



BC EAO EAC Application – Tenas Project

Section 6.0 Social Effects Assessment

Chapter 3 Infrastructure and Services Valued
Component

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Tenas Project

Section 6.0 Social Effects Assessment Chapter 3 Infrastructure and Services Valued Component

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Appendix 6.3-A Traffic Study

ABBREVIATIONS AND ACRONYMS

Abbreviation or Acronym	Long Form of Abbreviation or Acronym
AIHIC	Aboriginal/Indigenous Health Improvement Committee
AIR	Application Information Requirements
ALR	Agricultural Land Reserve
ARD	acid rock drainage
BAT	best available technologies
BC	British Columbia
BC EAO	British Columbia Environmental Assessment Office
BC EHS	British Columbia Emergency Health Services
BC MEMLI	British Columbia Ministry of Energy, Mines and Low Carbon Innovation
BC MFLNRORD	British Columbia Ministry of Forests, Lands, Natural Resource Operations and Rural Development
BC MOTI	British Columbia Ministry of Transportation and Infrastructure
BMPs	best management practices
BVDH	Bulkley Valley District Hospital
BVSAR	Bulkley Valley Search and Rescue
C	Chapter
C&M	care and maintenance
CAFS	compressed air foam system
CCP	Child Care Plan
CEA	cumulative effects assessment
CGL	Coastal GasLink Project
CIRNAC	Crown Indigenous Relations and Northern Affairs Canada
CMC	Coast Mountain College
CMHC	Canada Mortgage and Housing Corporation
CNR	Canadian National Railway
Code	Health, Safety and Reclamation Code for Mines in British Columbia (British Columbia Ministry of Energy, Mines and Low Carbon Innovation [BC MEMLI] 2021)
CPP	Coal Processing Plant
CUS	Cultural Use Study
EA	Environmental Assessment
EAA	<i>Environmental Assessment Act</i> , SBC 2002, c 43 (Government of British Columbia [GovBC] 2002)
EAC	Environmental Assessment Certificate
EMS	Environmental Management System (S13.0-C1)
EOC	Emergency Operations Centre

Abbreviation or Acronym	Long Form of Abbreviation or Acronym
ERT	Emergency Response Team
FIFO	Fly-In-Fly-Out
FNHA	First Nations Health Authority
FNHC	First Nations Health Council
FSR	Forest Service Road
FTE	full-time equivalent
ISSET	Indigenous Skills and Employment Training Program
KWES	Kyah Wiget Education Society
LHA	Local Health Area
LRMP	Land and Resource Use Plan
LNG	liquefied natural gas
LSA	Local Study Area
MERP	Minesite Emergency Response Plan (S13.0-C9)
MRI	magnetic resonance imaging
MTCP	Minesite Traffic Control Plan (S13.0-C10)
NGO	non-governmental organization
NWFC	Northwest Fire Centre
NWRHD	Northwest Regional Hospital District
OCP	Official Community Plan
OFA	Occupational First Aid
OW	Office of the Wet'suwet'en
PAG	potentially acid generating
RCMP	Royal Canadian Mounted Police
RDBN	Reginal District of Bulkley Nechako
RFP	Request for Proposal
ROM	run-of-mine
ROW	right-of-way
RSA	Regional Study Area
RV	recreational vehicle
S	Section
SAR	Search and Rescue
SC	subcomponent
SD	School District
SCSA	Smithers Community Services Association
SEMP	Socio-economic Management Plan (S13.0-C16)
SRMP	Sustainable Resource Management Plan
TAC	Tenas Access Corridor

Abbreviation or Acronym	Long Form of Abbreviation or Acronym
TCL	Telkwa Coal Limited
TK	Traditional Knowledge
TSS	total suspended solid
VC	Valued Component

UNITS OF MEASURE

Abbreviation	Long form of Abbreviation or Acronym
\$	Canadian dollar
%	percent
gpm	gallons per minute
ha	hectare
km	kilometre
km ²	square kilometre
kV	kilovolt
V	volt

EXECUTIVE SUMMARY

This chapter provides an analysis of potential interactions between the Tenas Project (Project) and the Infrastructure and Services Valued Component (VC). Infrastructure and Services was selected as VC during the pre-application phase of the Project following the VC selection process set out in **Section (S) 3.0-Chapter (C) 1-2.4.1 Selection of and Valued Components (VCs)** of the **Environmental Assessment Certificate (EAC) Application**, and used the methodology provided in the Guideline for Selection of Valued Components and Assessment of Potential Effects (BC EAO 2013). The Infrastructure and Services Valued VC is divided into three (3) subcomponents:

1. Accommodation and Housing;
2. Community Infrastructure and Services; and
3. Transportation.

Spatial boundaries for the assessment of potential effects on Infrastructure and Services VC include the Local Study Area (LSA) defined to include Village of Telkwa, Town of Smithers, District of Houston, and the community of Witset (formerly Moricetown); and the Regional Study Area (RSA) defined to encompass the RDBN and the community of Witset. The assessment of Project-related effects and cumulative effects was conducted according to the methods set out in **S3.0 Assessment Methodology** of the **EAC Application**.

The provision of Project employment and contracting opportunities, resulting in in-migration into the LSA during the Construction, and Operation phases will increase the number of people seeking accommodation in the LSA, and making use of community infrastructure and services, including emergency services. Increased vehicle movement associated with the Construction, Operation, and Decommissioning and Reclamation phases may affect traffic patterns and result in wear on transport infrastructure.

The assessment in this chapter identified three (3) potential adverse effects on the Infrastructure and Services VC subcomponents:

1. Housing and Accommodation subcomponent: increase in cost or decrease in availability of housing and accommodations;
2. Community Infrastructure and Services subcomponent: increase in demand for community infrastructure and services, including emergency services; and
3. Transportation subcomponent: change in use of roads and related increases in traffic.

The Project will implement a **Socio-Economic Management Plan (S13.0-C16) (SEMP)** that will include various programs to mitigate potential effects to the Infrastructure and Services VC subcomponents such as:

- ▶ Housing and Accommodation Program;
- ▶ Education, Training and Employment Program, which includes a Child Care Program;
- ▶ Procurement Program; and
- ▶ Community Engagement Programs.

Additionally, a **Minesite Traffic Control Plan (S13.0-C10) (MTCP)** will be implemented and will describe the traffic management processes and procedures in place for the Project, including use of the Tenas Access Corridor (TAC) which provides access to the Minesite, and its associated haul and service roads within the Minesite.

After the implementation of mitigation measures, three (3) residual effects were predicted for the Infrastructure and Services VC subcomponents:

1. Housing and Accommodation subcomponent: increase in cost or decreased availability of housing and accommodations during the Operation Phase;
2. Community Infrastructure and Services subcomponent: increased demand for child care services; and
3. Transportation subcomponent: change in use of roads and related increases in traffic during the Construction, and Decommissioning and Reclamation phases.

Upon characterisation and determination of Likelihood and Significance the Project residual effects for the Infrastructure and Services VC subcomponents are **Not Significant**.

Project-related residual effects were assessed in terms of their cumulative effect within the RSA based on available information and understanding of other reasonably foreseeable projects and activities. Upon review of projects and activities within the RSA (past, present, and reasonably foreseeable future), and after determining that no additional mitigation measures are expected to be necessary, it was predicted cumulative effects are expected to occur but are **Not Significant** for an increase in cost or decrease in availability of housing and accommodations, increased demand for child care services, and change in use of roads and related increases in traffic. The overall effect of the Project on Infrastructure and Services is **Not Significant**.

1. INTRODUCTION

This chapter presents the identification and assessment of the potential for residual effects of the Tenas Project (Project) on community and regional infrastructure and services. The Project will require changes and additions to roads and has the potential to affect the use of local infrastructure and community services, including emergency services. This chapter presents the subcomponents, indicators, and boundaries of the assessment for the Infrastructure and Services Valued Component (VC), and pathways along which potential Project-related effects could occur, with cross references to other supporting VC assessment sections.

The assessment proceeds as follows:

- ▶ **Regulatory Context:** A description of the applicable legislation, policies, standards, and guidelines relevant to the Infrastructure and Services VC;
- ▶ **Scope of Assessment:** A description of the assessment scope including issues scoping, rationale for the selection of the Infrastructure and Services VC and indicators, and definitions for the spatial and temporal boundaries of the assessment;
- ▶ **Existing Conditions:** The existing conditions of the Infrastructure and Services VC are reviewed, including literature review and desktop research and field study interviews. The **Socio-Economic Baseline Report (5.1-A)** of **S5.0-C1 Labour Market VC** of the **EAC Application** undertaken for the Project provides a summary of existing conditions indicates sources of regional and site-specific data, timeframe, and data collection methods. Assumptions and uncertainties have been documented, as appropriate. Relevant data used in other project assessments was also considered;
- ▶ **Assessment of Project-related Effects:** Potential interactions between the Project and the Infrastructure and Services VC are identified and evaluated to determine whether those interactions could result in effects on the VC. Upon identification of these potential effects, mitigation measures are outlined, and any subsequent residual effects are described. These effects are characterised, and their significance is determined;
- ▶ **Cumulative Effects Assessment (CEA):** Potential interactions between residual effects due to the Project and residual effects due to other past, present, or future projects or activities are identified and assessed to determine if residual cumulative effects are likely to occur. Upon identification of effects, any additional available mitigation measures are outlined, and any subsequent residual adverse changes are described and characterised, and their significance is determined; and
- ▶ **Follow-up Strategy:** When adverse changes are identified and mitigated, a process of monitoring and adaptive management is provided.

2. REGULATORY CONTEXT

This environmental assessment (EA) has considered applicable provincial legislation, regulations, strategies, guidelines, plans, and best management practices (BMPs) relevant to the Infrastructure and Services VC, and includes information provided by Indigenous groups.

The Application Information Requirements (AIR) for the Project, approved by the BC Environmental Assessment Office (BC EAO 2022), outlines the requirements of the EA for the Infrastructure and Services VC to meet the provincial requirements under the BC *Environmental Assessment Act*, SBC 2002, c 43 (Government of British Columbia [GovBC] 2002a) (EAA). The assessment of the Infrastructure and Services VC follows these guidelines and legislated requirements and is consistent with the requirements of the Project AIR. Legislation and management plans specific to the Infrastructure and Services VC are presented in the following subsections.

2.1 Provincial Legislation Regarding Infrastructure and Services

Provincial legislation applicable to the Project and relevant to the management of infrastructure and services are described in **Table 2.1-1**.

Table 2.1-1: Provincial Legislation Applicable to the Infrastructure and Services Valued Component (VC)

Name	Year	Description
<i>Environmental Assessment Act, SBC 2002, c. 43</i> (Government of British Columbia [GovBC] 2002a) (EAA)	2002	The EAA provides a mechanism for the Province of British Columbia to review all major projects proposed in BC to assess for any potentially adverse environmental, economic, social, heritage, or health effects. The Tenas Project (Project) requires an assessment of potential adverse environmental effects under the Reviewable Projects Regulation, BC Reg 243/2019 (GovBC 2019c) of the EAA because the Project exceeds a production capacity of 250,000 tonnes per year.
<i>Water Sustainability Act, SBC 2014, c 15</i> (GovBC 2014)	2014	The Act stipulates that the government of British Columbia (BC) controls groundwater and surface water in the province. Includes provisions for restricting water usage during shortages. Also provides consumers certainty about their water rights, as well as transparency in the rules pertaining to water
<i>Agricultural Land Commission Act, SBC 2002, c 36</i> (GovBC 2002b)	2002	The Act sets the legislative framework for the establishment and administration of the agricultural land preservation program. The associated <i>Agricultural Land Reserve Use Regulation BC Reg 30/2019 (GovBC 2019b)</i> permitted land uses within the Agricultural Land Reserve (ALR), and the <i>Agricultural Land Reserve General Regulation, BC Reg 30/2019 (GovBC 2019a)</i> sets out the required application procedures for alternative (i.e., non-farm) land uses.

2.2 Infrastructure and Services Management Plans and Guidance Documents

2.2.1 Provincial and Regional Plans and Guidance

Table 2.2-1 provides a summary of provincial and regional plans and guidance related to the management of infrastructure and services.

Table 2.2-1: Management Plans and Guidance Documents Applicable to the Infrastructure and Services Valued Component (VC)

Name	Year	Description
Bulkley Land and Resource Management Plan (LRMP) (GovBC 1998)	1998	Directs the management of 760,000 hectares (ha) of Crown land and provides general management direction related to eleven (11) categories: biodiversity, access, timber, water quality, fish and wildlife habitat, visual quality, range, outdoor recreation and tourism, subsurface resources, cultural heritage resources, and future planning processes. The Bulkley LRMP established six (6) resource management zones and new protected areas. Each sub-planning unit falls into one of the six (6) zones.
Bulkley Valley Sustainable Resource Management Plan (SRMP) (GovBC 2005)	2005	Provides objectives and strategies for resource management within the Bulkley Valley. The objective of the Bulkley Valley SRMP is to further break down the large Bulkley Valley into more specific areas and update them with their own objectives. There are seven (7) resource zones within the Bulkley Landscape Unit.
Health and Medical Services Plan Best Management Guide for Industrial Camps (Northern Health) (Northern Health 2015a)	2015	Provides details on Northern Health's expectations of on-site services, describes the types of health care needs that can be anticipated, and provides information on the level of detail that should be included in an effective Health and Medical Services Plan.
Standard Working Group Comments and Recommendations for Provincial Environmental Assessments in Northern British Columbia (Northern Health 2015b)	2015	Provides information intended for the identification, evaluation, and management of adverse effects that fall under health. Working group comments made by Northern Health are summarized in this document.
The Social Determinants of Health Impacts of Resource Extraction and Development in Rural and Northern Communities (Northern Health 2018a)	2018	Explores how resource extraction and development in rural and Northern communities can influence social determinants of health. It summarizes social determinants of health related to 15 socio-cultural determinants of health, including determinants related to Indigenous self-determination and connections to the land.
Communicable Disease Control Plan Best Management Guide for Industrial Camps (Northern Health 2017)	2017	Provides guidance for the development of infection prevention and outbreak protocols, and outlines expectations for Communicable Disease Control Plans. This plan targets larger sized camps but could be modified for application in smaller camps.
Health and Safety During the Opioid Overdose Emergency: Northern Health's Recommendations for Industrial Camps (Northern Health 2018b)	2018	Outlines areas where management in industrial camp sites can contribute to reducing the impact of an opioid overdose emergency among its workforce.

2.2.2 Local and Regional Regulations

The Regional District of Bulkley-Nechako (RDBN) Floodplain Management By-law No.1300 (RDBN 2016) defines flood plain designations and establishes management regulations and procedures for buildings and structure in areas prone to flooding. The Bylaw was established to reduce or prevent injury or the loss of life, and to minimize property damage, during flood events.

The Regional District of Bulkley-Nechako Zoning Bylaw No. 1800, 2020 (RDBN 2020b) of the Smithers Telkwa Rural Official Community Plan (OCP) (RDBN 2014), under the *Local Government Act*, RSBC 2015, c 1 (GovBC 2015) provides the RDBN with zoning authority. RDBN zoning applies to the Project, and the land that the Rail Infrastructure is located on will need to be rezoned as it is not currently a permitted use.

The OCP covers RDBN Area A and contains objectives to help guide land use planning and development of a variety of topics. The OCP also provides an overview of the communities found in Area A and the general plan vision. There are eight (8) different land designations in the OCP (RDBN 2014).

The Village of Telkwa has a range of bylaws that are relevant to the Project, and the Infrastructure and Services VC, including:

- ▶ Village of Telkwa Traffic Bylaw No. 592 (Village of Telkwa 2009): A bylaw to regulate traffic parking and the use of all public streets, roads, ways, trails, lanes, approaches and any other public way;
- ▶ Village of Telkwa Obstruction Bylaw No 602 (Village of Telkwa 2011): In accordance with this Bylaw, it is unlawful for any person(s), business, or other body to place an obstruction on municipal roads, parks, and properties; and
- ▶ Village of Telkwa Building Bylaw No. 533 (Village of Telkwa 2003): This bylaw applies to the design, construction and occupancy of new buildings and structures, and the alteration, reconstruction, demolition, removal, relocation, and occupancy of existing buildings and structures.

2.2.3 Indigenous Groups and Related Management Plans

The Project Area is located within the territory of the Wet'suwet'en. The Wet'suwet'en are in Stage 4: Active Negotiations of the treaty process with the Governments of BC and Canada (BC Treaty Commission 1995). In 2020, Hereditary Chiefs of the Wet'suwet'en as represented by Office of Wet'suwet'en (OW) signed a Memorandum of Understanding on rights and title with BC and Canada (Crown Indigenous Relations and Northern Affairs Canada [CIRNAC 2020]).

The First Nations Health Council manages a Social Determinants of Health Discussion Guide (First Nations Health Council [FNHC] 2017). This guide supports discussions on the social determinants of health at Sub-Regional and Regional Caucuses and illustrates the link between issues and health outcomes (National Collaborating Centre for Aboriginal Health 2017).

3. SCOPE OF THE ASSESSMENT

The Infrastructure and Services VC effects assessment, including the assessment of Project-related residual effects and cumulative effects was conducted in accordance with the methods set out in **S3.0 Assessment Methodology** of this **EAC Application**. The assessment boundaries specific to Infrastructure and Services VC are provided in **3.2.4** and the characterisation criteria specific to Infrastructure and Services VC are provided at the start of **5.4**.

This subsection outlines the scope of the assessment, including the rationale for the inclusion of Infrastructure and Services as a VC along with its subcomponents, the selection of indicators, and the definition of spatial and temporal boundaries. The assessment is based primarily on publicly available data managed by governments of BC and Canada or by regional authorities. This information has been supplemented by socio-economic baseline interviews and other Project-specific studies. When available and relevant, studies undertaken for other projects or for regional or community-specific reports have also been included. Publicly available traditional and local community knowledge has been considered, including the **Cultural Use Study** provided in **Appendix 7.1-B of S7.0-C1 Heritage Resources VC** of the **EAC Application**. Reports on Wet'suwet'en title and rights presented by the OW to the BC EAO and other regulatory decision makers in their review of other projects have also been considered.

3.1 Issues Scoping

Telkwa Coal Limited (TCL) has undertaken an engagement and consultation process to support the scoping of issues for the Project (please refer to **S11.0 Wet'suwet'en Rights and Interests Assessment** and **S12.0 Public Consultation** of the **EAC Application** for details on the consultation and engagement program). The consultation and engagement process has included technical working groups established with Indigenous groups and government departments, community meetings, one-on-one and small group meetings regarding key themes of interest and discussion of candidate VCs to represent the themes of interest.

Key themes of interests highlighted by this consultation and engagement process, and review of other information, included potential employment opportunities, issues around demand and availability for housing and accommodation (including costs and taxes), the use of local infrastructure and community services (such as education, child care, health care, and recreation), and the supply and quality of emergency services (policing, fire, and search and rescue [SAR]).

Study of local and regional infrastructure and services trends and characteristics was initiated in order to contextualize key themes of interests and determine how they might be influenced by Project-induced changes. Quantitative data on infrastructure and services from Statistics Canada (2019) were supplemented with available provincial, regional and local reports. Key informant interviews conducted with local residents and organizations of Telkwa, Smithers, and Houston as well as with regional representatives also provided insightful information on perceived infrastructure and services issues and trends.

3.2 Rationale for Selection of Infrastructure and Services Valued Component (VC)

The Infrastructure and Services VC and associated subcomponents were selected during the pre-application phase of the Project following the VC selection process set out in **S3.0-C1-2.4.1 Selection of and Valued Components (VCs)** of the **EAC Application**, and used the methodology provided in the Guideline for Selection of Valued Components and Assessment of Potential Effects (BC EAO 2013). The

goal was to focus on relevant issues, concerns, and components within the human environment as they relate to infrastructure and services provision and use that may be adversely affected by the Project.

3.2.1 Valued Component (VC)

The provision of Project employment and contracting opportunities, resulting in in-migration into the Local Study Area (LSA). Refer to **3.2.4** for definition during the Construction, and Operation phases will increase the number of people seeking accommodation in the LSA and making use of community infrastructure and services. Increased vehicle movement associated with Construction, Operation, and Decommissioning and Reclamation (refer to **3.2.4** for temporal boundary definitions) phases may affect traffic patterns and result in wear on transport infrastructure. Infrastructure and Services was selected as a VC in the assessment as there may not be sufficient capacity within the LSA to absorb the additional population, which could potentially adversely effect existing populations within the LSA.

The Infrastructure and Services VC supports and is dependent on the assessment of several VCs as outlined below:

- ▶ **Dependent on:**
 - ▶ **Labour Market VC (S5.0-C1):** Provision of employment and procurement can have implications on availability of housing and the provision of public services;
 - ▶ **Economic Development VC (S5.0-C2):** Changes in economic conditions resulting from the Project can affect the capacity to provide new community infrastructure and services if needed;
 - ▶ **Demographics VC (S6.0-C1):** Changes in population may affect availability of housing and the provision of public services; and
- ▶ **Supporting:**
 - ▶ **Community Well-being VC (S6.0-C5):** Increased demand for housing can effect cost of living which can have adverse effects on the well-being of communities.

3.2.2 Subcomponents

Subcomponents help to focus the assessment, and certain subcomponents may be of specific interest to a stakeholder groups or government agencies. Three (3) subcomponents have been selected to focus the Infrastructure and Services VC assessment on key themes of interest identified through the engagement and consultation process and based on reviews of other information (**Table 3.2-1**).

The three (3) subcomponents in this VC are:

1. Housing and Accommodation;
2. Community Infrastructure and Services; and
3. Transportation.

Table 3.2-1: Summary of Rationale for Selection of Infrastructure and Services Valued Component (VC) and Subcomponents and Their Linkages

Subcomponent	Rationale for Inclusion	Source of Information	VC Linkages	
Housing and Accommodation	- An increase or influx of employees (and their families) for Project Construction and Operation phases has the potential to increase demand on local infrastructure and services such as housing, emergency services, education services, child care services, health care services, recreation facilities and other local infrastructure. <i>Environmental Assessment Act</i>, SBC 2002, c 43 (GovBC 2002a) requires consideration of adverse social effects. - Regional service providers are interested in the potential Project-related increases in demand in relation to the current capacity for services.	- Regulatory requirements - Issues scoping - Interviews conducted during baseline data collection - Comparable EAs	Dependent on: - Labour Market - Economic Development - Demographics	Supporting: Community Well-being
Community Infrastructure and Services				
Transportation	- Project-related transportation have the potential to increase traffic volumes on access roads to the Minesite area. - Potential for employees not residing locally to increase air or road traffic volumes. - Potential for the export of product by rail to increase rail traffic. - Increased activity has the potential to change road, rail and air traffic patterns.	- Regulatory requirements - Issues scoping - Interviews conducted during baseline data collection - Comparable EAs	Dependent on: - Labour Market - Economic Development - Demographics	Supporting: Community Well-being

Notes: EA=environmental assessment; GovBC=Government of British Columbia; SC=subcomponent; Project=Tenas Project; VC=Valued Component

3.2.3 Indicators

Indicators are quantitative or qualitative measures used to describe existing VC or VC subcomponent conditions and trends, and to evaluate potential Project effects and cumulative effects on the VC. Social indicators that demonstrate changes to the Infrastructure and Services VC have been selected. For example, indicators considered to evaluate effects Housing and Accommodation Subcomponent include housing cost, as the Project may have an effect on housing availability if the cost of housing increases, indicating a shortage of housing relative to demand. Indicators for the Infrastructure and Services VC and the rationale for selecting those indicators are summarised in **Table 3.2-2**.

Table 3.2-2: Indicators for Infrastructure and Services Valued Component (VC) and Subcomponents

Indicator	Rationale for Selection
Housing and Accommodation	
Increase in cost or decrease in availability of housing and accommodations (change in demand for housing and accommodation, active residential listings, housing costs, property taxes, vacancy rates).	The in-migration of the (Project) workforce may increase the demand for accommodation in the short-term during Construction phase, and in the long-term during Operation phase. This may increase the cost of rentals and purchase of housing, and result in lack of supply in the Local Study Area (LSA).
Community Infrastructure and Services	
Use of community services and infrastructure (change in supply and demand for education, childcare, health care, recreation, and community infrastructure).	The Project workforce may make use of community services in the LSA such as education, recreation, healthcare, and other community infrastructure and services.
Use of emergency services (change in level of service of policing, fire, and search and rescue [SAR]).	The Project workforce may make use of emergency services in the LSA. In addition, the Project may require support from local emergency services should an unplanned event occur.
Transportation	
Use of roads and related increases in traffic (change in road, rail and air traffic patterns and infrastructure)	Vehicle movement associated with the Project has the potential to increase traffic on public roads, causing wear on the roads and traffic delays for other road users. The Project will also increase the use of an existing railway line.

