Ridley Island Export Logistics Platform Project

January 28, 2020

PRINCE RUPERT PORT AUTHORITY
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Table of Abbreviations

3-D	three dimensional
AIA	Archaeological Impact Assessment
AOA	Archaeological Overview Assessment
B	Bulk
BB	Break Bulk
BC	British Columbia
CAC	Criteria air contaminants
cm	centimetres
CN	Canadian National
CN Rail	Canadian National Railway
CWHvh2	Coastal Western Hemlock zone, Very Wet Hypermaritime, Central variant
EEE	Environmental effects evaluation
GHG	greenhouse gas
ha	Hectares
IAA	Impact Assessment Act
IM	intermodal
IT	Information Technology
kV	kilovolt
LPG	Liquified petroleum gas
MBCA	Migratory Bird Conventions Act
MEWQ	Marine Environmental Water Quality
mm	millimetres
PRPA	Prince Rupert Port Authority
RIELP	Ridley Island Export Logistics Platform Project
RMG	rail-mounted gantry
SARA	Species at Risk Act
TEUs	twenty-foot equivalent units
UTM	Universal Transverse Mercator
WQI	Water Quality index

1 Introduction

1.1 Project Overview

Prince Rupert Port Authority (PRPA) proposes to develop a new export logistics platform on Ridley Island on the northwest coast of British Columbia (BC). The Ridley Island Export Logistics Platform Project (RIELP or 'the Project') is intended to enhance the export transloading capacity and improve operational logistics at the Port of Prince Rupert. The Project will include the following physical infrastructure:

- New rail and two grade-separated rail crossings;
- Upgraded access road and new automated truck gate;
- New Intermodal container yard:
- New Bulk transload facility;
- New Break bulk facility;
- New ancillary facilities, e.g., administration building, stormwater management;
- Extension of existing ancillary facilities, e.g., water distribution line; and
- New on-site equipment, e.g., reach stackers.

At full build out, the Project will be constructed over a 46.5 hectare (ha) / 115 acre parcel of land at the southern end of Ridley Island (**Figure 1**). RIELP will have an annual transload capacity of 400,000 twenty-foot equivalent units (TEUs), with the potential for expansion to 700,000 TEUs over a 10-year period. The bulk and break bulk facilities will process the transport of agricultural products, resins, potash, lumber and pulp to overseas customers while the off-dock container yard will provide an additional 50,000 TEUs to 200,000 TEUs of intermodal capacity to Fairview Terminal. PRPA anticipates the Project will be operational by the fourth quarter of 2022.

RIELP will be entirely on federal land under the administrative authority of PRPA. As currently defined, the Project does not exceed the applicable thresholds defined within the *Physical Activities Regulations* of the *Impact Assessment Act* (IAA)[1] and is not subject to the review process of an impact assessment of a designated project. As a federal authority under the *Canada Marine Act*, however, PRPA will undertake an environmental effects evaluation (EEE) of the Project and make a determination on the environmental effects pursuant to Section 82 of the IAA. Fisheries and Oceans Canada, Transport Canada and Environment Climate Change Canada may also be responsible federal authorities in reaching a determination under the IAA.

The purpose of this document is to provide a project description to receive feedback from the general public, Indigenous groups and other federal authorities about RIELP. The feedback received will be considered by PRPA and other responsible federal authorities as part of the EEE process.

[1] Physical Activities Regulations (SOR/2019-285) and Impact Assessment Act (S.C. 2019, c. 28, s. 1)

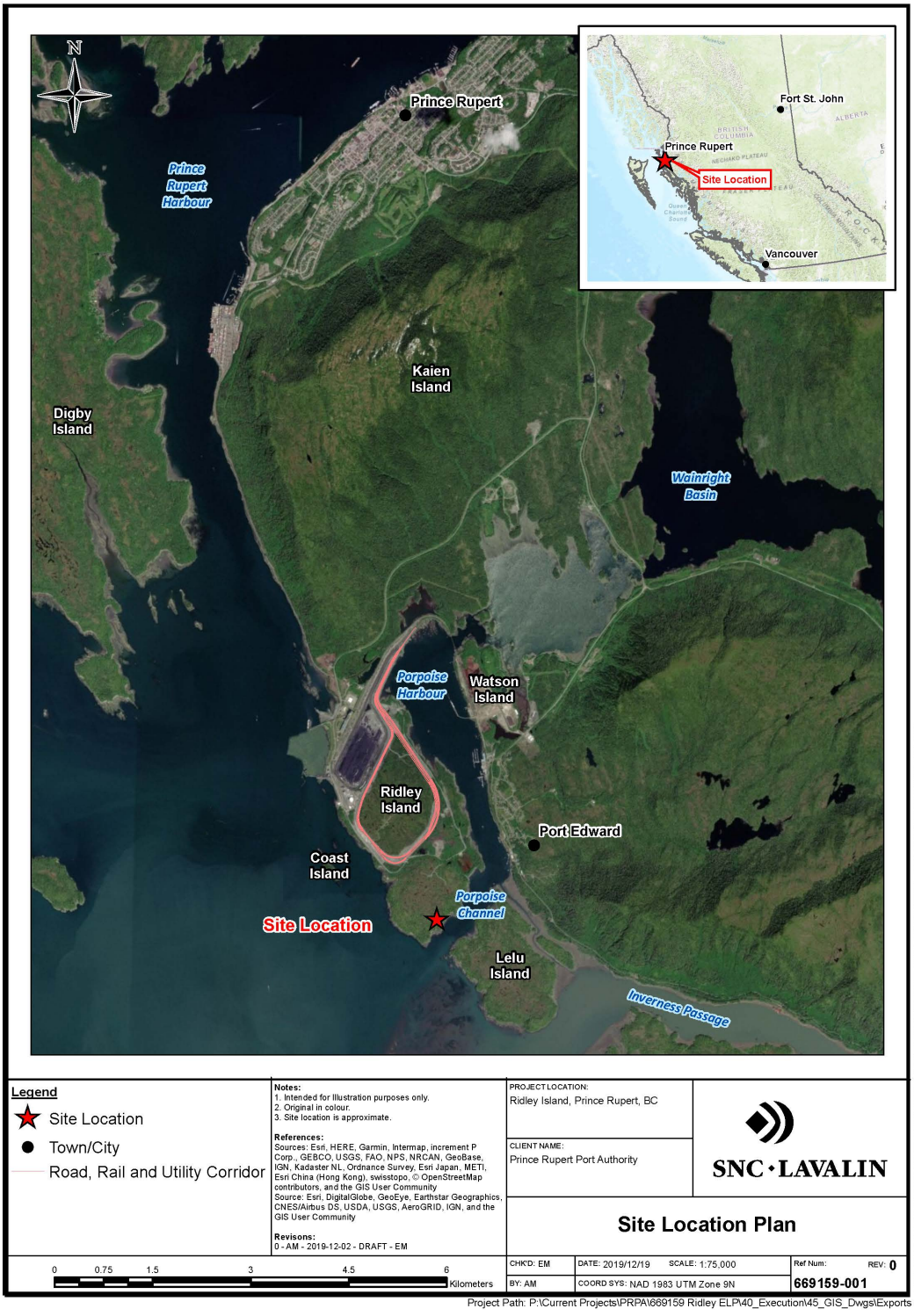

Figure 1: Project Location

1.2 Proponent Information

PRPA is a Canadian Port Authority under the *Canada Marine Act* and is the Project proponent. PRPA is responsible for the overall planning, development and management of the Port of Prince Rupert. PRPA's core values are:

- Building relationships of trust with clients, partners and communities;
- Committing to safe, secure and environmentally responsible movement of vessels and their cargoes;
- Providing Environmental Stewardship to protect the land, water and air of the North Coast;
- Strengthening local communities that provide the people, resources, and vibrancy that sustain the Port;
- Seeking opportunity for innovation that creates value; and
- Providing pro-active leadership to challenge the status quo and seek better ways of operating.

Project information, including identification of the primary representative of PRPA for the purpose of this project description is provided in **Table 1** below.

