BC EAO EAC Application – Tenas Project

Section 6.0 Social Effects Assessment
Chapter 2 Visual Resources Valued Component

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VERSION 1.0

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BC EAO EAC Application – Tenas Project

Section 6.0 Social Effects Assessment
Chapter 2 Visual Resources Valued Component

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ABBREVIATIONS AND ACRONYMS

Abbreviation or Acronym	Long Form of Abbreviation or Acronym
AIR	Application Information Requirements
BC	British Columbia
BC EAO	British Columbia Environmental Assessment Agency
BC ILMB	British Columbia Integrated Land & Resource Registry
BC MFLNRO	British Columbia Ministry of Forests, Lands and Natural Resource Operations
BC MOF	British Columbia Ministry of Forests
BCTC	British Columbia Transmission Corporation
BMP	best management practices
C	Chapter
CDEM	Canadian Digital Elevation Model
CEA	cumulative effects assessment
CNR	Canadian National Railway
CPP	Coal Processing Plant
CUS	Cultural Use Study
EA	environmental assessment
EAC	Environmental Assessment Certificate
EVC	Existing Visual Condition
FRPA	*Forest and Range Practices Act 2002*, SBC 2002, c 69 (Government of British Columbia [GovBC])
FSR	Forest Service Road
FVER	Final Visual Effect Rating
GovBC	Government of British Columbia
HCMC	Harper Creek Mining Corporation
ISENA	Illuminating Engineers Society of North America
LRMP	Land and Resource Management Plan
LSA	Local Study Area
LUP	Landscape Unit Plans
MIC	Mine Infrastructure Complex
NRCAN	Natural Resources Canada
PAG	potentially acid generating
PNG	Pacific Northern Gas
OW	Office of the Wet'suwet'en
Project	Tenas Project
RCP	Reclamation and Closure Plan (S13.0-C15)

Abbreviation or Acronym	Long Form of Abbreviation or Acronym
ROW	right-of-way
RSA	Regional Study Area
S	Section
SRMP	Sustainable Resource Management Plan
TAC	Tenas Access Corridor
TCL	Telkwa Coal Limited
TCRC	Telkwa Coal Recreation Camp
TK	traditional knowledge
VC	Valued Component
VLI	Visual Landscape Inventory
VRMP	Visual Resources Management Plan (S13.0-C19)
VQO	Visual Quality Objective

UNITS OF MEASURE

Abbreviation	Long form of Abbreviation or Acronym
°	degrees
%	percent
ha	hectare
km	kilometre
km^2	square kilometres
kV	kilovolt
m	metre
m^3	cubic metres
V	volt

EXECUTIVE SUMMARY

This chapter is an analysis of potential interactions between the Tenas Project (Project) and the Visual Resources Valued Component (VC) in the landscape of the Bulkley and Telkwa river valleys. 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 British Columbia recognizes visual quality as a management objective as outlined in the *Forest and Range Practices Act,* SBC 2002, c 69 (*FRPA*) (Government of British Columbia [GovBC] 2002b), which establishes a framework for identifying and classifying scenic value as an important part of the province's resource base. Similarly, both the Bulkley Land and Resource Management Plan (LRMP) and the Bulkley Valley Sustainable Resource Management Plan (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 (refer to Chapter 12.0 of **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 used to evaluate the effects of the Project on Visual Quality. FVER is the ultimate output of a Hassell Matrix analysis, which addresses the two (2) 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 (1) for the Minesite during the Construction, Operation, and Decommissioning and Reclamation Phases (collectively referred to as the Active Phases, one (1) 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 (1) viewpoint reported a FVER of Moderate, 11 reported Slight, and six (6) reported Negligible. None reported FVERs of Substantial or Severe. One (1) viewpoint was excluded from the Rail Infrastructure assessment as the Rail Infrastructure was not visible from that location.

Measures put forward to mitigate potential effects of the Project on Visual Quality include: limiting the Project footprint and Project Area, Project component design measures, reclamation measures, revegetation of disturbed areas, and targeted vegetation screening. Mitigations are not expected to be fully effective, so a residual effect is expected for all three (3) 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 cumulative effects assessment (CEA).

While ambient light is not a subcomponent of the Visual Resources VC (Telkwa Coal Limited [TCL] 2019, British Columbia Environmental Assessment Office [BC EAO] 2021) 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 best management practices (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 subcomponent, 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 percent (%) 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.