3.2.4 Assessment Boundaries

The LSA and RSA for the VCs related to the economic and social effects assessments were selected based on the proximity of identified communities to the proposed Project Area, and their anticipated interaction with Project activities during Construction, Operation, Decommissioning and Reclamation, and Post-closure phases. Consideration was given to the potential economic and socio-community effects of the Project, noting that Project-induced changes in population, employment, contracting, procurement, and other economic conditions (e.g., labour market supply, demand, and production systems) are typically pathways to related social and economic effects. For consistency in the assessment, selection of study areas also considered administrative and technical boundaries with respect to the availability of existing conditions data and how the data was organized.

3.2.4.1 Spatial Boundaries

The Infrastructure and Services VC has adopted the same LSA and RSA as the **Socio-economic Baseline Report (Appendix 5.1-A)** of **S5.0-C1 Labour Market VC** of the **EAC Application** and as described below (Table 3.2-3, Figure 3.2-1).

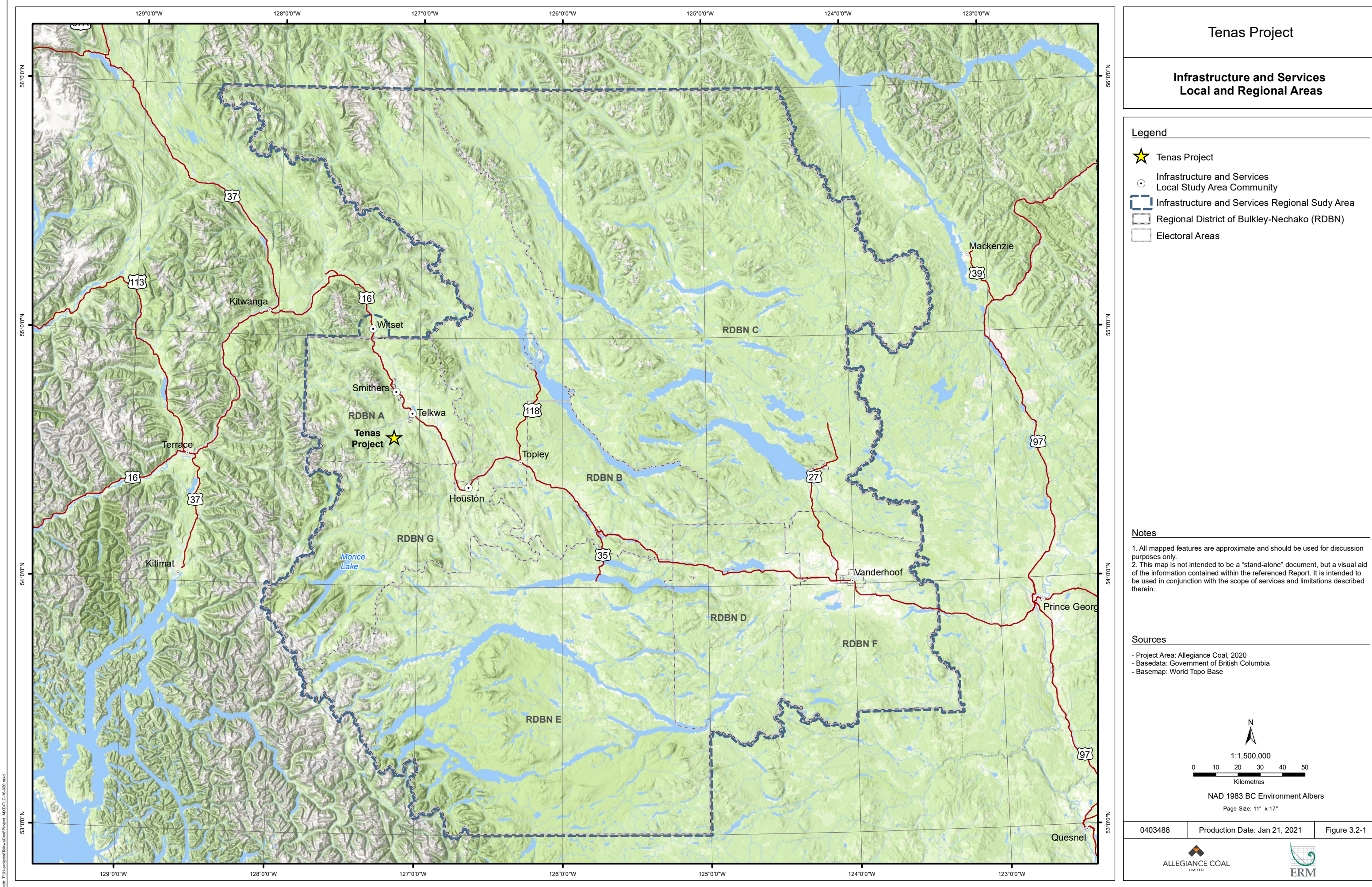


Table 3.2-3: Spatial Boundary Definitions for the Infrastructure and Services Valued Component (VC)

Spatial Boundary	Description of Study Area
Local Study Area (LSA)	Telkwa, Smithers, Houston and Witset (formerly Moricetown)
Regional Study Area (RSA)	Regional District of Bulkley Nechako (RDBN) and the community of Witset

The LSA comprises the Village of Telkwa, Town of Smithers, the District of Houston, and Witset¹ (formerly Moricetown). Based on their relatively close proximity and daily and short commuting range to the Project, as defined as approximately a one half hour commute one-way, it is anticipated that residents of these communities are likely to be directly influenced to varying degrees by socio-economic effects during its Construction, Operation, Decommissioning and Reclamation, and Post-closure phases.

The RSA comprises the RDBN and the community of Witset. Within the RDBN, Project-related effects on the Infrastructure and Services VC are expected to be less direct but provide regional context for the availability of infrastructure and services. The RSA reflects a regional dependency on natural resources, resource development, agriculture and tourism for employment and economic opportunities. The RSA includes LSA communities and the rural electoral areas of Smithers (A), and Houston (G), as well as Burns Lake (B), Fort St. James (C), Fraser Lake (D), Francois/Ootsa (E), Vanderhoof (F). Wet'suwet'en traditional territory is also located within the RSA. The spatial boundaries of the CEA for the Infrastructure and Services VC include the LSA (defined to include Village of Telkwa, Town of Smithers, District of Houston, and Witset); and the RSA (defined to encompass the RDBN and Witset.)

3.2.4.2 Temporal Boundaries

As described in **S3.0-C1-3.2 Temporal Boundaries** of the **EAC Application**, the temporal boundaries for the assessment of Project-related effects on the Infrastructure and Services VC encompass the time periods during which the Project is expected to interact with the VC. These include the Construction, Operation, Decommissioning and Reclamation, and Post-closure phases. There is potential for Project-related effects during each of the phases as described in **Table 3.2-4**.

¹ The community of Witset is located outside the RDBN. Witset (formerly Moricetown) comprises four (4) occupied and adjacent reserves of the Witset First Nation, a member of the Wet'suwet'en Nation as represented by the Office of the Wet'suwet'en (OW). Statistical data for Witset is based on data for Moricetown 1, Coryatsaqua (Moricetown) 2, Bulkley River 19, and Babine 17 as those Indian Reserves have residences; however, the Witset First Nation also has two (2) other Indian Reserves, Oschawwinna 3 and Jean Baptiste 28, that are mostly undeveloped and forested areas, with some land used for agricultural uses (Witset First Nation 2018a). The OW is identified in the Project's Section 11 Order as a Schedule A Indigenous Group requiring on-going consultation and engagement. Accordingly, Witset is included in the LSA and RSA.

Table 3.2-4: Temporal Boundaries for the Tenas Project

Phase	Year	Duration (years)	Description of Activities
Construction	-0.5 to 0	1.5	Site clearing, soil salvage, open pit development, building construction, service and haul road development, Rail Infrastructure construction, bridge construction and development of onsite utilities and services. Development of mine rock, and overburden storage piles, stockpiling of reclamation material such as soil, overburden and other materials suitable for reclamation. Development of water management systems and management ponds for storage of potentially acid generating (PAG) materials.
Operation	1 to 21	21	Development of the open pit through drilling, blasting, loading, and hauling functions. Development of mine rock, and overburden storage piles, stockpiling of reclamation material such as soil, overburden and other materials suitable for reclamation. Development of water management systems and management ponds for PAG storage. Conducting coal processing, stockpiling of raw coal prior to processing, and stockpiling of processed coal prior to shipping. Progressive reclamation will be accomplished during operation including, where available, reclamation activities such as sloping, topsoil placement and revegetation.
Decommissioning and Reclamation	22 to 25	4	Tear-down of infrastructure onsite plus reclamation activities, including sloping of storage piles, backfill materials, and placement of reclamation materials including growth media, overburden and non-PAG rock for management pond covers and revegetating surfaces that are planned to be reclaimed.
Post-closure	26 to 50	10	Active: This involves the filling of the open pit with water, monitoring of vegetation growth and water quality for both groundwater and surface water and wildlife. Control and sedimentation ponds may still be needed for settling of total suspended solid levels. The management ponds are left as dry land reclamation except for portions that will be left as open water.
		15	Passive: This stage is when the control and sedimentation ponds are no longer required for settling of total suspended solid (TSS) levels and the management ponds are left as dry land reclamation except for portions that will be left as open water. Telkwa Coal Limited (TCL) is now simply monitoring the site.

3.2.4.3 Administrative Boundaries

Administrative boundaries relate to the designated political and social responsibilities and legislative authorities within designated geographic regions that constrain the availability of data. Federal census population and demographic information is mandated by the *Statistics Act*, R.S.C., 1985, c.S-19 (Government of Canada [GovCan] 1985). Provincial population and demographic information is collected by several BC government departments and regional authorities. Some LSA and RSA data were available for individual communities or electoral areas identified in the federal census. Other data sources were only available at a regional or Local Health Authority (LHA) level.

Data availability for LSA communities is also dependent on key informant interviews conducted with local authorities of the Telkwa Village Council, Smithers Town Council, District of Houston, and regional health authorities and Witset First Nation.

3.2.4.4 *Technical Boundaries*

Technical boundaries include limitations in baseline data, data analyses, limitations of primary data collected from interviews, and limitations in the statistics and information available to characterise existing conditions and the Project workforce. Limitations in the census data from 2016 and 2011 potentially affect data accuracy in smaller and Indigenous communities are discussed in Section 2.3 of the **Socio-Economic Baseline (Appendix 5.1-A)**. In municipalities such as Smithers and Houston, the number of residents may be undercounted if residents live outside of the boundaries used for census data collection.

In First Nation communities such as Witset, data from the federal census (2006 and 2016) may be incomplete due to small population sizes and/or low survey participation rates.

Primary information collected during interviews with stakeholders reflect the conditions at the time of interview, focusing on the most current issues. Road traffic volume data were limited temporally; no primary rail information was collected as part of the baseline.

4. EXISTING CONDITIONS

This section describes the existing conditions of the Infrastructure and Services VC based on Traditional Knowledge (TK), scientific and other information, and baseline studies undertaken for the Project. The information in this section establishes the context for the assessment of effects on the VC.

4.1 Background Information and Studies

4.1.1 Traditional Knowledge (TK)

Traditional Knowledge (TK) and its use in an EA is important to providing a broad-based understanding of potential Project effects, determination of their Significance and in design of appropriate mitigation measures. The Infrastructure and Services VC assessment makes use of information provided in the Witset Community Land Use Plan (Witset First Nation 2018a) and the Witset First Nation Comprehensive Community Plan and (Witset First Nation 2018b), and the Project-specific **Cultural Use Study (Appendix 7.1-B)**, which compiles various aspects of TK as public sources of this information.

4.1.2 Scientific and Other Information

Scientific information is important to the assessment, as the existing conditions relating to the Infrastructure and Services VC is based on desktop research that included the review of studies, databases, news articles, and government publications. Key sources of data that describe the existing infrastructure and services conditions in the LSA and RSA include the 2016 Census Profiles, other 2016 Census data tables, BC Stats data, information from a traffic summary completed for the Project by McElhanney, and presented as **Traffic Study (Appendix 6.3-A)**, and the Telkwa Housing Needs Report prepared for the Village of Telkwa (Watson Projects 2020).

4.1.3 Baseline Studies

Desktop and field studies that are of relevance to the Infrastructure and Services VC and were considered in the review and assessment process and are summarized in **Table 4.1-1**.

Table 4.1-1: Summary of Desktop and Field Studies Related to Infrastructure and Services Valued Component (VC) and Subcomponents

Study Name	Study Purpose, Duration and Spatial Boundaries
Socio-Economic Baseline Report (Appendix 5.1-A)	▪ The report documents the regional and local socio-economic conditions in the communities that may be affected by development of the Tenas Project (Project) in the Local Study Area (LSA) and Regional Study Area (RSA), to support the assessment of potential economic and social effects to be presented in the Environmental Assessment Certificate (EAC) Application. ▪ The report is based on the review, analysis, and summary of multiple sources of data and information collected between January and August 2019; this includes official government statistics, information from provincial, regional, and local organizations and government agencies, public and unpublished reports, media analyses, and the results of public engagement activities. ▪ Socio-economic baseline interviews were conducted in 2019 with community leaders, administrators, and managers responsible for a range of social and economic issues, programs, and/or facilities. Notes and other information gathered during interviews were primarily used to qualitatively supplement statistical information and to contextualize understanding of existing issues and concerns in the communities.

Study Name	Study Purpose, Duration and Spatial Boundaries
Traffic Study (Appendix 6.3-A)	▪ A Traffic Summary was undertaken for the Project by McElhanney in 2020 to understand existing traffic volume and movements at key intersections along transport routes that will be used for the Project. ▪ The study draws on data from a Permanent Count Station (PCS) as well as manual traffic counts undertaken at four (4) strategic locations.
Cultural Use Study (CUS) (Appendix 7.1-B)	▪ The 2021 CUS compiled a baseline inventory of cultural heritage resources pertaining to Wet'suwet'en communities, including an examination of pre-existing cultural, social, historic, and economic data. ▪ The CUS also describes concerns of landowners and non-Indigenous stakeholders with longstanding histories in the area.

4.2 Description of Existing Conditions

This subsection provides a summary and overview of existing conditions for the Infrastructure and Services VC within the LSA communities of Smithers, Telkwa, Houston, and Witset, and the RSA. The information presented below is based on the **Socio-economic Baseline Report (Appendix 5.1-A)** of **S5.0-C1 Labour Market VC** of the **EAC Application** unless otherwise noted. Existing conditions information was collected from interviews with key informants. Please refer to **Appendix 5.1-A**. This information is supplemented by qualitative data collected through additional interviews conducted in 2020 and 2021.

4.2.1 Regional Study Area (RSA)

The RSA was defined to represent the Project's anticipated reliance on the RSA for infrastructure and services, and other requirements.

4.2.1.1 Regional District of Bulkley-Nechako (RDBN)

The RDBN is located northwest BC, spanning 73,419 square kilometres (km²). The RDBN is situated in between Prince George and Prince Rupert, and includes seven (7) Electoral Areas, representing the rural areas of Smithers (A), Burns Lake (B), Fort St. James (C), Fraser Lake (D), Francois/Ootsa (E), Vanderhoof (F), and Houston (G). The RDBN's population in 2016 was 37,896, a 3.3% decrease from 2011. 19.6% of the RDBN's population identifies as aboriginal. The median age of residents of the RDBN is 41.1. The median total income of RDBN residents was \$34,688, which is below the provincial median of \$40,370. 75.1% of RDBN receive their income via employment, whereas 12.2% rely on government transfers.

Provincial Highway 16 is the key transportation route that runs through the RDBN, connecting Vanderhoof, Burns Lake, Houston, and Smithers. The Canadian National Railway (CNR) follows the Highway 16 corridor from Prince George to Prince Rupert, with service through the RDBN. There are six (6) airports within the RDBN. Smithers is the regional air travel provider, with smaller airports in Vanderhoof, Burns Lake, Fort St. James, Fraser Lake and Houston.

The RSA's economy relies heavily on natural resources, primarily forestry and mining. In recent decades, forestry has waned. In the summer of 2019, mills in Fraser Lake and Smithers were temporarily shutdown, and the Houston mill saw production cuts. The community of Fort St. James mill declared a financial crisis following the closure and sale of its largest sawmill, which employs about 1,600 people locally. In recent years, northwest BC has seen an increase in exploration and mining activities.

Due to geographic location, Electoral Area A and G are expected to be the most affected Electoral Areas

within the RDBN, as they represent the rural areas surrounding most of the LSA communities. The Project is located within RDBN Electoral Area A, the most populated Electoral Area in the RDBN with 5,256 people. Electoral Area A represents the rural areas surrounding Smithers and Telkwa. Electoral Area G includes the rural area surrounding Houston and is the least populated Electoral Area with 903 people.

4.2.1.2 Health Services

The RDBN includes the Northwest Regional Hospital District (NWRHD) and the Stuart-Nechako Regional Hospital District. Regional Hospital Districts do not own or operate any hospitals, health centres or medical clinics of any kind. Regional Hospital Districts provide funding to the facilities operated by the Northern Health Authority, and their purpose is to provide a portion (up to 40% of capital expenditures) of the funds required by hospitals within their boundaries for equipment, renovations and new construction. This funding is raised through property taxes (RDBN 2021b). The Project is located within the NWRHD, which was established in December 1995 by Letters Patent (RDBN 2019a). The NWRHD is the largest hospital district geographically in the province and serves a population of approximately 80,000 residents from three (3) regional districts (Regional District of Kitimat-Stikine 2020). Hospitals and other health facilities available in each of the LSA communities are described in the subsections that follow.

Northern Health operates Northern Health Connections which is a bus service for patients who are 60+, who need health care outside their home communities, or who are travelling home after an ambulance ride to another community (BC Transit 2021a). For northern residents who cannot directly access the main Northern Health Connection bus service, other travel options are available through a number of non-profit providers who offer a variety of service options to passengers or patients (Northern Health Connections 2021).

4.2.1.3 Emergency Services

Policing in the RDBN is provided by the BC “E” Division of the Royal Canadian Mounted Police (RCMP). The Province has been divided into four (4) specific regions, and the Project is located in the North District which represents the upper two-thirds (72%) of the province. There are seven (7) RCMP detachments in the following communities within the RDBN: Smithers, Houston, Fort St. James, Granisle, Burns Lake, Fraser Lake and Vanderhoof (RCMP 2021a). For additional information on the Smithers and Houston detachments please refer to 4.2.2.5 and 4.2.4.5.

The Protective Services Department of the RDBN is responsible for facilitating the RDBN's Emergency Management Program, 911 Service, Rural Fire Protection, and Emergency Response. During an emergency, the RDBN activates its Emergency Operations Centre (EOC) to support residents (RDBN 2019b).

Fire protection within the RDBN is provided by municipal and rural fire departments. Fire/rescue agencies are dispatched through the Fire Operations Communication Centre as part of the 911 Emergency Service. The RDBN has 13 rural fire protection areas. The Fire Departments in the region provide one (1) or more of the following: structural firefighting, public fire safety education, fire prevention, and volunteer fire fighting training. The RDBN provides annual funding to support operations and capital purchases to all fire departments who provide fire protection services to the rural residents in our region. The Smithers Rural (Electoral Area A) Fire Protection Area service is provided by Smithers Fire Rescue, which is operated by the Town of Smithers. The Houston Rural Fire Protection Area (Electoral Area G) service is provided by Houston Volunteer Fire Department, which is operated by the District of Houston. The RDBN provides annual funding to support operations and capital purchases for both the Smithers Fire Rescue and Houston Volunteer Fire Department (RDBN 2019b). To work outside of a Fire Protection Area, the fire department requires approval from Emergency BC. In general fire departments respond to emergencies that can be

accessed by their equipment. If the emergency is beyond what they can reach with their equipment it will likely be attended by a different agency such as Forest Fire Fighters, or SAR.

The BC Ambulance Service, under BC Emergency Health Services, provides ambulance services throughout the province. Refer to **4.2.2.5** for information on the Smithers ambulance station. Burns Lake and Terrace have "Mass Casualty" ambulances stationed to use throughout the region. A Mass Casualty ambulance appears the same as other ambulances but contains more stretchers, blankets, first aid gear, and extra equipment such as generators/lights than regular ambulances. The BC Ambulance Service does not do extrication or rescue work. This work would be conducted by Fire/Rescue services or SAR (BC Ambulance Service 2021).

In the region, and particularly the Bulkley Valley, there is an emergency response community of people. People who work for government or private sector emergency response groups are often the same people who volunteer or participate in other groups as well. For example, staff at Raven Rescue (based out of Smithers) are also members of volunteer fire departments. Paramedics at the BC Ambulance service volunteer on weekends to be ski patrollers. There are also a number of private sector emergency service providers in the RSA however, many do not operate as a 24-hour on call emergency response provider unless there are specific contracts in place to do so.

Wildfires in BC are handled by the BC Wildfire Service. The province is divided into six (6) regional fire centres, and are further divided into local fire zones. The Project is located in the Northwest Fire Centre (NWFC) and the Bulkley Fire Zone. The Bulkley Fire Zone covers Telkwa to Hazelton and the Wildlife Service has a base in each community. The Nadina Fire Zone is south of the Project and encompasses the communities of Houston and Burns Lake. Both communities also have Wildlife Service bases (GovBC 2021a). Air support by tankers/bombers is based out of the provincial headquarters in Kamloops. The NWFC has tanker base at the airport in Smithers however, it is not often that tankers are there on standby as tankers are typically deployed to the Smithers base as required for specific firefighting actions (Telkwa Rangers 2021).

4.2.1.4 *Transportation*

Transportation infrastructure in the RDBN is meeting the needs of growing industrial, residential, and visitor traffic. Highway 16 is the main paved transportation route for truck and vehicle traffic running east to west through RDBN. Highway 16 is the transportation route for goods being shipped into and out of the region. The British Columbia Ministry of Forests, Lands, and Natural Resource Operation and Rural Development (BC MFLNRORD) is responsible for the off-road network of Forest Service Roads (FSRs) throughout the RDBN (Bulkley-Nechako Opportunities 2019).

Within the RDBN, there are five community airports and one regional airport. The community airports provide varying degrees of service from year-round to snow free only access. The airports provide vital transportation links for the region's resource industries. The Smithers Regional Airport offers passenger flights to Vancouver, Terrace, Prince George, Kamloops, and Kelowna. Most of the communities in the RDBN have helicopter services either through the airport or from private helicopter bases. The Prince George Airport is the closest international airport to the RDBN (Bulkley-Nechako Opportunities 2019).

The rail system is well established and delivers products from around Canada destined to Asia markets, via the Port of Prince Rupert. The CNR follows the Highway 16 corridor from Prince George to Prince Rupert. There are siding access points throughout the region, which service the forest industry. VIA Rail operates 'The Skeena' passenger train, running from Jasper to Prince Rupert and back again, with stops in many of the communities within the RDBN. Passengers are able to disembark at different communities on route (Bulkley-Nechako Opportunities 2019).

The RDBN is located near three (3) major shipping ports (Bulkley-Nechako Opportunities 2019). The Prince Rupert Port Authority operates the Port in the Prince Rupert Harbour which is the closest North American West Coast port to Asia. There are six (6) terminals at the Port, and of those, the Ridley Terminals loads metallurgical coal, thermal coal and petroleum coke at a rate of 9,000 tonnes per hour (Prince Rupert Port Authority 2021). The Port of Stewart is the most northerly ice-free port located in North America. The Port of Stewart provides full service to large freighters that carry loads throughout the Pacific Rim. The Port of Kitimat is the third largest Canadian Asia Pacific Gateway port on the West Coast of Canada. The Private Port of Kitimat is the deepest and closest inland port on Canada's Northwest Transportation and Trade Corridor and offers both inbound and outbound transportation cost savings to shippers (Bulkley-Nechako Opportunities 2019).

4.2.2 Smithers

As the largest community in the Bulkley Valley, Smithers is a regional service centre where residents from the surrounding areas, including Telkwa, Witset and the RDBN Electoral A Area come to access most services. This includes employment, shopping, health services, and child care (Town of Smithers 2021).

