<i>As the Project lifetime is longer than a single generation (i.e., 25 years), the residual effects, with respect to Haisla, on human health and social determinants of health are considered long-term.</i>	No change



Characterization of Residual Effects from the Assessment Report			Changes to the Residual Effects Characterization
Criteria	Assessment Rating	Rationale	
<i>Reversibility</i>	<i>Irreversible</i>	<i>As the Project lifetime is longer than a single generation, the residual effects, with respect to Haisla, on human health and social determinants of health are considered irreversible.</i>	No change
<i>Frequency</i>	<i>Continuous</i>	<i>The residual effects related to human health and social determinants of health will occur continuously throughout the lifetime of Cedar LNG.</i>	No change
<i>Affected Populations</i>	<i>Disproportionate</i>	<i>Residual effects may be disproportionately experienced by subgroups (e.g., women, children, families, Indigenous women requiring specific health services, low-income families requiring housing, other vulnerable populations) who already experience challenges in accessing infrastructure and services and housing in larger centers in Terrace and Kitimat. These subgroups may be more adversely affected than other groups by the increased competition for such services resulting from a Project-related temporary increase in the population.</i>	No change
<i>Uncertainty</i>	<i>Moderate</i>	<i>The effectiveness of Mitigation Measures may be moderate; uncertainty is moderate overall based on the uncertainty regarding employment and economy and decision-making including volume of employment throughout the Project's lifetime.</i>	No change

Note:

The text in italics was copied from the Assessment Report for the Cedar LNG Project (EAO 2022).

8.2.3 Cumulative Effects to Indigenous Interests

The proposed changes are anticipated to have the same interaction with past, present, and reasonably foreseeable projects and activities compared to the cumulative effects interactions presented in the Assessment Report. A further assessment of potential cumulative environmental effects to Haisla Nation interests was not conducted as the proposed changes do not change the characterization of residual effects presented in the EAC Application (Cedar 2022a, b) or the Assessment Report. Measures to mitigate potential effects will be in place through continued implementation of existing management plans (i.e., CEMP, Socioeconomic Management Plan) and industry standard mitigation measures.

8.2.4 Risks and Uncertainties

The level of confidence in the predictions for residual effects and residual cumulative effects on Haisla Nation interests is high. The prediction confidence is based on engagement with Haisla Nation, understanding of current baseline conditions, understanding of amendment activities, locations and described interactions, the known effectiveness of mitigation measures, and experience of the assessment team. The environmental effects mechanisms identified in the EAC Application, and the Assessment Report are typical of projects involving linear transmission line components and remain well-understood.



8.2.5 Follow-up Strategy to Effects on Indigenous Interests

As described in the Assessment Report, the recommended federal Mitigation Measures and Follow-up Programs under the *Impact Assessment Act* inform the federal conditions. The legally binding federal conditions as well as the recommended mitigation measures and follow-up programs that are not linked to the *Impact Assessment Act* are applicable to the amendment components. As described in Table 118 of the Assessment Report, recommended key mitigation measures and follow-up programs were identified for air quality, acoustics, vegetation resources, wildlife, marine resources, marine use, infrastructure and services, GHG emissions and gender-based analysis plus. Annual summary reports and other monitoring reports required by select follow-up programs will be provided to the Indigenous Nations for review, as applicable.

Cedar has a project specific CEMP (Cedar 2024a), a Socioeconomic Management Plan (Cedar 2024b), and a Health and Medical Services Plan (Stantec 2024c) which will be applicable to the amendment components. Cedar engaged the Indigenous Nations for review and feedback relative to each of these plans and for the purpose of informing adaptive management strategies (Cedar 2024a, b, c). Cedar will continue to work with Indigenous Nations to understand and address the Project's effects on their interests, discuss concerns, and share information about employment and contracting opportunities to enhance local benefits.



9.0 Other Matters under s. 25 of the Act

The only further matter required for consideration under section 25 of the *Environmental Assessment Act* to be considered is greenhouse gas emissions, including the potential effects on the province being able to meet its targets under the *Greenhouse Gas Reduction Targets Act*. The proposed changes are limited to construction and do not affect any aspect of the Project's operational GHG emissions or Cedar's commitment to its net-zero emissions plan within the SACC Technical Report. Due to the larger area of clearing required for the wider right-of-way for the alternative transmission line, and the newly proposed distribution powerline along the Bish Creek FSR there will be additional greenhouse gas emissions during construction.

Using the same methodology and data sources as described in the EAC Application (see Section 4.1.4 of Appendix 8A GHG TDR of the EAC Application), the estimate of land-use change emissions from construction of the Project will increase from 26.7 kilotonnes carbon dioxide equivalent (kt CO₂e) to 49.5 kt CO₂e as a greater area of land will be cleared for the wider alternative transmission line right-of-way and the distribution powerline. This includes approximately 29.9 kt CO₂e from biomass burning and 19.5 kt CO₂e from land clearing decay residuals.

The estimate of GHG emissions from diesel combustion in off-road equipment will increase from 9,775 t CO₂e to 9,860 t CO₂e (excluding land-use change emissions) due to increased combustion from equipment during land clearing activities. This estimate was made using the same methodology and data sources as described in the Application (see Section 4.1.1 of Appendix 8A Technical Data Report—Greenhouse Gas Emissions, Revision 1 of the EAC Application) and using representative equipment for the distribution powerline construction.

The distribution powerline will bring electricity to the Project during construction, which will reduce the overall use of gasoline and diesel generators during construction and replace that energy with low GHG-intensity BC grid electricity. The amount of this reduction depends on construction timing and use.

The alternative transmission line and the addition of the distribution powerline results in a 62% increase in GHG emissions from Project construction, mainly due to the increase in area to be cleared.

The carbon sink impact was calculated for forest land in the EAC Application Appendix 8B Strategic Assessment of Climate Change Technical Data Report. Using the amended disturbed area and following the methodology described in the EAC Application Appendix 8B, the amended carbon sink impact is 1,986 t carbon, which is equivalent to 7,285 t CO₂, assuming that all lost carbon is oxidized to carbon dioxide.

The Assessment Report did not provide a discussion on the potential effects of construction GHG emissions but did conclude that the Project would not have significant adverse effects on GHG emissions in consideration of the provincial greenhouse gas reduction plan and mitigation measures under the *Impact Assessment Act* related to GHGs. The incremental change in GHG emissions related to clearing represents a substantive increase in the GHG emissions during construction. There is potential for a reduction in construction GHG emissions as the electricity used during construction will reduce the need for diesel generators onsite. The mitigations indicated in CEMP for GHG emissions during construction remain relevant. As a result, the change in GHG emissions does not affect this conclusion.

A comparison of the conclusions from the Assessment Report and the amendment application residual effects is presented in Table 9.1.1.

TABLE 9.1.1 CHANGES TO ASSESSMENT REPORT CHARACTERIZATION OF RESIDUAL EFFECTS – GREENHOUSE GAS EMISSIONS

Characterization of Residual Effects from the Assessment Report			Changes to the Residual Effects Characterization
Criteria	Assessment Rating	Rationale	
Context	Low	<p>The EAO considers GHGs to have low resiliency/be acutely sensitive to existing conditions. The Intergovernmental Panel on Climate Change.</p> <p>(IPCC) has confirmed that GHG emissions are at levels that are affecting the global climate and the Government of Canada declared a climate emergency in 2019. As such, the EAO considers GHGs to have low resiliency/be acutely sensitive to existing conditions. Although GHGs have global effects, the EAO also notes that, regionally, high levels of GHG emissions are expected to result from the LNG Canada facility (approximately 4,000 kt CO₂e/year during operations).</p>	No change
Direction and Magnitude	Adverse and Low	<p>The highest level of Cedar LNG-related GHG emissions (direct and indirect), including all marine emissions, will occur during operations and is expected to be an average of 251 kt CO₂e/yr. GHG emissions during operations will be about 2.5 times above the provincial and Greenhouse Gas Reporting Program reporting threshold, and annual reporting will be required. Annual emissions during operations would be approximately 0.38 percent of BC's total emissions (2019), 0.034 percent of Canada's total emissions (2019), and approximately 1/16 of predicted of predicted emissions from LNG Canada. During operations, the facility's GHG emissions intensity will be 50 percent of the 0.16 tonnes CO₂e per tonne of LNG production set out in the Schedule of Regulated Operations and Emission Limits in the Greenhouse Gas Industrial Reporting and Control Act.</p>	No change
Extent	Beyond Regional	The geographic effect of GHG emissions from Cedar LNG is cumulative globally.	No change
Duration	Permanent	GHG emissions will be produced for the lifetime of Cedar LNG. The residual effects of GHG emissions will be permanent as these effects will continue to be experienced long after (hundreds of years) emissions are no longer produced.	No change
Reversibility	Irreversible	While GHG emissions will cease after decommissioning, given current technology and the persistence of CO ₂ in the atmosphere, the effects of the GHG emissions resulting from Cedar LNG are effectively irreversible.	No change
Frequency	Continuous	GHG emissions will occur throughout the lifetime of Cedar LNG and be greatest during operations of Cedar LNG.	No change



Characterization of Residual Effects from the Assessment Report			Changes to the Residual Effects Characterization
Criteria	Assessment Rating	Rationale	
<i>Risk (likelihood and consequences)</i>	<i>Likelihood: There is a high likelihood that the levels of GHG emissions reported will be produced with the current design of Cedar LNG, and that these emissions will contribute to a residual effect, climate change.</i> <i>Consequence: Moderate consequence based on the low magnitude extending beyond regional.</i> <i>Risk: based on the likelihood and consequence of residual effects from GHGs, it was determined that there would be a moderate level of risk.</i>		No change
<i>Uncertainty</i>	<i>The EAO has a high level of confidence in the likelihood of adverse residual effects based on there being a good understanding of the predicted GHG emissions and their contributions to climate change. There is a low degree of uncertainty associated with data inputs and modelling techniques.</i>		No change
<i>Significance</i>	<i>In consideration of the low magnitude of the predicted effects, as well as the proposed provincial condition and federal Mitigation Measures, the EAO concludes that Cedar LNG would not have significant adverse effects on GHG emissions.</i>		While this characterization is the responsibility of the EAO and IAAC, it is Cedar's opinion there is no change

Note:

The text in italics was copied from the Assessment Report for the Cedar LNG Project (EAO 2022).



10.0 Summary of Requested Changes

Table 10.1.1 and Table 10.1.2 summarizes the requested amendments to the Schedule A to EAC #23-01 and Schedule 1 to the Decision Statement, respectively.

TABLE 10.1.1 ORIGINAL AND REVISED CERTIFIED PROJECT DESCRIPTION

Original Wording	Proposed Changes	Rationale
<p>1.3 The Project components consist of:</p> <p>a) The Facility Area (which contains the floating liquefied natural gas (FLNG) facility, the marine terminal and supporting infrastructure), is up to 88 hectares in area and located within District Lot 99, a portion of the adjacent water lot (Lot A District Lot 5469) and an area of submerged Crown land (Figure 2);</p> <p>b) A transmission line within the Transmission Line Corridor, from BC Hydro’s Minette Substation to the Facility Area as shown in Figure 2 and described below in sections 3.4 and 3.5; and</p> <p>c) Shipping of LNG along the Marine Shipping Route from the FLNG facility to the Triple Island Pilot Boarding Station, as shown in Figure 3.</p>	<p>1.3 The Project components consist of:</p> <p>a) The Facility Area (which contains the floating liquefied natural gas (FLNG) facility, the marine terminal and supporting infrastructure), is up to 88 <u>330</u> hectares in area and located within District Lot 99, a portion of the two adjacent water lots (Lot A <u>both water lots are within</u> District Lot 5469) and an area of submerged Crown land (Figure 2);</p> <p>b) A transmission line within <u>one of two route options for</u> the Transmission Line Corridor, from BC Hydro’s Minette Substation to the Facility Area as shown in Figure 2 and described below in sections 3.4 and 3.5; and</p> <p>c) Shipping of LNG along the Marine Shipping Route from the FLNG facility to the Triple Island Pilot Boarding Station, as shown in Figure 3; <u>and</u></p> <p><u>d) A distribution powerline along the Bish Creek Forest Service Road to the Facility Area.</u></p>	<p>The selection of a catenary mooring system for the FLNG requires an extension of the Marine Terminal Area to accommodate the mooring lines and anchors for the mooring system. This will increase the total Facility Area to 330 ha, of which the Marine Terminal Area will be 277 ha. There will be no change in the land based portion of the Facility Area.</p> <p>The distribution powerline is a new Project component that will provide hydroelectric power and communications during construction and operation. It will require a separate right-of-way along Bish Creek FSR.</p>
<p>2.1 Temporary work areas within the Facility Area, Transmission Line Corridor or on private property that are required only for Construction include:...</p>	<p>2.1 Temporary work areas within the Facility Area, Transmission Line Corridor, <u>distribution powerline right-of-way</u>, or on private property that are required only for Construction include:...</p>	<p>The distribution powerline is a new Project component that will provide hydroelectric power and communications to the Facility Area during construction and operation. It will require a separate right-of-way along Bish Creek FSR. Temporary components may be required to support construction of the distribution powerline.</p>
<p>2.3 c) Site preparation, clearing of the right-of-way, installation of the transmission line and access roads identified in sections 3.4, 3.5 and 3.6;</p>	<p>2.3 c) Site preparation, clearing of the right-of-way, installation of the transmission line, <u>distribution powerline</u>, and access roads identified in sections 3.4, 3.5 and 3.6 <u>and 3.7</u>;</p>	<p>The distribution powerline is a new Project component that will require a separate right-of-way along Bish Creek FSR.</p>



Original Wording	Proposed Changes	Rationale
<p>3.5 The transmission line right-of-way is up to 45 metres wide, except in the case of danger tree removal, and is within the Transmission Line Corridor (within one of the two options for the northern end of the transmission line), as shown in Figure 2.</p>	<p>3.5 The <u>base</u> transmission line right-of-way is up to 45 metres wide, except in the case of danger tree removal, and is within the <u>base</u> Transmission Line Corridor (within one of the two options for the northern end of the transmission line), as shown in Figure 2.</p> <p><u>The alternative transmission line right-of-way is up to 90 metres wide, except in the case of danger tree removal, and is within the alternative Transmission Line Corridor, as shown in Figure 2.</u></p>	<p>If the transmission line is rerouted to the new alignment, a 90 m wide right-of-way would be needed to accommodate safety and operability requirements.</p>
	<p><u>Distribution Powerline</u></p> <p><u>3.7 A 2.8 km long, 25 kV distribution powerline line will run along the Bish Creek Forest Service Road to the Facility Area. The distribution powerline right-of-way is up to 15 m wide, except in the case if danger tree removal.</u></p>	<p>The distribution powerline is a new Project component and will require a separate right-of-way along Bish Creek FSR.</p>
<p>Figure 2</p>	<p>Figure 2</p>	<p>Figure 2, as approved in EAC #23-01 requires an update to show:</p> <ol style="list-style-type: none"> 1) the option to relocate the transmission line (the alternative transmission line); 2) the extension of the Marine Terminal Area to include the area for the mooring lines and anchors for the catenary mooring system; and 3) the new distribution powerline right-of-way.

Note:

New text is underlined and text to be removed is shown in strikethrough text.

NA – not applicable.

**TABLE 10.1.2 ORIGINAL AND REVISED SCHEDULE 1 DECISION STATEMENT DESCRIPTION AND RATIONALE**

Original Wording	Proposed Changes	Rationale
<p>The floating LNG facility and marine terminal (and supporting infrastructures) will be located within the Facility Area (Figure 2), which will be located within District Lot 99, a portion of the adjacent water lot (Lot A District Lot 5469) and an area of submerged Crown land. These areas will be up to 88 hectares. The transmission line will be located within the Transmission Line Corridor, running from BC Hydro's Minette Substation to the Facility Area (Figure 2).</p>	<p>The floating LNG facility and marine terminal (and supporting infrastructures) will be located within the Facility Area (Figure 2), which will be located within District Lot 99, a portion of the two adjacent water lots (Lot A <u>both water lots</u> <u>are within</u> District Lot 5469) and an area of submerged Crown land. These areas will be up to 88 <u>330</u> hectares. The transmission line will be located within <u>one of two route options for the</u> Transmission Line Corridor, running from BC Hydro's Minette Substation to the Facility Area (Figure 2).</p>	<p>The selection of a catenary mooring system for the FLNG requires an extension of the Marine Terminal Area to accommodate the mooring lines and anchors for the mooring system. This will increase the total Facility Area to 330 ha, of which the Marine Terminal Area will be 277 ha. There will be no change in the land based portion of the Facility Area.</p>
<p>Construction</p> <p>Construction will require the following temporary components within the Facility Area, Transmission Line Corridor or on private property:</p>	<p>Construction</p> <p>Construction will require the following temporary components within the Facility Area, Transmission Line Corridor, <u>distribution powerline right-of-way</u>, or on private property:</p>	<p>The distribution powerline is a new Project component that will provide hydroelectric power and communications to the Facility Area during construction and operation. It will require a separate right-of-way along Bish Creek FSR. Temporary components may be required to support construction of the distribution powerline.</p>
<p>Construction will require undertaking the following physical activities:</p> <ul style="list-style-type: none"> • site preparation and construction of the marine terminal and supporting infrastructure; • connection, start-up and commissioning of the floating LNG facility (to be constructed outside Canada and subsequently transported to the Facility Area); • site preparation, clearing of the right-of-way, installation of the transmission line and access roads; and • shipping of construction materials, including the floating LNG facility. 	<p>Construction will require undertaking the following physical activities:</p> <ul style="list-style-type: none"> • site preparation and construction of the marine terminal and supporting infrastructure; • connection, start-up and commissioning of the floating LNG facility (to be constructed outside Canada and subsequently transported to the Facility Area); • site preparation, clearing of the rights-of-way, installation of the transmission line <u>and distribution powerline</u> and access roads; and • shipping of construction materials, including the floating LNG facility. 	<p>The distribution powerline is a new Project component and will require a separate right-of-way along Bish Creek FSR.</p>



Original Wording	Proposed Changes	Rationale
<p>Transmission Line</p> <p>3.4 Electricity is supplied to the Project by an up to 8.5 km long, up to 287 kilovolt, power transmission line between BC Hydro's Minette Substation and the substation within the Facility Area.</p> <p>3.5 The transmission line right-of-way is up to 45 metres wide, except in the case of danger tree removal, and is within the Transmission Line Corridor (within one of the two options for the northern end of the transmission line), as shown in Figure 2.</p>	<p>Transmission Line</p> <p>3.4 Electricity is supplied to the Project by an up to 8.5 km long, up to 287 kilovolt, power transmission line <u>within one of two route options</u> between BC Hydro's Minette Substation and the substation within the Facility Area.</p> <p>3.5 The <u>base</u> transmission line right-of-way is up to 45 metres wide, except in the case of danger tree removal, and is within the <u>base</u> Transmission Line Corridor (within one of the two options for the northern end of the transmission line), as shown in Figure 2.</p> <p><u>The alternative transmission line right-of-way is up to 90 metres wide, except in the case of danger tree removal, and is within Option 2 Transmission Line Corridor, as shown in Figure 2.</u></p>	<p>If the transmission line is rerouted to the new alignment, a 90 m wide right-of-way would be needed to accommodate safety and operational requirements.</p>
<p>NA</p>	<p><u>Distribution Powerline</u></p> <p><u>3.7 A 2.8 km long, 25 kV distribution powerline line will run along the Bish Creek Forest Service Road to the Facility Area. The distribution powerline right-of-way is up to 15 m wide.</u></p>	<p>The distribution powerline is a new Project component and will require a separate right-of-way along Bish Creek FSR.</p>
<p>Figure 2</p>	<p>Figure 2</p>	<p>Figure 2, as approved in the Decision Statement requires an update to show:</p> <ol style="list-style-type: none"> 1) the option to relocate the transmission line (the alternative transmission line); 2) the extension of the Marine Terminal Area to include the area for the mooring lines and anchors for the catenary mooring system; and 3) the new distribution powerline right-of-way.

Note:

Proposed new text is underlined and text to be removed is shown in strikethrough text.

NA – not applicable.

11.0 Conclusions

With submission of this application Cedar is requesting that the CPD in Schedule A of EAC #E23 01 and the Description of the Designated Project in Schedule 1 of the Impact Assessment Act Decision Statement are amended to:

- Add the option to relocate the 8.5-km long, 287 kV transmission line from the original alignment between the Minette BC Hydro Substation and the Marine Facility, downslope to follow the base and toe of the mountainside and increase its right-of-way from 45 m to 90 m (referred to as the alternative transmission line)
- Add a new 2.8 km, 25 kV distribution powerline within a 15 m wide right-of-way along the Bish Creek FSR to the Facility Area
- Expand the Marine Terminal Area to accommodate the mooring lines and anchors for the catenary mooring system

The amendment application impacts only construction related aspects and does not affect operations. Based on the assessments presented within this amendment application, it is Cedar's conclusion the proposed changes do not alter the findings or conclusions of the EAO's Assessment Report for the Project. Key findings presented in this amendment application are:

- Noise levels at all receptors are predicted to remain in compliance with the applicable noise thresholds during construction
- Construction of the catenary mooring system is not predicted to result in a harmful alteration, disruption or destruction of marine fish habitat or result in elevated TSS concentrations that would affect marine fish, invertebrates or marine habitat forming structures (e.g., sponges or corals)
- The catenary mooring system will result in reduced installation time in comparison to the previously assessed strut mooring system, which will reduce the disturbance time to marine users in the vicinity
- Use of the distribution powerline will allow for modest reductions in GHG emissions during construction
- There will be no changes to business and contracting opportunities
- There will be no changes to the number of workers required for construction

If Cedar elects to construct the alternative transmission line, the following benefits will occur:

- Old forest will no longer be affected
- Effects on blue-listed ecological communities and wetlands will be reduced
- Effects on marbled murrelet nesting habitat will change from a predicted loss to no loss
- There will be reduced impacts on Crown land with effects primarily occurring on private property
- Clearing will slightly increase GHG emissions during construction, but this will be offset by through Cedar's net-zero emissions plan



The mitigation measures already recommended by both the CEMP and the Assessment Report remain appropriate for the amendment. Potential effects will be managed through existing and planned management plans (including the CEMP, Socioeconomic Management Plan, Marine Transportation Management Plan and Health and Medical Services Plan). The amendment has not identified additional mitigation measures and no additional effects to Indigenous interests are anticipated. Cedar has engaged and will continue to engage with Haisla Nation, Kitselas First Nation, Kitsumkalum First Nation, Gitga'at First Nation, Gitxaala Nation, Metlakatla First Nation, Lax Kw'alaams Band, Métis Nation British Columbia, and Haida Nation.

12.0 References

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- Stantec. 2021. Interim Report - 2020-0013: Archaeological Impact Assessment Cedar LNG Project. Report on file with the Archaeology Branch of the Ministry of Forests, Victoria, BC.



Appendix A

Vegetation Technical Memo

Reference: Cedar LNG Project – 2024 Amendment Vegetation Technical Memo

2 Local Study Area

The amendment application project components revised local study area (120 m buffer on the project components), and field survey locations are shown in Figure 1. The alternative transmission line corridor and distribution powerline both lie within one biogeoclimatic ecosystem classification variant: the Coastal Western Hemlock Submontane Very Wet Maritime subzone Submontane variant (CWHvm1). The CWHvm subzone is characterized by a wet, humid, oceanic climate and vegetation species such as yellow-cedar (*Callitropsis nootkatensis*), western hemlock (*Tsuga heterophylla*), salal (*Gaultheria shallon*), deer fern (*Blechnum spicant*), and sword fern (*Polystichum munitum*). The CWHvm1 variant occurs below 400 metres (m) above sea level (Banner et al. 1993).

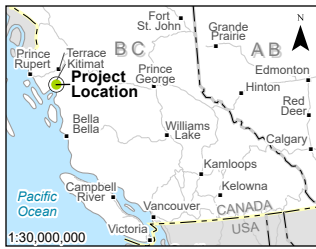
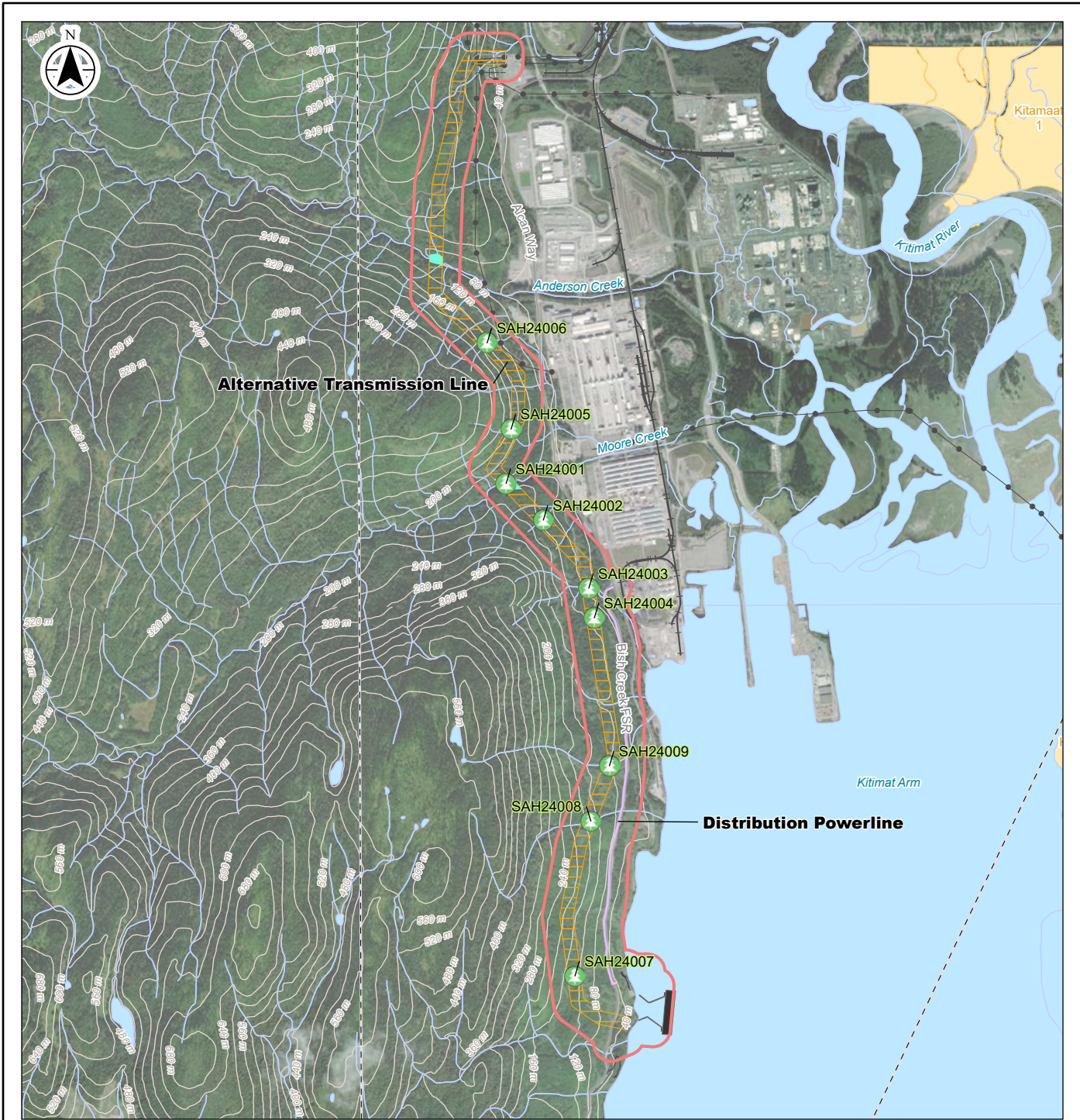
Vegetation and/or soils in the local study area has been altered in locations of existing roads and trails. Additionally, the entire alternative transmission line corridor and distribution powerline lie within an area where historical forest harvesting has occurred.

3 Methods

A vegetation survey was completed by a crew of two ecologists from July 9 to July 10, 2024. Surveys for plant species at risk and weeds were completed, and an ecosystem characterisation approach was used to verify the Project ecosystem mapping of ecological communities at risk, old forest, and wetlands. The surveys focused on provincially and federally listed plant species at risk, provincially listed ecosystems at risk, and watercourse crossings that may be affected by construction activities.

The vegetation survey followed methods described in Field Manual for Describing Terrestrial Ecosystems Second Edition (BC MOFR and BC MOE 2010) for describing site and vegetation characteristics during site visit inspections. Upland ecosystems were classified using A Field Guide to Site Identification and Interpretation for the Prince Rupert Forest Region (Banner et al. 1993). The British Columbia Conservation Data Centre (BC CDC) website was queried prior to fieldwork to identify red- and blue-listed plant species or ecosystems that have the potential to occur in the RSA (BC CDC 2024). Survey methods for vascular plant species at risk followed the floristic inventory methods in the Inventory and Survey Methods for Rare Plants and Lichens (RISC 2018), including use of the intuitive meander survey technique.

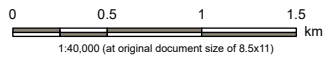
The plant species at risk surveys also included collection of non-vascular plants. Non-vascular plant surveys used a community-based unbounded plot (i.e., one with no fixed spatial area). The goal of the non-vascular plant surveys was to capture the maximum number of species at a site by sampling the different microhabitat (i.e., substrate) types. Microhabitats associated with potential species of conservation concern were emphasized. Microhabitat types include wood (green and dead wood at different decay levels and species), boulder, rock (bedrock, cliff face and crevices), soil, and litter (deciduous or coniferous litter, hollows, or riparian banks). Collected non-vascular plant specimens were subsequently sent for identification by Dr. Terry McIntosh (University of British Columbia).



Notes: 1. Coordinate System: NAD 1983 UTM Zone 9N
 2. Data Sources: DataBC, Government of British Columbia; Natural Resources Canada; Canadian Hydrographic Service

- Road
- Railway
- Transmission Line
- Topographic Contour (40 m)
- Watercourse
- Waterbody
- Reserve Land
- District of Kitimat
- Municipal Boundary

- Project Components**
- Distribution Powerline
 - Alternative Transmission Line
 - FLNG
- Vegetation Data**
- No Tree Clearing
 - Local Study Area
 - Field Plot



Project Location: Kitimat, British Columbia
 Project Number: 123222394
 Prepared by: JPOUCHER on 20241016
 Discipline Review by: MO'NEILL on 20240812
 Review by: IGURESHI on 20240827

Client/Project/Report: Cedar LNG Partners LP
 Cedar LNG Project
 Environmental Assessment Amendment

Figure No. **1**
 Title: **2024 Vegetation Field Survey Effort**

Disclaimer: Stantec assumes no responsibility for data supplied in electronic format. The recipient accepts full responsibility for verifying the accuracy and completeness of the data. The recipient releases Stantec, its officers, employees, consultants and agents, from any and all claims arising in any way from the content or provision of the data.

Reference: Cedar LNG Project – 2024 Amendment Vegetation Technical Memo

Ecosystem survey plots used to confirm ecosystem mapping were completed in three locations, consisting of three ground site inspections to confirm site series. Survey targets were established ahead of field work in pre-selected areas based on imagery where provincially listed ecosystems or watercourse crossings were suspected. At each ground inspection site, vegetation data, site information, and soil moisture and soil nutrient regimes were recorded. The percent cover of dominant vascular and non-vascular plants was recorded, along with general site characteristics such as aspect, elevation, slope position, and geographic location. Soil, terrain, vegetation, and topographic information were considered together to classify the ecosystem unit at each inspection. Ecological communities of interest were identified from the plot data.

4 Results

A summary of the 2024 vegetation survey results is provided in the following section. The locations of vegetation plots are shown in Figure 1. A list of plant species recorded during 2024 field surveys is provided in Attachment A.

Ecosystems identified during the field survey are summarized in Table 1. Field surveys did not detect any unmapped old forest (greater than 250 years) along the corridor or any unmapped wetlands. The results of the field surveys did not require any updates to the attributes of the ecosystem mapping, though some minor adjustment of polygon boundaries was completed in the area around the transmission line right-of-way.

Table 1 Ecosystems Identified in the Local Study Area

Plot Number	Plot Detail ¹	BEC Unit	Site Series	Ecosystem Name	Structural Stage	BC CDC Status
SAH24001	G	CWHvm1	08	amabilis fir/Sitka spruce–Devil’s club	5 – young forest	blue
SAH24004	G	CWHvm1	01	western hemlock/amabilis fir–blueberry	5 – young forest	-
SAH24007	G	CWHvm1	01	western hemlock/amabilis fir–blueberry	4 – pole/sapling	-

Note:

¹ G = ground site inspection.