1. INTRODUCTION

This chapter is an analysis of potential interactions between the Telkwa Project (Project) and the Visual Resources Valued Component (VC) in the landscape of the Bulkley River and Telkwa river valleys. Visual Resources refers to the collection of natural features within a landscape that have aesthetic value to viewers of that landscape, including resources such as forests, mountains, or other natural features that are considered scenic. For the purposes of this assessment, Visual Resources is supported by the Visual Quality subcomponent. Visual Resources is a management priority in British Columbia (BC), as outlined in the *Forest and Range Practices Act,* SBC 2002, c. 69 (Government of British Columbia [GovBC] 2002b) *(FRPA*). While ambient light is not a subcomponent of the Visual Resources VC (Telkwa Coal Limited [TCL] 2019, British Columbia Environmental Assessment Agency [BC EAO] 2022) a qualitative discussion is included as a matter of community interest is included in this chapter.

This assessment is comprised of the following steps:

- **Regulatory Context**: A description of the relevant regulatory frameworks in BC and the Bulkley Valley region relevant to Visual Resources, specifically the *FRPA* and the Bulkley Land and Resource Management Plan (LRMP), and the regional Bulkley Valley Sustainable Resource Management Plan (SRMP);
- **Scope of the Assessment**: A description of the assessment scope including issues scoping, rationale for the selection of the Visual Resources VC, its subcomponent and indicator, and definitions for the spatial and temporal boundaries of the assessment;
- **Existing Conditions**: The existing conditions of Visual Resources in the landscape are reviewed and described, including an overview of the regulatory environment and an analysis of visual lines of sight to the Project; this informs the selection of viewpoints, incorporating a range of land uses and viewing geometries;
- **Assessment of Project-related Effects**: Potential interactions between the Project and Visual Resources are identified and evaluated to determine whether those interactions could result in adverse effects on the Visual Resources VC. Mitigation measures are outlined, and any subsequent residual adverse effects are described. These effects are characterised, and their significance is determined;
- **Cumulative Effects Assessment (CEA)**: Potential interactions between residual effects due to the Project and residual effects due to other past, present, or reasonably foreseeable future projects or activities are identified and assessed to determine if cumulative effects are likely to occur. Mitigation measures (if/where necessary) are described, and any subsequent cumulative residual effects are described and characterised, and their significance is determined; and
- **Follow-up Strategy**: Due to uncertainties inherent in this analysis and the changing nature of the landscape, a monitoring procedure is outlined to support adaptive management of the Project for any unexpected potential adverse effects to the Visual Resources VC.

2. REGULATORY CONTEXT

The Application Information Requirements (AIR) for the Project, approved by the British Columbia Environmental Assessment Office (BC EAO) in 2022, outline the requirements of the Environmental Assessment (EA) for the Visual Resources VC to meet the provincial EA requirements under the BC *Environmental Assessment Act,* SBC 2002, c. 43 (GovBC 2002a) (*EAA*). The EA for the Visual Resources VC follows these guidelines and legislated requirements and is consistent with the requirements of the Project AIR. Legislation specific to the Visual Resources VC and descriptions of the data requirements to assess the environmental effects are presented in the following subsections.

The Province of British Columbia recognizes visual quality to be an important management objective as outlined in the *FRPA*. This Act establishes a framework for identifying and classifying "scenic value" as an important part of the provincial resource base. The key tool in this framework is the Visual Landscape Inventory (VLI), a database of landscapes throughout the province that have been identified as having some scenic value. Ultimately, most of these landscape units are assigned a Visual Quality Objective (VQO), which represents a desired limit to visual disturbance for that landscape unit (**Table 2-1**). Although the *FRPA* imposes no regulatory burden on non-forestry activities, the framework remains a tool to assess visual quality.

Table 3.1-1: Visual Quality Objectives and Definitions

Objective	Code	% of Alteration of View	Definition
Preservation	P	0	Alteration is very small in scale, and not easily distinguishable from the pre-harvest landscape.
Retention	R	0 to 1.5	Alteration is difficult to see, small in scale, and natural in appearance.
Partial Retention	PR	1.5 to 7	Alteration is easy to see, small to medium in scale, and natural and not rectilinear or geometric in shape.
Modification	M	7 to 18	Alteration is very easy to see and is: (a) large in scale and natural in its appearance, or (b) small to medium in scale but with some angular characteristics.
Maximum Modification	MM	18 to 30	Alteration is very easy to see and is: (a) very large in scale, (b) rectilinear and geometric in shape, or (c) both.

Note: *%=percent*

The Project is situated within two resource management plan areas – the Bulkley LRMP (GovBC 1998) and the Bulkley Valley SRMP (British Columbia Integrated Land & Resource Registry [BC ILMB] 2005). Both plans identify visual quality as a key consideration in resource development activities, and largely use existing VQOs as the guideline for acceptable levels of visual disturbance. Section 2.1.6 in the Bulkley LRMP (GovBC 1998) explicitly states that all resource development activities must consider visual quality.