4.2.2.1 Housing

The Canada Mortgage and Housing Corporation (CMHC) reports on a number of housing statistics, including vacancy rates. The CMHC doesn't report on any of the LSA communities, but includes nearby Northern communities of Terrace, Prince George, and Prince Rupert for comparison. In 2019, the vacancy rates in these communities was more than double that of Vancouver and Victoria. Prince Rupert had the highest vacancy rate (3.4 percent [%]), followed by Prince George (2.8%), and Terrace at (2.1%), compared to Vancouver at 1.1%, Victoria at 1.0% and the provincial average of 1.5% (CMHC 2020). Although these numbers aren't specific to LSA communities, they do illustrate a trend of higher vacancy rates (ranging from about 2 to 3.5%) in northwest BC compared to larger metropolitan cities.

According to the Smithers census profile, the average number of persons per household was 2.3 in 2016. 68% of private households by tenure were owned and the average number of rooms per dwelling was 7.5. With a total of 2,285 occupied private dwellings, 7% are in need of major repairs or maintenance.

The median value of dwellings was \$289,262 and the average monthly shelter costs for owned dwellings was \$1,025. Around 18% of owner households spent 30% or more of their income on shelter costs. A total of 715 tenant householders lived in non-farm and non-reserve private dwellings and approximately 7% of these tenant households live in subsidized housing. The average monthly shelter costs for rented dwellings was \$896 and 38% of tenant households spent 30% or more of its income on shelter costs.

Smithers housing market has been consistent and steady over the last ten (10) years. Because of the desirability of Smithers as a place to live, there is high demand for housing in Smithers. The vacancy rate in Smithers is about 1%, which has been consistent over the last decade.

Smithers has several housing developments for low-income people or the elderly requiring affordable housing, as well as facilities to serve the homeless (refer to **Appendix 5.1-A** for additional information).

4.2.2.2 Water

For the majority of Smithers' residents, water supply is sourced from three (3) deep wells. These wells feed into a single pressure zone distribution grid which includes two (2) water storage reservoirs capable of holding 505 million litres. The water from the wells is treated with sodium hypochlorite during the Town's annual water main flushing operations, which is approximately one (1) month of the year.

The Smithers Airport is supplied by a separate water system from the Town. It consists of one (1) deep well and three (3) underground storage cisterns, two (2) small distribution pumps and a fire pump. The airport system also services a 29-lot subdivision on Lake Kathlyn and an elementary school. The only gap in community infrastructure projects is the cistern at Smithers airport that requires either replacement or upgrades; however, this water is for emergency purposes only.

The Town of Smithers is not at capacity for the sewer system or water system, nor do they require updating in the near future.

4.2.2.3 Solid Waste

In town curbside garbage and recycling are picked up bi-weekly, alternating each week. The Smithers/Telkwa Transfer Station, located between Smithers and Telkwa is operated by the RDBN and is free to all residents for disposal of items such as household waste, yard waste, and residential appliances (RDBN 2020a). A recycling depot is also located at the Transfer Station (RDBN 2019c). Knockholt Regional Landfill, approximately 12 km east of Houston, is the only landfill that services Smithers. As of 2019, the landfill has 59 years of capacity at the current site.

4.2.2.4 Health Services

Smithers is the health care hub that services the LSA communities. Smithers has one (1) hospital, one (1) community health unit centre, two (2) long-term care seniors' centres, and several physical therapy offices. Smithers also has a number of social services including programs for the treatment of drug and alcohol addictions, emergency housing and shelter, child care, programs related to child protection, programs for learning (youth, literacy, seniors, and disabled individuals), family support programs, fetal alcohol spectrum disorder services, programs for seniors, risk reduction services, pregnancy outreach, and victims services.

According to representatives from Northern Health, the LSA has adequate services based on the size of the population. It was noted that worker camps associated with resource development projects can present challenges as the temporary presence of the workforce is not accounted for in funding models – which are based on population numbers.

4.2.2.4.1 Bulkley Valley District Hospital (BVDH)

Smithers and the surrounding area are serviced by the Bulkley Valley District Hospital (BVDH), which is operated by Northern Health. Bulkley Valley District Hospital is a 24-bed acute care facility, which integrates home and community care into one (1) facility. Some of the services include:

- ▶ Emergency/outpatient;
- ▶ Medical;
- ▶ Surgical;
- ▶ Maternity;
- ▶ Palliative Care;
- ▶ Psychiatric observation unit;
- ▶ Laboratory;
- ▶ Radiology (x-ray, mammography, ultrasound, CT scanner);
- ▶ Pediatrics services;
- ▶ Home and Community Care;

- ▶ Community Cancer Clinic; and
- ▶ Diverse programs of visiting specialists and surgeons (Northern Health 2021a).

The BVDH has a high capacity and provides more services than other hospitals in communities of a comparable size because the BVDH services a number of satellite communities in the region such as Smithers, Telkwa, Witset, Houston and Fort Babine. Granisle and Topley may be serviced by BVDH or the Lakes District Hospital and Health Centre in Burns Lake. Patients may also get transferred from the small hospital in Hazelton to BVDH for specific treatment or to alleviate capacity issues (Northern Health 2021b). The BVDH sees about 15,000 emergency room visits per year, and 6,000 acute patient days per year.

The BVDH is primarily made up of visiting physicians with the following specialties: ears, nose, and throat, internal medicine, pediatric endocrinologist, dermatologist, plastic surgery, urology, and obstetrics and gynecology. In terms of permanent local positions, Smithers has 25 family doctors, three (3) psychiatrists, and the hospital is currently recruiting a radiologist and a pediatrician.

A specialist nursing team provides care for those under cancer treatment. Some community services are also based at the hospital, including home support, home care nursing, and rehabilitation therapy. The hospital also offers physiotherapy and occupational therapy, as well as numerous mental health and addictions services, social work services, and outreach clinics. Ambulance and air ambulance services are available and major medical care transfer is to Prince George.

Northern Health provides various “tiers of service” depending on the size and location of the community. Based on this, the BVDH does not offer cardiac services, intensive care, a psychiatry unit, or have a magnetic resonance imaging (MRI) scan. Individuals requiring these medical services have to go to Terrace (204 km) or Prince George (370 km) for additional health services.

Northern Health is currently working through the planning process to fully replace the BVDH with a larger and more modern hospital. It is anticipated that the planning, funding, and approval phase of the replacement will take seven (7) to 15 years.

4.2.2.4.2 *Smithers Community Health Unit*

The Smithers Community Health Unit offers public health nursing services including family health services, postpartum support, parent-baby drop-in, immunization clinics, school health, options for sexual health, communicable disease services, harm reduction and needle exchange services, injury prevention, quit smoking services, and community development.

4.2.2.4.3 *Bulkley Lodge*

Bulkley Lodge is a stand-alone, long-term care home located in central Smithers near the BVDH. Bulkley Lodge provides care to 70 residents across four units within the building. There are 53 beds including two (2) respite beds plus three (3) short stay beds (Northern Health 2021c).

4.2.2.4.4 *The Meadows*

The Meadows is a 14-unit supportive housing development located in Smithers, made possible through a partnership between Smithers Community Services Association (SCSA), BC Housing, and Northern Health. The Meadows provides assisted living to seniors and people with disabilities. The units are self-contained, wheelchair-accessible apartments with a 24-hour response system.

4.2.2.4.5 *Aboriginal/Indigenous Health Improvement Committee*

The Aboriginal/Indigenous Health Improvement Committee (AIHIC) in Smithers is a venue for Indigenous peoples to voice their health concerns and provide information about events or opportunities. Committee members include representatives from Indigenous communities, Indigenous organizations, and local Northern Health leadership. The Northwest East (Smithers and Area) AIHIC is administered out of the Bulkley Valley Hospital in Smithers, and Wrinch Memorial Hospital in Hazelton (Northern Health 2021d).

4.2.2.5 *Emergency Services*

The Smithers RCMP detachment serves: Smithers, Telkwa, Fort Babine Reserve, and Witset (RCMP 2021b). The detachment has 16 General Duty positions, four (4) Traffic Services positions, five (5) clerical positions (shared between seven [7] employees), eight (8) Guards, a Victim Services Manager (three [3] volunteers), two (2) Auxiliary Constables, and one (1) Victim Support Councillor. The Smithers RCMP detachment is sufficiently resourced to meet its service goals. Detachments rely on each other for equipment such as helicopters, and police dogs. Forensic identification can be requested from Terrace or Prince George in a timely manner.

Smithers has a volunteer Fire Department comprised of 40 volunteers. Smithers Fire Department provides first responder services, highway rescue, aircraft firefighting, fire prevention, and public fire safety education. Smithers Fire Department has the following equipment:

- ▶ two (2) Class "A" Pumpers: 1,500 gallons per minute (gpm) & 1,050 gpm;
- ▶ aerial 85 foot 1050 gpm pump;
- ▶ compressed air foam system (CAFS) mini-pump;
- ▶ two (2) rescue trucks;
- ▶ crash rescue vehicle; and
- ▶ tanker 4,500 gallons.

Taxes from residents of Smithers help fund the Fire Department, and planning decisions made by the Town of Smithers include considerations to make sure that residents have the highest level of fire protection. Some residents that live outside the municipal boundary, within the RDBN, are still within a defined Fire Protection Area. These areas are not serviced by fire hydrants, and municipal decisions do not consider these residents heavily in decisions making, but in the event of a fire the Fire Department will still respond. The RDBN does provide funding to the fire department to compensate them for providing this service (refer to 4.2.1).

Smithers has an ambulance stations with four (4) ambulances. There are three (3) paramedics on shift during the day and two (2) at night. The Smithers ambulance station is well equipped, and because Smithers is a hub, extra ambulances and equipment are stored at the Smithers station to support the smaller stations in Hazelton and Houston. If the Smithers station requires additional ambulances, they can call for ambulances from other stations (i.e., Houston, Hazelton and Burns Lake), and will do this before calling in off-duty paramedics. Local ambulances attend emergency calls and do transfers between communities and the majority of the transfers between communities are to take people to Terrace or Prince George to see specialists or to access equipment or services that smaller hospitals do not have (BC Ambulance Service 2021).

Bulkley Valley Search and Rescue (BVSAR) is a volunteer search and rescue team based in Smithers. Currently BVSAR has 35 operational members, 16 members in training, and three (3) support members. The team assists police with searching for lost recreationalists and helps accessing and transporting injured

people when specialized skills or equipment are required. The BVSAR team also provides support during emergencies, such as wildfires and flooding, by distributing information during evacuations and other emergency response activities. Volunteers are prepared to respond to calls 24 hours a day, 365 days of the year. BVSAR is responsible for the Smithers, Hazelton, and Dease Lake RCMP areas (117,476 km²). Their coverage area is extensive and overlaps other SAR areas because they are the initial response team for Winter Response, Swiftwater Rescue, and Rope Rescue calls. BVSAR frequently responds to mutual aid requests across Northern BC (BVSAR 2021).

4.2.2.6 Community Services

The Smithers Community Services Association (SCSA) is the main non-governmental organization (NGO) providing community services for Smithers and the Bulkley Valley. SCSA provides the following services:

- ▶ youth and family support;
- ▶ housing;
- ▶ community learning; and
- ▶ health.

For further details on the services and programs that the SCSA provides, please refer to **Section 5.10.2** in the **Socio-economic Baseline Report (Appendix 5.1-A)**.

4.2.2.6.1 Recreation and Arts

Popular recreation activities in Smithers include fishing, hiking, golfing, hunting, and skiing. Smithers has golf courses, camping and recreational vehicle (RV) parks, cross-country skiing trails, and Hudson Bay Mountain, a downhill skiing resort. The Bulkley Valley Regional Pool and Recreation Centre in Smithers provides swimming and fitness facilities, as well as a gym, and climbing wall. Smithers also has two (2) hockey arenas, a curling rink, a bowling alley, sporting fields, baseball diamonds, walking and hiking trails, and a number of public parks. Smithers does not have a community or youth center, which have been identified by residents as gaps in the town's community services.

Smithers is also known as a hub for arts and culture. Smithers has a number of cultural and artistic community assets, including the Smithers Public Library, Smithers Art Gallery, Bulkley Valley Museum, and Bovill Square. Annual events include the Midsummer Music Festival, a three (3)-day family music festival that occurs in July; an artisan studio tour, where the public is invited to tour studios in and around Smithers and Telkwa; and the Bulkley Valley Exhibition, held each August that features a rodeo, parade, entertainment, dancing, amusement rides, and games.

4.2.2.6.2 Education

School District (SD) 54 serves the Bulkley Valley, providing education services between Witset and Houston. During interviews for the **Socio-economic Baseline Report (Appendix 5.1-A)** it was noted that SD 54 is sufficiently staffed and adequately funded.

Public schools in Smithers include three (3) elementary schools, one (1) secondary school, and the Bulkley Valley Learning Centre which offers flexible learning programs for Grades 10-12. Smithers also has also three (3) independent schools: one (1) elementary (Kindergarten to Grade 7), and two (2) schools that teach Kindergarten to Grade 12 (GovBC 2021b). Schools in Smithers have seen a decrease in enrollment numbers, attributed to an aging population and a reduction in industry that would otherwise attract families with young children.

Coast Mountain College (CMC) is the nearest post-secondary education facility in the RSA, based in Terrace, with satellite campuses in communities across the northwest, including Smithers. CMC offers a variety of full-time programming in Smithers that includes university courses, diploma and certificate options to study art, business, health and social services, science, or trades. Local education trends have seen a decrease in enrollment numbers, attributed to decreasing high school graduation numbers, as well as work opportunities with industrial projects that don't require post-secondary education. Additional information regarding CMC can be found in **5.5.2.4.1** in **Appendix 5.1-A**.

4.2.2.6.3 Child Care

Throughout the Bulkley Valley, child care for infants through to pre-school age, as well as afterschool care, is provided through privately run facilities, and as well non-profit organizations. There is high demand for child care in the LSA, with most facilities consistently operating at capacity and running waitlists, some up to a year long.

While access to licenced quality child care is a province-wide issue, the Town of Smithers recognizes local child care space shortages is an ongoing community issue and that access to child care is an essential service that not only benefits families, but the local economy and community. With Community Child Care Planning funding received from the Union of BC Municipalities, the Town of Smithers prepared a Child Care Plan (CCP) in February 2021 (Town of Smithers 2021).

The purpose of the Smithers CCP is to determine local child care needs, and actions to create space and funding. The CCP was developed with community engagement, results of a child care inventory and project child population trends. The CCP highlights the current and future needs of child care in the local and broader community, including: infant and toddler spaces; flexible and extended hour options; family hub approach; space creation barriers, affordability; and care and support for vulnerable families (Town of Smithers 2021).

According to the Smithers CCP (2021), there are 14 licensed child care programs provided by nine (9) licensed child care providers for a total of 296 child care spaces in Smithers. Of all licensed child care providers, four (4) are non-profit, and five (5) are for-profit. Currently, there is one (1) registered license-not-required² care provider in Smithers. The majority of programs and spaces in Smithers are provided in a centre-based setting. The largest portion of spaces are in the 30 months to school-age programs, followed by preschool spaces. There is only one (1) centre-based program dedicated to infants and toddlers (under 36 months), for a total of 36 spaces.

The majority of licensed child care programs operate within traditional Monday–Friday working hours. There are no overnight care programs, occasional care, drop-in programs, or programs open on statutory holidays. There are 167 full-day spaces and 129 part time (i.e., part day) spaces available (Town of Smithers 2021).

As of 2020, the Town of Smithers child care coverage rate is 36% or 36 spaces per 100 children aged 0-12 years. While Smithers coverage rates are higher than regional and provincial averages, licensed child care spaces in Smithers are challenging to access (Town of Smithers 2021).

² Providers can care for up to two (2) children (or a sibling group) who are not related to them. Parents / guardians are responsible for overseeing the care and safety of these arrangement (Town of Smithers 2021).

4.2.2.6.4 Transit

As a regional hub, Smithers has several different transit services that provide routing through the town. Northern Health Connections bus (refer to 4.2.1.2 above) is primarily for patients who need health care outside their home communities, or who are travelling home after an ambulance ride to another community (BC Transit 2021b). The Smithers & District Transit System (Smithers Transit) is sponsored by BC Transit, and the Town of Smithers, in partnership with the Village of Telkwa and the RDBN, and the system is managed by SCSA (SCSA 2021a).

Smithers Transit operates two (2) 24-passenger buses and transports over 18,000 passengers each year. The system serves the communities of Smithers, Telkwa and portions of the RDBN. The buses are equipped with accessible features to make boarding easier for those passengers with mobility difficulties. The buses also have bike racks (SCSA 2021a).

Smithers Transit operates two (2) routes six (6) days a week: Route 22 Smithers/Telkwa, and Route 23 Smithers/Witset (BC Transit 2021b). Two (2) different kinds of transit service are provided by Smithers Transit; fixed route and curb-to-curb. Fixed Route Transit provides scheduled service and also offer deviated door-to-door service for passengers who are less physically mobile and are unable to access the service along its scheduled route. Curb-to-Curb Transit provides convenient transportation to and from destinations in the Smithers and RDBN areas. Passengers book these trips in advance through the Smithers Transit dispatcher (SCSA 2021a).

Additional transit routes include Route 162 Smithers/Burns Lake which runs on Monday, Wednesday and Friday and is operated through the Bulkley Nechako Regional Transit system and connects communities between Burns Lake and Smithers (BC Transit 2021c). And Route 163 Hazeltons/Smithers which runs on Monday, Wednesday and Friday, and is operated through the Hazeltons Transit system connecting communities between Kispiox and Smithers (BC Transit 2021d).

Community vehicles are another transportation option for residents. With funding from BC Ministry of Transportation and Infrastructure (BC MOTI), a number of communities and organizations provide community-based transportation services. Some provide scheduled services with defined routes, whereas other provide on-demand services within a geographic area (RDBN 2019d).

4.2.2.7 Accommodations

There are a number of different short-term accommodation options available in and near the town of Smithers, **Table 4.2-1** provides a list of accommodation establishments together with the number of rooms at each establishment. There are also at least 20 additional short-term rentals of various sizes available in Smithers that can be rented through websites such as Airbnb (Airbnb 2021) and VRBO (VRBO 2021).

Table 4.2-1: Accommodations In and Near Smithers

Business Name	Accommodation
Aspen Inn and Suites	60 rooms
Capri Motor Inn	61 rooms
Chickadee Acres Bed and Breakfast	2 rooms
Fireweed Motor Inn	21 rooms
Florence Motel	21 rooms
Mountain View Motel	40 rooms

Business Name	Accommodation
Logpile Lodge	7 rooms
Prestige Hudson Bay Lodge	98 rooms
Sandman Inn	35 rooms
Sidewinder Inn	1 cabin (with 8 rooms)
Silvern Lake Trail Bed and Breakfast	4 rooms
Smithers Driftwood Lodge	▪ 4 rooms ▪ 1 private apartment
Smithers Guesthouse	5 rooms
Stork Nest Inn	22 rooms
Sunshine Inn	57 rooms
Twin Valley Inn	12 rooms
Total Rooms/Apartments	▪ 427 rooms ▪ 1 private apartment
Glacier View RV Park & Cabin Rental	▪ 20 RV and camping sites ▪ 1 private guest house ▪ 9 cabins
Smithers Par 3 and RV Park (Formerly Riverside RV Park and Camping)	▪ 35 RV sites 12 camping sites
Total RV/Camping Sites	▪ 55 RV sites ▪ 21 camping sites

Notes: RV=recreational vehicle

4.2.3 Telkwa

Telkwa is located on the banks of the Bulkley and Telkwa rivers. Telkwa is a bedroom community to Smithers, and therefore relies on Smithers for most retail needs and community services. Telkwa is also considered a bedroom community to Houston as well, but at a lesser scale. Telkwa has 81 businesses and seven (7) seasonal businesses. A sizable number of these business are home-based. Local businesses in Telkwa are specialized in natural resource contracting, tourism, accommodation, food and hospitality, health and fitness, and esthetics.

Ninety-two (92) % of Telkwa's municipal taxes are derived from residential properties taxes, predominantly due to the lack of local commercial properties. As a result, Telkwa relies heavily on grants to finance community infrastructure services. Telkwa also has high municipal service costs per capita because of its rural nature. Typically, the denser a community is, the cheaper it is to provide municipal services.

4.2.3.1 Housing

According to the 2016 census, around 90% of private households by tenure are owned. The average number of rooms per dwelling is 7.3. With a total of 495 occupied private dwellings, 5% were in need of major repairs or maintenance.

The median value of dwellings was \$268,451 and the average monthly shelter costs for owned dwellings was \$1,219. Around 6.7% of owner households spent 30% or more of their income on shelter costs. A total

of 50 tenant householders lived in non-farm and non-reserve private dwellings and the average monthly shelter costs for rented dwellings was \$1,087.

Section 4.2.2.1 notes a low vacancy rate for Smithers. CMHC does not provide a vacancy rates for small communities, but the 2020 Telkwa Housing Needs Study notes high rental costs and low vacancy for both Smithers and Telkwa (Watson Projects 2020).

Interviews conducted for the **Socio-economic Baseline Report (Appendix 5.1-A)** indicated that there is a housing shortage in Telkwa, as well as in the Bulkley Valley as a region. There are some logistical challenges that limit Telkwa's ability to develop more housing, including issues transporting building materials into Telkwa over the wood truss bridge, its proximity to neighbouring Agricultural Land Reserve (ALR) land and a lack of municipal water for new developments. Telkwa does have a sizable amount of private land that could be developed to accommodate roughly 30-60 units.

4.2.3.2 Water

The Village of Telkwa's water is sourced primarily from the Bulkley River. The water is pumped from the Bulkley River to a traditional Water Treatment Facility located on the west side of the Telkwa Bridge. The water is treated and sent through a distribution system. Backup water sources include a reservoir and a groundwater well. The village sought funding for a water tower to enhance supply, water quality, and safety of water. In 2018, the Village of Telkwa received a key grant funding of \$3.6 million for the construction of the Trobak Water Reservoir project enhance supply, water quality, and safety of water. The new water reservoir was put into service in early 2019.

For waste water management, Telkwa has aerated lagoons with a capacity of 2,000 residential users. In 2017, essential repairs, maintenance and investigative work on Telkwa's sewage lagoons and water treatment plant occurred.

4.2.3.3 Solid Waste

Curbside garbage is picked up weekly and recycling every second week. Knockholt Regional Landfill is the only landfill that services Telkwa. As of 2019, the landfill has 59 years of capacity at the current site. Refer to **Section 4.2.2.3** for a description of the Smithers/Telkwa Transfer Station and Recycling Depot.

4.2.3.4 Health Services

Telkwa does not have any medical services in the Village and is served by Smithers health care services. Refer to **4.2.2.4** for a description of the health care services in Smithers.

Well Spring Home & Community Services is a senior home care assistance company located in Telkwa offering companionship services, personal care services, and education and consultation for senior home care assistance.

4.2.3.5 Emergency Services

The Village of Telkwa is served by the Smithers RCMP detachment. Telkwa does not have a dedicated ambulance service and is serviced by the Smithers ambulance station (BC Ambulance Service 2021). Refer to **4.2.2.5** for a description of the emergency services offered by Smithers.

Telkwa Fire Rescue Department is a volunteer Fire Department that currently has 27 members. Telkwa Fire Rescue fills all the of the same roles as the Smithers Fire Department (refer to **4.2.2.5** above), but at a

smaller scale as Telkwa Fire Rescue does not have the budget to have as many paid positions doing non-emergency work (Telkwa Fire Rescue Department 2021).

Telkwa Fire Rescue has the following equipment:

- ▶ One (1) Engine;
- ▶ One (1) Tender 3000 gallons pump;
- ▶ One (1) Rescue Truck;
- ▶ One (1) Bush Fire Truck; and
- ▶ One (1) Command Truck (Telkwa Fire Rescue Department 2021).

In 2017, there were a total of 71 calls responded to, with 60% being medical calls and 15% related to motor vehicle incidents.

4.2.3.6 Community Services

4.2.3.6.1 Recreation and Arts

Telkwa residents enjoy a number of outdoor activities including snowmobiling, snowshoeing, cross country skiing, fishing and hiking. The Village has a number of walking trails, parks, and sporting fields including the Dockrill Outdoor Ice Rink. Telkwa hosts several annual events including the Telkwa Barbecue and Demolition Derby which has been a Telkwa tradition for over 100 years; and Music in the Park, a series of concerts in Eddy Park throughout the summer months.

The Telkwa Museum is a small and seasonal museum that highlights Telkwa's rich history. Telkwa also has a library, the Reading Centre, that is run by volunteers on a part-time basis.

The Telkwa Seniors' Society is a local club for residents 50 years and up, that holds regularly scheduled activities such as carpet bowling, bingo and crib, and monthly special events such as pancake breakfast, pot luck dinner and general meetings.