Table 1: Project Information

Project Name	Ridley Island Export Logistics Platform
Proponent	Prince Rupert Port Authority www.rupertport.com
Mailing Address	Prince Rupert Port Authority 200 – 215 Cow Bay Rd. Prince Rupert, BC V8J 1A2
Principal Contact	Jack Smith Director, Environmental Planning and Compliance
Contact Information	info@rupertport.com 1 250 627-8899 (office) 1 250 627 5621 (community comment line)

1.3 Purpose and Need for the Project

The Project is aligned with the Port of Prince Rupert 2020 Land Use Management Plan[2] which is currently under update for 2030. The 2020 plan set out the following vision for PRPA:

- *"Expanding Port development to benefit the national and regional economy through trade and employment opportunities;*
- *Enabling Port infrastructure and terminal capacity to accommodate future growth;*
- *Facilitating future regional industrial development that supports Port and marine operations;*
- *Positioning the Port as an outstanding area of business opportunity as a result of its strategic location in relation to northern marine and rail transportation corridors; and*
- *Ensuring development plans provide for sustainable and environmentally appropriate development by minimizing environmental impact, by meeting or exceeding the Canada/US Green Marine Environmental Stewardship Program and by striving for compatible development with neighbouring communities."*

[2] AECOM. 2012. PRPA 2020 Land Use Management Plan

Once in operation, RIELP will enhance the export transloading capacity between Fairview Terminal and Ridley Island and will ensure that the Prince Rupert gateway continues to be well-positioned to grow international trade opportunities for Canadian commodity exporters. Through the Project, PRPA will advance the vision of the 2020 plan. The Project undertaking will realize the opportunities of a new general cargo terminal, bulk terminal and break bulk terminals for commodities such as agricultural grains, resins, potash, lumber and pulp. At full buildout, RIELP will create additional intermodal capacity at Fairview Terminals to improve export logistics and reduce port-related traffic on public roads.

2 Description of the Project

2.1 Project Location

The Project will be located on the southern portion of Ridley Island adjacent to Porpoise Harbour, on federal crown land under the governance of PRPA. There is no legal description of the site. The geographic coordinates of the centre of the RIELP in Universal Transverse Mercator (UTM) are:

› 9U Easting 414881 Northing 6007379

The general location of RIELP is shown on **Figure 1.**

2.2 Physical Components

RIELP, at full build, will be constructed over a 46.5 hectare (ha) / 115 acre parcel of land at the southern end of Ridley Island. A three dimensional (3-D) representation is provided in **Figure 2**. The Project will include the following physical infrastructure (**Figure 3**):

1. **New rail and two grade-separated rail crossings:**
   - › Inbound, outbound and yard tracks, as described below.
   - › two grade-separated crossings.
2. **Upgrade to the existing unpaved access road and new automated truck gate**
3. **New Intermodal (IM) Container Yard:**
   - › Approximately 28.8 ha in area.
   - › One inbound and one outbound track to accommodate up to one intermodal unit train per day and up to three trains in the future.
   - › Up to six yard tracks – ranging from 620 meters to 762 metres in length each.
   - › Container storage yard to facilitate the movement of empty containers to both transload facilities (see below) and to store full containers until they are needed at Fairview Container Terminal.
4. **New Bulk (B) Transload Facility:**
   - › Approximately 7.7 ha in area.
   - › Up to Three inbound tracks and two outbound tracks to accommodate up to three unit train per day of dry bulk commodities (cereal grains, specialty crops, potash and resin pellets).
   - › Up to nine separated dumper pits for agri commodities and potash.
   - › Two covered grain elevators for agri commodity transfer to containers.
   - › Covered storage elevator for potash.
   - › Vacuum unloading platforms and covered bagging/palletizing plant for resin pellets.
5. **New Break Bulk (BB) Facility:**
   - › Approximately 7.7 ha in area.
   - › Up to two inbound tracks and one outbound track to accommodate up to one and a half unit trains per day of breakbulk commodities (lumber and pulp).
   - › Covered pulp and lumber shed.

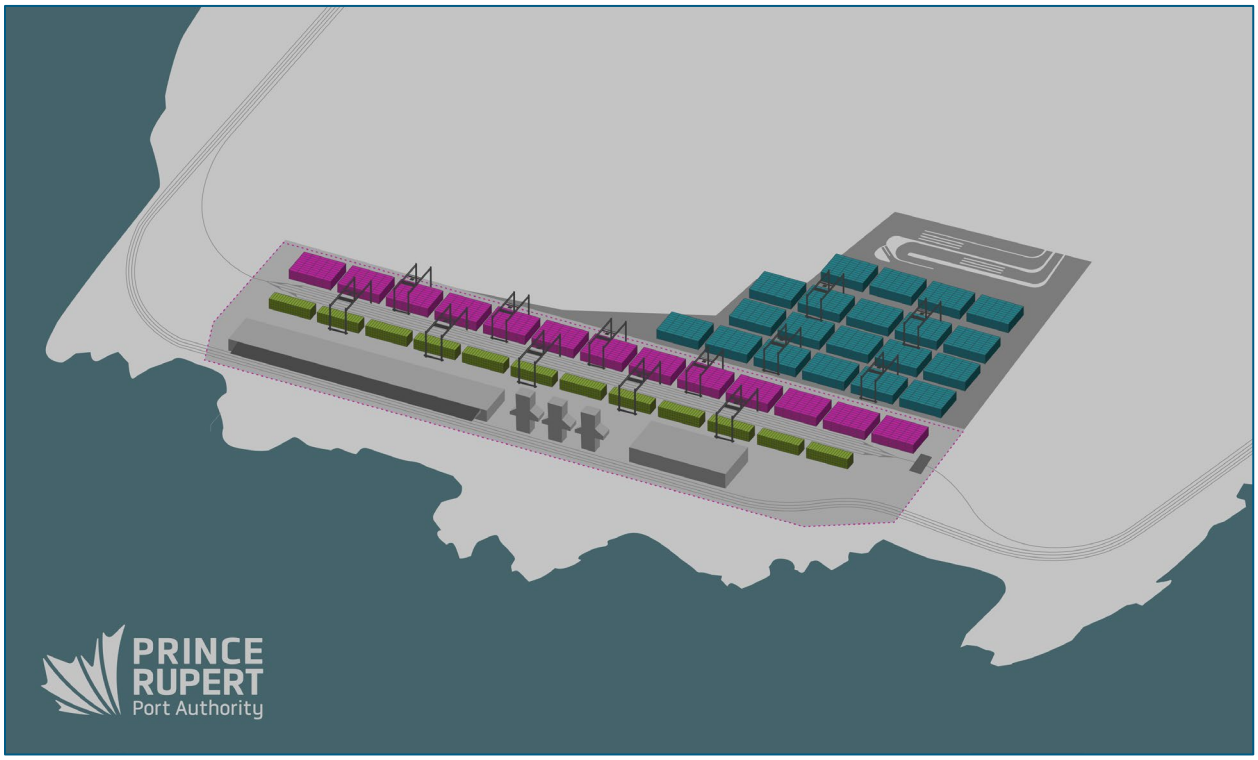

Figure 2: 3-D Representation of the RIELP Facility

6. **Ancillary Facilities**

- New administration and maintenance building.
- New parking lot with capacity for at least 50 cars.
- Extension of the existing 69 kilovolt (kV) power distribution line.
- Extension of telecommunications and IT system.
- Extension of water distribution line.
- New sanitary wastewater treatment package plant.
- New culverts and ditches to manage stormwater.
- New security fencing.

7. **On Site Equipment**

- Up to five cantilevered rail-mounted gantry (RMG) cranes for loading and unloading IM rail cars.
- Up to 14 cantilevered RMG cranes for working the container yard.
- Reach stackers.
- Electric bomb cart (tractor trailer) for shuttling containers between gantry cranes and reach stackers and yard based RMG cranes.
- Forklifts.
- Pick up trucks.