The Bulkley LRMP is subdivided into 12 Landscape Unit Plans (LUPs), in which more specific visual quality directives focus on either the views of specific landscapes or the views from specific viewpoints. None of the directives apply to the landscape on which the Project is situated, but a number of identified viewpoints fall within the Local Study Area (LSA). See **Table 2-2**. The Bulkley Valley SRMP defers to the LRMP with respect to visual quality directives and contains language regarding strategies to meet established VQOs applicable to forestry activities.

Table 3.1-2: Viewpoints in the Local Study Area (LSA)/Regional Study Area (RSA) Identified in the Bulkley Land and Resource Management Plan Landscape Unit Plans

Landscape Unit Plan (LUP)	Viewpoint
Bulkley LUP	Telkwa/Hubert Rest Stop
Bulkley LUP	Smithers Goat Statue
Bulkley LUP	Smithers Airport
Bulkley LUP	Adams Igloo
Copper LUP	McDonnell Lake
Copper LUP	Dennis Lake
Copper LUP/Telkwa LUP	Hudson Mountain Resort
Deep Creek LUP/Bulkley LUP	Quick School
Deep Creek LUP/Bulkley LUP	Hungry Hill Rest stop
Resister LUP	Grassy Mountain
Reiseter LUP	Harvey Mountain
Telkwa LUP	Aldrich
Telkwa LUP	Jonas Creek Recreation Site

The Project also sits near the boundary of the Morice LRMP. The Morice LRMP considers the management of visual resources within its jurisdiction but does not indicate specific viewpoints from which views should be preserved (BC ILMB 2007). Furthermore, following the analysis of the results from viewshed modelling, no land uses, or viewpoints were identified at locations where the Project is potentially visible. Therefore, no further consideration of the effects of the Project with respect to the Morice LRMP will be carried forward (assessment boundaries are described in **3.2.4**).

Ambient light refers to nighttime light conditions affected by artificial light from built up areas, including resource development, urban and rural development, and transportation. There are no legal requirements (e.g., regulations, guidelines, or policies) in place in BC that regulate the amount of obtrusive light[1] being emitted from facilities. However, the International Commission on Illumination and the Illuminating Engineers Society of North America (IESNA), have developed a set recommended light trespass[2] limitations (IES 2020). TCL has already mitigated for the potential change in ambient light by utilizing lighting designs that incorporate horizontal cut-off light fixtures to prevent light trespass, sky glow, and glare. Additionally, all lighting at the Minesite, roadways, and Rail Loadout will follow best management practices (BMP), such as IESNA lighting design guidance, to optimize efficiency and minimize sensory disturbance.

[1] Obtrusive light is direct or reflected light that, because of quantitative, directional or spectral attributes in a given context, causes annoyance, discomfort, distraction or a reduction in the ability to see (IES 2020).
[2] The encroachment of light, typically across property boundaries, causing annoyance, loss of privacy, or other nuisance (IES 2020).

3. SCOPE OF THE ASSESSMENT

The assessment of the Visual Resources VC, including the assessment of Project-related effects and cumulative effects, was conducted according to the methods set out in **Section (S) 3.0 Assessment Methodology** of this EAC Application.

The subsection outlines the scope of the assessment, including the rationale for the inclusion of Visual Resources as a VC along with its subcomponent, the selection of an indicator, and the definition of spatial and temporal boundaries. The assessment is informed by the **Tenas Project 2017 to 2019 Baseline Report (Appendix 4.1-C** of **S4.0-Chapter [C] 1 Atmospheric Environment VC** of the **EAC Application)** hereafter referred to as **Appendix 4.1-C**, as well as input from Indigenous Groups, the public and government agencies through working groups and comment solicitation, which identified the importance of Visual Resources and aided in identifying specific locations of concern. The Visual Resources VC has one (1) subcomponent: Visual Quality (**3.3.2 Subcomponents**) and assessed using a methodology specific to the subcomponent. For the Visual Quality subcomponent, information collected from 19 viewpoints in the surrounding area includes the type of land use, the existing visual condition of the landscape in the direction of the Project, and various visual parameters characterising how the Project appears to viewers. Those parameters are organized into a matrix that rates the overall visual effect of the Project as it appears from each viewpoint. These ratings feed into the final characterisation of the residual effects of the Project on Visual Quality, based on which a determination of the significance is made. All residual effects are carried forward into the CEA; there, these Project-related effects are placed in the context of similar effects from all other projects and activities in the area. These cumulative effects are characterised in a similar manner as the residual effects, leading to a determination of the significance of the Project's contribution to the cumulative effects.

3.1 Issues Scoping

Initial scoping activities involved reviewing a variety of information sources, including regional development plan, along with past EAC applications for open pit and coal mines in BC, to understand the value placed on the visual resources in the region.