4.2.3.6.2 Education

As noted above in **4.2.2.6**, SD 54 serves the Bulkley Valley. There is one (1) elementary school in Telkwa which serves Kindergarten through Grade 7. During interviews for the **Socio-economic Baseline Report (Appendix 5.1-A)** it was noted that the Telkwa Elementary School is near capacity.

4.2.3.6.3 Child Care

There are currently 63 licenced child care spaces in Telkwa (Town of Smithers 2021). There is one (1) Licenced Family Child Care Facility in Telkwa (Blossoming Buddies Early Learning Centre) and one (1) Licensed Group Child Care Facility Telkwa – the Ark Playday Centre (the Ark) (GovBC 2021c).

The Ark offers a variety of programs and services including daycare, preschool programs, after school care, school-aged care, and an outdoors, nature-based preschool program in which much of the children's learning takes place outside (LoveTelkwa 2021). The Ark mostly serves residents of Telkwa. Some families from Smithers will bring their children to the facility in Telkwa because it is on their way to work either in Telkwa or beyond. Some families from Smithers make the trip because it is the only option available to them while others make the trip because they prefer the program at the Ark to options available in Smithers (Ark Playday Centre 2021). The Ark has a maximum capacity of 39 children (Northern Health 2021e) and is currently at capacity (Ark Playday Centre 2021).

The Smithers CCP (refer to **4.2.2.7**) reported that the child care coverage rate (number of child care spaces per 100 children) in Telkwa is 24%, which means 24 % of children under the age of 12 have access to a licenced child care space (Town of Smithers 2021).

4.2.3.6.4 Transit

Refer to **4.2.2.6.4** for information on transit services.

4.2.3.7 Accommodations

Telkwa has five (5) accommodation options in and near the Village, including two (2) small hotels, one (1) lodge, and an RV campground (**Table 4.2-2**). There are also at least eight (8) additional short-term rentals of various sizes available in Telkwa that can be rented through Airbnb (Airbnb 2021).

Table 4.2-2: Accommodations In and Near the Village of Telkwa

Business Name	Accommodations
The Cointe River Inn	6 rooms
The Inn at the Creamery	4 rooms
Eddy Park Lodge	6 rooms
Tyhee Lake Guest Ranch B&B	3 rooms
Total Rooms	19 rooms
Fort Telkwa Riverfront RV Campground (just outside of Telkwa)	▪ 30 RV sites ▪ 2 guest houses

Notes: B&B=bed and breakfast

4.2.4 Houston

The home of the World's Largest Fly Rod, Houston is located at the confluence of the Bulkley River and Morice River, 64 km east of Smithers.

4.2.4.1 Housing

Houston is located within the Nadina Forest District where forestry and mining sectors have been both major employers for residents and key stakeholders that have shaped the development of housing over time (Community Development Institute 2020).

According to the 2016 census, single detached dwellings make up around two-thirds of the housing stock in Houston, followed by mobile homes, apartments, and row housing. 68% of private households by tenure are owned. The average number of rooms per occupied private dwelling is 6.3. The median value of dwellings is \$139,684 and the average monthly shelter costs for owned dwellings was \$839. Around 9% of owner households spent 30% or more of their income on shelter costs. A total of 290 tenant householders lived in non-farm and non-reserve private dwellings and the average monthly shelter costs for rented dwellings was \$708. With a total of 920 occupied private dwellings, 12% are in need of major repairs or maintenance. Vacancy rate information for Houston was not available.

The Houston housing and rental market is influenced by housing shortages and conditions in other nearby Indigenous and non-Indigenous communities. This has supported an influx of residents looking for affordable housing and market rental options (Community Development Institute 2020).

During baseline interviews, it was noted that the housing values in Houston have increased as a result of the Coastal Gas Link (CGL) Project.

4.2.4.2 Water

The District of Houston's water system is comprised of four (4) supply wells and a 500,000 gallon reservoir. Two (2) of the wells are used on a regular basis and two (2) are available for back up purposes. One (1) of the backup wells has a standby diesel engine that can be used in the event of a sustained power failure.

4.2.4.3 Solid Waste

Residential garbage is picked up once a week. Residents must drop off their own recycling at the Houston Bottle Depot. In March 2019, the RDBN approved the construction of a new recycling depot and waste transfer station in Houston at the old Houston Landfill site on Mountain View Drive.

Knockholt Regional Landfill is the only landfill that services Houston. As of 2019, the landfill has 59 years of capacity at the current site.

4.2.4.4 Health Services

Smithers is the healthcare hub for LSA communities, including Houston. Houston has a small medical clinic but no hospital. An ambulance responding to a call in Houston would transport the patient(s) to the BVDH in Smithers (Northern Health 2021b). Refer to **4.2.2.4** for a description of the health care services in Smithers.

4.2.4.4.1 Houston Health Centre

Houston Health Centre offers a variety of services including urgent care and outpatient services, public health, and home and community care. Further services available include Assistive Devices Program, mental health and addictions, private physiotherapy clinic, child and infant development programs, women's health clinic, and visiting specialists that include pediatrics and gynecology. The health centre provides space for many community groups, such as club house, and support groups for new mothers.

4.2.4.4.2 Houston Residential Care

Houston Residential care is part of the Houston Health Centre and includes a Primary Care Physician, Mental Health Clinicians, an Urgent Care Department, as well as a visiting dietician and diabetic nurse. Houston residential care consists of four (4) permanent beds and two (2) short stay beds used for Respite and Palliative Care. This care facility is attached to the Health Center and primarily staffed with one (1) Licensed Practical Nurse and one (1) Residential Care Aid .

4.2.4.4.3 Cottonwood Manor

Cottonwood Manor is a seniors housing facility in Houston offering five (5) Assisted Living units and 11 Independent single bedroom units. Cottonwood Manor is a partnership between SCSA, BC Housing and the Northern Health Authority that provides seniors with affordable housing, social and recreational activities, and hospitality services (SCSA 2021b).

4.2.4.5 Emergency Services

Houston's emergency services are provided by the Houston RCMP detachment, which serves Houston, Granisle, Topley, and Tachet. Some of the services available at the Houston detachment include criminal

records check, police certificate, online crime reporting fingerprints, report a crime, and vulnerable sector check.

Houston has a volunteer Fire Department consisting of 30 members, including six (6) officers. In addition to fire suppression services, the Houston Volunteer Fire Department provides a range of other services including fire prevention, fire investigation, highway rescue, public education, vehicle extrication, hazardous material response, and confined space rescue.

Fire department equipment includes:

- ▶ One (1) Unit E-13 – 1991 Superior Emergency customer pumper (750 gallon tank; 1050 gpm pump);
- ▶ One (1) Unit E-12 – 2004 Freightliner FL80 crew cab with a hub body (800 gallon tank; 1050 gpm pump and 140 CFM CAFS);
- ▶ One (1) Unit E-11 – 2016 Freightliner M2 crew cab with a hub body (1000 gallon tank; 1050 gpm pump and 140 CFM CAFS);
- ▶ One (1) Unit T-11 – 2012 Freightliner M2 chassis Rosenbauer Tanker (1500 gallon tank, 500 gpm pump); and
- ▶ One (1) Unit R-11 – 2000 Superior Emergency Freightliner FL60 crew cab (150 gallon tank; CAFS, hurst cutting jams and other rescue equipment) (District of Houston 2019a).

The Fire Department responded to a total of 233 incidents in 2017, an increase of 66% over the 2016 call volume. Of these calls, 73 were fire related calls (31% of call volume), 138 were first responder calls (59.5% of call volume), and 22 were rescue (motor vehicle accident) calls (9.5% of call volume).

Ambulatory services are provided by the BC Ambulance Service, a provincially operated pre-hospital emergency service (District of Houston 2018). In 2016, the BC Emergency Health Services (BC EHS) working closely with the Ministry of Health, regional health authorities, the Ambulance Paramedics of BC (CUPE BC Local 873), and others launched a program to provide community paramedicine in rural and remote communities throughout the province (BC EHS 2021a). Houston was selected as one (1) of many communities to be part of the program, which allows residents to receive select homecare services from the BC Ambulance Service directly (District of Houston 2018). Community paramedics provide community outreach and awareness, health promotion, wellness checks, wellness clinics, and community paramedicine home health monitoring (BC EHS 2021b). Community paramedics also provide services to neighbouring communities and First Nations in the station's "catchment" area (BC EHS 2021c).

4.2.4.6 Community Services

Over time, social services have become centralized into regional hubs, such as Smithers. This means that the majority of government social services related to mental health, addiction, employment income assistance, parole, etc., are located in Smithers.

4.2.4.6.1 Recreation and Arts

Popular recreation activities in Houston include fishing, water sports, snowmobiling, skiing, and golf. Houston has two (2) main public recreation facilities: Claude Parish Memorial Arena for skating and hockey; and the Houston Leisure Facility that hosts an aquatic centre and fitness gym. Houston also has a local curling rink, golf course, and bowling alley. Houston has 13 public parks that include sporting fields, baseball diamonds, and playgrounds.

Houston Community Hall operates year around with various functions from community events, social parties, and weddings (District of Houston 2019c). Major annual community events in Houston include Pleasant Valley Days (May), Canada Day (July), Drag Races (July), Mud Racing (July), and Christmas Light-Up (November).

The main community service provider in Houston is the Dze L K'ant Friendship Centre (Friendship Centre). The Friendship Centre is a NGO guided by Indigenous values that provides activities, services, and information to all people. The Centre's mission is to "develop skills and strengths while incorporating spiritual, emotional, mental and physical well-being to help people become self-sufficient and self-reliant". The Friendship Centre has five (5) full time staff that service about 55 families. On a typical day, the Friendship Centre has 80 to 100 people come through the door. The Friendship Centre's demographics are mainly Indigenous females that are single moms. The majority of users of the Friendship Centre are aged 20 to 25, have 3 to 5 children, and are on income assistance.

Most people that use the Friendship Centre come for the programs (which includes meals, served twice daily) as well as to use the laundry facilities. Programs that are offered include:

- ▶ Afterschool program (for children aged 8 to 12);
- ▶ Teen program;
- ▶ Family support program;
- ▶ Tadpoles program (for pre-kindergarten children); and
- ▶ Connections program (youth-at-risk or youth-in-care).

The Friendship Centre also offers counselling services, including emotional and mental health support; however, the staff are not trained professionals in this field. Staff also help to facilitate meetings between users of the Centre and government appointed social workers and/or lawyers to discuss custody arrangements and other similar disputes.

Although the Friendship Centre is the main community service provider in Houston, it is operating beyond its capacity. The physical infrastructure of the Friendship Centre is not sufficient and often turns people away because capacity has been reached. There are six (6) rooms to support all the programs offered, including for private meetings for counselling services or with social workers/lawyers. The Friendship Centre is also not wheelchair accessible and because of the building size, programs are capped at 15 person maximums.

4.2.4.6.2 Education

Similar to Smithers (refer to **4.2.2.6**), schools in Houston have seen a decrease in enrollment numbers, attributed to an aging population and a reduction in industry that would otherwise attract families with young children (**Appendix 5.1-A**). Houston has two (2) public elementary schools and one secondary school, and one independent school for Kindergarten to Grade 12.

Based on enrolment declines, changes to the grade offerings at the two (2) elementary schools were made in 2021 such that Silverthorne Elementary School is now exclusively Kindergarten to Grade 3, and Twain Sullivan Elementary School is exclusively Grades 4 through 7 (Silverthorne Elementary 2021). This shift allowed the move of an existing child care centre into the Silverthorne school and created more child care spaces (refer to Child Care below).

4.2.4.6.3 Child Care

There are six (6) licenced child care facilities in Houston, including the Friendship Centre, described above, and range in capacity from seven (7) to 48 children (Northern Health 2021e). Child care services at the Friendship Centre serve families in Houston, Topley, Topley Landing and Granisle (Dze L Kant Friendship Centre 2021). As noted above, size of the Friendship Centre itself is a limiting factors for the child care services available. More staff could potentially mean that more child care opportunities would be available but the facility restricts the amount of staff/children that the programs could handle (Dze L Kant Friendship Centre 2021).

In 2020, the province announced that families in Houston would soon have access to 48 new licensed child care spaces at Silverthorne Elementary school as part of the province's ongoing commitment to increase child care throughout the COVID-19 pandemic and beyond. The Bulkley Valley School District partnered with the Houston Community Services Association and the Beanstalk Child Care Centre to run a child care centre, which was built as part of the renovation to the elementary school (GovBC 2020). The new Beanstalk Child care Centre opened in September 2021 and provides 48 licensed spaces that are separated into specific categories as such

- ▶ 8 in multiage (all day attendance);
- ▶ 16 in daycare (all day attendance); and
- ▶ 24 in before and after school care.

With the addition of the Silverthorne space, Beanstalk Child Care Centre now has 146 licensed spaces (Link 2021).

4.2.4.6.4 Transit

Refer to **4.2.2.6.4** for information on transit services.

4.2.4.7 Accommodations

Houston has a number of different accommodation options as provided in **Table 4.2-3**. There are also at least eight (8) additional short-term rentals of various sizes available in Houston that can be rented through Airbnb (Airbnb 2021).

Table 4.2-3: Accommodations in Houston

Business Name	Accommodation
Bearspaw Suites	▪ 2 private suites ▪ 1 room
Houston Motor Inn	55 rooms
Idylwild Motor Inn	Under renovations
Knotty Pines B&B	1 private suite
Pleasant Valley Motel	51 rooms
Sunshine Inn Houston	36 rooms
Total Rooms	▪ 143 rooms ▪ 3 private suites
Shady Rest RV Park	▪ 26 RV sites ▪ 6 camp sites

Business Name	Accommodation
Silverthorne RV Park	▪ 15 RV sites ▪ 10 camp sites
Total Sites	▪ 41 RV sites ▪ 16 camp sites

Notes: B&B=bed and breakfast; RV=recreational vehicle

4.2.5 Witset

Most of Witset's services and buildings are located in Witset, including the Witset Health Centre, Witset Elementary Secondary School (WESS) and Witset administrative offices, multiplex, fire hall, Centennial Hall, and outdoor sports facilities. Businesses located here include Kyah Food and Fuel gas station, the Widzin Kwah Canyon House Museum, RV Park and Campground, and Kyahwood Forest Products (Witset First Nation 2018a).

Additionally, Witset's infrastructure services include Telus fibre optic internet, and a slow sand water filtration system to provide clean water to residents. Witset community water system consists of a reservoir and man-made lagoons. Witset and surrounding areas are connected by a relatively well-maintained road system, allowing fairly easy access to all of the reserves Witset First Nation 2018a).

4.2.5.1 Housing

According to the 2016 census, 70% of private households are privately owned. The average number of rooms per dwelling is 6.3. In 2016, 44% of the total occupied private dwellings were in need of major repairs or maintenance. Vacancy rate information for Witset was not available.

Currently, there are 229 homes in Witset. Most were built prior to 1991 and about half of them are in need of major repairs house (Witset First Nation 2018b). The Witset First Nation builds four (4) houses per year and they are immediately taken by community members (Witset First Nation 2020). Currently there are about 120 members on the waitlist for a new house. In the future, Witset will need more housing suited to families with children, as well as housing that will allow Elders to stay in the community as they age. According to the Witset First Nation Comprehensive Community Plan, Witset will need to build between 150 and 240 homes over the next 20 years (between seven and 12 new units a year) to meet their needs (Witset First Nation 2018b).

In Witset, the Housing Manager applies to the government to build homes on behalf of the community members. Funding for housing is provided by the non-profit housing program known as CMHC Section 95 housing. The objective of the program is to assist First Nations in providing affordable rental housing on-reserve (Witset First Nation 2021a). As there are approximately 700 people living in Witset and less than 250 houses, housing occupancy can range from one (1) person to six (6) or seven (7) (Witset First Nation 2020).

Addressing the housing needs by improving existing houses and improving a range of healthy, housing options is one of the goals of the Witset First Nation Comprehensive Community Plan (Witset First Nation 2018b). In 2021, construction started on the 26 Unit Passive House project which is intended to address the affordable housing shortage. The project will provide 16 studio and 10 2-bedroom apartments. Other facilities will include a common room with a kitchen, a counselling room, boardroom, laundry area, recycling room and building management office (Witset First Nation 2021b).

4.2.5.2 Health Services

The Witset Health Centre has been in operation for 30 years serving on-reserve members of Witset and provides various health programs for community members through education, advocacy, support, and prevention, including:

- ▶ Canada's oral health initiative;
- ▶ Canada's prenatal nutritional program;
- ▶ patient transportation;
- ▶ home and community care program;
- ▶ mental health counsellor;
- ▶ community health nurse;
- ▶ cultural wellness advocate/community health representative;
- ▶ recreation director;
- ▶ addictions counselling; and
- ▶ nurse practitioners.

The Health Centre programs are funded by First Nations Health Authority (FNHA) and each program has objectives and guidelines that must be met each year. Refer to **Appendix 5.1-A** for more information on these programs.

Witset First Nation is also working with the FNHA to expand home-based care and support services. While these programs and services are making an impact, challenges remain. There are also opportunities to better coordinate health programming with Kyah Wiget Education Society, Witsuwit'en Culture and Language Society and others to make good health and well-being a part of everyday life at Witset (Witset First Nation 2018b).

4.2.5.3 Emergency Services

Smithers is the emergency services hub for LSA communities, including Witset. In an emergency, an ambulance would respond from Smithers and transport patient(s) to the BVDH in Smithers (Northern Health 2021b). Refer to **Section 4.2.2.45** for a description of the emergency services in Smithers.

4.2.5.4 Community Services

Widzin Kwah Canyon House Museum is open to the public daily from May to September and offers 45-minute professionally guided Wet'suwet'en cultural tour of either the museum or the Widzin Kwah Canyon. The museum tour shares Wet'suwet'en culture, stories and traditions with visitors, and the canyon tour focuses on archaeology, traditional fishing and fish preparation activities, plants and traditional uses, and fisheries management.

Witset has a Cultural Wellness Advocate that is responsible for the planning, development, implementation and coordination of support services for children and families. Responsibilities also include providing appropriate home and community-based support and prevention services, ensuring programs that promote Wet'suwet'en culture and language, healthy lifestyles, and relationships for youth.

The Health Centre hosts bi-weekly sports and fitness outings, cooking activities and drop-in nights. Information on recreation programs and events are shared on the Witset Recreation Facebook group.

Witset First Nation is working on an initiative to have a perimeter trail (walking trail) built in the village, and a boxing gym is also being opened. There are also two (2) baseball diamonds in the village (Witset First Nation 2020).

Witset is a part of School District 54, although no public schools operate locally. Witset has one (1) independent school, Witset Elementary and Secondary School which teaches Kindergarten to Grade 12 and is run by Kyah Wiget Education Society (KWES).

KWES provides a range of educational programs and services from daycare through to adult education and is our community's largest employer. Education outcomes in Witset are improving. Between 2006 to 2016, high school graduation rates increased significantly, as did the number of members with college and university certificates, diplomas or degrees. However, gaps remain between education levels achieved by Witset members and the rest of the province. KWES is working on developing and delivering new and expanded education programs for all groups (Witset First Nation 2018b).

Witsuwit'en Child and Family Center offers a Head Start Program designed to enhance early childhood development, school readiness and overall family health and wellness for First Nations children – from birth to 6 years – on reserve. They also offer an infant/toddler program, three year old program and a Kindergarten to Grade 4 program. According to the Smithers CCP, there are 39 child care spaces available in Witset which means 60% of children under the age of 12 have access to a licenced child care space (Town of Smithers 2021).

Witset First Nation provides a daily shuttle service for community members who work outside of Witset and do not have their own transportation. Refer to **4.2.2.6.4** for information on transit services.

4.2.5.5 Accommodations

In 2018, Witset conducted a major \$1.4 million redevelopment of their RV Park and Campground that is the first accessible campground in BC. The RV Park and Campground has seven (7) large pull-through sites that include water, sewer, and power, as well as eight (8) un-serviced tent sites. Amenities for the RV Park and Campground include high-speed internet, children's playground, washrooms, and washer and dryers.

5. ASSESSMENT OF PROJECT-RELATED EFFECTS

This subsection identifies and describes:

- ▶ identification of potential interaction between the Project and the Infrastructure and Services VC;
- ▶ description of potential Project effects on the Infrastructure and Services VC;
- ▶ mitigation measures to eliminate, reduce, or control the potential effects on the Infrastructure and Services VC; and
- ▶ characterisation of Project residual effects and determination of their significance on the Infrastructure and Services VC.

5.1 Potential Project-related Interactions with Infrastructure and Services Valued Component (VC)

Whereas interactions with the Project may be positive or adverse, this subsection will focus on those interactions with potential to adversely affect the Infrastructure and Services VC. Potential Project-related interactions with the Infrastructure and Services VC were determined by spatial analysis of the extent of Project components and activities in relation to existing conditions related to the Infrastructure and Services VC and associated subcomponents as outlined in **4. Existing Conditions**. Each potential interaction is rated using the terms provided in **Table 5.1-1**.

Table 5.1-1: Potential for an Interaction between Infrastructure and Services Valued Component (VC) or Subcomponent and the Tenas Project

Term	Definition
No Interaction	Tenas Project (Project) activity will not interact with the Infrastructure and Services Valued Component (VC), no adverse effect is expected; no further consideration is warranted.
Interaction	Interaction between the Project activity and the Infrastructure and Services VC may have a substantive influence on the short- or long-term integrity of the VC (i.e., measurable or detectable using the identified indicator). The potential effect(s) of the interaction is considered further in the effects assessment.

Table 5.1-2 provides a summary of potential interactions between Project components or activities and Infrastructure and Services VC. Where an interaction is possible, the anticipated potential effect(s) is identified and carried forward in the assessment (**5.2 Potential Project-related Effects**). Where no interaction between the Project and a subcomponent is anticipated or the interaction is considered negligible (i.e., not expected to have a substantive influence on the short- or long-term integrity of the subcomponent as the effect would not be measurable or detectable using the identified Indicator) the interaction is not considered further in the assessment.

For the Infrastructure and Services VC, the potential interaction(s) and associated effects are anticipated to manifest at the overall Project phase level (i.e., Construction Phase, Operation Phase, Decommissioning and Reclamation Phase, and Post-closure Phase), but may be felt more during the Construction Phase and during the first few years of the Operation Phase, when the workforce is at its peak and/or there is active workforce recruitment. This is because the effect on this VC is closely linked to potential population changes due to Project employment opportunities resulting from the Project.

Table 5.1-2: Potential Interactions Between the Infrastructure and Services Valued Component (VC) and the Tenas Project

Project Activities	Infrastructure and Services Valued Component (VC)		
	Housing and Accommodation	Community Infrastructure and Services	Transportation
Construction			
Transportation of equipment, materials, and personnel			X
Site clearing (surveying, clearing, grubbing, soil salvaging)			
Construction of Surface Water Management Infrastructure, including channels and ponds (sedimentation, control, management, storage)			
Construction of Bypass Road and quarries from the Minesite to the Rail Infrastructure			X
Improvements to existing private road and Forest Service Roads			X
Construction of haul roads and service roads within the Minesite			
Construction of the permanent Goathorn Bridge Crossing over Goathorn Creek			
Construction of the Coal Processing Plant			
Construction of fuel and lubricant storage facilities and distribution network			
Construction of administration buildings (first aid, maintenance, mine dry, warehouse, laboratory, parking, and vehicle wash facilities)			
Construction of a 25 kilovolt (kV) powerline and a 600 volt (V) substation adjacent to the Coal Processing Plant			
Construction of Rail Infrastructure including Rail Loop and Loadout connecting to the existing main Canadian National Railway line			
Installation of water supply wells, storage, and distribution system			
Construction of the water discharge infrastructure			
Construction of storage piles for overburden, rock separated from coal in Coal Processing Plant, and stockpiles for topsoil and vegetation management			
Construction of material handling systems for Minesite, including run-of-mine coal, processed coal, process rock conveyors, and stockpiles			
Construction of solid waste management systems including recycling and composting facilities			

Project Activities	Infrastructure and Services Valued Component (VC)		
	Housing and Accommodation	Community Infrastructure and Services	Transportation
Construction of Explosives Magazine (storage building)			
Employment and labour	X	X	
Operation			
Mining the open pit (soil salvaging, drilling and blasting, excavation of material, dewatering, loading, hauling, unloading)			
Operation of Surface Water Management Infrastructure including channels and ponds (sedimentation, control, management, storage)			
Maintain and use Bypass Road and quarries from the Minesite to the Rail Infrastructure			X
Maintain improved private and Forest Service Roads			X
Maintain haul roads within the Minesite, including service roads			
Maintain permanent bridge over Goathorn Creek			
Operate Coal Preparation Plant			
Maintain fuel and lubricant storage facilities			
Maintain administration buildings (first aid, maintenance, mine dry, warehouse, laboratory, and vehicle wash facilities)			
Maintain, 25 kV powerline and a 600 V substation adjacent to the Coal Processing Plant			
Transportation of equipment, materials, and personnel			X
Maintain and use Rail Infrastructure including Rail Loop and Loadout connecting to the existing main Canadian National Railway line			X
Operate water supply wells, storage, and distribution system			
Operate the water discharge infrastructure			
Maintain storage piles for overburden, rock separated from coal in Coal Processing Plant, and stockpiles for topsoil and vegetation management			
Operate material handling systems for Minesite, including run-of-mine coal, processed coal, process rock conveyors, and stockpiles			

Project Activities	Infrastructure and Services Valued Component (VC)		
	Housing and Accommodation	Community Infrastructure and Services	Transportation
Operate solid waste management systems including recycling and composting facilities			
Maintains Explosives Magazine (storage building)			
Progressive reclamation			
Employment and labour	X	X	
Decommissioning and Reclamation			
Dismantle and remove mining equipment and facilities (including powerline, Rail Infrastructure)			
Transportation of equipment, materials, and personnel			X
Reclamation and closure activities at Minesite			
Reclamation and closure of Bypass Road and haul roads, including quarries			
Reclamation and closure of permanent bridge over Goathorn Creek			
Reclamation and closure of Powerlines			
Reclamation and closure of Rail Infrastructure			
Implement post-mining systems and monitoring			
Employment and labour	X	X	
Post-closure			
Maintain post-mining systems and ongoing monitoring			
Transportation of equipment, materials, and personnel			X
Employment and labour	X		

Notes:

Interaction (X): Interaction between the Project activity and the VC may have a substantive influence on the short- or long-term integrity of the VC (i.e., measurable or detectable using the identified indicator). The potential effect(s) of the interaction is considered further in the effects assessment.