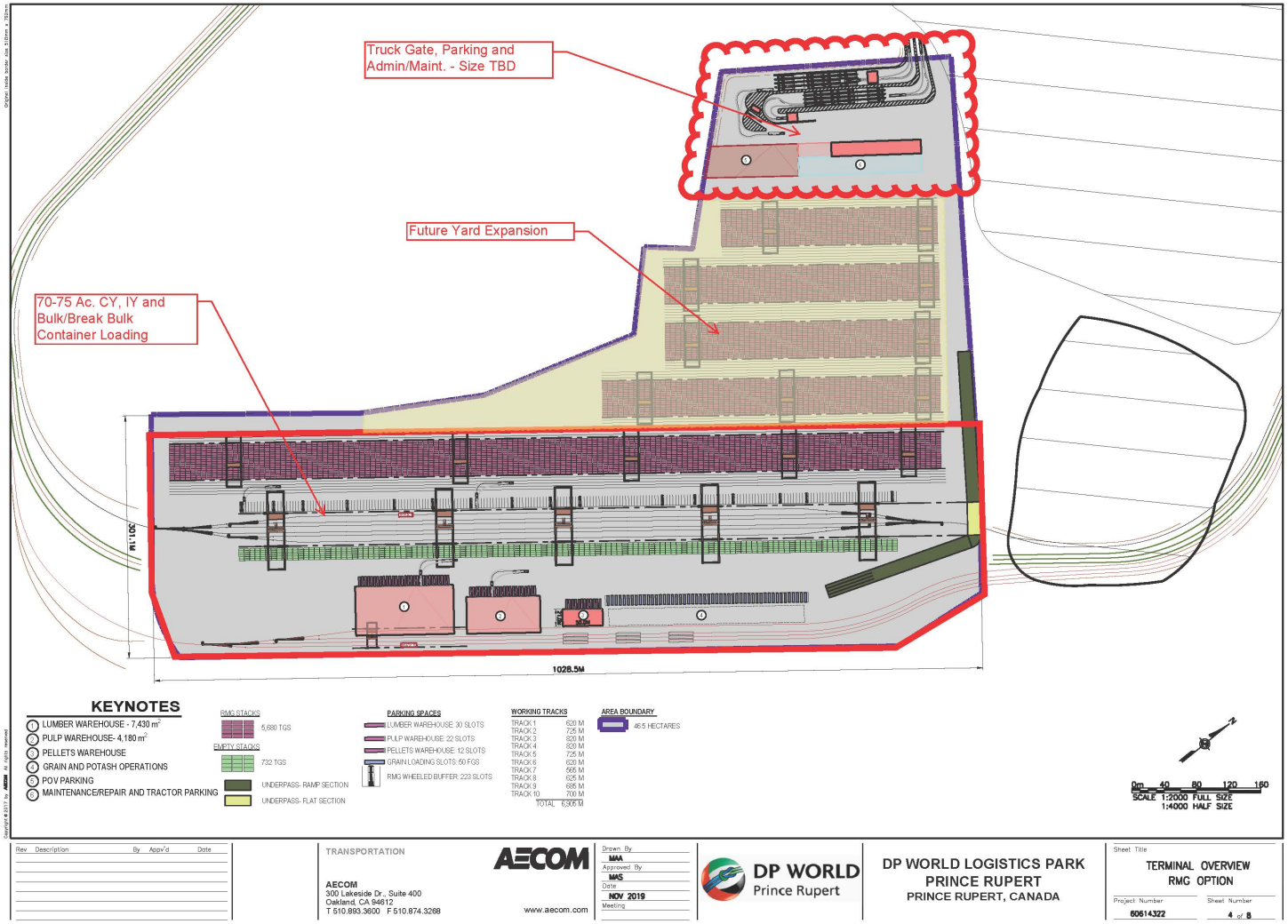

Figure 3: Project Configuration

2.3 Project Capacity

The RIELP component capacities are summarized below in **Table 2**.

Table 2: Project Capacity

Description	Capacity at 2022	Full Capacity
Timeline	› Q4 2022 (Operation)	› + 5 to 10 years
Employees	› Up to 50 people per shift	› Up to 50 people per shift
Hours of Operation	› 3 shifts › 24/7 operation	› 3 shifts › 24/7 operation
Goods handled	› Agricultural (legumes, grains & pulses) › Resin pellets › Potash › Lumber, pulp	› Agricultural (legumes, grains & pulses) › Resin pellets › Potash › Lumber, pulp
Bulk (B) Transload Facility	› Area: 7.7 ha (B) / 7.7 ha (BB) › Up to 400,000 TEUs/year	› Area: 7.7 ha / 7.9 ha › Up to 700,000 TEUs/year
Break Bulk (BB) Transload Facility		
Intermodal (IM) Container Yard	› Area: 16.3 ha (IM) › Up to 200,000 TEUs/year	› Area: 28.8 ha › Up to 200,000 TEUs/year
Combined B/BB Facilities & IM Yard	› Area: 31.7 ha › 600,000 TEUs/year (export capacity)	› Area: 44.2 ha › Up to 900,000 TEUs/year (export capacity)
Inbound tracks	› 3 tracks (total)	› 6 tracks (total)
Outbound tracks	› 3 tracks (total)	› 4 tracks (total)
Intermodal Container Yard tracks	› Up to 6 tracks	› 6 tracks (IM)
Access Road	› Up to 2.5 km	› Up to 2.5 km
Truck Transits	› 1,100 transits s between Fairview Terminal and RIELP (daily round trip)	› 2000 transits between Fairview Terminals and RIELP (daily round trip)
Train transits	› 3 trains per day (in/out)	› 4.5 trains per day (in/out)

2.4 Project Activities

2.4.1 Construction Phase

Construction is planned to occur from Q3 2020 to Q3 2022. The scope of the construction phase would include the following activities:

1. **Site Preparation**
   - Clearing & grubbing of up to 40 ha / 90 acres of land.
   - Disposal of the upper 1-2 metres of organic overburden in PRPA's disposal site.
   - Rock excavation, fill and placement:
     - Drill and blast: standard drill and blast techniques would be used to lower the elevation of the rock to corridor design elevations.
     - Large rock will be sorted from the blast rock to be used as rip rap along the face of exposed embankments.
     - Mechanical processing and placement: Excavated rock would be processed down to meet the fill specifications to bring any of the low-lying areas to the design elevation.
     - Import of additional rock supply: surfacing gravels and rail ballast will be imported from off site.
   - Overall site grading.
2. **Rail and Rail Crossings**
   - Grading of inbound and outbound rail embankment.
   - Track installation: inbound, outbound and yard tracks.
   - Potential for in-water work to stabilize rail embankment, including the installation of a large pre-fabricated archway to span creek crossing o the south west of Ridley Island.
   - Installation of grade-separated crossings at two locations (**Figure 2**).
3. **Access Road and Truck Gate to the Intermodal Container Yard**
   - Paving and re-grading of the access road (approximately 2.5 km long).
   - Installation of a new truck in-gate, including automated data collection.
4. **Intermodal Container Yard**
   - Yard surfacing.
   - Yard reinforcements for container storage.
   - Installation of rail track for RMG cranes.
   - Installation of yard lighting.
5. **Break Bulk Transload Facility**
   - Grading of the facility.
   - Installation of a covered pulp and lumber shed.
   - One inbound and one outbound track would be installed through the facility.

6. **Bulk Transload Facility**

- Grading of the facility.
- Construct and line separate dumper pits for agri and potash products.
- Installation of two agri elevators and container loading tippers.
- Installation of one potash elevator and container loading tippers.
- Installation of vacuum unloading system and covered bagging/palletizing plant for resin pellets.
- Two inbound tracks and one outbound track would be installed through the facility.

7. **Buildings and Utilities**

- Construction of a new administration and maintenance building.
- Construction of a new parking lot with capacity for at least 50 cars.
- Extension of the existing 69 kV power distribution line.
- Extension of telecommunications and Information Technology (IT) system.
- Installation of new lighting for the IM yard, transload facilities, outbound tracks, access road, parking lot, administration and maintenance building.
- Extension of a water distribution line.
- Installation of a sanitary wastewater treatment package plant.
- Installation of culverts and ditches to manage stormwater.
- Security fencing.

2.4.2 Operations and Maintenance Phase

RIELP operations is planned to begin by Q4 2022. The scope of the operations and maintenance phase would be focused on the export transloading of commodities through RIELP, and would include the following activities:

1. **Train Arrival and Offloading**

- Import of laden bulk and breakbulk trains via inbound trains to RIELP.
- Import of intermodal train with empty containers via inbound train to RIELP.
- Bulk commodities would be offloaded from rail via designated covered dumper pits, or vacuum unload system.
- Breakbulk Commodities would be offloaded from rail forklifts and gantry cranes.
- Empty containers would be offloaded from rail via gantry crane and/or reach stackers to bomb carts for distribution to Bulk/Breakbulk container loading facilities or storage in the container yard.

2. **Commodity storage**

- Agri and Potash commodities would be transferred from dumper pits directly into containers.
- Resin pellets would be unloaded directly into a covered facility and then bagged, palletized and loaded into containers.
- Forest products (lumber and pulp) would be transferred to a covered facility until ready for export, where they would then be loaded into containers.
- Laden containers would be shuttled to the Container yard for storage.

3. **Truck Movement on Fairview Connector Road**
   - Trucks would transport laden containers to Fairview Terminal for export via Ocean Vessel.
   - Trucks would transport either empty containers or laden import containers from Fairview Terminal to the Container yard.
   - A total of 1,100 daily round trip truck movements are expected from Fairview Terminal to RIELP, with the potential of 2,000 daily truck trips at full build out.
   - Laden export containers would move from RIELP to Fairview Terminal.
   - Laden import, or empty containers would move from Fairview Terminal back to RIELP.
4. **Truck Movement from public roads**
   - A total of 100 truck trips/day (up to 200/day at full build out) would be diverted onto the Ridley Island Access Road from Highway 16.
5. **Train Departures**
   - Intermodal trains would depart eastward with laden import containers.
   - Bulk and Breakbulk trains would depart eastward empty.