Reference: Cedar LNG Project – 2024 Amendment Vegetation Technical Memo

4.1 Ecological Communities at Risk

There have been no changes to BC CDC ecological communities at risk statuses for communities in the CWHvm1 since the Vegetation Resources Technical Data Report (Stantec 2021).

One blue-listed ecological community, amabilis fir/Sitka spruce–Devil's club (CWHvm1/08), was confirmed within the alternative transmission line corridor. This field plot matches the ecosystem mapping in that location. The BC blue-list includes any species or communities considered to be of special concern (formerly vulnerable) in British Columbia (BC CDC 2024); they possess characteristics that make them sensitive to either human activities or natural disturbance.

4.2 Plant Species at Risk

In total, nine target locations were surveyed along the alternative transmission line corridor for plant species at risk. No provincially or federally listed plant species at risk were identified during the survey. Because the general area has been well studied and due to the disturbance history of the survey locations, the probability of an unidentified listed plant species being present is considered low.

4.3 Invasive Plant Species

One invasive plant species, bull thistle (*Cirsium vulgare*) was observed at site SAH24008. This species is on the Northwest Invasive Plant Council's Target Invasive Plant List (2020) with a low priority for control and is not considered a noxious weed according to the BC *Weed Control Act* and Regulation. Low priority species "may be widespread or not, may be of concern in specific situations with certain high values - e.g., conservation lands, specific agriculture crops. Bull thistle was previously known to occur within the Regional Assessment Area (Stantec 2021).

5 Discussion

Key findings of the 2024 baseline vegetation field studies within the alternative transmission line corridor include the following:

- One blue-listed community at risk was confirmed at one location
- No old forest was observed
- No wetland communities were observed
- One invasive plant species was observed
- No plant species at risk were observed

No updates were needed to the attributes of the ecosystem mapping that will support the amendment application.

Reference: Cedar LNG Project – 2024 Amendment Vegetation Technical Memo

6 Closure

This memo provides the results of Stantec's baseline vegetation field studies that took place on July 9 to July 10, 2024, in support of a proposed amendment application to the Certified Project Description in Schedule A of EAC #E23-01 and the Description of the Designated Project in Schedule 1 of the *Impact Assessment Act* Decision Statement. These studies indicate that 2021 data (Stantec 2021) collected to support the understanding of species at risk and invasive plant species presence, as well as the Project ecosystem mapping are still valid. The vegetation data previously collected and validated herein is expected to be sufficient to satisfy the data requirements for an EAC amendment application.

We trust this information meets your present requirements. Please contact the undersigned if you have any questions.

Regards,

Stantec Consulting Ltd.

<original signed by>

<original signed by>

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Attachments: A: Plant Species Recorded During 2024 Field Surveys

Reference: Cedar LNG Project – 2024 Amendment Vegetation Technical Memo

7 References

Banner et al. 1993. A Field Guide to Site Identification and Interpretation for the Prince Rupert Forest Region (Part 1, Part 2, and Supplement No. 1). Land Management Handbook No. 26. Victoria, BC. Available from: <https://www.for.gov.bc.ca/hfd/pubs/Docs/Lmh/Lmh26.htm>. Accessed August 2024.

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Reference: Cedar LNG Project – 2024 Amendment Vegetation Technical Memo

Attachment A Plant Species Recorded During 2024 Field Surveys

Reference: Cedar LNG Project – 2024 Amendment Vegetation Technical Memo

A.1 Plant Species Recorded During 2024 Field Surveys

Scientific Name	English Name	Lifeform
<i>Alnus rubra</i>	red alder	broad-leaved tree
<i>Malus fusca</i>	Pacific crabapple	broad-leaved tree
<i>Abies amabilis</i>	amabilis fir	coniferous tree
<i>Picea sitchensis</i>	Sitka spruce	coniferous tree
<i>Thuja plicata</i>	western redcedar	coniferous tree
<i>Tsuga heterophylla</i>	western hemlock	coniferous tree
<i>Cornus sericea</i>	red-osier dogwood	deciduous shrub
<i>Menziesia ferruginea</i>	false azalea	deciduous shrub
<i>Oplopanax horridus</i>	devil's club	deciduous shrub
<i>Ribes bracteosum</i>	stink currant	deciduous shrub
<i>Ribes lacustre</i>	black gooseberry	deciduous shrub
<i>Rubus parviflorus</i>	thimbleberry	deciduous shrub
<i>Rubus spectabilis</i>	salmonberry	deciduous shrub
<i>Sambucus racemosa</i>	red elderberry	deciduous shrub
<i>Sorbus sitchensis</i>	Sitka mountain-ash	deciduous shrub
<i>Vaccinium ovalifolium</i>	oval-leaved blueberry	deciduous shrub
<i>Vaccinium parvifolium</i>	red huckleberry	deciduous shrub
<i>Adiantum aleuticum</i>	northern maidenhair fern	fern or fern-ally
<i>Asplenium trichomanes</i>	maidenhair spleenwort	fern or fern-ally
<i>Asplenium viride</i>	green spleenwort	fern or fern-ally
<i>Athyrium alpestre</i>	alpine lady fern	fern or fern-ally
<i>Athyrium filix-femina</i>	common lady fern	fern or fern-ally
<i>Cystopteris fragilis</i>	fragile brittle fern	fern or fern-ally
<i>Dryopteris cristata</i>	crested wood fern	fern or fern-ally
<i>Dryopteris expansa</i>	spiny wood fern	fern or fern-ally
<i>Equisetum arvense</i>	common horsetail	fern or fern-ally
<i>Gymnocarpium dryopteris</i>	common oak fern	fern or fern-ally
<i>Huperzia selago</i>	northern fir-moss	fern or fern-ally
<i>Phegopteris connectilis</i>	northern beech fern	fern or fern-ally
<i>Polystichum munitum</i>	western sword fern	fern or fern-ally
<i>Struthiopteris spicant</i>	deer fern	fern or fern-ally

Reference: Cedar LNG Project – 2024 Amendment Vegetation Technical Memo

Scientific Name	English Name	Lifeform
<i>Aruncus dioicus</i>	goatsbeard	forb
<i>Circaea alpina</i>	enchanter's-nightshade	forb
<i>Cirsium vulgare</i>	bull thistle	forb
<i>Clintonia uniflora</i>	queen's cup	forb
<i>Cornus unalaschkensis</i>	Alaskan bunchberry	forb
<i>Epilobium ciliatum</i>	northern purple-leaved willowherb	forb
<i>Galium trifidum</i>	small bedstraw	forb
<i>Lysichiton americanus</i>	skunk cabbage	forb
<i>Mycelis muralis</i>	wall lettuce	forb
<i>Parnassia fimbriata</i>	fringed grass-of-Parnassus	forb
<i>Saxifraga mertensiana</i>	Mertens' saxifrage	forb
<i>Stellaria crispa</i>	crisp starwort	forb
<i>Streptopus amplexifolius</i>	clasping twistedstalk	forb
<i>Streptopus lanceolatus</i>	rosy twistedstalk	forb
<i>Tiarella trifoliata</i>	foamflower	forb
<i>Urtica dioica</i>	stinging nettle	forb
<i>Viola glabella</i>	stream violet	forb
<i>Viola palustris</i>	alpine marsh violet	forb
<i>Viola praemorsa</i>	yellow montane violet	forb
<i>Carex echinata</i>	star sedge	graminoid
<i>Cinna latifolia</i>	nodding wood-reed	graminoid
<i>Luzula parviflora</i>	small-flowered woodrush	graminoid
<i>Calypogeia muelleriana</i>	—	hepatic
<i>Marchantia polymorpha</i>	green-tongue liverwort	hepatic
<i>Mylia taylorii</i>	hard-scale liverwort	hepatic
<i>Pellia neesiana</i>	shiny liverwort	hepatic
<i>Scapania americana</i>	—	hepatic
<i>Candelariella sp.</i>	powdery lichen	lichen
<i>Cladonia sp.</i>	clad lichen	lichen
<i>Peltigera scabrosa</i>	greater toad pelt lichen	lichen
<i>Aulacomnium androgynum</i>	lover's groove moss	moss
<i>Brachythecium sp.</i>	ragged moss	moss
<i>Buckiella undulata</i>	flat moss	moss

Reference: Cedar LNG Project – 2024 Amendment Vegetation Technical Memo

Scientific Name	English Name	Lifeform
<i>Codriophorus acicularis</i>	black-tufted rock moss	moss
<i>Dichodontium pellucidum</i>	hair matted moss	moss
<i>Dicranum flagellare</i>	whip heron's-bill moss	moss
<i>Dicranum fuscescens</i>	curly heron's-bill moss	moss
<i>Dicranum polysetum</i>	wavy-leaved heron's-bill moss	moss
<i>Dicranum tauricum</i>	broken-leaf heron's-bill moss	moss
<i>Hylocomium splendens</i>	step moss	moss
<i>Hypnum dieckii</i>	—	moss
<i>Isothecium stoloniferum</i>	—	moss
<i>Mnium marginatum</i>	bordered leafy moss	moss
<i>Plagiomnium cuspidatum</i>	woods leafy moss	moss
<i>Plagiothecium denticulatum</i>	dented matted moss	moss
<i>Plagiothecium laetum</i>	bright matted moss	moss
<i>Plagiothecium piliferum</i>	hair matted moss	moss
<i>Polytrichum commune</i>	common haircap moss	moss
<i>Pseudotaxiphyllum elegans</i>	small flat moss	moss
<i>Rhizomnium glabrescens</i>	large leafy moss	moss
<i>Rhytidiadelphus loreus</i>	lanky moss	moss
<i>Sphagnum girgensohnii</i>	common green peat moss	moss
<i>Stereodon callichrous</i>	downy claw-moss	moss
<i>Tetraphis pellucida</i>	common four-tooth moss	moss
<i>Trochophyllohypnum circinale</i>	coiled-leaf claw moss	moss

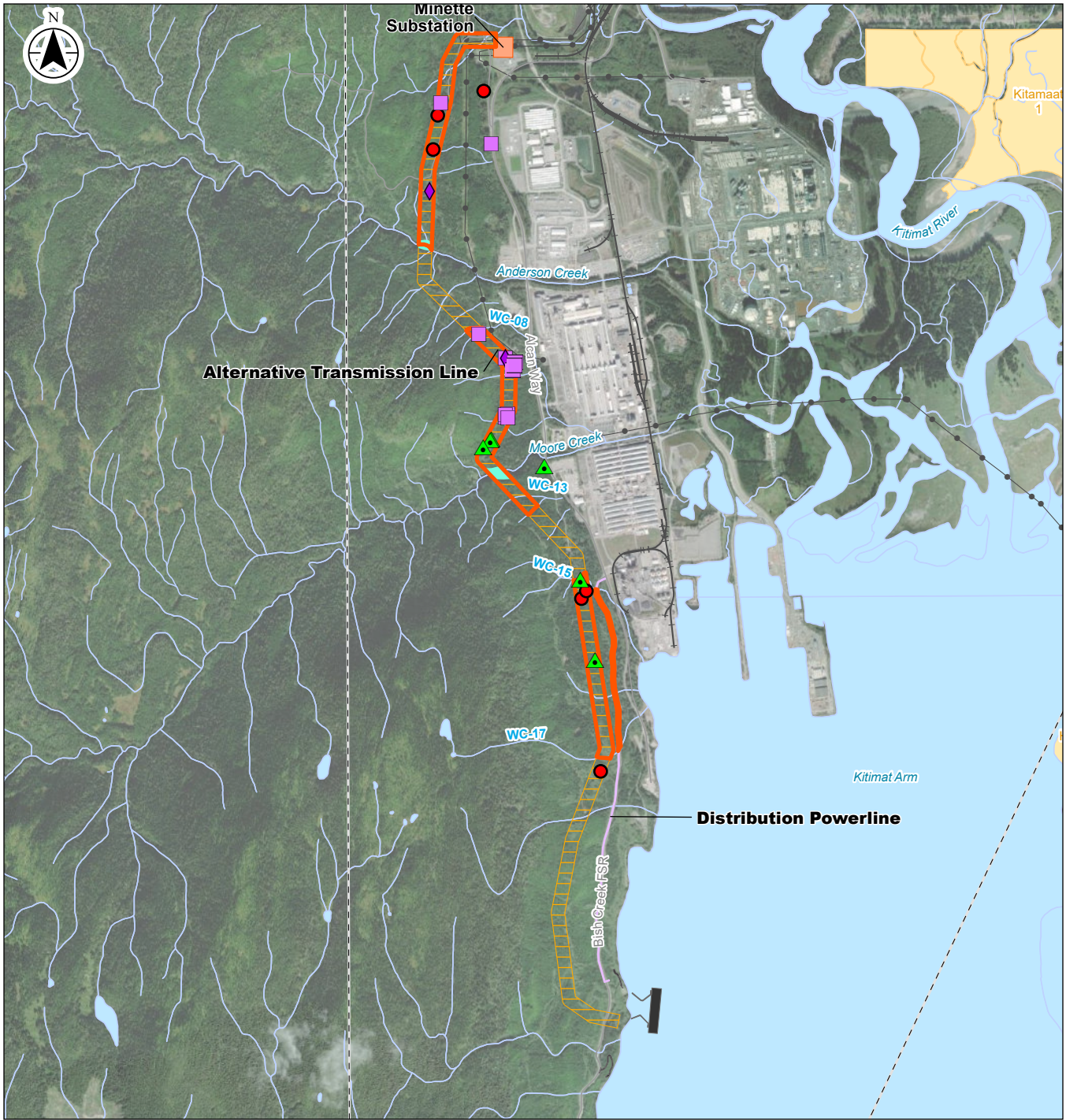
Note:

No common name



Appendix B

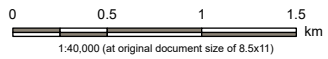
Wildlife Technical Memo



Notes: 1. Coordinate System: NAD 1983 UTM Zone 9N
 2. Data Sources: DataBC, Government of British Columbia; Natural Resources Canada; Canadian Hydrographic Service

- Road
- +— Railway
- Transmission Line
- Watercourse
- Waterbody
- Reserve Land
- District of Kitimat
- Municipal Boundary
- Minette Substation

- Project Components**
- Distribution Powerline
 - Alternative Transmission Line
 - FLNG
- Wildlife Observations**
- Potential Bat Roost
 - ◆ Potential Western Toad Breeding Site
 - Western Toad Observation
 - ▲ Wildlife Tree
 - ▭ Survey Target Area



Project Location: Kitimat, British Columbia
 Project Number: 123222394
 Prepared by: JPOUCHER on 20241016
 Discipline Review by: CBRYPDEN on 20241010
 Review by: CBRYPDEN on 20241010

Client/Project/Report: Cedar LNG Partners LP
 Cedar LNG Project
 Environmental Assessment Amendment
 Wildlife Technical Memo

Figure No. **1**

Title: **2024 Wildlife Survey Target Areas and Observations**

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Reference: Cedar LNG Project – 2024 Amendment Wildlife Technical Memo

2 Methods

The wildlife survey was completed by a crew of two biologists from June 7 to 9, 2024. The crew walked a meandering transect, where safe to do so, within and up to 50 m from the amendment application Project components in each of the three target areas. The survey focused on suitable habitat for bat roosts and pileated woodpecker cavities (i.e., mature forest, snags, rock outcrops). Identification of potential bat roosts was supported by professional experience and available literature (e.g., Lausen et al. 2022). Identification of pileated woodpecker nest cavities was supported by professional experience and federal guidance (i.e., ECCC 2023). Where accessible from the ground, a borescope was used to investigate inside tree cavities identified as potential bat roosts or pileated woodpecker nests. Additionally, the crew recorded observations of wildlife trees (not considered suitable as bat roosts or pileated woodpecker nest sites), western toads, and potential western toad breeding sites. Wildlife observations were documented with GPS coordinates, descriptions, and photos.

3 Results

The results of the 2024 wildlife survey are summarized in Table 1 and shown in Figure 1.

Table 1 Summary of Wildlife Survey Observations, June 2024

Observation	UTM Northing	UTM Easting	Comments
Potential bat roost	5982395	519570	Snags on top of large boulders; deep cavities and crevices; surroundings may be too cluttered for bats; Photo 1 (Attachment A)
Potential bat roost	5983556	519441	Large snag above boulders; extensive crevices; surroundings may be too cluttered for bats; Photo 2 (Attachment A)
Potential bat roost	5983608	519473	Snag with sloughing bark; potential day roost; Photo 3 (Attachment A)
Potential bat roost	5986803	518475	Dead tree with sloughing bark; potential day roost; Photo 4 (Attachment A)
Potential bat roost	5986573	518445	Two large cedars stumps with cavities; potential day roost; Photo 5 (Attachment A)
Potential bat roost	5986966	518784	Snag on rock; Photo 6 (Attachment A)
Wildlife tree	5983681	519433	Dead tree with small cavities
Wildlife tree	5983143	519532	Snag with some cavities
Wildlife tree	5984628	518835	Large snag with cavities, open at top
Wildlife tree	5984621	518829	Woodpecker feeding cavities, open at top
Wildlife tree	5984574	518781	Stump with woodpecker feeding cavities
Wildlife tree	5984445	519192	Snag on top of rock face, no cavities

Reference: Cedar LNG Project – 2024 Amendment Wildlife Technical Memo

Observation	UTM Northing	UTM Easting	Comments
Potential western toad breeding site	5985233	518945	Ephemeral breeding site created by small drainage, western toad adult, subadult, and toadlets present; Photo 7 (Attachment A)
Potential western toad breeding site	5986295	518421	Pooling on and beside road; western toad adults and toadlets present; Photo 8 (Attachment A)
Western toad	5985169	518957	Adult on access trail
Western toad	5985199	518955	Subadult on access trail
Western toad	5985233	518944	Toadlet in dried drainage
Western toad	5984780	518935	Toadlet and subadult, near WC-10
Western toad	5984783	518942	Toadlet and subadult in dried drainage
Western toad	5984777	518942	Subadult
Western toad	5984793	518946	Adult
Western toad	5984774	518936	Toadlet in bed of WC-10
Western toad	5984797	518947	Two toadlets
Western toad	5984776	518930	Adult
Western toad	5984792	518930	Toadlet
Western toad	5984772	518947	Two toadlets
Western toad	5985333	518752	Toadlet
Western toad	5986886	518495	Subadult in clearing
Western toad	5986612	518834	Adult along road

NOTE:

Observations are plotted on Figure 1; however, due to the scale of the figure and proximity of some observations, not all locations are visible on the figure

4 Key Findings

The key findings of the 2024 wildlife survey are:

- Potential bat roosts identified along alternative transmission line target areas
- Western toad presence confirmed along alternative transmission line target areas
- Potential western toad breeding sites identified along alternative transmission line target areas
- No pileated woodpecker nest cavities identified along target areas

These key findings are consistent with expectations based on the habitats within the target areas and the findings of the Wildlife Technical Data Report for the Project's marine terminal local assessment area (Stantec 2022) and the Pre-Construction Wildlife Survey Report (Stantec 2024).

Reference: Cedar LNG Project – 2024 Amendment Wildlife Technical Memo

5 Closure

This memo provides the results of Stantec's wildlife survey that was completed in early June 2024 in support of the Project's amendment application. We trust this information meets your present requirements. Please contact the undersigned if you have questions.

Regards,

Stantec Consulting Ltd.

<original signed by> <original signed by>

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Attachments: A: Selected Photos of Wildlife Survey Observations, June 2024

Reference: Cedar LNG Project – 2024 Amendment Wildlife Technical Memo

6 References

- ECCC (Environment and Climate Change Canada). 2023. Pileated Woodpecker Cavity Identification Guide. Last updated on May 30, 2023. Available at: <https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds/pileated-woodpecker-cavity-identification-guide.html>. Accessed October 2024.
- Lausen, C.L., D.W. Nagorsen, R.M. Brigham, and J. Hobbs. 2022. Bats of British Columbia. Second edition. Royal BC Museum, Victoria, BC.
- Stantec (Stantec Consulting Ltd.). 2022. Cedar LNG Project: Technical Data Report Wildlife. Burnaby, BC.
- Stantec. 2024a. Cedar LNG – Pre-Construction Wildlife Surveys Report. Prepared for Cedar LNG Partners LP, Vancouver, BC.
- Stantec. 2024b. Cedar LNG Project – Pre-Construction Coastal Tailed Frog Survey Report. Prepared for Cedar LNG Partners LP, Vancouver, BC.

Reference: Cedar LNG Project – 2024 Amendment Wildlife Technical Memo

Attachment A Selected Photos of Wildlife Survey Observations, June 2024

Reference: Cedar LNG Project – 2024 Amendment Wildlife Technical Memo



Photo 1 Potential bat roost – snags on boulders, June 7, 2024



Photo 2 Potential bat roost – large snag above boulders, June 7, 2024

Reference: Cedar LNG Project – 2024 Amendment Wildlife Technical Memo



Photo 3 Potential bat roost – snag with sloughing bark, June 7, 2024



Photo 4 Potential bat roost – dead tree with sloughing bark, June 9, 2024

Reference: Cedar LNG Project – 2024 Amendment Wildlife Technical Memo



Photo 5 Potential bat roost – two large cedars stumps with cavities, June 9, 2024



Photo 6 Potential bat roost – snag on rock, June 9, 2024

Reference: Cedar LNG Project – 2024 Amendment Wildlife Technical Memo



Photo 7 Potential western toad breeding site – ephemeral, created by small drainage, June 8, 2024



Photo 8 Potential western toad breeding site – pooling on and beside road, June 9, 2024

Appendix C

Freshwater Fish Technical Report

Freshwater Fish Technical Report

Cedar LNG Project

October 17, 2024

Prepared for:
Cedar LNG Partners LP
1800 – 1177 West Hastings Street
Vancouver, British Columbia V6E 2K3

Prepared by:
Stantec Consulting Ltd.
500 – 4515 Central Boulevard
Burnaby, British Columbia V5H 0C6

Project Number:
123222394



Limitations and Sign-off

This document entitled Freshwater Fish Technical Report was prepared by Stantec Consulting Ltd. (“Stantec”) for the account of Cedar LNG Partners LP (the “Client”) to support the regulatory review of proposed changes to the Cedar LNG Project. In connection therewith, this document may be reviewed and used by the Environmental Assessment Office, Impact Assessment Agency of Canada, participating Indigenous nations, and all members of the Technical Advisory Committee participating in the review process in the normal course of their duties. Except as set forth in the previous sentence, any reliance on this document by any other party or use of it for any other purpose is strictly prohibited. The material in it reflects Stantec’s professional judgment in light of the scope, schedule and other limitations stated in the document and in the contract between Stantec and the Client. The information and conclusions in the document are based on the conditions existing at the time the document was published and does not take into account any subsequent changes. In preparing the document, Stantec did not verify information supplied to it by the Client or others, unless expressly stated otherwise in the document. Any use which another party makes of this document is the responsibility and risk of such party. Such party agrees that Stantec shall not be responsible for costs or damages of any kind, if any, suffered by it or any other party as a result of decisions made or actions taken based on this document.

<original signed by>

Prepared by: _____
Signature

Michelle Penner, B.Sc., R.P.Bio,
Aquatic Biologist

Printed Name

<original signed by>

Reviewed by: _____
Signature

Rachel Keeler, M.Sc., R.P.Bio,
Associate Aquatic Biologist

Printed Name



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List of Attachments

- Attachment A Freshwater Fisheries Resources Mapbook**
- Attachment B Stream Crossing Summary Sheets**
- Attachment C Riparian Clearing Mapbook**



Acronyms / Abbreviations

°C	degrees Celsius
BC CDC	British Columbia Conservation Data Centre
BCER	BC Energy Regulator
Cedar	Cedar LNG Partners LP, by its general partner Cedar LNG Partners (GP) Ltd.
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CPUE	catch per unit effort
DFO	Fisheries and Oceans Canada
EAC	environmental assessment certificate
EF	electrofishing
ENV	British Columbia Ministry of Environment and Climate Change Strategy
EPMG	Environmental Protection and Management Guideline
EPMR	Environmental Protection and Management Regulation
FSR	Forest Service Road
GIS	geographic information system
GOBC	Government of British Columbia
GOC	Government of Canada
ha	hectares
HPW	high priority wildlife
km	kilometre
kV	kilovolt
LAA	local assessment area
LNG	liquefied natural gas
m	metre
mg/L	milligrams per litre
mm	millimetre
MT	minnow trap
NCD	non-classified drainage
NFC	no fish captured



Freshwater Fish Technical Report
Acronyms / Abbreviations
October 17, 2024

NTU	Nephelometric Turbidity Units
NVC	no visible channel
RAA	regional assessment area
RIC	Resources Inventory Committee
RMA	riparian management area
RRZ	riparian reserve zone
SARA	<i>Species at Risk Act</i>
Stantec	Stantec Consulting Ltd.
TDR	Technical Data Report



Glossary

Term	Definition
fish-bearing	Used to describe watercourses or watercourse reaches that contain or potentially contain fish. Watercourses were considered fish-bearing where there were no known barriers immediately downstream of the crossing and where channel characteristics, habitat features, and water quality provided the minimum requirements to support fish.
Local Assessment Area (LAA)	The LAA includes the project footprint plus up to 100 m upstream and 300 m downstream from potentially affected stream and riparian habitat (Figure 1). The LAA extends up to 1 km downstream of potentially affected habitat in Moore Creek and Anderson Creek. The LAA has been selected to encompass the area where the Project may interact directly or indirectly with freshwater fish and their habitat (e.g., extent of physical disturbance, downstream extent of sediment deposition) given the extent and nature of the project activities and the known distribution of fish and extent of freshwater fish habitat.



Term	Definition
non-classified drainage (NCD)	<p>An ephemeral or intermittent watercourse having a continuous defined channel that is less than 100 m in length, and at some points may spread over a level area without defined banks, before flowing again as a defined channel. NCDs do not meet the definition of fish habitat under the <i>Fisheries Act</i> and do not provide direct or indirect habitat values for fish. NCDs are generally considered streams under the <i>Water Sustainability Act</i>, but not under the Environmental Protection and Management Regulation pursuant to the <i>Energy Resource Activities Act</i>.</p>
non-fish bearing	<p>Used to describe watercourses or watercourse reaches that do not contain fish at any time of year. At least one of the following conditions were required to designate a watercourse as non-fish bearing:</p> <ul style="list-style-type: none"> • The existence of a permanent barrier to fish passage (e.g., falls, cascade, sub-surface flows) downstream of the crossing location as well as one of the following two conditions: <ul style="list-style-type: none"> – An absence of perennial fish habitat upstream of the barrier (i.e., all areas of the watercourse above the barrier are dry or frozen to the bottom at the same time), or – An absence of fish observation and captures during two different sampling events in two different seasons upstream of the barrier • A measured channel gradient of 20% or greater with no fish captured during field surveys • The existence of a past study that has determined that the watercourse is not fish-bearing at the crossing location
no visible channel (NVC)	<p>A site with a mapped watercourse where field surveys do not find one present. These mapped features lack defined bed and banks and are often vegetated by terrestrial plant species. Although surface water may be present during high precipitation events, they do not meet the definition of stream under the BC <i>Water Sustainability Act</i> or fish habitat under the <i>Fisheries Act</i>. Locations classified as NVC in the field were not assessed further for fish and fish habitat.</p>



Term	Definition
<p>regional assessment area (RAA)</p>	<p>The RAA includes the full watershed of each stream and creek that interacts with the project footprint; this includes Beaver, Anderson, Moore creeks and unnamed tributaries to Douglas Channel (Figure 1). These watercourses flow into the Kitimat River estuary and Kitimat Arm of Douglas Channel. The freshwater fish RAA has been selected to encompass the freshwater fish LAA and the geographic extent of potential cumulative effects with other past, present, or reasonably foreseeable projects on freshwater fish and their habitat.</p>
<p>Stream, also referred to as a 'watercourse' in this document, and encompasses streams, lakes, springs and wetlands</p>	<p>The <i>Water Sustainability Act</i> subsection 1(1) defines a "stream" as:</p> <p>"(a) a natural watercourse, including a natural glacier course, or a natural body of water, whether or not the stream channel of the stream has been modified, or</p> <p>(b) a natural source of water supply, including, without limitation, a lake, pond, river, creek, spring, ravine, gulch, wetland or glacier, whether or not usually containing water, including ice, but does not include an aquifer".</p>



1 Introduction

Cedar LNG Partners LP, by its general partner Cedar LNG Partners (GP) Ltd. (Cedar), a Haisla Nation-led partnership with Pembina Pipeline Corporation, is constructing a liquefied natural gas export facility within the District of Kitimat, British Columbia (the Project). Cedar is contemplating changes to the Project that will necessitate an environmental assessment certificate (EAC #E23-01) and *Impact Assessment Act* Decision Statement amendment (amendment application). The amendment-related changes to the Project that interact with freshwater fish and fish habitat include:

- The option to relocate the 8.5-kilometre (km) long, 287 kilovolt (kV) transmission line from the original Transmission Line Corridor between the Minette BC Hydro Substation and the Marine Terminal Area, downslope toward Douglas Channel, and to increase its right-of-way from 45 metres (m) to 90 m (referred to as the alternative transmission line)
- Adding a new 2.8 km long, 25 kV distribution powerline along the Bish Creek Forest Service Road (FSR) to the Marine Terminal Area.

This Freshwater Fish Technical Data Report presents the existing conditions for freshwater fish and habitat to support the amendment application and permitting requirements.

Project-specific baseline field studies were completed in 2019 and 2021 for the components that were part of the EAC Application and associated planning (Stantec Consulting Ltd. [Stantec] 2021). Project infrastructure changes resulted in changes to watercourse crossings for the amendment application; however, information from previous sampling remains relevant. The baseline field data collected in 2019 and 2021 is included, as applicable, to provide regional context, fish habitat details and fish-bearing status at watercourse crossings for the alternative transmission line and the new distribution powerline.

Stantec collected information on existing conditions for the amendment application through a desktop review of existing data (Stantec 2021), geographic information system (GIS) analysis, and June 2024 field surveys that were completed to ground truth information and fill gaps in available freshwater fish data from the Assessment Report (EAO 2022).