No interaction (blank cell): Project activity will not interact with the VC; no adverse effect is expected; no further consideration is warranted.

5.2 Potential Project-related Effects

Potential adverse effects of the Project on the Infrastructure and Services VC arising from potential interactions, as identified in **Table 5.1-2**, and in relation to indicators listed **Table 3.2-2**, are identified and described in this subsection.

Three (3) potential adverse Project-related effects on the Infrastructure and Services VC include:

- ▶ Housing and Accommodation subcomponent: increase in cost or decrease in availability of housing and accommodations;
- ▶ Community Infrastructure and Services subcomponent: increase in demand for community infrastructure and services, including emergency services; and
- ▶ Transportation subcomponent: change in use of roads and related increases in traffic.

Potential effects on the Infrastructure and Services VC depend largely on the level of in-migration and population increase in the RSA and LSA communities directly and indirectly as a result of the Project. Secondly, changes in socio-economic conditions because of the Project, such as household income and spending, may also indirectly result in effects on the Infrastructure and Services VC. The Project anticipates that a substantial portion of the construction and operational workforce will be made up of existing residents of LSA communities and, therefore, will not cause a change in population or the use of infrastructure and services. However, given it is difficult to adequately forecast the success of the Project's hiring strategy or the potential availability of some specialized construction skillsets and workers within the LSA, in order to test the Project's local hire assumptions and provide a conservative estimate, the assessment has considered two (2) local employment sourcing scenarios for comparison:

- ▶ Construction Phase:
 - ▶ conservative scenario: 30% locally sourced workers,
 - ▶ Project planned scenario: 60% locally sourced workers;
- ▶ Operation Phase:
 - ▶ conservative scenario: 60% locally sourced workers, and
 - ▶ Project planned scenario: 75% locally sourced workers.

The size of the Project workforce are currently unknown and is based on estimates and modelling outputs described in **S5.0-C1 Labour Market VC**. An assessment of a range of proportions of locally-sourced workforce is provided in **S6.0-C1 Demographics VC** which is intended to provide a conservative and potentially an overestimate of potential effects on the Infrastructure and Services VC.

5.2.1 Housing and Accommodation Subcomponent

The in-migration of a Project workforce may increase the demand for housing and accommodation, affecting the availability and cost of housing. Based on existing conditions described in **4.2**, the following subsections provides a summary of the potential effects on housing availability and cost for each phase of the Project, based on the anticipated population and demographic changes and assumptions described above. Mitigation measures for the potential effects are described in **5.3**.

5.2.1.1 Increase in Cost or Decrease in Availability of Housing and Accommodations**5.2.1.1.1 Construction Phase**

Population growth resulting from workforce hiring during the Construction Phase could increase demand on short-term accommodation and rental housing, potentially resulting in decreased access to housing and accommodation, and increased housing and rental costs.

As described in **S5.0-C1 Labour Market**, direct Project employment at peak construction is estimated to include 118.3 full-time equivalents (FTEs) of contractor³ employment and 9.6 FTE of TCL employees, filling up to 186 jobs at peak workforce in the second year of the Construction⁴ Phase. An additional 9.0 FTEs of contractor employment related to the Heavy Equipment and Maintenance Shop were also considered in relation to the Construction Phase.

While there may be up to 186 jobs available during peak construction, a portion of fabrication activities are expected to take place offsite with complete modules and equipment being assembled offsite and brought to the site. In general, the onsite construction workforce at any time is expected to be small (around 70 people or less), dependent on the specific scheduled construction requirements.

The Project estimates that at least 60% of the construction workforce will be locally-sourced. Considering on the wide mix of skillsets required and using a more conservative scenario of a 30% level of locally-sourced construction workforce described in **5.2**, approximately 41 of the 137 FTEs would be filled by 41 to 60 existing residents of LSA communities, as shown in **Table 5.2-1**. The remaining 96 FTEs would be filled by up to 110 contract workers that will temporarily in-migrate to the LSA from the RSA or elsewhere for varying durations of time within the Construction Phase (1.5 years). Spin-off employment within the RSA/LSA is expected to be primarily filled by local residents.

Table 5.2-1: Construction Phase Workforce Scenarios

	Hired from LSA	Temporarily in-migrating to LSA
Peak Workforce (Construction Phase)	137 FTE (approximately 186 workers/jobs)	
Conservative scenario: 30% locally sourced workers	56	130
Project planned scenario: 60% locally sourced workers	112	74

Note: %=percent; FTE=full-time equivalent; LSA=Local Study Area

The Project intends to contract blocks of short-term accommodation rooms in the LSA communities of Smithers and Houston (25 km and 41 km from the Project site respectively) during the year and a half (1.5) Construction Phase, thereby eliminating the need for a Project work camp or Fly-In-Fly-Out (FIFO) arrangements. Ground transportation to and from the construction site would be arranged by TCL.

TCL has initiated conversations with short-term accommodation establishments in Houston and Smithers to determine the availability of short-term units during the Construction Phase. Based on these initial informal conversations with 13 establishments, there are approximately 197 rooms in Houston and Smithers

³ Contractor is a person or company that works on a contractual basis..

⁴ This refers to the peak workforce activity, not the various jobs that would be created as a result of Project construction.

are likely available for temporary accommodation during the Construction Phase. From these inquiries, TCL's understanding is that this would represent no more than 33% percent of the available short-term rental accommodations supply in these two (2) centres.

During the Construction Phase, workers are not expected to permanently relocate to the LSA, given the temporary nature of construction contracts. However, some construction workers may opt not to stay in Project-provided accommodation, and instead prefer to rent a house or apartment for the duration of their stay. While the Project is seeking to employ a local workforce, up to 110 people from outside the LSA will be required to fill positions that cannot be filled locally. This has the potential to have an adverse effect on the Housing and Accommodation subcomponent during the Construction Phase associated with an increase in cost and a decrease in availability of housing and accommodations.

5.2.1.1.2 Operation Phase

In the fourth year of the Operation Phase, the Project would provide direct employment for up to 166 FTEs (including TCL employees and direct contractors), after a three (3)-year ramp up. An estimated 60 people will be working onsite at any given time due to shift rotations for all workers (**S5.0-C1 Labour Market**).

The Project expects that most operational workforce would be hired from the LSA and RSA. TCL estimates that at least 75% of the peak operations workforce (130 workers) will be drawn from existing labour force residing in the LSA. The longer time period associated with the Operation Phase of the Project and the more stable nature of the jobs means that any incoming workers and their families are more likely to seek more permanent accommodations (i.e., buying or renting homes) compared to the Construction Phase.

Based on a more conservative estimate of 60% locally sourced operations workforce, an estimated 102 workers will be sourced locally from LSA communities and surrounding area in Electoral Areas RDBN A and RDBN G, while an estimated 68 workers will in-migrate to the LSA, approximately 80% with families (a rate similar to population movements in previous census data). Using the average family size for families in the RSA of 2.9 residents per households, conservatively up to 197 additional residents are expected to move to the LSA, requiring up to 68 residential units. The spin-off employment, primarily in the retail, transportation and services sectors and the wages typically offered in those sectors are unlikely to be sufficient inducement to migration into the RSA/LSA when an existing labour pool is present in the LSA.

Table 5.2-2: Operation Phase Workforce Scenarios

	Direct Hires		Total In-migrants to LSA (including families)
	Hired from LSA	In-migrating to LSA	
Peak Workforce (Operation Phase)	166 FTE (approximately 170 workers/jobs)		
Conservative scenario: 60% locally sourced	102	68	197
Project planned scenario: 75% locally sourced	130	40	116

Notes: %=percent; FTE=full-time equivalent; LSA=Local Study Area

As described in 5.2.1.1.1, there are existing pressures on the supply of housing in the LSA and the Project could potentially have an adverse effect on the Housing and Accommodation subcomponent associated with a change in the cost or availability of housing and accommodations during the Construction Phase. This is expected to be particularly true during the first few years of Operation when there is active workforce recruitment to fill available positions. The capacity of the LSA communities to absorb an influx of workers

and their families in response to the labour demands of the Project is currently limited, and increased demand may drive up already escalating rental and housing costs.

In the long term, it is expected that increased tax revenue associated with the Project and higher incomes, as discussed in **S5.0-C2 Economic Development VC**, will work to partially mitigate the potential adverse effects on housing availability and cost. In addition, with respect to housing development, the private sector is expected to respond to the increase in housing demand over time by providing new housing developments, as determined by the market. Nevertheless, there is the potential for an adverse effect on the Housing and Accommodation subcomponent associated with an increase in the cost or availability of housing and accommodations during the Operation Phase.

5.2.1.1.3 *Decommissioning and Reclamation Phase*

Activities associated with the Decommissioning and Reclamation Phase are anticipated to provide some short-term employment for approximately 45 workers or 38.8 FTEs over a four (4) year period. However, the net overall effect during this phase of the Project is expected to be the loss of 85.2 operations jobs in the previous year. It is not likely that there will be an additional demand for accommodation during this phase. No Project-related effects on the Housing and Accommodation subcomponent during the Decommissioning and Reclamation Phase are anticipated.

5.2.1.1.4 *Post-closure Phase*

The Project would provide one (1) job during the Active Post-closure Phase. Most workers previously employed in the Operation, or Decommissioning and Reclamation phases of the Project are expected to seek other employment opportunities in the LSA or out-migrate to other RSA communities or out of the region. It is not likely that there will be an additional demand for accommodation during this phase. No Project-related effects on the Housing and Accommodation subcomponent during the post-closure phase are anticipated.

5.2.2 Community Infrastructure and Services Subcomponent

The in-migration of a Project workforce is anticipated to increase the demand for community services and infrastructure, and emergency services within the LSA. Changes in socio-economic conditions because of the Project, such as household income and spending, may also indirectly result in an increased demand on the Community Infrastructure and Services subcomponent. The following subsection provides a summary of the potential effects on community services (education, child care, health care, and recreation) and community infrastructure, as well as emergency services for each phase of the Project, based primarily on the anticipated population and demographic changes discussed in **S5.0-C1 Labour Market VC** and assumptions in **5.2**. Mitigation measures for the potential effects are described in **5.3**.

5.2.2.1 *Increased Demand for Community Infrastructure and Services, including Emergency Services*

5.2.2.1.1 *Construction Phase*

As described in **5.2.1.1.1**, the Project is seeking to reduce in-migration through hiring a local workforce. Based on a conservative estimate of 30% locally-sourced construction workforce, up to 110 contract workers that will temporarily in-migrate to the LSA from the RSA, or elsewhere, for varying durations of time during the year and half (1.5) Construction Phase. Spin-off employment within the RSA/LSA is expected to be primarily filled by local residents.

The temporary in-migration of up to 110 workers into the LSA is not expected to exceed BC Stats population projections during this period for the area and is not anticipated to have a measurable effect on community services and infrastructure, particularly because workers' stay in the LSA will be temporary and they are unlikely to be accompanied by family members. Both Smithers and Houston, where most of the non-resident construction workers would be housed and where the bulk of available rental accommodations exists, appear to have adequate community service and infrastructure capacity to absorb the temporary in-migration of construction workers, and are not under existing pressure to meet current demands.

In terms of healthcare, the workers will be able to receive basic health care onsite for minor incidents in the workplace. For general health care services, workers may seek medical attention in Smithers. As the construction contracts will be temporary in nature, it is anticipated that most workers will seek speciality healthcare services when they return to their hometowns, as opposed to seeking these services in Terrace or Prince George. Given that the Construction workforce will be modest in size (up to 110 workers) and represent a temporary presence in the LSA, the Project is not likely to create pressure on healthcare or emergency services in the LSA or in Terrace or Prince George that cannot be absorbed.

No adverse effect on the Community Infrastructure and Services subcomponent, including emergency services, is anticipated during the Construction Phase.

5.2.2.1.2 Operation Phase

During the Operation Phase, the in-migration of a permanent workforce may result in increased pressure on existing community services and infrastructure such as on education, child care, health care, recreation services, and emergency services.

As described in **5.2.1.1.2**, the Project requires a modest operational workforce, and based on a conservative estimate of 60% locally-sourced operations workforce, an estimated 68 workers will in-migrate to the LSA, approximately 80% with their families. Using the average family size for families in the RSA of 2.9 residents per households, conservatively up to 197 additional residents may move to the LSA. The spin-off employment is unlikely to be sufficient to induce migration into the RSA/LSA when an existing labour pool is present in the LSA.

Since some of the expected in-migrants associated with the Operation Phase workforce will be family members, it is expected that there will be an increased demand for education services in the LSA. While the elementary school in Telkwa is reported to be near capacity, there is additional capacity to absorb new students in Houston and Smithers, where enrollment rates have been decreasing. Child care facilities across the LSA, however, are currently at capacity and the demand for child care has been trending upward in the LSA. Using the BC provincial average of percent of children below 15 of 14.9% (see **S6.0-C1 Demographics VC**), it could be assumed that approximately 30 children under the age of 15 could in-migrate into the LSA. It can further be assumed that less than 10 of those 15 children will be under the age of five (5) (approximately one-third of children below 15 years). Given that child care facilities are already at or over capacity, the Project may increase demand for child care services in the LSA during the Operation Phase.

In terms of water and sewage infrastructure, as well as waste, there is expected to be adequate infrastructure for cater to current populations and it is understood that there is capacity to absorb a potential increase in demand.

During the Operation Phase, up to 197 additional residents may place additional pressure on healthcare services as the increase in population may alter the percentage of the population in LSA communities who have a regular health care provider. The in-migration during the Operation Phase is not expected to exceed

BC Stats population projections during this period for the area and accounts for an increase of approximately 1.9% in the total population of the LSA (based on the 2016 population of 10,381). Based on the small scale of the population increase, the healthcare services at the healthcare hub in Smithers and the regional hub in Prince George are expected to be able to absorb the additional demand.

As required by Part 3.7.1 of the Health, Safety and Reclamation Code for Mines in British Columbia (BC MEMLI 2021) (Code), TCL will develop and implement at **Minesite Emergency Response Plan S13.0-C9 (MERP)** as part of the **Environmental Management System (S13.0-C1) (EMS)** for the Project that will provide guidance regarding how to respond to emergencies in the Project Area, and specifically at the Minesite. The Project will have a site ambulance parked adjacent to the Emergency Response/Mine Rescue Building during the Operation, and Decommissioning and Reclamation phases, and the ambulance will be supplied with a Level 3 First Aid kit plus accessories. The Project will also have a trained Emergency Response Team⁵ (ERT) (with some members having Occupational First Aid (OFA) Level 3 certification being responsible for patient care in the ambulance) that will meet or exceed the minimum requirements specified in the Code. Minesite workers will be able to receive basic health care onsite for minor incidents in the workplace. For more serious incidents and in the event of an emergency at the Minesite (i.e., Level 3 Emergency requires outside agencies to be alerted), BC Ambulance would provide support through the dispatch of ambulances from the Smithers Station. They would be supported by the Smithers and Telkwa Fire Departments for extrication needs, or for additional trained support. The attendants would assess the situation and call for more support from other stations if needed. Where possible, TCL will support emergency response efforts initiated by local government to manage the effects of environmental events in the Project Area and vicinity, which may include funding a portion (up to 25%) of an ambulance capable of advanced life support for Smithers which is currently not available.

In the long-term, increasing incomes associated with Project employment will result in an increase in overall government tax base, including corporate and personal income tax, sales tax, property tax, and mining tax payments (as described in **S5.0-C2 Economic Development VC**). The increase in taxes will assist governments and local municipalities in the provision of infrastructure necessary to support the change in demand. In addition, Northern Health is currently working through the planning process to fully replace the BVDH with a larger, modern hospital which will improve the access to healthcare in the LSA. The planning and approval phase of the replacement will likely take seven (7) to 15 years.

With the exception of a potential increased demand for child care services, no adverse effects on the Community Infrastructure and Services subcomponent, is anticipated during the Operation Phase.

5.2.2.1.3 Decommissioning and Reclamation Phase

Activities associated with the Decommissioning and Reclamation Phase will provide some short-term employment, expected to be approximately 35 workers or 101 FTEs over a one (1)-year period. However, the net overall effect during this phase of the Project is predicted to be the loss of 82 operations jobs in the previous year. It is not likely that there will be an additional demand for community infrastructure and services in this phase. During the Decommissioning and Reclamation Phase, there is no predicted Project-related effect on the Community Infrastructure and Services subcomponent.

⁵ Emergency Response Team is also known as Mine Rescue Team.

5.2.2.1.4 Post-closure Phase

The Project would provide one (1) job during the Active Post-closure Phase. Most workers previously employed in the Operation, or Decommissioning and Reclamation phases of the Project are expected to seek other employment opportunities in the LSA or out-migrate to other RSA communities or out of the region. It is not likely that there will be an additional demand for community infrastructure and services in this phase. During the Post-closure Phase, there is no predicted Project-related effect on the Community Infrastructure and Services subcomponent.

5.2.3 Transportation Subcomponent

Project activities, particularly during Construction and Operation phases, together with any in-migration of a Project workforce, has the potential to increase the number of vehicles on the road, leading to increased traffic delays and road wear and, overall, a decrease in the level of service. Effects on traffic and pressure on transport infrastructure are generated by the movement of workers, materials, equipment, and coal to and from the Minesite. The following subsection provides a summary of the potential effects on road and rail transportation infrastructure. This subsection draws on data collected as part of the **Traffic Study (Appendix 6.3-A)**. Mitigation measures for the potential effects are described in **5.3**.

Access to the Minesite will be gained from Telkwa through the Tenas Access Corridor (TAC), which includes a portion of the existing Caribou FSR through the Goathorn Creek Valley and a new 11 km dedicated Bypass Road, from Lawson Road. Once built, the Bypass Road will allow the Project to be accessed without using the Telkwa Coalmine Road, a public road under the jurisdiction of the BC MOTI except in an emergency where the Bypass Road is not accessible and during the Construction Phase.

During construction of the Bypass Road, the existing Telkwa Coalmine Road and the existing FSR will be used for access. The existing FSR was previously used for forestry operations, and current recreational use of this road is low due to a washout of the Goathorn Bridge that occurred over 10 years ago. All Minesite traffic will use the TAC once it is available including but not limited to explosives, fuel, lubricant and part deliveries, recycling, hazardous waste, and general solid waste removal.

5.2.3.1 Change in the Use of Roads and Related Increase in Traffic

5.2.3.1.1 Construction Phase

During the Construction Phase, road transportation will be the primary transport mode affected by the Project, which will generate additional vehicle traffic between communities in the LSA and the Minesite. As described in **5.2.1**, the Project intends to house construction workers in temporary accommodation in Smithers and Houston, so an increase in traffic from these communities to the Minesite will be expected along Highway 16. Additional construction traffic will include the movement of construction materials, pre-fabricated modules, heavy equipment, and fuel to the Minesite.

According to the **Traffic Study (Appendix 6.3-A)** completed for the Project, existing traffic volumes on Telkwa Coalmine Road, and Lawson Road are low and can be attributed to residential commuter traffic. Volumes at Hankin Road and Highway 16 (where commuters would exit Highway 16 to Telkwa) can largely be attributed to commuter traffic. Primary movements at this intersection were found to be through traffic on Highway 16 and turning movements onto Highway 16.

The Project will use a pre-assembled steel modular approach, instead of a traditional wood frame build construction methodology for some Project infrastructure (**S1.0-C1**), which means that most fabrication activities will occur offsite and outside of the RSA, with completed modules brought to the Minesite for

installation. This reduces not only the number of workers required onsite during construction, but also the quantity of construction materials required to be delivered to site. Abnormal loads associated with the delivery of Project infrastructure will be a temporary disruption to road traffic and are anticipated to occur infrequently during the Construction Phase.

The Project will not have any FIFO arrangements during the Construction Phase and, therefore, is not expected to have any direct effect on air transportation infrastructure or services for the LSA communities.

During the Construction Phase, there remains the potential for an adverse effect on the Transportation subcomponent associated with a change in the use of roads and related increases in traffic.

5.2.3.1.2 Operation Phase

Rail will be primarily used to transport coal from the Minesite, while road transportation will be used for the movement of workers, materials, and equipment. The use of a dedicated Bypass Road during the Operation Phase will avoid increased traffic volumes on existing roads, with planned processed coal super B-train truck movements of four (4) to eight (8) trucks per hour.

Processed coal will be shipped by rail to coal terminals in Prince Rupert. The nearest rail line is operated by CNR, located 7 km northeast of the Project near Telkwa. An approximately 2.5 km Rail Loop will be constructed and connected on one end to the CNR line. The Project has had preliminary discussions with CNR regarding the Rail Loop and the capacity of the CN network to accommodate the additional shipping volume. No concerns were raised by CNR, given the lead time associated with the Project's first coal production.

The Rail Loop will service approximately 1.2 rail cars consisting of 116 coal cars and up to 3 locomotives per week. The preferred option for the Rail Infrastructure is to locate it adjacent to the adjacent CNR main line, which will require super B-train on-highway trucks⁶ to transport processed coal between the Coal Processing Plant (CPP) site and the Rail Infrastructure via the existing Caribou FSR and Bypass Road.

It is expected that there will be a day and a night shift for workers; however, the general deliveries are expected to occur during the day shift only. According to the **Traffic Study (Appendix 6.3-A)**, during the day on weekdays it can be expected that the Project would generate:

- ▶ seven (7) return trips for general deliveries (fuel, recycle etc.);
- ▶ 10 return trips for busses (dayshift and nightshift start and end); and
- ▶ eight (8) return trips for passenger vehicles (dayshift and nightshift start and end).

The **Traffic Study (Appendix 6.3-A)** concluded that traffic expected to be generated by the Project will be low and is not expected to have an impact to the existing traffic flow at the intersection of Hankin Road and Highway 16. The trips generated coincide with the primary movements at the existing intersection. Based on the known traffic volumes at the intersections, the level of service for all movements will be acceptable. During the Operation Phase, there is not predicted to be an adverse effect on the Transportation subcomponent associated with a change in the use of roads and related increases in traffic.

⁶ A super-B train is truck-trailer combination is where the axles of the lead trailer stick out and a fifth wheel is mounted on the lead trailer. It has eight (8) axles allowing it to carry large loads.

The Project will not have any FIFO arrangements during the Operation Phase and, therefore, is not expected to have any direct effect on air transportation infrastructure or services for the RSA and LSA communities.