2.5 Project Schedule

The Project schedule is presented in **Table 3**.

Table 3: Project Schedule

Project Phase	Time Period
Design and Planning	Q1 2019 to Q2 2020
Construction and Permitting	Q3 2020 to Q3 2022
Operation	Q4 2022
Decommissioning	+50 years

3 Past Studies, Land Use and Regulatory Overview

3.1 Past Studies

Ridley Island and the Port of Prince Rupert have been the subject of several environmental assessments, planning and monitoring initiatives for over a decade resulting in a considerable body of research that is readily available to the public. This Project Description document is a compilation of information gathered from several reports and documents including, but not limited to, the following:

- Ridley Island Master Development Plan (2008).
- Canpotex Potash Export Terminal Project (2011).
- PRPA 2020 Land Use Management Plan (2012).
- Fairview Terminal Phase II Expansion Project (2012).
- Ridley Terminals Expansion Project (2012).
- PRPA Marine Environmental Water Quality Monitoring Program (since 2013).
- Prince Rupert LNG Project (2013).
- Pacific NorthWest LNG Project (2016).
- AltaGas Ridley Island Propane Export Terminal Project (2016).
- Aurora LNG Project (2016).
- Pacific North Coast Integrated Management Area (PNCIMA) Plan (2017).
- Vopak Pacific Canada Bulk Liquids Export Terminal Project (2018).

3.2 Land Use Designation

PRPA manages 965 ha of lands and waters under its jurisdiction under the 2020 Land Use Plan. The plan is a requirement of PRPA pursuant to the Canada Marine Act and is intended to provide detailed objectives and policies for future port development (AECOM 2012).

Although much of the plan remains valid, changes to operating context, strategic direction, economic opportunities and land portfolio have taken place. At the time of writing, PRPA initiated public consultation on updates to the plan for 2030 objectives. PRPA expects to finalize the 2030 Land Use Plan sometime in 2020.

Under the 2020 Land Use Plan, Ridley Island is managed within a planning district that includes the Outer Harbour (Porpoise Harbour and Outer Islands), with the intent of development for major port oriented industrial operations (AECOM 2012). The potential uses for the south and western areas of Ridley Island are listed as:

- Major industrial use with a requirement for Port access;
- Dry and liquid bulk commodity terminals;
- Transload facilities;
- Rail support services; and
- Container service areas.

Ridley Island is also designated as a long-term industrial area by the City of Prince Rupert in its Official Community Plan. The Project will be located entirely on federal Crown land and designated water lot under the jurisdiction and administration of PRPA. Ridley Island is located within the City of Prince Rupert's zoning boundaries (City of Prince Rupert 2015) and is zoned as "M3-Waterfront Industrial Zone" under bylaw 3286 (2009).

3.3 Regulatory Framework

PRPA is a federal port authority constituted under the *Canada Marine Act*, and is mandated to facilitate and expand the movement of cargo and passengers through the Port of Prince Rupert. Federal environmental legislation, regulation and policy that are relevant to the Project include:

- The *Impact Assessment Act*[3] (2019). This Act specifies that an authority must not carry out a project on federal lands unless the authority *"determines that the carrying out of the project is not likely to cause significant adverse environmental effects*" for projects designated under the *Physical Activities Regulation* of the *Impact Assessment Act*.
- The *Fisheries Act*[4] (2019). This Act and associated regulations prohibit causing the death of fish by means other than fishing, and prohibits the harmful alteration, disruption or destruction of fish habitat. An Authorization from Fisheries and Oceans Canada (DFO) under the Act is a potential requirement for the Project.
- The *Species at Risk Act*[5] (SARA). This Act protects, provides for the recovery of, and manages taxa listed under the Act and their critical habitats. The prohibitions of the Act apply automatically to all taxa on federal lands. Site-specific mitigation(s) or permit(s) under the Act may be necessary for the Project.
- The *Migratory Bird Convention Act*[6] (MBCA). This Act and associated regulations prohibit the killing, capturing, injuring, taking or disturbing of migratory birds or the damaging, destroying, removing or disturbing of their nests. Site-specific mitigation(s) may be necessary to maintain compliance with the Act.
- The *Federal Policy on Wetland Conservation*. The wetlands policy specifies no net loss of wetland function due to projects on federal lands (Government of Canada 1991).

RIELP will be entirely on federal land under the administrative authority of PRPA. As currently defined, the Project does not exceed the applicable thresholds defined within the *Physical Activities Regulations* of the IAA[7] and is not subject to the review process of an impact assessment of a designated project. As a federal authority under the *Canada Marine Act*[8], however, PRPA will undertake an EEE of the Project and make a determination on the environmental effects pursuant to Section 82 of the IAA. Fisheries and Oceans Canada, Transport Canada and Environment Climate Change Canada may also be responsible federal authorities in reaching a determination under the IAA.

The Project may also benefit from a federal infrastructure fund administered through Transport Canada.

3 Impact Assessment Act, S.C. 2019, c. 28, s.1
4 Fisheries Act (FA), (R.S., 1985, c. F-14), last amended by on April 5, 2016.
5 *Species at Risk Act* (SARA), (S.C. 2002, c.29), last amended on May 22, 2019.
6 *Migratory Birds Convention Act* (MBCA), S.C. 1994, c. 22, last amended on December 12, 2017.
7 Physical Activities Regulations (SOR/2019-285) and Impact Assessment Act (S.C. 2019, c. 28, s. 1)
8 Canada Marine Act (1998, c.10).

Pursuant to Section 82 of the *Impact Assessment Act*, responsible federal authorities will undertake an EEE and issue an Environmental Effects Determination in consideration of the following factors:

- Rights of Indigenous peoples of Canada;
- Indigenous knowledge provided with respect to the project;
- Community knowledge provided with respect to the project;
- Comments received from the public; and
- Implementation of technically and economically feasible measures that would mitigate significant adverse environmental effects from the project.

4 Environmental Overview

4.1 Atmospheric Environment

The Project is situated in a region with a wet but moderate climate due to moist, warm air moving eastward off the Pacific Ocean. Colder air moving south and west from the interior is mostly diverted away from the region by the Coast Mountains.

Canadian climate normal station data 1981-2010 for the 'Prince Rupert A' weather station indicate that the average number of days with rainfall is at least 16 days per month for all months of the year, to a maximum of 24 days in October (Government of Canada 2019). The annual precipitation averages for the region measures 2,619 millimetres (mm), of which 92.4 mm falls as snow. Snow depths rarely exceed 2 centimetres (cm) (Government of Canada 2019). The mean temperature of Prince Rupert ranges from 1°C in the winter to 12.8°C in the summer.

PRPA has collected data on port-related emissions since 2010 and measures ambient levels of particulate matter ($PM_{2.5}$ and PM_{10}), nitrogen oxides (NO_X, NO_2, NO), sulfur dioxide (SO_2), and tropospheric ozone (O_3). Air quality data at the Port is made available by PRPA from two air quality monitoring stations at the Westview Terminal and Fairview Terminal in Prince Rupert. Real-time results are posted to the BC Air Data Archive[9] and found categorized under the Coastal Air Zone which extends along the Canadian coastline from Bamfield to Stewart, including Haida Gwaii (**Figure 4**). On December 10, 2019, the data showed that air quality measurements within the Port were well within the BC Air Quality Objectives (**Table 4**).

[9] Coastal Air Zone Data

Figure 4: BC Air Zones (Source: Government of BC 2019)

Table 4: Air Quality Data on December 10, 2019 (Prince Rupert Fairview – Air Monitoring Station)

Air Quality Parameter	Units	Current Data*	BC Air Quality Objective**
$PM_{2.5}$	micrograms per cubic metre (µg/m^3)	0.7	25
$PM_{2.5}$ (24-hour)	µg/m^3	1.8	
PM_{10}	µg/m^3	1.5	50
PM_{10} (24-hour)	µg/m^3	2.5	
O_3	parts per billion (ppb)	24.8	63
O_3 (8-hour)	ppb	26.4	
NO_2	ppb	2.9	100
NO_2 (24-hour)	ppb	2.7	
SO_2	ppb	0.8	70
SO_2 (24-hour)	ppb	0.9	

* Measured on December 10, 2019; http://www.env.gov.bc.ca/epd/bcairquality/data/station.html?id=E312331
** The Air Quality Objective is the provincial acceptable limit

4.2 Terrestrial Environment

Ridley Island is an area of moderate terrain, dominated by muskeg (bog) wetlands and moist to wet coniferous forest. Summaries of the physical and terrestrial environments are provided below.