For watercourses that are in immediate proximity to, or crossed by, the alternative transmission line and distribution powerline, the objectives of the freshwater fish and fish habitat baseline studies were to:

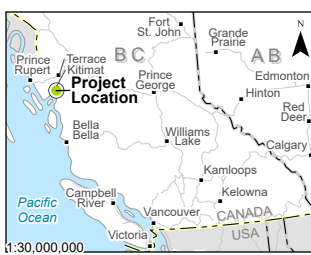
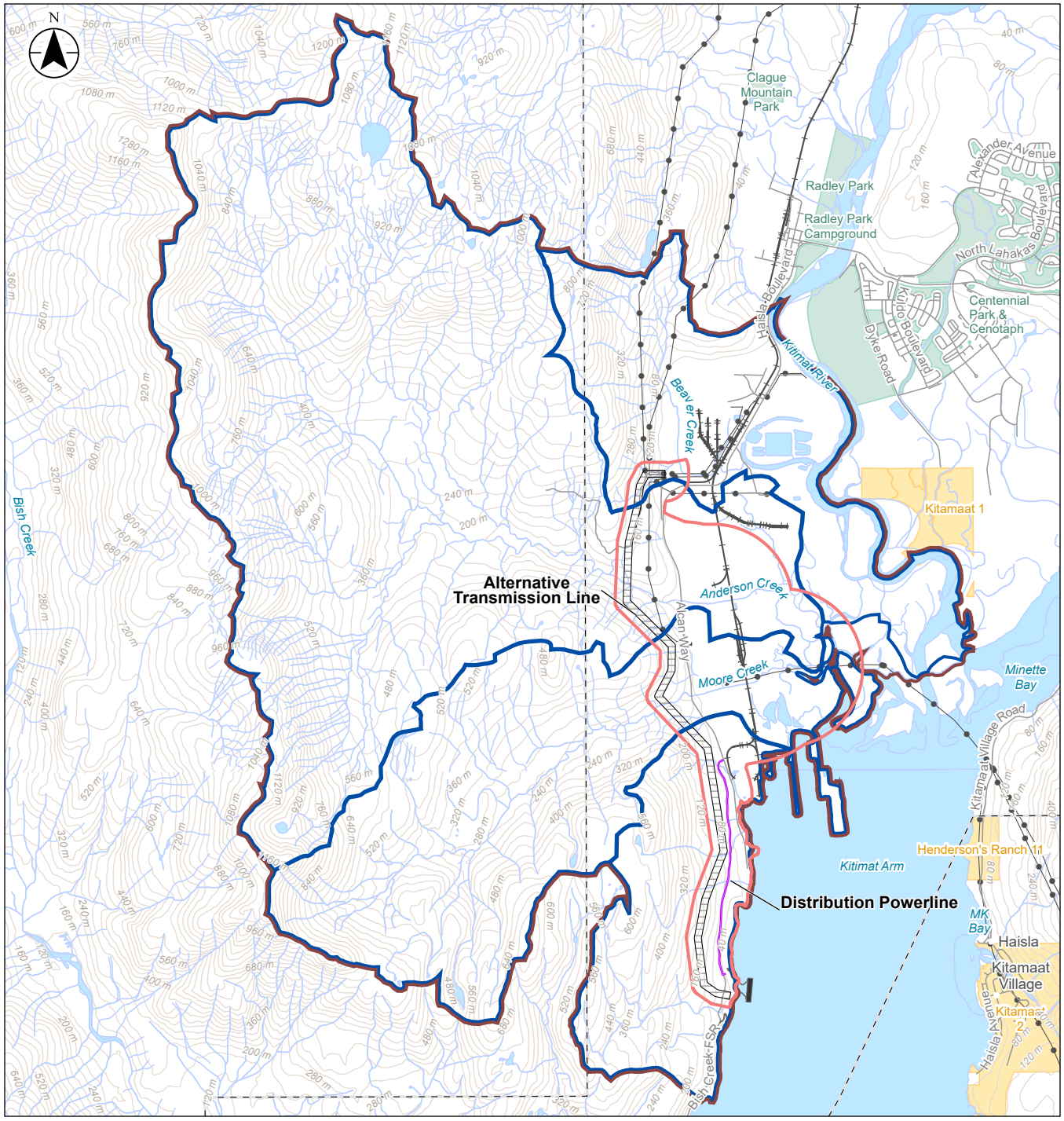
- Review and summarize existing freshwater fish and fish habitat information relevant to the amendment application
- Identify potential species present, including species at risk and species of management concern
- Characterize fish bearing status of watercourses
- Assess fish habitat availability, quality and barriers
- Calculate potential riparian clearing for the watercourses that intersect the alternative transmission line and distribution powerline



2 Spatial Boundaries

The freshwater fish regional assessment area (RAA) remains the same as in the Assessment Report and includes the full watershed of each watercourse that interacts with the Project footprint: Beaver Creek, Anderson Creek, Moore Creek, and unnamed tributaries to Douglas Channel (Figure 1). The definition of the freshwater fish local assessment area (LAA) is the same as in the Assessment Report and includes the Project footprint plus up to 100 m upstream and 300 m downstream from potentially affected watercourses and riparian habitat (Figure 1). The freshwater fish LAA extends up to 1 km downstream of potentially affected habitat in Moore Creek and Anderson Creek. The LAA boundary has shifted closer to Douglas Channel with the alternative transmission line and distribution powerline addition (Figure 1); however, the Project footprint interacts with the same watersheds in both the Assessment Report and the amendment application.

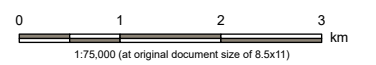




Notes: 1. Coordinate System: NAD 1983 UTM Zone 9N
 2. Data Sources: DataBC, Government of British Columbia; Natural Resources Canada; Canadian Hydrographic Service

- Road
- Railway
- Transmission Line
- Topographic Contour (40 m)
- Waterbody
- Reserve Land
- Local Greenspace
- District of Kitimat Municipal Boundary
- Watershed

- Project Components**
- Distribution Powerline
 - Alternative Transmission Line
 - FLNG
- Freshwater Fish**
- Local Assessment Area
 - Regional Assessment Area



Project Location: Kitimat, British Columbia
 Project Number 123221953
 Prepared by JPOUCHER on 20241015
 Discipline Review by RKEELER on 20240814
 Review by IGRRESHI on 20240821

Client/Project/Report
 Cedar LNG Partners LP
 Cedar LNG Project
 EA Amendment
 Freshwater Fish Technical Report

Figure No. **1**
 Title

Local and Regional Assessment Area

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3 Methods

Existing conditions for freshwater fish were assessed based on desktop review, Indigenous Knowledge, and freshwater fish and fish habitat field assessments completed in 2019 and 2021 (Stantec 2021). To evaluate the existing conditions for the amendment application, the information in the EAC Application was considered for applicability to the alternative transmission line and the new distribution powerline. Data gaps that were identified were addressed through additional freshwater fish and fish habitat field assessments completed in June 2024.

3.1 Desktop Review

3.1.1 Identification of Mapped Watercourse Crossings

Watercourses potentially intersecting the alternative transmission line and distribution powerline were identified using information from 2019 and 2021 field work (Stantec 2021), 1:20,000 scale Terrain Resource Information Management mapping, and review of data collected in support of other projects in the area.

Potential watercourse crossings for the alternative transmission line and distribution powerline were given an alpha-numeric identifier associated with the component the crossing was related to: watercourse crossings associated with the alternative transmission line start with “T-“ (e.g., T-14) and crossings associated with distribution powerline starting with “DL-“ (e.g., DL-14). The numeric component of the identifier related to the watercourse number (e.g., T-14 and DL-14 refers to the same unnamed tributary of Douglas Channel known as watercourse 14; Attachment A). Potential watercourse crossings starting with a TL, AC, and WC are associated with the original transmission line route, access roads and pipeline, and other potential interactions (e.g., other land-based facilities), respectively, in previous assessments from 2019 and 2021.

3.1.2 Fish and Fish Habitat

Fish and fish habitat information summarized for the amendment application was based on:

- The previous Freshwater Fish and Fish Habitat Technical Data Report (TDR) for the Project (Stantec 2021), which had incorporated pertinent freshwater fish and fish habitat information from fieldwork in 2019 and 2021 and other projects in the area
- Provincial and federal government resources and databases including:
 - Fisheries and Oceans Canada (DFO)’s aquatic species at risk map (DFO 2024)
 - BC Species and Ecosystem Explorer (BC Conservation Data Centre [BC CDC] 2024)
 - Species at risk public registry (Government of Canada [GOC] 2024)
 - HabitatWizard (Government of British Columbia [GOBC] 2024a)



- Fish Inventories Data Queries (GOBC 2024b)
- BC EcoCat Ecological Reports Catalog (GOBC 2024c)

Fish observation records within the RAA and the previous Freshwater Fish and Fish Habitat TDR (Stantec 2021) were used to determine potential species present within the LAA. Fish species information was cross-referenced with provincial and federal listings to determine if any were species at risk or species of management concern. For this amendment application, fish species at risk are defined as fish that are protected under federal or provincial legislation, including species:

- Listed as endangered, threatened, or special concern on Schedule 1 of the *Species at Risk Act* (SARA; GOC 2024)
- Listed under the Environmental Protection and Management Guideline (EPMG) as high priority wildlife (BC Energy Regulator [BCER] 2024), or

Species of management concern include species:

- Listed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as endangered, threatened, or special concern (GOC 2024) but not yet listed under the SARA
- Listed as Red¹ or Blue² by the BC CDC (2024)

3.2 Fish and Fish Habitat Surveys

3.2.1 Fish Habitat Surveys

Field surveys were completed in June 2024 to consider fish and fish habitat in watercourses intersected by the alternative transmission line and distribution powerline corridors where data gaps were identified during the desktop review. The 2024 field surveys primarily focused on lower reaches of watercourses in areas downstream of the Bish Creek FSR to assess freshwater fish habitat and connectivity between Douglas Channel and areas of the watercourses previously assessed in 2019 and 2021 (Attachment A). These surveys included lower gradient sections of stream with potential to provide habitat for resident fish populations and anadromous fish if accessible. Fish habitat, connectivity, and potential barriers to fish access (e.g., falls or continuous gradients above 20%) were documented.

Fish and fish habitat surveys collected quantitative and qualitative measurements to characterize stream channel morphology, fish habitat area, and available fish cover. The field crews collected data using a detailed habitat assessment card (Table 1) based on Resources Inventory Committee (RIC) standards (RIC 2001).

¹ Any species or ecosystem that is at risk of being lost (extirpated, endangered or threatened)

² Any species or ecosystem that is of special concern



Table 1 Field Methods for Fish Habitat Parameters

Parameter	Field and Analysis Methods
Water quality	Measured in situ temperature (°C), pH, specific conductance (µS/cm) and dissolved oxygen (mg/L) using a YSI ProDSS instrument. Water clarity was categorized qualitatively.
Channel measurements ^{1,2}	Measured channel and wetted width, channel depth, residual and pool depth at transects with measuring stick, measuring tape, or rangefinder. Measured gradient at transects with a clinometer ² . Mean measurements were determined for the watercourses from surveyed transects.
Channel characteristics	Visually classified based on observations made along length of transects to include pattern, islands, bars, coupling, confinement, and morphology.
Stream bed	Visually estimated percent composition of channel bed substrates: organics, fines (<0.06 mm), sand (0.06–2 mm), small gravel (2–16 mm), large gravel (17–64 mm), cobble (65–256 mm), small boulder (>257–1,000 mm), large boulder (>1,000 mm) and bedrock. Included estimate for % embeddedness and % of available spawning gravels.
Stream banks	Visually categorized stream banks along the surveyed stream for height (measured if less than 2 m), shape, stability, substrate texture, vegetation cover, and vegetation type and stage.
Cover characteristics	Visually estimated instream cover, overhead cover, and riparian vegetation cover.
Additional features	Additional observations during the survey including barriers to fish passage and culverts.

Notes:

¹ Measurement and estimation techniques are as outlined in Reconnaissance (1:20 000) Fish and Fish Habitat Inventory: Standards and Procedures (RIC 2001).

² Slope was recorded by using a clinometer to site a crew member to eye level of sighter across the longest visible distance (through brush/trees) along the watercourse.

3.2.2 Fish Sampling

Fish sampling was focused on watercourse crossings downgradient of Bish FSR where fish-bearing status was unconfirmed based on previous assessments (Stantec 2021). Fish sampling was conducted in accordance with the Project’s permits (provincial scientific fish collection SM24-869767 and federal fish collection permit XR 318 2024). A combination of minnow trapping and electrofishing was used to determine fish absence/presence.

3.2.3 Surface Water Quality

In situ water temperature, pH, dissolved oxygen, specific conductivity, and turbidity was collected using a water quality meter at watercourses with flowing water. Turbidity was also visually and qualitatively assessed according to these categories: clear, brown/yellow, green/algae, cloudy, milky, and plume.



3.3 Data Analysis

3.3.1 Fish-bearing Status

Determination of fish-bearing status at each watercourse crossing was based on fish sampling, habitat data, gradient analysis (see Section 3.3.4), water quality, presence of obstructions to fish passage, known fish distributions in the watercourse and watershed, and a qualitative assessment of the fish habitat by the fisheries biologist conducting the field surveys.

Watercourses were considered fish-bearing where there were no known barriers immediately downstream of the crossing and where channel characteristics, habitat features, and water quality provided the minimum requirements to support fish. At least one of the following conditions were required to designate a watercourse as non-fish bearing:

- The existence of a permanent barrier to fish passage (e.g., falls, cascade, sub-surface flows) downstream of the crossing location as well as one of the following two conditions:
 - An absence of perennial fish habitat upstream of the barrier (i.e., all areas of the watercourse above the barrier are dry or frozen to the bottom at the same time), or
 - An absence of fish observation and captures during two different sampling events in two different seasons upstream of the barrier
- A measured channel gradient of 20% or greater with no fish captured during field surveys
- The existence of a past study that has determined the watercourse is not fish-bearing at the crossing location

Watercourses with gradients between 16% and 19% are considered to have a low probability of containing fish (BC Ministry of Forests 1998). Examples of permanent barriers include sustained stream gradients greater than 20% and falls and cascades greater than 2m in height. Barriers that are not considered permanent (i.e., temporary barriers) include beaver dams, logjams, and culverts (BC Ministry of Forests 1998). Non-permanent barriers were not used as conditions to designate a watercourse as non-fish bearing.

3.3.2 Watercourse Classification

Watercourses were classified in accordance with the provincial Environmental Protection and Management Regulation (EPMR) under the *Energy Resource Activities Act* and EPMG (BCER 2024), based on mean channel width and fish-stream status (Table 2). The classifications were based on fish presence and the average channel width across the surveyed length of the stream. If a watercourse did not show signs of continuous scour or alluvial deposition for at least 100 m, it was classified as a non-classified drainage (NCD; BCER 2024). Watercourses with no evidence of channel bed or banks (i.e., no evidence of scour) were classified as no visible channel (NVC; RIC 2001).



Table 2 Riparian Classification Method for Watercourses Crossed by the Project

Riparian Class	Description
S1A	Fish-bearing with >100 m mean channel width
S1B	Fish-bearing with >20 m and <100 m mean channel width
S2	Fish-bearing with >5 m and <20 m mean channel width
S3	Fish-bearing with >1.5 m and <5 m mean channel width
S4	Fish-bearing with <1.5 m mean channel width
S5	Non-fish bearing with >3 m mean channel width
S6	Non-fish bearing with <3 m mean channel width
NVC	No visible channel (not fish habitat)
NCD	Non-classified drainage: an ephemeral or intermittent watercourse having a continuous defined channel that is less than 100 m in length, and at some points may spread over a level area without defined banks, before flowing again as a defined channel

Source: Adapted from the EPMR and EMPG (BCER 2024)

3.3.3 Habitat Quality

Habitat quality for different life stages of fish (i.e., spawning, rearing, overwintering, passage) was assessed using data collected during field surveys, known habitat requirements for salmon and trout species present in the area, and mean discharge information to estimate habitat availability throughout the year (i.e., whether the watercourse had sufficient depth to support fish). Preferred habitats were identified based on characteristics documented by McPhail (2007) and Washington Department of Fish and Wildlife (2016). Habitat ratings were based on habitat suitability or availability at the sites; ratings range from good to unsuitable (Table 3).

Table 3 Fish Habitat Ratings

Habitat Type	Habitat Rating	Description ^a
Spawning	Good	<ul style="list-style-type: none"> • Substrate is suitable for spawning and abundant • Flows and depths are suitable throughout the LAA • Interstices clear/low embeddedness • Water quality meets applicable guidelines^b and is within ideal range for life stage
	Moderate	<ul style="list-style-type: none"> • Substrate is suitable for spawning but has limited abundance • Flows and depths are not suitable in portions of the LAA • Interstices reduced/ moderate embeddedness • Water quality meets applicable guidelines^b but may not be within optimal range life stage



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Habitat Type	Habitat Rating	Description ^a
Spawning (cont'd)	Poor	<ul style="list-style-type: none"> • Substrate is not suitable for spawning or has very limited abundance • Flow and depth are not suitable for life stage of fish • Interstices filled/high embeddedness • Water quality meets the short-term (acute) guidelines^b but does not meet long-term (chronic) guidelines
	Unsuitable	<ul style="list-style-type: none"> • No spawning gravels or suitable spawning habitat • Waterbody is dry or frozen • Interstices filled/high embeddedness • Water quality does not meet applicable guidelines^b and is inadequate to support aquatic life.
Rearing	Good	<ul style="list-style-type: none"> • Abundant instream and overhead cover • Flows and depths are suitable throughout the LAA • Water quality meets applicable guidelines^b and is within ideal range for life stage
	Moderate	<ul style="list-style-type: none"> • Instream and overhead cover present, but limited in abundance and/or distribution • Flows and depths are not suitable in portions of the LAA • Water quality meets applicable guidelines^b but may not be within optimal range life stage
	Poor	<ul style="list-style-type: none"> • Instream cover and overhead cover are minimal • Flow and depth are not suitable for life stage of fish • Water quality meets the short-term (acute) guidelines^b but does not meet long-term (chronic) guidelines
	Unsuitable	<ul style="list-style-type: none"> • Waterbody is dry • No suitable habitat to meet life stage requirements • Water quality does not meet applicable guidelines^b and is inadequate to support aquatic life.
Overwintering	Good	<ul style="list-style-type: none"> • Depths/flows are sufficient to prevent watercourse from freezing to bottom • Off-channel habitat present in the form of backwaters with cover and ponds, oxbows, and other low energy off-channel areas • Water quality meets applicable guidelines^b and is within ideal range for life stage
	Moderate	<ul style="list-style-type: none"> • Flows and depths are not suitable to prevent watercourse from freezing to bottom in portions of the LAA • Some backwaters present • Water quality meets applicable guidelines^b but may not be within optimal range life stage



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Habitat Type	Habitat Rating	Description ^a
Overwintering (cont'd)	Poor	<ul style="list-style-type: none"> Insufficient depths/flows to prevent watercourse from freezing to bottom Few or no backwaters or off channel ponds Water quality meets the short-term (acute) guidelines^b but does not meet long-term (chronic) guidelines
	Unsuitable	<ul style="list-style-type: none"> Waterbody is dry or frozen No backwaters or off channel ponds Water quality does not meet applicable guidelines^b and is inadequate to support aquatic life.
Passage	Good	<ul style="list-style-type: none"> No permanent barriers to fish passage Average reach gradient <8% Flows and depths are suitable throughout the LAA
	Moderate	<ul style="list-style-type: none"> Small temporary obstructions may be present but are passable by one or more life-stages, or during higher flows (e.g., high spring flows provide overflow above a small beaver dam) Average reach gradient between 8% and 16% Flows and depths are not suitable in portions of the LAA
	Poor	<ul style="list-style-type: none"> Temporary or seasonal barriers to fish passage are present (e.g., ephemeral flow, beaver dams, falls, or perched culverts) Average reach gradient between 16% and 19% Flow and depth are not suitable for life stage of fish
	Unsuitable	<ul style="list-style-type: none"> Permanent barriers to fish passage (e.g., falls, cascades) Average reach gradient >20% Waterbody is dry or frozen

Notes:

^a Habitat required to meet at least one criterion for certain habitat rating.

^b ENV 2024

3.3.4 Gradient Analysis

A gradient analysis was performed on potential watercourses that crossed into (or came near) the EAC Application transmission line corridor to inform fish-bearing status of watercourses (Stantec 2021). A digital elevation model was developed using Light Detection and Ranging to determine gradients of streams along this corridor, which was then used to inform fish-bearing status. According to provincial guidance, gradients over 20% are considered barriers to upstream fish migration and streams with 100 m sections above this gradient can be considered non-fish-bearing if they do not have upstream habitat that can maintain resident populations (BC Ministry of Forests 1998). See the previous Freshwater Fish and Fish Habitat Technical Data Report (Stantec 2021) for more information on the methods used in the gradient analysis. Results of the previous assessment were incorporated into this fish and fish habitat assessment for the amendment application, as applicable.



3.3.5 Riparian Clearing Calculations

Riparian clearing was calculated by overlapping the Project footprint with riparian areas on both sides of each watercourse. Riparian areas for watercourses were defined in the following ways:

- Riparian reserve zone (RRZ), which is based on riparian class as defined in the EPMP. The function of the RRZ is to conserve fish habitat, wildlife habitat, biodiversity, and water values and it is measured from the edge of the stream channel bank (BCER 2024).
- Riparian management area (RMA), which is based on riparian class as defined in the EPMP. RMAs are transitional areas where there is a shift in vegetation from aquatic to upland communities (BCER 2024). Management of RMAs is required to conserve fish habitat, biodiversity, and water values (BCER 2024). It includes the RRZ plus the riparian management zone. The riparian management zone is located outside the RRZ and helps to protect the RRZ and its function (BCER 2024).

The RRZ and RMA are riparian widths measured from edge of the stream channel bank and were used to develop riparian areas (one for each the RRZ and RMA) for each watercourse crossing. Potential changes in riparian habitat were calculated by overlapping the riparian areas defined by the RRZ and RMA with the Project footprint using GIS analysis.

As discussed in Stantec 2021, the riparian clearing was calculated in two ways to provide a conservative estimate since RRZ is zero for non-fish-bearing watercourses, but RRZ provides details about more sensitive riparian areas for fish-bearing watercourses. In locations where the RRZ was equal to zero (i.e., S5, S6 class watercourses), a minimum riparian width of 20 m was applied to be consistent with the recommended RMA in the EPMP (BCER 2024) and DFO's minimum set-back standard (Chilibeck 1993). The width of clearing for the alternative transmission line corridor was assumed to be 90 m (i.e., 45 m on each side of the centreline) except where the design shows that spans are planned to be high enough above ground to avoid vegetation clearing. The assumed width of clearing for the distribution powerline corridor was 15 m.



4 Results

The following section provides a summary of the existing conditions for fish and fish habitat associated with the alternative transmission line and distribution powerline. Information from the previous freshwater fish assessments (Stantec 2021) is included where relevant to the alternative transmission line and the new distribution powerline.

4.1 Fish Presence in the RAA

Sixteen species of fish have been documented within watersheds intersected by the Project in the RAA as summarized in Table 4. Most observations of these fish species were recorded from the low gradient, lower reaches of Beaver Creek, Anderson Creek and Moore Creek (GOBC 2024a). No fish have been previously documented in unnamed tributaries to Douglas Channel intersected by the Project (GOBC 2024a). Within the RAA, salmonid species include coho salmon, chinook salmon, chum salmon, pink salmon, coastal cutthroat trout, rainbow trout, and Dolly Varden. None of the 16 fish species known to occur in the freshwater fish RAA are listed under the *Species at Risk Act* (SARA; GOC 2024, BC CDC 2024). However, oolichan of the Central Pacific Coast population (of which oolichan runs in the Kitimat River are a part) are considered endangered by COSEWIC and are currently under consideration for status change under the SARA by DFO (GOC 2024). Coastal cutthroat trout and oolichan are provincially blue-listed (i.e., species of special concern; CDC 2024) and High Priority Wildlife (HPW) under the EPMG (BCER 2024). Seven other fish species in the freshwater fish RAA are provincially yellow-listed (i.e., apparently secure; CDC 2024). There is no critical habitat for freshwater aquatics species in the RAA (DFO 2024).



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Table 4 Fish Species Documented within the RAA

Common Name	Scientific Name	Watershed			EPMR	Provincial Status	SARA Status	COSEWIC Status
		Beaver Creek	Anderson Creek	Moore Creek				
Chinook salmon	<i>Oncorhynchus tshawytscha</i>	✓	✓	-	No status	No status	None	None
Chum salmon	<i>O. keta</i>	-	✓	-	No status	No status	None	None
Coastrange sculpin	<i>Cottus aleuticus</i>	✓	-	✓	No status	Yellow	None	None
Coho salmon	<i>O. kisutch</i>	✓	✓	✓	No status	No status	None	None
Cutthroat trout	<i>O. clarkii clarkii</i>	✓	✓	✓	HPW	Blue	None	None
Dolly Varden	<i>Salvelinus malma</i>	✓	✓	-	No status	Yellow	None	None
Oolichan / eulachon – Central Pacific Coast population ¹	<i>Thaleichthys pacificus</i>	✓ ¹	✓ ¹	✓ ¹	HPW	Blue	None	Endangered
Pacific lamprey	<i>Lampetra tridentate</i>	✓	✓	-	No status	Yellow	None	None
Pink salmon	<i>O. gorbuscha</i>	-	✓	✓	No status	No status	None	None
Prickly sculpin	<i>C. asper</i>	✓	✓	✓	No status	Yellow	None	None
Rainbow trout	<i>O. mykiss</i>	✓	✓	✓	No status	Yellow	None	None
Slimy sculpin ²	<i>C. cognatus</i>	✓ ²	✓ ²	✓ ²	No status	Yellow	None	None
Sockeye salmon ³	<i>O. nerka</i>	✓ ³	✓ ³	-	No status	No status	None	None
Staghorn sculpin	<i>Leptocottus armatus</i>	✓	✓	-	No status	No status	None	None



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Common Name	Scientific Name	Watershed			EPMR	Provincial Status	SARA Status	COSEWIC Status
		Beaver Creek	Anderson Creek	Moore Creek				
Starry flounder ⁴	<i>Platichthys stellatus</i>	-	✓ ⁴	✓ ⁴	No status	No status	None	None
Threespine stickleback	<i>Gasterosteus aculeatus</i>	✓	✓	✓	No status	Yellow	None	None

Notes:

✓ *species presence documented*

- *species presence not documented*

¹ Five adult oolichan were documented in Moore Creek during spring fyke netting in 2014 (LNG Canada 2017).

² Several instances of slimy sculpin were documented in HabitatWizard (GOBC 2024a) but McPhail (2007) indicates the Kitimat River is not within their distribution and slimy sculpin is an interior species. Therefore, these fish are assumed to be a misidentification of another sculpin species.

³ Less than five adult sockeye salmon were observed in Anderson Creek during LNG Canada baseline studies. These fish were likely strays from the Kitimat River run (LNG Canada 2014). Haisla Nation reported juvenile sockeye salmon presence in Beaver Creek and Anderson Creek (LNG Canada 2017).

⁴ Starry flounder is a marine species commonly found in saline to brackish water. Therefore, their distribution is assumed to be more restricted to the lower marine influenced reaches of watercourses than the GOBC (2024a) data may imply.

Sources:

GOBC (2024a), CDC (2024), GOC (2024); LNG Canada (2017) and LNG Canada (2014); BCER 2024

Blue: Special Concern

Yellow: Apparently secure

SARA: *Species at Risk Act*

EPMR: *Environmental Protection and Management Regulation*; HPW – High Priority Wildlife



4.2 2024 Field and Fish Habitat Survey Summary

4.2.1 Watercourse Assessments

The watercourse assessments were completed from June 24 to 27, 2024 on portions of watercourses between Bish Creek FSR and Douglas Channel where there were gaps in existing information (Attachment A). Assessments were also completed for field-finds (i.e., watercourse that are not mapped in provincial data sources). Stream crossing summary sheets for these portions of watercourses are provided in Attachment B.

4.2.2 Fish Sampling Summary

Fish sampling was conducted in four watercourse crossings with minnow trapping and/or electrofishing, as summarized in Table 5. Fish sampling was conducted at or downstream of the distribution powerline crossings. No fish were captured. Remaining watercourse crossings visited in 2024 (Attachment A) were dry or had insufficient water depths for fish sampling.



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Table 5 Fish Sampling Summary

Watercourse ID	Watercourse Name	Method^a	Electrofishing (EF) Effort (seconds)	Minnow Trapping (MT) Effort (trap hours)	Species^b	Count	Fork Length Range (mm)	EF CPUE^c (fish/sec)	MT CPUE^c (fish/hour)
DL-16	Trib. to Douglas Channel	EF, MT	ND	89.1	NFC	0	N/A	0	0
DL-17	Trib. to Douglas Channel	EF	45	N/A	NFC	0	N/A	0	0
DL-18	Trib. to Douglas Channel	EF, MT	66	47.1	NFC	0	N/A	0	0
DL-18.6	Trib. to Douglas Channel	EF	56	N/A	NFC	0	N/A	0	0

Notes:

N/A = not applicable; ND = no data

^a EF = electrofishing; MT = minnow trap

^b NFC = no fish captured

^c CPUE = catch per unit effort



4.2.3 In Situ Water Quality Summary

In situ water quality parameters were recorded for five watercourse locations (Table 6). Remaining watercourses visited in 2024 were dry or had insufficient depths to complete water sampling.



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Table 6 In Situ Water Quality Summary

Watercourse ID	Watercourse Name	Location (UTM Zone 9N)		Date	Temperature (°C)	Dissolved Oxygen (mg/L)	Specific Conductivity (µS/cm)	pH	Turbidity (NTU)	Clarity
		Easting	Nothing							
DL-16	Trib. to Douglas Channel	519764	5982944	26-Jun-24	11.1	10.59	45.8	7.1	2.95	Clear
DL-17	Trib. to Douglas Channel	519847	5982472	26-Jun-24	11.6	10.66	34.5	7.5	0.42	Clear
DL-18	Trib. to Douglas Channel	519847	5982204	26-Jun-24	13.5	10.18	42.9	7.0	1.87	Clear
DL-18.5	Trib. to Douglas Channel	519643	5981384	24-Jun-24	10.2	10.62	31.4	6.8	0.53	Clear
DL-18.6	Trib. to Douglas Channel	519657	5981361	24-Jun-24	11.6	10.31	50.5	7.1	0.07	Clear

Notes:

°C = degrees Celsius; mg/L = milligrams per litre; µS/cm = microsiemens/centimetre; NTU = Nephelometric Turbidity Units



4.2.4 Habitat Quality

No habitat quality assessments were completed in 2024, as the watercourse crossings along the alternative transmission line and distribution powerline were assessed as non-fish bearing and do not provide direct fish habitat (Attachment B). Habitat quality at watercourses crossed by the alternative transmission line and distribution powerline that were previously assessed are summarized in Table 7 and Table 8.

4.3 Watercourse Overview

The following sections provide a summary of the habitat and fish-bearing status at the alternative transmission line and distribution powerline crossings. Within the RAA, watercourses flow east from mountain slopes into Douglas Channel. Creeks flowing under the Bish Creek FSR have vertical drops and steep gradients (greater than 20%) that limit upstream fish passage (Attachment A). In addition, most unnamed watercourses flowing along the western side of Douglas Channel are dry in summer or have additional barriers to fish passage downstream of Bish Creek FSR. The shift of the alternative transmission line footprint to lower slopes closer to the Douglas Channel results in interactions with more watercourses.

4.3.1 Alternative Transmission Line

There are 38 watercourses crossed by the alternative transmission line: four fish-bearing (S2-S3), 27 non-fish bearing (S5-S6), and seven NCDs (Table 7). The fish bearing watercourses intersected by the alternative transmission line include a tributary to Beaver Creek (T-01.2-2), Anderson Creek (T-03), Moore Creek (T-11) and tributary to Douglas Channel (T-14). Anderson Creek and Moore Creek are watercourses that provide good quality fish habitat and support populations of anadromous and resident fish. However, these creeks only provide habitat for resident fish at the alternative transmission line as both have barriers to anadromous fish downstream of the alternative transmission line: the barrier on Anderson Creek is a 30 m falls located approximately 2 km upstream from the ocean; the barrier on Moore Creek is a 40 m high falls located approximately 1.2 km upstream from the ocean.

Riparian clearing associated with alternative transmission line for each crossing is summarized in Table 7 and shown in Attachment C. Riparian clearing in the RMA is approximately 15.49 hectares (ha); 4.10 ha around fish-bearing watercourses and 11.39 ha around non-fish bearing watercourses. Riparian clearing in the RRZ is approximately 1.80 ha around fish-bearing watercourses. Riparian clearing in the RMA around the most important fish-bearing watercourses, Anderson and Moore creeks, has been reduced through design and will be approximately 0.44 and 0.15 ha, respectively.