5.2.3.1.3 Decommissioning and Reclamation Phase

During the Decommissioning and Reclamation Phase, all buildings and other infrastructure on the Minesite, including conveyors, powerlines, substations, clean water pipelines, will be dismantled or demolished and removed from the Minesite. Activities associated with this phase will require a workforce of approximately 35 workers over a one (1)-year period. Vehicle movements are anticipated to be similar to that of the Construction Phase and will include the movement of waste, rubble and recyclable materials from the Minesite, pre-fabricated modules, heavy equipment, fuel and potentially contaminated soils. Additional details regarding specific transportation demands by the Project during the Decommissioning and Reclamation Phase have yet to be defined. During the Decommissioning and Reclamation Phase, there is the potential for an adverse effect on the Transportation subcomponent associated with a change in the use of roads and related increases in traffic.

5.2.3.1.4 Post-closure Phase

The Project is expected to provide one (1) job during the Active Post-closure Phase. It is not likely that there will be an additional effect on transportation infrastructure or traffic. During Post-closure, there is no predicted Project-related effect on the Transportation subcomponent.

5.3 Mitigation Measures

This subsection describes mitigation measures applicable to potential Project effects on the Infrastructure and Services VC. The mitigations provided are aligned with the BC EAO (2013) which describe mitigation measures as any practical means or measures taken to avoid, minimize, rehabilitate onsite, and if required, compensate, or offset the potential adverse effects of a project. Mitigation measures include applicable standards and guidelines.

TCL has incorporated several mitigation measures in the Project's design and/or operational procedures to reduce the magnitude, duration, and extent of effects due to the Project. These Project mitigation measures are outlined in **S1.0 Overview of Project Proponent Description** of the **EAC Application** and include Project design aspects such as site selection, and selection of best available technologies (BAT) to-date for Project infrastructure and mining equipment. Project mitigation measures that are relevant to minimizing a potential Project-related effect on the Infrastructure and Services VC are described in **5.3.1** and **5.3.3**. As not all effects can be addressed through design, additional mitigation measures specific to the Infrastructure and Services VC are described in **5.3.4** to **5.3.10**. All mitigation measures for Infrastructure and Services VC are summarized in **Table 5.3-1**.

Several environmental management plans will define the standard operating procedures, the best management practices (BMPs), the adherence to existing regulations, and the use of appropriate design criteria. Environmental management plans will define the purpose and objectives, scope, the BMPs, the adherence to existing regulations, and mine employee roles and responsibilities. Project operations are governed by an overarching **EMS**, of which all management plans are a part. Measures to mitigate potential adverse effects on the Infrastructure and Services VC will be incorporated into the various Project management plans such as:

- ▶ **MERP**;
- ▶ **MTCP**; and

► **SEMP.**

The management plans provide direction on sequencing, monitoring and adaptive management to ensure that measures are timely and effective.

Mitigation measures (described below) are based on proven and accepted mitigation used in BC following standard industry guidelines and BMPs such as those listed in **2.2 Infrastructure and Services Management Plans and Guidance Documents**. The mitigation measures are expected to be effective immediately following implementation.

5.3.1 Minimize the Project Footprint and Project Area

To limit the Project footprint and Project Area the Project has been designed to:

- Cluster Project components, including the pit, stockpiles for run-of-mine (ROM) coal, processed coal and processed rock, CPP, management ponds, and ancillary facilities such as the Maintenance Facility and Administration Building;
- Align linear Project features (such as powerlines, roads, water distribution) into a common right-of-way (ROW);
- Place Project features within existing or planned Project component footprints to limit the clearing of vegetation and the salvage of reclamation materials (surface soil, woody debris, and overburden). For example, the Minesite buildings will be built in areas previously cleared by forestry activity;
- Minimize the length of haul roads, access roads, and rail line where possible. Use or improve existing roads where practical;
- Utilize a loop design configuration for the rail that requires half the space and subsequent footprint compared to the standard teardrop shape seen at other operating or proposed coal mines in western Canada;
- Place reclamation material (surface soil and woody debris) stockpiles within development areas such as the open pit and haul roads to avoid disturbance, while overburden is directly placed on Project components for future reclamation activities;
- Limit the TAC to a single lane width for long distances and utilize existing FSRs or private roads where appropriate;
- Backfill approximately 50% of non-coal material back into the open pit; and
- Place processed rock from the CPP within the management ponds versus a separate permanent pile to avoid any potential acid rock drainage (ARD) from this material and reduce the Project footprint.

5.3.2 Transport Measures

The following mitigation measures refer to transport measures:

- Build, maintain, and use the TAC for hauling processed coal to the Rail Infrastructure for the duration of all Project phases after the Construction Phase to minimize traffic on existing, residential roads;

- ▶ Build, maintain, and use the TAC for transport of personnel, goods, and services for the duration of all Project phases after the Construction Phase to minimize traffic on existing, residential roads;
- ▶ Repair and/or replace and/or upgrade existing FSRs or private roads that will be used as part of the TAC.
- ▶ Repair and replace new and existing culverts as required for all Project related transport corridors including the TAC;
- ▶ Design and build a permanent clear span bridge over Goathorn Creek and Helps Creek and its related tributaries to provide vehicular access to the Project that will be controlled by TCL;
- ▶ Use buses and/or vans for employees and contractors as much as practical to reduce the risk of traffic incidents, and to reduce noise and fugitive dust emissions generated by the Project. Bussing options to Witset and/or Houston to be provided (if requested, and based on sufficient employees are in these locations) to facilitate potential employees accessing employment opportunities with the Project;
- ▶ Use dust suppressing agents on the rail cars to reduce fugitive dust emissions;
- ▶ Cover super B-train trucks when hauling processed coal and ROM coal from CPP to Rail Infrastructure to reduce fugitive dust emissions from trucks;
- ▶ Use water and chemical agents on the TAC to reduce fugitive dust emissions, where and when appropriate; and
- ▶ Use water and chemical agents, as required, on processed coal and ROM coal stockpiles to reduce fugitive dust emissions resulting from storage and handling;
- ▶ Use privately controlled Rail Infrastructure so that there are no train whistles generated from Rail Infrastructure;
- ▶ Utilize low train speeds (10 kilometres/hour [km/hr]) within the Rail Infrastructure, and up to 20 km/hr while entering and exiting the Rail Infrastructure) to mitigate vibration and noise;
- ▶ Post a speed limit of 50 km/hr on the TAC, 70 km/hr on Minesite haul roads, and 30 km/hr on Project service roads. Mine haul trucks within the Minesite portion of the Project footprint will have a maximum operating speed of approximately 35 km/hr, given their size and weight; and
- ▶ Investigate implementing a no train whistle requirement at the existing level rail crossing in the Village of Telkwa based on consultation with and approval of the CNR.

5.3.3 Housing Measures

TCL is aware of the current housing shortage and lack of housing stock and diversity within the Socio-economic RSA determined for the Project. The following measures are intended to promote local housing opportunities:

- ▶ Provide incentives and inducements to employees to move permanently to a location within the Socio-economic RSA and require the Project management team to reside in the Socio-economic RSA to benefit the local and regional economy (refer to the **SEMP**); and
- ▶ Provide incentives and inducements to developers and partner with government to encourage the development of additional housing stock/supply and diversity of housing in the Socio-economic LSA/RSA.

5.3.4 Procurement Program

A Procurement Program will be implemented to support procurement from local and regional businesses, and to reduce the barriers to entry for contracting opportunities for local and regional businesses, to maximize economic benefits to those businesses. The Procurement Program will assist local and regional businesses in taking advantage of the opportunities to supply the Project directly and indirectly, and it will improve the understanding of procurement requirements and expectations. The Procurement Program is presented in the **SEMP**.

A Buyer role will be created for the Project to develop local opportunities, improve understanding of the local/regional market, and assess the availability of goods and services that can be sourced locally. TCL will also:

- ▶ Advertise contracting opportunities well in advance of the goods or services being required, to allow local suppliers to increase capacity, meet qualifying requirements, and prepare a competitive bid. TCL internal policy is to obtain at least three (3) received quotes for each good or service request for quote (RFQ);
- ▶ Provide smaller contracts to allow businesses with limited capacity to participate in the bidding process, and/or implement a multi-supplier procurement by allowing the breakdown of some larger contracts; and
- ▶ Improve the participation of Indigenous-owned businesses in the procurement process.

5.3.5 Housing and Accommodation Program

To assist employees of TCL to own permanent housing in the region around the proposed Project, the following mitigation measures will be addressed through the Housing and Accommodation Program (refer to **SEMP**) and will include:

- ▶ TCL will fund the accommodation of non-local experienced personnel that the company requires during the Construction Phase:
 - ▶ A Request for Proposal (RFP) will be provided to accommodation providers at least six (6) months prior to use by the Project construction workforce, and the RFP will be for a set number of rooms for a guaranteed duration of time;
 - ▶ Reservations will be made at various campgrounds and RV parks to allow the Project construction workforce to use some of these facilities;
 - ▶ Discussions with groups in Telkwa, Smithers and Houston for the temporary rental of rooms for the construction workforce will be secured at least six (6) months prior to use;
 - ▶ TCL will endeavour to use local companies to complete most of the construction activities for the Project to reduce the requirements for temporary accommodation;
- ▶ To accommodate the permanent workforce for the Operation Phase:
 - ▶ Grants to be used for the purchase or upgrade of permanent local housing will be provided to employees who reach designated milestones with the company;
 - ▶ TCL will work with local developers to provide guaranteed rental rates and duration to incentivize the construction of accommodation for permanent employees and communities at large; and
 - ▶ TCL will provide transportation from both Houston and Witset if at least six (6) employees reside in these locations to promote alternatives for employees to reside and still be within a reasonable driving distance (less than 90 minutes) from the Project.

5.3.6 Education and Training Support

TCL will work to increase the skill capacity of the local and regional labour force and to reduce barriers to employment for Indigenous workers, which will help manage a potential influx of workers that could affect housing availability and cost. This in turn could help manage potential economic inflation and the affordability of housing, food, consumer goods, and other supplies, consequently affecting cost of living. Mitigation measures will focus on training efforts to prepare the unemployed and underutilized labour force for employment at the Project, as well as to increase the availability of skilled workers in the region for employment at other local and regional businesses.

The following measures will be addressed through the Education, Training, and Employment Program (refer to **SEMP**) and will include:

- ▶ provide training, targeting entry-level positions and on-the-job training where previous experience is not necessary;
- ▶ develop and implement of a professional training plan to support training needs for the Project that can include specialized skilled training, such as apprenticeship programs for trades positions;
- ▶ support efforts on the part of employees to upgrade their education as a means towards job advancement;
- ▶ cooperate with local educational authorities, institutions, and the industry in general, to develop and implement high school and college training with mining sector content;
- ▶ support the training of Indigenous people and cooperate with programs such as Indigenous Skills and Employment Training Program (ISET) to improve access to funding for Indigenous individuals and support skill building of the Indigenous workforce in the RSA; and
- ▶ cooperate with financial institutions to support financial resource needs required for training (e.g., a clear indication of workforce needs and intention to employ workers at the Project), given specific education can increase the likelihood of receiving a student loan.

The Education, Training and Employment Program will also contribute to creating positive effects from the Project, likely by contributing to a positive feedback loop of meaningful Project interactions with the community, a sense of pride among workers, and integration of the Project in the local social fabric, thus also contributing to mitigate potential Project effects on community cohesion and mental health.

5.3.7 Child Care Program

TCL will share information about its projected workforce needs with child care service providers in the LSA in accordance with the **SEMP** so that they can anticipate and plan for the increased demand for services.

TCL will fund at least one (1) full-time position at a government approved child care facility in RDBN that will be selected by TCL via an application process, with the provision that additional matching full-time positions are funded by government sources, and that preference is given to children of TCL employees for additional capacity created; and

TCL will fund at least one (1) full-time position with Indigenous groups at an approved child care facility run by an Indigenous group in the region that will be selected by TCL via an application process, with the provision that an additional matching full-time position is funded from Indigenous and/or government sources, and that preference is given to children of TCL Indigenous employees first, and then TCL non-Indigenous employees for additional capacity created.

5.3.8 Traffic Management

Oversized loads (weight and or dimensions) will obtain the required permits from BC MOTI. Oversized loads will be routed through Houston and along Lawson Road to the TAC during the Operation, and Decommissioning and Reclamation phases, and the Telkwa Coalmine Road during the Construction and Post-closure phases and will not be permitted to cross the bridge in Telkwa.

Personal pick-up trucks will be limited to front-line supervisors, selected contractors, and the Mine Manager for travel between the Project and residences. Freight and fuel deliveries will be scheduled to avoid busy periods on the Telkwa Coalmine Road and the TAC during shift change for the crews working for the Project.

The **MTCP** will be implemented and will describe the traffic management processes and procedures in place for the Project, including use of the TAC which provides access to the Minesite, and its associated haul and service roads within the Minesite. The MTCP will address maximum allowable speeds, rules for passing and parking, “stop” and “yield” locations, priority rules for various vehicles, rules for night operation, maximum operating grades, emergency runaway measures, and shoulder barrier prescriptions (berms).

5.3.9 Land Use Agreements

TCL has land use agreements or understandings in place with landowners whose land is overlapped by the Project. Private lands that are overlapped by TAC will be provided clear and identified locations where they can cross the TAC with vehicles, walking or other means (such as horseback riding) on an unrestricted basis if it is safe to do so.

Access to, within, and beyond the Project Area by designated Indigenous groups for land use and resource harvesting purposes will be discussed and facilitated during Project phases by TCL.

5.3.10 Community Engagement Programs

TCL is committed to creating and maintaining opportunities for constructive dialogue and relationships with the local community and other interested parties over the course of the Project. The Project will develop and implement Community Engagement Programs as part of the **SEMP** that will involve continuous engagement with key stakeholder groups most likely to be concerned and affected by the Project, including:

- ▶ Indigenous groups, including the OW, Wet’suwet’en First Nation, and Witset First Nation;
- ▶ local and regional authorities and key representatives such as the Village of Telkwa, the Town of Smithers, and the RDBN;
- ▶ local community groups such as Tenas Mine Neighbours and other Bulkley Valley residents;
- ▶ local recreation groups;
- ▶ local community groups; and
- ▶ other local non-governmental organizations, and
- ▶ members of the local and regional workforce potentially interested in work at the Project.

Community consultation provides an opportunity for stakeholders to express their concerns, ask questions, and get a clearer understanding of Project effects and associated mitigation measures. Sustained stakeholder engagement activities are expected to contribute to positive interactions between the Project and community members from the LSA and the RSA and are likely to foster a climate of collaboration and

trust. Through the implementation of Community Engagement Programs, the Project's goal is to operate as a good neighbour to residents of the LSA, well-integrated into the social fabric of the Bulkley Valley where mining was accepted activity in the past.

The Community Engagement Programs (for Construction, Operation, and Decommissioning and Reclamation phases of the Project) will include:

- ▶ open-door policy;
- ▶ general engagement meetings and presentations;
- ▶ company website;
- ▶ social media;
- ▶ Project tours;
- ▶ participation at community and industry events;
- ▶ neighbours' group(s),
- ▶ Project Access Committee,
- ▶ Project Advisory Committee, and
- ▶ sponsorship.

5.3.11 Summary of Mitigation Measures

A summary of the mitigation measures to avoid or reduce potential Project-related adverse effects on the Infrastructure and Services VC, and whether or not a residual effect is anticipated, is provided in **Table 5.3-1**.

Table 5.3-1: Summary of Potential Effects and Mitigation Measures for the Infrastructure and Services Subcomponents

Potential Effect	Contributing Activities within the Project Phases (C, O, D, P)	Proposed Mitigation Measure	Applicable VC Subcomponent	Residual Effect (Yes/No)
Increase in Cost or Decrease in Availability of Housing and Accommodations	Employment and Labour (C)	- Housing measures - Procurement Program (SEMP) - Housing and Accommodation Program (SEMP) - Education and training support (SEMP) - Community Engagement Programs (SEMP)	Housing And Accommodation	No
	Employment and Labour (O)	- Housing measures - Procurement program (SEMP) - Housing and Accommodation Program (SEMP) - Education and training support (SEMP) - Community Engagement Programs (SEMP)	Housing and Accommodation	Yes
Increased Demand for Community Infrastructure and Services (Increased Demand for Child Care Services)	Employment and Labour (O)	- Procurement Program (SEMP) - Education and training support (SEMP) - Child Care Program (SEMP) - Community Engagement Programs (SEMP)	Community Infrastructure and Services	Yes
Change in Use of Roads and Related Increases in Traffic	Transportation of equipment, materials, and personnel (C, D)	- Minimize Project footprint and Project Area - Transport measures - Traffic management - Land use agreements - Community Engagement Programs (SEMP)	Transportation	Yes

Notes: C, O, D, P represent Project Phases: (C)onstruction, (O)peration, (D)ecommissioning and Reclamation, (P)ost-closure

SEMP=Socio-economic Management Plan (S13.0-C16); VC=Valued Component

See Table 5.1-2 for list of applicable activities for each listed Project phase, unless otherwise noted in this table.

5.4 Residual Effects and Significance of Residual Effects

This subsection describes anticipated residual adverse effects (i.e., effects anticipated to occur subsequent to the application of mitigation measures) as they relate to the Infrastructure and Services VC and associated subcomponents including:

- ▶ Housing and Accommodation;
- ▶ Community Infrastructure and Services; and
- ▶ Transportation.

The subsection discusses the Likelihood of residual effects, determines the level of anticipated Significance and the Level of Confidence associated with the determination of Significance. The assessment is based on consideration of identified residual effect characteristics and socio-economic context for the Infrastructure and Services VC in informing the assessment of other VCs listed in **1. Introduction**.

As discussed in **5.2 Potential Project-related Effects**, the duration of the Construction Phase is Short-term in nature and using a conservative estimate of 30% of the construction workforce will be made of current residents of the LSA/RSA and the remaining workforce of up to 110 people will be housed in short-term accommodations in Smithers and Houston. There is potential for some construction workers, not wanting to stay in Project-provided accommodation, to seek alternative accommodation; however, this is not expected to be a substantial number of people. Spin-off employment within the RSA/LSA is expected to be primarily filled by local residents, therefore, resulting in no change in the cost or availability of housing and accommodations. As such, the potential adverse effect on the Housing and Accommodation subcomponent associated with an increase in the cost or decrease in availability of housing and accommodations during the Construction Phase is expected to be Negligible and fully mitigated and, therefore, is not carried forward in assessment of residual effects. An increase in the cost or decrease in availability of housing and accommodations during the Operation Phase is carried forward in the assessment of residual effects.

The in-migration of the Project workforce during both the Construction and Operation phases could potentially increase demand for Community Infrastructure and Services. However, with the exception of an increased demand to child care services during the Operation Phase, no adverse effects on the Community Infrastructure and Services subcomponent are anticipated during the Construction, and Operation phases.

Construction, and Decommissioning and Reclamation phases, together with any in-migration of a Project workforce, has the potential to increase the number vehicles on the road, leading to increased traffic delays and road wear and, overall, a decrease in the level of service.

In summary, the following residual effects assessment focuses on potential residual adverse effects on the:

- ▶ Housing and Accommodation subcomponent during the Operation Phase;
- ▶ Community Infrastructure and Services subcomponent during the Operation Phase (increased demand for child care services only); and
- ▶ Transportation subcomponent during the Construction and Decommissioning and Reclamation phases.

5.4.1 Description of Evaluation Criteria

5.4.1.1 Residual Effects Characteristics

Residual effects on the Infrastructure and Services VC subcomponents have been characterised in terms of Magnitude, Geographical Extent, Frequency, Duration, Reversibility, and Context. Definitions and ratings for each residual effect characteristic are provided in **Table 5.4-1**. Only adverse effects are characterised.

Table 5.4-1: Effect Characteristics Considered when Determining the Significance of Residual Effects on Infrastructure and Services Valued Component (VC)

Residual Effect Characteristic	Definition	Rating
Magnitude	Size or severity of the residual effect – measured in terms of the proportion of the VC affected within the LSA	Low – There is a minimal or no change in the cost of housing and accommodations, the use of community infrastructure and services or the use transportation infrastructure within the LSA. Moderate – There is a measurable change in the cost of housing and accommodations, the use of community infrastructure and services or the use transportation infrastructure that can be absorbed by existing housing or rental accommodations, community services capacity or the transportation system within the LSA. High – There is a measurable change in the cost of housing and accommodations, the use of community infrastructure and services or the use transportation infrastructure that requires improvements to existing housing or rental accommodations, community services capacity or the transportation system within the LSA in order to avoid overwhelming local infrastructure and services.
Geographic Extent	Spatial scale over which the residual effect is expected to occur.	Local – The effect is limited to a portion of the LSA or the LSA. Regional – The effect is limited to portion of RSA or all of the RSA. Beyond Regional – The effect is beyond RSA.
Duration	Length of time over which the residual effect is expected to persist before returning to existing conditions or the effect can no longer be measured.	Short-term – The effect is restricted to a period of up to two (2) years or less. Medium-term – The effect extends over a period of two (2) and 25 years. Long-term – The effect extends throughout the Project lifetime or permanently.
Frequency	How often the residual effect is expected to occur.	Infrequent – The effect is not likely to occur or to occur only sporadically. Frequent – The effect is likely to occur on a regular but not continuous basis. Continuous: The effect occurs continuously.
Reversibility	Whether or not the residual effect can be reversed once the activity causing the residual effect ceases.	Fully reversible – Measurable parameters of the effect fully return to existing conditions after decommissioning and reclamation.

Residual Effect Characteristic	Definition	Rating
		Partially reversible – Measurable parameters of the effect partially return to existing conditions after the Decommissioning and Reclamation Phase. Irreversible – Measurable parameters of the effect fully remain after decommissioning and reclamation and are considered permanent.
Context	The extent to which the Infrastructure and Services VC has been affected by past and present environmental and socio-economic processes and conditions, its potential sensitivity to the Project-related residual effect, and its ability to recover from that effect (i.e., resilience)	High sensitivity – The existing housing and accommodation, community infrastructure and services, and transportation are under existing pressure and do not have the capacity to absorb an increased demand or use. Moderate sensitivity – The existing infrastructure and services are adequate and can absorb some additional demand for services or infrastructure Low sensitivity – The existing housing and accommodation, community infrastructure and services, and transportation are not at capacity and there is scope to absorb a higher demand or use.

Notes: LSA=Local Study Area; Project=Tenas Project; RSA=Regional Study Area, VC=Valued Component

5.4.1.2 Likelihood

Likelihood is the probability that the predicted residual effect will occur including consideration of the likelihood that the mitigation will be successful. Likelihood is defined as:

- ▶ **Likely:** Moderate-to-High probability of an effect; or
- ▶ **Unlikely:** Low probability of an effect.

5.4.1.3 Significance Determination

For the purpose of this effects assessment, each residual effect is rated as **Not Significant**, or **Significant**, according to the following definitions:

- ▶ **Significant** – Residual effects are Significant if they are characterised as having High Magnitude and Long-term Duration, with Frequent or Continuous Frequency, with a High or Medium Context, and/or being Irreversible. The Geographic Extent is also considered in this determination, noting that for Significant residual effects are carried forward to the CEA; or
- ▶ **Not Significant** – Residual effects are Not Significant when any condition of Significant described above is not met. Not Significant residual effects are still carried forward to the CEA.

In addition, Levels of Confidence in the assessment include the following ratings: Low, Moderate, and High. Confidence, which can also be understood as the level of uncertainty/risk associated with the residual effects assessment (including Significance determination), is a measure of how well residual effects are understood and the quality of the input data. The reliability of data inputs and analytical methods used to predict Project effects, confidence regarding the effectiveness of mitigation measures and certainty of the predicted outcome are all considered. Level of Confidence allows the decision-maker to evaluate risk

associated with the residual effects of the Project. In the determination of confidence, the following is considered:

- ▶ **Low Confidence:** Cause-effect relationships between the Project and Infrastructure and Services VC are poorly understood. There may be a number of unknown external variables and/or data for the Project is incomplete. The effectiveness of the mitigation measures may not yet be proven. Modelling results may vary considerably given the data inputs. There is a high degree of uncertainty in the conclusions of the assessment;
- ▶ **Moderate Confidence:** The cause-effect relationships between the Project and Infrastructure and Services VC are not fully understood (e.g., there are a number of unknown external variables or data for the Project are incomplete). The effectiveness of mitigation measures may be moderate or high. Modelling predictions are relatively confident. Based on the above, there is a Moderate Level of Confidence in the assessment conclusions; or
- ▶ **High Confidence:** There is a good understanding of the cause-effect relationship between the Project and Infrastructure and Services VC, and all necessary data are available to support the assessment. The effectiveness of the selected mitigation measures is moderate to high. There is a low degree of uncertainty associated with data inputs and/or modelling techniques, and variation from the predicted effect is expected to be low. Given the above, there is High Level of Confidence in the conclusions of the assessment.