4.2.1 Geology, Soils and Terrain

The surficial geology of Ridley Island is mapped as a compound unit, composed of a poorly-drained organic veneer of peat and muck (humisol), a glaciomarine silt/clay veneer and bedrock (Clague 1984). The bedrock on Ridley Island is composed of weathered metasedimentary biotite-muscovite schists (Hutchinson 1979, 1982). The bedrock plunges in small folds to the northwest or southeast. Soils are composed of orthic dystric brunisols adjacent to the shoreline of the island and organic terric mesisols and typic mesisols in the interior of the island (Stantec 2014). The mild temperatures and high rainfall characteristic of the north coast contribute to very wet soils and slow decomposition rates of organic material (Banner et al. 2005), which tends to accumulate and drive succession towards bog forests or woodlands (Banner et al. 1993). Analysis of five soil samples from Ridley Island indicated that soils are generally low in nutrients (Stantec 2014).

Ridley Island has low relief and a maximum elevation of approximately 50 m (Jacques Whitford-AXYS 2008). The shoreline of the island has been altered by previous development activities. Riprap has been added to stabilize the shoreline in some areas. Mudflat Bay was dyked at its outlet and subsequently used as a disposal area for dredgeate and overburden removed during construction of the coal and grain terminals (Jacques Whitford-AXYS 2008). The former bay has now been almost completely infilled, but a small sedimentation pond and muskeg pond remain.

4.2.2 Ground and Surface Water

The bogs of Ridley Island are composed of saturated organic peat and silt layers of varying depth over bedrock. The water in the bog communities is acidic (Stantec 2014) and is thus poor habitat for fish and most amphibians. The surface watercourses are small and discontinuous, originate from the wetlands, and almost all have barriers that prevent connectivity to marine habitats (Jacques Whitford-AXYS 2008). Some watercourses drain to the marine environment through culverts.

Groundwater flows are expected to drain from the centre of the island in all directions to Porpoise Harbour (east), Porpoise Channel (south) and Chatham Sound (west) (Jacques Whitford-AXYS 2008). There are no groundwater wells on the island, nor are ground or surface waters used as domestic drinking water sources.

4.2.3 Vegetation and Wildlife

Ridley Island is located within the Coastal Western Hemlock zone, Very Wet Hypermaritime biogeoclimatic subzone, Central variant (CWHvh2) (Banner et al. 1993), within the Hecate Lowland and North Coast Fjords ecosections. Bog, fen and swamp wetlands have been mapped on the island during various terrestrial ecosystem mapping projects since 2008 (Jacques Whitford-AXYS 2008; Stantec 2011; Ecora Resource Group 2013).

Most of the southern portion of the island is vegetated with a mixture of slope/blanket bog wetlands with small areas of open water, forested bog, and mesic to wet coniferous forest. The bogs are dominated by a variety of *Sphagnum* and brown mosses, shrubs such as sweet gale (*Myrica gale*) and Labrador-tea (*Rhododendron groenlandicum*), and sparse tree cover consisting of small-diameter western redcedar (*Thuja plicata*), yellow-cedar (*Xanthocyparis nootkatensis*) and shore pine (*Pinus contorta*). Mesic forests are dominated by western redcedar, western hemlock (*Tsuga heterophylla*), and Sitka spruce (*Picea sitchensis*). Red alder (*Alnus rubra*) is commonly found in areas of recent disturbance and on fluvial sites (Banner et al. 1993). Four rare ecological communities, as described by the BC Conservation Data Centre (CDC), have been mapped near the Project including Western redcedar-Sitka spruce / Skunk cabbage – CWHvh2/13 (Ws54) (AECOM 2013).

Photo 1: Bald Eagle
(SNC-Lavalin photo)

The largest terrestrial mammals with documented occurrence on Ridley Island are black-tailed deer (*Odocoileus hemionus*), black bear (*Ursus americanus*) and grey wolf (*Canis lupus*). Porcupines (*Erethizon dorsatum*) are also commonly encountered, and multiple small mammal species (mice, rats, voles, shrews) and bat species are expected present. A wide variety of migratory birds (songbirds, waterfowl, shorebirds, seabirds, herons) has been documented on the island and the majority of them are expected to nest there. Bald Eagles (*Haliaeetus leucocephalus;* **Photo 1**) have been observed nesting on the island in the past (Jacques Whitford-AXYS 2008).

Higher elevation ponds and marshes on Ridley Island provide suitable breeding habitat for amphibians, including western toad (*Anaxyrus boreas*) which is well-documented in wetland areas of Ridley Island (WorleyParsons 2012). Four other amphibian species may occur near the Project including roughskin newt (*Taricha granulosa*), red-legged frog (*Rana aurora*), long-toed salamander (*Ambystoma macrodactylum*), and northwestern salamander (A. gracile) (WorleyParsons 2012; CDC 2019). Ridley Island is within the geographic distribution of coastal tailed frog (*Ascaphus truei*); however, there is a lack of suitable breeding habitat for this species so the likelihood of tailed frog presence is low.

Common garter snake (*Thamnophis sirtalis*) and the western garter snake (*T. elegans*) are two reptile species that may occur near the site (WorleyParsons 2012).

4.2.4 Freshwater Fish and Fish Habitat

Photo 2: Threespine Stickleback
(*R. Hagerty USFWS public domain)*

Dominant freshwater habitats present on Ridley Island are highly acidic, small ponds, and short non-connected watercourses that are not considered suitable habitats for fish. These rain or snow fed bogs typically have low pH (acidic) water and low productivity, and generally considered unsuitable as fish habitat (WorleyParsons 2012).

Fish-bearing watercourses and waterbodies are limited on Ridley Island. Threespine Stickleback (*Gasterosteus aculeatus;* **Photo 2**) and sculpins have been documented in water features at the south end of Ridley Island (Jacques Whitford-AXYS 2008; AECOM 2013).

4.3 Marine Environment

4.3.1 Marine Water Quality

Marine water quality around Prince Rupert is monitored through the Port of Prince Rupert Marine Environmental Water Quality (MEWQ) program, a collaborative initiative between the PRPA, port partners, First Nations and government agencies. Water quality samples are taken at three site groups: Prince Rupert Harbour, Skeena River, and the Outer Anchorage. The program objectives include (1) the characterization of natural marine environmental variability, (2) comparison of measured parameters against government water quality thresholds, (3) temporal and spatial characterization of water quality changes, and (4) detection of anomalous water quality conditions that may be attributed to activities in the region (SNC-Lavalin 2018).

Seasonal differences in environmental conditions of the waters around the Port of Prince Rupert are driven by regional climatic events (e.g., precipitation) and/or the Skeena River discharge that affect water quality measurements/properties in the Prince Rupert marine environment. The Canadian Council of Ministers of the Environment Water Quality Index (WQI) was developed so that complex water quality data can be summarized to help facilitate its communication to a general audience.

Enterococcus and fecal coliform were the most common MEWQ variables to exceed Provincial or Federal guideline values in 2018 (SNC-Lavalin 2018). Two metal parameters exceeded their respective water quality guideline value during the 2018 MEWQ program: selenium and boron; however, those exceedances may be due to natural occurrences of these metals in marine waters.

Overall, average WQI values reported in 2018 indicate that Port water quality is considered “good” to “excellent”. Sites rated as “good” typically have several parameters exceeding respective guidelines (e.g., enterococcus, fecal coliform, selenium and turbidity/Total Suspended Solids). Prince Rupert Harbour typically has had lower WQI scores than the Skeena River and the Outer Anchorage over the past six years, which is likely attributable to bacteriological exceedances related to stormwater discharge and sewage outfalls (SNC-Lavalin 2018).

4.3.2 Marine Vegetation, Fish and Wildlife

The rocky shoreline around Ridley Island supports a variety of kelps, alga and rockweeds that provide fish habitat. Eelgrass (*Zostera marina*) beds are present where sediments have accumulated and are particularly important to juvenile fish (Jacques Whitford-AXYS 2008; Stantec 2011). The shoreline on the eastern side of the island is sheltered and the lower zones are mainly mudflats, with boulders and cobbles forming the substrate at the mid and high intertidal zones (Stantec 2011). AECOM (2012) indicated the south shore of Ridley Island is high value habitat, attributing to the diversity of habitat type and abundant presence of marine vegetation such as algae and grasses.

