



BC EAO EAC Application – Tenas Project

Section 0.0 Application Summary

May 2022

VERSION 1.0

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Pursuant to:	Environmental Assessment Act, S.B.C. 2002, c.43
Submitted by:	Telkwa Coal Limited Suite 1410 – 409 Granville Street Vancouver, BC V6C 1T2

Tenas Project

Section 0.0 Application Summary

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ABBREVIATIONS AND ACRONYMS

Abbreviation or Acronym	Long Form of Abbreviation or Acronym
ACL	Allegiance Coal Limited
AIR	Application Information Requirements
ALC	Agricultural Land Commissions
ALR	Agricultural Land Reserve
AQMP	Air Quality Management Plan (S13.0-C2)
ARD	acid rock drainage
BC	British Columbia
BC EAO	British Columbia Environmental Assessment Office
BC MFLNRORD	British Columbia Ministry of Forests, Lands and Natural Resource Operations and Rural Development
BC MECCS	British Columbia Ministry of Environment and Climate Change Strategy
BC MEMLI	British Columbia Ministry of Energy, Mines and Low Carbon Innovation
BC MOTI	British Columbia Ministry of Transportation and Infrastructure (BC MOTI)
BMPs	best management practices
C	Chapter
CAC	Criteria Air Contaminants
CEA	cumulative effects assessment
CEAA	<i>Canadian Environmental Assessment Act</i>
CEMP	Construction Environmental Management Plan (S13.0-C4)
CMSTHP	Chemicals and Materials, Storage, Transfer, and Handling Plan (S13.0-C3)
CMT	culturally modified trees
CNR	Canadian National Railway
COC	Contaminants of Concern
COPC	Contaminants of Potential Concern
CPP	Coal Processing Plant
DFO	Department of Fisheries and Oceans Canada
EA	environmental assessment
EAA	<i>Environmental Assessment Act</i>
EAC	Environmental Assessment Certificate
ECCC	Environment and Climate Change Canada
EMA	<i>Environment Management Act</i>
EMP	Explosives Management Plan (S13.0-C6)
ESG	Environmental, Social and Governance
FCM-RAC	Federation of Canadian Municipalities and the Railway Association of Canada

Abbreviation or Acronym	Long Form of Abbreviation or Acronym
FMSCP	Fuel Management and Spill Control Plan (S13.0-C7)
FRPA	<i>Forest and Range Practices Act</i>
FSR	Forest Service Road
FTE	full-time equivalent
FVER	Final Visual Effect Rating
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GovBC	Government of British Columbia
GovCan	Government of Canada
HADD	harmful alteration, destruction, or disruption of fish habitats
HHRA	Human Health Risk Assessment
HMC	heavy media cyclone
HRMP	Heritage Resources Management Plan (S13.0-C8)
IAA	<i>Impact Assessment Act, SC 2019, c 28, s 1 (GovCan 2019)</i>
IOM	Input-Output Model
LOM	Life-of-mine
LRMP	Land and Resource Management Plan
LSA	Local Study Area
MAD	Mean annual discharge
MERP	Mine Emergency Response Plan (S13.0-C9)
MTCP	Minesite Traffic Control Plan (S13.0-C10)
MWMP	Minesite water Management Plan (S13.0-C11)
ML/ARD	metal leaching/acid rock drainage
ML/ARDMP	Metal Leaching/Acid Rock Drainage Management Plan (S13.0-C12)
n/a	not applicable
NO ₂	nitrogen dioxide
NRCAN	Natural Resources Canada
OCP	Official Community Plan
OW	Office of the Wet'suwet'en
OHSP	Occupational Health and Safety Program (S13.0-C13)
PAA	Project Assessment Agreement
PAG	potentially acid generating
PAH	polycyclic aromatic hydrocarbons
PAMP	Public Access Management Plan (S13.0-C14)
PM	particulate matter
PM ₁₀	particulate matter less than 10 microns in diameter

Abbreviation or Acronym	Long Form of Abbreviation or Acronym
PM _{2.5}	particulate matter less than 2.5 microns in diameter
POC	Parameters of Concern
POPC	Parameters of Potential Concern
PPR	Private Property Receptor
Project	Tenas Project
RCP	Reclamation and Closure Plan (S13.0-C15)
RDBN	Regional District of Bulkley Nechako
RMZ	Resource Management Zone
ROM	run-of-mine
ROW	right-of-way
RSA	Regional Study Area
S	<i>Section</i>
SARA	<i>Species at Risk Act, SC 2002, c. 29 (GovCan 2002)</i>
SEMP	Socio-Economic Management Plan (S13.0-C16)
SPO	site performance objective
SRMP	Sustainable Resource Management Plan
SROW	Statutory Right-of-way
TAC	Tenas Access Corridor
TARP	Trigger Action Response Plan
TCL	Telkwa Coal Limited
TCRC	Telkwa Coalmine Recreation Camp
TK	Traditional Knowledge
TSA	Timber Supply Area
TSS	total suspended solid
USA	United States of America
VC	Valued Component
VOC	volatile organic compounds
VMP	Vegetation Management Plan (S13.0-C18)
VRMP	Visual Resources Management Plan (S13.0-C19)
WHA	Wildlife Habitat Area
WMP	Wildlife Management Plan (S13.0-C21)
WMPRE	Water Management Plan for Refuse and Emissions (S13.0-C20)

UNITS OF MEASURE

Abbreviation	Long form of Abbreviation or Acronym
%	percent
BCM	bank cubic metre
ha	hectare
K	hydraulic conductivity
km	kilometre
km ²	square kilometre
kV	kilovolt
m	metre
Mt	million tonnes
V	volt

1. SUMMARY OF THE PROJECT

Telkwa Coal Limited (TCL) is proposing to develop the Tenas Project (Project), which is a surface metallurgical coal mine in northwestern British Columbia (BC), Canada. The Project will produce metallurgical coal at an annual production rate of between 775,000 and 825,000 metric tonnes of processed coal with a maximum daily production rate of 2,500 metric tonnes of processed coal per day. The Project will have a life-of-mine (LOM) of approximately 26.5 years, including the Construction, Operation, and Decommissioning and Reclamation phases.

The Project is subject to review under the BC *Environmental Assessment Act*, SBC 2002, c 43 (Government of British Columbia [GovBC] 2002b) (EAA) per the thresholds specified in Part 3, Section 8 of the Reviewable Projects Regulation, BC Reg 370/2002 for the EAA. This Environmental Assessment Certificate (EAC) Application has been prepared in accordance with Guideline for the Selection of Valued Components and Assessment of Potential Effects (British Columbia Environmental Assessment Office [BC EAO] 2013) and is being submitted to the BC EAO to meet the requirements of the EAA.

1.1 Proponent

TCL is a joint venture partnership of Allegiance Coal Limited (ACL) and the Itochu Corporation. ACL is a publicly listed company on the Australia stock exchange (ASX: AHQ) with headquarters in Sydney, Australia. ACL does not own or operate any other projects or mines in BC. ITOCHU Corporation is a Japanese trading house founded in 1858. ITOCHU Corporation is a Japanese trading house founded in 1858. ITOCHU has offices in 100 cities in 62 countries engaged in various commodities including textile, machinery, metals, minerals, energy, and communications technology. TCL has offices in both Telkwa and Vancouver, BC. The company was registered in BC on September 10, 2014 (BC1013154). The ACL website is: <http://www.allegiancecoal.com.au>, while TCL's website is <http://www.telkwacoal.com>.

Dan Farmer, P.Eng., the Chief Operating Officer, is the single point of contact for all communication related to the Project's EAC Application.

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1.2 Project Description

1.2.1 Exploration and Mining History

Coal was reportedly discovered in the Telkwa Area around the year 1900. The Geological Society of Canada's Report No. 988, entitled The Telkwa River and Vicinity, BC (Leach 1907), included the first geological map of the area and documented the geology and coal occurrences in the area.

Small-scale underground and surface mining began in the Telkwa Area in 1918 and continued into 1985. Sporadic production since 1918 has resulted in the recovery of over 400,000 tonnes of coal. Modern exploration of the Project started with Cyprus Anvil Mining Corporation in 1978 and since then, over 800

exploration drillholes and three (3) bulk samples have been carried out on the Telkwa Property (of which the Project is a part).

1.2.2 Project Scope

The Project is located within the Regional District of Bulkley Nechako (RDBN), approximately 25 kilometres (km) south of the Town of Smithers and seven (7) km southwest of the Village of Telkwa (**Figure 1.1-1**). The Project is within Wet'suwet'en traditional territory, specifically the Gitdumden and Laksilyu clans (**Figure 1.1-2**). TCL acknowledges and respects the unceded rights, title, interests, culture, and aspirations of the Wet'suwet'en to 22,000 square kilometres (km²) of traditional territory, the lands where the Project is located. This is the core culture of TCL, and it guides its discussions and actions in relation to this Project.

The purpose of the Project is to develop a surface coal mine to produce metallurgical coal, which is a vital ingredient for making steel, iron alloy, carbon, and other metals for uses such as:

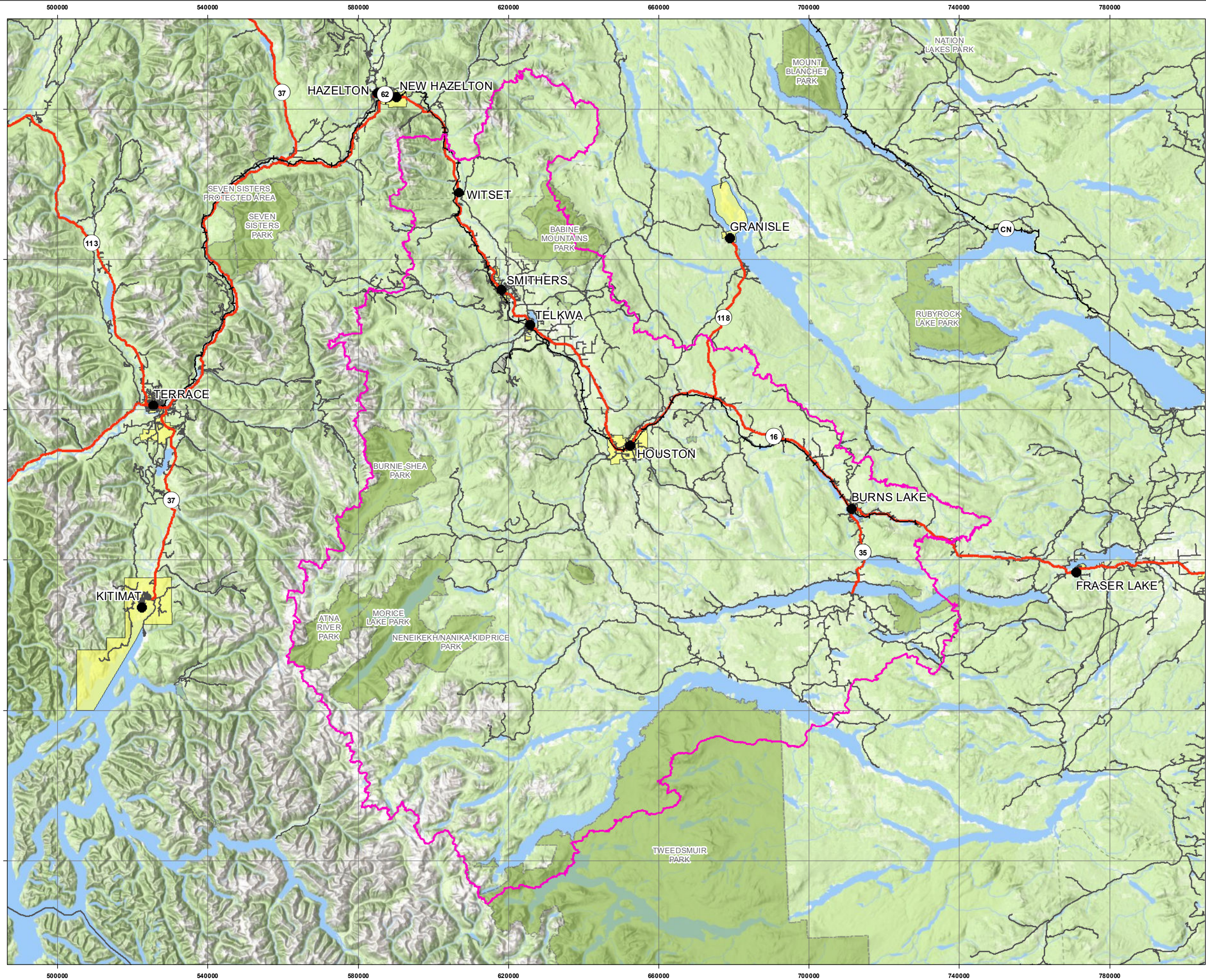
- ▶ vehicles, including automobiles, ships, and planes;
- ▶ bridges and multi-story buildings and other infrastructure;
- ▶ surgical tools and implants;
- ▶ green energy requirements such as wind turbines, turbines for hydroelectric projects, and
- ▶ facilitating the mining and processing of rare earth minerals for battery components, such as nickel and lithium in hybrid and electric vehicles.

As noted above, the Project will produce metallurgical coal at an annual production rate of between 775,000 and 825,000 metric tonnes of processed coal with a maximum daily production rate of 2,500 metric tonnes of processed coal per day. The metallurgical coal produced from the Project will be exported primarily to the Asian marketplace.

The LOM (i.e., the end of the Operation Phase) of the Project will be approximately 26.5 years, including the Construction, Operation, and Decommissioning and Reclamation phases. The Post-closure Phase occurs after the Decommissioning and Reclamation Phase is completed and will have an unspecified period but will likely be approximately 25 years with this timing dependent on regulatory approvals and progress of reclamation. This is a total Project life of 51.5 years.



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Tenas Project

Wet'suwet'en Traditional Territory

Legend

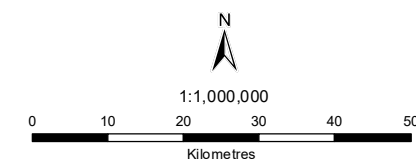
- City/Town
- +— Rail Line
- Highway
- Road
- Watercourse
- Waterbody
- Park or Protected Area
- Municipal Area
- Project Area
- Wet'suwet'en Traditional Territory

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, April 21, 2021
- Basedata: Government of British Columbia
- Basemap: World Topo Base



NAD 1983 UTM Zone 9N
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21P0172 Production Date: Nov 04, 2021 Figure 1.1-2



1.2.2.1 Existing Infrastructure and Information

One of the major advantages for development of the Project is that it is close to existing infrastructure as listed below:

- ▶ a 25 kilovolt (kV) BC Hydro grid within 3 km of the Project's Coal Processing Plant (CPP) which can provide access to renewable electricity;
- ▶ two (2) communities located within 25 km of the Project that provide accommodations, services, and a potential source of labour;
- ▶ extensive development of Forestry Service Roads (FSRs) and private roads which provide easy access to the Project once a planned permanent bridge is re-installed over Goathorn Creek;
- ▶ 15 km from an existing Class I railroad, which is owned and operated by Canadian National Railway (CNR); and
- ▶ favorable (shallow) topography both where the Project's open pit, management ponds, and Rail Infrastructure are located.

Another advantage is the extensive geological and environmental data that has been acquired over the past 40 years by various owners who have worked on this Project and by TCL since 2018.

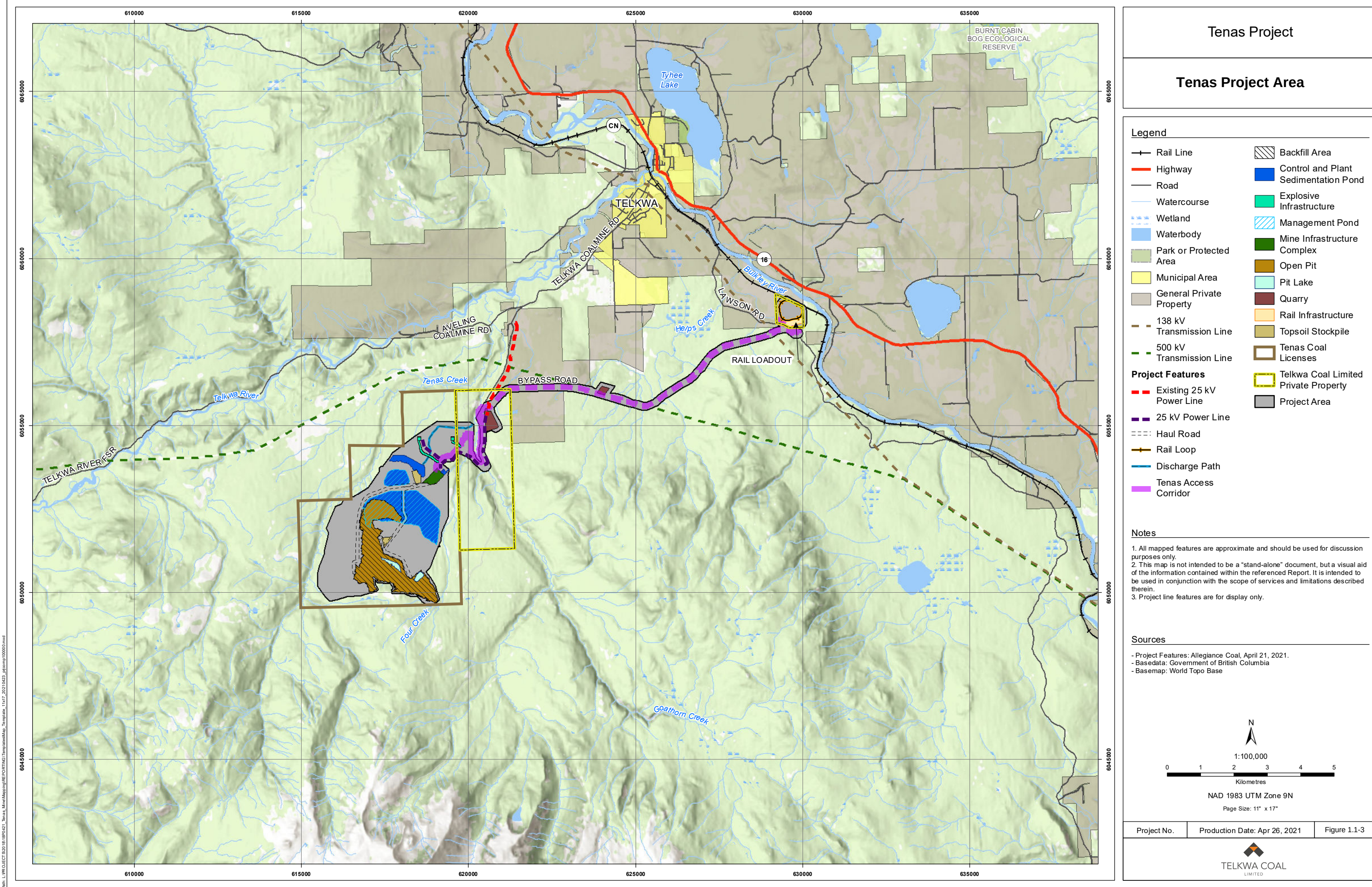
1.2.2.2 Tenas Project Components

This EAC Application is based on a feasibility level of engineering design. The components and activities described in this EAC Application do not comprise an initial stage or subcomponent of a larger project or planned later expansion but represent the entire Project envisioned. The Project components for the Project consists of:

- ▶ open pit;
- ▶ CPP
- ▶ coal handling systems for run-of-mine (ROM) coal, processed rock, and processed coal (including CPP conveyors, storage bins, and stockpiles);
- ▶ administration, first aid, maintenance/warehouse, mine dry, laboratory, light vehicle, mine rescue, and warehouse buildings;
- ▶ Surface Water Management Infrastructure, including the Project sedimentation ponds, such as the Tenas Control Pond dam and associated spillway, the CPP Sedimentation Pond, Rail Infrastructure Sedimentation Pond, Explosive Magazine Sedimentation Pond and Explosive Facility Sedimentation Pond, as well as erosion protection along Goathorn Creek tributary;
- ▶ temporary diversion berms and channels to collect and divert runoff around working areas;
- ▶ Potable Water Storage Pond and associated collection channel and distribution network, as well as water supply wells;
- ▶ fuel and lubricant storage facilities and distribution network;
- ▶ Explosive Magazine, storage silos, and vehicle wash and maintenance facilities, including the associated sedimentation ponds;
- ▶ propane storage facilities and distribution network (as required);

- ▶ solid waste management systems including landfill, recycling, and composting facilities;
- ▶ haul roads and access roads within the Minesite;
- ▶ Tenas Access Corridor (TAC) which encompasses an 11 km of newly constructed Bypass Road and improvements to approximately 5.0 km of an existing FSR;
- ▶ a 3.5 km long 25 kV powerline and a 25 kV to 600 V substation adjacent to the CPP;
- ▶ Rail Infrastructure consisting of processed coal stockpiles, scales, dust control facilities and a 2.5 km Rail Loop connected to the CNR track and the Rail Infrastructure Sedimentation Pond; and
- ▶ a permanent bridge over Goathorn Creek.

The Project components listed above are typical of similar operating surface coal mines located in southeastern BC and are well proven and understood, including the CPP and ancillary infrastructure. **Figures 1.1-3** shows the location of the Project components.



1.2.2.3 Project Phases

The Project consists of four (4) phases (Construction, Operation, Decommissioning and Reclamation, and Post-closure), which are summarized in **Table 1.2-1** and described in more detail below.

Table 1.2-1: 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.

1.2.2.3.1 Construction Phase

Planning for construction began with the completion of the Definitive Feasibility Study (DFS) (TCL 2019) and is ongoing with the submission of this EAC Application. Once the required authorizations, permits, and licenses have been obtained, the Construction Phase will proceed for approximately one (1) and a half years.

As this a greenfield operation, all required Mine Infrastructure and facilities need to be constructed. However, TCL will leverage existing infrastructure such as office space in the Village of Telkwa and nearby infrastructure such as grid power, and a Class I rail line.

Construction Phase activities will be undertaken largely by contractors hired by TCL. The Construction Phase ends with the CPP achieving commercial production, which it is expected in Year 1.

Site preparation activities will begin in Year -0.5 and continue into Year 1 of the Operation Phase after the receipt of all the necessary regulatory authorizations. The following are the main site preparation activities:

- ▶ logging of merchantable timber for sawmills in the region;
- ▶ logging of timber for pellet mills in the region;
- ▶ grubbing;
- ▶ reclamation material (surface soils, woody debris) salvage where required;
- ▶ construction of erosion and control facilities to allow for the construction of the Tenas Control Pond;
- ▶ construction of collection and diversion channels to allow for subsequent mining activities;
- ▶ removal of any poor-quality foundation materials (e.g., peat, clay, or other weak soil materials) within the management pond dam and buttress footprints; and
- ▶ dozing and establishing the initial bench working area for the mining equipment selected for the Project.