Based on these criteria, it was determined that an additional risk analysis was not required.

Characterisation of residual effects is based on the reviewed publicly available information on existing trends and conditions in **4.2 Description of Existing Conditions**, assessment of Project effects in **5.2 Potential Project-related Effects**, scientific information, and professional expertise obtained while conducting similar assessments.

5.4.2 Housing and Accommodation Subcomponent

5.4.2.1 *Increase in Cost or Decrease in Availability of Housing and Accommodations*

5.4.2.1.1 *Residual Effect Characteristics*

During the Operation Phase, based on a conservative estimate of 60% locally-sourced operations workforce, an estimated 102 workers will be sourced locally from LSA communities and surrounding area in Electoral Areas RDBN A and RDBN G, while an estimated 68 workers will in-migrate to the LSA, approximately 80 % with families (a rate similar to population movements in previous census data), resulting in 197 additional residents to the LSA, requiring up to 68 residential units. The spin-off employment, primarily in the retail, transportation and services sectors and the wages typically offered in those sectors are unlikely to be sufficient inducement to migration into the RSA/LSA when an existing labour pool is present in the LSA. Housing and accommodation in the LSA are under existing pressure, which housing shortages and escalating costs reported in Telkwa, Houston, and Smithers. There is, therefore, a residual effect on the Housing and Accommodation subcomponent associated with a change in the cost or availability of housing and accommodations during the Operation Phase.

A residual effect of an increase in cost or decrease in availability of housing and accommodations is expected during the Operation Phase as proposed mitigation measures will not be able to fully mitigate the predicted effect. **Table 5.4-2** provides characterisation of the residual effect and the rationale for each rating according to definitions in **Table 5.4-1**.

Table 5.4-2: Summary of Effect Characteristics Ratings for an Increase in Cost or Decrease in Availability of Housing and Accommodations (Operation Phase)

Residual Effects Characteristic	Rating	Rationale for Rating
Magnitude	Moderate	After the implementation of mitigation measures, the Project may result in up to 197 additional residents to the LSA, requiring up to 68 residential units. The number of residential units required may be higher than those available in the LSA and could lead to an increase in cost of housing and a decrease in availability.
Geographic Extent	LSA	Housing and accommodation pressure will be experienced in the LSA as employees seek accommodation within reasonable commuting distance from the Minesite.
Duration	Short-term	The effect is predicted to occur primarily during the first few years of the Operation Phase as the workforce is hired and begins work at the Minesite. The private sector is expected to respond to the increase in housing demand over time by providing new housing developments, as determined by the market
Frequency	Continuous	The pressure on, and increased costs of accommodation and housing will be continuous; however, it is likely that supply will adjust to meet demand and the pressure eases.
Reversibility	Fully Reversible	Once the Project no longer contributes to the demand for housing and accommodation, conditions are expected to recover to pre-Project conditions.
Context	High	There are existing pressures on accommodation and housing in the LSA, with current supply not keeping up with the demand, and increasing costs associated with this VC.

Notes: LSA=Local Study Area; Project=Tenas Project; VC=Valued Component

5.4.2.1.2 Likelihood

It is Likely that this residual effect will occur despite the implemented mitigation measures. The Project intends to hire a local workforce as far as possible; however, based on the skills required to fill all positions, and the skills available among current workforce in the LSA, there will still be a need for an outside workforce. While the workforce is moderate in size, an estimated 197 residents, requiring up to 68 housing units, may in-migrate to the LSA during the Operation Phase.

5.4.2.1.3 Significance Determination

The Project is expected to result in an in-migration of workforce during the Operation Phase that will be Moderate in Magnitude given the size of the Project workforce, compared to the availability of long-term accommodation in the LSA. Currently, there are approximately 33 homes for sale in Smithers, and 13 in Houston and no rentals (The Canadian Real Estate Association 2021), which would not be sufficient to meet the needs of the Project workforce, resulting in increased housing costs, and decreased availability. The effect will be felt in the LSA, and will be Continuous in the Short-term, predicted to occur primarily

during the first few years of the Operation Phase as the workforce is hired and begins work at the Minesite. The private sector is likely to respond to the increase in housing demand with new housing developments provided. The effect is considered Fully Reversible, as the housing market will even out when the supply is sufficient to the demand. Given current housing shortages; however, the sensitivity for the Housing and Accommodation subcomponent is considered High.

The residual effect of an increase in cost or decrease in availability of housing and accommodations is rated as **Not Significant**. Baseline data and interviews indicate that housing shortages, together with escalating rental and housing costs already exist in the LSA. The Project will increase the demand for housing by up to 68 units, affecting supply and the cost of housing in the LSA although Moderate in Magnitude and Short-term in Duration. The Level of Confidence in this rating is Moderate; while changes in the population are based on the availability of existing conditions, data, modelling, population projections, as well as the conservative approach taken in assessment of effects, the timeframe and extent to which the private sector reacts to the increased demand for housing is not certain.

In the long-term, however, it is expected that increased tax revenue associated with the Project and higher incomes will work to mitigate the potential adverse effect. In addition, with respect to housing development, the private sector is expected to respond to the increase in housing demand over time by providing new housing developments, as determined by the market.

5.4.3 Community Services and Infrastructure Subcomponent

5.4.3.1 Increased Demand for Child Care Services

5.4.3.2 Residual Effect Characteristics

The in-migration of a Project workforce will increase the demand for child care within the LSA. Increased demand for child care has the potential to decrease community members' access to child care services, depending on the current and predicted future capacity of child care services to absorb increased demand. Access to child care services can be measured by the ratio of child care-aged children to child care spaces. Child care services in the LSA are currently over-subscribed, and many have waiting lists. Further, it is reportedly challenge to secure suitability qualified staff for child care as the compensation is poor.

A residual effect is expected because the proposed mitigation measures will not be able to fully mitigate the predicted effect during the Operation Phase. **Table 5.4-4** provides characterisation of the residual effect and the rationale for each rating according to definitions in **Table 5.4-1**.

Table 5.4-3: Summary of Effect Characteristics Ratings for an Increased Demand for Child Care Services (Operation Phase)

Residual Effects Characteristic	Rating	Rationale for Rating
Magnitude	Moderate	After the implementation of mitigation measures, the Project may result in up to 197 additional residents to the LSA. Based on current population trends in BC, 30 of those residents may be under the age of 15 and require child care.
Geographic Extent	LSA	Increased demand for child care will be experienced in the LSA as employees seek accommodation within reasonable commuting distance from the Minesite.
Duration	Long-term	The effect is predicted to occur primarily during the first few years of the Operation Phase. LSA communities

Residual Effects Characteristic	Rating	Rationale for Rating
		are aware of child care shortage and are actively seeking to address the problem. Consequently, the effect may be addressed as the Project continues.
Frequency	Continuous	Increased demand for child care will be continuous; however, if the issue is addressed the pressure will ease.
Reversibility	Fully Reversible	Once the Project no longer contributes to the demand for child care, conditions are expected to recover to pre-Project conditions.
Context	High	There are existing pressures on child care facilities, which are operating at or over capacity with long waiting lists.

Notes: BC=British Columbia; LSA=Local Study Area; Project=Tenas Project; RSA=Regional Study Area; VC=Valued Component

5.4.3.2.1 Likelihood

It is Likely that this residual effect will occur despite the implemented mitigation measures. The Project intends to hire a local workforce as far as possible; however, based on the skills required to fill all positions, and the skills available among current workforce in the LSA, there will still be a need for an outside workforce. While the workforce is moderate in size, an estimated 197 residents, up to 30 children may require child care at any time during the Operation Phase.

5.4.3.2.2 Significance Determination

The residual effect of an increased demand on child care services during the Operation Phase is rated as **Not Significant**. The change is predicted to be Moderate in Magnitude because Project may result in up to 197 additional residents to the LSA and based on current population trends in BC, 30 of those residents may be under the age of 15 and require child care. Although the potential number of child care spaces required by workforce families is small, child care services are already over-subscribed in the LSA. The effect will be felt in the LSA and will be Continuous during the first few years of the Operation Phase as the workforce is hired and begins work at the Minesite, but more child care spaces may become available as the communities in the LSA seek to address the problem. The effect is considered Fully Reversible, and conditions will even out when the supply is sufficient to the demand. Given current high demand for child care; however, the sensitivity is considered High.

The Level of Confidence in this rating is Moderate; while changes in the population are based on the availability of existing conditions, data, modelling, population projections, as well as the conservative approach taken in assessment of effects, the number of families that come to the area and require child care is not known for certain.

In the long-term, however, it is expected that increased tax revenue associated with the Project and higher incomes will work to mitigate the potential adverse effect.

5.4.4 Transportation Subcomponent

5.4.4.1 Change in the Use of Roads and Related Increase in Traffic

5.4.4.2 Residual Effect Characteristics

Access to the Minesite will be gained from Telkwa through a portion of an existing FSR through the Goathorn Creek Valley and a new 11 km dedicated Bypass Road, from Lawson Road. During the construction of the dedicated Bypass Road, the existing Telkwa Coalmine Road (a public road under the jurisdiction of BC MOTI) and the existing FSR will be used for access. To reduce traffic on the Telkwa Coalmine Road and dedicated Bypass Road, employees will be bussed to the Minesite from Telkwa, as is the practice at other mine operations in the province. An employee parking lot, where employees will park and then take a bus to the Minesite will be located in Telkwa. Additional road transportation will be provided from Smithers and Houston to the Minesite, to reduce traffic effects on Highway 16.

During the Construction Phase, and part of the Decommissioning and Reclamation Phase, there is predicted to be an adverse effect on the Transportation subcomponent associated with a change in the use of roads and related increases in traffic as construction vehicles, pre-fabricated modules, heavy equipment, and fuel are moved either to or from the Minesite.

A residual effect on the Transportation subcomponent is expected because it is not known whether proposed mitigation measures will not be able to fully mitigate the predicted effect during the Construction, and Decommissioning and Reclamation phases. **Table 5.4-4** provides characterisation of the residual effect and the rationale for each rating according to definitions in **Table 5.4 1**.

Table 5.4-4: Summary of Effect Characteristics Ratings for Change in Use of Roads and Related Increase in Traffic (Construction, Decommissioning and Reclamation Phases)

Residual Effects Characteristic	Rating	Rationale for Rating
Magnitude	Low	The Project is relatively small compared to other Projects of this nature. After the implementation of mitigation measures, however, the Project will result in the movement of abnormal loads, additional truck traffic, and heavy equipment.
Geographic Extent	LSA	Transportation effects will be experienced largely in the LSA, with some effects being felt in the RSA.
Duration	Short-term	The effect will be felt during the Construction, and Decommissioning and Reclamation phases.
Frequency	Frequent	The effects on the Transportation subcomponent will be experienced frequently throughout the Construction, and Decommissioning and Reclamation phases.
Reversibility	Fully Reversible	Once the Project no longer exists, transportation and traffic conditions are expected to recover to pre-Project conditions.
Context	Low	Transportation infrastructure are not at capacity and there is capacity to absorb a higher demand or use.

Notes: LSA=Local Study Area; Project=Tenas Project; RSA=Regional Study Area

5.4.4.2.1 *Likelihood*

It is Likely that a change in road use and traffic will occur as a result of Project and that this residual effect will occur despite the implemented mitigation measures.

5.4.4.2.2 *Significance Determination*

The effect of change in the use of roads and related traffic is expected to be Short-term, limited to the duration of the Construction and Decommissioning and Reclamation phases, Low in Magnitude and primarily experienced in the LSA. The effect will be frequent during these phases but is considered reversible and when the Project no longer exists, the effect will decrease, and the subcomponent will recover. Based on the above, the residual effect of change for the Transportation subcomponent is rated as **Not Significant**. Level of Confidence is Low, because the exact number of vehicle movements, abnormal loads and timing of deliveries is not known at this stage. During Construction and Decommissioning and Reclamation phases, the movement of equipment, materials and abnormal loads may cause changes in use of roads and related increases in traffic.

5.5 Summary of Project-related Residual Adverse Effects and Significance

Project-related residual adverse effects for the Infrastructure and Services VC are summarized in **Table 5.5-1**, including Significance and Level of Confidence ratings. Residual effects on the Housing and Accommodation, Community Infrastructure and Services, and Transportation subcomponents are rated as **Not Significant**. Based on the determination of **Not Significant** for all residual effects listed in **Table 5.5-1**, it is concluded that there is no potential for a significant residual effect(s) on Infrastructure and Services. All residual effects are carried forward to the CEA.

Table 5.5-1: Summary of Residual Adverse Effects for Infrastructure and Services Valued Component (VC)

Residual Adverse Effects	Contributing Activities within the Project Phases (C,O,D,P)	Proposed Mitigation Measures	Subcomponent	Residual Effects Characterisation								
				Magnitude	Geographic Extent	Duration	Frequency	Reversibility	Context	Likelihood	Significance	Level of Confidence
Increase in Cost or Decrease in Availability of Housing and Accommodations	Employment and Labour (O)	- Procurement Program (SEMP) - Housing and Accommodation Program (SEMP) - Education and training support (SEMP) - Community Engagement Programs (SEMP)	Housing and Accommodations	M	LSA	ST	CF	FR	H	L	NS	M
Increased Demand for Community Infrastructure and Services (increased demand for child care services)	Employment and Labour (O)	- Procurement Program (SEMP) - Education and training support (SEMP) - Child Care Program (SEMP) - Community Engagement Programs (SEMP)	Community Infrastructure and Services	M	LSA	LT	CF	FR	H	L	NS	M
Change in the Use of Roads and Related Increased in Traffic	Transportation of equipment, materials, and personnel (C, D)	- Minimize Project footprint and Project Area - Transport measures - Traffic Management - Land use agreements - Community Engagement Programs (SEMP)	Transportation	L	LSA	ST	FF	FR	H	L	NS	L

Notes: C, O, D, P represent Project Phases: (C)onstruction, (O)peration, (D)ecommissioning and Reclamation, (P)ost-closure

SEMP=Socio-economic Management Plan (S13.0-C16)

Magnitude: Low (L), Moderate (M), High (H)

Geographic Extent: Local (LSA), Regional (RSA), Beyond Regional (Beyond RSA)

Duration: Short-term (ST), Medium-term (MT), Long-term (LT)

Frequency: Infrequent (IF), Frequent (FF), Continuous (CF)

Reversibility: Fully reversible (FR), Partially reversible (PR), Irreversible (IR)

Context: Low (L), Moderate (M), High (H)

Likelihood: Unlikely (UL), Likely (L)

Significance: Not-Significant (NS), Significant (S)

Level of Confidence: High (H), Moderate (M), or Low (L)

See **Table 5.1-2** for list of applicable activities for each listed Project phase, unless otherwise noted in this table.

6. CUMULATIVE EFFECTS ASSESSMENT (CEA)

This subsection presents potential contributions to cumulative effects of the Project as they relate to the Infrastructure and Services VC. All past and present Project-related effects have been addressed as part of the assessment of existing conditions in 5.4. Potential cumulative effects of the Project in relation to reasonably foreseeable future projects and activities will now be considered. Consideration of cumulative effects is made for all residual adverse effects, whether or not they are **Significant** or **Not Significant**. The following criteria must be met:

- ▶ There must be an effect of the Project;
- ▶ That effect is demonstrated to act cumulatively with the effects from other projects or activities;
- ▶ It must be known that the other projects or activities have been or will be carried out and are not hypothetical; and
- ▶ The cumulative effect must be likely to occur. If no cumulative interaction is considered likely, no further analysis is completed.

A rationale is provided if a project or activity is not analyzed further than the initial consideration of each project.

A Project and Activity Inclusion List is provided in the **S3.0 Assessment Methodology** of the **EAC Application** and identifies past, present and reasonably foreseeable future projects in the LSA and RSA that could have residual effects overlapping with the Project's residual effect on the Infrastructure and Services VC. The potential cumulative effects, in consideration of Project's residual effects in **5.4 Residual Effects and Significance of Residual Effects** include:

- ▶ increase in cost or decreased availability of housing and accommodations during the Operation Phase;
- ▶ increased demand for child care services during the Operation Phase; and
- ▶ change in the use of roads and related increased in traffic during Construction, and Reclamation and Decommissioning phases.

The spatial boundaries of the CEA for the Infrastructure and Services VC include the LSA (defined to include Village of Telkwa, Town of Smithers, District of Houston, and Witset); and the RSA (defined to encompass the RDBN and Witset).

Temporal boundaries within which cumulative effects will be considered are defined as those overlapping with the Construction, Operation, and Decommissioning and Reclamation phases of the Project as provided in **3.2.4.2**.

The approach used in determining cumulative effects is as follows:

- ▶ Consider all residual Project effects (**Table 5.5-11**);
- ▶ Assess type of project/activity and location of project/activity of identified future/reasonably foreseeable future projects overlaid with the LSA and RSA;
- ▶ Use assumptions of spatial and temporal boundaries based on project/activity category;
- ▶ Determine which projects/activities will have an interaction with the residual effects of the Project, based on set criteria;

- ▶ Proceed with CEA appropriate in resolution to the detail known of the residual effects of reasonably foreseeable future projects/activities;
- ▶ Characterise cumulative effects;
- ▶ Determine if additional mitigation measures are feasible to address cumulative effects (in addition to mitigation measures identified for Project-related effects in **5.3 Mitigation Measures**); and
- ▶ Determine significance as defined in and as carried out for residual Project effects assessment in **5.4 Residual Effects and Significance of Residual Effects**.

6.1 Cumulative Effects Assessment (CEA) for the Infrastructure and Services Valued Component (VC)

6.1.1 Potential Cumulative Effects

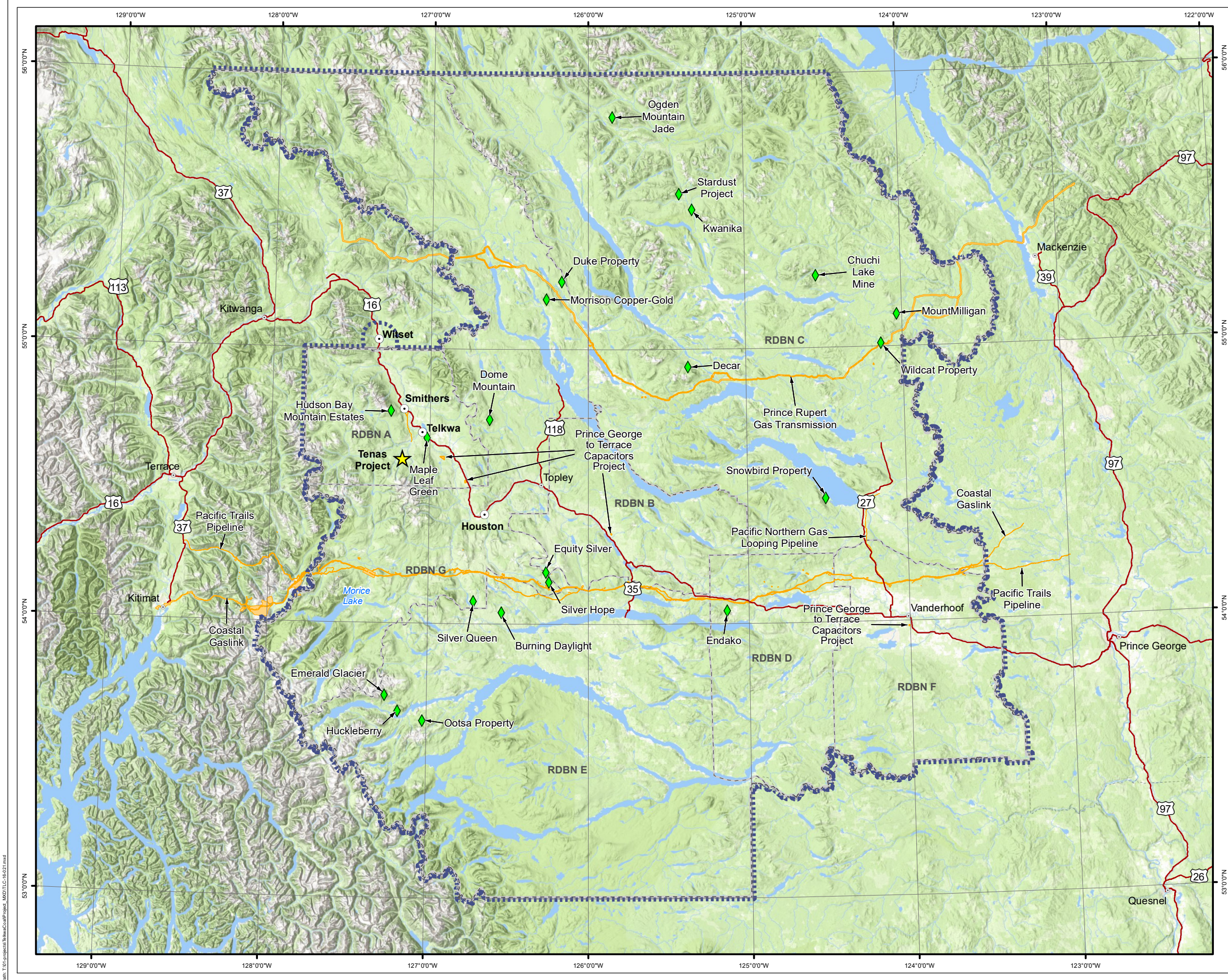
Table 6.1-1 provides a list of projects included in the cumulative assessment based on their potential to interact with the Infrastructure and Services VC, as well as the spatial and temporal (past, present, reasonably foreseeable future) context of those projects and activities, while **Figure 6.1-1** depicts their locations with the RSA.

There is a Likelihood for cumulative effects to occur in the RSA or LSA given the spatial and temporal boundaries of these projects and activities. **Table 6.1-1** lists projects included in the CEA of the Infrastructure and Services VC based on their potential spatial and temporal interaction with the Project.

Table 6.1-1: Projects Included in the Cumulative Assessment of Infrastructure and Services Valued Component (VC) Based on Spatial and Temporal Interaction

Type	Project/Activity Name	Interacts with Project-related Effects on the Valued Component (VC) as a Past, Present or Future Project/Activity	
		Past and Present	Future
Commercial	Maple Leaf Cannabis production facility	Yes	No
Community	Hudson Bay Mountain Estates	Yes	Yes
Community	Smithers, Houston, Telkwa, Witset, Hudson's Bay Estates, and any miscellaneous developments	Yes	Yes
Mining	Burning Daylight Quarry	Yes	Yes
Exploration	Chuchi Lake Mine	Yes	Yes
Mining	Decar	Yes	Yes
Mining	Dome Mountain	Yes	Yes
Exploration	Duke Property	Yes	Yes
Mining	Emerald Glacier	Yes	No
Mining	Endako	Yes	No
Mining	Equity Silver	Yes	No
Mining	Huckleberry	Yes	Yes
Exploration	Kwanika	Yes	Yes
Mining	Morrison Copper/Gold	Yes	Yes
Mining	Mount Milligan	Yes	Yes

Type	Project/Activity Name	Interacts with Project-related Effects on the Valued Component (VC) as a Past, Present or Future Project/Activity	
		Past and Present	Future
Mining	Ogden Mountain Jade	Yes	No
Exploration	Ootsa Property	Yes	Yes
Exploration	Silver Hope	Yes	Yes
Exploration	Silver Queen Property	Yes	Yes
Exploration	Snowbird Property	Yes	Yes
Exploration	Stardust Project	Yes	Yes
Exploration	Wildcat Property	Yes	Yes
Recreation	Telkwa to Smithers Bike Trail	No	Yes
Utilities	Coastal Gaslink	Yes	Yes
Utilities	Pacific Northern Gas Looping Pipeline	No	Yes
Utilities	Pacific Trails Pipeline	No	Yes
Utilities	Prince George to Terrace Capacitors Project	No	Yes
Utilities	Prince Rupert Gas Transmission	No	Yes



Tenas Project

Projects and Activities Included in the Cumulative Effects Assessment for Infrastructure and Services Local and Regional Areas

Legend

- ★ Tenas Project
- Economic Development Local Study Area Community
- ▤ Economic Development Regional Study Area
- ▭ Regional District of Bulkley-Nechako (RDBN)
- ▭ Electoral Areas
- ◆ Project
- ▬ Oil and Gas Feature

Notes

1. All mapped features are approximate and should be used for discussion purposes only.
2. This map is not intended to be a "stand-alone" document, but a visual aid of the information contained within the referenced Report. It is intended to be used in conjunction with the scope of services and limitations described therein.