Multiple species of marine fish and aquatic life occur in the marine waters off the shore of Ridley Island. Invertebrate species observed in May 2009 (Stantec 2011) included shrimp and prawns (*Pandalus* spp.), geoduck clams (*Panopea abrupta*), Dungeness crab (*Cancer magister*), California sea cucumbers (*Parasticopus californicus*) and scallops (*Chlamys* spp.).

Northern Ronquils (*Ronquilus jordani*), eelpout species and English Sole (*Parophrys vetulus*) were the most common fish in the waters off Ridley Island by AECOM (2014). Longnose Skate (*Raja rhina*), Blackeye Goby (*Rhinogobiops nicholsii*), Surf Smelt (*Hypomesus pretiosus*), Pacific Halibut (*Hippoglossus stenolepsis*), Northern Sculpin (*Icelinus borealis*), Starry Flounder (*Platichthys stellatus*) and Rock Sole (*Lepidopsetta bilineata*) also occur. Most of the fish observed were noted at depths exceeding 10 m (AECOM 2014). At least 300 other marine fish species are found in the northeast Pacific Ocean (Stantec 2011), including commercially-harvested salmonids, Pacific Herring (*Clupea pallasii*), Eulachon (*Thaleichthys pacificus*), and rockfish (*Sebastes* spp.).

Multiple gull species and alcids are the most common marine birds using the marine waters around Ridley Island.

Photo 3: Harbour Porpoise
(*NPS public domain*)

Photo 4: Killer whale
(P. Calamari, *NPS public domain*)

Marine mammals that regularly occur around Ridley Island include harbour seal (*Phoca vitulina*), Dall's porpoises (*Phocoenoides dalli*) and Pacific white-sided dolphins (*Lagenorhynchus obliquidens*) (Stantec 2014). Humpback whales (*Megaptera novaeangliae*) and Northeast Pacific Northern Resident killer whales (*Orcinus orca*) may also be observed. In addition to these, Prince Rupert LNG surveys conducted in Fall 2012 documented harbour porpoise (**Photo 3**), Steller's sea lions, humpback whales, and transient killer whales (**Photo 4**).

4.4 Species at Risk

Wildlife taxa listed on Schedule 1 of the federal *Species at Risk Act* (*SARA*) have been observed on or near Ridley Island and/or the waters surrounding the island (**Table 5**; Jacques Whitford-AXYS 2008; Stantec 2016a). A 3.3-hectare area of Critical Habitat has been designated for Marbled Murrelet (*Brachyramphus marmoratus*) on the island's southeast coast.

No plant species listed on *SARA*'s Schedule 1 have been confirmed present on the island. Stantec (2011) reported two provincially blue-listed plants, Alaska holly fern (*Polystichum setigerum*) and Gmelin's sedge (*Carex gmelinii*), on Ridley Island.

Table 5: Wildlife species at risk potentially present near the Project

English Name	Latin Name	*SARA* Schedule 1 Status	Class
Harbour porpoise	*Phocoena phocoena*	Special Concern	Mammal
Killer Whale - Northeast Pacific Northern Resident Population 6	*Orcinus orca*	Threatened	Mammal
Little brown myotis	*Myotis lucifugus*	Endangered	Mammal
Common Nighthawk	*Chordeiles minor*	Threatened	Bird
Barn Swallow	*Hirundo rustica*	Threatened	Bird
Western Screech-owl	*Megascops kennicottii kennicottii*	Threatened	Bird
Great Blue Heron	*Ardea herodias fannini*	Special Concern	Bird
Band-tailed Pigeon	*Patagioenas fasciata*	Special Concern	Bird
Marbled Murrelet	*Brachyramphus marmoratus*	Threatened	Bird
Western Toad	*Anaxyrus boreas*	Special Concern	Amphibian

5 Social and Economic Overview

5.1 Social Overview

5.1.1 Local Communities

The Project is situated within the Skeena-Queen Charlotte Regional District on the northwest coast of BC. Located approximately 2 km northeast of the Project is the District Municipality of Port Edward. The population is estimated at 467 residents (Statistics Canada 2019a).

The City of Prince Rupert is the main urban centre, located approximately 12 km due north (**Figure 6**). The population of Prince Rupert was 11,733 in the 2016 census profile (Statistics Canada 2019b).

The communities of Metlakatla and Lax Kw'alaams (Port Simpson) are situated on the mainland coast north of Prince Rupert. There are also a number of other small villages and towns located nearby, on adjacent islands, and on the islands of Haida Gwaii.

The Regional District has experienced a 20% decrease in population over the last decade, and at the same time its economy has been facing substantial restructuring with decreasing reliance on more traditional sectors such as fishing and forestry (SNC-Lavalin 2016).

The average total annual income of households in Prince Rupert was $87,581 with an unemployment rate of 12.7 (Statistics Canada 2016a). Most of the employed residents were employed in the sectors of:

- Sales and service;
- Trades, transport and equipment operation;
- Business, finance and administration; and
- Management.

The average total annual income of households in Port Edward was very similar ($86,780), with an unemployment rate of 6.9 (Statistics Canada 2016b). Employed residents primarily worked in the sectors of:

- Trades, transport and equipment operation;
- Business, finance and administration; and
- Sales and service.

5.1.2 Community Services and Infrastructure

Port Edward has an elementary school (to Grade 5), a church, grocery stores, a skateboard park and tot park. The North Pacific Cannery National Historic Site is located in Port Edward. The Porpoise Harbour Marina Complex can handle up to about 250 vessels and includes facilities for gear and vessel repair and storage.

Many community services and infrastructure are based out of Prince Rupert located 15 km north of Port Edward (**Figure 4**). These include libraries, museums, hotels, elementary and high schools, shopping plazas, grocery stores, day-cares, sports facilities, and health-care facilities (including Prince Rupert Hospital, a clinic and residential and assisted-living facilities) as well as other health services such as dentistry, addiction, counselling and mental health. Coast Mountain College and the University of Northern BC provide opportunities for higher education.

Emergency services (fire, police, ambulance and air ambulance) are based in Prince Rupert. These services include those of the Canadian Coast Guard's Marine Traffic Services, Pacific Pilotage Authority, BC Coast Pilots, SMIT Marine and PRPA, provincial ambulance, fire and policing, as well as resources available from tenants of PRPA.

Four Coast Guard Stations (CGS) (with up to 90 staff) are located in the North Coast. One of those stations is located in Prince Rupert at the Seal Cove Seaplane Base. The Prince Rupert CCG Station offers services to assist maritime safety (DFO 2007).

5.1.3 Recreation and Parks

Fishing, hiking, cycling, golfing, wildlife viewing, skiing, trapping, boating, snowmobiling and hunting are popular recreational activities around Prince Rupert. Ridley Island overlaps a registered trapline boundary.

The closest provincial protected areas are Diana Lake and Prudhomme Lake Provincial Parks east of Port Edward, and Woodworth Lake Conservancy northwest of Prince Rupert (**Figure 4**). Kitson Island (proposed as a marine park) is located south of Ridley Island.

5.1.4 Access

Access to the region is by boat, ferry, by air, by rail, or by road along Highway 16 through the Skeena River valley. The regional airport is situated on Digby Island and air travellers are transported to the airport via shuttle from Prince Rupert. Ferry services to Vancouver Island, Haida Gwaii and Alaska are available in Prince Rupert harbour. Passenger rail services to Prince Rupert are available from VIA Rail, which connects Canadian stations such as Jasper, Alberta, along the CN Rail line.

The Port is connected by the Canadian National Railway (CN Rail) to destinations across Canada and the United States (AECOM 2012). Large volumes of cargo shipped through the Port are destined for CN Intermodal terminals in Toronto, Chicago and Memphis.

5.1.5 Archaeology

Culturally-modified trees have been mapped at multiple locations on Ridley Island as a result of an Archaeological Overview Assessment (AOA) carried out for PRPA in 2008, as well as additional surveys since then. A review of potential archaeological sites within the Project area will be completed for RIELP. An AOA will be conducted as part of an initial screening. If potential exists for archaeological features, further study such as an Archaeological Impact Assessment (AIA) will be completed as necessary. Site-specific mitigations and Chance Find protocols will be developed as part of the environmental review of the Project.