A **Reclamation and Closure Plan (S13.0-C15) (RCP)** has been developed to manage the soil/reclamation salvage activities for disturbed areas within the Project footprint. The reclamation material (surface soils) planning horizons were based on field surface soil sampling activities and subsequent ecohydrological modelling will be utilized for all planned disturbances onsite.

Project construction activities will occur in the Telkwa River and Bulkley River watersheds, with most of the Minesite components being either in the Tenas, Goathorn, and/or Four Creek watersheds. Surface water management involves the following key activities to allow construction activities:

- ▶ phasing of Construction Phase activities to reduce disturbance footprint;
- ▶ diversion of non-contact water around and away from the Project;
- ▶ installation of temporary diversion berms around the Tenas Control Pond construction area to divert non-contact water around working area;
- ▶ placement of erosion control materials on disturbed ground to reduce sediment generation;
- ▶ use of contingency active sediment treatment facilities along channel C-04 downstream of the Tenas Control Pond dam; and

- ▶ lining of the sedimentation pond internal area to reduce erosion and sediment generation.

1.2.2.3.2 Operation Phase

The Project is a conventional surface metallurgical coal mine similar but smaller than other operating coal mines in BC. The current ROM coal production is estimated at approximately 1.05 million tonnes (Mt) per annum which is approximately 20 percent (%) the rate of production of the mines seen in the Elk Valley of BC. The ratio of the Project is approximately 3.8 bank cubic meters (BCM) of overlying material above the coal to one (1) tonne of recoverable coal which again at least 50% below other operating mines in BC. The infrastructure that will be constructed as part of the Operation Phase:

- ▶ open pit;
- ▶ management ponds for permanent storage of potentially acid generating (PAG) material;
- ▶ water management infrastructure consisting of sedimentation and control ponds; and
- ▶ stockpiles for ROM, processed coal and processed rock.

A summary of the LOM plan with detailed coal production is provided in **Table 1.2-2** below.

Table 1.2-2: Tenas Project Life-of-mine (LOM) Plan Including Construction (Years -0.5 to 0) and Operation Phases (Years 1 to 21)

Year Materials	Total for Years -0.5 to 5	Total for Years 6 to 11	Total for Years 12 to 15	Total for Years 16 to 21	TOTAL
Reclamation Materials (surface soils) for Entire Project Footprint (BCM)	1,578,917	252,650	273,379	158,927	2,263,873
Overburden (BCM)	11,204,868	5,530,474	3,904,769	1,320,188	21,960,298
PAG Rock (BCM)	8,551,181	9,676,163	7,055,350	6,545,899	31,828,593
Non-PAG Rock (BCM)	4,939,364	11,976,138	7,478,159	5,127,909	29,521,571
ROM coal(@ 5% moisture) (tonnes)	5,512,500	6,300,000	5,250,001	4,953,105	22,015,606
Processed coal (@ 10% Moisture) (tonnes)	4,079,482	4,590,248	3,978,342	3,626,497	16,274,569

Notes: @=at; %=percent; BCM=bank cubic metre; PAG=potentially acid generating; ROM=run-of-mine; non-Pag=not potentially acid generating

The Project is understood to have a portion of PAG material that needs to be appropriately managed to ensure acid rock drainage (ARD) is prevented for the life of the Project and beyond the Post-closure Phase or active treatment. TCL spent time and conducted engagement with Indigenous, regulators, stakeholders and engineering consultants to complete a full options assessment involving:

- ▶ storage of PAG materials below water as source control;
- ▶ blending of non-PAG and PAG materials to achieve a design neutralizing potential ratio (NPR) as source control; and
- ▶ active treatment using a lime treatment plant.

TCL has selected storage of PAG materials below water as source control as it is considered the highest standard by regulators and independent third-party groups for mitigation PAG materials for the prevention of ARD. Furthermore, this option is considered the most robust method with the fewest risks versus the other two (2) options that were reviewed.

TCL is constructing unique and separate management ponds to saturate PAG materials underwater during the Operation Phase starting with the North Management Pond, and then moving on to the East Management Pond and finally finishing with the West Management Pond. The management ponds are outside of the open pit and are constructed by constructing embankments and/or through the excavation of structures within the overburden layer above bedrock. The West Management Pond is constructed as a part of the open pit and excavation of overburden outside of the open pit and the construction of an embankment.

Once a management pond has met its design elevation for PAG material, non-PAG rock is then placed on top within about 0.5 metres (m) of final water elevation. Then overburden is used to complete the cover design to be at least 0.25 m above the design final water level. Topsoil will then be placed at a thickness of approximately 30 centimetre (cm) to complete the final dry land reclamation for the management ponds. Areas within the surface of the management ponds will be left open to the water and the atmosphere to ensure there is adequate conductivity between the management pond water levels and water being collected in the contact water channels to provide certainty for a water source.

The CPP selected for the Project is a standard two (2) circuit design consisting of a heavy media cyclone (HMC) and flotation circuit with the ability to a middlings circuit if coal conditions warrant this during the Operation Phase.

The overall stated reserves from the Project Area, including soil salvaged for reclamation purposes, is provided in **Table 1.2-3**.

Table 1.2-3: Project Reserves for the Tenas Project as of December 31, 2021, with Coal Reserves Being NI 43-101 and JORC Compliant

Parameter	Units	Value
Reclamation materials (surface soils) within the Open Pit	BCM	886,910
Reclamation materials (surface soils) within the remainder of Project Area	BCM	1,376,963
Overburden excluding reclamation materials (surface soils)	BCM	21,409,298
Non-PAG rock	BCM	28,705,845
PAG rock	BCM	31,828,593
Road Construction (Overburden)	BCM	551,000
Rehandle (PAG)	BCM	815,726

Parameter	Units	Value
Proven ROM Coal @ 5.0% moisture	tonnes	17,112,387
Probable Rom Coal @ 5.0% moisture	tonnes	4,903,218
Proven and Probable Processed Coal @ 10.0% moisture	tonnes	16,274,569
CPP Yield	%	73.9%
ROM Coal Ratio	BCM: ROM tonnes	3.75
Processed Coal Ratio	BCM: Processed coal tonnes	5.07

Notes: @=at; %=percent; CPP=Coal Processing Plant; JORC=Joint Ore Reserves Committee; NI=National Instrument; PAG=potentially acid generating; ROM=run-of-mine;

TCL has conducted geotechnical assessments on all proposed components, as required by the Health, Safety and Reclamation Code in British Columbia (British Columbia Ministry of Energy, Mines and Low Carbon Innovation [BC MEMLI] 2021)) (Code), including:

- ▶ open pit slopes;
- ▶ management and control pond embankments and buttresses;
- ▶ TAC; and
- ▶ Rail Infrastructure.

1.2.2.3.3 Decommissioning and Reclamation Phase

At the end of the Operation Phase in Year 21, decommissioning activities will commence focussing on dismantling and removal of infrastructure components. Concurrent with the decommissioning activities, reclamation activities will commence which will involve resloping of any piles with dozers that have not been completed. The West Management Pond cover will be completed as will any open pit walls that have not been backfilled during the Operation Phase. Once reclamation materials (surface soils) are placed, revegetation activities can then occur which will involve seeding and fertilizing activities.

Reclamation Prescriptions have been developed for the following major categories as follows:

- ▶ Structures and Equipment;
- ▶ Material Backfill Piles;
- ▶ Open Pit;
- ▶ Haul Roads and Access Roads within the Minesite;
- ▶ Rail Infrastructure;
- ▶ Management Ponds (Tailings Storage Facility);
- ▶ TAC; and
- ▶ Surface Water Management Infrastructure.

1.2.2.3.4 *Post-closure Phase*

In the Post-closure Phase, mainly monitoring and maintenance activities will be undertaken for the Project.

1.2.3 **Project Mitigation Measures**

TCL has incorporated several mitigation measures in the Project design and/or operational procedures to reduce the magnitude, duration, and extent of potential effects due to the Project. These Project mitigation measures are grouped under the categories below:

- ▶ Avoid Sensitive Environments;
- ▶ Limit Project Footprint and Project Area;
- ▶ Reclamation Measures;
- ▶ Project Footprint Boundaries;
- ▶ Transport Measures;
- ▶ Project Component Design;
- ▶ Blasting Measures;
- ▶ Coal Processing Measures;
- ▶ Forest Management Practices;
- ▶ Management, Control and Water Storage Pond Designs;
- ▶ Seepage Management Measures;
- ▶ Water Capture Measures;
- ▶ Project Use of Water;
- ▶ Water Quality Monitoring and Reporting Measures;
- ▶ Management of Metal Leaching/Acid Rock Drainage (ML/ARD);
- ▶ People, Employees, Contractors, and Onsite Policies;
- ▶ Occupational Health and Safety Program (OHSP);
- ▶ Public Access Management;
- ▶ Enhance Local and Regional Benefits including Employment;
- ▶ Housing Measures;
- ▶ indigenous Consultation and Engagement;
- ▶ Consultation with Tenure Holders;
- ▶ Compensation for Affected Commercial Tenure Holders; and
- ▶ Heritage Resources Management Plan (S13.0-C8) (HRMP).

Where Project mitigation measures are relevant to minimizing a potential Project-related effect on a Valued Component (VC), the mitigation measure has been included in the VC assessment. Furthermore, if there

were VC specific mitigation measures required, these are provided in each VC environmental effects assessment chapter. See **Section (S) 4.0 to S8.0** for Project and VC-specific mitigation measures relevant to each VC.

1.2.4 Project Emissions

The Project will generate three (3) main types of emissions from mining and processing activities, all of which will be managed through design and best management practices (BMPs). The emission types are:

1. airborne (gases);
2. liquids; and
3. solids.

These emissions will be managed according to the compliance requirements outlined and guidelines in **1.2.5 Applicable Permits and Authorizations**.

1.2.5 Estimated Project Benefits

The Project's initial estimated capital cost is 123.5 million CDN\$ (2018 dollars) to achieve the full commercial production rate. The Project is anticipated to generate 125 person-years of direct employment during the Construction Phase. The Project is anticipated to require between 55 and 145 full-time equivalent (FTE) employees during the Operation Phase, and generate approximately 3,125 person-years of employment over the life of the Project excluding the Construction activities and the Post-closure Phase. TCL anticipates that approximately 58% of construction workers (direct jobs), 90% of operations workers (total workforce), and 50% of decommissioning workers will be from the local region (Local Study Area¹ including RDBN Electoral Area A and RDBN Electoral Area G).

Tables 1.2-4 to 1.2-7 summarize the potential benefits of the Project in terms of labour, wages, and taxes during each Project phase.

Table 1.2-4: Direct, Indirect, and Induced Effects of Construction Phase on Employment (Full-time Equivalent [FTE])

Phase	Effect on Employment	Employment (FTEs)	Total Wages and Salaries (Millions CDN\$)	Labour Income (Millions CDND\$)
Construction Phase (Years -0.5 to end of Year 0 (only belonging to Construction activities))	Direct, Indirect, Induced for all of BC and Canada	655.9	\$45.38	\$54.58

Notes: CDN\$=Canadian Dollar; FTE=full-time equivalent

¹ Local Study Area (LSA) for the Economic and Social Effects Assessment (Part B, Section 5.0 and Section 6.0) are defined as Telkwa, Smithers, Houston, and Witset (formerly Moricetown).

Table 1.2-5: Number of Direct, Indirect, and Induced (Full-time equivalent [FTE]) during the Operation Phase

	Total		
Year	Direct	Indirect	Induced
0 (last quarter only belong to operation)	59.7	14.7	14.6
1	144.1	132.1	58.8
2	129.3	136.3	59.1
3	161.6	112.2	58.7
4	165.9	123.9	62.5
5	161.6	95.5	54.3
6	164.9	158.9	71.4
7	157.7	84.6	50.7
8	147.0	79.3	47.4
9	146.3	89.0	49.8
10	161.3	147.8	68.0
11	162.0	130.4	63.3
12	148.1	112.8	56.4
13	136.7	76.0	44.6
14	134.2	96.6	49.6
15	133.7	87.3	47.0
16	134.1	90.4	48.0
17	129.1	66.8	40.9
18	130.0	88.0	46.6
19	119.5	63.6	38.3
20	122.7	63.6	38.9
21	85.2	44.3	27.0

Table 1.2-6: Direct, Indirect and Induced Effects of the Project on Total Wages and Salaries During the Operation Phase (in Millions of Canadian Dollars)

Total RDBN, BC and Canada		
Direct	Indirect	Induced
\$287.46	\$166.94	\$53.58

Notes: \$=Canadian dollar; BC=British Columbia; RDBN=Regional District of Bulkley-Nechako

Table 1.2-7: Number of Direct, Indirect and Induced Full-time Equivalents (FTEs) during Project Decommissioning and Reclamation and Post-closure Phases

	Direct	Indirect	Induced
Decommissioning	35.4	2.8	7.4
Reclamation	98.7	28.2	28.8
Active Post-closure	7.8	2.7	2.8
Passive Post-closure	6.1	2.4	2.4

Notes: \$=Canadian dollar; BC=British Columbia; FTE=full-time equivalent; RDBN=Regional District of Bulkley-Nechako

1.2.6 Applicable Permits and Authorizations

Table 1.2-8 provides the preliminary list of applicable federal and provincial authorizations, licenses, and permits that may be required for the Project, with completed submissions listed where applicable in ***bold italic***. There are no known municipal authorizations currently.

With the noted exceptions, permit applications have not yet been drafted, and this list is not intended to be comprehensive; however, TCL will meet with the appropriate federal and provincial government agencies and local governments to discuss permitting requirements as the Project moves forward.

TCL will not be seeking concurrent permitting pursuant to the Concurrent Approval Regulation (BC Reg. 371/2002) (GovBC 2002c) as per a request from the Wet'suwet'en during early consultation and engagement activities. As an alternative to concurrent permitting, the coordinated authorizations process will allow TCL to advance primary and secondary applications for all required authorizations while the EAC Application process proceeds; however, the EAC Application process must be completed, and an EAC issued before other authorizations can be issued.

Table 1.2-8: Preliminary List of Authorizations and Permits Likely Required for the Tenas Project

Authorization	Legislation	Authorizing Agency	Purpose
Federal Division 1 Factory License and Permit	<i>Explosives Act</i> , RSC 1985, c E-17 (Government of Canada [GovCan] 1985a), <i>Explosives Regulations</i> 2013, SOR/2013-211 (Part 5 / division 1 of the ER-2013) (GovCan] 2013)	Natural Resources Canada (NRCAN)	Explosive authorizations are required during the Construction and Operation phases. Authorization is required to manufacture and operate an explosives storage facility. Licenses are required by either Telkwa Coal Limited (TCL) or a blasting contractor. (Note: A third party will apply for the authorization and own the facility to be located on TCL tenure. TCL will acquire the explosives license from this third party).
<i>Fisheries Act</i> Authorization	<i>Fisheries Act</i> , 1985, c F-14 (GovCan 1985b), Authorizations Concerning Fish and Fish Habitat Protection Regulations, SOR/2019-286 (GovCan 2019)	Department of Fisheries and Oceans Canada (DFO)	A <i>Fisheries Act</i> , 35(2b) authorization for Four Creek will be required to allow for the harmful alteration, disruption or destruction of fish habitat (HADD) and the fish habitat compensation plan in Goathorn Creek.
Migratory Birds Damage or Danger Permit	<i>Migratory Birds Convention Act</i> , 1994, S.C. 1994a, c. 22 (GovCan 1994), <i>Migratory Birds Regulations</i> , C.R.C. c. 1035 (GovCan 1994b)	Environment and Climate Change Canada (ECCC)	May require an authorization if the Project is shown to affect nesting habitats used by migratory birds or if activities occur during the nesting season (e.g., clearing of vegetation, disturbance to nests).
Navigation Protection Program (NPP) Approval Permit	<i>Canadian Navigable Waters Act</i> , RSC 1985, c N-22 (GovCan 1985)	Transport Canada	May require a NPP approval if TCL proposes to construct or place a major work (such as a bridge) and/or in a navigable water listed in the schedule that is on any navigable water that may interfere with navigation. If TCL proposes to construct or place a work in any navigable water that will not interfere with navigation, TCL will deposit information specified by the Minister and publish a notice.
<i>Species at Risk Act</i> (SARA) permits, Agreements, and/or Exceptions	<i>Species at Risk Act</i> , SC 2002, c 29 (GovCan 2002) (SARA)	ECCC	Permits, agreements, and/or exceptions may be required if the Project has the potential to affect a species listed on Schedule 1 of SARA, including any part of its critical habitat, or the residences of its individuals.

1.2.7 Land Use

The Project is located in an area in northwestern BC where there is a variety of tenured and non-tenured land use, private land, parks, and protected areas. Resource-based industries are important drivers of the local and regional economy. Forestry, agriculture, and grazing are important in the region.

The Project is located on provincial Crown land, three (3) freehold land parcels owned by TCL, and 11 coal licences held by TCL. There are no federal lands existing within the Project Area. The Project is located outside of the Village of Telkwa, and thus not subject to Village bylaws and zoning. The Project is located within the Smithers Telkwa Rural Official Community Plan (OCP).

The Project falls within the Bulkley Land and Resource Management Plan (LRMP), Bulkley Valley Sustainable Resource Management Plan (SRMP). The Bulkley LRMP, created by the BC Government in 1998, directs the management of 760,000 hectares (ha) of Crown land and provides general management direction related to eleven (11) categories. The Project is located within the Private Zone and the Integrated Resource Management Zone (RMZ), in Planning Unit 11 (Telkwa) and Sub-Unit 11-4 (Goathorn Creek). Specific management direction for Subsurface Resources in this Sub-Unit 11-4 include maintaining “opportunities for coal exploration and extraction” (GovBC 1998).

Crown tenures that overlap with the Project include range, trapline and guide outfitting tenures. The Minesite is located outside of the Agricultural Land Reserve (ALR), but the TAC overlaps with a small portion of ALR land and TCL has submitted a Non-Farm Use Application and zoning change to the Agricultural Land Commission (ALC) for the TAC. The Project does not overlap with any Old Growth Management Areas or Ungulate Winter Range. The Project does overlaps with a Wildlife Habitat Area (WHA) established for the Telkwa Caribou Herd.

Portions of the Project are also within the ALR of BC:

- ▶ Bypass Road, which is a portion of the TAC; and
- ▶ Rail Infrastructure.

The land will have to be rezoned to a “Non-Farm Use” via an application to the ALC and the RDBN. Furthermore, a Statutory Right-of-way (SROW) will need to be obtained under the Lands Act, RSBC 1996, c 245 (GovBC 1996b) to allow the construction of the Bypass Road. Lastly the land that the Rail Infrastructure is located on will need to be rezoned for this use by the RDBN.

1.2.8 Alternative Means for Carrying Out of the Project

TCL used the following performance objectives to assess the alternatives means to carry out the Project activities:

- ▶ effects on the natural environment;
- ▶ technical applicability, system integrity, and reliability;
- ▶ cost effectiveness; and
- ▶ community effects and input.

Table 1.2-9 below provides a summary and results of the alternatives reviewed.

Table 1.2-9: Summary of Alternative Means for Completing the Project

Component	Alternatives Considered	Option Selected and Carried Forward Into the Environmental Effects Assessments
Mining Method	Surface	<i>Surface-only was selected</i> due to the dip of the coal structure and presence of numerous faults in the area.
	Underground	
Surface Mining Method	Truck/shovel	The <i>truck/shovel</i> method was selected due to its flexibility and ability to maximize the recovery of the available resource.
	Contour and highwall	Contour and highwall was rejected due to the dip of the coal, presence of faults and low resource extraction levels of 40%.
	Dragline	Dragline was rejected due to the small size of the deposit, and incompatible geometry of the deposit.
Production Rate for Project	<250,000 tonnes of processed coal per annum	Stakeholder input and the requirement to construct the Tenas Access Corridor (TAC) and Rail Infrastructure required capital amounts that a 250,000 tonnes of processed coal per annum operation could justify.
	775,000 to 825,000 tonnes of processed coal per annum	Modular plant design limits the feed rates available to reduce capital costs, as a result the production rate of <i>775,000 to 825,000 tonnes of processed coal per annum has been selected</i> for this Project.
	>1,500,000 tonnes of processed coal per annum	Community effects and input requested a smaller Project and the ability for the company to finance the Project selected ruled out a production rate greater than 1.50 million tonnes (Mt) of processed coal per annum.
Processed Coal Transport from CPP to Port	Truck	To reduce the amount of traffic on existing road network, <i>rail haulage was selected</i> as each unit train replaces, approximately 305 truck trips.
	Rail	To reduce the amount of traffic on existing road network, <i>rail haulage was selected</i> as each unit train replaces, approximately 305 truck trips.
Mine Equipment Selection – Loading Equipment	Backhoe	<i>A backhoe configured loading equipment was selected</i> for this Project due to its added flexibility when dealing with coal seams.
	Shovel	
Mine Equipment Selection – Equipment Size	6 m ³ backhoe/45 tonne trucks	The Project requires two (2) loading units to be able to produce ROM coal and mine rock at the same time.
	12 m ³ backhoe / 90 tonne trucks	
	15 m ³ backhoe / 135 tonne trucks	

Component	Alternatives Considered	Option Selected and Carried Forward Into the Environmental Effects Assessments
	22 m ³ backhoe / 180 tonne trucks	Given the production schedule required to produce enough ROM coal 1,050,000 tonnes for the CPP, only the 12 m ³ was small enough to provide two (2) units while being large enough to provide an economic Project, so the 12 m ³ was selected.
	29 m ³ backhoe / 205 tonne trucks	
CPP Location	CPP located on the east side of Goathorn Creek.	To keep operation activities as far from public property as possible, the <i>west side of Goathorn Creek</i> was selected for the CPP location.
	CPP located on the west side of Goathorn Creek	<i>Furthermore</i> , to keep the ROM coal hauls as short as possible, a <i>CPP location on the west side of Goathorn Creek</i> is preferred.
Rail Infrastructure Location	Rail Loop on private land parcel east of Lawson Road	The <i>Rail Loop location on private land parcel</i> was selected as it did not require disturbing an important archaeological resource that is on Crown land. Secondly the private land Rail Loop location requires less earthwork and related disturbance versus the Crown land Rail Loop location. Lastly, it was generally more acceptable to the community.
	Rail Loop on Crown land parcel east of Lawson Road	Due to the high capital cost of constructing the Rail Loop at this location and having to disturb an important archaeological resource this option was unacceptable.
	Rail Loop on Crown land west of Lawson Road	Due to the high capital cost of bringing the Rail Loop closer to the Minesite, the Rail Loop east of Lawson Road was ruled out.
	Linear siding along existing CNR right-of-way	Due to the higher capital cost of the two (2) linear siding options these were ruled out.
	Linear siding on Crown land west of Lawson Road	
Processed Coal Transport Methodology from CPP to Rail Infrastructure	Truck haulage	<i>Truck haulage</i> was selected due to the high capital cost of using conveyors to transport coal between the CPP and Rail Infrastructure.
	Conveyor transport	Conveyor transport was rejected due to the high capital cost of using conveyors to transport coal between the CPP and Rail Infrastructure.
	Slurry pipeline transport	Pipeline transport was rejected due to the large increase of water that would be required to make this option possible plus the capital cost of dewatering equipment at the Rail Infrastructure and an increased disturbance footprint for the Project.
Processed Coal Truck Haul and Project Access	Tenas Access Corridor (TAC)	<i>Dedicated constructed haul road (TAC)</i> to transport processed coal was selected to reduce potential traffic effects in the area and was requested during Telkwa Coal Limited (TCL)'s discussions with stakeholders.