Table 7 Summary of Alternative Transmission Line Watercourse Crossings

Watercourse ID	Watercourse Name	Riparian Class ^a	Coordinates (UTM Zone 9)		Habitat Quality Ranking				Fish Species Previously Documented ^b	Riparian Impacts (ha)	
			Easting	Northing	Spawning	Overwintering	Rearing	Migration		RRZ	RMA
T-01.1-1	Trib. to Beaver Creek	S6	518652	5987309	N/A	N/A	N/A	N/A	N/A	0	0.51 ^c
T-01.2-2	Trib. to Beaver Creek	S3	518788	5987309	Moderate	Moderate	Good	Moderate	Coho salmon, chinook salmon, Dolly Varden, coastrange sculpin, prickly sculpin, threespine stickleback, Pacific lamprey, rainbow trout	1.08	1.80
T-01.1-2	Trib. to Beaver Creek	S6	518554	5987162	N/A	N/A	N/A	N/A	N/A	0	0.52 ^c
T-01.2-1	Trib. to Beaver Creek	S6	518545	5987104	N/A	N/A	N/A	N/A	N/A	0.21 ^d	0.84
T-01.5	Trib. to Beaver Creek	S6	518529	5986975	N/A	N/A	N/A	N/A	N/A	0	0.96
T-01.6	Unnamed drainage	NCD	518511	5986862	N/A	N/A	N/A	N/A	N/A	0	0
T-01A	Unnamed drainage	NCD	518503	5986828	N/A	N/A	N/A	N/A	N/A	0	0
T-02	Trib. to Anderson Creek	S6	518394	5985996	N/A	N/A	N/A	N/A	N/A	0	0.66
T-03	Anderson Creek	S2	518392	5985933	Good	Good	Good	Good	Coho salmon, cutthroat trout, Dolly Varden, threespine stickleback, Pacific lamprey, staghorn sculpin, starry flounder	0.07 ^e	0.44 ^e
T-3.1	Trib. to Anderson Creek	S6	518389	5985869	N/A	N/A	N/A	N/A	N/A	0	0.39
T-04	Trib. to Anderson Creek	S6	518407	5985672	N/A	N/A	N/A	N/A	N/A	0	0.40
T-04.5	Trib. to Anderson Creek	S6	518502	5985579	N/A	N/A	N/A	N/A	N/A	0	0.20
T-05	Trib. to Anderson Creek	S6	518518	5985563	N/A	N/A	N/A	N/A	N/A	0	0.37
T-05A	Trib. to Anderson Creek	S6	518576	5985506	N/A	N/A	N/A	N/A	N/A	0	0.34
T-06	Trib. to Anderson Creek	S6	518626	5985457	N/A	N/A	N/A	N/A	N/A	0	0.37
T-08	Trib. to Moore Creek	S6	518711	5985374	N/A	N/A	N/A	N/A	N/A	0	0.45
T-08.1	Trib. to Moore Creek	S6	518736	5985350	N/A	N/A	N/A	N/A	N/A	0	0.37
T-09	Trib. to Moore Creek	S6	518954	5985064	N/A	N/A	N/A	N/A	N/A	0	0.37
T-10	Trib. to Moore Creek	S6	518923	5984775	N/A	N/A	N/A	N/A	N/A	0	0.41
T-11	Moore Creek	S2	518885	5984392	Good	Good	Good	Good	Coho salmon, pink salmon, cutthroat trout, rainbow trout, threespine stickleback, coastrange sculpin, prickly sculpin, starry flounder	0 ^e	0.15 ^e
T-12	Trib. to Douglas Channel	S5	519026	5984243	N/A	N/A	N/A	N/A	N/A	0	0.41
T-13	Trib. to Douglas Channel	S6	519114	5984150	N/A	N/A	N/A	N/A	N/A	0	0.36
T-13A	Unnamed drainage	NCD	519129	5984135	N/A	N/A	N/A	N/A	N/A	0	0
T-13B	Unnamed drainage	NCD	519252	5984005	N/A	N/A	N/A	N/A	N/A	0	0
T-13C	Unnamed drainage	NCD	519409	5983829	N/A	N/A	N/A	N/A	N/A	0	0
T-14	Trib. to Douglas Channel	S3	519432	5983686	Moderate	Poor	Good	Poor	Coho salmon	0.44	0.87



Freshwater Fish Technical Report

Section 4: Results

October 17, 2024

Watercourse ID	Watercourse Name	Riparian Class ^a	Coordinates (UTM Zone 9)		Habitat Quality Ranking				Fish Species Previously Documented ^b	Riparian Impacts (ha)	
			Easting	Northing	Spawning	Overwintering	Rearing	Migration		RRZ	RMA
T-16	Trib. to Douglas Channel	S6	519556	5982887	N/A	N/A	N/A	N/A	N/A	0	0.42
T-16.5	Trib. to Douglas Channel	S6	519557	5982886	N/A	N/A	N/A	N/A	N/A	0	0.27
T-17	Trib. to Douglas Channel	S5	519588	5982486	N/A	N/A	N/A	N/A	N/A	0	0.56
T-18	Trib. to Douglas Channel	S5	519433	5982081	N/A	N/A	N/A	N/A	N/A	0	0.80
T-18A	Unnamed drainage	NCD	519398	5981989	N/A	N/A	N/A	N/A	N/A	0	0
T-18.5	Trib. to Douglas Channel	S5	519304	5981554	N/A	N/A	N/A	N/A	N/A	0	0.94
T-18.6	Trib. to Douglas Channel	S6	519291	5981381	N/A	N/A	N/A	N/A	N/A	0	0.37
T-18.7	Trib. to Douglas Channel	S6	519324	5981122	N/A	N/A	N/A	N/A	N/A	0	0.36
T-18.8	Trib. to Douglas Channel	S6	519343	5980980	N/A	N/A	N/A	N/A	N/A	0	0.38
T-18B	Trib. to Douglas Channel	S6	519430	5980809	N/A	N/A	N/A	N/A	N/A	0	0.31
T-18.9	Trib. to Douglas Channel	S6	519600	5980733	N/A	N/A	N/A	N/A	N/A	0	0.17
T-18.9B	Unnamed drainage	NCD	519677	5980718	N/A	N/A	N/A	N/A	N/A	0	0

Notes:

ha=hectares; ID = identifier; N/A = not applicable because not fish bearing; Trib. = tributary; NCD = non-classified drainage

^a Riparian class based on definition from the EPMP

^b HabitatWizard (GOBC 2024a), LNG Canada (2014, 2017), Stantec 2021; see Stantec 2021 for scientific species names

^c RMAs of these two crossings overlap, so approximately half of the total RMA clearing area (1.03 ha) has been applied to each crossing

^d Though crossing has a riparian class of S6, it becomes an S3 watercourse <20 m downstream of the crossing, so has some clearing in the RRZ of the S3 reach

^e Approximately .057 ha and 0.98 ha of riparian clearing has been avoided through design for Anderson Creek and Moore Creek, respectively



4.3.2 Distribution Powerline

Nine mapped watercourses are crossed by the distribution powerline; one fish-bearing (unnamed tributary to Douglas Channel; S3) and eight non-fish bearing watercourses (S5-S6; Table 8). The unnamed tributary to Douglas Channel (DL-14) is considered to have good rearing habitat, moderate spawning habitat, and poor overwintering and migration potential.

Riparian clearing associated with the distribution powerline for each crossing is summarized in Table 8 and shown in Attachment C. Riparian clearing in the RMA is approximately 0.88 ha: 0.19 ha around fish-bearing watercourses and 0.69 ha around non-fish bearing watercourses. Riparian clearing in the RRZ is approximately 0.07 ha around fish-bearing watercourses.



Table 8 Summary of Distribution Powerline Watercourse Crossings

Watercourse ID	Watercourse Name	Riparian Class ^a	Coordinates (UTM Zone 9)		Habitat Quality Ranking				Fish Species Previously Documented ^b	Riparian Impacts (ha)	
			Easting	Northing	Spawning	Overwintering	Rearing	Migration		RRZ	RMA
DL-14	Trib. to Douglas Channel	S3	519558	5983670	Moderate	Poor	Good	Poor	Coho salmon	0.07	0.19
DL-16	Trib. to Douglas Channel	S6	519665	5982918	N/A	N/A	N/A	N/A	N/A	0	0.13
DL-17	Trib. to Douglas Channel	S5	519691	5982490	N/A	N/A	N/A	N/A	N/A	0	0.10
DL-18	Trib. to Douglas Channel	S5	519657	5982163	N/A	N/A	N/A	N/A	N/A	0	0.11
DL-18.5	Trib. to Douglas Channel	S6	519555	5981486	N/A	N/A	N/A	N/A	N/A	0	0.21
DL-18.6	Trib. to Douglas Channel	S6	519542	5981361	N/A	N/A	N/A	N/A	N/A	0	0.07
DL-18.7	Trib. to Douglas Channel	S6	519567	5981087	N/A	N/A	N/A	N/A	N/A	0	0.04 ^c
DL-18.7.1	Trib. to Douglas Channel	S6	519570	5981075	N/A	N/A	N/A	N/A	N/A	0	0.03 ^c
DL-18.8	Trib. to Douglas Channel	S6	519590	5981005	N/A	N/A	N/A	N/A	N/A	0	0.83

Notes:

ID = identifier; N/A = not applicable because not fish bearing; Trib. = tributary

^a Riparian class based on definition from the EPMR.

^b HabitatWizard (GOBC 2024a), LNG Canada (2014, 2017), Stantec 2021; see Stantec 2021 for scientific species names.

^c RMAs of these two crossings overlap, so approximately half of the total RMA clearing area (0.07 ha) has been applied to each crossing.



5 Conclusions

There are 38 watercourse crossings associated with the alternative transmission line including four fish-bearing watercourse crossings, 27 non-fish bearing watercourse crossings and seven NCDs. There are nine watercourse crossings associated with the distribution powerline including one fish-bearing watercourse crossings and eight non-fish bearing watercourse crossings. Table 7 and Table 8 summarize the watercourse crossings associated with the amendment application.



6 References

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- McPhail, J.D. 2007. The Freshwater Fishes of British Columbia. University of Alberta Press. 620 pp.



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Section 6: References

October 17, 2024

RIC (Resources Inventory Committee). 2001. Reconnaissance (1:20 000) Fish and Fish Habitat Inventory: Standards and Procedures.

Stantec (Stantec Consulting Ltd.). 2021. Environmental Assessment Certificate Application. Appendix 7.6A Technical Data Report – Freshwater Fish and Fish Habitat – Cedar LNG Project. Report prepared for Cedar LNG Partners LP. November 2021.

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<https://fortress.wa.gov/ecy/publications/documents/0411007.pdf>. Accessed August 2024.

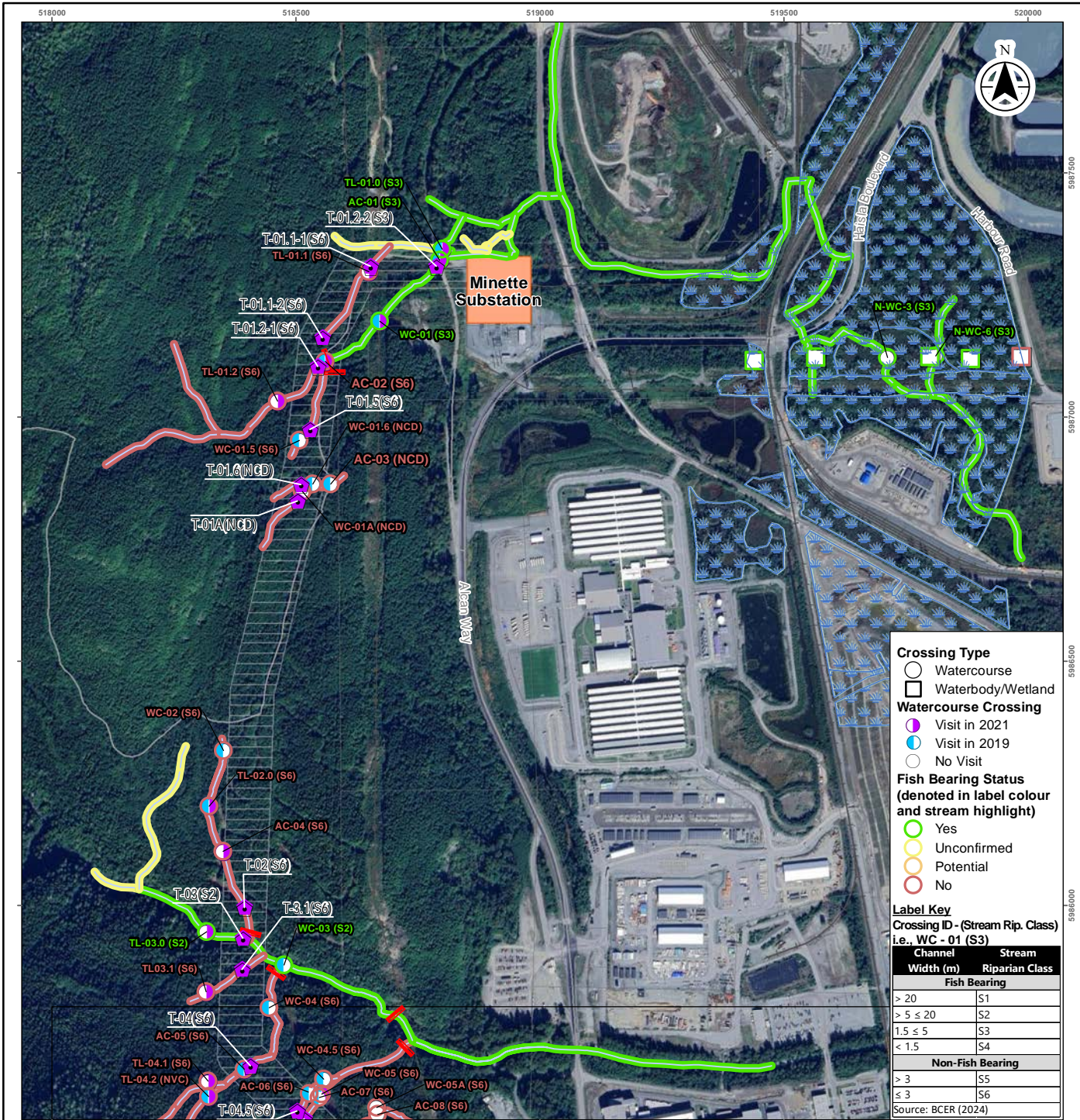


Appendices



Attachment A Freshwater Fisheries Resources Mapbook





Crossing Type

- Watercourse
- Waterbody/Wetland

Watercourse Crossing

- Visit in 2021
- Visit in 2019
- No Visit

Fish Bearing Status (denoted in label colour and stream highlight)

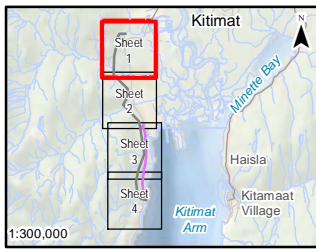
- Yes
- Unconfirmed
- Potential
- No

Label Key

Crossing ID - (Stream Rip. Class)
i.e., WC - 01 (S3)

Channel Width (m)	Stream Riparian Class
Fish Bearing	
> 20	S1
> 5 ≤ 20	S2
1.5 ≤ 5	S3
< 1.5	S4
Non-Fish Bearing	
> 3	S5
≤ 3	S6

Source: BCER (2024)

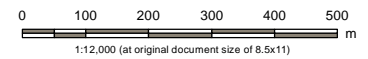


Notes

- Coordinate System: NAD 1983 UTM Zone 9N
- Data Sources: DataBC, Government of British Columbia; Natural Resources Canada; Canadian Hydrographic Service
- Imagery: ESRI World Imagery; PTE 10cm 2017 Orthoimagery

- Road
- Railway
- Transmission Line
- Waterbody
- Wetland Ecosystem
- Cadastral (Legal Lot) Boundary
- District of Kitimat Municipal Boundary
- Minette Substation
- Alternative Transmission Line
- Watercourse Crossing
- Alternative Transmission Line

- Fish Presence**
- Present
 - Unconfirmed
 - Not Present
- Fisheries Data**
- Observed Barrier (i.e., waterfall, cascade, gradient, culvert)



Stantec **CEDAR LNG**

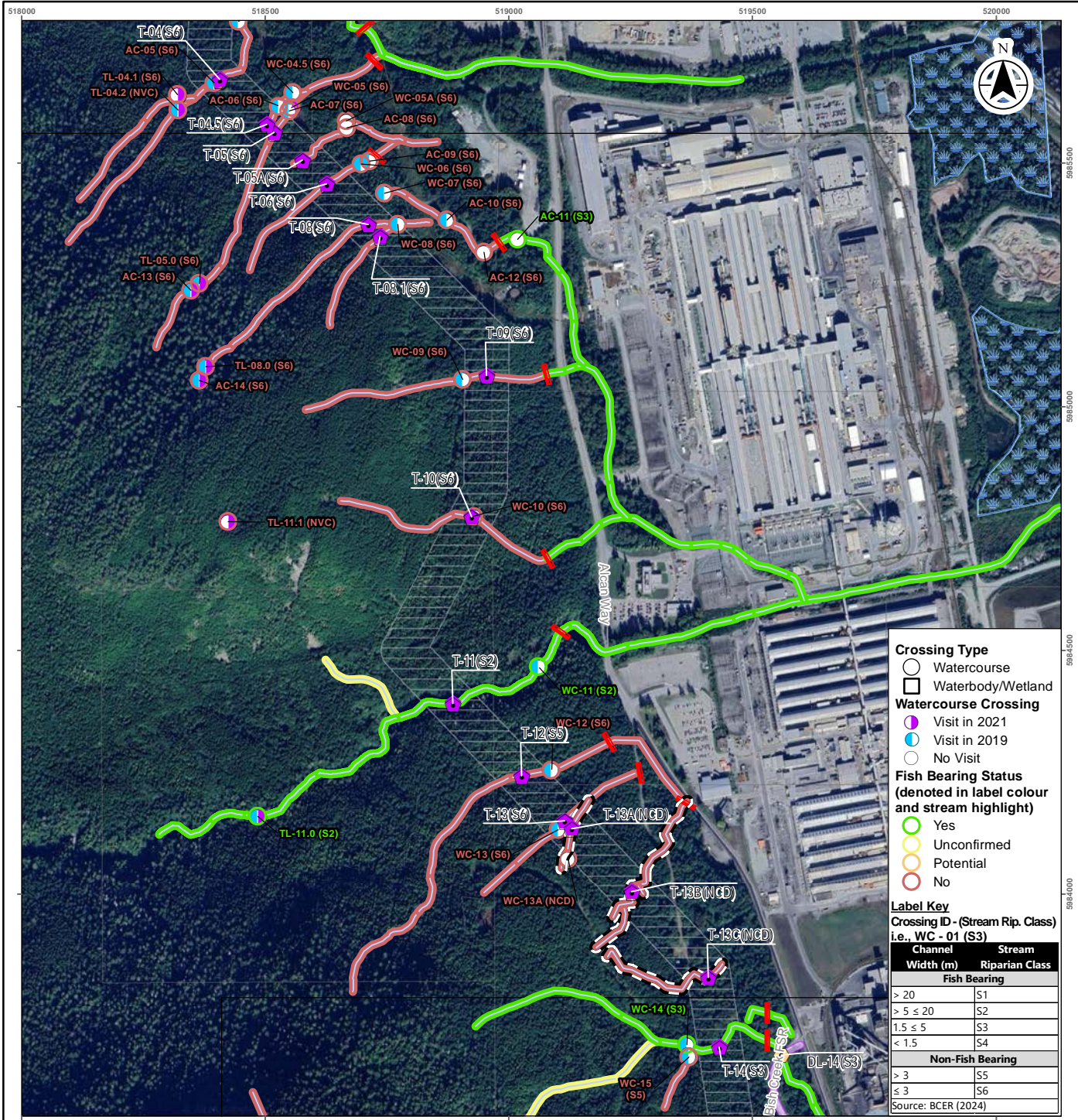
Project Location: Kitimat, British Columbia

Project Number 123222394
Prepared by TCARDINAL on 20240731
Requested by MPENNER on 20240730
Review by IQUIRESHI on 20240831

Cient/Project/Report
Cedar LNG Partners LP
Cedar LNG Project
EA Amendment
Freshwater Fish Technical Data Report

Figure No.
Appendix A Sheet 1 of 4
Title
Freshwater Fisheries Resources

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Crossing Type

- Watercourse
- Waterbody/Wetland

Watercourse Crossing

- Visit in 2021
- Visit in 2019
- No Visit

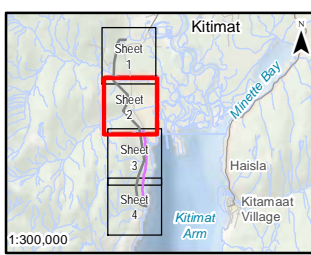
Fish Bearing Status (denoted in label colour and stream highlight)

- Yes
- Unconfirmed
- Potential
- No

Label Key
Crossing ID - (Stream Rip. Class)
i.e., WC - 01 (S3)

Channel Width (m)	Stream Riparian Class
Fish Bearing	
> 20	S1
5 ≤ 20	S2
1.5 ≤ 5	S3
< 1.5	S4
Non-Fish Bearing	
> 3	S5
≤ 3	S6

Source: BCER (2024)

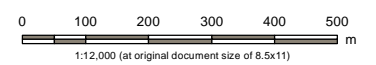


Notes

1. Coordinate System: NAD 1983 UTM Zone 9N
2. Data Sources: DataBC, Government of British Columbia; Natural Resources Canada; Canadian Hydrographic Service
3. Imagery: ESRI World Imagery; PTE 10cm 2017 Orthoimagery

- Road
 - Railway
 - Transmission Line
 - Waterbody
 - Wetland Ecosystem
 - Cadastral (Legal Lot) Boundary
 - District of Kitimat Municipal Boundary
- Project Components (Amendment)**
- Distribution Powerline
 - Alternative Transmission Line
- Watercourse Crossing**
- Distribution Powerline
 - Alternative Transmission Line

- Fish Presence**
- Present
 - Unconfirmed
 - Not Present
- Fisheries Data**
- Observed Barrier (i.e., waterfall, cascade, gradient, culvert)
 - Field Work 2024



Stantec **CEDAR LNG**

Project Location: Kitimat, British Columbia

Project Number 123222394

Prepared by TCARDINAL on 20240731

Requested by MPENNER on 20240730

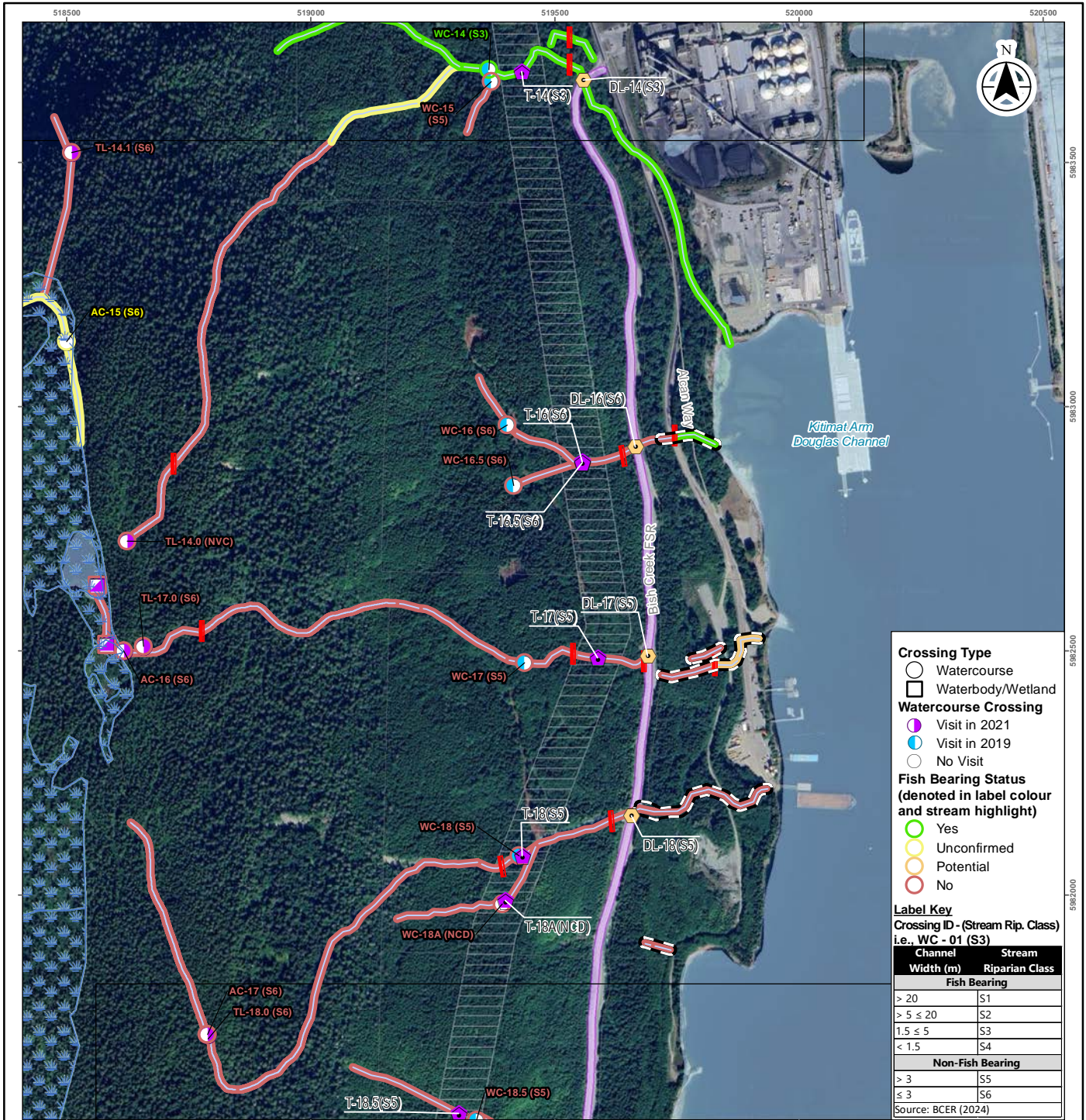
Review by IQUIRESHI on 20240831

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Crossing Type

- Watercourse
- Waterbody/Wetland

Watercourse Crossing

- Visit in 2021
- Visit in 2019
- No Visit

Fish Bearing Status (denoted in label colour and stream highlight)

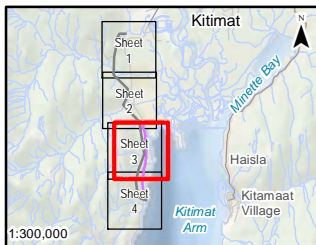
- Yes
- Unconfirmed
- Potential
- No

Label Key

Crossing ID - (Stream Rip. Class)
i.e., WC - 01 (S3)

Channel Width (m)	Stream Riparian Class
Fish Bearing	
> 20	S1
> 5 ≤ 20	S2
1.5 ≤ 5	S3
< 1.5	S4
Non-Fish Bearing	
> 3	S5
≤ 3	S6

Source: BCER (2024)

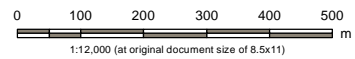


Notes

1. Coordinate System: NAD 1983 UTM Zone 9N
2. Data Sources: DataBC, Government of British Columbia; Natural Resources Canada; Canadian Hydrographic Service
3. Imagery: ESRI World Imagery; PTE 10cm 2017 Orthoimagery

- Road
- Railway
- Waterbody
- Wetland Ecosystem
- Cadastral (Legal Lot) Boundary
- District of Kitimat Municipal Boundary
- Project Components (Amendment)
 - Distribution Powerline
 - Alternative Transmission Line
- Watercourse Crossing
 - Distribution Powerline
 - Alternative Transmission Line

- Fish Presence**
- Present
 - Potential
 - Unconfirmed
 - Not Present
- Fisheries Data**
- Observed Barrier (i.e., waterfall, cascade, gradient, culvert)
 - Field Work 2024



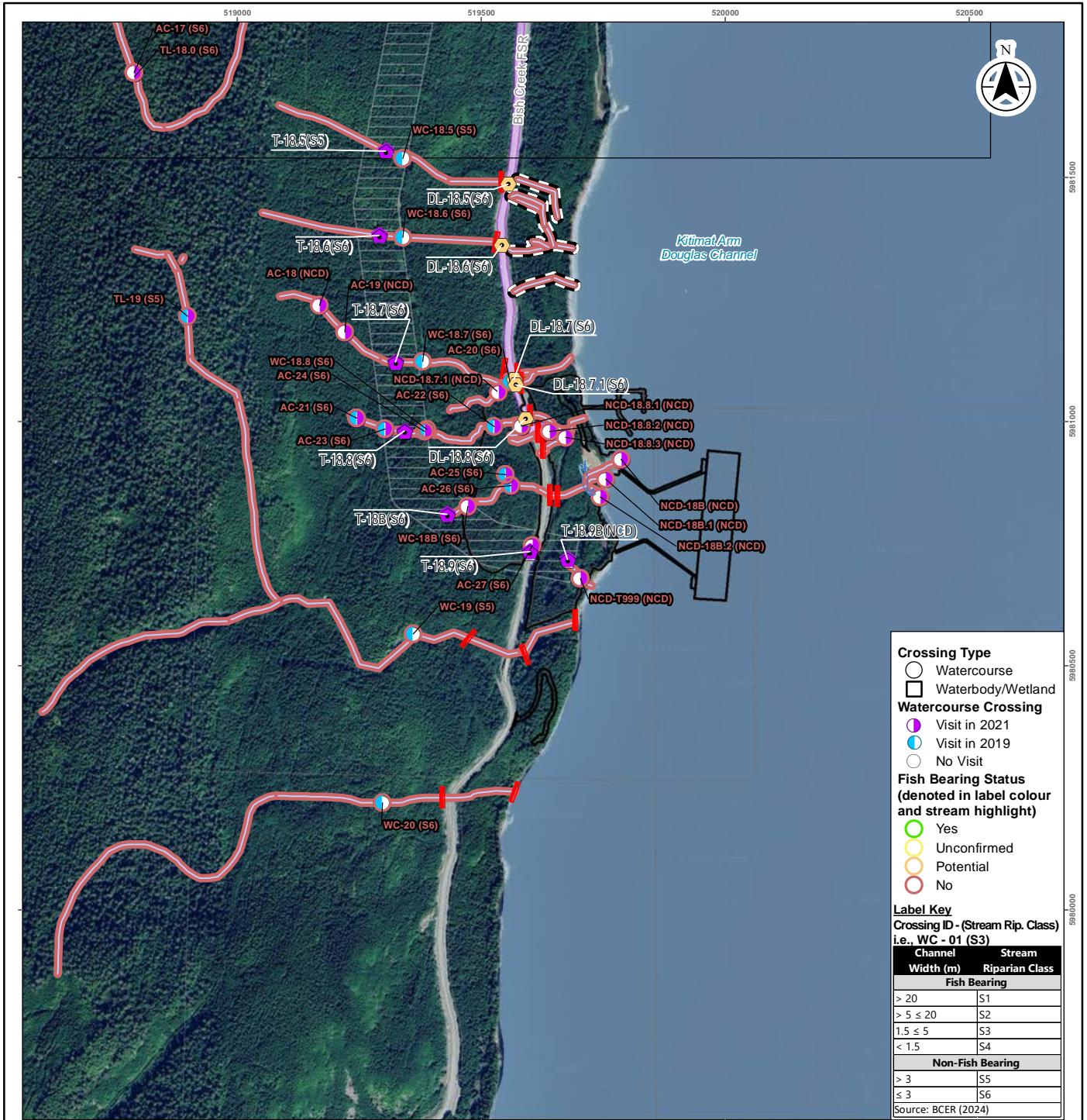
Project Location: Kitimat, British Columbia

Project Number 123222394
Prepared by TCARDINAL on 20240731
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Crossing Type

- Watercourse
- Waterbody/Wetland

Watercourse Crossing

- Visit in 2021
- Visit in 2019
- No Visit

Fish Bearing Status (denoted in label colour and stream highlight)

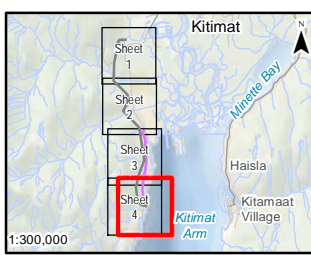
- Yes
- Unconfirmed
- Potential
- No

Label Key

Crossing ID - (Stream Rip. Class)
i.e., WC - 01 (S3)

Channel Width (m)	Stream Riparian Class
Fish Bearing	
> 20	S1
> 5 ≤ 20	S2
1.5 ≤ 5	S3
< 1.5	S4
Non-Fish Bearing	
> 3	S5
≤ 3	S6

Source: BCER (2024)



Notes

1. Coordinate System: NAD 1983 UTM Zone 9N
2. Data Sources: DataBC, Government of British Columbia; Natural Resources Canada; Canadian Hydrographic Service
3. Imagery: ESRI World Imagery; PTE 10cm 2017 Orthoimagery

- Road
- Waterbody
- Wetland Ecosystem
- Cadastral (Legal Lot) Boundary
- District of Kitimat Municipal Boundary

Project Components (Amendment)

- Distribution Powerline
- Alternative Transmission Line
- Marine Terminal

Watercourse Crossing

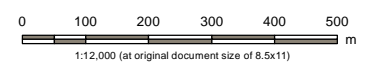
- Distribution Powerline
- Alternative Transmission Line

Fish Presence

- Not Present

Fisheries Data

- Observed Barrier (i.e., waterfall, cascade, gradient, culvert)
- Field Work 2024



Project Location: Kitimat, British Columbia

Project Number 123222394
Prepared by TCARDINAL on 20240731
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Attachment B Stream Crossing Summary Sheets



Acronyms

-	=	data not available due to lack of channel definition or absence of feature
CL	=	centerline
CPUE	=	catch-per-unit-effort
DS	=	downstream
EF	=	electrofishing
ND	=	no data / data not collected
NFC	=	no fish caught
MT	=	minnow trap

Channel Measurements

FL	=	flat
RF	=	riffle
R	=	run (unclassified)
R2	=	run 2 (0.5-1.0m)
PL	=	pool (unclassified)
P2	=	pool 2 (0.5-1.0m)
SP	=	step-pool

Bank Texture

F	=	finer
LG	=	large gravel
SG	=	small gravel
O	=	organics

Channel Characteristics

ST	=	straight
SI	=	sinuous
IR	=	irregular, wandering
IM	=	irregular meandering
ME	=	regular meanders
CO	=	confined
EN	=	entrenched
FC	=	frequently confined
OC	=	occasionally confined
UN	=	unconfined
CO	=	coupled
PC	=	partially coupled
DC	=	decoupled
AN	=	anatomosing - islands
F	=	frequent, regular - islands
I	=	frequent, irregular - islands
N	=	none - no islands in channel
O	=	occasional - islands
S	=	split - islands
SIDE	=	side bar/point bar
MID	=	mid-channel bar
SPAN	=	span bar
DIAG	=	diagonal bar

SITE DETAILS			
Watercourse Name:	DL-16	Coordinates:	53.9942, -128.70039
Stream Class:	S3/S6	Survey Date:	26-Jun-24
Flow Periodicity:	Possibly Permanent	Field Crew:	OG, AS

CHANNEL MEASUREMENTS			
Channel Width (m)	4.70		
Wetted Width (m)			
Max. Riffle Wetted Depth (m)			
Max. Pool Depth (m)			
Pool Tailout Depth (m)			
Residual Pool Depth (m)			
Bankfull Depth (m)			
Gradient (%)	2.3		
Crown Closure (%)			
Pool / Riffle / Run (%)		10/85/5	

BANK MEASUREMENTS	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right
Bank Height (m)										
Bank Shape										
Bank Slope (°)										
Dom. Bank Texture										
Subdom. Bank Texture										

BANK STABILITY		Left	Right	CHANNEL CHARACTERISTICS	
Average % Bank Stability	Stable	0	0	Pattern	Coupling
	Moderately Stable	0	0	Islands	Confinement
	Unstable	100	100	Bars	Morphology

COVER CHARACTERISTICS			Left			Right			
Instream Cover (% of Stream Profile)	LWD	0	Overhead Cover (% of Stream Profile)	UC Bank	0	Riparian Veg. Cover (%)	Bare	50	50
	SWD	5		Grass/Forbe	0		Grass	0	0
	Boulders	5		Tree/Shrub	15		Shrub	0	20
	Water Visibility	0		Overhead LWD	5		Conifer	15	20
	Vegetation	0		Total	20		Deciduous	10	10
Total	10			Wetland	0	0			

STREAM BED		WATER QUALITY			
Substrate (% of Stream Profile Area)	Organics	5	Time (HH:MM)	17:07	
	Fines	5	Clarity	Clear	
	Sands	0	Depth (m)	0.25	
	Sm Gravel (SG)	10	Water Temperature (°C)	11.10	
	Lg Gravel (LG)	10	Dissolved Oxygen (mg/L)	10.59	
	Cobble	30	Specific Conductivity (µs/cm)	45.80	
	Sm Boulder (SB)	20	pH	7.06	
	Lg Boulder (LB)	10			
	Bedrock	10			

% Embeddedness		HABITAT QUALITY	
% Embeddedness	<25	N/A. No fish habitat at distribution crossing location (between Haisla Blvd and Bish FSR). Poor fish habitat downstream of barrier at Haisla Blvd.	
% Spawning Gravel	0		

FISH SAMPLING					GENERAL COMMENTS
Method	Effort	Species	Catch (#)	CPUE	No visible channel at crossing location between Haisla Blvd and Bish FSR; however, the watercourse in this area may be in a buried culvert. There is a barrier to fish access at Haisla Blvd, but areas downstream may be fish-bearing and are classified S3. Areas upstream of the culvert, including distribution line crossing, are S6.
MT	No data	NFC	NFC	N/A	
MT	44.5 h	NFC	NFC	N/A	
EF	44.8 h	NFC	NFC	N/A	
Previous Fish Capture: NFC with EF upstream of cascade in 2005 (Jacques Whitford and AMEC 2010)					



Photo 1 - No channel is present between Haisla Blvd and Bish FSR, but water may be conveyed in a culvert.