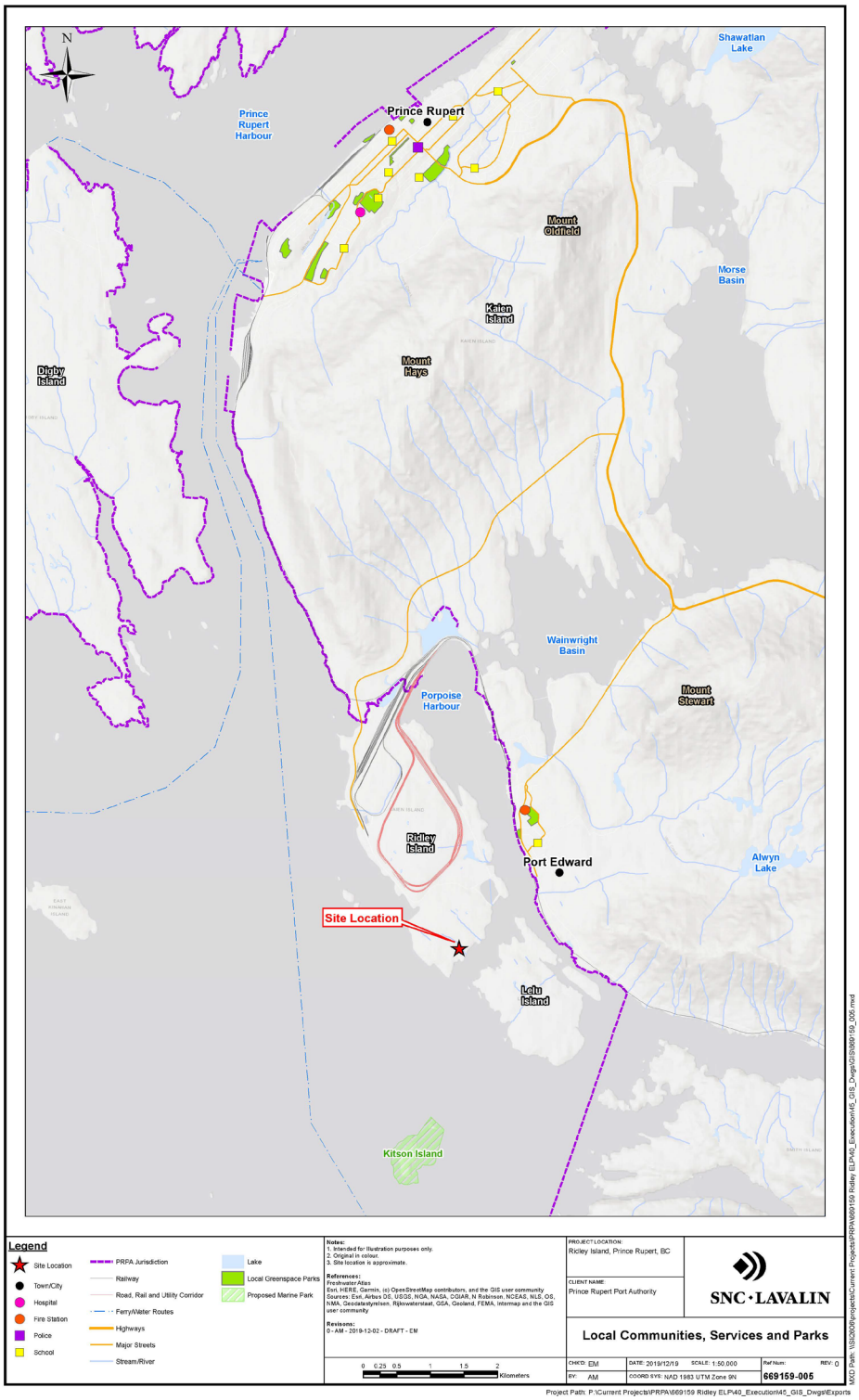

Figure 5: Local Communities, Services and Parks

5.2 Economic Overview

5.2.1 Port of Prince Rupert

The Port of Prince Rupert is the major transportation and business centre for the northwest coast of the province. PRPA is estimated to directly support or facilitate 3,600 full-time equivalents of employment, contribute $763 million to the province's Gross Domestic Product and generate almost $1.5 billion annually in direct regional economic output (InterVISTAS 2019). The total value of export trade moving through the port is estimated at $7.8-$10.6 billion, and that of import trade at $31.7-$59.6 billion (InterVISTAS 2019).

Canadian National (CN) rail provides overland transportation of cargoes, connecting shippers and receivers all across North America with vessels transporting goods to and from overseas customers and suppliers. Prince Rupert is the closest major North American port to Asia that has on-dock CN rail access and is the deepest harbour in North America. Over 25,000,000 metric tonnes of cargo moved through the port in 2018 (InterVISTAS 2019).

The port currently has 52 tenants. The main terminals currently operating in the port are (InterVISTAS 2019):

- Fairview Container Terminal, currently with an expanded operational capacity of 1.35 TEU annually and handling containers and bulk wax;
- Prince Rupert Grain Terminal, currently with an operational capacity of 7.8 million tonnes annually and exporting wheat, canola and barley;
- Ridley Coal Terminal, currently exporting coking coal, thermal coal and petroleum coke with an expanded operational capacity of 18 million tonnes annually;
- Westview Wood Pellet Terminal, exporting wood pellets and with an operational capacity of 1.25 million tonnes annually;
- Northland Cruise Terminal, handling large passenger cruise ships (10,100 passengers in 2018);
- Prince Rupert Harbour, which primarily transports logs, chemicals, liquid gases, steel, and heavy machinery; and
- Ridley Island Propane Export Terminal (AltaGas), began operations in 2019, exports liquid propane and other liquefied petroleum gas (LPG) and has an annual capacity of 1.2 million tonnes (AltaGas 2019).

Figure 6 shows the location of several terminal operators in the Port of Prince Rupert in relation to the Project location.