Component	Alternatives Considered	Option Selected and Carried Forward Into the Environmental Effects Assessments
	Existing road network	Using the existing road network was ruled out due to feedback from community stakeholders.
	Powerline road	The TAC option of using the powerline road was ruled out as it would require the coal haul to go through the Cottonwood neighborhood close to the mine.
Fine Processed Rock Dewatering	Filter press and haul with trucks	The <i>filter press option</i> was selected to reduce the amount of make-up water required by the CPP.
	Conventional wet processed rock (tailings) disposal	
Potentially Acid Generating (PAG) Material Management	Material blending	TCL has spent a significant amount of resources on understanding this issue for the Project, given Equity Silver's issues in the region. Material blending was ruled out as viable option due to the quantity of PAG material present in the deposit and the requirement to get almost perfect blending for this method to work.
	Passive treatment	Passive treatment was ruled out for much the same reason as material blending.
	Active treatment	Active treatment is a viable method for dealing with potential acid rock drainage (ARD) onsite, however, it was ruled out as it would have an unknown duration for treatment.
	Dry covers	Dry covers were ruled out as this method is prone to letting oxygen and water come into PAG material and subsequent ARD. This method is also prone to degradation over time and again causing PAG material to encounter the environment.
	Water covers	<i>Water covers</i> are the best technology for preventing PAG material from going acidic and <i>was selected</i> versus dry covers.
Water Cover Methodology	Use existing water body	There are no existing water bodies available in the Project area that could be used for PAG material storage so one has to be constructed.
	Construct a water body using excavation only	Of the three (3) options, the option of <i>constructing a water body using dams only</i> was selected as it creates the least amount of disturbance and allows the use of an engineered liner to limit groundwater seepage from the structure.
	Construct a water body using a combination of excavation and dams	
	Construct a water body using dams only	
	Offsite	

Component	Alternatives Considered	Option Selected and Carried Forward Into the Environmental Effects Assessments
Office and Mine Dry Location	Onsite	Majority of components will be <i>onsite with an administration office in Telkwa</i> at current location to minimize transport of personnel and have a more efficient operation. The option selected is to have this infrastructure onsite for the time being.
CPP Plant Flowsheet	Standard three (3) stage circuit consisting of Heavy Media Cyclones, Reflux Classifiers and Floatation	Of the two (2) options presented, the two (2) stage CPP Flowsheet was selected as it had a lower capital cost while still maintaining an acceptable CPP yield. However, the CPP has been designed to allow for a second middling circuit in the future if it is found that coal yield is lower than predicted due to the ROM coal being finer than testing to date have provided.
	Two (2) stage circuit consisting of Heavy Media Cyclones and Floatation	
Process Water Supply for the Project	Precipitation only	Based on the water balance completed, <i>precipitation only</i> will meet all the requirements, so it <i>was selected</i> for the Project. However, for the effects assessment for the Fish and Fish habitat Valued Component it was felt that additional water should be sourced from Goathorn Creek
	Precipitation and surface water Precipitation and groundwater	Precipitation and groundwater was ruled out as available groundwater resources onsite are very limited and not able to supply sufficient water to meet Project requirements.
Potable Water Supply	Surface water	Along with precipitation, a backup surface water source was selected as there is enough and acceptable quality to meet the daily requirement of 16 m ³ .
	Groundwater	Potable water sourced from groundwater sources was ruled out as adequate pump studies have not been completed to verify if enough groundwater is available for potable water.
	Offsite supplier	An offsite supplier was ruled out due the amount of potable water required and associated costs.
Sewage Treatment Methodology	Trucking to offsite disposal	Due to the quantity of sewage water generated onsite, trucking was ruled out.
	Sewage Treatment Plant	<i>A secondary Sewage Treatment Plant was selected</i> for this Project
	Septic field	Site geology does not favor a septic field.
Employee Transport	Bus from designated parking lot	<i>Bus transport from a designated parking lot was selected to:</i> reduce traffic on local roads and for the safety of employees, and
	Bus using designated route through communities	

Component	Alternatives Considered	Option Selected and Carried Forward Into the Environmental Effects Assessments
	Employees using private vehicles	allow for a more efficient bus transport, with bus service from a designated lot instead of having designated buses going through town doing pickups.
Employee Parking Lot Location	East side of Bulkley River	The <i>east side</i> of the Bulkley River was selected for the parking lot location to reduce traffic over the existing one-lane bridge to get to the Project.
	West side of Bulkley River	
	Extend three-phase 25 kV along Lawson Road	
	New 138 kV to 25 kV transformer west of Rail Infrastructure	
	2 m	
	2.5 m	

Notes: <=less than; kV=kilovolt; m=metre; m³=cubic metre; V=volt

1.2.9 Alternatives to the Project

TCL also reviewed actual alternatives to the development of Project which were:

- ▶ no project;
- ▶ alternative Project production rates,
- ▶ use of alternative methods to produce steel, and
- ▶ development of an alternative steelmaking coal resource outside BC.

In summary, the current market is strong for steel and subsequently metallurgical coal over the next 30 years and the alternative methods for making steel without using coal are not predicted to replace 100% of blast furnace coal over the next 30 years and will be challenged to even replace 50% of total Blast Furnace steel production by the Year 2050. Therefore, even if this Project is not built, the global demand for steel is driving metallurgical coal projects forward and it is highly likely other metallurgical coal projects elsewhere across the globe will be constructed which may be in a jurisdiction with less regulatory oversight than BC.

Based on an evaluation of the potential development of several other projects, including not developing the Project, and given the positive results for pre-feasibility and feasibility studies for the Project, and the market demand for steel and subsequently metallurgical coal for the next 30 years, TCL is proceeding with its plans to develop the Project.

2. ASSESSMENT PROCESS

The Project is subject to review under the BC *EAA* per the thresholds specified in Part 3, Section 8 of the Reviewable Projects Regulation, BC Reg 370/2002. In 2018, *EAA* was repealed and replaced, however, the Project continues to be reviewed under the 2002 *EAA*. Pursuant to Section 78(6) of the 2018 *EAA* (GovBC 2018), in March 2020 TCL submitted a request to continue the EA under the 2002 *EAA*.

The Project is not subject to review under the former *Canadian Environmental Assessment Act, SBC 2012, c 43* (Government of Canada [GovCan] 2012) (*CEAA*) or the *Impact Assessment Act, SC 2019, c 28, s 1* (GovCan 2019) (*IAA*).

The Pre-Application Phase was initiated in November 2018 with the submission of the Project Description (PD) by TCL to the BC EAO. An order under Section 10 of the *EAA* was issued by the BC EAO indicating the Project is reviewable. An order under Section 11 of the *EAA* was issued by the BC EAO in June 2019 specifying the scope, procedures, and methods by which a review must be conducted.

A draft Application Information Requirements (AIR) for the Project was submitted by TCL in May 2020, which specified the matters that would be studied and information that would be included in the EAC Application. Revisions to the draft AIR were made by TCL in consideration of comments received from BC EAO, Wet'suwet'en, community members, stakeholders, the public, and the Working Group. BC EAO issued an approved AIR in January 2022.

The final stage of the Pre-Application Phase is the 30-day evaluation (screening) of the EAC Application by the BC EAO and Working Group to determine whether the submission provides information on all matters required by the approved AIR. If the EAC Application is determined to be sufficient, it will enter the Application Review Phase, comprising a 180-day review, which will involve the Working Group, Wet'suwet'en, local government, and the public. These groups will have opportunities to provide comments on the EAC Application, and TCL will track and respond to all of the comments received.

During the Application Review Phase, the BC EAO will prepare an Assessment Report that summarizes the results of the assessment. At the end of the Application review stage, the BC EAO will refer this report along with its recommendation and the draft EAC, which includes a Certified Project Description and conditions that must be met by TCL if an EAC is issued, to the provincial Minister of Environment and Climate Change Strategy. The Ministers' decision is made within 45 days of a referral and is posted to the BC EAO's ePIC website. Once issued, the EAC is a legally binding document granting conditional approval for the Project to proceed.

Table 2-1 summarizes regulatory milestones, including, but not limited to, the issuance of Section 10 and Section 11 Orders by the BC EAO, Working Group meetings, public comment periods, open houses, and the issuance of the AIR, including the links to documents on the BC EAO's public website.

Table 2-1: Regulatory Milestones

Milestone	Date
Project Description accepted by BC EAO	November 2018
Issuance of Section 10 Order	November 6, 2018
Working Group meetings: #1 – Introductory meeting #2 – Introductory meeting #3 – Valued Components Scoping	November 27, 2018 January 17, 2019 January 31, 2019
Working Group – subgroup meetings: Aquatics subgroup Caribou subgroup Caribou subgroup	January 30, 2019 March 21, 2019 June 13, 2019
Issuance of Section 11 Order	June 25, 2019
Working Group – subgroup meeting: Terrestrial subgroup	July 10, 2019
EA process put on hold at the request of the Office of the Wet'suwet'en (OW)	July 2019 to April 30, 2020
Confirmation that the assessment will continue under the 2002 EAA	March 4, 2020
Posting of draft AIR to BC EAO's Electronic Project Information Centre (EPIC)	May 4, 2020
Working Group consultation of the draft AIR: Meeting #1 Meeting #2	May 6, 2020 May 27, 2020
Public Comment Period on draft AIR	Jun 8, 2020 to Jul 23, 2020
Pre-Application Public Consultation Report	September 23, 2020
Formal Issuance of AIR to TCL by BC EAO	January 2022
Submission of Draft EAC Application to provincial authorities for review	February 2022
Public Comment Period on the Application	Q2 2022 ¹
Environmental Assessment Certificate (EAC)	Q4 2022 ¹

Notes: AIR=Application Information Requirements; BC EAO=British Columbia Environmental Assessment Office; EA=environmental assessment; EAC=Environmental Assessment Certificate; Q1=first quarter; Q4=fourth quarter
A full list of project documents is available on BC EAO's website: - <https://projects.eao.gov.bc.ca/p/5b905af23965330024d5b706/project-details>.

¹ – TCL forecasted dates

3. ASSESSMENT METHODOLOGY

The EAC Application has been developed pursuant to the AIR issued by the BC EAO and complied with relevant instructions provided in the Section 11 Order and any other direction provided by the BC EAO.

The assessment methodology followed the recommended guidelines and legislated requirements, pursuant to the *EAA*. **S3.0** of the EAC Application outlines how issues were scoped and VCs were selected per the BC EAO Guideline for the Selection of Valued Components and Assessment of Potential Effects (BC EAO 2013). This includes describing the assessment boundaries for the Project and the approach taken to set the VC-specific boundaries, which are provided within each VC chapter. The framework for how the establishment of existing conditions for each VC and what is included in existing conditions within each VC chapter is provided.

An assessment pursuant to the *EAA* supports a process for identifying and evaluating the potential adverse environmental, economic, social, heritage, and health effects that may occur during the life of a reviewable project. During initial issues scoping, TCL compiled a list of candidate VCs that considered the five (5) pillars requiring assessment under the *EAA*: environmental, economic, social, heritage, and health. Identifying candidate VCs involved the analysis of available information to identify issues relevant to the five (5) pillars that may be related to the Project. Previous EAs in northern BC were reviewed to provide insight on potential issues/values of interest to the Indigenous groups, public and stakeholders in the region.

Available information pertaining to the Project, local area and region, Indigenous groups and coal mining in BC was compiled and analyzed to identify environmental, economic, social, heritage and health issues that may be affected by the Project. Comments received from BC EAO and the Working Group members informed the refinement of the VCs that were selected for the assessment and VC presented in the AIR (BC EAO 2022). The final list of VCs is provided in **Table 3-1** below. There are no differences in the list of VCs presented in the EAC Application compared with those listed in the final AIR.

Table 3-1: Valued Components (VCs) and Subcomponents

Valued Component	Subcomponent
Environmental Pillar	
Atmospheric Environment	Air Quality
	Greenhouse Gas (GHG) Emissions
	Noise
Terrain and Soils	Soil Quality
	Terrain Stability
Surface Water	Surface Water Quantity
	Surface Water Quality
Groundwater	Groundwater Quantity
	Groundwater Quality
Aquatic Resources (benthic invertebrates,	n/a

Valued Component	Subcomponent
periphyton, sediment quality)	
Fish and Fish Habitat	Fish Habitat
	Fish
Vegetation	Old Growth Forest
	Wetlands (including biodiversity, water quantity and quality, and habitat function)
	Listed Ecological Communities
	Culturally Important Species
	Rare Plants and Lichens
Wildlife	Furbearers: - American marten (<i>Martes americana</i>) - Fisher (<i>Pekania pennanti</i>) - Wolverine (<i>Gulo gulo</i>)
	Caribou (<i>Rangifer tarandus</i>) (northern mountain population – Telkwa subpopulation)
	Grizzly Bear (<i>Ursus arctos</i>) (Bulkley-Lakes and Babine Grizzly Bear Population Units)
	Moose (<i>Alces americanus</i>)
	Bats: - Little Brown myotis (<i>Myotis lucifugus</i>) - Northern myotis (<i>Myotis septentrionalis</i>)
	Western Toad (<i>Anaxyrus boreas</i>)
Avian Species	Migratory Breeding Birds
	Listed Bird Species
	Raptors
Economic Pillar	
Labour Market	n/a
Economic Development	Local Business and Industry
Social Pillar	
Demographics	n/a
Visual Resources	Visual Quality
Infrastructure and Services	Housing and Accommodation
	Community Infrastructure and Services

Valued Component	Subcomponent
	Transportation
Land and Resource Use	Commercial Land Use
	Public Recreation Use
Community Well-being	n/a
Heritage Pillar	
Heritage Resources	Archaeological Resources
	Historic and Cultural Sites
Health Pillar	
Human Health	n/a

Note: n/a=not applicable, where division into subcomponents is not needed/appropriate for a Valued Component (VC).

The following steps were followed for the assessment of Project-related effects:

- ▶ Potential Project-related interactions are presented in tabular format for each VC. The interactions table lists the Project activities during Construction, Operation, Decommissioning and Reclamation, and Post-closure phases, and indicates whether there is likely to be an interaction with each VC and with each subcomponent, where applicable;
- ▶ Potential Project-related effects are considered in the assessment based on the interactions that were identified. A description of the potential Project-related effects is provided in each VC chapter and for each subcomponent, where applicable;
- ▶ Mitigation measures to reduce or eliminate an adverse effect are described in **S1.0 Overview of Project Proponent Description** in the **EAC Application**. Mitigation measures that are specific to a VC are described in the assessment of each VC. Mitigations are described in terms of how, once applied, they lead to avoiding or lessening Project-related effects;
- ▶ Residual effects are those Project-related effects that are not eliminated through mitigation measures. These are identified and the significance of residual effects are characterised for each VC subcomponent; and
- ▶ The results of the residual effects characterisations for the subcomponents are considered together (i.e., rolled up) to inform the determination of the significance of the effect of the Project on the VC in the summary of Project-related residual effects.

Cumulative effects may occur when potential environmental, economic, social, heritage, and/or health effects resulting from Project-specific residual effects interact cumulatively with similar effects of past, present, and reasonably foreseeable future projects and activities. The EA methodology provides the approach to cumulative effects assessment (CEA) based on a list of projects and activities included in the assessment because they temporally and spatially overlap with at least one (1) VC in the EAC Application.

The overall summary of the effects assessment for each VC is provided, and then a Follow-up Strategy is presented. The Follow-up Strategy is intended to provide a description of the monitoring and follow-up programs that TCL will implement, and the reporting structure as identified within the environmental management plans, monitoring plans, and EAC conditions. Each VC chapter describes the approach to identifying and developing a monitoring and adaptive management strategy or provides a rationale where no strategy is considered necessary.

4. CONSULTATION AND ENGAGEMENT

TCL's consultation and engagement on this Project are guided by TCL's commitment to providing the local community and Wet'suwet'en with meaningful opportunities to provide input on the Project, as well as meeting the requirements set out in the Section 11 Order.

Since February 2017, TCL has engaged with community members and parties interested or potentially affected by the Project, either directly or indirectly. Public consultation has been, and continues to be, conducted to meet the requirements for consultation set out in the Section 11 Order, and to allow for meaningful opportunities for the public and local communities to learn about and provide input on the Project. A Public Consultation Plan was prepared by TCL in accordance with the Section 11 Order to outline the approach, methods, and activities for consulting with the public and stakeholders with respect to the Project during the EA process. The Public Consultation Plan was developed using a phased approach to consultation to allow for consultation activities to occur throughout the environmental review process of the Project and over the lifetime of the Project.

In December of 2106, TCL initiated communication and engagement with the Office of the Wet'suwet'en (OW) to discuss Project matters and share Project information. TCL is committed to creating and maintaining opportunities for constructive dialogue and relationships with Indigenous groups to develop the Project responsibly.

In accordance with Schedule B of the Section 11 Order, TCL is engaging with the Wet'suwet'en through the OW Hereditary Chiefs. In recognition that the members of the Wet'suwet'en First Nation and Witset First Nation (formerly known as Moricetown Band) are part of the broader Wet'suwet'en, TCL is also undertaking engagement activities with these Wet'suwet'en communities.

TCL developed an Indigenous Consultation and Engagement Plan in accordance with the Section 11 Order and TCL's principles for consultation and engagement. The Indigenous Consultation and Engagement Plan is also in line with the expectations set out in the Communication and Engagement Agreement between the OW and TCL, signed in April 2017. The Indigenous Consultation and Engagement Plan is also inclusive of the requirements of the Wet'suwet'en expectations for phases of engagement, as outlined in the Wet'suwet'en Work Plan delivered to TCL by the OW on July 16, 2020, and the Project Assessment Agreement between TCL and the OW, signed in December 2021. TCL has an inclusive and transparent engagement approach with the Wet'suwet'en and is committed to upholding this approach throughout the regulatory process. This approach is founded upon frequent communication and ensuring the Wet'suwet'en the opportunity to review and provide input to important documents before finalization. TCL's staged approach to engagement with the Wet'suwet'en involves sharing Project information, gathering input and feedback on an ongoing basis, and ensuring it is considered during Project planning and assessment, fostering strong, collaborative, and long-term partnerships with the Wet'suwet'en, and working to resolve issues and concerns raised by the Wet'suwet'en.

A Working Group involving representatives of the OW, as well as representatives of federal, provincial, and local government agencies, was established for the Project. The purpose of the Working Group is to provide input on aspects of the EA, including information required for the assessment, the data collection and analysis used in the development of the EAC Application, conformity of the Application with the AIR, potential effects of VCs and mitigation measures, and potential effects on Wet'suwet'en Interests and measures to mitigate such effects. A full list of reviewing agencies is included in **Part A - S2.0 Environmental Assessment Process** of the EAC Application.

Table 4-1 below summarizes key issues raised by Indigenous groups, the public and government agencies. For more details on issues and issue resolution, please refer to **Appendix 2.0-A Tenas Project Valued**

Components Working Group Comment Tracker and the **Appendix 2.0-B Draft Application Information Requirements – Working Group Issues Tracking Table**. Both tracking tables are also available on BC EAO's public website, EPIC.