Photo 2 - Watercourse downstream of Haisla Blvd.



Photo 3 - Culvert outlet at Haisla Blvd.

SITE DETAILS			
Watercourse Name:	DL-17	Coordinates:	53.990352, -128.69967
Stream Class:	S6	Survey Date:	25-Jul-24
Flow Periodicity:	Intermittent	Field Crew:	OG, AS

CHANNEL MEASUREMENTS					
Channel Width (m)	3.85				
Wetted Width (m)	1.29				
Max. Riffle Wetted Depth (m)	0.07				
Max. Pool Depth (m)	0.25				
Pool Tailout Depth (m)	0.05				
Residual Pool Depth (m)					
Bankfull Depth (m)					
Gradient (%)	30				
Crown Closure (%)					
Pool / Riffle / Run (%)			20/20/60		

BANK MEASUREMENTS		Left	Right	Left	Right	Left	Right	Left	Right	Left	Right
Bank Height (m)		1.22	0.7								
Bank Shape		S	S								
Bank Slope (°)		20	6								
Dom. Bank Texture		C	LG								
Subdom. Bank Texture		O	O								

BANK STABILITY		Left	Right	CHANNEL CHARACTERISTICS	
Average % Bank Stability	Stable	10	10	Pattern	Coupling
	Moderately Stable	50	50	Islands	Confinement
	Unstable	40	40	Bars	Morphology

COVER CHARACTERISTICS			Left			Right			
Instream Cover (% of Stream Profile)	LWD	0	Overhead Cover (% of Stream Profile)	UC Bank	0	Riparian Veg. Cover (%)	Bare	10	30
	SWD	5		Grass/Forbe	0		Grass	0	0
	Boulders	0		Tree/Shrub	20		Shrub	75	45
	Water Visibility	0		Overhead LWD	5		Conifer	5	5
	Vegetation	0		Total	25		Deciduous	10	20
Total	5			Wetland	0	0			

STREAM BED		WATER QUALITY		
Substrate (% of Stream Profile Area)	Organics	0	Time (HH:MM)	13:48
	Fines	0	Clarity	Clear
	Sands	0	Depth (m)	0.25
	Sm Gravel (SG)	5	Water Temperature (°C)	11.60
	Lg Gravel (LG)	10	Dissolved Oxygen (mg/L)	10.66
	Cobble	30	Specific Conductivity (µs/cm)	34.40
	Sm Boulder (SB)	15	pH	7.47
	Lg Boulder (LB)	20		
	Bedrock	10		
% Embeddedness	<25	HABITAT QUALITY		
% Spawning Gravel	0	N/A. Not fish habitat.		

FISH SAMPLING					GENERAL COMMENTS
Method	Effort	Species	Catch (#)	CPUE	A bedrock falls >30 m tall is present downstream of crossings and Bish Creek FSR, which is a barrier to fish access. Areas downstream of the falls are potentially fish-bearing.
EF	45 s	NFC	NFC	N/A	
Previous Fish Capture: eDNA sample tested negative for fish presence in 2017 u/s of Bish Creek FSR (Hemmera). CT captured d/s of falls in 2005 using EF (Northern Gateway 2010)					



Photo 1 - Example transect of habitat downstream of Bish FSR (near pipeline centreline) looking upstream



Photo 2 - Example transect of habitat downstream of Bish FSR (near pipeline centreline) looking downstream



Photo 3 - Bedrock falls more than 30 m tall downstream of crossings and Bish FSR.

SITE DETAILS			
Watercourse Name:	DL-18	Coordinates:	53.987415, -128.70021
Stream Class:	S5	Survey Date:	26-Jul-24
Flow Periodicity:	Possibly Permanent	Field Crew:	OG, SS

CHANNEL MEASUREMENTS					
Channel Width (m)	3.25	6.50			
Wetted Width (m)	0.87	2.75			
Max. Riffle Wetted Depth (m)	0.11	0.11			
Max. Pool Depth (m)	0.00	0.00			
Pool Tailout Depth (m)	0.00	0.00			
Residual Pool Depth (m)					
Bankfull Depth (m)	0.70	0.75			
Gradient (%)	9	39			
Crown Closure (%)	40	55			
Pool / Riffle / Run (%)	20/20/60				

BANK MEASUREMENTS	Left		Right		Left		Right		Left		Right	
Bank Height (m)	0.85	0.5	0.8	4.15								
Bank Shape	S	S	S	S								
Bank Slope (°)	2	2	9	11								
Dom. Bank Texture	LG	SG	C	C								
Subdom. Bank Texture	O	O	O	SB								

BANK STABILITY			
Average % Bank Stability	Stable	30	20
	Moderately Stable	35	48
	Unstable	35	32

CHANNEL CHARACTERISTICS			
Pattern		Coupling	
Islands		Confinement	
Bars		Morphology	

COVER CHARACTERISTICS						
Instream Cover (% of Stream Profile)	LWD	1				
	SWD	3				
	Boulders	0				
	Water Visibility	0				
	Vegetation	2				
	Total	6				
Overhead Cover (% of Stream Profile)	UC Bank	0				
	Grass/Forbe	38				
	Tree/Shrub	15				
	Overhead LWD	2				
	Total	55				
Riparian Veg. Cover (%)			Left		Right	
	Bare	45	45			
	Grass	0	0			
	Shrub	38	42			
	Conifer	12	3			
	Deciduous	5	10			
Wetland	0	0				

STREAM BED		
Substrate (% of Stream Profile Area)	Organics	2
	Fines	0
	Sands	3
	Sm Gravel (SG)	5
	Lg Gravel (LG)	5
	Cobble	13
	Sm Boulder (SB)	25
	Lg Boulder (LB)	17
	Bedrock	30
	% Embeddedness	<25
% Spawning Gravel	14	

WATER QUALITY			
Time (HH:MM)	11:02		
Clarity	Clear		
Depth (m)	0.25		
Water Temperature (°C)	13.50		
Dissolved Oxygen (mg/L)	10.18		
Specific Conductivity (µs/cm)	42.90		
pH	7.00		

HABITAT QUALITY	
N/A. Not fish habitat.	

FISH SAMPLING				
Method	Effort	Species	Catch (#)	CPUE
EF	66 s	NFC	NFC	N/A
Previous Fish Capture:				

GENERAL COMMENTS
 A bedrock falls with a 75% gradient over 30 m is present at the mouth of the watercourse, which limits fish access.



Photo 1 - Transect downstream of Bish FSR, facing upstream



Photo 2 - Transect downstream of Bish FSR, facing downstream



Photo 3 - Bedrock falls with 75% gradient over 30 m at mouth of watercourse.

SITE DETAILS			
Watercourse Name:	DL-18.5	Coordinates:	53.981334, -128.701809
Stream Class:	S6	Survey Date:	25-Jun-24
Flow Periodicity:	Intermittent	Field Crew:	OG, AS

CHANNEL MEASUREMENTS		AVG			
Channel Width (m)		4.20	0.76	1.48	
Wetted Width (m)		0.00	0.39	0.75	
Max. Riffle Wetted Depth (m)					
Max. Pool Depth (m)			0.20	0.12	
Pool Tailout Depth (m)			0.20	0.02	
Residual Pool Depth (m)					
Bankfull Depth (m)		0.40	0.42	0.48	
Gradient (%)		32	33	35	
Crown Closure (%)		35	30	30	
Pool / Riffle / Run (%)		50/0/0			

BANK MEASUREMENTS		Left		Right		Left		Right		Left		Right	
Bank Height (m)		0.35	1	1.5	2	2.2	7						
Bank Shape		S	S	S	S	S	S						
Bank Slope (°)		5	10	30	50	15	65						
Dom. Bank Texture		O	O	O	O	O	O						
Subdom. Bank Texture		C	C	C	C	LB	B						

BANK STABILITY		Left		Right		CHANNEL CHARACTERISTICS	
Average % Bank Stability	Stable	5	5	Pattern		Coupling	
	Moderately Stable	60	70	Islands		Confinement	
	Unstable	35	25	Bars		Morphology	

COVER CHARACTERISTICS		Left				Right									
Instream Cover (% of Stream Profile)	LWD	3				UC Bank		3		Bare		20		10	
	SWD	2				Grass/Forbe		0		Grass		0		0	
	Boulders	12				Tree/Shrub		15		Shrub		45		72	
	Water Visibility	0				Overhead LWD		2		Conifer		5		5	
	Vegetation	0				Total		20		Deciduous		30		13	
Total	17								Wetland		0		0		

STREAM BED		WATER QUALITY			
Substrate (% of Stream Profile Area)	Organics	8	Time (HH:MM)	11:49	
	Fines	0	Clarity	Clear	
	Sands	5	Depth (m)	0.20	
	Sm Gravel (SG)	10	Water Temperature (°C)	10.20	
	Lg Gravel (LG)	15	Dissolved Oxygen (mg/L)	10.62	
	Cobble	28	Specific Conductivity (µs/cm)	94.60	
	Sm Boulder (SB)	20	pH	6.81	
	Lg Boulder (LB)	8			
Bedrock	5				
% Embeddedness	0	HABITAT QUALITY			
% Spawning Gravel	0	N/A. Not fish habitat.			

FISH SAMPLING					GENERAL COMMENTS
Method	Effort	Species	Catch (#)	CPUE	Step pool morphology with low flows, which are a barrier to fish passage.
Previous Fish Capture:					



Photo 1 - Transect downstream of Bish FSR, facing downstream



Photo 2 - Side channel downstream of Bish FSR, facing upstream



Photo 2 - Side channel running down old skid trail downstream of Bish FSR, facing upstream

SITE DETAILS			
Watercourse Name:	DL-18.6	Coordinates:	53.980211, -128.702015
Stream Class:	S6	Survey Date:	24-Jul-24
Flow Periodicity:	Intermittent	Field Crew:	OG, SS

CHANNEL MEASUREMENTS						
Channel Width (m)	1.62	1.27	2.46			
Wetted Width (m)	0.67	0.93	0.65			
Max. Riffle Wetted Depth (m)	0.03		0.03			
Max. Pool Depth (m)	0.22		0.07			
Pool Tailout Depth (m)	0.02		0.01			
Residual Pool Depth (m)						
Bankfull Depth (m)	0.43	0.05	0.57			
Gradient (%)	25	30	20			
Crown Closure (%)	60	70	80			
Pool / Riffle / Run (%)	5/0/95					

BANK MEASUREMENTS											
	Left		Right		Left		Right		Left		Right
Bank Height (m)	0.55	1.8	0.31	3	1.2	1.4					
Bank Shape	S	V	S	S	S	S					
Bank Slope (°)	5	60	20	50	50	40					
Dom. Bank Texture	SG	O	O	O	O	O					
Subdom. Bank Texture	O	F	F	F	C	C					

BANK STABILITY			CHANNEL CHARACTERISTICS		
	Left	Right			
Average % Bank Stability	Stable	0	0	Pattern	Coupling
	Moderately Stable	5	5	Islands	Confinement
	Unstable	95	95	Bars	Morphology

COVER CHARACTERISTICS				Left				Right			
Instream Cover (% of Stream Profile)	LWD	30		Overhead Cover (% of Stream Profile)	UC Bank	10		Riparian Veg. Cover (%)	Bare	75	75
	SWD	0			Grass/Forbe	0			Grass	0	0
	Boulders	5			Tree/Shrub	0			Shrub	10	10
	Water Visibility	0			Overhead LWD	20			Conifer	5	5
	Vegetation	0			Total	30			Deciduous	10	10
Total	35					Wetland	0	0			

STREAM BED			WATER QUALITY			
Substrate (% of Stream Profile Area)	Organics	5	Time (HH:MM)	11:28		
	Fines	5	Clarity	Clear		
	Sands	0	Depth (m)	0.25		
	Sm Gravel (SG)	15	Water Temperature (°C)	11.60		
	Lg Gravel (LG)	10	Dissolved Oxygen (mg/L)	10.31		
	Cobble	20	Specific Conductivity (µs/cm)	50.50		
	Sm Boulder (SB)	20	pH	7.12		
	Lg Boulder (LB)	20				
Bedrock	5					
% Embeddedness	<25					
% Spawning Gravel	0					

HABITAT QUALITY	
N/A. Not fish habitat.	

FISH SAMPLING					GENERAL COMMENTS
Method	Effort	Species	Catch (#)	CPUE	
EF	56 s	NFC	NFC	N/A	Pool depth and steep slopes do not support upstream fish passage.
Previous Fish Capture:					



Photo 1 - Transect downstream of Bish FSR, facing upstream



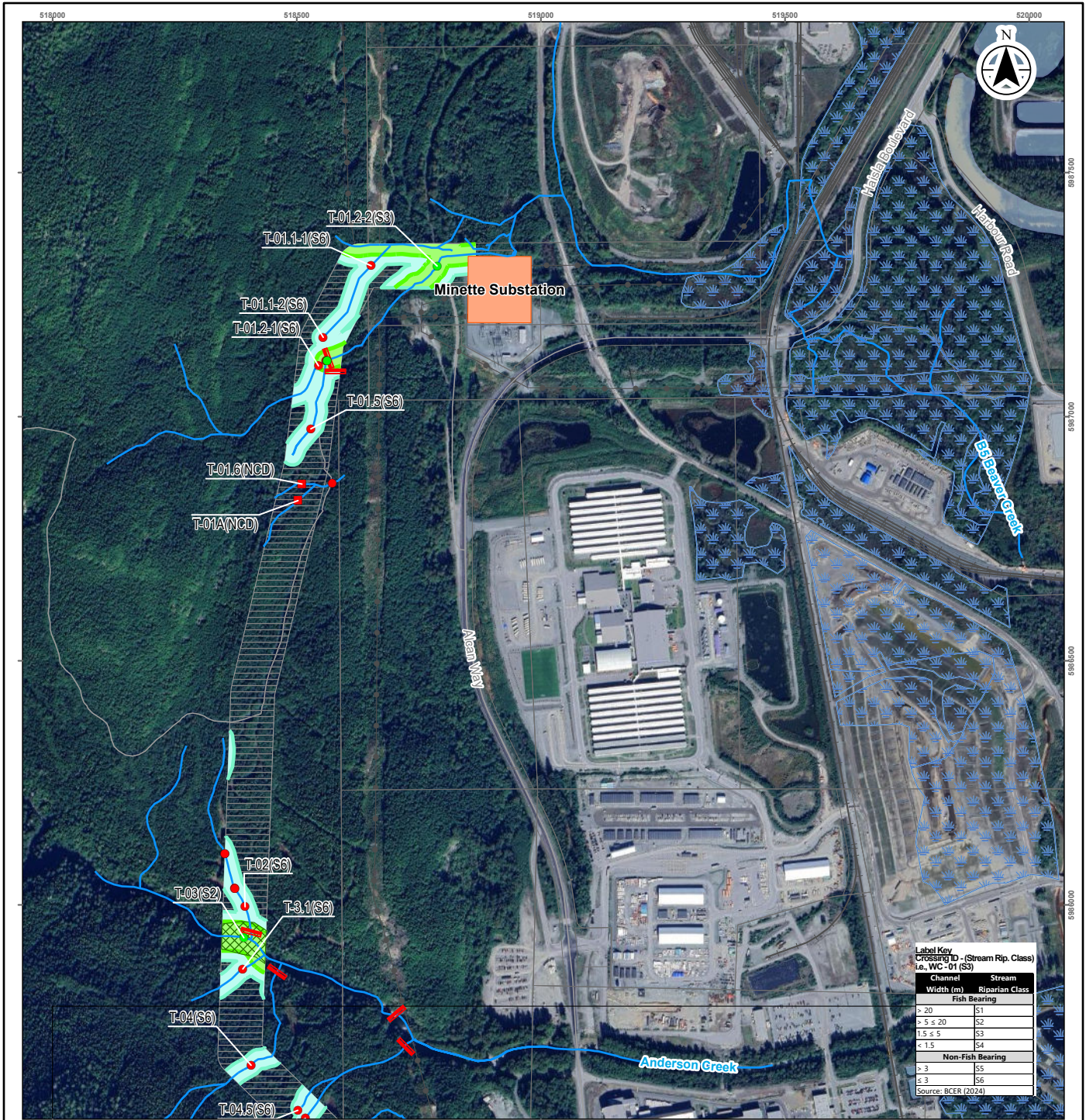
Photo 2 - Transect downstream of Bish FSR, facing downstream



Photo 3 - Transect downstream of Bish FSR, facing downstream.

Attachment C Riparian Clearing Mapbook

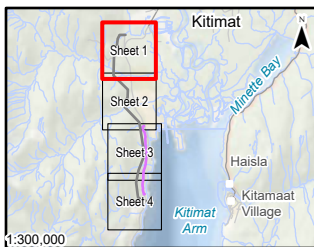




Label Key
Crossing ID - (Stream Rip. Class)
i.e. WC-01 (S3)

Channel Width (m)	Stream Riparian Class
Fish Bearing	
> 20	S1
> 5 ≤ 20	S2
1.5 ≤ 5	S3
< 1.5	S4
Non-Fish Bearing	
> 3	S5
≤ 3	S6

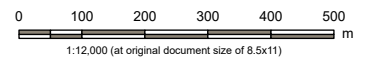
Source: BCER (2024)



Notes
 1. Coordinate System: NAD 1983 UTM Zone 9N
 2. Data Sources: DataBC, Government of British Columbia; Natural Resources Canada; Canadian Hydrographic Service
 3. Imagery: ESRI World Imagery; PTE 10cm 2017 Orthoimagery

- Road
- Railway
- Transmission Line
- Watercourse
- Waterbody
- Wetland Ecosystem
- Cadastral (Legal Lot) Boundary
- District of Kitimat Municipal Boundary
- Minette Substation
- Alternative Transmission Line
- No Riparian Tree Clearing

- Watercourse Crossing Fish Presence**
- Not Present
 - Present
 - Non-classified Drainage (NCD) - Not Present
- Riparian Impact**
- RMA
 - RRZ
- Fisheries Data**
- Observed Barrier (i.e., waterfall, cascade, gradient, culvert)



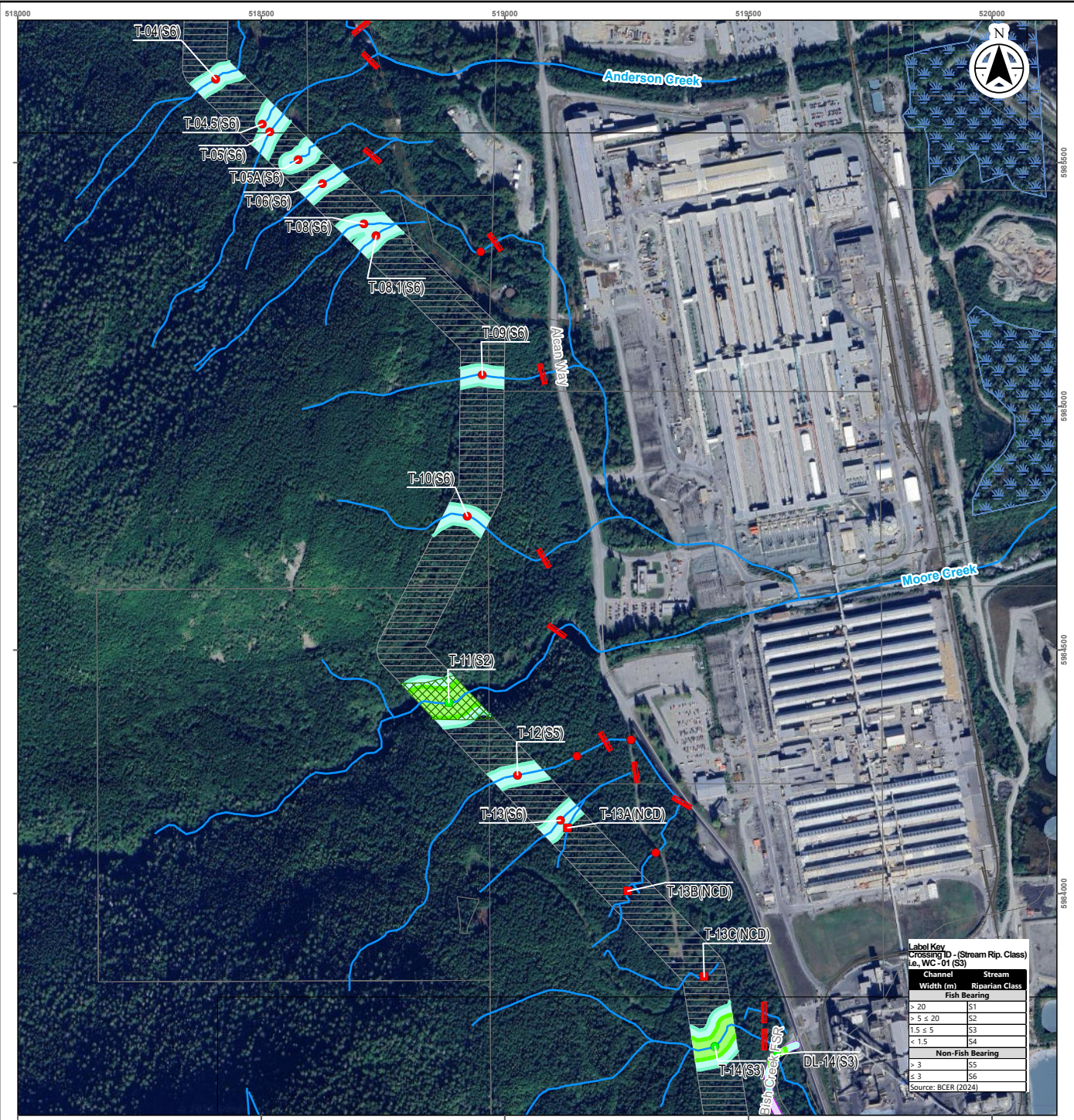
Project Location: Kitimat, British Columbia
 Project Number: 12322394
 Prepared by: JPOUCHER on 20241015
 Requested by: RKELLER on 20240808
 Review by: IGRUSHI on 20240821

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 Cedar LNG Partners LP
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 Freshwater Fish Technical Report

Figure No. **Appendix C** (Sheet 1 of 4)

Title
Riparian Clearing

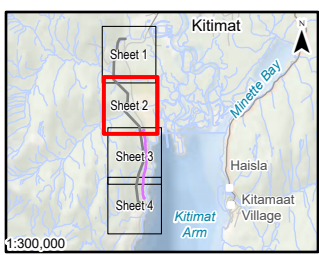
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Label Key
Crossing ID - (Stream Rip. Class)
i.e., WC-01 (S3)

Channel Width (m)	Stream Riparian Class
Fish Bearing	
> 20	S1
> 5 ≤ 20	S2
1.5 ≤ 5	S3
< 1.5	S4
Non-Fish Bearing	
≥ 3	S5
≤ 3	S6

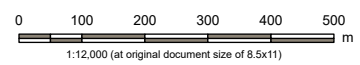
Source: BCER (2024)



Notes
 1. Coordinate System: NAD 1983 UTM Zone 9N
 2. Data Sources: DataBC, Government of British Columbia; Natural Resources Canada; Canadian Hydrographic Service
 3. Imagery: ESRI World Imagery; PTE 10cm 2017 Orthoimagery

- Road
- Railway
- Transmission Line
- Watercourse
- Waterbody
- Wetland Ecosystem
- Cadastral (Legal Lot) Boundary
- District of Kitimat Municipal Boundary
- Distribution Powerline
- Alternative Transmission Line
- No Riparian Tree Clearing

- Watercourse Crossing Fish Presence**
- Not Present
 - Present
 - Non-classified Drainage (NCD) - Not Present
- Riparian Impact**
- RMA
 - RRZ
- Fisheries Data**
- Observed Barrier (i.e., waterfall, cascade, gradient, culvert)



Project Location: Kitimat, British Columbia
 Project Number: 123222394
 Prepared by: JPOUCHER on 20241015
 Requested by: RKELE on 20240808
 Review by: IGURESHI on 20240821

Client/Project/Report: Cedar LNG Partners LP
 Cedar LNG Project
 EA Amendment
 Freshwater Fish Technical Report

Figure No. Appendix C (Sheet 2 of 4)
 Title: Riparian Clearing

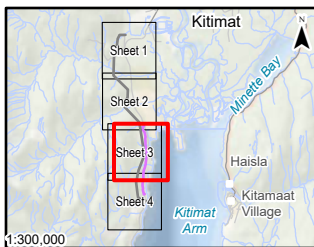
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Label Key
Crossing ID - (Stream Rip. Class)
i.e., WC-01 (S3)

Channel Width (m)	Stream Riparian Class
Fish Bearing	
> 20	S1
> 5 ≤ 20	S2
1.5 ≤ 5	S3
< 1.5	S4
Non-Fish Bearing	
> 3	S5
≤ 3	S6

Source: BCER (2024)



Notes
 1. Coordinate System: NAD 1983 UTM Zone 9N
 2. Data Sources: DataBC, Government of British Columbia; Natural Resources Canada; Canadian Hydrographic Service
 3. Imagery: ESRI World Imagery; PTE 10cm 2017 Orthoimagery

- Road
- Railway
- Watercourse
- Waterbody
- Wetland Ecosystem
- Cadastral (Legal Lot) Boundary
- District of Kitimat Municipal Boundary
- Distribution Powerline
- Alternative Transmission Line

Watercourse Crossing Fish Presence

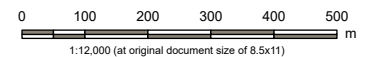
- Not Present
- Present
- Non-classified Drainage (NCD) - Not Present

Riparian Impact

- RMA
- RRZ

Fisheries Data

- Observed Barrier (i.e., waterfall, cascade, gradient, culvert)



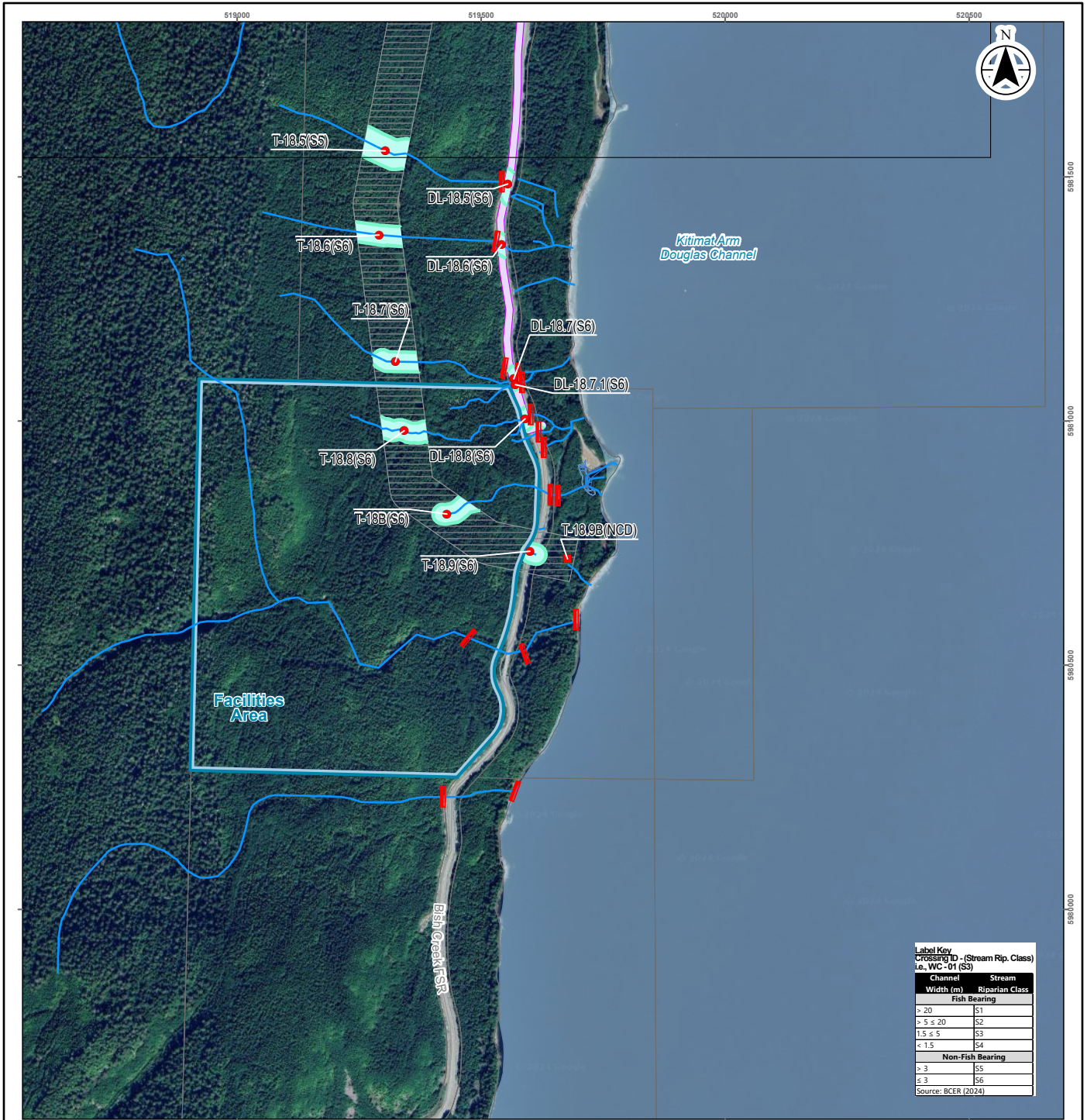
Project Location: Kitimat, British Columbia
 Project Number: 123222394
 Prepared by: JPOUCHER on 20241015
 Requested by: RKELLER on 20240808
 Review by: IGURESHI on 20240821

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Figure No.
Appendix C (Sheet 3 of 4)

Title
Riparian Clearing

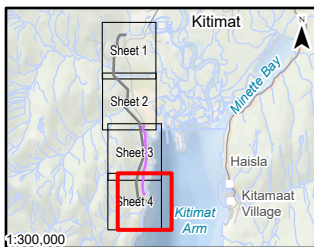
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Label Key
Crossing ID - (Stream Rip. Class)
i.e., WC-01 (S3)

Channel Width (m)	Stream Riparian Class
Fish Bearing	
> 20	S1
> 5 ≤ 20	S2
1.5 ≤ 5	S3
< 1.5	S4
Non-Fish Bearing	
> 3	S5
≤ 3	S6

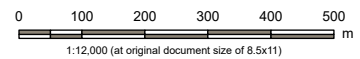
Source: BCER (2024)



Notes
 1. Coordinate System: NAD 1983 UTM Zone 9N
 2. Data Sources: DataBC, Government of British Columbia; Natural Resources Canada; Canadian Hydrographic Service
 3. Imagery: ESRI World Imagery; PTE 10cm 2017 Orthoimagery

- Road
- Watercourse
- Waterbody
- Wetland Ecosystem
- Cadastral (Legal Lot) Boundary
- District of Kitimat Municipal Boundary
- Distribution Powerline
- Alternative Transmission Line
- Project Area

- Watercourse Crossing Fish Presence**
- Not Present
 - Non-classified Drainage (NCD) - Not Present
- Riparian Impact**
- RMA
- Fisheries Data**
- Observed Barrier (i.e., waterfall, cascade, gradient, culvert)



Project Location: Kitimat, British Columbia
 Project Number: 123222394
 Prepared by: JPOUCHER on 20241015
 Requested by: RKELLER on 20240808
 Review by: IGURESHI on 20240821

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Figure No. **Appendix C** (Sheet 4 of 4)
 Title **Riparian Clearing**

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Appendix D

Marine 2024 ROV Survey Results

To: Josh Miller and Lara Taylor
Cedar LNG Partners LP

From: Summer Schulte, Sarah Smith, and
Ward Prystay
Stantec Consulting Ltd.