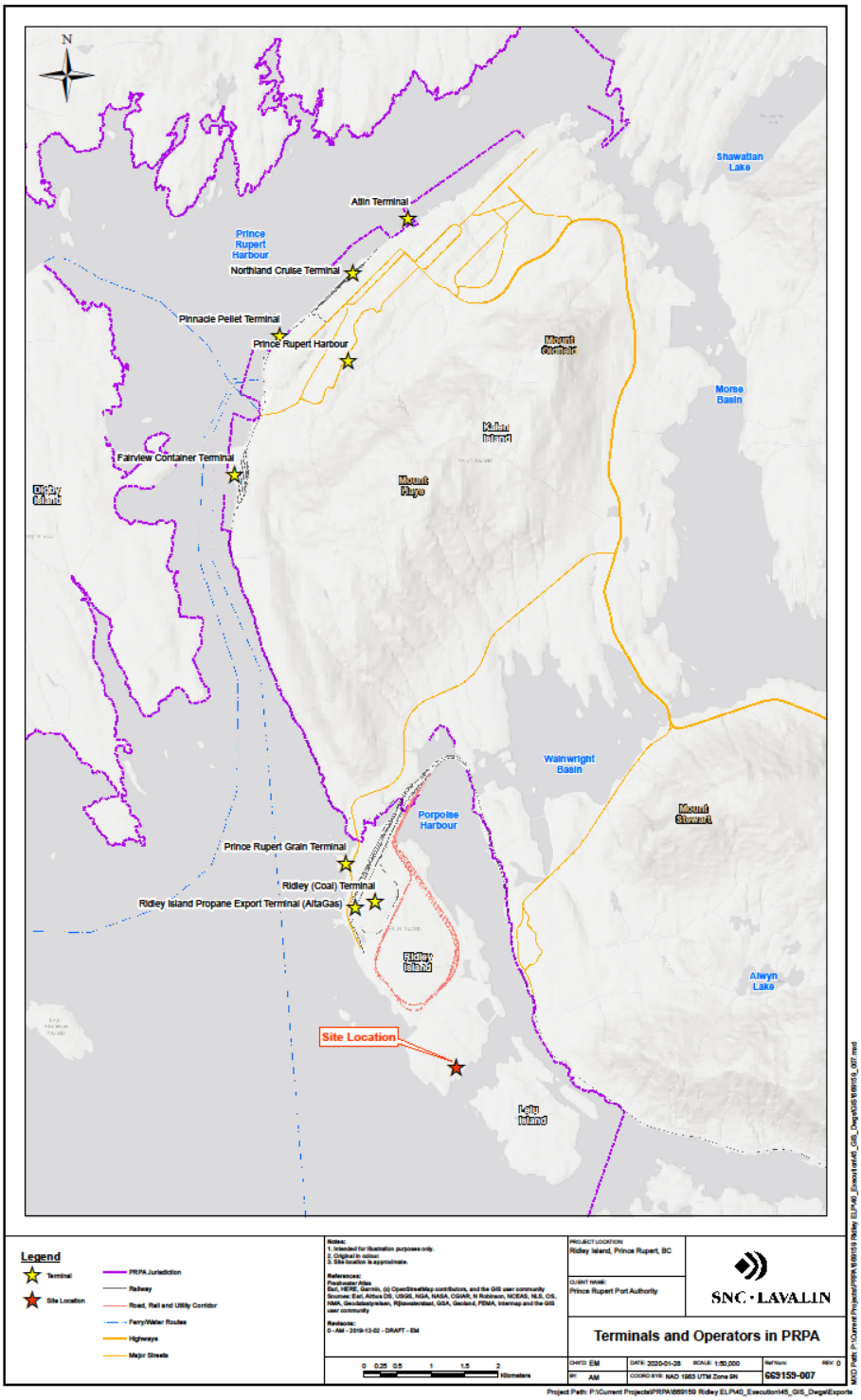

Figure 6: Terminals and Operators in PRPA

5.2.2 Local Economy

Port Edward Harbour Authority serves small craft harbours in each of the small vessel marinas in Prince Rupert and Port Edward (Fairview Harbour, Porpoise Harbour, Rushbrook Harbour, and Cow Bay Harbour). There are several other types of marine facilities within Prince Rupert and Port Edward including marinas, yacht clubs, public wharves, and coastal ecotourism and fishing lodges.

Fishing is an important cultural, commercial, and recreational activity for the people of the Prince Rupert and Port Edward area. Fisheries active in the area around Project site depend upon several species (e.g., salmon, halibut, ling cod, rock cod, geoduck, Pacific herring and Dungeness crab).

Regionally, tourism is playing an increasing role in the economy, taking advantage of the area's natural beauty and abundance of eco-adventure opportunities.

6 Indigenous Peoples and Traditional Land Use

6.1 Overview

Prince Rupert Harbour sits within the traditional territory of the Coast Tsimshian, this coastal area is also one of the oldest continuously occupied area in British Columbia. The traditional territories of several Indigenous Nations encompass the Project and include:

- Lax Kw'alaams Band.
- Metlakatla First Nation.
- Kitselas Nation.
- Kitsumkalum First Nation.
- Gitxaala Nation.
- Gitga'at First Nation.

There are 10 reserve lands within a 20 km distance of RIELP. These are listed below in **Table 6**.

Table 6: Reserve Land in Proximity to the Project

Name	Distance from Project
Lax Kw'alaams and Metlakatla Willaclough IR No. 6	2.2 km east
Metlakatla Grassy Bay IR	11.1 km northeast
Metlakatla Wilnaskancaud 3 IR	12 km northeast
Metlakatla S 1/2 Tsimpsean 2 IR	12 km northwest
Metlakatla Shoowahtlans 4 IR	13.4 km northeast
Metlakatla Tugwell Island IR 21	16 km northwest
Lax Kw'alaams and Metlakatla Tsimpsean IR No. 2a	18 km north
Metlakatla Tugwell Island 21	18.4 km northwest
Lax Kw'alaams and Metlakatla Dashken 22	11 km southeast
Lax Kw'alaams and Metlakatla Kshaoom 23	12.2 km southeast

6.2 Potential Changes Affecting Indigenous Peoples

Ridley Island has no public access and little current land use for traditional purposes. The EEE will identify and assess potential changes caused by the Project that could affect Indigenous peoples. These may include, among others, potential changes in human health risk from Project emissions (air, noise, light); traditional fishing and marine food harvest practices; and sites of archaeological or cultural importance.

7 Potential Project Effects

General potential effects of the Project are summarized in **Table 7** below. The Project will potentially have effects upon;

- fish and fish habitat as defined in subsection 2(1) of the *Fisheries Act*;
- aquatic species, as defined in subsection 2(1) of the *Species at Risk Act* (marine plants); and
- migratory birds, as defined in subsection 2(1) of the *Migratory Birds Convention Act*, 1994.

More detailed analysis of potential effects and mitigations (avoiding, minimizing, and/or compensating for potential impacts) will be developed during the Environmental Effects Evaluation, and as the design of the Project progresses.

Table 7: Potential Adverse Effects of the Project during Construction and Operation Phases

Topic	Construction	Operation
Atmospheric Environment	› Reduction in air quality, increased greenhouse gas (GHG) emissions and criteria air contaminants (CAC) › Noise or Light disturbance to the local residents or other sensitive receptors (e.g., marine and land-based wildlife) from construction and operations	› Reduction in air quality, increased GHG emissions and CAC › Noise or Light disturbance to the local residents or other sensitive receptors (e.g., marine and land-based wildlife) from construction and operations
Terrestrial Environment	› Loss or alteration of suitable habitat for wildlife, e.g., western toad, little brown myotis › Loss of sensitive ecological communities › Introduction of invasive species › Loss or alteration of wetlands › Increased erosion and sedimentation of local water features › Altered drainage patterns from reduced permeability › Potential to disturb critical habitat for Marbled Murrelet at the southeast end of Ridley Island. › Disturbance or displacement of wildlife	› Introduction of invasive species › Disturbance or displacement of wildlife › Potential to disturb critical habitat for Marbled Murrelet at the southeast end of Ridley Island. › Increased erosion and sedimentation of local water features as a result of altered drainage patterns
Marine Environment	› Adverse effects on marine habitat, fish and mammals from the release of a deleterious substance into the marine environment from construction activities › Disturbance and displacement of fish, aquatic species and migratory birds	› Adverse effects on marine habitat, fish and mammals from the release of a deleterious substance into the marine environment from construction activities › Disturbance and displacement of fish, aquatic species and migratory birds
Social and Economic Environment	› Reduced visual quality › Disturbance to archaeological sites	› Reduced visual quality › Light emissions

8 Anticipated Project Emissions

8.1 Construction Phase

PRPA anticipates the following types of project emissions during the construction phase of RIELP:

- **Air emissions** from construction equipment used during site clearing, grading and construction. Project sources will emit particulate matter, nitrogen oxides, sulphur oxides, carbon monoxide, volatile organic compounds, and GHG.
- **Stormwater runoff** is anticipated during precipitation events. Runoff and drainage will be managed through the implementation of erosion and sediment control measures.
- **Sanitary wastewater** will result from grey water and sewage from sanitary facilities on site.
- **Light** from construction equipment, machines and vehicles, and security lighting.
- **Noise** from construction equipment, machines and vehicles.
- **Waste soils and cleared vegetation** – waste vegetation, soils and rock is anticipated to be stored within PRPA's approved soil disposal area.
- **Solid waste** from construction materials (e.g., tires, packaging; paper, lumber, metals.
- **Hazardous waste** (e.g. batteries, oil filters, solvents, used oil) from construction equipment, machines and vehicles. There is the potential to encounter contaminated soils; however, it is not expected due to low amount of previous industrial use at the south end of the island.

8.2 Operations Phase

Emissions generated during operations are expected within the following categories:

- **Air emissions (**particulates and gases from vehicle exhausts, trains, vessels, HVAC). Operational sources will emit particulate matter, nitrogen oxides, sulphur oxides, carbon monoxide, volatile organic compounds, and GHG.
- **Stormwater** (from site drainage) drainage systems will collect and dispose of stormwater.
- **Sanitary Wastewater** will result from grey water and sewage from sanitary facilities on site.
- **Light** from office lighting, train, vehicle, yard operations and security lighting.
- **Noise** from train movements, trucks, vehicles, cranes, onloading and offloading of containers.
- **Solid Waste** from packaging, food waste, scrap lumber, office paper).
- **Hazardous Waste** from used oil and solvents, used cleaning materials, machinery, equipment and vehicles.

9 Consultation and Engagement

PRPA is committed to ensuring the Project has communication with and involvement of local Indigenous communities, local governments, residents, businesses, government agencies, neighbouring communities, and other members of the public. As part of the EEE, PRPA will engage with the community to raise awareness and understanding about the determination process and to receive comments for consideration on the Project.

PRPA will provide an opportunity for the incorporation of public concerns in preparing the environmental effects evaluation.

PRPA will facilitate meaningful consultation and engagement with Indigenous communities to identify their concerns as the design progresses. During this period, PRPA will develop strategies to ensure the concerns raised are adequately considered. PRPA will include the following Nations in consultations:

- Lax Kw'alaams Band.
- Metlakatla First Nation.
- Kitselas Nation.
- Kitsumkalum First Nation.
- Gitxaala Nation.
- Gitga'at First Nation.

PRPA will also engage with terminal operators on Ridley Island to ensure project activities do not affect other terminal operations.

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