Table 4-1: Summary of Key Issues Raised by Wet'suwet'en, the Public, and Government Agencies to Date

Agency/Local Government/ Indigenous Group/Public	Subject	Issue/Concern Identified	Relevant Section of the Environmental Assessment Certificate (EAC) Application
Office of the Wet'suwet'en (OW)	Valued Components (VC) and Intermediate Components	Concerns that some components we consider important VCs have been identified as Intermediate Components instead.	Part B S1.0- 8.0
British Columbia Ministry of Environment and Climate Change Strategy (BC MECCS)	Surface Water	Concerns about including treatment options in the EAC Application and Environmental Management Act, SBC 2003, c 53 (GovBC 2003b) (EMA) applications.	S4.0-C3 Surface Water VC
British Columbia Ministry of Energy, Mines and Low Carbon Innovation (BC MEMLI)	Surface Water	BC MEMLI expects that the site-wide water balance and water quality models incorporate the results of the groundwater numerical flow model(s) in order to delineate surface water-groundwater interactions and potential effects to both surface water quantity and surface water quality.	▪ S4.0-C3 Surface Water VC ▪ S4.0-C4 Groundwater VC
BC MECCS	Groundwater	Concerns related to potential effects to groundwater. This section should clarify how the numerical groundwater flow model will be used to assess the mine water load into the receiving environment. Will this be completed within the groundwater model (e.g., solute transport model) or will the load be estimated under a different modelling effort (e.g., mass balance model).	S4.0-C4 Groundwater VC
British Columbia Ministry of Forests, Lands, Natural Resource Operations and Rural Development (BC MFLNRORD) and Environment and Climate Change Canada (ECCC)	Caribou	Concerns related to which Regional Study Areas (RSA) will be used for the effects assessment and the cumulative effects assessment.	S4.0-C8 Wildlife VC
ECCC	Wildlife	Concerns that the Project may impact wildlife health due to releases of suspended sediment, mine contact water, blast residues, flow alterations, and potential groundwater seepage from tailings and other mine waste	▪ S4.0-C8 Avian Species VC ▪ S4.0-C9 Wildlife VC

Agency/Local Government/ Indigenous Group/Public	Subject	Issue/Concern Identified	Relevant Section of the Environmental Assessment Certificate (EAC) Application
		disposal facilities (particularly due to the potential risk of selenium toxicity). As such, a wildlife health assessment should be conducted to evaluate potential adverse effects to terrestrial wildlife, birds, and aquatic-feeding wildlife (e.g., amphibians and water birds) due to changes in air, soil, water, and sediment quality.	
BC FLNRORD	Recreation and Trails	Concern that recreation mapping layers not shown on maps in the draft AIR.	▪ S6.0-C2 Visual Resources VC ▪ S6.0-C4 Land and Resource Use VC
BC FLNRORD	Public Recreation	Concerns regarding potential effects recreation sites and trails from potential Project-related effects access, noise, visuals and economic.	▪ S4.0-C1 Atmospheric Environment VC ▪ S5.0-C2 Economic Development VC ▪ S6.0-C4 Land and Resource Use VC
Agricultural Land Commissions (ALC)	Permitting	Non-farm use in the ALR requires an application to the ALC and is not guaranteed to be approved.	▪ S1.0-1.4 Overview of Project Proponent Description-Applicable Authorizations ▪ S6.0-C4 Land and Resource Use VC
Northern Health	Air Quality	Concerns regarding how parameters (i.e., metals, polycyclic aromatic hydrocarbons [PAHs] and volatile organic compounds [VOCs]) will be assessed.	S4.0-C1 Atmospheric Environment VC
Regional District of Bulkley-Nechako (RDBN)	Mitigation Measures	Specific mitigation actions need to be developed, evaluated, and discussed during the EAC Application review process. The development of mitigation plans and strategies should not be deferred to the Socio-Economic and Environment Management Planning process.	▪ Part B – S5.0 Economic Effects Assessment; ▪ Part B – S6.0 Social Effects Assessment
Town of Smithers	Noise	Concerns regarding noise and blasting and the potential effects to health and wildlife needs to be clearly presented.	▪ S4.0-C1 Atmospheric Environment VC ▪ S4.0-C8 Avian Species VC ▪ S4.0-C9 Wildlife VC ▪ S8.0-C1 Human Health VC
Member of the Public	Water	Concerns regarding changes to water quality and quantity. Effects to other Intermediate Components (IC)/ Valued Components (VCs) because of	▪ S4.0-C3 Surface Water VC ▪ S4.0-C4 Groundwater VC

Agency/Local Government/ Indigenous Group/Public	Subject	Issue/Concern Identified	Relevant Section of the Environmental Assessment Certificate (EAC) Application
		changes to water (i.e., human health, wildlife, fish and fish habitat, recreation, etc.). Requests the re-categorisation of Surface Water and Groundwater from IC to VC.	
Member of the Public	Fish and Fish Habitat:	Concerns regarding changes to fish and fish habitat, including a potential decrease to populations. Effects to other IC/VCS because of changes to fish (i.e., human health, wildlife, recreation, socio-economics etc.).	▪ S4.0-C3 Surface Water VC ▪ S4.0-C5 Fish and Fish Habitat VC
Member of the Public	Access to Recreation:	Concerns regarding changes to land use, leading to potential reduction in outdoor recreation opportunities, and limited access to recreation sites beyond the Project.	S6.0-C4 Land and Resource Use VC
Member of the Public	Climate Change	Concerns regarding changes to climate change, including a potential increase in green house gases, unpredictable weather events, drought, and negative, long term, global environmental effects.	S4.0-C1 Atmospheric Environment VC

Notes: C=Chapter; S=Section

5. SUMMARY OF KEY ADVERSE EFFECTS ON INDIGENOUS INTERESTS AND MITIGATION MEASURES

Components representing Wet'suwet'en Rights and Interests assessed in the EAC Application include:

- ▶ Wet'suwet'en System of Governance, *Anuk Nu'at'en*, and Aboriginal Right of Title;
- ▶ Current Land Use and Resource Harvesting;
- ▶ Cultural Heritage:
 - ▶ Intangible Cultural Heritage subcomponent;
 - ▶ Physical/Tangible Cultural Heritage subcomponent;
- ▶ Community Well-being; and
- ▶ Wet'suwet'en Health

The above components were identified based on previous Wet'suwet'en statements regarding their key interests and values in the context of natural resource stewardship and planning, responses to other proposed resource development projects (e.g., Northern Gateway Pipelines Project, Pacific Trails Pipeline, Coastal GasLink), OW input through the Project Working Group, and the components selected to represent First Nations Rights and Interests sections in other EAs.

The assessment of potential effects on Wet'suwet'en Rights and Interests was based on desk-based references and does not yet include direct input from Wet'suwet'en, and TCL acknowledges that some issues raised by Wet'suwet'en during pre-Application engagement were not fully resolved prior to submission of the EAC Application. Engagement with Wet'suwet'en and has followed the process laid out in the Communication and Engagement Agreement and the Project Assessment Agreement (PAA), between TCL and the OW.

Mitigation measures in **Part B** of the **EAC Application** are designed to avoid, manage, and mitigate potential Project-related effects to VCs, and if successful will also serve to avoid, manage, and mitigate potential Project-related effects on Wet'suwet'en Rights and Interests. Additional mitigations, and opportunities for alignment of interest are proposed for addressing potential adverse Project effects to Wet'suwet'en Rights and Interests (**Table 5-1**). While some mitigations are more specific to certain Wet'suwet'en components, in general the mitigations proposed address the Project components and subsequent potential effects. The proposed mitigations are intended as guidance to inform discussions for the formal PAA, which has been established between TCL and the OW.

Table 5-1: Summary of Potential Effects on Wet'suwet'en Rights and Interests and Proposed Mitigation Measures

Components Representing Wet'suwet'en Rights and Interests	Potential Effect on Wet'suwet'en Interests and Rights	Proposed Mitigation Measures/Opportunities for Alignment of Interests
Wet'suwet'en system of governance, <i>Anuk Nu'at'en</i>, and Aboriginal right of title	Change in ability to fulfill fiduciary obligations to the <i>Yintah</i> and to future generations of Wet'suwet'en	▪ Collaborative Governance ▪ Intergenerational Trust Fund ▪ Equity Ownership

Components Representing Wet'suwet'en Rights and Interests	Potential Effect on Wet'suwet'en Interests and Rights	Proposed Mitigation Measures/Opportunities for Alignment of Interests
	Change in integrity of Section 35, Aboriginal right of title	▪ Application of Environmental, Social and Governance (ESG) framework ▪ Wet'suwet'en involvement in Tenas Project (Project) mitigation design and implementation ▪ Wet'suwet'en involvement in Project monitoring design and implement ▪ Wet'suwet'en involvement in Project Access Committee.
Current Land Use and Resource Harvesting	Change in abundance or quality of wildlife, fish, and plant/vegetation resources	▪ Collaborative Governance ▪ Intergenerational Trust Fund ▪ Equity Ownership ▪ Application of ESG framework ▪ Wet'suwet'en involvement in Project mitigation design and implementation ▪ Wet'suwet'en involvement in Project monitoring design and implementation ▪ Wet'suwet'en involvement in Project Access Committee
	Change in the utility of lands and waters for Wet'suwet'en land use and resource harvesting	
	Change in Wet'suwet'en access to territory for land use and resource harvesting	
Cultural Heritage – Intangible and Physical aspects	Change in sense of place and connection to land	▪ Collaborative Governance ▪ Intergenerational Trust Fund ▪ Equity Ownership ▪ Application of ESG framework ▪ Wet'suwet'en involvement in Project mitigation design and implementation ▪ Wet'suwet'en involvement in Project monitoring design and implementation ▪ Wet'suwet'en involvement in Project Access Committee
	Change in Wet'suwet'en knowledge and cultural transmission	
	Change to physical cultural heritage features	
Community Well-being	Change in food and economic security	▪ Collaborative Governance ▪ Intergenerational Trust Fund ▪ Equity Ownership ▪ Application of ESG framework ▪ Wet'suwet'en involvement in Project mitigation design and implementation ▪ Wet'suwet'en involvement in Project monitoring design and implementation ▪ Wet'suwet'en involvement in Project Access Committee
	Change in community cohesion	
	Change in physical security, mental and emotional health	
Wet'suwet'en Health	Change in quality of air, water, and traditional foods	▪ Collaborative Governance ▪ Intergenerational Trust Fund ▪ Equity Ownership ▪ Application of ESG framework
	Change in Wet'suwet'en traditional food security	

Components Representing Wet'suwet'en Rights and Interests	Potential Effect on Wet'suwet'en Interests and Rights	Proposed Mitigation Measures/Opportunities for Alignment of Interests
		▪ Wet'suwet'en involvement in Project mitigation design and implementation ▪ Wet'suwet'en involvement in Project monitoring design and implementation ▪ Wet'suwet'en involvement in Project Access Committee

The EAC Application will be reviewed by the OW through the Application Review Phase. TCL will continue to engage with the OW, and other Indigenous groups, throughout the EA process and, if needed, work to develop mutually acceptable mitigation measures that will avoid or reduce residual Project effects on the Wet'suwet'en Interests and Rights.

6. ASSESSMENT OF ENVIRONMENTAL, ECONOMIC, SOCIAL, HERITAGE AND HEALTH EFFECTS

The following provides a summary of the assessment of potential Project effects on VCs, as well as a summary of Accidents and Malfunctions, and Effects of the Environment on the Project.

6.1 Environmental Effects Assessment

6.1.1 Atmospheric Environment Valued Component (VC)

The Atmospheric Environment VC includes the subcomponents: Air Quality; GHG Emissions; and Noise.

While all phases of the Project have the potential to result in effects to the Atmospheric Environment VC, the Operation Phase is expected to have the greatest effects. Therefore, the assessment focussed on the Operation Phase. Predicted effects associated with the Operation Phase encompass any potential effects during the Construction, Decommissioning and Reclamation, and Post-closure phases, and are effectively captured through the assessment of the Operation Phase.

Emissions of criteria air contaminants (CACs) were estimated for all Project activities during a select peak year (Year 5) of the Operation Phase. Estimated emissions were then input in the CALPUFF dispersion modelling system to estimate maximum ambient concentrations and dustfall deposition rates in the air quality Local Study Area (LSA). Project contribution to maximum predicted concentrations of PM and NO₂, as well as maximum predicted dustfall deposition rates, may exceed the relevant ambient air quality criteria in a small area surrounding the Minesite and CPP. Maximum predicted concentrations for all contaminants are expected to remain below the relevant ambient air quality criteria at sensitive receptors including the Telkwa Coalmine Recreation Camp (TCRC) and nearby residences. In the populated area of Telkwa, maximum predicted concentrations of PM may exceed the ambient air quality criteria due to high background concentrations; however, the Project contribution is very low, less than 3% of background particulate matter less than 10 microns in diameter (PM₁₀) and particulate matter less than 2.5 microns in diameter (PM_{2.5}) concentrations.

Emissions of GHGs were estimated for all Project activities during Year 5 of the Operation Phase. Total annual GHG emissions associated with the Project is estimated to be 68,973 tonnes. The largest sources of GHG emissions are fuel combustion in mobile Minesite equipment and fugitive releases of coalbed methane. Project-related GHG emissions represent 0.10% of existing GHG emissions in BC and 0.010% of existing GHG emissions in Canada. The GHG emission intensity associated with the Project is within the range of the industry profile.

Project-related effects on continuous noise were considered by estimating sound power levels associated with all equipment and activities associated with the Operation Phase. The CadnaA noise propagation modelling software was used to estimate potential changes in ambient noise levels. Maximum daytime and nighttime noise levels at the nearest residences and at the TCRC are expected to remain below permissible sound levels. Nighttime noise levels may exceed the permissible sound level at several residences within the surrounding residential subdivisions; however, these exceedances are related to background noise levels rather than the Project. The change in the percentage of high annoyance at all sensitive receptors is expected to remain well below the threshold for severe noise impact.

Project-related vibration effects are expected to be limited for the following reasons:

- ▶ Train speeds within the Rail Infrastructure will be low; at a maximum speed of approximately 10 kilometres per hour (km/hr) and up to 20 km/hr while entering and exiting the Rail Infrastructure;
- ▶ Project results in less than a 1.0% increase above the current train activity on the CNR rail line; and
- ▶ Nearest residences are over 500 metres (m) away, well beyond the vibration influence area of 75 m recommended by the Federation of Canadian Municipalities and the Railway Association of Canada (FCM-RAC) (2013).

In summary, changes in air quality and noise are predicted to remain below relevant guidelines and thresholds at sensitive receptors. Changes in GHG emissions are predicted to be small relative to provincial and federal totals, and within the industry profile. Therefore, potential residual effects on the Atmospheric Environment VC were rated as **Not Significant**.

Reasonably foreseeable future projects in the area may have overlapping effects on air quality and noise. However, based on the location of these projects and the type of projects, overlapping effects are expected to be minimal. Ambient concentrations and noise levels are expected to remain below relevant guidelines and thresholds at sensitive receptors. Cumulative effects on GHG emissions were assessed based on projected provincial and federal totals which incorporate reasonably foreseeable future development. GHG emissions are projected to decrease in the future. Therefore, cumulative effects on the Atmospheric Environment VC were **Not Significant**.

To verify the accuracy of anticipated residual effects and the efficacy of mitigation measures, it is recommended that the baseline air quality monitoring station located at PPR2 be maintained to collect continuous measurements of PM₁₀ and PM_{2.5} concentrations associated with the Project. A Thermo Scientific Partisol 2025i-D dichotomous sequential air sampler will be operated and maintained in accordance with manufacturer specifications and the most recent edition of the British Columbia Field Sampling Manual (GovBC 2014a) for the duration of the Project and ceases to be in force at the final closure of the Project as approved by regulatory authorities. If ambient concentrations more than 40% above the predicted concentrations from dispersion modelling are observed, an investigation should be conducted to determine the need for additional mitigation. Details are provided in the **Air Quality Management Plan (S13.0-C2) (AQMP)**.

To assist with the evaluation of air quality monitoring data and to assist with the implementation of additional mitigation as required, the baseline meteorological station at the Tenas Deposit should be maintained to collect continuous measurements of wind speed and direction. The meteorological station consists of an RM Young 05305 wind sensor, installed at a height of 10 m above the ground, and programmed to automatically log data at hourly intervals.

6.1.2 Terrain and Soils Valued Component (VC)

Terrain and Soils were selected as a VC based on the likelihood of interaction with the Project, their contributing role on landscape form, function, and future land capability and (by extension) their interactions with biodiversity, ecosystem function and capacity to support wildlife habitat. Terrain and Soils then contributes to environmental, socio-economic, and cultural values of Indigenous groups, regulators, the public and other stakeholders. Subcomponents and associated indicators under the Terrain and Soils VC refer to:

- ▶ Terrain Stability: change in stability and morphology; and
- ▶ Soil Quality: change in physical and chemical properties of soil in context of land use capability.

Changes to terrain are defined by the net alteration to landscape stability and morphology from baseline conditions. Changes to soil quality are defined by changes in both soil quantity and soil chemicals and physical characteristics to the extent that they change current land capability. Potential effects on the Terrain and Soils subcomponents include:

- ▶ Terrain Stability: change to terrain from vegetation and rock removal; and
- ▶ Soil Quality: loss of soils and changes to soil quality due to change in chemical and physical properties.

The Project will be developed to design-specifications so that a safe and stable landscape exists during all Project phases. Project activities will be planned and sequenced to account for terrain stability, soil erosion and soil conservation to the extent practical. Mitigation measures will be designed and implemented to monitor and maintain Terrain Stability and Soil Quality during all Project phases. The mitigation being proposed is based on industry BMPs, procedures, and proven/accepted mitigation used on other similar projects.

After mitigation, Project residual effects for both Terrain Stability and Soil Quality should mostly be within the limits of the natural range of variability or, otherwise, at the limits of the natural range of variability. Upon further characterisation and determination of Likelihood and Significance, the residual effects for the Terrain and Soils VC are expected to be **Not Significant**. The Level of Confidence for this prediction is High.

Project-related residual effects were assessed in terms of their cumulative effect within the Regional Study Area (RSA) based on available information and understanding of other reasonably foreseeable projects and activities. 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**. Upon review of all 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 that there is no potential for Project residual effects to interact cumulatively within the RSA for the Terrain Stability subcomponent, and that cumulative effects in the RSA are expected to occur but are characterised as **Not Significant** for the Soil Quality subcomponent. Therefore, cumulative effects on the Terrain and Soils VC are **Not Significant**.

6.1.3 Surface Water Valued Component (VC)

Surface Water was selected as a VC based on feedback from community stakeholders and Indigenous groups due to its intrinsic value, not only as a pathway or means of influencing other resources. The Project has the potential to interact with Surface Water Quantity and Surface Water Quality, which are considered as separate subcomponents for the effects assessment.

A water and load balance model was developed to generate continuous time series of monthly flows and concentrations of water quality parameters for pre-mining and post-mining conditions and throughout the life-of-mine (LOM) through the Year 2100. Hydrologic components of the model were calibrated to regional and local streamflow datasets and encompassed interactions between surface water and groundwater. Streamflow was generated on a daily timestep based on precipitation and temperature datasets, which included orographic gradient adjustments. Both precipitation and temperature had additional adjustments to account for climate change through the Year 2100.

The load balance component was based on conservation of mass, assuming a fully-mixed scenario at each node and time step. Geochemical characterisation results were included to estimate mass of constituents released per mass of rock stored in various mine waste facilities. The in-stream water quality was calculated based on mixing of Project discharge with background loading, developed based on baseline monitoring of

surface and groundwater quality. Baseline monitoring data and model results were screened against water quality guidelines and site performance objectives (SPOs).

Prediction nodes were selected to represent expected conditions in the downstream environment and were evaluated in relation to the baseline condition, which estimates streamflow and quality through the Year 2100 without influence of the proposed Project.

While the Project is expected to change catchment areas and summer and winter streamflow from baseline conditions in sections of Four and Tenas creeks, the residual effects on Surface Water Quantity are limited to the LSA. The potentially affected watercourses represent 0.5 percent (%) of the RSA in the case of change in mean annual discharge (MAD), and 0.8% of the RSA in the case of both change in seasonal flow distribution and change in low and high flows. Based on the characterisation criteria, the Magnitude of all potential residual effects on Surface Water Quantity is Low, and residual effects are predicted to be **Not Significant** (i.e., not expected to result in a change within the RSA that will alter its integrity beyond an acceptable level).

Modelling results showed potential exceedances of SPOs, and the conditions experienced in both Four and Tenas creeks' baseline monitoring data (greater than the 95th percentile from baseline records) for total selenium and nitrite, as well as increases in total dissolved solids concentrations and conductivity relative to baseline conditions. All other parameters were below the SPO, where applicable, or the guideline and the 95th percentile of historical records. The potentially affected area is limited to within the watersheds of Four and Tenas creeks, occupying 2.0% of the RSA. Based on the characterisation criteria, the Magnitude of the potential residual effect on Surface Water Quality for both the change in parameter concentrations and the change in other measurable parameters are Low, and residual effects are predicted to be **Not Significant** (i.e., not expected to result in a change within the RSA that will alter its integrity beyond an acceptable level).

Considering the results of the assessment, the Project effects on the Surface Water VC are predicted to be **Not Significant** (i.e., not expected to result in a change in the RSA that will alter its integrity beyond an acceptable level).

The CEA included review of potential effects on the Surface Water VC due to the Project's residual effects overlapping both spatially and temporally with the same residual effects resulting from other projects and activities. Projects included in the assessment for the cumulative effects on the Surface Water VC based on spatial and temporal interaction were proposed mining, forestry, agricultural and urban activities. All planned or current projects and activities are located outside the LSA but within the RSA in the watersheds of the Telkwa and Bulkley rivers. The proposed projects are expected to occupy a small portion of either watershed, and like the Project, their residual effects on the Telkwa and Bulkley rivers are expected to be minor. Additional mitigation measures beyond those considered in the assessment of Project-related effects are not expected to be necessary to avoid or minimize predicted cumulative effects on the Surface Water VC and its subcomponents; Surface Water Quantity; and Surface Water Quality.

Based on the available information supporting each reasonably foreseeable future project and current projects and activities, the Magnitude of the cumulative effects is expected be Low, since less than 5% of the RSA would be affected. Effects in the RSA would be expected to be of Short Duration and Infrequent, and are predicted to be **Not Significant** (i.e., not expected to result in a change in the RSA that will alter its integrity beyond an acceptable level).

Monitoring programs will be used to gauge the performance of the Project water management system and mitigation measures against model results and regulatory commitments. When changes relative to

modelling results are observed, appropriate solutions will be developed using adaptive management and applied in a timely manner.

6.1.4 Groundwater Valued Component (VC)

Groundwater was identified as a VC because it is protected under various legislation, and the Project has the potential to interact with groundwater quantity and/or quality. The open pit and the waste and water management systems can potentially have an adverse effect on humans via private groundwater wells, and to fish and other wildlife via the groundwater contributions to the streams.

The conceptual model of the groundwater system at the scale of the RSA is based on topographical, geomorphological, and geological information, and the common understanding of hydrogeological systems within the profession. The recharge occurs in the highlands in the form of snowmelt and/or rain infiltration, and the discharges occur as baseflow and/or sub-stream flow in the creeks and riverbeds, and possibly in smaller order streams, gullies, breaks in slope, and geologic discontinuities. Some flow systems may be perched and have localized seepage areas. Groundwater is contained either in the fractured rock or in valley fill deposits. In fractured bedrock, flows are expected to be typically slower, with longer residence time as bedrock is generally characterised by low to moderate hydraulic conductivity (K). In valleys, groundwater fills the glacial and fluvial sandy gravelly deposits. These deposits are expected to have a larger capacity than bedrock to transmit groundwater (i.e., moderate to high K) resulting in shorter residence times. The water table is expected to be a subdued replica of topography, with depths to groundwater typically greater in the uplands relative to the valley bottoms. Groundwater flows from the mountain's summits in the south towards the Telkwa River valley in the north. The tributaries of the Telkwa River form secondary shallow flow systems dominated by discharges from shallow bedrock and overburden.

The potential interactions between groundwater and the Project components and activities were identified based on professional experience with other mining projects in BC and through multi-disciplinary consultation with consultants working on behalf of TCL. Four (4) potential Project-related effects were identified related to groundwater quantity or quality:

- ▶ changes to the groundwater level around private wells;
- ▶ change in groundwater discharge rates to creeks and rivers;
- ▶ changes to groundwater quality around private wells; and
- ▶ change in the quality of groundwater discharging to creeks and rivers.

The analyses of the Project's residual effects on groundwater quantity and quality were performed using a three (3)-dimensional numerical groundwater flow model. Based on the model results:

- ▶ The potential change of groundwater levels around private well users resulting from Project activities is considered Not Significant because the predicted Magnitude of level changes is Negligible;
- ▶ The change in groundwater discharge rates to creeks and rivers due to Project activities are considered Not Significant because the predicted changes are expected to be of Low Magnitude;
- ▶ The changes to groundwater quality around private well users due to Project activities are considered Not Significant because the predicted changes are expected to be Low in Magnitude; and

- ▶ The change to the quality of groundwater discharging to creeks and rivers due to the Project activities are considered **Not Significant** because the effect Magnitude is predicted to be **Low** and only Local in Extent.

The analyses are based on the site-specific and public data available about the Project, therefore the Level of Confidence for the model predictions is rated as Moderate. As no other project or activity was identified as having a potential interaction with the predicted Project residual effects, the characterisation and significance of the cumulative effects remain identical to those for the Project's residual effects.