Project/File: 123222394

Date: September 19, 2024

Reference: Cedar LNG Project | Summary of May 2024 ROV Survey Results

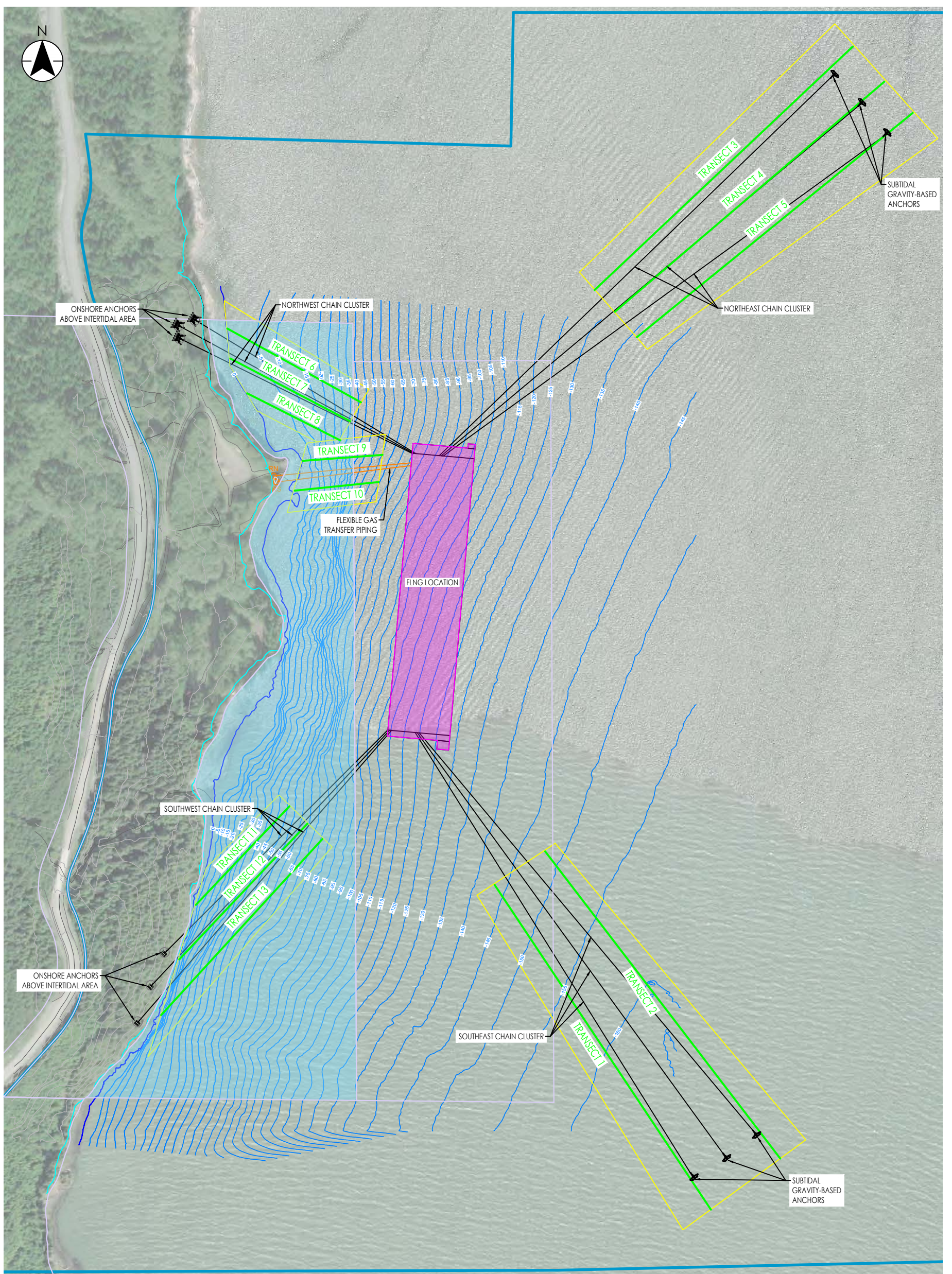
This memo has been prepared to provide a summary of the remotely operated vehicle (ROV) survey completed from May 4 to 5, 2024 where infrastructure for the Cedar LNG Project (the Project) could interact with the existing marine fish and fish habitat.

1 Introduction

Cedar LNG Partners LP (Cedar), a Haisla Nation led partnership with Pembina Pipeline Corporation (Pembina), is constructing a liquefied natural gas (LNG) export facility within the District of Kitimat, British Columbia (BC). The Project consists of a floating liquefied natural gas (FLNG) production and storage facility, marine terminal, and related infrastructure for the export of LNG. The marine terminal includes the following in-water components (Figure 1):

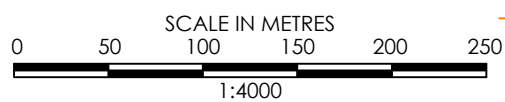
- A floating LNG (FLNG) facility to produce and store LNG.
- A catenary mooring system. The FLNG facility will be moored using four chain clusters originating from the bow and stern of the FLNG. The western (shoreward) side of the FLNG will be moored to the shoreline, with the anchors located above the higher high water mean tide (HHWMT) and the eastern (seaward) side will be moored to six gravity-based anchors (GBA) on the seafloor.
- Gas transfer infrastructure consisting of two flexible subsea natural gas pipelines (16-inch outside diameter nominal pipe size [NPS 16]) that will extend from the shoreline to the FLNG facility. The gas transfer line will have a protective concrete blanket placed over it across the intertidal shoreline area to protect the pipeline from damage caused by debris, vessels, etc.

A ROV survey was completed to better understand the fish and fish habitat present on the seafloor near the proposed GBA locations, anchor chain footprints, and gas transfer pipeline footprints.



LEGEND

- BATHYMETRY CONTOUR (0 m MSL)
- HHWMT (5.3 m MSL)
- - - ROV SURVEY AREA
- ROV SURVEY TRANSECT
- GAS TRANSFER INFRASTRUCTURE
- PROJECT AREA
- WATER LOT



Project Information
 Project No.: 123222394
 Scale: 1:4000
 Date: 2024-SEP-13
 Drawn by: G. BRIONES
 Checked by: S. SCHULTE
 Project Location
 KITIMAT, BC

Client/Project
 CEDAR LNG PARTNERS LP
 CEDAR LNG PROJECT

Title
ROV SURVEY TRANSECTS

Figure No.

Reference: Cedar LNG Project | Summary of May 2024 ROV Survey Results

2 Methods

Two Stantec qualified professionals (QP) completed the marine fish and fish habitat survey on May 4 and 5, 2024 using a Deep Trekker Pivot ROV. The crew operated the ROV from the deck of a boat (Kermodei Adventures) using a 300-meter tether. The boat was positioned along predetermined transects and advanced along the transect allowing the ROV to travel along the full length of the transects. The crew surveyed 13 transects collecting global positioning system (GPS) coordinates, video footage and still photos (Figure 1).

After the survey, the video footage was reviewed and processed by a QP to document the substrate types, and flora and fauna present. Organisms were identified to the lowest practicable taxonomic level recognizing some of the challenges with species identification from the ROV video. In some instances, organisms were only in the ROVs field of view for a short time, or only a portion of the organism would be visible (ex. a few arms of the starfish in the corner of the screen). As a result, identification of organisms to the species level was not always possible.

Representative photos were also captured from the video files and are presented in Attachment A.

3 Results

A summary of all of the substrates, flora and fauna observed by transects is provided below. Representative photos for each of the transects is provided in Attachment A.

Table 1 **Approximate Distance ROV Travelled Along Transects**

Transect	Distance Covered (m)
1	295
2	383
3	382
4	410
5	390
6	160
7	92
8	121
9	98
10	91
11	97
12	171
13	215

Reference: Cedar LNG Project | Summary of May 2024 ROV Survey Results

Transect 1:

The transect was captured in 19.4 minutes of footage. The ROV travelled 295 m along the transect (Table 1). It started at a depth of 163.9 m and ended at a depth of 156.7 m. Temperature remained at 6°C throughout the transect.

Substrates along the transect were primarily composed of fines and sands. Woody debris was scattered along the transect.

Shrimp (*Pandalus spp.*) were the most abundant invertebrates, with 94 individuals observed along the transect. Humpback shrimp (*Pandalus hypinotus*) and pacific prawns (*Pandalus platyceros*) were the only identifiable species; however, it is likely that other species were present. Two tanner crabs (*Chinonocetes bairdi*) and one squat lobster (*Munida quadrispina*) were observed along the transect. One giant sea cucumber (*Parastichopus californicus*) and 19 crimson anemones (*Cribrinopsis fernaldi*) were observed (Attachment A; Transect 1 Photo 1 and 2).

A total of 24 fish were observed along the transect, resulting in a catch-per-unit-effort (CPUE) of 1.24 fish/minute. Fish observed included 13 flatfish (Family *Pleuronectidae*), four eelpout (*Lycodes spp.*), and seven fish of an unidentifiable species.

Transect 2:

The transect was captured in 28.02 minutes of footage. The ROV travelled 383 m along the transect (Table 1). It started at a depth of 164.7 m and ended at a depth of 151.2 m. Temperature remained at 6°C throughout the transect.

Substrates along the transect were primarily composed of fines and sands. Woody debris was scattered along the transect.

The most commonly observed invertebrate were shrimp, with 158 individuals observed along the transect. Humpback shrimp were the only identifiable species; however, it is likely that other species were present. Four squat lobsters were observed along the transect, as well as one giant sea cucumber (Attachment A; Transect 2 Photo 1 and 2). Twenty-two crimson anemones, one moon jelly (*Aurelia labiata*), as well as one tube dwelling anemone (*Pachycerianthus fimbriatus*) were also observed. Unidentified invertebrate casings were observed on a piece of woody debris (Attachment A; Transect 2 Photo 1 and 2).

A total of 32 fish were observed along the transect, resulting in a CPUE of 1.14 fish/minute. Fish observed included 15 flatfish, eight eelpout, and nine fish of an unidentifiable species.

Transect 3:

The transect was captured in 24.62 minutes of footage. The ROV travelled 382 m along the transect (Table 1). It started at a depth of 154 m and ended at a depth of 88.6 m. Temperature at the beginning of the transect was 6°C and increased to 7°C by the end of the transect.

Reference: Cedar LNG Project | Summary of May 2024 ROV Survey Results

Substrates along the transect were primarily composed of fines and sands. Woody debris was scattered along the transect.

Shrimp (*Pandalus* spp.) were the most abundant invertebrates observed, with 116 observed along the transect. Humpback shrimp were the only identifiable species (Attachment A; Transect 3 Photo 1 and 2); however, it is likely that other species were present. Two tanner crabs and 19 crimson anemones were also observed (Attachment A; Transect 3 Photo 1 and 2). One jelly (Phylum Cnidaria) and one squid or octopus (Class Cephalopoda) were observed along the transect.

A total of 59 fish were observed along the transect, resulting in a CPUE 2.40 fish/minute. Fish observed included 24 flatfish (Attachment A; Transect 3 Photo 3), 20 eelpout, two sculpin (Family *Cottidae*) and 13 fish of an unidentifiable species.

Incidental observations included a bucket and bottle laying on the seafloor (Attachment A; Transect 3 Photo 4).

Transect 4:

The transect was captured in 32.05 minutes of footage. The ROV travelled 410 m along the transect (Table 1). It started at a depth of 151 m and ended at a depth of 106.3 m. Temperature remained at 6°C throughout the transect.

Substrates along the transect were primarily composed of fines and sands. Woody debris was scattered along the transect.

Shrimp were the most abundant invertebrates observed, with 103 individuals observed along the transect. Humpback shrimp and pacific prawns (Attachment A; Transect 4 Photo 1) were the only identifiable species; however, it is likely other unidentifiable species were present. A total of nine crabs were observed along the transect, consisting of five squat lobsters and four tanner crabs (Attachment A; Transect 4 Photo 2 and 4). Nine crimson anemones, as well as two jellyfish were also observed.

A total of 59 fish were observed along the transect, resulting in a CPUE of 1.84 fish/minute. Fish included 29 flatfish and 17 eelpout (Attachment A; Transect 4 Photo 3) and 13 fish of an unidentifiable species.

Transect 5:

The transect was captured in 36.12 minutes of footage. The ROV travelled 390 m along the transect (Table 1). It started at a depth of 151.3 m and ended at a depth of 116 m. Temperature remained at 6°C throughout the transect.

Substrates along the transect were primarily composed of fines and sands. Woody debris was scattered along the transect.

Reference: Cedar LNG Project | Summary of May 2024 ROV Survey Results

The most commonly observed invertebrate was shrimp, with 66 observed along the transect. Humpback shrimp were the only identifiable species (Attachment A; Transect 5 Photo 1); however, it is likely that other unidentifiable species were present. Two tanner crabs, one squat lobster, and two crabs (Order Decapoda) were observed along the transect. Ten crimson anemones and two moon jellyfish were observed (Attachment A; Transect 5 Photo 4).

A total of 47 fish were observed along the transect, resulting in a CPUE of 1.30 fish/minute. Fish observed included 15 flatfish, 12 eelpout (Attachment A; Transect 5 Photo 2 and 3), two sculpins, and 18 fish of an unidentifiable species.

Incidental observations included a metal structure on the seafloor, surrounded by multiple shrimp and fish.

Transect 6:

The transect was captured in 12.53 minutes of footage. The ROV travelled 160 m along the transect (Table 1). It started at a depth of 38.3 m and ended at a depth of 1.2 m. Temperature at the beginning of the transect was 6°C and increased to 8°C by the end of the transect.

Substrates along the transect started as fines and sands, transitioning to sands, gravels, and cobbles as the ROV travelled shoreward and water depth shallowed (Attachment A; Transect 6 Photo 3 and 4). As the ROV approached the end of the transect, substrates consisted of gravels and cobbles. Woody debris was scattered along the transect. In the shallower sections of the transect (i.e., in waters less than 3 m) the vegetation become more prominent, and rockweed was identifiable near the shore.

Invertebrates observed along the transect included two tanner crabs (Attachment A; Transect 6 Photo), three sea urchins, and one anemone.

Two fish were observed along the transect, resulting in a CPUE of 0.16 fish/minute. Fish observed included one flatfish and one sculpin (Attachment A; Transect 6 Photo 1).

Transect 7:

The transect was captured in 5.78 minutes of footage. The ROV travelled 92 m along the transect (Table 1). It started at a depth of 13.5 m and ended at a depth of 0.1 m. Temperature at the beginning of the transect was 6°C and increased to 9°C by the end of the transect.

Substrates along the transect started as sands and gravels, with lots of woody debris and patches of vegetation. There is a hard transition line to cobbles and large gravels at a depth of 5 m as the ROV worked its way closer to shore. The cobbles and large gravels were heavily coated with what appears to be silt and macroalgae. As the ROV approached the end of the transect substrates consisted of clean gravels and cobbles (Attachment A; Transect 7 Photo 2). The transect ended in a heavily vegetated area of rockweed.

Reference: Cedar LNG Project | Summary of May 2024 ROV Survey Results

Invertebrates observed along the transect included one Dungeness crab, three starfish, and two jellyfish (Attachment A; Transect 7 Photo 1).

No fish were observed along the transect, resulting in a CPUE of 0 fish/minute.

Transect 8:

The transect was captured in 7.95 minutes of footage. The ROV travelled 121 m along the transect (Table 1). It started at a depth of 35.5 m and ended at a depth of 1.9 m. Temperature at the beginning of the transect was 6°C and increased to 8°C by the end of the transect.

Substrates along the transect started as fines and sand, with some woody debris. The substrates eventually transitioned to sand and gravels, with patches of bedrock. Large patches of woody debris were observed. Cobbles and large gravels coated with what appears to be silt, macroalgae, and patches of rockweed become more prominent as the ROV moves towards the end of the transect. As the ROV approached the end of the transect the marine vegetation was dominantly rockweed.

Sea urchins were the most abundant invertebrate, with over 50 observed along the transect. Green sea urchins were the only identifiable species; however, it is likely other unidentifiable species were also present (Attachment A; Transect 8 Photo 2). Fourteen starfish were also observed.

Two fish were observed along the transect, resulting in a CPUE of 0.25 fish/minute. One sculpin (Attachment A; Transect 8 Photo 1) was observed, while the other fish moved through the ROVs field of vision too rapidly to allow for identification.

Transect 9:

The transect was captured in 12.65 minutes of footage. The ROV travelled 98 m along the transect (Table 1). It started at a depth of 63.7 m and ended at a depth of 0.1 m. Temperature at the beginning of the transect was 7°C and increased to 8°C by the end of the transect.

Substrates along the deeper portions of the along transect were primarily composed of fines and sands, transitioning to gravel/cobble/boulder habitat as the transect became shallower. Portions of bedrock were also observed. Woody debris was scattered along the transect. In the shallower sections of the transect the vegetation become more prominent, and rockweed was identifiable near the shore.

Sea urchins were the most abundant invertebrate, with over 300 observed along the transect. Species identified included green sea urchin (Attachment A; Transect 9 Photo 3 and 4); however, it is likely other unidentifiable species were present. While the sea urchins were more prominent on the gravel/cobble/boulder and bedrock habitat, a few were also observed on the finer substrates. The gravel/cobble/boulder and bedrock habitat were inhabited by a variety of invertebrates including barnacles (*Balanus spp.*) and blue mussels (*Mytilus spp.*). Other invertebrates observed included one anemone, as well two crabs. The one crab was identified as a tanner crab, while the other was hidden beneath a rock and prevented species identification.

Reference: Cedar LNG Project | Summary of May 2024 ROV Survey Results

A total of 15 fish were observed along the transect, resulting in a CPUE of 1.19 fish/minute. One spotfin sculpin (*Icelinus tenuis*), one great sculpin (*Myoxocephalus polyacanthocephalus*) (Attachment A; Transect 9 Photo 1), and five sculpin of an unidentified species were observed. Four eelpouts were observed along the transect, with one identified as a blackbelly eelpout (Attachment A; Transect 9 Photo 2). Four fish were of an unidentifiable species.

Incidental sightings included a piece of rope lying amongst the boulders.

Transect 10:

The transect was captured in 10.45 minutes of footage. The ROV travelled 91 m along the transect (Table 1). It started at a depth of 63.9 m and ended at a depth of 0.1 m. Temperature at the beginning of the transect was 7°C and increased to 9°C by the end of the transect.

Substrates along the deeper portions of the along transect were primarily composed of fines and sands, transitioning to gravel/cobble/boulder habitat as the transect became shallower. Portions of bedrock were also observed. Woody debris was scattered along the transect. In the shallower sections of the transect the vegetation become more prominent, and rockweed was identifiable near the shore (Attachment A; Transect 10 Photo 4).

Sea urchins were the most abundant invertebrate, with over 350 observed along the transect. Green sea urchin was the only species identified; however, it is likely other unidentifiable species were present. While the sea urchins were more prominent on the gravel/cobble/boulder and bedrock habitat, a few were also observed on the finer substrates. The gravel/cobble/boulder and bedrock habitat were inhabited by a variety of invertebrates including barnacles and blue mussels. One tanner crab, as well as one unidentified crab were observed. One sunflower star (*Pycnopodia helianthoides*), as well as 12 starfish of an unidentified species were observed along the transect. One cloud sponge (*Aphrocallistes vastus*) and one glass sponge (Class *Hexactinellida*) of an unidentified species was observed. A total of 12 tubeworms, three crimson anemones (Attachment A; Transect 10 Photo 1), and one jellyfish were also observed along the transect.

A total of 11 fish were observed along the transect, resulting in a CPUE of 1.05 fish/minute. Six of the fish observed along the transect were identified: one quillback rockfish (*Sebastes maliger*; Attachment A; Transect 10 Photo 3), a spotfin sculpin, an unidentified sculpin, an unidentified flatfish, one blackbelly eelpout (Attachment A; Transect 10 Photo 2), and one unidentified species of eelpout. The remaining five fish could not be identified.

Transect 11:

The transect was captured in 9.77 minutes of footage. The ROV travelled 97 m along the transect (Table 1). It started at a depth of 56 m and ended at a depth of 0.1 m. Temperature at the beginning of the transect was 7°C, decreased to 6°C, and increased back up to 7°C by the end of the transect.

Reference: Cedar LNG Project | Summary of May 2024 ROV Survey Results

Substrates along the deeper portions of the along transect were primarily composed of fines and sands, transitioning to gravel/cobble/boulder habitat as the transect became shallower. Portions of bedrock were also observed. In the shallower sections of the transect the vegetation become more prominent, and rockweed was identifiable near the shore.

Sea urchins were the most abundant invertebrates observed along the transect, with over 200 observed. Species identified included green sea urchin (Attachment A; Transect 11 Photo 4); however, it is likely other unidentifiable species were also present. Sea urchins were predominately using the gravel/cobble/boulder and bedrock habitat. The gravel/cobble/boulder and bedrock habitat also supported a variety of invertebrates including barnacles and blue mussels. Two tanner crabs (Attachment A; Transect 11 Photo 1), one starfish, one glass sponge, one shrimp, one crimson anemone, one giant sea cucumber (Attachment A; Transect 11 Photo 3), and six jellyfish of an unidentified species were also observed along the transect.

A total of 10 fish were observed along the transect, resulting in a CPUE of 1.02 fish/minute. Two sculpins, and five eelpouts were observed. One of the eelpouts was a blackbelly eelpout (Attachment A; Transect 11 Photo 2). The remaining three fish were of an unidentifiable species.

Transect 12:

The transect was captured in 15.12 minutes of footage. The ROV travelled 171 m along the transect (Table 1). It started at a depth of 62.5 m and ended at a depth of 0.1 m. Temperature at the beginning of the transect was 7°C and increased to 8°C by the end of the transect.

Substrates along the deeper portions of the along transect were primarily composed of fines and sands, transitioning to boulder/bedrock habitat as the transect became shallower. In the shallower sections of the transect the vegetation become more prominent, and rockweed was identifiable near the shore.

Sea urchins were the most abundant invertebrate observed along the transect, with over 200 observed. Species identified included green sea urchin; however, it is likely other unidentifiable species were also present. Sea urchins were predominately using the gravel/cobble/boulder and bedrock habitat. The gravel/cobble/boulder and bedrock habitat also supported a variety of invertebrates including barnacles and blue mussels. One anemone, six shrimp, and two mollusks (Phylum Mollusca) ne cloud sponge, as well as 13 glass sponges (Attachment A; Transect 12 Photo 2 and 4), nine tanner crabs, one squat lobster, one gunpowder star (*Gephyreaster swifti*; Attachment A; Transect 13 Photo 3), one velcro star (*Stylasterias forreri*; Attachment A; Transect 12 Photo 1), and 10 starfish of an unidentified species were observed along the transect.

Approximately 40 fish were observed along the transect, resulting in a CPUE of 2.65 fish/minute. Nine sculpins and one flatfish were observed along the transect. Six yellowtail rockfish (*Sebastes flavidus*) and approximately 20 juvenile salmonids (*Oncorhynchus spp.*) were observed swimming along the transect. The remaining four fish were of an unidentifiable species.

Reference: Cedar LNG Project | Summary of May 2024 ROV Survey Results

Transect 13:

The transect was captured in 23.45 minutes of footage. The ROV travelled 215 m along the transect (Table 1). It started at a depth of 74.1 m and ended at a depth of 0.1 m. Temperature at the beginning of the transect was 7°C, decreased to 6°C, and increased up to 8°C by the end of the transect.

Substrates along the deeper portions of the along transect were primarily composed of fines and sands, transitioning to gravel/sand, and then boulder/bedrock habitat as the transect became shallower. Aquatic vegetation is sparse in the deeper sections of the transect, and identification is difficult due to limited light and the silty nature of the substrates coating the vegetation. In the shallower sections of the transect the vegetation become more prominent, and rockweed was identifiable near the shore.

Sea urchins were the most abundant invertebrate observed along the transect, with over 150 observed. Species identified included green sea urchin (Attachment A; Transect 13 Photo 4); however, it is likely other unidentifiable species were also present. Sea urchins were most prominent on the boulder/bedrock habitat; however, a few were observed in the deeper portions of the transect on the fine substrates. The boulder and bedrock habitat were also inhabited by a variety of invertebrates including barnacles and blue mussels. Ten tanner crabs (Attachment A; Transect 13 Photo 1), two Dungeness crabs (Attachment A; Transect 13 Photo 2), and four crab of an unidentified species were observed along the transect. One of the unidentified crabs was dead. Sixteen starfish, two jellyfish, three tubeworms, fifteen cloud sponges (Attachment A; Transect 13 Photo 3), and one anemone were observed along the transect.

A total of 22 fish were observed along the transect, resulting in a CPUE of 0.94 fish/minute. Eight sculpins were observed, with one of them identified as a spotfin sculpin. One flatfish, two eelpout, and 10 fish of unidentified species were also observed along the transect.

4 Summary

On May 4 and 5, 2024, 13 transects were surveyed using an ROV to collect biophysical information in areas where project infrastructure could interact with the existing marine fish and fish habitat. Substrates observed during the surveys followed similar patterns for all of the transects; fines at depth, transitioning to gravels, cobbles, boulder, and bedrock as the ROV approached the shore. The coarser substrates near the shoreline reflects the higher wind and water energy regime near the surface of Kitimat Arm. Marine vegetation was observed in the shallower waters throughout the transects (i.e., in waters less than 5 m) and was the densest close to shore. Habitat forming eelgrass beds or kelp forests were not present within the surveyed area. A variety of invertebrates and fish were observed; all were species with secure populations and none of the individuals identified to species were a species at risk.

Transects representing the eastern (seaward) side of the catenary mooring system (Transects 1, 2, 3, 4, and 5) all had similar CPUE's, ranging from 1.24 fish/min – 2.40 fish/min. The habitat was similar at all five transects, with substrates consisting of fines and muds along the entirety of each transect. Transects 6, 7, and 8, which surveyed habitats in the vicinity of the northwestern (shoreward) section of the catenary mooring system, had the lowest CPUE of all the transects, ranging from 0 fish/min to 0.25 fish/min.

Reference: Cedar LNG Project | Summary of May 2024 ROV Survey Results

Transects 9 and 10, which surveyed habitats in the vicinity of the gas transfer infrastructure had a CPUE of 1.19 fish/min and 1.05 fish/min. Transects 10, 11, and 12, which surveyed habitats in the vicinity of the southwestern (shoreward) section of the catenary mooring, had the greatest range in CPUEs (1.02 fish/min, 2.65 CPUE fish/min, and 0.94 fish/min respectively). Habitat along the eight shoreward transects was composed of fines and sands, transitioning to gravel/cobble/boulder substrates as the transect became shallower. Vegetation near shore, as well as the cobble/boulder nature of the substrates could make it easier for fish to hide out of the view of the ROV. Incidental sightings of harbour seals (*Phoca vitulina*) and an unidentified sea lion species were recorded during the ROV surveys along transect 9 and 10 and their presence could also have impacted the number of fish observed.

We trust that the summary provided in this memorandum is helpful. Should you have any questions please do not hesitate to reach out.

Regards,

Stantec Consulting Ltd.

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Attachments: A: Photos

Reference: Cedar LNG Project | Summary of May 2024 ROV Survey Results

Attachment A Photo Appendix

Reference: Cedar LNG Project | Summary of May 2024 ROV Survey Results

Transect 1	
	
Photo 1—Crimson Anemone (<i>Cribrinopsis fernaldi</i>)	Photo 2—Crimson Anemone (<i>Cribrinopsis fernaldi</i>)
Transect 2	
	
Photo 1—Galatheid Crab (<i>Munida quadrispina</i>) and unidentified invertebrate casings	Photo 2—Giant Sea Cucumber (<i>Parastichopus californicus</i>)

Reference: Cedar LNG Project | Summary of May 2024 ROV Survey Results

Transect 3



Photo 1—Crimson Anemone (*Cribrinopsis fernaldi*) and a Humpback Shrimp (*Pandalus hypinotus*)



Photo 2—Three Crimson Anemone (*Cribrinopsis fernaldi*) and Shrimp (*Pandalus spp.*)





Photo 3—Unidentified species of flatfish (Family *Pleuronectidae*)



Photo 4—Incidental observation of bucket

Reference: Cedar LNG Project | Summary of May 2024 ROV Survey Results

Transect 4	
	
Photo 1—Pacific Prawn (<i>Pandalus platyceros</i>)	Photo 2—Squat Lobster (<i>Munida quadrispina</i>)
	
Photo 3—Blackbelly Eelpout (<i>Lycodes pacificus</i>) and an unidentified species of flatfish (Family <i>Pleuronectidae</i>)	Photo 4—Tanner Crab (<i>Chionoecetes bairdi</i>)

Reference: Cedar LNG Project | Summary of May 2024 ROV Survey Results

Transect 5



Photo 1—Humpback Shrimp (*Pandalus hypinotus*)



Photo 2—Two unidentified species of flatfish (Family *Pleuronectidae*) and an eelpout (*Lycodes spp.*)



Photo 3—Unidentified species of flatfish (Family *Pleuronectidae*)



Photo 4—Crimson Anenome (*Cribrinopsis fernaldi*) and a Humpback Shrimp (*Pandalus hypinotus*)

Reference: Cedar LNG Project | Summary of May 2024 ROV Survey Results

Transect 6



Photo 1—Unidentified species of sculpin (Family *Cottidae*)



Photo 2—Tanner Crab (*Chionoecetes bairdi*)



Photo 3—Substrates and aquatic vegetation

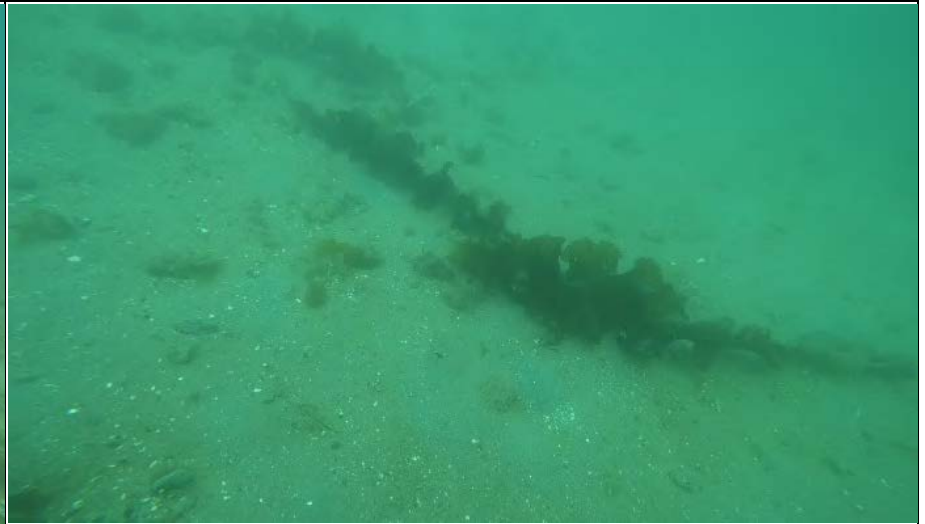


Photo 4—Substrates and aquatic vegetation

Reference: Cedar LNG Project | Summary of May 2024 ROV Survey Results

Transect 7



Photo 1—Unidentified species of jellyfish (Phylum Cnidaria)



Photo 2—Substrates and Rockweed (*Fucus spp.*)

Transect 8



Photo 1—Unidentified species of sculpin (Family *Cottidae*)



Photo 2—Green Sea Urchins (*Strongylocentrotus droebachiensis*)

Reference: Cedar LNG Project | Summary of May 2024 ROV Survey Results

Transect 9



Photo 1—Great Sculpin (*Myoxocephalus polyacanthocephalus*)



Photo 2—Blackbelly Eelpout (*Lycodes pacificus*)



Photo 3—Green Sea Urchins (*Strongylocentrotus droebachiensis*)



Photo 4—Green Sea Urchins (*Strongylocentrotus droebachiensis*)

Reference: Cedar LNG Project | Summary of May 2024 ROV Survey Results

Transect 10



Photo 1—Crimson Anenome (*Cribrinopsis fernaldi*)



Photo 2—Blackbelly Eelpout (*Lycodes pacificus*)



Photo 3—Quillback Rockfish (*Sebastes maliger*) hiding behind an unidentified species of glass sponge (Class Hexactinellida)



Photo 4—Rockweed (*Fucus* spp.)