Sources

- Project Area: Allegiance Coal, 2020
- Basedata: Government of British Columbia
- Basemap: World Topo Base

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The following provides a brief overview of the project and activities identified for inclusion in the CEA for the Infrastructure and Services VC. The activity of past projects is accounted for in assessment of existing conditions in **5.4 Assessment of Effects**. Projects that at have been completed fully or do not have a foreseeable likelihood of future activities have been excluded from the overview of projects below.

- ▶ Burning Daylight Quarry (Mining): Located within the RDBN, the quarry is currently operating. Ongoing future operations may contribute incrementally to population change within the RSA resulting in an increase in cost or decreased availability of housing and accommodations, increased demand for child care, and change in the use of roads and related increased in traffic;
- ▶ Chuchi Lake Mine (Mining): Located in Electoral Area C of the RDBN, south of Klawdetelle Creek. The mine is approximately 6 km north of Chuchi Lake and 90 km north of the community of Fort St. James. Exploration drilling occurred in 2019. Further exploration or development may contribute to population change within the RSA resulting in increase in cost or decreased availability of housing and accommodations, increased demand for child care, and change in the use of roads and related increased in traffic;
- ▶ Coastal Gaslink (Utilities): Traversing Electoral Area G of the RDBN, construction of the pipeline is currently underway. Development and maintenance are likely to contribute to population change within the RSA/LSA resulting in increase in cost or decreased availability of housing, increased demand for child care, and change in the use of roads and related increased in traffic;
- ▶ Decar (Mining): Located within the Electoral Area C of the RDBN, rock testing was conducted in 2019. Further exploration or development may contribute to population change within the RSA resulting in increase in cost or decreased availability of housing and accommodations, increased demand for child care, and change in the use of roads and related increased in traffic;
- ▶ Dome Mountain (Mining): Located within the Electoral Area G of the RDBN, approximately 38 km east of the town of Smithers. A past producing mine, additional infrastructure was completed 2010-2012. Further development may contribute to population change within the RSA resulting in increase in cost or decreased availability of housing, increased demand for child care, and change in the use of roads and related increased in traffic;
- ▶ Duke Property (Exploration): Duke Property is an important porphyry copper-molybdenum-silver-gold deposit located 80 km northeast of Smithers (RDBN), with exploration in 2017 and 2018, and may contribute to population change within the RSA resulting in increase in cost or decreased availability of housing and accommodations, increased demand for child care, and change in the use of roads and related increased in traffic;
- ▶ Emerald Glacier (Mining): Located inside Electoral Area E of the RDBN, near the border with Area G, adjacent to the previously operating Huckleberry and Ootsa mines. The last exploration drilling was constructed in 2012. Further development may contribute to population change within the RSA resulting in increase in cost or decreased availability of housing and accommodations, increased demand for child care, and change in the use of roads and related increased in traffic;
- ▶ Endako (Mining): Located near Fraser Lake, within the RDBN, the mine has been in care and maintenance (C&M) since 2015. Further future operations may contribute to population change within the RSA resulting in increase in cost or decreased availability of housing and accommodations, increased demand for child care, and change in the use of roads and related increased in traffic;
- ▶ Equity Silver (Mining): A silver, copper and gold mine, Equity Silver is located in the RDBN, and is currently under care and maintenance. Further operations may contribute to population change within the RSA resulting in increase in cost or decreased availability of housing and

accommodations, increased demand for child care, and change in the use of roads and related increased in traffic;

- ▶ Hudson Bay Mountain Estates (Community): Located within Electoral Area A of the RDBN, the resort development includes the addition of a chairlift, 10 runs and a 148 lot residential component to Hudson Bay Mountain. The Area Master Plan has received approval, with 35 lots released in phase 1. Further development and operations is likely to contribute to population change within the RSA/LSA, and while it may relieve housing pressures, the project may increase demand for child care, and change in the use of roads and related increased in traffic;
- ▶ Huckleberry (Mining): A previously operating mine located inside Electoral Area E of the RDBN. The project is currently in C&M. Exploration drilling occurred in 2020. Further exploration and development may contribute to population change within the RSA/LSA resulting in increase in cost or decreased availability of housing and accommodations, change in the use of roads and related increased in traffic and increased demand for child care services;
- ▶ Kenney Dam Cold Water Release Facility (Utilities): Located within the RDBN, the project aims to protect salmon on the Nechako River through either a cold water release facility (Kenney Dam) or other environmental enhancements. Ongoing studies and consultations are in progress. Future construction and operations may contribute to population change within the RSA resulting in increase in cost or decreased availability of housing and accommodations, increased demand for child care services and change in the use of roads and related increased in traffic;
- ▶ Kwanika (Mining): Located within Electoral Area C of the RDBN, the last exploration drilling occurred in September 2020, together with an agreement with Takla Nation. Further development and operations is likely to contribute to population change within the RSA resulting in increase in cost or decreased availability of housing and accommodations, increased demand for child care, and change in the use of roads and related increased in traffic;
- ▶ Maple Leaf Cannabis production facility (Commercial): Located near the Village of Telkwa, Maple Leaf has leased 37+ acres of land with the option to purchase from Woodmere Nurseries Ltd. The company is currently constructing a 27,200 square foot cannabis production facility. Further development and operations is likely to contribute incrementally to population change within the RSA/LSA resulting in an increase in cost or decreased availability of housing and accommodations, increased demand for child care, and change in the use of roads and related increased in traffic;
- ▶ Morrison Copper/Gold (Mining): Located within Electoral Area G of the RDBN, the project was refused certification by the BC EAO in 2012. A supplemental AIR was submitted in 2019. Further development and operations may contribute to population change within the RSA/LSA resulting in an increase in cost or decreased availability of housing and accommodations, increased demand for child care, and change in the use of roads and related increased in traffic;
- ▶ Mount Milligan (Mining): Located 155 km northwest of Prince George, between the communities of Fort St. James and Mackenzie, within RDBN, the mine has been in operation since 2013. Further development may contribute to population change within the RSA resulting in an increase in cost or decreased availability of housing and accommodations, increased demand for child care, and change in the use of roads and related increased in traffic;
- ▶ Ogden Mountain Jade (Mining): Located within Electoral Area C of the RDBN, jade has been mined from Ogden Mountain for over 30 years. Further development may contribute incrementally to population change within the RSA resulting in an increase in cost or decreased availability of housing and accommodations, increased demand for child care, and change in the use of roads and related increased in traffic;
- ▶ Ootsa Property (Mining): Located adjacent to the Huckleberry Mine and Mill Complex within the RDBN, the last exploration occurred in 2020. Further development may contribute incrementally to

population change within the RSA resulting in an increase in cost or decreased availability of housing and accommodations, increased demand for child care, and change in the use of roads and related increased in traffic;

- ▶ Pacific Northern Gas Looping Pipeline (Utilities): Traversing Electoral Area G of the RDBN, the proposed pipeline would loop an existing natural gas transmission pipeline between Summit Lake and Kitimat. Further development may contribute incrementally to population change within the RSA resulting in an increase in cost or decreased availability of housing and accommodations, increased demand for child care, and change in the use of roads and related increased in traffic;
- ▶ Pacific Trails Pipeline (Utilities): Traversing Electoral Area G of the RDBN, the proposed pipeline would construct a 463 km, 42-inch natural gas pipeline that will deliver natural gas from Summit Lake, BC. to the proposed Kitimat liquid natural gas (LNG) facility site at Bish Cove near Kitimat. Further development may contribute incrementally to population change within the RSA resulting in an increase in cost or decreased availability of housing and accommodations, increased demand for child care, and change in the use of roads and related increased in traffic;
- ▶ Prince George to Terrace Capacitors Project (Utilities): Located in Electoral Area A and G of the RDBN, the project includes constructing three (3) new capacitor stations to increase the capacity along a 450 km, 500 kilovolt (kV) transmission line that runs between Prince George and northwest BC. The projects includes one (1) station near Vanderhoof; one (1) station near Burns Lake; and one (1) near Telkwa. Construction of the project may contribute to population change in the RSA/LSA resulting in an increase in cost or decreased availability of housing and accommodations, increased demand for child care, and change in the use of roads and related increased in traffic;
- ▶ Prince Rupert Gas Transmission (Utilities): Traversing Electoral Area G of the RDBN, the proposed 900 km natural gas pipeline running from Hudson's Hope to Lelu Island near Prince Rupert support an LNG export facility. The project was granted a five (5)-year EAC extension in 2019. Construction of the project may contribute to population change in the RSA/LSA resulting in an increase in cost or decreased availability of housing and accommodations, increased demand for child care, and change in the use of roads and related increased in traffic;
- ▶ Silver Hope Property (Mining): Located in Electoral Area G and B of the RDBN, last exploration drilling occurred in 2020. Further development may contribute to population change within the RSA/LSA resulting in an increase in cost or decreased availability of housing and accommodations, increase demand for child care, and change in the use of roads and related increased in traffic;
- ▶ Silver Queen Property (Mining): Located in Electoral Area G of the RDBN, the property is located on the road to the Huckleberry mine at Owen Lake - 43 km south of Houston. Further development may contribute to population change within the RSA/LSA resulting in an increase in cost or decreased availability of housing and accommodations, increased demand for child care, and change in the use of roads and related increased in traffic;
- ▶ Snowbird Property (Mining): Located in Electoral Area C of the RDBN, near Fort St. James. Further development may contribute to population change within the RSA resulting in an increase in cost or decreased availability of housing and accommodations, increased demand for child care, and change in the use of roads and related increased in traffic;
- ▶ Stardust Project (Mining): Located in Electoral Area C of the RDBN, the last exploration drilling occurred in 2020. Further development may contribute to population change within the RSA resulting in an increase in cost or decreased availability of housing and accommodations, increased demand for child care, and change in the use of roads and related increased in traffic;
- ▶ Telkwa to Smithers Bike Trail (Recreation): Located in Electoral Area A of the RDBN, the trail will run off of Highway 16 along the right-of-way (ROW). At Smithers, it is planned to be along the west side of the highway. At about midway, it will cross the highway via a bridge and follow the east side

of the highway to Telkwa. Detailed construction plans were completed in 2020. Construction of the bike trail may contribute incrementally to population change in the RSA/LSA resulting in an increase in cost or decreased availability of housing and accommodations, increased demand for child care, and change in the use of roads and related increased in traffic; and

- ▶ Wildcat Property (Mining): Located in Electoral Area C of the RDBN, the last exploration drilling occurred in 2018. Further development may contribute to population change within the RSA resulting in an increase in cost or decreased availability of housing and accommodations, increased demand for child care, and change in the use of roads and related increased in traffic.

6.1.2 Additional Mitigation Measures

No additional mitigation measures are considered to mitigate potential adverse cumulative effects on the Infrastructure and Services VC during the Operation Phase of the Project. The Community Engagement Programs (refer to **SEMP**) will also be reviewed and adjusted frequently to reflect arising social issues and potential changes in stakeholder concerns and preferences. Additional information on these mitigation measures is available in **the SEMP**.

Furthermore, it is expected that other present and potential future projects and activities would have similar mitigation measures in place to cumulatively reduce or remove potential cumulative effects in the LSA and the RSA.

6.1.3 Cumulative Effects and Characterisation of Significance

The following describes the cumulative effects and the characterisation of residual effects of the Project in combination with those of other projects/activities for the Infrastructure and Services VC subcomponents.

6.1.3.1 Housing and Accommodation Subcomponent

6.1.3.1.1 Increase in Cost or Decrease in Availability of Housing and Accommodations

The projects described in **6.1.1** are expected to have a cumulative interaction with housing availability and cost. Project residual effects on housing availability and cost may overlap with the effects of any one of the future projects as an in-migration of workers (including indirect and induced) are likely to reside in the same RSA or LSA communities. Projects nearer to Telkwa, Houston and Smithers would have the greatest overlap particularly if the timelines for these projects are concurrent with the Project. Given the existing pressure on housing availability and cost, it is assumed other projects will apply similar mitigation measures to those for the Project, and some mining projects may have FIFO arrangements, which will serve to mitigate the adverse effect on housing availability.

The Project residual effects, when considered in the context of cumulative effects from all the other projects and activities occurring in the region, are Moderate in Magnitude. The Project will contribute to a small increase in population during the Operations Phase as a proportion of the Project's workforce and their families in-migrate into the LSA (25-40% amounting to less than 200 people) and will require housing. This expected Project-related increase is small relative to population projections, and it is expected that communities and private developers will respond to the increased demand for housing, making the effects on housing availability and cost less substantial in the long-term, as such the Context is considered Moderate. The effect has a Moderate Magnitude, Long-term Duration, the cumulative effect on the increase in cost or decreased availability of housing and accommodations is therefore predicted to be **Not Significant (Table 6.1-2)**.

Table 6.1-2: Summary of Cumulative Effects for the Housing and Accommodation Subcomponent

Subcomponent	Cumulative Effects	Contributing Activities within the Project Phases (C, O, D, P)	Cumulative Effects Characterisation								
			Magnitude	Geographic Extent	Duration	Frequency	Reversibility	Context	Likelihood	Significance	Level of Confidence
Housing and accommodations	Increase in cost or decrease in availability of housing and accommodations	Employment and Labour (O)	M	LSA	LT	CF	PR	M	L	S	M

Notes: C, O, D, P represent Project Phases: (C)onstruction, (O)peration, (D)ecommissioning and Reclamation, (P)ost-closure

Magnitude: Low (L), Moderate (M), High (H)

Geographic Extent: Local (LSA), Regional (RSA), Beyond Regional (Beyond RSA)

Duration: Short-term (ST), Medium-term (MT), Long-term (LT)

Frequency: Infrequent (IF), Frequent (FF), Continuous (CF)

Reversibility: Fully reversible (FR), Partially reversible (PR), Irreversible (IR)

Context (resilience): Low (L), Moderate (M), High (H)

Likelihood: Unlikely (UL), Likely (L)

Significance: Not-Significant (NS), Significant (S)

Level of Confidence: High (H), Moderate (M), Low (L)

See **Table 5.1-2** for list of applicable activities for each listed Project phase, unless otherwise noted in this table. Includes all existing and reasonably foreseeable projects as outlined in **Table 6.1-1**.

6.1.3.2 Community and Infrastructure Subcomponent

6.1.3.2.1 Increased in Demand for to Child Care Services

The projects described in **6.1.1** are expected to have a cumulative interaction with an increased demand for child care services. Project residual effects on access to child care may overlap with the effects of any one of the future projects as an in-migration of workers and their families (including indirect and induced) are likely to reside in the same RSA or LSA communities. Projects nearer Telkwa, Houston and Smithers would have the greatest overlap particularly if the timelines for these projects are concurrent with the Project. Currently, child care services are over-subscribed in the LSA, and many facilities have waiting lists. Further, the availability of certified staff is limited by poor compensation.

The Project residual effects, when considered in the context of cumulative effects from all the other projects and activities occurring in the region, are Moderate in Magnitude. The Project will contribute to a small increase in the demand for child care services during the Operations Phase as a proportion of the Project's workforce and their families in-migrate into the LSA (25-40% amounting to less than 200 people, resulting in an estimated 10 children under the age of 15 who may require child care services). Child care facilities in the LSA are currently over-subscribed. This is a common challenge across BC, and the BC Government has plans to address some of the challenges in this sector, such as subsidize wages for child care workers by \$4 per hour (Ark Playday Centre 2021). In the long term, therefore, the Context is considered Moderate. The effect has a Moderate Magnitude, Long-term Duration, the cumulative effect of an increased demand for child care services is therefore assessed to be **Not Significant** (**Table 6.1-3**).

Table 6.1-3: Summary of Cumulative Effects for the Community Services and Infrastructure Subcomponent

Subcomponent	Cumulative Effects	Contributing Activities within the Project Phases (C, O, D, P)	Cumulative Effects Characterisation								
			Magnitude	Geographic Extent	Duration	Frequency	Reversibility	Context	Likelihood	Significance	Level of Confidence
Community Services and Infrastructure	Increased demand for child care services	Employment and Labour (O)	M	LSA	LT	CF	PR	M	L	S	M

Notes: C, O, D, P represent Project Phases: (C)onstruction, (O)peration, (D)ecommissioning and Reclamation, (P)ost-closure

Magnitude: Low (L), Moderate (M), High (H)

Geographic Extent: Local (LSA), Regional (RSA), Beyond Regional (Beyond RSA)

Duration: Short-term (ST), Medium-term (MT), Long-term (LT)

Frequency: Infrequent (IF), Frequent (FF), Continuous (CF)

Reversibility: Fully reversible (FR), Partially reversible (PR), Irreversible (IR)

Context (resilience): Low (L), Moderate (M), High (H)

Likelihood: Unlikely (UL), Likely (L)

Significance: Not-Significant (NS), Significant (S)

Level of Confidence: High (H), Moderate (M), Low (L)

See **Table 5.1-2** for list of applicable activities for each listed Project phase, unless otherwise noted in this table. Includes all existing and reasonably foreseeable projects as outlined in **Table 6.1-1**.

6.1.3.3 Transportation Subcomponent

6.1.3.3.1 Change in Use of Roads and Related Increases in Traffic

Future projects have been identified in **6.1.1** as having an interaction with traffic patterns and pressure on transportation infrastructure. Project residual effects may overlap with the effects of these projects as some of the same transportation infrastructure is likely to be used, particularly Highway 16 as it functions as the main connection between towns in the RSA and LSA. Projects that require rail transport have only one (1) main rail option and will, therefore, increase demands on CNR's network.

Currently, much of the transportation infrastructure in the RSA and LSA is operating below capacity and at a high level of service and is expected to be able to handle growth in demand for a number of years to come. Upgrades at key locations may be required over time, and the increase in tax base from the increased population will help with funding. It is expected that other projects will apply similar mitigation measures to those for the Project. The residual Project effects, when considered in the context of cumulative effects from all the projects and activities in the region, are of relatively Low Magnitude and occur in a High sensitivity environment. Therefore, the cumulative effects of a change in use of roads and related increases in traffic during the Construction, and Decommissioning and Reclamation phases is predicted to be **Not Significant (Table 6.1-4)**. Level of Confidence is Low, because the exact number of vehicle movements is not known at this stage.

Table 6.1-4: Summary of Cumulative Effects for the Transportation Subcomponent

Subcomponent	Cumulative Effects	Contributing Activities within the Project Phases (C, O, D, P)	Cumulative Effects Characterisation								
			Magnitude	Geographic Extent	Duration	Frequency	Reversibility	Context	Likelihood	Significance	Level of Confidence
Transportation	Change in use of roads and related increases in traffic	Transportation of equipment, materials, and personnel (C, D)	L	RSA	ST	FF	PR	H	L	NS	L

Notes: C, O, D, P represent Project Phases: (C)onstruction, (O)peration, (D)ecommissioning and Reclamation, (P)ost-closure

Magnitude: Low (L), Moderate (M), High (H)

Geographic Extent: Local (LSA), Regional (RSA), Beyond Regional (Beyond RSA)

Duration: Short-term (ST), Medium-term (MT), Long-term (LT)

Frequency: Infrequent (IF), Frequent (FF), Continuous (CF)

Reversibility: Fully reversible (FR), Partially reversible (PR), Irreversible (IR)

Context (resilience): Low (L), Moderate (M), High (H)

Likelihood: Unlikely (UL), Likely (L)

Significance: Not-Significant (NS), Significant (S)

Level of Confidence: High (H), Moderate (M), Low (L)

See Table 5.1-2 for list of applicable activities for each listed Project phase, unless otherwise noted in this table. Includes all existing and reasonably foreseeable projects as outlined in Table 6.1-1.

6.2 Summary of Cumulative Effects Assessment (CEA)

As mentioned in 6.1.1, a reasonable estimate of the potential adverse cumulative effects on the Infrastructure and Services VC from the Project's interaction with future projects or activities, is provided by inclusion of the Major Projects Inventory. Table 6.2-1 summarizes the potential cumulative effects on the Infrastructure and Services VC.

Table 6.2-1: Summary of Cumulative Effects on Infrastructure and Services Subcomponents

VC Subcomponent	Potential Cumulative Effect	Contributing Activities within the Project Phases (C, O, D, P)	Cumulative Effect (Yes/No)	Significant (Yes/No)
Housing and Accommodation	Increase in cost or decrease in availability of housing and accommodations	Employment and Labour (O)	Yes	No
Community Infrastructure and Services	Increased demand for child care services	Employment and Labour (O)	Yes	No
Transportation	Change in use of roads and related increases in traffic	Transportation of equipment, materials, and personnel (C, D)	Yes	No

Notes: C, O, D, P represent Project Phases: (C)onstruction, (O)peration, (D)ecommissioning and Reclamation, (P)ost-closure

VC=Valued Component

See Table 5.1-2 for list of applicable activities for each listed Project phase, unless otherwise noted in this table. Includes all existing and reasonably foreseeable projects as outlined in Table 6.1-1.

7. SUMMARY OF EFFECTS ASSESSMENT FOR INFRASTRUCTURE AND SERVICES VALUED COMPONENT (VC)

The assessment identified three (3) potential adverse effects on the Infrastructure and Services VC subcomponents:

1. Housing and Accommodation subcomponent: increase in cost or decreased availability of housing and accommodations;
2. Community Infrastructure and Services subcomponent: increased demand on community infrastructure and services; and
3. Transportation subcomponent: Change in use of roads and related increases in traffic.

As discussed in **5.3 Mitigation Measures**, TCL will implement a Housing and Accommodation Program (refer to **SEMP**) that will include measures to assist employees of TCL to own permanent housing in the region around the proposed, and TCL will fund the accommodation of non-local experienced personnel that the company requires during the Construction Phase thus reducing pressure on the demand for accommodation in the LSA.

An Employment, Education and Employment Program, will be implemented as part of the **SEMP** to enhance the potential of maximizing local resident employment. TCL will work to increase the skill capacity of the local and regional labour force and to reduce barriers to employment for Indigenous workers, which will help manage a potential influx of workers that could affect housing availability and cost. As part of the Employment, Education and Employment Program, TCL will also develop and implement a Child Care Program that will provide funding to create more full-time positions at approved child care facilities in the region.

A Procurement Program focussed on obtaining goods and services from the local and regional businesses and will work with groups to ensure that barriers to entry for contracting opportunities are reduced for local and regional businesses will be implemented as part of the **SEMP**. By strengthening local and regional businesses, the Procurement Program will broadly drive positive socio-economic effects of the Project in the LSA and the RSA, contributing to an increase in financial resources and opportunities available to LSA residents with respect to the Housing and Accommodation subcomponent.

TCL is committed to creating and maintaining opportunities for constructive dialogue and relationships with the local community and other interested parties over the course of the Project. The Project will develop and implement Community Engagement Programs as part of the **SEMP** that will involve continuous engagement with key stakeholder groups most likely to be concerned and affected by the Project.

To manage traffic effects, the TAC will be built for hauling processed to the Rail Infrastructure for the duration of all Project phases to minimize traffic on existing, residential roads. A **MTCP** will be implemented and will describe the traffic management processes and procedures in place for the Project, including use of the TAC which provides access to the Minesite, and its associated haul and service roads within the Minesite.

After the implementation of mitigation measures, three (3) residual effects were predicted for the Infrastructure and Services VC subcomponents:

- ▶ Housing and Accommodation subcomponent: increase in cost or decreased availability of housing and accommodations during the Operation Phase;

- ▶ Community Infrastructure and Services subcomponent: increased demand for child care services; and
- ▶ Transportation subcomponent: change in use of roads and related increases in traffic during the Construction, and Decommissioning and Reclamation phases.

Upon characterisation and determination of Likelihood and Significance the Project residual effects for the Infrastructure and Services VC subcomponents are **Not Significant**. The Level of Confidence for these predictions is Moderate to Low.

Project-related residual effects were assessed in terms of their cumulative effect within the RSA based on available information and understanding of other reasonably foreseeable projects and activities. Upon review of projects and activities within the RSA (past, present, and reasonably foreseeable future), and after determining that no additional mitigation measures are expected to be necessary, it was predicted cumulative effects are expected to occur but are **Not Significant** for an increase in cost or decrease in availability of housing and accommodations, increased demand for child care services and change in use of roads and related increases in traffic. The overall effect of the Project on Infrastructure and Services VC is **Not Significant**.

8. FOLLOW-UP STRATEGY

No specific monitoring or adaptive management programs are recommended. However, it can be reasonably anticipated that the Project, through the Community Engagement Programs (refer to the **SEMP**), will continue to engage with local residents and Indigenous groups to address a range of interests, issues and concerns related to the Infrastructure and Services VC, including:

- ▶ availability of housing and accommodations;
- ▶ community infrastructure and services; and
- ▶ traffic and transportation.

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