TCL has identified a Follow-up Strategy to evaluate the accuracy of effects predictions and effectiveness of proposed mitigation measures regarding groundwater. The strategy focuses on implementation of a monitoring program, which involves the implementation of widely recognized BMPs and the development of procedural mitigation measures to minimize anticipated effects. The proposed monitoring program will evaluate the effectiveness of implemented mitigations, promote continuous improvement, and detect unanticipated effects where adaptive management protocols will be triggered. The monitored parameters will include groundwater levels (automated and manual), creek flow rates, and groundwater and surface water quality. The results of the monitoring program will be reviewed on a frequency to be stipulated by future permit conditions however at least quarterly is expected; statistical analyses will be performed to evaluate the trends in monitoring indicators; and TCL will submit detailed reports as required by the operational permits.

If original predictions of effects and mitigation effectiveness are not as expected, adaptive management principles and strategies will be implemented. Performance objectives (i.e., groundwater level and groundwater quality measurements) will be developed by TCL prior to the Construction Phase but may be adjusted if and as necessary as part of the adaptive management approach, e.g., if legislation or guidelines change, measurable parameters or thresholds need be adjusted. The adaptive management approach will also require consideration of management reviews, incident investigations, shared traditional, cultural, or local knowledge, new or improved scientific methods, regulatory changes, or other Project-related changes. The mitigation and monitoring strategies for groundwater will be updated to maintain consistency with action plans, management plans, and BMPs that may become available during the life of the Project. Stakeholders, Indigenous groups, and government agencies will be involved, as necessary, in developing effective strategies and additional mitigation.

6.1.5 Aquatic Resources Valued Component (VC)

Aquatic Resources were selected as a VC based on the likelihood of interaction with the Project and due to the importance of aquatic resources in supporting and indicating aquatic ecosystem health for humans, wildlife, and fish. Because of their short life-cycles, phytoplankton and periphyton are among the first organisms to respond to environmental change, and can exhibit taxon-specific responses to stressors, making them good indicators of prevailing environmental conditions.

Change in water quality relevant to the Project can be caused by diversions, sediment releases associated with construction activities, and discharges of contact and non-contact water. Sediment quality can be altered by Project activities through changes in the chemistry of sediments. Sediment chemistry can be an indicator of long-term patterns in water quality because sediment particles adsorb water constituents. Potential changes to periphyton and benthic invertebrate abundance and community structure are closely linked to potential changes in surface water quality and sediment quality. Discharges of Minesite contact water into watercourses downstream of the Project have the potential to increase the concentration of water quality parameters that could cause toxicity (either lethal or sub-lethal effects) to periphyton and benthic invertebrates.

The Project will be developed to design-specifications to avoid, minimize, and offset potential effects on the Aquatic Resources VC during all Project phases. Project activities have been planned and sequenced to avoid watercourses and sensitive aquatic habitats to the extent practical, and the Project footprint has been minimized to the extent feasible. Mitigation measures based on industry best management practices (BMP), procedures and proven/accepted mitigation used on other similar projects have been designed and implemented to monitor and maintain the integrity of the Aquatic Resources VC during Project phases.

After mitigations the only predicted residual effect are predicted changes in water quality. Project residual effects on the Aquatic Resources VC are expected to be **Not Significant**. Considering this, the Project effects are not expected to alter the productivity and viability of the Aquatic Resources VC nor their ability to support healthy aquatic ecosystems within the RSA.

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 projects), it was determined while there is potential for present and reasonably foreseeable future projects (specifically forestry activities), cumulative effects on the Aquatic Resources VC are rated as **Not Significant**. The Level of Confidence for these predictions is high.

Targeted monitoring and inspection will be implemented to verify the accuracy of residual effects and the efficacy of mitigation measures. Two (2) types of monitoring should be implemented:

1. compliance monitoring to document implementation of environmental protection measures; and
2. environmental monitoring to detect alterations in receiving environments (water quality, benthic invertebrate and periphyton abundance/composition/diversity, and sediment quality).

Monitoring of Parameters of Potential Concern/Contaminants of Potential Concern (POPC/COPC) and Parameters of Concern/Contaminants of Concern (POC/COC) identified for aquatic life, wildlife, terrestrial vegetation, human health, and land uses will be conducted for soils, vegetation, sediment, and surface and groundwater.

Considering the findings of the environmental assessment, the proposed management plans and monitoring, and the adaptive management approach, it was deemed that a Trigger Action Response Plan (TARP) would be developed to establish and identify objectives and normal operating procedures, monitoring, trigger thresholds, actions to be implemented when thresholds are surpassed, and responses (including further mitigations or offsetting) for water quality and water quantity in streams where changes in base flows and water quality parameters are predicted. Thresholds for water quality will be established through the development of SPOs, and water quantity thresholds will be identified through modelling of critical flow levels for which the viability of fish.

6.1.6 Fish and Fish Habitat Valued Component (VC)

Fish and Fish Habitat were selected as a VC based on the likelihood of interaction with the Project, the importance of fish to Indigenous communities, as economic and recreational components of fisheries, and as an important indicator of overall aquatic ecosystem health.

The alteration of fish and fish habitat relevant to the Project includes changes in habitat structure and cover, changes in sediment concentrations, changes in water temperature, changes in food and nutrient concentrations, changes in mortality of fish and eggs, changes in contaminant concentrations (water quality), changes in base flows, displacement or stranding of fish and changes in fish migration and access

to habitats. Alteration of fish habitats can reduce the productivity of fish habitat and result in lower number of fish or a reduction in fish health. Changes in fish health and mortality can affect the viability of self-sustaining local and regional fish populations.

The Project will be developed to design-specifications to avoid, minimize, and offset potential effects on the Fish and Fish habitat VC and subcomponents during all Project phases. Project activities have been planned and sequenced to avoid watercourses and sensitive aquatic habitats to the extent practical, and the Project footprint has been minimized to the extent feasible. Mitigation measures based on industry BMP, procedures and proven/accepted mitigation used on other similar projects have been designed and implemented to monitor and maintain the integrity of Fish and Fish Habitat during Project phases.

The Project residual effects on Fish and Fish Habitat are expected to be **Not Significant**. Considering this, the Project effects are not expected to alter the productivity and viability of the Fish and Fish Habitat VC within the Fish and Fish Habitat RSA. With implementation of fish habitat offsetting for harmful alteration, destruction, or disruption of fish habitats (HADDs), a net gain of fish habitat productivity is predicted.

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 that there is no potential for Project residual effects to interact cumulatively within the RSA. The Level of Confidence for these predictions is High.

Targeted monitoring and inspection will be implemented to verify the accuracy of residual effects and the efficacy of mitigation measures. Three (3) types of monitoring should be implemented:

- ▶ compliance monitoring to document implementation of environmental protection measures and construction of offsetting measures in accordance with final designs;
- ▶ environmental monitoring to detect alterations in receiving environments (water quality, fish abundance/composition, fish tissue, and health); and
- ▶ habitat effectiveness monitoring for 10 years (with surveys in Years 1, 2, 3, 5, 7 and 10 Post-construction) to track and document the effectiveness of offsetting measures.

Assessing adherence to the conditions of the paragraph 35(2)(b) *Fisheries Act* authorization will be a key feature of these monitoring components.

Monitoring of POPC/COPC and POC/COC identified for aquatic life, wildlife, terrestrial vegetation, human health, and land uses will be conducted for soils, vegetation, sediment, and surface and groundwater.

Considering the findings of the environmental assessment, the proposed management plans and monitoring, and the adaptive management approach, it was deemed that a TARP would be developed to establish and identify objectives and normal operating procedures, monitoring, trigger thresholds, actions to be implemented when thresholds are surpassed, and responses (including further mitigations or offsetting) for water quality and water quantity in streams where changes in base flows and water quality parameters are predicted. Thresholds for water quality will be established through the development of science-based, site-specific water quality performance objectives, and water quantity thresholds will be identified through modeling of critical flow levels for which the viability of fish.

6.1.7 Vegetation Valued Component (VC)

Vegetation was selected as a VC based on the likelihood of interaction with the Project, its contributing role to biodiversity, ecosystem function, and maintenance of wildlife habitat. Vegetation then contributes to environmental, socio-economic, and cultural values of Indigenous groups, regulators, the public and other stakeholders.

The alteration of vegetation is defined as reduced ecosystem function, plant vigour, and/or changes to population extent. The alteration of vegetation may occur due to introduction and/or proliferation of invasive plants, changes in water quality and quantity, edge effects, dust deposition, and soil erosion, deposition, and sedimentation. Alteration of vegetation can lead to the loss of vegetation, ecosystems and/or wetlands. The loss of vegetation is defined as habitat alteration to the extent that it is rendered functionally unable to support vegetation populations or ecosystems. Land clearing and grubbing are anticipated to result in the greatest contribution to loss of vegetation. Trace metals deposition is defined as the deposition of elements on plants and soil at abundances higher than baseline conditions due to Project activities.

The Project will be developed to design-specifications to avoid, minimize, and rehabilitate onsite, potential effects on the Vegetation VC and subcomponents during all Project phases. Project activities have been planned and sequenced to avoid wetlands, watercourses, and sensitive ecosystems to the extent practical, and the Project footprint has been minimized to the extent feasible. Mitigation measures based on industry BMP, procedures and proven/accepted mitigation used on other similar projects have been designed and implemented to monitor and maintain the integrity of the Vegetation VC during Project phases.

The Project residual effects on Old Growth Forest, Wetlands, Listed Ecological Communities, Culturally Important Species, and Rare Plants and Lichens are expected to be **Not Significant**. Considering this, the Project effects are not expected to alter the integrity of the Vegetation VC within the Vegetation RSA beyond an acceptable level (i.e., it remains sustainable and is available to contribute to ecological function).

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 Vegetation RSA (past, present and future), it was determined that cumulative effects are expected to occur but expected to be **Not Significant**. The Level of Confidence for these predictions is Moderate. No additional mitigation is deemed necessary.

Project monitoring and adaptive management plans specific to the Vegetation VC include:

- ▶ Vegetation and invasive plants will be routinely monitored throughout the life of the Project in accordance with the **Vegetation Management Plan (S13.0-C18) VMP**;
- ▶ Soil monitoring during salvaging and stockpiling activities will be undertaken (**S4.0-C2**);
- ▶ Progressive reclamation and revegetation of disturbed areas will be monitored in accordance with the **RCP**; and
- ▶ Metals monitoring will be employed to understand metals uptake in plants in accordance with the **VMP**.

Monitoring of POPC/COPC and POC/COC identified for aquatic life, wildlife, terrestrial vegetation, human health, and land uses will be conducted for soils, vegetation, sediment, and surface and groundwater.

Where mitigation measures are not deemed to be successful, adaptive management techniques will be employed. Findings during monitoring, as well as revised BMPs, improved scientific methods, and regulatory changes will be incorporated into the environmental management plans (e.g., **VMP**) to reduce

effects during the lifetime of the Project. Key stakeholders, Indigenous groups, and government agencies will be involved in developing mitigation and adaptive management measures where applicable.

In consideration of the findings of the environmental assessment, the proposed management plans and monitoring, and the adaptive management approach, it was deemed that Vegetation VC-specific follow-up programs (i.e., to verify the accuracy of the residual effects and cumulative effects predictions) were not warranted at this time.

6.1.8 Wildlife Valued Component (VC)

Wildlife as a VC includes the collection of species that occur on the landscape, excluding avian species which are addressed as a separate VC. Wildlife was selected as a VC based on the collective species' likelihood of interaction with the Project, federal and provincial government management obligations, and its contributing role to biodiversity and ecosystem function. Wildlife contributes to environmental, socio-economic, and cultural values of Indigenous groups, the public, and stakeholders.

Habitat alteration and habitat loss are defined as indirect and direct changes to habitat (i.e., indirect includes habitat fragmentation, edge effects, and sensory disturbance) where suitable habitat for wildlife is rendered less suitable or not suitable for wildlife use. A change in mortality is defined as a change in the abundance of wildlife due to direct and indirect sources of mortality. A change in movement patterns is defined as a change in the daily and seasonal movement patterns of wildlife through the displacement of individuals due to direct (i.e., habitat loss) and indirect (i.e., habitat alteration) Project effects or the attraction of individuals to Project components that may support life requisites (e.g., food, shelter, reproduction).

Mitigation measures to address the potential adverse effects of the Project on the Wildlife VC include measures developed by TCL that have been incorporated in the Project's design and/or operational procedures plus additional mitigation measures specific to the Wildlife VC. These mitigation measures are based on proven and accepted mitigation used on other similar approved projects in BC (e.g., Red Mountain Underground Gold, Blackwater Gold) that had similar potential adverse effects on wildlife, as well as standard industry guidelines and best management practices. The mitigation measures implemented during all Project phases are expected to avoid and minimize the potential adverse effects of the Project on the Wildlife VC; however, these effects are not anticipated to be fully mitigated and residual effects (i.e., effects remaining after consideration of mitigation measures and management strategies) of the Project on the Wildlife VC subcomponents are anticipated. These residual effects were carried forward in the assessment.

The Project-related residual effects on Furbearers, Caribou, Grizzly Bear, Moose, Bats, and Western Toad were predicted to be **Not Significant**. Considering this, the Project effects are not expected to alter the population viability, persistence, or integrity of the Wildlife VC beyond an acceptable level (i.e., remains sustainable and is available to contribute to ecological function).

Project-related residual effects were assessed in terms of their cumulative effect within the Wildlife RSAs based on available information and understanding of other reasonably foreseeable projects and activities. Following a review of projects and activities (past, present, and reasonably foreseeable) within the Wildlife RSAs, it was determined that cumulative effects are expected to occur but are not expected to alter wildlife population viability or persistence of the Wildlife VC and are predicted to be **Not Significant**. The Level of Confidence for these predictions is Moderate. No additional mitigation is deemed necessary. Follow-up programs (i.e., to verify the accuracy of the Project-related residual effects and cumulative effects predictions) specific to the Wildlife VC are not warranted at this time.

Targeted monitoring and inspections will be completed by environmental inspectors (i.e., onsite monitors) during the Construction, and Operation phases to verify that Project design and mitigation measures have been appropriately applied and maintained. Following verification environmental inspectors will evaluate

the success of Project design and mitigation measures and assist in the determination if adaptive management measures are required.

Monitoring of POPC/COPC and POC/COC identified for aquatic life, wildlife, terrestrial vegetation, human health, and land uses will be conducted for soils, vegetation, sediment, and surface and groundwater.

Adaptive management techniques will be employed where Project design measures and mitigation measures are found to be unsuccessful. When updating mitigation measures using adaptive management techniques key stakeholders, Indigenous groups, and government agencies will be invited, where appropriate, to provide input. Management plans, including the **Wildlife Management Plan (S13.0-C21) (WMP)**, will be considered living documents and updated when warranted to include input from consultations, monitoring results, regulatory or legislative changes, and any updated, improved, or revised BMPs and scientific methods. Project monitoring and adaptive management plans specific to Wildlife include:

- ▶ Wildlife will be routinely monitored throughout the life of the Project in accordance with the **WMP**; and
- ▶ Progressive reclamation and revegetation of disturbed areas (i.e., transitioning into wildlife habitat) will be monitored in accordance with the **RCP**.

Wildlife movements across the Wildlife LSA may bring it into contact with Project components and activities (i.e., vehicle traffic) which can result in mortalities and changes to movement patterns. Project design and mitigation measures have been identified that are expected to minimize the likelihood of these from occurring. However, changes in wildlife habitat and movement patterns over the life of the Project and require adaptive management techniques to update Project design and mitigation measures. The potential for these changes will require environmental inspectors to continually monitor for changes in Wildlife mortality or movement patterns and assess whether adaptive management techniques are warranted. No other additional monitoring or follow-up for the Wildlife VC is proposed at this time; however, if concerns involving wildlife are noted during the life of the Project (e.g., feeding of wildlife, disturbance of wildlife), Project design measures and mitigation measures will be reviewed and adapted to minimize any effects on the Wildlife VC.

6.1.9 Avian Species Valued Component (VC)

Avian Species as a VC includes the collection of avian species that occur on the landscape. Avian Species was selected as a VC based on the likelihood of interaction with the Project, federal and provincial government management obligations, and its contributing role to biodiversity and ecosystem function. Avian species contribute to environmental, socio-economic, and cultural values of Indigenous groups, the public, and stakeholders.

Alteration of habitat is defined as indirect habitat alteration (i.e., habitat fragmentation, edge effects, and sensory disturbance) where suitable habitat for avian species remains physically intact but is rendered less suitable or unsuitable for avian use (i.e., reduced use or avoidance). Loss of habitat is defined as direct habitat loss where suitable habitat for avian species is physically disturbed to the extent that it is rendered functionally unsuitable for avian use. Change in mortality is defined as a change in the abundance of avian species due to direct and indirect sources of mortality. Change in movement patterns is defined as a change in the daily and seasonal movement patterns of avian species through the displacement of individuals due to direct (i.e., habitat loss) and indirect (i.e., habitat alteration) Project effects or the attraction of individuals to Project components that may support life requisites (e.g., food, cover, breeding, migration).

Mitigation measures to address the potential adverse effects of the Project on the Avian Species include mitigation measures developed by TCL that have been incorporated in the Project's design and/or operational procedures and additional mitigation measures specific to the Avian Species VC. These mitigation measures are based on proven and accepted mitigation used on other similar approved projects in BC (e.g., Red Mountain Underground Gold, Blackwater Gold) that had similar potential adverse effects on avian species, as well as standard industry guidelines and BMPs. The mitigation measures implemented during all Project phases are expected to limit the potential adverse effects of the Project on the Avian Species VC; however, these effects are not anticipated to be fully mitigated and residual effects (i.e., effects remaining after consideration of mitigation measures and management strategies) of the Project on the Avian Species VC subcomponents are anticipated. These residual effects were carried forward in the assessment.

The Project-related residual effects on Migratory Breeding Birds, Listed Bird Species, and Raptors subcomponents were predicted to be **Not Significant**. Considering this, the Project is not expected to result in a change to the Avian Species VC and is not expected to alter avian population viability or persistence within the Avian Species RSA beyond an acceptable level (i.e., the composition and population of the Avian Species VC are expected to remain sustainable and available to contribute to biodiversity and ecosystem function) and the Project-related residual effects on the Avian Species VC are predicted to be **Not Significant**.

All Project-related residual effects were carried forward into the CEA and were assessed in relation to their overlap in time and space with the comparable residual effects of other projects and activities within the Avian Species RSA. Cumulative effects are expected to occur but are not expected to alter avian population viability or persistence within the Avian Species RSA beyond an acceptable level (i.e., the composition and population of the Avian Species VC are expected to remain sustainable and available to contribute to biodiversity and ecosystem function). Future forestry activities are anticipated to have the greatest contribution to cumulative effects on the Avian Species VC; however, this is expected to be mitigated with the implementation of provincial and regional biodiversity and old growth forest management objectives. As such, the cumulative effects on the Avian Species VC are predicted to be **Not Significant**. The Level of Confidence for these predictions is Moderate. No additional mitigation is deemed necessary. Follow-up programs (i.e., to verify the accuracy of the Project-related residual effects and cumulative effects predictions) specific to the Avian Species VC are not warranted at this time.

6.2 Economic Effects Assessment

6.2.1 Labour Market Valued Component (VC)

Labour Market refers to the availability and characteristics of labour and employment in terms of supply and demand. The Project will hire workers from nearby communities to staff jobs during the Construction and Operation phases. The increased employment levels and increased demand for skilled labour have the potential to result in effects on the Labour Market VC.

Stakeholder engagement and consultation, collection of secondary data, and preparation of the BC Input-Output Model (IOM) informed the selection of Labour Market as a VC, and issues scoping related to the VC. Key themes of interest identified through the consultation and reviews of other information related to Labour Market included Project potential effects on local hiring during Project Construction and Operation phases, as well as interest in local and Wet'suwet'en employment and training, potential barriers to inclusion of Wet'suwet'en in Project benefits, and potential effects related to income. Desktop data was collected to understand employment and unemployment levels by industry and educational attainment, as well as to describe relevant trends and challenges faced by workers in the region. BC IOM informed the estimation of direct, indirect, and induced effects of the Project on employment and income.

In addition to the Project's beneficial effects on employment and income, the assessment conducted in this chapter identified three (3) potential adverse effects on Labour Market resulting from the proposed Project. During the Construction, and Operation phases, the Project's need for skilled workers could lead to competition for skilled labour, resulting in an upward pressure on labour cost (i.e., wage inflation). In addition, Indigenous workers could face barriers to employment at the Project relating to lower levels of skills, and pre-existing socio-economic challenges; these conditions could limit their ability to participate in the economic benefits of the Project.

After the implementation of mitigation measures, three (3) potential residual effects were predicted for the Labour Market VC:

1. increase in competition for skilled local and regional workforce;
2. increase in labour cost; and
3. barriers to Indigenous employment and participation in Project-related economic benefits.

After characterisation, residual effects of the Project were predicted to be **Not Significant**; therefore, the effect of the Project on the VC is predicted to be **Not Significant**. The residual effects were carried forward for CEA. The CEA considered past, present, and reasonably foreseeable future projects and activities that could interact with the Project. The assessment determined that while there is potential for present and reasonably foreseeable future projects and activities to cumulatively interact with the Project, there is uncertainty surrounding the number of reasonably foreseeable future projects that will be realized, with additional uncertainty around scope and timing of those projects. While all three (3) cumulative effects are predicted, they are rated as **Not Significant**, and therefore cumulative effects on the VC are expected to be **Not Significant**.

A **Socio-economic Management Plan (S13.0-C16) (SEMP)** was developed as part of the EAC Application to outline processes related to planning and monitoring of required Project engagement and consultation, to monitor the predicted Project effects, to investigate the efficacy of the introduced mitigation measures, and to propose and develop new mitigation measures if needed.

6.2.2 Economic Development Valued Component (VC)

Economic development refers to processes that are aimed at improving the overall economic growth of a region. Provision of Project employment, business contracts and payment of taxes have the potential to affect the economic conditions and economic development of communities.

Stakeholder engagement and consultation, collection of secondary data, and preparation of the BC IOM informed the selection of Economic Development as a VC and issue scoping as related to the VC. Themes of interest identified through the consultation and review of other information, as related to the Economic Development VC, included Project-related distribution of revenues and benefits from industry, interest in and business response to procurement opportunities, effects of the Project on other industries including tourism, effects on income and the cost of living, potential of economic downturn associated with the Post-closure Phase, and potential barriers to inclusion of Wet'suwet'en in Project benefits. Desktop data was collected to understand existing economic conditions, as well as to describe relevant trends and challenges faced by businesses and main sectors in the region. BC IOM informed the estimation of direct, indirect, and induced effects of the Project on employment, income, Gross Domestic Product (GDP), and tax revenue.

After the implementation of mitigation measures, four (4) residual effects were predicted for Economic Development that included:

1. decrease in economic diversity;

2. change in the capacity of local or regional businesses to supply goods or services;
3. decrease in local or regional tourism; and
4. decrease in economic activity during the Decommissioning and Reclamation Phase.