Reference: Cedar LNG Project | Summary of May 2024 ROV Survey Results

Transect 11



Photo 1—Tanner Crab (*Chionoecetes bairdi*)



Photo 2—Blackbelly Eelpout (*Lycodes pacificus*)



Photo 3—Giant Sea Cucumber (*Parastichopus californicus*)



Photo 4—Green Sea Urchins (*Strongylocentrotus droebachiensis*)

Reference: Cedar LNG Project | Summary of May 2024 ROV Survey Results

Transect 12



Photo 1—Velcro Star (*Stylasterias forreri*)



Photo 2—Cloud sponge (*Aphrocallistes vastus*)



Photo 3—Gunpowder Star (*Gephyreaster swifti*)



Photo 4—Unidentified species of glass sponge (Class Hexactinellida)

Reference: Cedar LNG Project | Summary of May 2024 ROV Survey Results

Transect 13



Photo 1—Tanner Crab (*Chionoecetes bairdi*)



Photo 2—Two Dungeness Crabs (*Cancer magister*)



Photo 3—Cloud sponge (*Aphrocallistes vastus*)



Photo 4—Green Sea Urchins (*Strongylocentrotus droebachiensis*)

Appendix E

Heritage – 2020-0113: Interim Report –
Archaeological Impact Assessment of the 2024
Alternative Transmission Line and Distribution
Powerline Corridor

2020-0013: Interim Report – Archaeological Impact Assessment of 2024 Alternative Transmission Line and Distribution Powerline Corridor

Cedar LNG Amendment

October 21, 2024

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Interim Report No.
2020-0013-004



Limitations and Sign-off

This document entitled 2020-0013: Interim Report – Archaeological Impact Assessment of 2024 Alternative Transmission Line and Distribution Powerline Corridor was prepared by Stantec Consulting Ltd. (“Stantec”) for the account of Cedar LNG Partners LP (the “Client”). Any reliance on this document by any third party is strictly prohibited. The material in it reflects Stantec’s professional judgment in light of the scope, schedule and other limitations stated in the document and in the contract between Stantec and the Client. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. In preparing the document, Stantec did not verify information supplied to it by others. Any use which a third party makes of this document is the responsibility of such third party. Such third party agrees that Stantec shall not be responsible for costs or damages of any kind, if any, suffered by it or any other third party as a result of decisions made or actions taken based on this document.

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Cindy Hubick



Acknowledgements

Stantec Consulting Ltd. would like to thank Cedar LNG Partners LP for involving us in the project. We would also like to express our gratitude to the Haisla Nation for the opportunity to conduct meaningful heritage research within their traditional lands. We would like to acknowledge Haisla Nation Council – Environment Manager Candice Wilson for her support with coordinating study efforts. We also wish to thank Haisla member Chris Wilson, who participated in the June 2024 fieldwork.



Executive Summary

This report presents the results of an archaeological impact assessment (AIA) conducted by Stantec Consulting Ltd. in June 2024 for the alternative transmission line, new distribution powerline and expanded Marine Terminal Area for the Cedar LNG Project (the Project). The AIA was conducted under *Heritage Conservation Act* (HCA) Heritage Inspection Permit 2020-0013.

The Project is a liquefied natural gas (LNG) export facility within the District of Kitimat, British Columbia, proposed by Cedar LNG Partners LP, by its general partner Cedar LNG Partners (GP) Ltd. (Cedar), a Haisla Nation-led partnership with Pembina Pipeline Corporation. The Project will be located on Haisla Nation-owned land within the Nation's traditional territory, approximately three kilometres (km) west across Kitimat Arm from Kitamaat Village and approximately 10 km southwest of Kitimat's town centre. The Project is within the traditional territory of the Haisla Nation, a landscape they have been stewards of for over 9,000 years.

An AIA for the Project was completed in 2021 and 2022 under Permit 2020-0013 (Smith 2022, Gauvreau and Thompson 2024). Prior to these 2021-2022 AIAs, portions of the Project footprint had been subject to archaeological studies associated with adjacent and overlapping proposed developments under Permits 2011-0295, 2013-0149, and 2019-0225 (Haugrud 2019). The AIA in 2024 under Permit 2020-0013 assessed portions of a revised and new Project footprint that extends outside of the areas previously assessed (study area).

The alternative transmission line right-of-way will adversely impact three recorded archaeological sites (GaTe-11, GaTe-20 and FITe-133). All sites represent pre-1846 culturally modified tree sites and project impacts should be avoided through minor route modifications or will require a *Heritage Conservation Act* Section 12.4 Alteration Permit. No additional archaeological sites or areas of archaeological potential were identified during the 2024 AIA. No further archaeological assessment is recommended for the alternative transmission line, distribution powerline or expansion of the Marine Terminal Area. If changes to the Project are required, the changes should be reviewed by a qualified archaeologist to determine if additional work is recommended.



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Acronyms / Abbreviations

AIA	archaeological impact assessment
ASL	above sea level
BCER	British Columbia Energy Regulator
Cedar	Cedar LNG Partners (GP) Ltd., by its general partner Cedar LNG Partners (GP) Ltd.
CMT	culturally modified tree
FSR	Forestry Service Road
HCA	<i>Heritage Conservation Act</i>
LNG	liquefied natural gas
LPG	liquefied petroleum gas
Stantec	Stantec Consulting Ltd.
VRI	vegetation resource inventory



1 Introduction

Cedar LNG Partners LP, by its general partner Cedar LNG Partners (GP) Ltd. (Cedar), a Haisla Nation-led partnership with Pembina Pipeline Corporation, is proposing to construct and operate the Cedar LNG Project (the Project), a liquefied natural gas (LNG) export facility within the District of Kitimat, British Columbia (Figure 1). The Project is within the traditional territory of the Haisla Nation, a landscape they have been stewards of for over 9,000 years.

The proposed changes to the Project which comprise the Study area include:

- Add the option to relocate the 8.5-kilometre (km) long, 287 kilovolt (kV) transmission line from the original Transmission Line corridor between the Minette BC Hydro Substation and the Marine Terminal Area, downslope toward Douglas Channel, and to increase its right-of-way from 45 metres (m) to 90 m (referred to as the alternative transmission line)
- Add a new 2.8 km long, 25 kV distribution powerline line along the Bish Creek Forest Service Road (FSR) to the Marine Terminal Area
- Expand the Marine Terminal Area to encompass the anchors for the floating LNG (FLNG) facility's catenary mooring system.

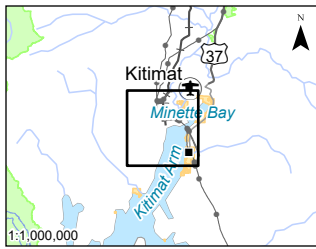
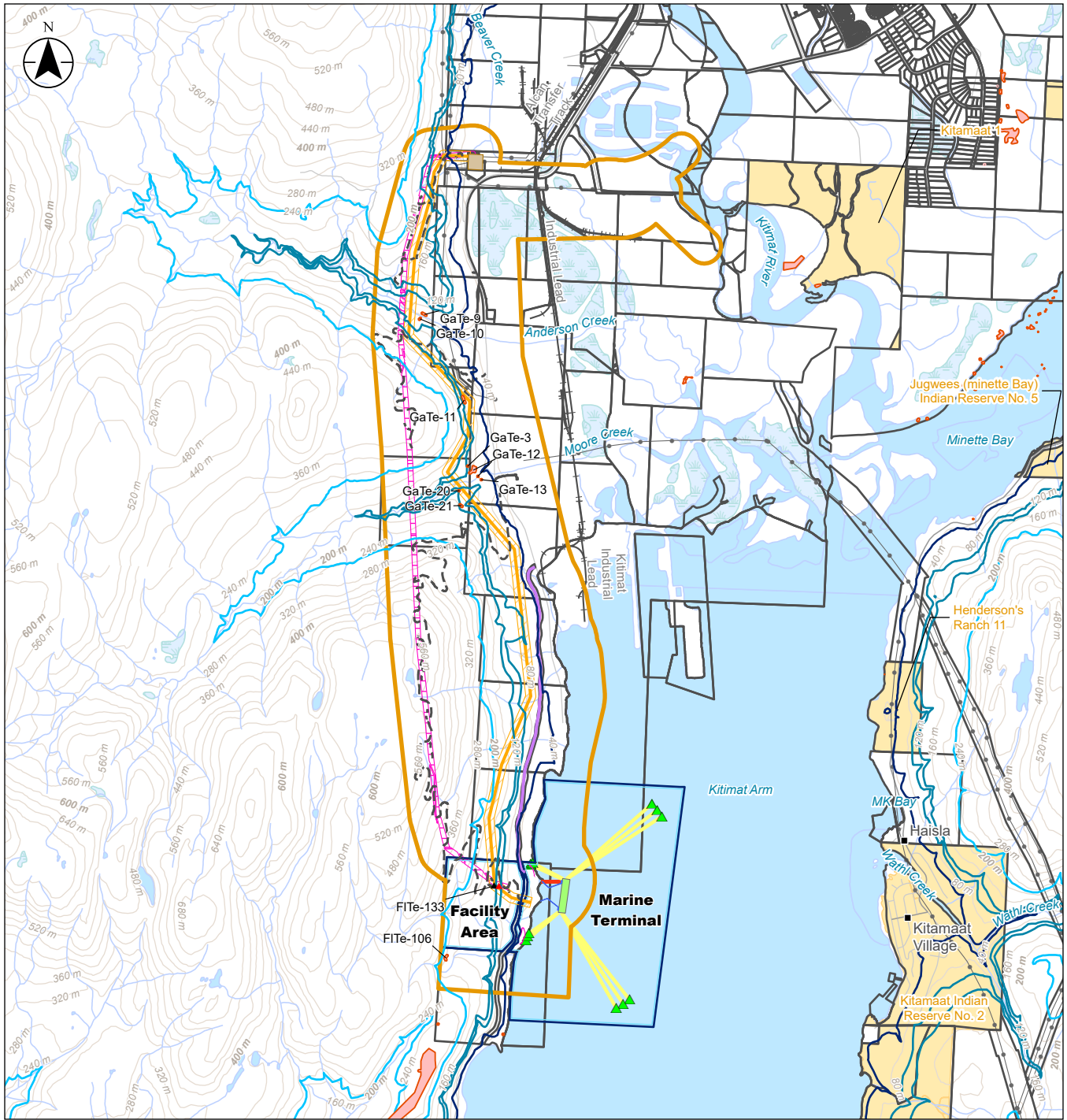
In June 2024, Stantec Consulting Ltd. (Stantec) conducted an Archaeological Impact Assessment (AIA) on behalf of Cedar. The assessment was carried out under the *Heritage Conservation Act* (HCA) Heritage Inspection Permit 2020-0013. Previous archaeological assessments had already covered the local and regional assessment areas (Project footprint), including both the Project and other overlapping development areas. The Project had undergone previous AIAs in 2021 and 2022 under the same permit (Smith 2022, Gauvreau and Thompson 2024).. Stantec reviewed the alternative transmission line and new distribution powerline against previous archaeological assessment coverage. The June 2024 field work specifically targeted areas where previous survey coverage had gaps. The focus was on assessing the revised Project footprint which extends beyond the areas assessed in 2021 and 2022 under Permit 2020-0013, as well as areas assessed under Permits 2011-0295, 2013-0149, and 2019-0225 (Haugrud 2019, Stantec 2015, and Stantec 2016).

The following Project components were subject to AIA in 2024 and comprise the study area:

- Alternative transmission line right-of-way
- New distribution powerline right-of-way
- Expanded Marine Terminal Area

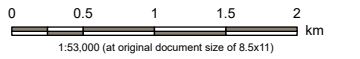


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Notes
 1. Coordinate System: NAD 1983 BC Environment Albers
 2. Data Sources: DataBC, Government of British Columbia; Natural Resources Canada

<p>Base Data</p> <ul style="list-style-type: none"> — Road — Local Street — Resource Road — Railway — Transmission Line — Paleoshoreline (~40 m above current sea level) — Paleoshoreline (~100 to 120 m above current sea level) — Paleoshoreline (~200 m above current sea level) — Topographic Contour — Watercourse — Waterbody — Wetland 	<ul style="list-style-type: none"> — Federal Land — Cadastral (Legal Lot) Boundary — Minette Substation — Original Transmission Line — Proposed Project Components — Alternative Transmission Line Corridor — Project Area — FLNG — Floating Access — Access — Access Road — Distribution Powerline — Alternative Transmission Line Centreline 	<ul style="list-style-type: none"> ▲ Mooring Anchor — Dynamic Riser — Mooring Line <p>Archaeological Assessment</p> <ul style="list-style-type: none"> — Previously Recorded Archaeological Site Boundary ▲ Previous Archaeological Site Boundary ▲ Updated Archaeological Site Boundary — Legacy Archaeological Site Boundary <p>Archaeological Assessment</p> <ul style="list-style-type: none"> — Revised Permit Area 2020-0013
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Project Location: Kitimat, BC
 Project Number: 123222394
 Prepared by JPOUCHER on 20241008
 Requested by KBOETIGER on 20240814
 Checked by SSMITH on 20240820

Client/Project/Report: Cedar LNG Partners LP
 Cedar LNG Project
 AIA of 2024 Alternative Transmission Line and Distribution Powerline Corridors

Figure No. **1**
 Title: **Overview Map**

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1.1 Study Objectives

The fieldwork was carried out with the following objectives to meet regulatory guidelines (Archaeology Branch 2014) for an AIA:

- Identify archaeological resources
- Assess potential impacts of the proposed development on archaeological resources
- Develop recommendations for archaeological site impact avoidance, mitigation and or additional archaeological studies, as warranted (e.g., monitoring or systematic data recovery).

Although Haisla Nation coordinated with Cedar to conduct this study, the results do not address Haisla Nation traditional use, nor does this involvement constitute meaningful Indigenous consultation or indicate that support for development has been given under the process of Free, Prior and Informed Consent. It is not Stantec's intent, in conducting this study to prejudice First Nations treaty negotiations, aboriginal rights or aboriginal title.

1.2 Regulatory Context

The HCA extends legal protection to archaeological sites with evidence of human habitation or use before 1846, burial places with historical or archaeological value, Indigenous rock art, and heritage ship and aircraft wrecks. These heritage sites and objects, whether recorded or previously unidentified, are protected from disturbance on private and provincial Crown land under the HCA, which is administered by the Archaeology Branch of the Ministry of Forests. The British Columbia Energy Regulator (BCER) administers heritage regulation authority over the archaeological assessment and review processes for oil and gas developments in the province.



2 Project Description

The Project is on the west side of the Kitimat Arm of Douglas Channel, approximately 10 km southwest of Kitimat town centre, on the northwest coast of British Columbia. The nearest residential area to the Project is Kitamaat Village, located approximately 3 km directly east across Kitimat Arm. A detailed description of the project setting is provided in the first interim report prepared for the Project under HCA permit 2020-0013 (Smith 2022).

The AIA assessed the proposed alternative transmission line that would extend from the BC Hydro Minette Substation south to the Marine Terminal Area, on the western side of Kitimat Arm, Douglas Channel (Figure 1). Additionally, the AIA assessed a proposed distribution powerline right-of-way extending along the east side of the Bish Creek FSR from the existing BC Hydro distribution line at Alcan Way to the Marine Terminal Area.

Proposed changes to Project including an expanded Marine Terminal Area to encompass the anchors for the FLNG facility's catenary mooring system were reviewed via desktop for archaeological constraints and the result of this assessment is included in this AIA interim report to support heritage management of the proposed changes to the Project (Figure 1).



3 Methods

A description of the methods applied for the background review, archaeological potential assessment, and reporting is provided in interim report 2020-0013-001 prepared for the Project under HCA permit 2020-0013 (Smith 2022).

Prior to fieldwork, previous AIA studies completed for proposed developments that overlap with the study area were reviewed, and survey areas were overlain on Project component maps to identify gaps in survey coverage. Field work focused on the survey gaps to identify any areas of archaeological potential requiring shovel testing or with culturally modified tree (CMT) sites present.

AIA field survey of the proposed alternative transmission line and new distribution powerline rights-of-way was conducted from June 11 to June 12, 2024 by a crew of two Stantec archaeologists (Adrienne Marr and Kirsten Boettger) and one Haisla Nation representative (Chris Wilson), and from June 13 to June 14, 2024 by a crew of two Stantec Archaeologists consisting of a Field Director (Sarah Smith) and Crew Lead (Kirsten Boettger), and one Haisla Nation representative (Chris Wilson).

Transect intervals were 5 to 20 m, depending on visibility and the nature of terrain, with 10 to 15 m spacing typically employed. Terrain was examined for visible archaeological features and materials, as well as for landforms considered to have potential for buried archaeological sites, such as raised, well-drained terraces, benches, and knolls. Standing and fallen trees were examined for evidence of cultural modifications, and observed exposures were inspected for the presence of archaeological materials. All transects were tracked using handheld global positioning system units, and the evaluation of archaeological potential of all assessed lands was recorded in field notes.



4 Results

4.1 Background Review

The background research conducted for the Project was built on extensive previous investigation within and directly adjacent to the study area. Several archaeological studies have been completed for the existing LNG Canada development (Stantec 2015), the previously proposed Kitimat Liquid Natural Gas (LNG) (Fedirchuk 2005; Varsakis et al. 2015), Douglas LNG (Wharram 2013) and Kitimat Liquefied Petroleum Gas (LPG) (Haugrud 2019) export facility projects, and the Coastal GasLink (Fry 2015) pipeline project. Prior to conducting AIA field studies, a data gap analysis was conducted to identify the extent of previous archaeological survey and assessment in relation to the current location of Project components.

Biophysical, ethnographic, and historical literature relating to the north coast region and the general vicinity of the Project were reviewed. Additionally, the Haisla Nation community has shared a wealth of traditional knowledge during the development of recent traditional land use studies. The objective of this research was to identify information that contributes to the assessment of archaeological potential within the study area and region as well as factors that may have contributed to either the disturbance or preservation of archaeological resources. The review of past archaeological studies in the Project vicinity was completed to identify the nature of recorded archaeological resources and evaluations of archaeological potential relevant to the current Project.

Preliminary background research involved a search of the Provincial Heritage Registry using the Remote Access to Archaeological Data (RAAD) application to identify the nature and location of documented archaeological resources within the study area. The provincial Archaeology Branch was contacted to request information on any pending site updates and archaeological site inventory. Identifying recorded archaeological sites in comparable environmental settings to that found within the study area is one way of establishing possible locations where as-yet undiscovered archaeological resources may be recorded during the field study.

Topographic information derived from TRIM, satellite imagery and vegetation resource inventory (VRI) information were plotted onto geospatially referenced digital maps with the alternative transmission line and distribution powerline overlaid. VRI information regarding forestry cutblock harvesting dates after 1994 and estimated stand age for older standing cedar forest area was acquired from GeoBC. These maps were used to plan survey access, review areas where previous studies overlapped with the current study area, identify locations suspected of exhibiting elevated archaeological potential and to navigate during the pedestrian survey.

Based on a review of existing archaeological predictive modelling in the areas (Hartley 2018), lands surrounding Moore and Anderson Creeks as well as the marine shoreline along the Kitimat arm area, were assessed as having high potential for containing habitation sites. Additionally, the majority of the alternative transmission line right-of-way is within lands modelled as having high potential for containing CMT sites associated with the still-stand palaeolandscapes. These potential modelling results were



identified during pre-field desktop review and used along with other biophysical and topographic mapping data to assist with planning and executing the AIA field survey. The 40 m above seal level (asl), 100 to 120 m asl and ~200 m asl still-stands were mapped onto general Project area maps and used with digital data collection methods to identify potential paleoshoreline activity areas and areas with the potential to contain buried archaeological material (Figure 1).

4.2 Previously Recorded Archaeological Sites

A search of RAAD identified 14 previously recorded archaeological sites in the Provincial Heritage Register located within 2 km of the alternative transmission line and distribution powerline (study area) (Figure 1). The sites located within the vicinity of the study area are predominantly CMTs which have been barked stripped, notched, and/or aboriginally logged.

Table 1 Archaeological Sites Within 2 km of the Study Area

Borden No. and Name	Distance from Alternative Transmission Line	Site Type
GaTe-11	0 m	Culturally Modified Tree
FiTe-133	0 m	Culturally Modified Tree
GaTe-20	0 m	Culturally Modified Tree
GaTe-10	88 m east	Culturally Modified Tree
GaTe-21	121 m west	Culturally Modified Tree
GaTe-9	123 m east	Culturally Modified Tree
GaTe-3	144 m east	Culturally Modified Tree
GaTe-13	185 m northeast	Culturally Modified Tree
GaTe-12	178 m east	Culturally Modified Tree
FiTe-106	750 m southwest	Culturally Modified Tree
FiTe-132	1,289 m south	Culturally Modified Tree
FiTe-107	1,318 m southwest	Culturally Modified Tree
FiTe-33	1,557 m south	Culturally Modified Trees
GaTe-5	1,899 m east	Subsurface Lithics and Subsurface Fire Altered Rock



4.3 Previous Archaeological Studies

Several archaeological studies have been completed in the Kitimat Area, three of which overlap with the alternative transmission line, distribution powerline, and Marine Terminal Area. The following projects have been subject to HCA permitted AIAs which overlap with the Study area:

- Kitimat LNG Project (Permit 2011-0295, 2011-0370, and 2013-0161; 2017-0288)
- LNG Canada (Permit 2013-0149)
- Kitimat LPG Export Project (Permit 2019-0225)
- Douglas Channel LNG (Permit 2011-0351)

Between 2011 and 2017, AIAs were completed for Chevron Canada Ltd.'s proposed Kitimat LNG situated along the west side of Kitimat Arm of Douglas Channel, south of Kitimat, BC (Stantec 2016). The AIA associated with the Kitimat LNG Project overlaps with the portions of the alternative transmission line, distribution powerline, and Marine Terminal Area. No archaeological sites or areas of subsurface archaeological potential were identified within the areas of overlap with the study area.

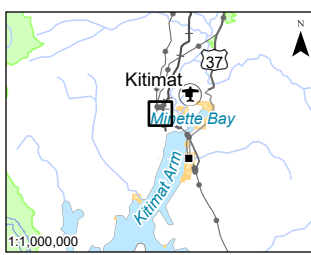
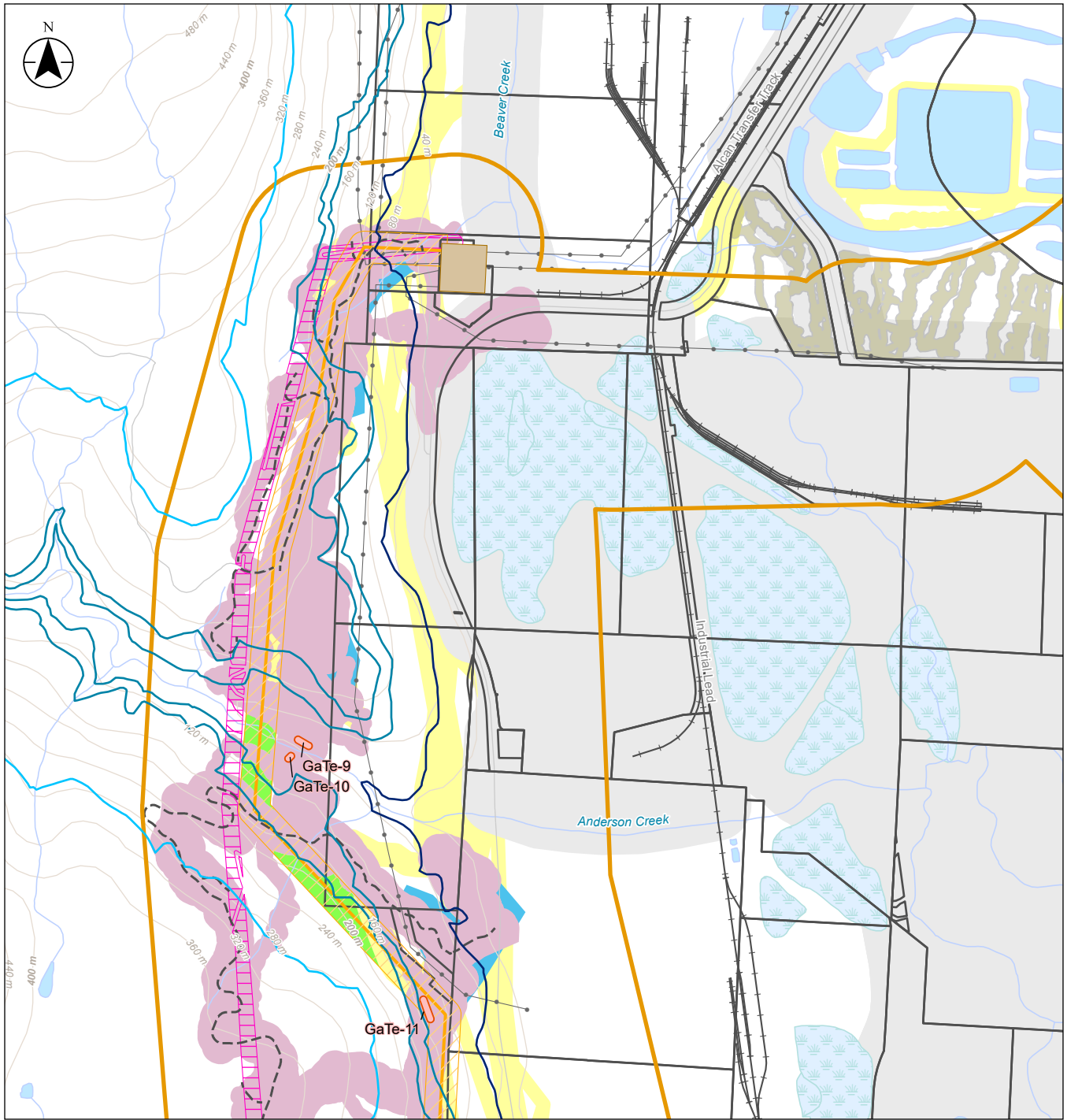
In 2013 and 2014, AIA field survey was completed under HCA Permit 2013-0149 for LNG Canada Development Inc.'s, LNG Canada Project, under construction located on the west side of Kitimat Arm approximately 3 km southwest of Kitimat, BC (Varsakis et al 2015). No archaeological sites or areas of subsurface archaeological potential were identified within the area of overlap with the Project.

In 2019, an AIA was completed under HCA Permit 2019-0225 for Pacific Traverse Energy's proposed Kitimat LPG Export Project, located on the lot adjacent to the south side of the Marine Terminal Area (Haugrud 2019). Two archaeological sites were identified which now overlap with the alternative transmission line right-of-way. Site GaTe-11 and FITe-133 were identified during this AIA; both are CMT sites.

Portions of the alternative transmission line have been subject to field work during Stantec's ongoing AIA for the Project under HCA permit 2020-0013. One archaeological site was identified (GaTe-20). All previous survey coverage and recorded archaeological sites are plotted on midrange maps (Figure 2.1– Figure 2.3).