After characterisation, all residual effects of the Project were predicted to be **Not Significant**, and therefore, the residual effects of the Project on Economic Development were predicted to be **Not Significant**. All residual effects were carried forward for a CEA. The CEA considered past, present and reasonably foreseeable future projects and activities that could interact with the Project. The assessment determined that while there is potential for present and reasonably foreseeable future projects and activities to cumulatively interact with the Project going forward, there is uncertainty surrounding the number of potential, reasonably foreseeable future projects that could take place, with additional uncertainty around scope and timing of those projects. Thus, while all four (4) cumulative effects are predicted, they are rated as **Not Significant**, and therefore, cumulative effects on Economic Development were rated to be **Not Significant**.

A **SEMP** was developed to outline processes related to planning and monitoring of required Project engagement and consultation, monitoring of the predicted Project-effects, as well as to investigate the efficacy of the introduced mitigation measures and proposing new measures if needed.

6.3 Social Effects Assessment

6.3.1 Demographics Valued Component (VC)

Project employment, contracting and procurement, and other induced local and regional economic effects may contribute to change in local and regional demographics.

Stakeholder engagement and consultation, collection of secondary census data, and preparation of the BC IOM informed related issues scoping, selection, and assessment of the Demographics VC (Demographics). Key themes of interest identified through consultation and review of other data included potential changes in population and community composition during Project Construction, and Operation phases. It was recognized that evaluation of these potential changes could support and inform assessment of multiple potential social and economic effects including potential effects on Community Well-being, Infrastructure and Services, Land and Resource Use, Economic Development, and Labour Market VCs. A change in population and related demographic factors could also inform assessment of potential effects on Indigenous rights and interests.

The small, short-term, and temporary nature of an in-migration of population during the Construction Phase was considered fully mitigated and was not carried forward in consideration of residual effects. With implementation of mitigation measures during the Operation Phase, the residual effect predicted for Demographics includes:

- ▶ an increase in population and a change in related demographic factors.

This change is expected to substantially decrease during the Decommissioning and Reclamation, and Post-Closure phases.

After characterisation, the adverse residual effect of the Project was predicted to be **Not Significant**. With a focus on employment of a local resident workforce, the change in population is predicted to be small and changes to demographic composition of communities to diminish over the life of the Project. The adverse residual effect was carried forward for CEA. The CEA considered past, present, and reasonably foreseeable

future projects and activities that could interact with the Project. Assessment determined that while there is potential for present and future projects and activities to cumulatively interact with the Project, there is uncertainty surrounding the number of potential future projects that will be realized, and the effect of Project-related migration of population is reasonably accounted for by provincial government population projections. While a residual cumulative effect is predicted, it is rated as **Not Significant**.

A **SEMP** was developed as part of the EAC Application to outline processes related to planning and monitoring of required Project engagement and consultation, to monitor the predicted Project effects, to investigate the efficacy of the introduced mitigation measures, and to propose and develop new mitigation measures if needed.

6.3.2 Visual Resources Valued Component (VC)

Visual Resources as a VC refers to the collection of natural features within a landscape that have aesthetic value to viewers of that landscape, which may include forests, mountains, or other natural features that are considered scenic. This VC is supported by the Visual Quality subcomponent, which is specific to daytime views of these scenic landscapes.

Although there is no regulatory requirement on non-forestry resource activities with respect to visual resources, its importance is made clear at the provincial, regional, and local levels. The Province of BC recognizes visual quality as a management objective as outlined in the *Forest and Range Practices Act*, SBC 2002, c. 69. (GovBC 2002d) (*FRPA*), which establishes a framework for identifying and classifying scenic value as an important part of the province's resource base. Similarly, both the Bulkley LRMP and the Bulkley Valley SRMP recognize visual quality as a key consideration, to the point where the Bulkley LRMP identifies specific locations in the LRMP area from which any resource development visual disturbances should be assessed. Finally, at several points in the consultation and engagement process, visual resources was raised as a concern by local stakeholders.

A baseline study to determine the current visual conditions of the landscape was conducted from 2017-2019 (**Appendix 4.1-C**). A desktop line-of-sight analysis was conducted to determine the areas from which the Project would be visible. The results were overlaid on a map of known land uses in the area, and 19 representative viewpoints were selected for field visits. Field photos were examined to understand the nature of existing visual disturbance in the landscape.

For the assessment, the Final Visual Effect Rating (FVER) was selected as the indicator to evaluate the effects of the Project on Visual Quality. FVER is the ultimate output of a Hassell Matrix analysis, which addresses the two primary considerations that comprise Visual Quality: the visual characteristics of the disturbance (i.e., its apparent size and appearance) and the value placed on the view by the people looking at the landscape. This analysis was conducted for each of the 19 viewpoints identified in the baseline study. From six (6) locations representing a variety of viewing angles, visual simulations were developed to assist and verify the Hassell Matrix analysis.

Three (3) separate Hassell Matrix analyses were conducted: one for the Minesite during the Construction, Operation, and Decommissioning and Reclamation Phases (collectively referred to as the Active Phases), one for the Minesite during the Post-closure Phase, and a separate analysis for the Rail Infrastructure during the Active Phases. The Minesite and Rail Infrastructure were assessed separately, as their visual disturbances are distinct and generally do not overlap. The Active Phases and the Post-closure Phase were assessed separately as the character of the visual disturbance between the two time periods were substantially different, where much of the visual disturbance in the Post-closure phase will be removed following Decommissioning and Reclamation Phase.

For the Minesite during the Active Phases, 11 of 19 viewpoints reported FVERs of Moderate, six (6) reported Slight, and two (2) reported Negligible. None reported Substantial or Severe FVERs. For the Minesite during the Post-closure Phase, 11 viewpoints reported FVERs of Slight and eight (8) reported Negligible. None of the viewpoints reported FVERs of Moderate, Substantial, or Severe. For the Rail Infrastructure, one viewpoint reported a FVER of Moderate, 11 reported Slight, and six (6) reported Negligible. None reported FVERs of Substantial or Severe. One viewpoint was excluded from the Rail Infrastructure assessment as the Rail Infrastructure was not visible from that location.

Mitigations are not expected to be fully effective, so a residual effect is expected for all three assessed Project scenarios. The most important characteristics for determining Significance of these residual effects were Magnitude (into which the FVER feeds), Reversibility, and Context. Significance determinations were as follows:

- ▶ The Minesite during the Active Phases was assessed as **Significant**;
- ▶ The Minesite during the Post-closure Phase was assessed as **Not Significant**;
- ▶ The Rail Infrastructure was assessed as **Not Significant**; and
- ▶ Overall, the effect of the Project on the Visual Resources VC was assessed as **Significant**.

All residual effects were carried forward into the CEA.

While ambient light is not a subcomponent of the Visual Resources VC (TCL 2019, EAO 2022) a qualitative discussion is included as a matter of community interest. Most light concerns will be generated from operating equipment and light sources during limited daylight conditions. The concern of unintentional light effects will be managed using BMPs and engineering design. Over the past few decades, advances have been made to lighting designs (i.e., horizontal cut-off fixtures) that ensure that there is minimal fugitive light emissions outside of work areas requiring light. TCL will also incorporate the following mitigations into Project component design measures:

- ▶ source point light fixtures for working areas only;
- ▶ directing light sources on buildings to ground versus the horizon;
- ▶ having fixed light sources automatically turn on and off based on ambient light conditions; and
- ▶ directing light sources on equipment at work areas versus the horizon.

In the analysis of potential cumulative effects to the Visual Quality, the Minesite during the Active Phases and the Rail Infrastructure were assessed together, as their effects are cumulative between themselves. The Minesite during the Post-closure Phase was assessed independently, as its effects do not overlap temporally with the Active Phases or the Rail Infrastructure.

An area-based analysis was conducted to understand the total contribution of the Project to visual disturbances in the region, where it was shown that the Project during the Active phases was predicted to represent 4 % of the total visual disturbance. By comparison, forestry activities (i.e. forest cut blocks) are expected to represent 61.6% of disturbances, and transportation corridors expected to represent 31.1% of disturbances. The Minesite during the Post-closure Phase is predicted to represent just 0.4% of the total disturbance once the Project is reclaimed.

This small contribution of the Project to total visual disturbance during both the Active Phases and the Post-Closure phase resulted in a cumulative effects Significance determination of **Not Significant** for all phases.

Monitoring will take the form of periodic Visual Quality audits in Years 8, 16, 25, and 30, roughly regular intervals that are relevant to likely milestones in the reclamation and revegetation of the Project. By Year

8, for example, many progressive reclamation efforts will have begun. Year 25 marks the end of the Decommissioning and Reclamation Phase, and Year 30 is five (5) years into the Post-closure Phase, where evaluating the progress of revegetation to achieve the end land use goals.

6.3.3 Infrastructure and Services Valued Component (VC)

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 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.

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 Phase 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**.

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.

6.3.4 Land and Resource Use Valued Component (VC)

Ongoing stakeholder engagement and consultation, field study interviews with commercial and recreational land users and collection of secondary land use data informed issues scoping, selection and assessment of the Land and Resource Use VC. Key themes of interest identified through consultation and review of other data included potential changes to access for commercial and recreational users, sensory disturbances, especially a change in visual quality, contributing to a loss of the quantity and quality of available land and resources.

The Project is located in an area in northwestern BC where there is a variety of tenured and non-tenured land use, private land, parks and protected areas. The Project may change access to some commercial and recreational land use areas. Project activities will contribute to a change in sensory disturbance. The Minesite and associated infrastructure will remove land and resources which may have been used by other competing commercial or recreational land users. Changes to access will be mitigated by improvements to existing access, creation of alternate access and implementation of appropriate management plans. From the commencement of site clearing during the Construction Phase, and throughout all Active Phases, noise and emissions and changes in the visual quality will be managed in a similar way and through active engagement with local stakeholders, community groups and associations. During the Operation Phase a program of progressive reclamation will also assist in mitigating changes in the visual quality. Changes in the quantity and quality of land and resources will be limited to the local area, with substantial portions of the Project Area available for alternative land and resource use after the Decommissioning and Reclamation Phase is completed.

After the implementation of mitigation measures, three (3) potential residual effects were predicted for the Land and Resource Use VC:

- ▶ change in access;
- ▶ change sensory disturbance; and
- ▶ change in quantity and quality of resources.

After characterisation, residual effects of the Project were predicted to be **Not Significant**; therefore, the effect of the Project on the VC is predicted to be **Not Significant**. The residual effects were carried forward for CEA. The CEA considered past, present, and reasonably foreseeable future projects and activities that could interact with the Project. The assessment determined that while there is potential for present and reasonably foreseeable future projects and activities to cumulatively interact with the Project, there is uncertainty surrounding the number of reasonably foreseeable future projects that will be realized, with additional uncertainty around scope and timing of those projects. While all three (3) cumulative effects are predicted, they are rated as **Not Significant**, and therefore cumulative effects on the VC are expected to be **Not Significant**.

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

- ▶ public health and safety restrictions on access and related issues;
- ▶ escorted access and maintenance of the Goathorn Creek Bridge;
- ▶ controlled crossing of the Bypass Road by local agricultural land users;
- ▶ maintenance of public roads and trails;

- ▶ monitoring of noise and emissions; and
- ▶ public participation in reclamation and closure planning.

Monitoring of POPC/COPC and POC/COC identified for aquatic life, wildlife, terrestrial vegetation, human health, and land uses will be conducted for soils, vegetation, sediment, and surface and groundwater.

6.3.5 Community Well-being Valued Component (VC)

Stakeholder engagement and consultation, collection of secondary census data, and available provincial, regional and local reports informed related issues scoping, selection and assessment of the Community Well-being VC. Key themes of interest identified through the consultation and review of other data included potential effects on community well-being as a result of the Project. It was recognized that evaluation of these potential changes could support and inform assessment of potential effects on the Community Well-being VC.

After the implementation of mitigation measures, four (4) potential residual effects were predicted for the Community Well-being VC:

- ▶ change in food security
- ▶ change in cost of living
- ▶ change in community cohesion; and
- ▶ change in mental health.

After characterisation, residual effects of the Project were predicted to be **Not Significant**; therefore, the effect of the Project on the VC is predicted to be **Not Significant**. The residual effects were carried forward in the CEA. The CEA considered past, present, and reasonably foreseeable future projects and activities that could interact with the Project. The assessment determined that while there is potential for present and reasonably foreseeable future projects and activities to cumulatively interact with the Project, there is uncertainty surrounding the number of potential future projects that could take place, with additional uncertainty around scope and timing of those projects. Therefore, while cumulative effects are predicted, they are rated as **Not Significant**.

A Subsistence Food Management Plan will be developed as part of the **RCP**, and in consultation with the Wet'suwet'en and relevant authorities. The plan will address potential effects of the Project on the change in access to land and the availability of subsistence foods. Details of the plan and associated monitoring to assess the actual effects and effectiveness of mitigation measures will be developed prior to reclamation (i.e., prior to Year 22).

No additional specific monitoring or follow-up strategies are recommended; however, the **SEMP** describes the initial components and contents of the Education, Training and Employment Program, Health and Wellness Program and Community Engagement Programs. A final **SEMP** will be developed in compliance with issued Conditions of the EAC and prior to the start of the Construction Phase. The **SEMP** will describe the predicted effects of the Project and corresponding mitigation measures, detail planned monitoring to assess the actual effects and effectiveness of the monitoring measures on the socio-economic environment, as well as to describe reporting requirements and schedule.

In addition, the **Public Access Management Plan (S13.0-C14) (PAMP)** will mitigate potential safety issues related to public access to the Project Area. A monitoring program will be developed to ensure that use of the Project Area by the public is compliant with both relevant legislation and the PAMP. Monitoring will

include regular inspections of public access trails to ensure structures are in good shape. TCL will also conduct regular monitoring to ensure that the PAMP is being followed, and to gather input from users.

6.4 Heritage Effects Assessment

6.4.1 Heritage Resources Valued Component (VC)

The Heritage Resources VC was identified as having value to local communities, Indigenous and non-Indigenous groups, and may be afforded protections under legislation. The Heritage Resources VC includes two (2) subcomponents: Archaeological Resources, and Historic and Cultural Sites (which includes palaeontological resources).

The assessment of Heritage Resources was based on available Traditional Knowledge (TK), previous studies, and Project specific baseline reports. The **Tenas Project Archaeological Baseline Report (Appendix 7.1-A)** describes the archaeological setting within the RSA, with fieldwork focused on the Project Area where impacts are most likely to occur. The **Cultural Use Study (Appendix 7.1-B)** describes cultural heritage resources within the RSA (**Appendix 7.1-B**). The **Tenas Project Fossil Impact Assessment Preliminary Study (Appendix 7.1-C)** discusses the palaeontological setting within the RSA, the potential for palaeontological sites within the LSA, and provides recommendations for identifying sites prior to construction activities.

There are no known Archaeological Resources within the LSA; however, there may be as-yet unknown Archaeological Resources. There are Historic and Cultural Sites within the LSA, including three (3) culturally modified trees (CMTs), three (3) areas with evidence of historic mining activity, and the Hubert town site. There are also four (4) known fossil sites within the LSA. There may also be as-yet unknown Historic and Cultural Sites. By committing to site avoidance or mitigation through data recovery and/or monitoring, in consultation with community stakeholders as appropriate, Historic and Cultural Sites will be avoided or adequately curated.

The assessment of effects on the Heritage Resources VC incorporates mitigation measures and accounts for both known and as-yet unknown Heritage Resources that may be affected by the Project. Following the implementation of mitigation measures, negligible effects from the Project on both the Archaeological Resources, and Historic and Cultural Sites subcomponents of the Heritage Resources VC are expected. Therefore, it has been determined that there are no adverse residual effects or adverse cumulative effects for the Heritage Resources VC.

A **HRMP**, including Heritage and Palaeontological Chance Find Procedures will be used to identify and protect as-yet unknown Heritage Resources or fossils. Compliance with avoidance of Heritage and Palaeontological Resources will be monitored. If additional Heritage Resources are identified through future studies or additional TK information, appropriate mitigations will be applied. A philosophy of adaptive management will be adopted to allow management plans and mitigation measures to be adapted to consistently meet or exceed performance targets. This will be achieved through periodic reviews of the **HRMP** and the results of monitoring programs. If negative trends are identified, a root cause analysis will be conducted to identify gaps and areas for improvement. When these are identified, the Environmental Coordinator and/or Consultant Archaeologist will develop and implement a suitable corrective action.

6.5 Health Effects Assessment

6.5.1 Human Health Valued Component (VC)

While it is acknowledged that there are many other determinants of human health, the Human Health VC chapter focusses on the assessment of only physical human health. Other determinants of human health are assessed in the **Land and Resource Use VC (S6.0-C4)** and **Community Well-being VC (S6.0-C5)**. Biophysical environment factors contributing to physical human health directly through biochemical linkages (e.g., quality of air, water, soil, and subsistence foods) and biophysical linkages (noise) are included in the Human Health VC chapter.

Existing conditions related to the Human Health VC were described to provide context for the effects assessment. Existing conditions in the LSA include air quality, the quality of drinking water, the quality of soil that people come in contact with, the quality of subsistence foods, and existing sound levels. The assessment was further informed by TK, land use information provided through consultation and engagement with government agencies, Indigenous groups, and the public, and peer-reviewed scientific studies. Indigenous and non-Indigenous Residents and Recreational Land Users were identified as the groups of people (receptors of concern) with the likelihood to experience the greatest exposure and, therefore, the greatest potential risk.

After consideration of mitigation measures incorporated into Project design and additional non-design mitigation measures (e.g., best management practices and proven and/or accepted mitigations used by similar projects), residual effects of the Project to the Human Health VC were characterised and rated as to their Significance.

The effects assessment for residual Project effects was based on the results of a quantitative human health risk assessment (HHRA) following established risk assessment methodology from Health Canada and the BC Ministry of Health (see **Appendix 8.0-A**). The HHRA considers three (3) scenarios:

- ▶ Base Case (for existing conditions);
- ▶ Project Case (Operation), which considers Construction and Operation phases; and
- ▶ Project Case (Closure), which includes both Decommissioning and Reclamation and Post-closure phases.

While all phases of the Project have the potential to result in effects to the Human Health VC, the Operation, Decommissioning and Reclamation, and Post-closure phases were predicted to have the greatest potential for effects. Assessment of residual Project effects was based on measurements or predictions of environmental concentrations of COPCs for Base Case, predictive modelling using upper-bound estimates of environmental concentrations of COPCs for Project Case, and derivation of the incremental change between Base Case and Project Case.

The following residual effects were identified and characterised:

- ▶ changes in Human Health due to Project-related changes in air quality from criteria air contaminants;
- ▶ changes in Human Health due to Project-related changes in metal concentrations in environmental media:
 - ▶ non-carcinogenic metals (all exposure pathways);
 - ▶ carcinogenic metals (ingestion pathway only);

- ▶ changes in Human Health due to Project-related increases in ambient noise levels.

The Project's residual effects on the Human Health VC were predicted to be **Not Significant**. Considering this, the Project effects were not expected to alter the integrity of the Human Health VC within the LSA beyond an acceptable level.

All residual effects were carried forward into the CEA for reasonably foreseeable future projects in the area that may have overlapping effects on the Human Health VC. Cumulative effects on the Human Health VC identified in the CEA were the same as the Project residual effects. The Significance of the cumulative effects were determined to be **Not Significant**, consistent with the conclusions of the Significance characterisation for Project residual effects.

Monitoring and adaptive management measures were recommended to address uncertainties in the predictions and in the assessment.

6.6 Accidents and Malfunctions

TCL's goal for the Project is to reduce the likelihood of accidents and malfunctions and the associated consequence that might affect people and the environment. TCL will develop training and education programs to facilitate a culture of risk awareness designed to prevent accidents and malfunctions. Emergency preparedness and other management plans will be maintained, and adaptive management approaches employed to continuously assess risks, and update management plans and training associated with the Project.

A risk assessment for accident and malfunction scenarios was completed, employing a risk analysis methodology based on the Likelihood and Consequences of the accident or malfunction. The assessment considers the engineering controls incorporated into the Project design, and implementation of the emergency response plans and clean-up and restoration in contingency plans. The assessment is a conservative approach in that the most severe Consequence to potentially affected VCs is used to determine the risk. Consequences from events that could result in fatalities and injuries (e.g., Human Health VC) generally presented the worst-case scenario and resulted in the highest risk ratings. The release of materials into water or on land affected VCs including Terrain and Soils, Surface Water, Groundwater, and in turn biophysical VCs for Aquatic Resources, Fish and Fish Habitat, Wildlife, and Avian Species. Events that resulted in temporary closure of the Minesite resulted in effects to the Economic Development VC.

None of the risks after mitigations and design requirements fell into the high, very high or critical risk categories. **Table 6.6-1** below summarizes the results of the risk assessment performed for the scenarios selected.

Table 6.6-1: Summary of Risk Assessment for Scenarios

Scenario	Likelihood	Consequence (Worst Case with Mitigation)	Risk Assessment
Containment Failure of the Management Ponds	Rare	Severe	Medium
Inability to Maintain Water Cover for Management Ponds	Rare	Negligible to Minor	Negligible
Misidentification and/or Misplacement of Potentially Acid Generating (PAG)	Unlikely	Minor	Low

Scenario	Likelihood	Consequence (Worst Case with Mitigation)	Risk Assessment
Hazardous Material Spills in Water Hydrocarbon Spill in Water Non-hydrocarbon Spill in Water	Rare	Moderate	Low
Hazardous Material Spills On Land Hydrocarbon Spill on Land Non-hydrocarbon Spill on Land	Rare	Moderate	Low
Sediment Release into Water	Rare	Major	Low
Motor Vehicle Accident	Unlikely	Severe	Medium
Rail Accident	Rare	Severe	Medium
Earthworks Failure	Rare	Severe	Medium
Power Failure	Unlikely	Negligible	Very Low
Fires or Explosions	Unlikely	Severe	Medium

6.7 Effects of the Environment on the Project

The potential for the environment to affect the Project has considered the frequency of environmental events, as described in the approved AIR for the Project, in the region and the Project Area. The events deemed to have possible consequences on the proposed Project included the following:

- ▶ potential impacts of climate change;
- ▶ extreme weather and weather-related events (e.g., heavy precipitation, extreme temperatures, and high winds);
- ▶ flood events;
- ▶ lightning strikes;
- ▶ geohazards;
- ▶ seismic activities/events; and
- ▶ forest fire.

The risks to VCs from potential effects to the Project were evaluated using a risk approach that considers the Likelihood (probability of occurrence) of Project effects on VCs and the consequences (severity of occurrence) of Project effects on VCs. The overall risk for each scenario was evaluated based on a combination of probability and consequence. A conclusion on the overall risk to the Project and the risk to VCs was determined.

The evaluation of the risk to VCs from effects to the Project was based on the implementation of the design and management measures proposed for each of the environmental events. Design standards for buildings, structures, infrastructure, and Minesite landforms have been implemented to avoid or minimize the risks to the Project, and the layout of the Project has avoided geohazards to the extent possible. Design standards have considered predicted extreme weather events due to climate change. Where risks have been identified, measures are in place to monitor for the occurrence of the event where possible, and initiate preparatory measures, for example for forest fires. The **Mine Emergency Response Plan (S13.0-C9) (MERP)** addresses a response system and measures to implement should the event occur, and TCL has

initiated engagement with local emergency service providers to coordinate capacity to respond to potentially large events.

With mitigation to avoid effects of the environment on the Project, the Likelihood of effects to VCs is considered **Rare** or **Unlikely**, with the exception of geohazard risk for the Goathorn Creek crossing (a necessary access point) where active and historic landslide escarpments are present, and stability issues are likely. Mitigation and monitoring are in place to manage this risk. Consequences to the Project and to VCs as a result of the effects on the Project were evaluated as **Negligible** to **Major**, with the highest consequences evaluated where there was a potential for employee injury or a closure of the Minesite (Human Health, and Economic Development VCs). Based on the Likelihood and Consequences, no high risks were determined, and the evaluated risks ranged from **Very Low** to **Moderate**.

6.8 Summary of Key Effects, Proposed Mitigation Measures and Residual and Cumulative Effects on Valued Components (VCs)

Table 6.8-1 below and includes a summary of the proposed mitigation measures for the Project to avoid, minimize, or offset potential adverse effects on the environment, social, economic, health and heritage VCs.

Table 6.8-1: Summary of Key Effects, Proposed Mitigation Measures, Residual and Cumulative Effects on Valued Components (VCs)

Valued Component	Subcomponent	Potential Effect	Contributing Activities within the Project Phases (C,O,D,P)*	Mitigation Measures	Residual Effect	Significance of Residual Effect	Cumulative Effect	Significant Cumulative Effect
Atmospheric Environment	Air Quality	Increase In Ambient Criteria Air Contaminant Concentrations	All activities (O)	▪ Limit Project footprint and Project Area ▪ Reclamation measures ▪ Transport measures ▪ Blasting measures. Refer to (EMP) ▪ Load management for processed coal trucks ▪ Drop height reduction See (AQMP) ▪ Vehicle and equipment fleet selection and maintenance (AQMP) ▪ Wood or oil stove replacement program	Yes	Not Significant	Yes	No
Atmospheric Environment	Greenhouse Gas Emissions	Increase In Greenhouse Gas Emissions	All activities (O)	▪ Transport measures ▪ Coal processing measures ▪ Vehicle and equipment fleet selection and maintenance (AQMP)	Yes	Not Significant	Yes	No
Atmospheric Environment	Noise	Increase In Ambient Noise Levels	All activities (O)	▪ Limit Project footprint and Project Area ▪ Transport measures ▪ Blasting measures (EMP) ▪ Vehicle and equipment fleet selection and maintenance (AQMP)	Yes	Not Significant	Yes	No
Terrain and Soils	Terrain Stability	Changes to Terrain from Vegetation and Rock Removal	All Activities (C, O, D, P)	▪ Avoid sensitive environments; ▪ Limit Project footprint and Project Area; ▪ Reclamation measures (refer to RCP); ▪ Project footprint boundaries; ▪ Transport measures; ▪ Forest management practices; ▪ Project siting and construction; and ▪ Vegetation clearing and soil salvage. Refer to CEMP, RCP and VMP). ▪ Additional VC-specific reclamation measures (Refer to RCP, VMP, CEMP, and SEPSCP)	Yes	Not Significant	No	No

Valued Component	Subcomponent	Potential Effect	Contributing Activities within the Project Phases (C,O,D,P)*	Mitigation Measures	Residual Effect	Significance of Residual Effect	Cumulative Effect	Significant Cumulative Effect
				Erosion and Sediment Control (Refer to CEMP and SEPSCP)				
Terrain and Soils	Soil Quality	Loss of Soils and Changes to Soil Quality Due to Changes in Chemical and Physical Characteristics	All Activities (C, O, D, P)	- Avoid sensitive environments - Limit Project footprint and Project Area - Reclamation measures (refer to RCP) - Project footprint boundaries - Transport measures - Forest management practices - Project siting and construction - Vegetation clearing and soil salvage (Refer to CEMP, RCP and VMP) - Additional VC-specific reclamation measures (Refer to RCP, VMP, CEMP, and SEPSCP) - Erosion and sediment control (Refer to CEMP and SEPSCP) - Spill prevention and response (Refer to FMSCP) - Blasting measures (refer to EMP) - Dust suppression and air emissions (Refer to AQMP, MTCP)	Yes	Not Significant	Yes	No
Surface Water	Surface Water Quantity	Change in Mean Annual Discharge	All Activities (C, O, D, P)	- Avoid sensitive environments - Limit Project footprint and Project Area - Reclamation measures (refer to RCP) - Management of metal leaching/acid rock drainage (refer to ML/ARDMP) - Water capture measures	Yes	Not Significant	Yes	No
Surface Water	Surface Water Quantity	Change in Seasonal Flow Distribution	All Activities (O, D, P)	- Limit Project footprint and Project Area - Transport measures - Water capture measures - Project use of water - Seepage management measures	Yes	Not Significant	Yes	No

Valued Component	Subcomponent	Potential Effect	Contributing Activities within the Project Phases (C,O,D,P)*	Mitigation Measures	Residual Effect	Significance of Residual Effect	Cumulative Effect	Significant Cumulative Effect
Surface Water	Surface Water Quantity	Change in Low and High Flows	All Activities (O, D, P)	- Water capture measures - Project use of water - Seepage management measures	Yes	Not Significant	Yes	No
Surface Water	Surface Water Quality	Change in Modelled Parameter Concentrations	All Activities (C, O, D, P)	- Avoid sensitive environments - Limit Project footprint and Project Area - Reclamation measures (refer to RCP) - Management of metal leaching/acid rock drainage (refer to ML/ARDMP) - Blasting measures (refer to EMP) - Water capture measures - Erosion and sediment control (refer to SEPSCP, CEMP, and MWMP) - Hazardous material and refueling (refer to FMSCP) - Water quality monitoring and reporting measures	Yes	Not Significant	Yes	No
Surface Water	Surface Water Quality	Change in other measurable water quality parameters	All Activities (C, O, D, P)	- Transport measures - Management of metal leaching/acid rock drainage (refer to ML/ARDMP) - Erosion and sediment control (refer to SEPSCP, CEMP, and MWMP) - Hazardous material and refueling (refer to FMSCP)	Yes	Not Significant	Yes	No
Groundwater	Groundwater Quantity	Change in Groundwater Level in Areas of Private Wells	- Mining the open pit (O) - Reclamation and closure activities at Minesite (D) - Maintain post-mining systems and ongoing monitoring (P)	- Limit Project footprint and Project Area - Management, control, and water storage pond designs - Project use of water - Flooding of the open pit in Decommissioning and Reclamation, and Post-closure phases of Project	Yes	Not Significant	No	No
Groundwater	Groundwater Quantity	Change in Groundwater	- Mining the open pit (O) - Operation of Surface Water Management	- Limit Project footprint and Project Area - Management, control, and water storage pond designs	Yes	Not Significant	No	No

Valued Component	Subcomponent	Potential Effect	Contributing Activities within the Project Phases (C,O,D,P)*	Mitigation Measures	Residual Effect	Significance of Residual Effect	Cumulative Effect	Significant Cumulative Effect
		Discharge Rates to Creeks and Rivers	- Infrastructure including channels and ponds (O) - Reclamation and closure activities at Minesite (D) - Maintain post-mining systems and ongoing monitoring (P)	- Project use of water - Flooding of the open pit in Decommissioning and Reclamation, and Post-closure phases of Project				
Groundwater	Groundwater Quality	Change in Groundwater Quality in Areas of Private Wells	- Mining the open pit (O) - Operation of Surface Water Management Infrastructure including channels and ponds (O) - Reclamation and closure activities at Minesite (D) - Maintain post-mining systems and ongoing monitoring (P)	- Limit Project footprint and Project Area - Blasting measures (refer to EMP) - Management, control, and water storage pond designs - Management of metal leaching/acid rock drainage (ML/ARDMP) - Spill management (FMSCP) - Chemical and materials storage and handling (CMSTHP) - Additional VC-specific measure to reduce nitrogen release (EMP)	Yes	Not Significant	No	No
Groundwater	Groundwater Quality	Change in Quality of Groundwater Discharging to Creeks and Rivers	- Mining the open pit (O) - Operation of Surface Water Management Infrastructure including channels and ponds (O) - Reclamation and closure activities at Minesite (D) - Maintain post-mining systems and ongoing monitoring (P)	- Limit Project footprint and Project Area - Blasting measures (refer to EMP) - Management, control, and water storage pond designs - Management of metal leaching/acid rock drainage (ML/ARDMP) - Spill management (FMSCP) - Chemical and materials storage and handling (CMSTHP) - Additional VC-specific measure to reduce nitrogen release (EMP)	Yes	Not Significant	No	No
Aquatic Resources	n/a	Changes in Water Quality	Maintain post-mining systems and ongoing monitoring (P)	- Limit Project footprint and Project Area - Avoid sensitive environments - Reclamation measures (refer to RCP) - Project footprint boundaries	Yes	Not Significant	No	No

Valued Component	Subcomponent	Potential Effect	Contributing Activities within the Project Phases (C,O,D,P)*	Mitigation Measures	Residual Effect	Significance of Residual Effect	Cumulative Effect	Significant Cumulative Effect
				▪ Transport measures ▪ Seepage management measures ▪ Erosion and sediment control (Refer to SEPSCP and MWMP) ▪ Water capture measures ▪ Spill prevention and response (Refer to FMSCP) ▪ Water quality monitoring and reporting measures				
Fish and Fish Habitat	Fish Habitat	Change in Fish Habitat	▪ All Activities (C) ▪ Mining the Tenas Open pit (O) ▪ Surface water management (O) ▪ Spillway operation(O) ▪ Storage pile maintenance (O) ▪ Removal and dismantling of mining equipment and facilities (D) ▪ Reclamation and closure of Project (D) ▪ Reclamation and closure of Goathorn Creek bridge (D)	▪ Limit Project footprint and Project Area ▪ Avoid sensitive environments ▪ Reclamation measures (refer to RCP) ▪ Project footprint boundaries ▪ Transport measures ▪ Project use of water ▪ Management of metal leaching/acid rock drainage (Refer to ML/ARDMP) ▪ Blasting measures ▪ Instream work windows ▪ Instream work procedures ▪ Clearing, grubbing and riparian setbacks (Refer to CEMP) ▪ Design and construction of watercourse crossing structures (Refer to CEMP) ▪ Erosion and sediment control (Refer to SEPSCP, CEMP and MWMP) ▪ Water withdrawal or diversion ▪ Hazardous materials and re-fueling (Refer to FMSCP) ▪ Restoration and reclamation ▪ Beaver dam removal	Yes	Not Significant	No	No
Fish and Fish Habitat	Fish Health	Change in Fish Health	▪ All Activities (C) ▪ Mining the Tenas Open pit (O)	▪ Limit Project footprint and Project Area ▪ Avoid sensitive environments	No	n/a	n/a	n/a

Valued Component	Subcomponent	Potential Effect	Contributing Activities within the Project Phases (C,O,D,P)*	Mitigation Measures	Residual Effect	Significance of Residual Effect	Cumulative Effect	Significant Cumulative Effect
			- Surface water management (O) - Spillway operation(O) - Storage pile maintenance (O) - Material handling systems (O) - Removal and dismantling of mining equipment and facilities (D) - Reclamation and closure of Project (D) - Reclamation and closure of Goathorn Creek bridge (D) - Post-mining systems and monitoring (D, P)	- Reclamation measures (refer to RCP) - Project footprint boundaries - Transport measures - Project use of water - Management of metal leaching/acid rock drainage (refer to ML/ARDMP) - Instream work windows - Instream work procedures - Fish salvage - Clearing, grubbing and riparian setbacks (Refer to CEMP) - Design and construction of watercourse crossing structures (Refer to CEMP) - Erosion and sediment control (Refer to SEPSCP and MWMP) - Water withdrawal or diversion - Hazardous materials and re-fueling (Refer to FMSCP) - Restoration and reclamation				
Vegetation	- Old Growth Forest - Wetlands - Listed Ecological Communities - Culturally Important Species - Rare Plants and Lichens	Alteration/ loss of vegetation, ecosystems, and wetlands	All Activities (C, O)	- Avoid sensitive environments - Limit Project footprint and Project Area - Reclamation (Refer to RCP) - Project footprint boundaries - Forest management practices - Transport measures - Project siting and construction - Vegetation clearing and soil salvage (Refer to RCP and VMP)	Yes	Not Significant	Yes	No
Vegetation	- Old Growth Forest - Wetlands - Listed Ecological Communities - Culturally Important Species	Alteration/ loss of vegetation, ecosystems, and wetlands	All Activities (C, O, D, P)	- Invasive plant management (Refer to VMP) - Erosion and sediment control (Refer to SEPSCP, CEMP and MWMP) - Management of metal leaching/acid rock drainage (Refer to ML/ARDMP)	Yes	Not Significant	Yes	No

Valued Component	Subcomponent	Potential Effect	Contributing Activities within the Project Phases (C,O,D,P)*	Mitigation Measures	Residual Effect	Significance of Residual Effect	Cumulative Effect	Significant Cumulative Effect
	Rare Plants and Lichens			Spill prevention and response (Refer to FMSCP)				
Vegetation	- Old Growth Forest - Wetlands - Listed Ecological Communities - Culturally Important Species - Rare Plants and Lichens	Alteration/ loss of vegetation, ecosystems, and wetlands	All Activities (C ,O, D)	- Transport measures - Dust suppression and air emissions (Refer to AQMP, MTCP)	Yes	Not Significant	Yes	No
Vegetation	- Old Growth Forest - Wetlands - Listed Ecological Communities - Culturally Important Species - Rare Plants and Lichens	Alteration/ loss of vegetation, ecosystems, and wetlands	All Activities (O, D, P)	Additional VC-specific reclamation measures (Refer to RCP, VMP, SEPSCP and CEMP)	Yes	Not Significant	Yes	No
Vegetation	- Old Growth Forest - Wetlands - Listed Ecological Communities - Culturally Important Species - Rare Plants and Lichens	Deposition of Trace Metals on Plants and Soil	All Activities (C, O)	- Avoid sensitive environments - Limit Project footprint and Project Area - Transport measures - Blasting measures - Project siting and construction - Vegetation clearing and soil salvage (Refer to RCP and VMP)	Yes	Not Significant	Yes	No
Wildlife	- Furbearers - Caribou - Grizzly Bear - Moose - Bats - Western Toad	Alteration and/or Loss of Habitat	- Mining the open pit (O) - Operation of Surface Water Management Infrastructure; Coal Processing Plant; water discharge infrastructure; material handling systems; and solid waste management systems (O) - Maintenance of Bypass Road; improved private road and Forest Service	- Avoid sensitive environments - Limit Project footprint and Project Area - Reclamation measures (refer to RCP) - Project footprint boundaries - Transport measures - Project component design - Blasting measures (refer to EMP) - Coal processing measures - Seepage management measures - Water capture measures - Management of metal leaching/acid rock drainage	Yes	Not Significant	Yes	No

Valued Component	Subcomponent	Potential Effect	Contributing Activities within the Project Phases (C,O,D,P)*	Mitigation Measures	Residual Effect	Significance of Residual Effect	Cumulative Effect	Significant Cumulative Effect
			Road; haul roads and service roads; bridge over Goathorn Creek; administration buildings; powerline and substation; Rail Infrastructure; and storage piles and stockpiles (O) - Progressive reclamation (O) - Dismantle and remove mining equipment and facilities (D) - Reclamation and closure activities at Minesite (D) - Reclamation and closure of Bypass Road; bridge over Goathorn Creek; powerline and substation; and Rail Infrastructure (D) - Implement post-mining systems and monitoring (D) - Maintain post-mining systems and ongoing monitoring (P)	- Project design and siting - Minimize habitat disturbance - Timing considerations. (Refer to WMP) - Wildlife education program (Refer to WMP) - Wildlife protection protocols (Refer to WMP) - Manage potential wildlife attractants (Refer to WMP)				
Wildlife	- Furbearers - Caribou - Grizzly Bear - Moose - Bats - Western Toad	Change in Mortality	- Transportation of equipment, materials, and personnel (C, O, D, P) - Site clearing (C) - Construction of Surface Water Management Infrastructure; Bypass Road; haul roads and	- Avoid sensitive environments - Limit Project footprint and Project Area - Project footprint boundaries - Transport measures - Project component design - Blasting measures (Refer to EMP) - Coal processing measures - Seepage management measures	Yes	Not Significant	Yes	No

Valued Component	Subcomponent	Potential Effect	Contributing Activities within the Project Phases (C,O,D,P)*	Mitigation Measures	Residual Effect	Significance of Residual Effect	Cumulative Effect	Significant Cumulative Effect
			service roads; Goathorn Creek Bridge; Coal Processing Plant; administration buildings; powerline and substation; Rail Infrastructure; water discharge infrastructure; and material handling systems (C) - Improvements to existing private road and Forest Service Road (C) - Mining the open pit (O) - Operation of Surface Water Management Infrastructure; Coal Processing Plant; water discharge infrastructure; material handling systems; and solid waste management systems (O) - Maintenance of Bypass Road; improved private road and Forest Service Road; haul roads and service roads; bridge over Goathorn Creek; administration buildings; powerline and substation; Rail Infrastructure; and storage piles and stockpiles (O) - Progressive reclamation (O)	- Water capture measures - Management of metal leaching/acid rock drainage - People, employees, contractors, and onsite policies - Project design and siting - Minimize habitat disturbance - Timing considerations (Refer to WMP) - Wildlife education program (Refer to WMP) - Wildlife protection protocols (Refer to WMP) - Manage hazardous materials (Refer to FMSCP and WMPRE) - Manage potential wildlife attractants (Refer to WMP)				

Valued Component	Subcomponent	Potential Effect	Contributing Activities within the Project Phases (C,O,D,P)*	Mitigation Measures	Residual Effect	Significance of Residual Effect	Cumulative Effect	Significant Cumulative Effect
			- Dismantle and remove mining equipment and facilities (D) - Reclamation and closure activities at Minesite (D) - Reclamation and closure of Bypass Road; bridge over Goathorn Creek; powerline and substation; and Rail Infrastructure (D) - Implement post-mining systems and monitoring (D) - Maintain post-mining systems and ongoing monitoring (P)					
Wildlife	- Furbearers - Caribou - Grizzly Bear - Moose - Bats - Western Toad	Change in Movement Patterns	- Transportation of equipment, materials, and personnel (C, O, D, P) - Site clearing (C) - Construction of Surface Water Management Infrastructure; Bypass Road; haul roads and service roads; Goathorn Creek Bridge; Coal Processing Plant; administration buildings; powerline and substation; Rail Infrastructure; water discharge infrastructure; and material handling systems (C)	- Avoid sensitive environments - Limit Project footprint and Project Area - Project footprint boundaries - Transport measures - Project component design - Blasting measures (Refer to EMP) - Coal processing measures - Seepage management measures - Water capture measures - Management of metal leaching/acid rock drainage - People, employees, contractors, and onsite policies - Project design and siting - Minimize habitat disturbance - Timing considerations (Refer to WMP) - Wildlife education program (Refer to WMP)	Yes	Not Significant	Yes	No

Valued Component	Subcomponent	Potential Effect	Contributing Activities within the Project Phases (C,O,D,P)*	Mitigation Measures	Residual Effect	Significance of Residual Effect	Cumulative Effect	Significant Cumulative Effect
			▪ Improvements to existing private road and Forest Service Roads (C) ▪ Mining the open pit (O) ▪ Operation of Surface Water Management Infrastructure; Coal Processing Plant; water discharge infrastructure; material handling systems; and solid waste management systems (O) ▪ Maintenance of Bypass Road; improved private road and Forest Service Road; haul roads and service roads; bridge over Goathorn Creek; administration buildings; powerline and substation; Rail Infrastructure; and storage piles and stockpiles (O) ▪ Progressive reclamation (O) ▪ Dismantle and remove mining equipment and facilities (D) ▪ Reclamation and closure activities at Minesite (D) ▪ Reclamation and closure of Bypass Road; bridge over Goathorn Creek; powerline and	▪ Wildlife protection protocols (Refer to WMP) ▪ Manage hazardous materials (refer to FMSCP and WMPRE) ▪ Manage potential wildlife attractants (Refer to WMP)				

Valued Component	Subcomponent	Potential Effect	Contributing Activities within the Project Phases (C,O,D,P)*	Mitigation Measures	Residual Effect	Significance of Residual Effect	Cumulative Effect	Significant Cumulative Effect
			substation; and Rail Infrastructure (D) - Implement post-mining systems and monitoring (D) - Maintain post-mining systems and ongoing monitoring (P)					
Avian Species	- Migratory Breeding Birds - Listed Bird Species - Raptors	Alteration and/or Loss of Habitat	- Transportation of equipment, materials, and personnel (C, O, D, P) - Site clearing (C) - Construction of Surface Water Management Infrastructure; Bypass Road; haul roads and service roads; Goathorn Creek Bridge; Coal Processing Plant; Administration Building; powerline and substation; Rail Infrastructure; water discharge infrastructure; and material handling systems (C) - Improvements to existing private road and Forest Service Roads (C) - Mining the open pit (O) - Operation of Surface Water Management Infrastructure; Coal Processing Plant; water discharge infrastructure; material handling	- Avoid sensitive environments - Minimize Project footprint and Project Area - Reclamation measures - Project footprint boundaries - Transport measures - Project component design - Blasting measures - Coal processing measures - Seepage management measures - Water capture measures - Management of metal leaching/acid rock drainage - Timing considerations - Establish “No Activity” buffers around nests - Wildlife education program - Wildlife protection protocols	Yes	Not Significant	Yes	No

Valued Component	Subcomponent	Potential Effect	Contributing Activities within the Project Phases (C,O,D,P)*	Mitigation Measures	Residual Effect	Significance of Residual Effect	Cumulative Effect	Significant Cumulative Effect
			systems; and solid waste management systems (O) ▪ Maintenance of Bypass Road; improved private road and Forest Service Road; haul roads and service roads; bridge over Goathorn Creek; Administration Building; powerline and substation; Rail Infrastructure; and storage piles and stockpiles (O) ▪ Progressive reclamation (O) ▪ Dismantle and remove mining equipment and facilities (D) ▪ Reclamation and closure activities at Minesite (D) ▪ Reclamation and closure of Bypass Road; bridge over Goathorn Creek; powerline and substation; and Rail Infrastructure (D) ▪ Implement post-mining systems and monitoring (D) ▪ Maintain post-mining systems and ongoing monitoring (P)					
Avian Species	▪ Migratory Breeding Birds ▪ Listed Bird Species	Change in Mortality	▪ Transportation of equipment, materials,	▪ Avoid sensitive environments ▪ Minimize Project footprint and Project Area	Yes	Not Significant	Yes	No