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Notes
 1. Coordinate System: NAD 1983 BC Environment Albers
 2. Data Sources: DataBC, Government of British Columbia; Natural Resources Canada

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| <p>Base Data</p> <ul style="list-style-type: none"> — Road — Local Street — Railway — Transmission Line — Paleoshoreline (~40 m above current sea level) — Paleoshoreline (~100 to 120 m above current sea level) — Paleoshoreline (~200 m above current sea level) — Topographic Contour — Watercourse — Waterbody — Wetland — Cadastral (Legal Lot) Boundary | <p>Proposed Project Components</p> <ul style="list-style-type: none"> — Minette Substation — Original Transmission Line — Alternative Transmission Line Corridor — Access Road — Alternative Transmission Line Centreline <p>Archaeological Assessment</p> <ul style="list-style-type: none"> — Previously Recorded — Archaeological Site Boundary — Revised Permit Area 2020-0013 | <p>Pedestrian Survey Coverage</p> <ul style="list-style-type: none"> — Pedestrian Survey Permit 2020-0013 (2024) <p>Previous Assessment Coverage</p> <ul style="list-style-type: none"> — Pedestrian Survey Permit 2020-0013 (2021 - 2022) — Assessment Coverage LNG Canada Permit 2013-0149 — PTE Survey Coverage 2019-0225 — Pedestrian Survey Permit Kitimat LNG 2017-0286 — Assessment Coverage Kitimat LNG Permit 2011-0295 |
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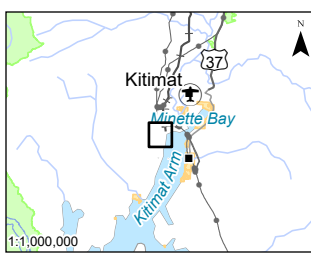
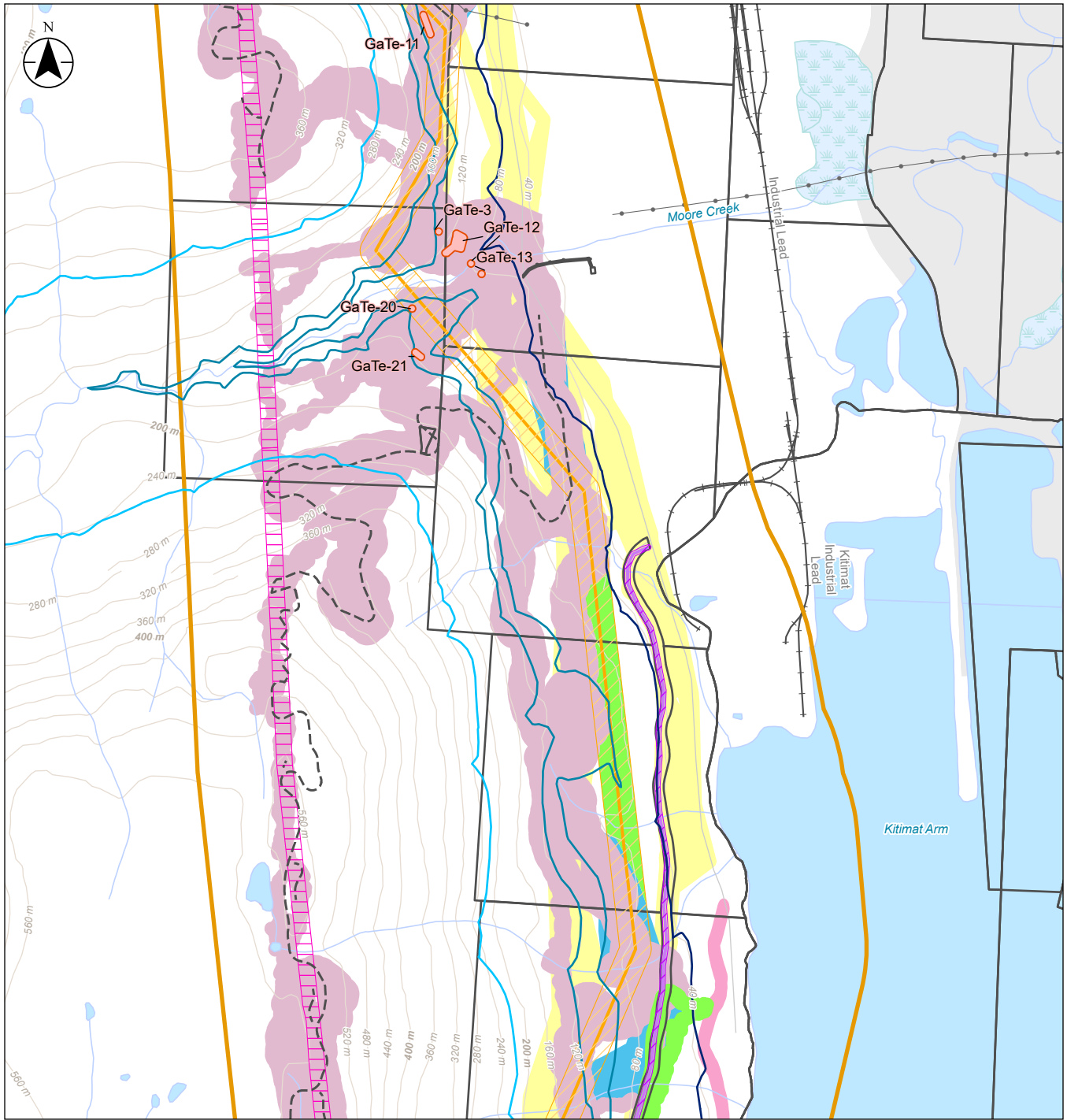
Project Location: Kitimat, BC
 Project Number: 123222394
 Prepared by JPOUCHER on 20241008
 Requested by KBOETTGER on 20240814
 Checked by SSMITH on 20240820

Client/Project/Report
 Cedar LNG Partners LP
 Cedar LNG Project
 AIA of 2024 Alternative Transmission Line and Distribution Powerline Corridors

Figure No. **2.1**
 Title **Midrange Map - Field Results**

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Notes
 1. Coordinate System: NAD 1983 BC Environment Albers
 2. Data Sources: DataBC, Government of British Columbia; Natural Resources Canada

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| <p>Base Data</p> <ul style="list-style-type: none"> Local Street Railway Transmission Line Paleoshoreline (~40 m above current sea level) Paleoshoreline (~100 to 120 m above current sea level) Paleoshoreline (~200 m above current sea level) Topographic Contour Watercourse Waterbody Wetland Cadastral (Legal Lot) Boundary Minette Substation | <p>Proposed Project Components</p> <ul style="list-style-type: none"> Original Transmission Line Distribution Powerline Corridor Alternative Transmission Line Corridor Access Road Distribution Powerline Centreline Alternative Transmission Line Centreline <p>Archaeological Assessment</p> <ul style="list-style-type: none"> Previously Recorded Archaeological Site Boundary Archaeological Assessment Revised Permit Area 2020-0013 |
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- Pedestrian Survey Coverage**
- Pedestrian Survey Permit 2020-0013 (2024)
- Previous Assessment Coverage**
- Pedestrian Survey Permit 2020-0013 (2021 - 2022)
 - Assessment Coverage LNG Canada Permit 2013-0149
 - Assessment Coverage Douglas Permit 2011-0351
 - PTE Survey Coverage 2019-0225
 - Assessment Coverage Kitimat LNG Permit 2011-0295



Project Location: Kitimat, BC
 Project Number: 123222394
 Prepared by: JPOUCHER on 20241008
 Requested by: KBOETTER on 20240814
 Checked by: SSMITH on 20240820

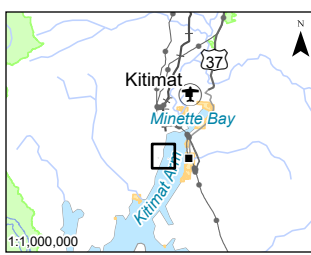
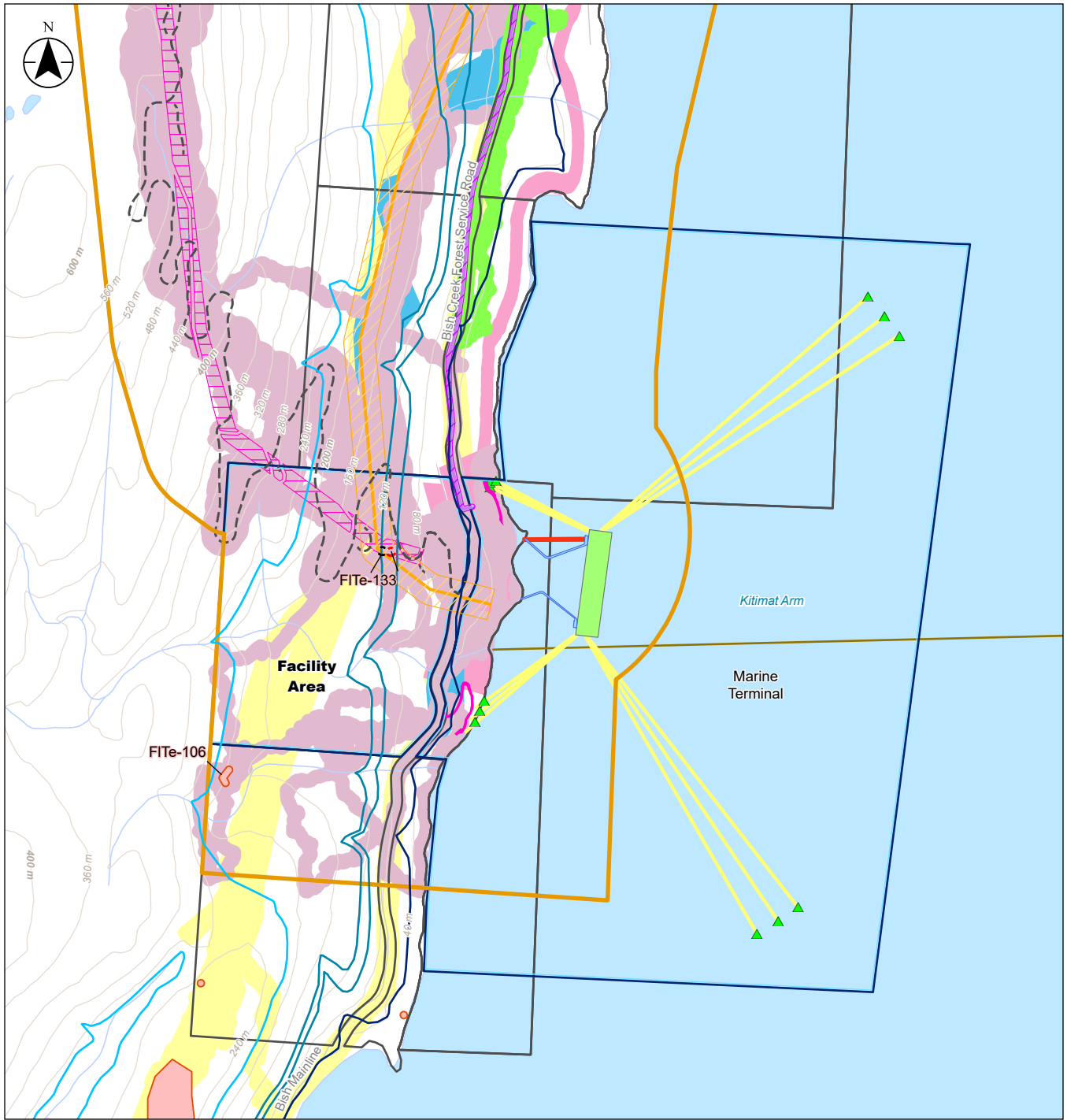
Client/Project/Report: Cedar LNG Partners LP, Cedar LNG Project, AIA of 2024 Alternative Transmission Line and Distribution Powerline Corridors

Figure No. **2.2**

Title: **Midrange Map - Field Results**

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Notes
 1. Coordinate System: NAD 1983 BC Environment Albers
 2. Data Sources: DataBC, Government of British Columbia; Natural Resources Canada

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| <p>Base Data</p> <ul style="list-style-type: none"> Local Street Paleoshoreline (~40 m above current sea level) Paleoshoreline (~100 to 120 m above current sea level) Paleoshoreline (~200 m above current sea level) Topographic Contour Watercourse Waterbody Cadastral (Legal Lot) Boundary Minette Substation <p>Proposed Project Components</p> <ul style="list-style-type: none"> Original Transmission Line Distribution Powerline Corridor Alternative Transmission Line Corridor | <ul style="list-style-type: none"> Project Area FLNG Floating Access Access Access Road Distribution Powerline Centreline Alternative Transmission Line Centreline Mooring Anchor; <Null> Dynamic Riser Mooring Line <all other values> <p>Archaeological Assessment</p> <ul style="list-style-type: none"> Previously Recorded Archaeological Site Boundary Previously Archaeological Site Boundary |
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- Updated Archaeological Site Boundary
- Archaeological Assessment**
- Revised Permit Area 2020-0013
- Pedestrian Survey Coverage**
- Pedestrian Survey Permit 2020-0013 (2024)
- Previous Assessment Coverage**
- Pedestrian Survey Permit 2020-0013 (2021 - 2022)
 - Assessment Coverage Douglas Permit 2011-0351
 - PTE Survey Coverage 2019-0225
 - Assessment Coverage Kitimat LNG Permit 2011-0295



Project Location: Kitimat, BC
 Project Number: 123222394
 Prepared by JPOUCHER on 20241008
 Requested by KBOETTGER on 20240814
 Checked by SSMITH on 20240820

Client/Project/Report
 Cedar LNG Partners LP
 Cedar LNG Project
 AIA of 2024 Alternative Transmission Line and Distribution Powerline Corridors

Figure No.
2.3

Title
Midrange Map - Field Results

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4.4 Desktop Review Revised Marine Terminal Area

A desktop review of RAAD to identify any protected underwater sites was conducted for the revised Marine Terminal Area mooring system (Figure 2.3). No submerged archaeological sites or shipwreck sites are recorded in this area of the Douglas Channel. Stantec completed a submerged remotely operated vehicle (ROV) survey of the mooring system to assess environmental impacts to the marine environment associated with the revised mooring anchor locations (Schulte 2024). The terrain of the sea floor is rocky, uneven and steeply sloping with low profile sandy bay areas. Based on the background review of sea level changes in the Douglas Channel area and the environment the mooring system anchors are located in this area is considered unlikely to contain submerged paleoshorelines or landscape capable of containing archaeological evidence of past land use. The Marine Terminal Area mooring system anchor locations are assessed as having low archaeological potential.

4.5 Field Observations

4.5.1 Pedestrian Survey

Between June 12, 2024, and June 13, 2024 a pedestrian survey was conducted in identified areas not captured during previous archaeological studies within the alternative transmission line and distribution powerline rights-of-way (Figure 2.1 to Figure 2.3). Three survey areas are on the north side of Anderson Creek that corresponded to the 120 m asl still stand and were in proximity to previously recorded CMT sites GaTe-9 and GaTe-10 (Photo 1, Photo 2 and Photo 3). The remaining two areas surveyed were located on the southwest and east side of the Bish Creek FSR, south of Moore Creek and portions corresponded with the 40 m and 120 m still stands (Photo 4 and Photo 5).

The survey area extends through moderate to very steeply sloping and undulating terrain interspersed with rocky outcrops and various small unnamed watercourses. Areas around Anderson Creek were very steeply sloped into the watercourse and were not well defined on the southern banks (Photo 1). The presence of poorly drained sediments, loose, rocky surface exposures with minimal to no sediment accumulation and the absence of level, elevated landforms suitable for past habitation activities support a low archaeological potential rating for the survey area. This assessment is consistent with the results of the AIA survey of adjacent terrain completed during the initial AIA for the Project in 2021 (Smith 2022) and the Kitimat LPG Export Project archaeological study (Haugrud 2019) that targeted select areas along the alternative transmission line and natural gas pipeline corridors that overlap with or are in the vicinity of the survey area.

No evidence of cultural modification was observed on any standing or fallen western redcedar or yellow cedar trees, or stumps during survey. No new archaeological sites, or areas of archaeological potential were identified during the survey. -



4.5.2 Archaeological Site Revisits

Three previously recorded sites in conflict with the proposed alternative transmission line were revisited during the field survey (GaTe-11, GaTe-20 and FiTe-133). All three sites were re-flagged with a 40 m buffer around the site boundary (pink and black stripped) and each CMT was flagged with yellow ‘no-work-zone’ and ‘culturally-modified-tree’ flagging (Photo 6, Photo 7, and Photo 8). All three sites will be 100% impacted by the alternative transmission line right-of-way and only GaTe-20 is represented by a living CMT suitable for a stem-round sample for dating (Table 2; Figure 3.1-Figure 3.3).

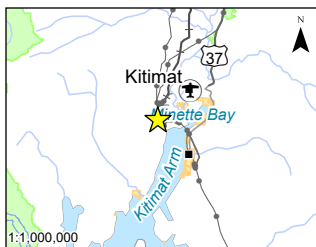
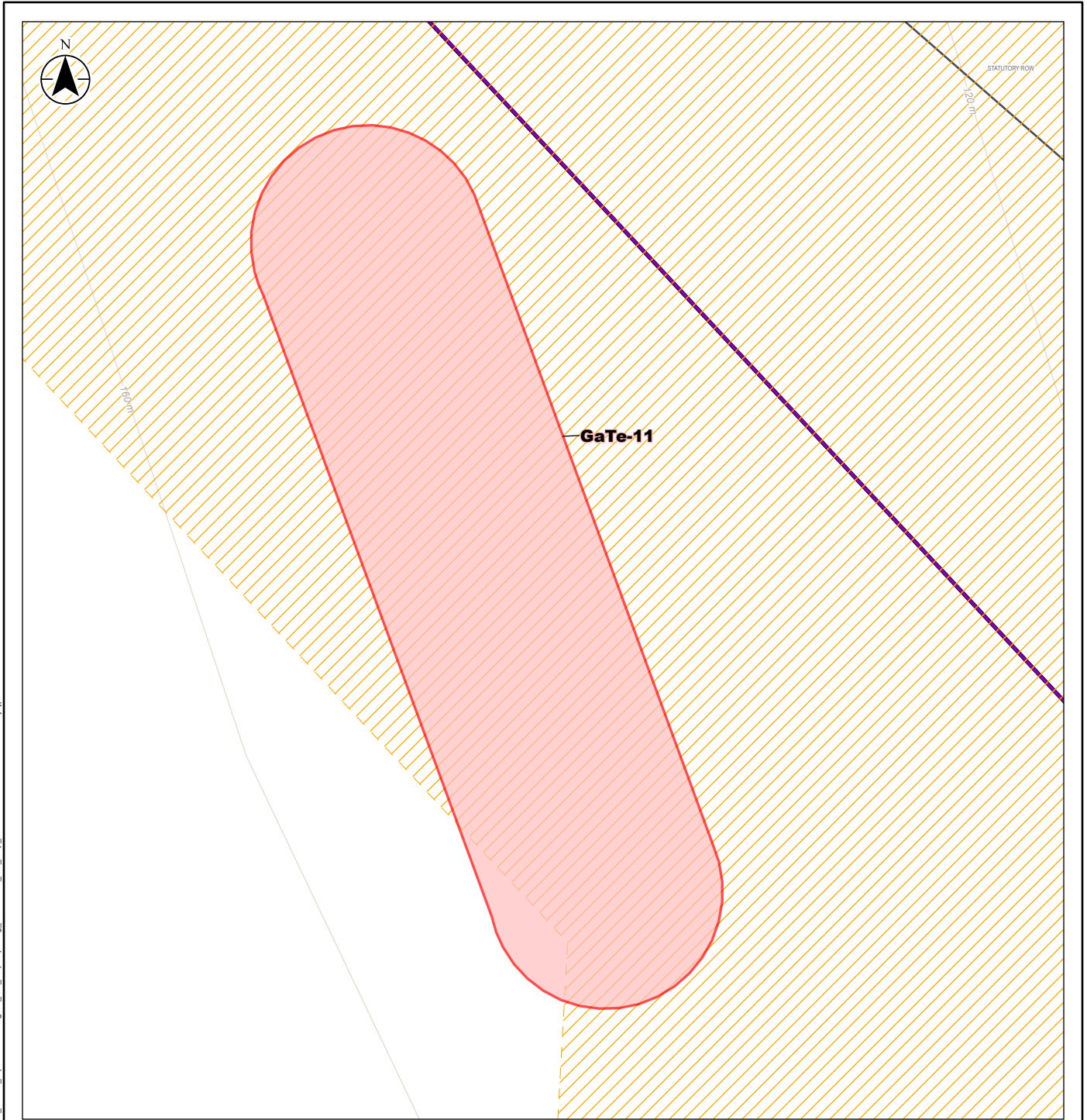
During the site revisit, FiTe-133 was observed to be misplotted in the Provincial Heritage Register by approximately 20 m. The CMT is a historically logged, windthrown stump lying downslope over the edge of an unused access road. The site boundary has been revised in a site form update submitted to the Archaeology Branch July 23, 2024, and the updated and original site boundary is shown on Figure 3.3.

Table 2 Recorded Archaeological Sites in Conflict - Revisited

Borden No.	Distance from Study Area	Environmental Setting	Elevation (ASL)	Description
GaTe-11	Within alternative transmission line right-of-way	Moderately sloping and rolling terrain between Anderson Creek to the north and Moore Creek to the south.	81–88 m	Bark-stripped, tapered scar, western redcedar (n=2); dead stumps See Photo 6
GaTe-20	Within alternative transmission line right-of-way	Moderately sloping terrain on a broad shoulder on south side of Moore Creek	85 m	Notched western red cedar (n=1); standing alive See Photo 7
FiTe-133	Within original and alternative transmission line right-of-way	Steeply sloping rocky terrain above Bish FSR, approximately 300 m away from the Douglas Channel shoreline.	134 m	Bark-stripped western red cedar (n=1); windthrown, historically logged stump, dead See Photo 8



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Topographic Contour

Proposed Project Component

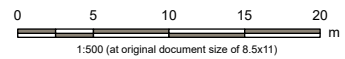
Alternative Transmission Line Corridor

Alternative Transmission Line Centreline

Archaeological Site

Previously Recorded

Archaeological Site Boundary



Project Location: Kitimat, BC
 Project Number: 123222394
 Prepared by JPOUCHER on 20241008
 Requested by KBOE TTGER on 20240814
 Checked by SSMITH on 20240821

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 Cedar LNG Project
 AIA of 2024 Alternative Transmission Line and
 Distribution Powerline Corridors

Figure No.

3.1

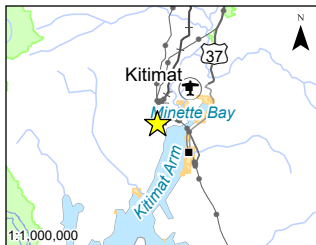
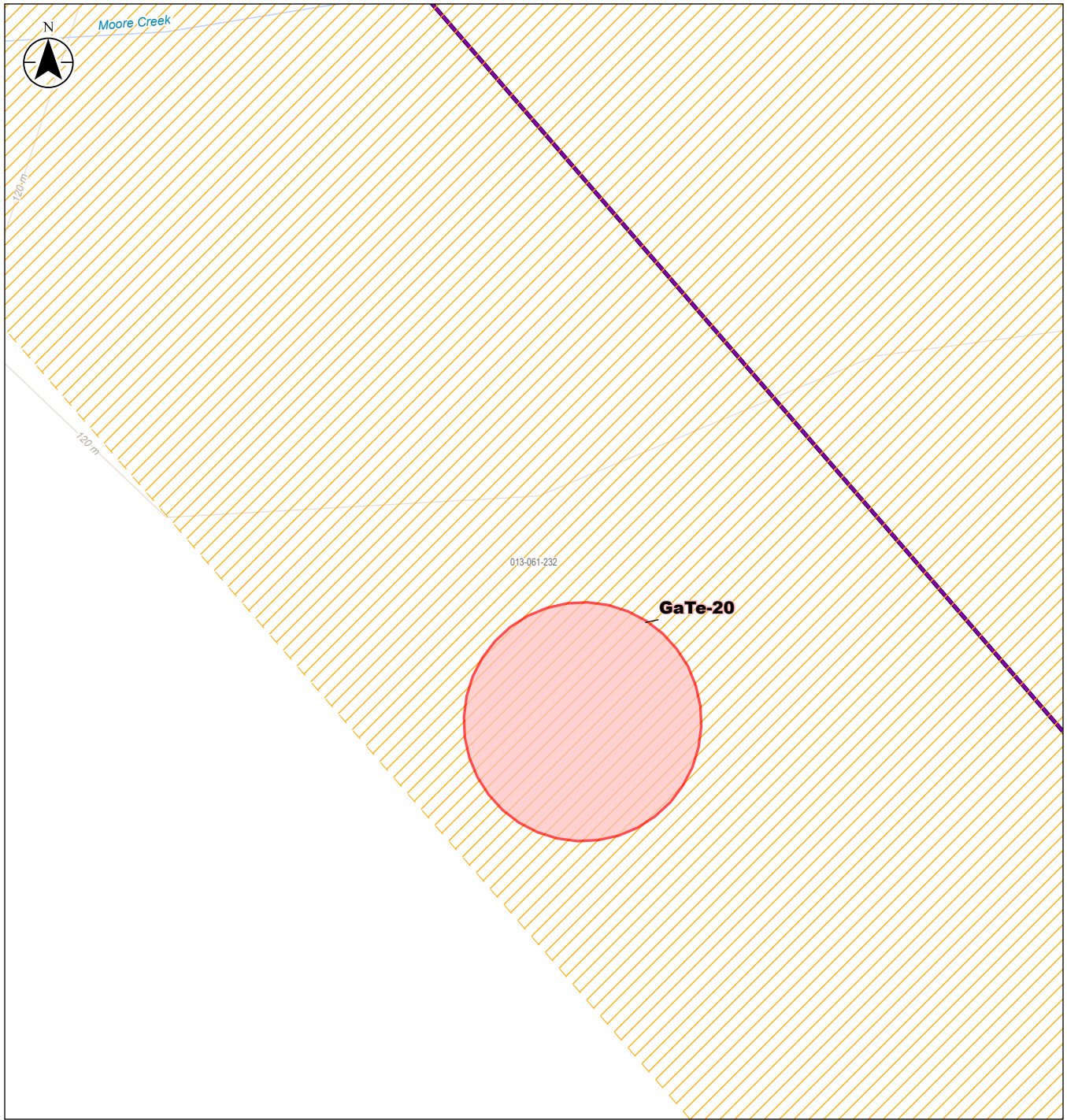
Title

**GaTe-11
Detailed Site Map**

Notes
 1. Coordinate System: NAD 1983 BC Environment Albers
 2. Data Sources: DataBC, Government of British Columbia;
 Natural Resources Canada

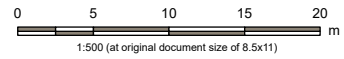
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— Topographic Contour
 — Watercourse

Proposed Project Component
 Alternative Transmission Line Corridor
 Alternative Transmission Line Centreline
Archaeological Site
 Previously Recorded Archaeological Site Boundary



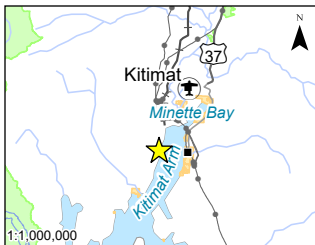
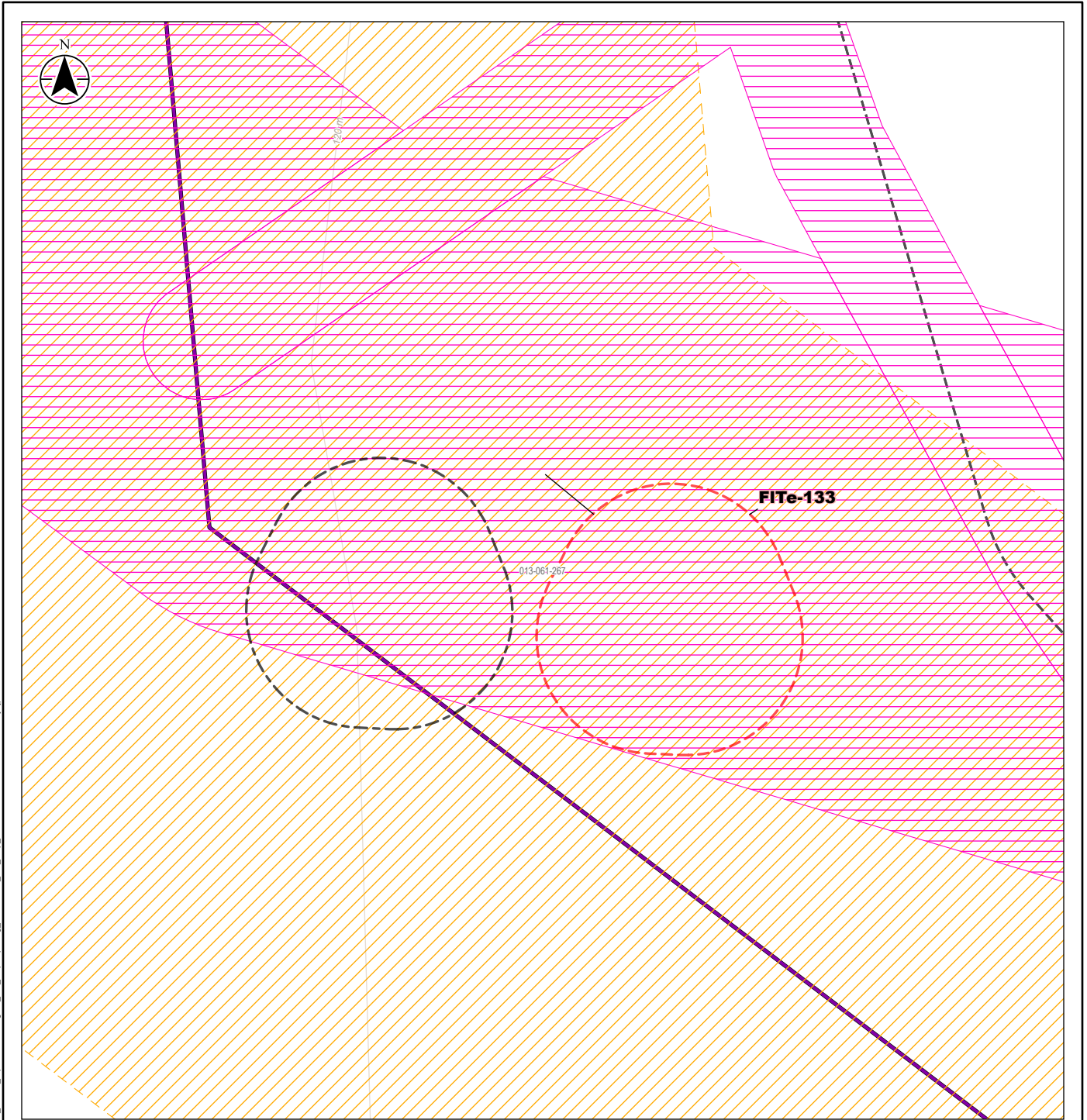
Project Location: Kitimat, BC
 Project Number: 123222394
 Prepared by JPOUCHER on 20241008
 Requested by KBOE TTGER on 20240814
 Checked by SSMITH on 20240821

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Figure No.
3.2
 Title
**GaTe-20
 Detailed Site Map**

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Notes
 1. Coordinate System: NAD 1983 BC Environment Albers
 2. Data Sources: DataBC, Government of British Columbia; Natural Resources Canada

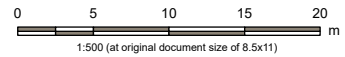
Topographic Contour

Proposed Project Component

- Alternative Transmission Line Corridor
- Access Road
- Alternative Transmission Line Centreline
- Original Transmission Line

Archaeological Site

- Updated Archaeological Site Boundary
- Original Archaeological Site Boundary



Project Location: Kitimat, BC
 Project Number: 123222394
 Prepared by JPOUCHER on 20240814
 Requested by KBOETTGER on 20240814
 Checked by SSMITH on 20240821

Client/Project/Report
 Cedar LNG Partners LP
 Cedar LNG Project
 AIA of 2024 Alternative Transmission Line and Distribution Powerline Corridors

Figure No.
3.3

Title
**FITE-133
 Detailed Site Map**

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5 Impact Assessment

Three archaeological sites (Gate-11, GaTe-20, and FITe-133) are likely to be impacted by Project construction. Stantec has recommended avoidance, if possible, through minor route modifications within the alternative transmission line corridor (Smith 2022). If Project impacts to recorded archaeological sites during construction are anticipated, a Section 12.4 Alteration Permit under the HCA, issued by the BCER will be required along with a mitigation plan for each site. See Table 3 for site specific recommendations.

Table 3 Archaeological Site Impact Assessment and Recommendations

Borden No.	Potential Impacts	Recommendations
GaTe-11	Within the alternative transmission line right-of-way	Avoidance, of impacts to the site. If avoidance is not feasible; monitor CMT removal during Project-related vegetation clearing within the site boundary.
GaTe-20	Within the alternative transmission line right-of-way	Avoidance, of impacts to the site. If avoidance is not feasible; monitor CMT removal during Project-related vegetation clearing within the site boundary. Stem-round sample collection for Class III recording.
FITe-133	Within the alternative transmission line right-of-way	Avoidance, of impacts to the site. If avoidance is not feasible; monitor CMT removal during Project-related vegetation clearing within the site boundary.



6 Recommendations

Avoidance is recommended for the three archaeological sites (GaTe-11, GaTe-20, and FITE-133) identified within the alternative transmission line right-of-way. If avoidance is not feasible, an HCA Section 12.4 Alteration Permit will be required for any developments within the site boundaries; with appropriate impact mitigation in place to reduce or eliminate adverse impacts. Mitigation, where required, usually involves site protection, route modifications, or systematic data recovery, and it normally involves archaeological excavation or CMT Level III recording. The following recommendations are provided based on the results of the 2024 AIA.

1. Archaeological monitoring under an HCA Section 12.4 Alteration Permit is recommended for sites in conflict with the alternative transmission line right-of-way (GaTe-11, GaTe-20, and FITE-133) where impacts cannot be avoided through minor route modifications within the alternative transmission line corridor.
2. GaTe-11 and FITE-133 consist of dead stumps, and post-impact assessment is recommended in place of monitoring to record site condition data.
3. A stem-round sample may be appropriate at GaTe-20 during site alteration to facilitate CMT dating and Class III site recording.
4. Remaining areas of the study area was assessed as having low archaeological potential and no further archaeological assessment is recommended. If changes to the Project are required, those should be reviewed by a qualified archaeologist to determine if additional work is required.



7 References

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2020-0013: Interim Report – Archaeological Impact Assessment of 2024 Alternative Transmission Line and Distribution Powerline Corridor

Section 7 References

October 21, 2024

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Appendices



Appendix A Photos



Photo 1 View north looking into Anderson Creek from safe vantage point showing steep terrain with low archaeological potential.



Photo 2 East view along steeply sloped edge within the alternative transmission line route south of Anderson Creek with low archaeological potential.



Photo 3 View looking southeast of Anderson Creek within the alternative transmission line right-of-way; showing undulating and uneven terrain with low archaeological potential.



Photo 4 View north along the east side of Bish Creek FSR and proposed distribution powerline route showing sloping and undulating, previously logged terrain with low archaeological potential.



Photo 5 View southwest along the west side of Bish Creek FSR and proposed distribution powerline route showing sloping terrain along drainage with undefined banks assessed as low archaeological potential.



Photo 6 View north showing CMT5 located within GaTe-11, shows yellow CMT flagging and pink/black striped buffer



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Appendix A: Photos

October 21, 2024

Photo 7 **View north showing CMT (GaTe-20), shows yellow CMT flagging and pink/black striped buffer**



Photo 8 View north showing CMT (FITE-133), shows yellow CMT flagging and pink/black striped buffer