Valued Component	Subcomponent	Potential Effect	Contributing Activities within the Project Phases (C,O,D,P)*	Mitigation Measures	Residual Effect	Significance of Residual Effect	Cumulative Effect	Significant Cumulative Effect
	Raptors		- and personnel (C, O, D, P) - Site clearing (C) - Construction of Surface Water Management Infrastructure; Bypass Road; haul roads and service roads; Goathorn Creek Bridge; Coal Processing Plant; Administration Building; powerline and substation; Rail Infrastructure; water discharge infrastructure; and material handling systems (C) - Improvements to existing private road and Forest Service Road (C) - Mining the open pit (O) - Operation of Surface Water Management Infrastructure; Coal Processing Plant; water discharge infrastructure; material handling systems; and solid waste management systems (O) - Maintenance of Bypass Road; improved private road and Forest Service Road; haul roads and service roads; bridge over Goathorn Creek; Administration Building; powerline and	- Project footprint boundaries - Transport measures - Project component design - Blasting measures - Coal processing measures - Seepage management measures - Water capture measures - Management of metal leaching/acid rock drainage - People, employees, contractors, and onsite policies - Powerline design and siting - Timing considerations - Establish "No Activity" buffers around nests - Wildlife education program - Wildlife protection protocols - Manage chemical hazards - Manage potential attractants				

Valued Component	Subcomponent	Potential Effect	Contributing Activities within the Project Phases (C,O,D,P)*	Mitigation Measures	Residual Effect	Significance of Residual Effect	Cumulative Effect	Significant Cumulative Effect
			substation; Rail Infrastructure; and storage piles and stockpiles (O) - Progressive reclamation (O) - Dismantle and remove mining equipment and facilities (D) - Reclamation and closure activities at Minesite (D) - Reclamation and closure of Bypass Road; bridge over Goathorn Creek; powerline and substation; and Rail Infrastructure (D) - Implement post-mining systems and monitoring (D) - Maintain post-mining systems and ongoing monitoring (P)					
Avian Species	- Migratory Breeding Birds - Listed Bird Species - Raptors	Change in Movement	- Transportation of equipment, materials, and personnel (C, O, D, P) - Site clearing (C) - Construction of Surface Water Management Infrastructure; Bypass Road; haul roads and service roads; Goathorn Creek Bridge; Coal Processing Plant; Administration Building; powerline and	- Avoid sensitive environments - Minimize Project footprint and Project Area - Reclamation measures - Project footprint boundaries - Transport measures - Project component design - Blasting measures - Coal processing measures - Seepage management measures - Water capture measures	Yes	Not Significant	Yes	No

Valued Component	Subcomponent	Potential Effect	Contributing Activities within the Project Phases (C,O,D,P)*	Mitigation Measures	Residual Effect	Significance of Residual Effect	Cumulative Effect	Significant Cumulative Effect
			substation; Rail Infrastructure; water discharge infrastructure; and material handling systems (C) ▪ Improvements to existing private road and Forest Service Roads (C) ▪ Mining the open pit (O) ▪ Operation of Surface Water Management Infrastructure; Coal Processing Plant; water discharge infrastructure; material handling systems; and solid waste management systems (O) ▪ Maintenance of Bypass Road; improved private road and Forest Service Road; haul roads and service roads; bridge over Goathorn Creek; Administration Building; powerline and substation; Rail Infrastructure; and storage piles and stockpiles (O) ▪ Progressive reclamation (O) ▪ Dismantle and remove mining equipment and facilities (D) ▪ Reclamation and closure activities at Minesite (D)	▪ Management of metal leaching/acid rock drainage ▪ Powerline design and siting ▪ Timing considerations ▪ Establish “no activity” buffers around nests ▪ Wildlife education program ▪ Wildlife protection protocols ▪ Manage chemical hazards ▪ Manage potential attractants				

Valued Component	Subcomponent	Potential Effect	Contributing Activities within the Project Phases (C,O,D,P)*	Mitigation Measures	Residual Effect	Significance of Residual Effect	Cumulative Effect	Significant Cumulative Effect
			- Reclamation and closure of Bypass Road; bridge over Goathorn Creek; powerline and substation; and Rail Infrastructure (D) - Implement post-mining systems and monitoring (D) - Maintain post-mining systems and ongoing monitoring (P)					
Labour Market	n/a	- Increase in Competition for Skilled Local and Regional Workforce - Increase in Labour Cost	Project Employment and Income (C, O)	- People, employees, contractors, and onsite policies OHSP - Enhance local and regional benefits including employment - Housing measures (refer to SEMP) - Procurement Program (Refer to SEMP) - Child Care Program (Refer to SEMP) - Communications (Refer to SEMP) - Education and Training Support (Refer to SEMP) SEMP	Yes	Not Significant	Yes	No
Labour Market	n/a	Barriers to Indigenous Employment and Participation in Project-Related Economic Benefits	Project Employment and Income (C, O)	In addition to the above, the following measures are applicable to this effect: - Health, Safety, and Human Resource Superintendent (Refer to SEMP) - Indigenous Cultural Awareness Induction (Refer to SEMP) SEMP	Yes	Not Significant	Yes	No
Economic Development	Local Business and Industry Subcomponent	Decrease in Economic Diversity	Project employment and procurement opportunities (C, O)	Enhance business diversity	Yes	Not Significant	Yes	No

Valued Component	Subcomponent	Potential Effect	Contributing Activities within the Project Phases (C,O,D,P)*	Mitigation Measures	Residual Effect	Significance of Residual Effect	Cumulative Effect	Significant Cumulative Effect
Economic Development	Local Business and Industry Subcomponent	Change in the Capacity of Local or Regional Businesses to supply goods or services	Project employment and procurement opportunities (C, O)	- Enhance local and regional benefits including employment - Procurement Program.(Refer to SEMP)	Yes	Not Significant	Yes	No
Economic Development	Local Business and Industry Subcomponent	Change that Affects Development Plans or Strategies of Government	Land use disturbance (C, O)	Mitigation measures to reduce or remove effects of the Project on Land and Resource Use VC (as related to land use and planning) are provided in Land and Resource Use VC (S6.0-C4 of the EAC Application).	No	n/a	n/a	n/a
Economic Development	Local Business and Industry Subcomponent	Decrease in Local and Regional Marketable Timber	Land use disturbance (C, O)	- Forest management practices - Reclamation measures. See RCP. - Mitigation measures to reduce or remove effects of the Project on Land and Resource Use VC (as related to forestry resources) are provided in S6.0-C4 Land and Resource Use VC.	No	n/a	n/a	n/a
Economic Development	Local Business and Industry Subcomponent	Decrease in Local or Regional Tourism	Visual disturbances, as well as noise, vibration, and dust from the Project (C, O, D)	- Limit Project footprint and Project Area - Project component design - Blasting measures. See EMP - Mitigation measures to reduce effects of the Project on land and resource use to preserve natural resources are described in S6.0-C4 Land and Resource Use VC. - Mitigation measures to enhance visual resources of the Project are provided in S6.0-C2 Visual Resources VC. - Mitigation measures to reduce noise, vibration, and dust, and improve air quality around the Minesite are provided in the S4.0-C1 Atmospherics VC.	Yes	Not Significant	Yes	No
Economic Development	Local Business and Industry Subcomponent	Decrease in Economic Activity During	Project employment and procurement opportunities (D)	- Procurement Program (SEMP) - Decommissioning and Reclamation, and Post-closure program (see SEMP)	Yes	Not Significant	Yes	No

Valued Component	Subcomponent	Potential Effect	Contributing Activities within the Project Phases (C,O,D,P)*	Mitigation Measures	Residual Effect	Significance of Residual Effect	Cumulative Effect	Significant Cumulative Effect
		Decommissioning and Reclamation Phase						
Demographics	n/a	Change in population and related demographic factors	Employment and Labour (C)	- People, employees, contractors and on-site policies - Enhance local and regional benefits including employment measures - Housing measures - Education and training support (See SEMP) - Housing and Accommodation Program (see SEMP) - Communication measures (see SEMP) - Health, Safety, and Human Resources Superintendent (see SEMP). - Indigenous Cultural Awareness Induction (see SEMP). - Child care program (see SEMP)	No	n/a	n/a	n/a
Demographics	n/a	Change in population and related demographic factors	Employment and Labour (O)	- People, employees, contractors and on-site policies - Enhance local and regional benefits including employment measures - Housing measures - Education and training support (see SEMP) - Housing and Accommodation Program (see SEMP) - Communication measures (see SEMP) - Health, Safety, and Human Resources Superintendent (see SEMP). - Indigenous Cultural Awareness Induction (see SEMP). - Child Care program (see SEMP)	Yes	Not Significant	Yes	No

Valued Component	Subcomponent	Potential Effect	Contributing Activities within the Project Phases (C,O,D,P)*	Mitigation Measures	Residual Effect	Significance of Residual Effect	Cumulative Effect	Significant Cumulative Effect
Demographics	n/a	Change in population and related demographic factors	Employment and Labour (D)	n/a	n/a	n/a	n/a	n/a
Demographics	n/a	Change in population and related demographic factors	Employment and Labour (P)	n/a	n/a	n/a	n/a	n/a
Visual Resources	Visual Quality	Reduction in Visual Quality (Minesite)	All activities (C, O, D)	- Limit Project footprint and Project Area - Reclamation measures (Refer to RCP) - Project component design - Revegetation of disturbed areas relevant to Visual Resources (Refer to VRMP) - Targeted vegetation screening (Refer to VRMP)	Yes	Significant	Yes	No
Visual Resources	Visual Quality	Reduction in Visual Quality (Minesite)	All activities (P)	- Limit Project footprint and Project Area - Reclamation measures (Refer to RCP) - Revegetation of disturbed areas relevant to Visual Resources (Refer to VRMP) - Targeted vegetation screening (Refer to VRMP)	Yes	Not Significant	Yes	No
Visual Resources	Visual Quality	Reduction in Visual Quality (Rail Infrastructure)	All activities (C, O, D)	- Limit Project footprint and Project Area - Targeted vegetation screening (Refer to VRMP)	Yes	Not Significant	Yes	No
Infrastructure and Services	Housing and Accommodation	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)	No	n/a	n/a	n/a
Infrastructure and Services	Housing and Accommodation	Increase in Cost or Decrease in	Employment and Labour (O)	- Housing measures - Procurement program (SEMP)	Yes	Not Significant	Yes	No

Valued Component	Subcomponent	Potential Effect	Contributing Activities within the Project Phases (C,O,D,P)*	Mitigation Measures	Residual Effect	Significance of Residual Effect	Cumulative Effect	Significant Cumulative Effect
		Availability of Housing and Accommodations		- Housing and accommodation program (SEMP) - Education and training support (SEMP) - Community Engagement Programs (SEMP)				
Infrastructure and Services	Community Infrastructure and Services	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)	Yes	Not Significant	Yes	No
Infrastructure and Services	Transportation	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)	Yes	Not Significant	Yes	No
Land and Resource Use	Commercial Land and Resource Use	Change in Access	All activities (C, O, D)	- Limit Project footprint and Project Area - Consultation with tenure holders - Indigenous consultation and engagement - Compensation for affected commercial tenure holders - Public Access Management (refer to PAMP) - Improvements to existing trail - Signage - Land use agreements	Yes	Not Significant	Yes	No
Land and Resource Use	Public Recreation Use	Change in Access	Activities on Mine site, Bypass Road and Rail Loop (C, O, D)	- Limit Project footprint and Project Area - Indigenous consultation and engagement - Public Access Management (refer to PAMP) - Improvements to existing trail	Yes	Not Significant	Yes	No

Valued Component	Subcomponent	Potential Effect	Contributing Activities within the Project Phases (C,O,D,P)*	Mitigation Measures	Residual Effect	Significance of Residual Effect	Cumulative Effect	Significant Cumulative Effect
				- Signage - Land use agreements				
Land and Resource Use	Commercial Land and Resource Use	Change in Sensory Disturbance	All activities (C, O, D)	- Limit Project footprint and Project Area - Reclamation measures (refer to RCP) - Transport measures - Project component design - Blasting measures (refer to EMP) - Coal processing measures - Consultation with tenure holders - Indigenous consultation and engagement	Yes	Not Significant	Yes	No
Land and Resource Use	Public Recreation Use	Change in Sensory Disturbance	All activities (C, O, D)	- Limit Project footprint and Project Area - Reclamation measures (refer to RCP) - Transport measures - Project component design - Blasting measures (refer to EMP) - Coal processing measures - Indigenous consultation and engagement	Yes	Not Significant	Yes	No
Land and Resource Use	Commercial Land and Resource Use	Change in Quantity and Quality of Resources	All activities (C, O, D)	- Limit Project footprint and Project Area - Reclamation measures (refer to RCP) - Transport measures - Seepage management measures - Water capture measures - Management of metal leaching/acid rock drainage - Public Access Management (refer to PAMP) - Improvements to existing trail - Consultation with tenure holders - Indigenous consultation and engagement	No	n/a	n/a	n/a
Land and Resource Use	Public Recreational Use	Change in Quantity and Quality of Resources	All activities (C, O, D)	- Reclamation measures (refer to RCP) - Transport measures - Seepage management measures	Yes	Not Significant	Yes	No

Valued Component	Subcomponent	Potential Effect	Contributing Activities within the Project Phases (C,O,D,P)*	Mitigation Measures	Residual Effect	Significance of Residual Effect	Cumulative Effect	Significant Cumulative Effect
				- Water capture measures - Management of metal leaching/acid rock drainage - Public Access Management (refer to PAMP) - Improvements to existing trail - Indigenous consultation and engagement				
Land and Resource Use	Public Recreational Use	Change in or Interference with Recreational Infrastructure	All activities (C, O, D)	- Public Access Management (refer PAMP) - Improvements to existing trail	Yes	Not Significant	Yes	No
Community Well-Being	n/a	Change in Food Security	All activities C, O, D	- Limit Project footprint and Project Area - Reclamation measures (refer to RCP) - Transport measures - Blasting measures (refer to EMP) - Management of metal leaching/acid rock drainage (refer to ML/ARDMP) - People, employees, contractors and onsite policies - Public access management (refer to PAMP) - Dust suppression and air emissions (refer to AQMP and MTCP) - Subsistence Food Management Plan (refer to RCP) - Community Engagement Programs (refer to SEMP) - Spill prevention and response (refer to FMSCP) - Management of hazardous materials and wildlife attractants (refer to FMSCP, WMPRE and WMP)	Yes	Not Significant	Yes	No
Community Well-Being	n/a	Change in Cost of Living	All activities (C, O)	Housing measures	Yes	Not Significant	Yes	No

Valued Component	Subcomponent	Potential Effect	Contributing Activities within the Project Phases (C,O,D,P)*	Mitigation Measures	Residual Effect	Significance of Residual Effect	Cumulative Effect	Significant Cumulative Effect
				- Education and training support (refer to SEMP) - Health and Wellness Program (refer to SEMP) - Housing and Accommodation Program (refer to SEMP) - Procurement program (refer to SEMP) - Health, Safety, and Human Resources Superintendent (refer to SEMP)				
Community Well-Being	n/a	Change in Community Cohesion	All activities (C, O)	- Health and Wellness Program (refer to SEMP) - Education and training support (refer to SEMP) - Procurement Program (refer to SEMP) - Community Engagement Programs (refer to SEMP)	Yes	Not Significant	Yes	No
Community Well-Being	n/a	Change in Community Cohesion	All activities (D)	- Health and Wellness Program (refer to SEMP) - Decommissioning and Reclamation, and Post-closure Program (refer to SEMP)	Yes	Not Significant	Yes	No
Community Well-Being	n/a	Change in Mental Health	All activities (C, O)	- Limit Project footprint and Project Area - Reclamation measures (refer to RCP) - Project component design - Blasting measures (refer to EMP) - Education and training support (refer to SEMP) - Health and Wellness Program (refer to SEMP) - Procurement Program (refer to SEMP) - Community Engagement Programs (refer to SEMP)	Yes	Not Significant	Yes	No
Community Well-Being	n/a	Change in Mental Health	All activities (D)	Decommissioning and Reclamation, and Post-closure Program (refer to SEMP)	Yes	Not Significant	Yes	No

Valued Component	Subcomponent	Potential Effect	Contributing Activities within the Project Phases (C,O,D,P)*	Mitigation Measures	Residual Effect	Significance of Residual Effect	Cumulative Effect	Significant Cumulative Effect
Heritage Resources	Archaeological Resources	Change in Presence, Number, Type, and/or Significance of Archaeological Resources	All activities (C, O)	- Avoid sensitive environments - Limit Project footprint and Project Area - Project footprint boundaries - Implement HRMP - Additional Archaeological Impact Assessment - Chance Find Procedures - Avoidance by the establishment of buffer zones to newly discovered or existing archaeological resources - Determination of final mitigation measures for Archaeological Resources	No	n/a	n/a	n/a
Heritage Resources	Historic and Cultural Sites	Change in Presence, Number, Type, and/or Significance of Historic and Cultural Sites (i.e., post-1846 culturally modified trees [CMTs], areas of Indigenous cultural significance, and palaeontological resources)	All activities (C, O)	- Avoid sensitive environments - Limit Project footprint and Project Area - Project footprint boundaries - Implement HRMP - Additional Archaeological Impact Assessment - Palaeontological Fossil Impact Assessment - Chance Find Procedures - Consultation to determine preferred mitigation measures (if avoidance is not feasible)	No	n/a	n/a	n/a
Human Health	n/a	Change in Human Health due to Changes in Air Quality	All activities generating emissions (O)	- Limit Project footprint and Project Area - Reclamation measures (refer to RCP) - Transport measures - Blasting measures (refer to EMP) - Vehicle and equipment fleet selection and maintenance (refer to AQMP) - Dust suppression and air emissions (refer to AQMP, MTCP) - Wood or oil stove replacement program	Yes	Not Significant	Yes	No

Valued Component	Subcomponent	Potential Effect	Contributing Activities within the Project Phases (C,O,D,P)*	Mitigation Measures	Residual Effect	Significance of Residual Effect	Cumulative Effect	Significant Cumulative Effect
Human Health	n/a	Change in Human Health due to Changes in Environmental Media Quality	All activities generating emissions and effluents (C, O, D, P)	- Limit Project footprint and Project Area - Reclamation measures (refer to RCP) - Transport measures - Blasting measures (refer to EMP) - People, employees, contractors, and onsite policies - Public access management (refer to PAMP) - Dust suppression and air emissions (refer to AQMP, MTCP) - Erosion and sediment control (refer to SEPSCP, CEMP, and MWMP) - Management of metal leaching/acid rock drainage (refer to ML/ARDMP) - Spill prevention and response (refer to FMSCP) - Management of hazardous materials and wildlife attractants (refer to FMSCP and WMPRE and WMP)	Yes	Not Significant	Yes	No
Human Health	n/a	Change in Human Health due to Changes in Noise	All activities generating noise (O)	- Limit Project footprint and Project Area - Transport measures - Blasting measures (refer to EMP) - Vehicle and equipment fleet selection and maintenance (refer to AQMP)	Yes	Not Significant	Yes	No

Notes: n/a =not applicable

VC=Valued Component; SC=subcomponent;

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

AQMP=Air Quality Management Plan (S13.0-C1); CMSTHP= Chemical and Materials, Storage, Transfer, and Handling Plan (S13.0-C3); CEMP=Construction Environmental Management Plan (S13.0-C4); EMP=Explosives Management Plan (S13.0-C6); FMSCP= Fuel Management and Spill Control Plan (S13.0-C7); HRMP=Heritage Resources Management Plan (S13.0-C8); MTCP=Minesite Traffic Control Plan (S13.0-C10); MWMP= Minesite Water Management Plan (S13.0-C11); ML/ARDMP= Metal Leaching/Acid Rock Drainage Management Plan (S13.0-C12); OHSP=Occupational Health and Safety Program (S13.0-C13); PAMP=Public Access Management Plan (S13.0-C14); RCP=Reclamation and Closure Plan (S13.0-C15); SEMP=Socio-Economic Management Plan (S13.0-C16); SEPSCP=Surface Erosion Prevention and Sediment Control Plan (S13.0-C17); VMP=Vegetation Management Plan (S13.0-C18); VRMP=Visual Resources Management Plan (S13.0-C19); WMPRE=Waste Management Plan for Refuse and Emissions (S13.0-C20); WMP=Wildlife Management Plan (S13.0-C21).

*Please refer to **Table 5.1-2** of each respective VC chapter for list of applicable activities for each listed Project phase, unless otherwise noted in this table.

7. PROPONENT CONCLUSIONS

Based on the results of this effects assessment, TCL concludes that the Project is likely to result in no significant adverse effects on all but one of the VCs with the application of proven, accepted mitigation measures summarized above in **Table 6.8-1**.

Only the Visual Quality subcomponent for the Minesite during the Active Phases (Construction, Operation, Decommissioning and Reclamation) was predicted to be Significant, resulting in a predicted Significant residual effect on Visual Resources VC. Mitigation measures are expected to reduce the overall visual disturbance caused by the Project, however, the location of the Project in proximity to Smithers and Telkwa on a slightly elevated plateau above the Telkwa River valley means that the Project will likely be visible from some of the assessed viewpoints within the LSA. As noted in the following paragraph, the cumulative effect for the Visual Resources VC was found to be Not Significant, indicating that within the Visual Resources RSA, the Project would not detract from people's appreciation, which is personal and subjective, of the existing viewshed.

All residual effects identified, Significant or Not Significant, were carried forward to the CEA. No significant adverse cumulative effects were identified in the assessment.

After consideration of the potential residual effects and considering the context of the Project Area, Project design, and mitigation measures, TCL and its assessment team are confident that the Project can be constructed, operated, and decommissioned and reclaimed in an environmentally responsible manner. This conclusion considers the proactive planning and engineering, the ongoing and progressive reclamation efforts that are proposed to occur during all phases of the Project and the commitment to an adaptive management process. TCL has identified appropriate monitoring programs to be conducted throughout the life of the Project. The information collected during these monitoring programs will be used to identify issues and the design and application of appropriate solutions in a timely manner to protect the identified VCs.

TCL is committed to continuing to work with the Wet'suwet'en, local communities, and regulatory agencies throughout all phases of the Project to limit the potential for adverse effects on the identified VCs and be a responsible neighbour in the Bulkley Valley.

TCL submits this Application as a request to the BC EAO for an Environmental Assessment Certificate under the BC *Environmental Assessment Act*, SBC 2002, c 43 (GovBC 2002b).

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