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

3.2 Rationale for Selection of the Visual Resources Valued Component (VC)

The Visual Resources VC and associated subcomponent were selected during the pre-Application phase of the Project following the VC selection process outlined in **S3.0-C1 Selection of Valued Components** of the **EAC Application** and used the methodology provided in Guideline for the Selection of Valued Components and Assessment of Potential Effects (BC EAO 2013). The goal was to focus on relevant issues, concerns, and components of the natural and human environment that may be affected by the Project.

3.2.1 Valued Component (VC)

The issue of visual resources was raised at several points in the engagement and consultation process. It was discussed at meetings of the BC EAO Technical Working Group for the Project. A few local private property owners identified visual quality as a concern, as did some community and recreation associations. Where specific locations were identified, most were with respect to private landowners. The Office of the Wet'suwet'en (OW) identified the location of a cabin site outside of Telkwa as a potential viewpoint. The Smithers Mountain Bike Association raised concerns about the potentially affected view from the Piper Recreation Area Mountain Biking Trails, situated on the south-facing slopes of Hudson Bay Mountain, just downslope of the Hudson Bay Mountain Resort ski hill. These locations were considered in the potential pool of viewpoints to be carried forward into the assessment.

The Bulkley LRMP (GovBC1998) and the Bulkley Valley SRMP (BC ILMB 2005) identify visual quality as a management goal. Although the language in these plans is directed at forest harvesting activities, it is made clear that other resource developments should include an assessment of the effects of the development on visual quality. The LRMP and the LUPs identify generally descriptive (in the case of the LRMP) and point-specific (in the case of the LUPs) locations for which the view of the landscape is considered important. These locations were considered in the potential pool of viewpoints to be carried forward into the assessment.

Reviews of other resource development projects in the region revealed that most major projects requiring an EA under the provincial *EAA* identified Visual Resources as a VC in their Terms of Reference/Application Information Requirements, including two proposed mines (the Davidson Project [Blue Pearl 2008] and the Morrison Copper/Gold Project [Pacific Booker 2009]). Further reviews of coal projects and other open pit mining projects throughout the rest of the province (e.g., Seabridge Gold Mine [Seabridge 2013], Blackwater Gold Mine [New Gold 2017], Elk Valley Baldy Ridge Extension [Teck 2016]) similarly included Visual Resources as a VC. While the specific requirements for each project differed depending on local, regional, and temporal contexts, the general principles with respect to the analysis of Visual Resources common to these projects informed the inclusion of Visual Resources in this EAC Application.

Visual Resources is supported by the **Land and Resource Use VC** (**S6.0-C4**). Several land uses common in the Bulkley and Telkwa River valleys, particularly forest harvesting and agriculture, are typically considered visual disturbances. These disturbances contribute to the existing visual condition of the landscape and contextualize any visual disturbances attributed to the Project. Additionally, these disturbances serve as a primary input into the Visual Resources CEA.

Visual Resources support and are dependent on the assessment of the following VCs:

- **Dependent on:**
  - **Land and Resource Use VC (S6.0-C4):** Some land uses such as forest harvesting, and agriculture are considered visual disturbances and will influence the existing visual condition of the landscape.
- **Supporting:**
  - **Wildlife** and **Avian Species VC (S4.0-C8** and **S4.0-C9):** Effects on visual resources can result in indirect effects on habitat, thereby affecting its suitability for use by avian and wildlife species;
  - **Economic Development VC (S5.0-C2):** Visual resources are a key factor in the tourism industry and real estate markets, where natural landscapes act as a regional and local attraction and enhance land values;

- **Land and Resource Use VC (S6.0-C4):** Certain land uses such as tourism, recreation, and residential development are sensitive to changes in the visual landscape. The presence of visual disturbances can discourage those kinds of land uses for which value is placed on the visual landscape, thus influencing regional patterns of land use; and
- **Community Well-being VC (S6.0-C5):** In addition to visual quality being intertwined with economic development and land values, nighttime light conditions are known to be linked to sleep patterns and physical and mental health.

3.2.2 Subcomponents

Visual Resources is supported by a single subcomponent, Visual Quality. **Table 3.2-1** summarizes the rationale for the inclusion of Visual Quality as a subcomponent.

Visual Quality refers specifically to the aesthetic value placed on a natural landscape by those to whom the landscape is visible during the day. Resource development is typically regarded as a visual disturbance, where the development has the potential to adversely affect the aesthetic value of a landscape. In the case of direct visual disturbances to landforms, these disturbances come in the form of unnatural shapes, colours, and textures that draw the eye away from the wider landscape and disrupt natural patterns. The Visual Quality subcomponent characterises the daytime visual disturbance attributable to the Project.

Table 3.2-1: Summary of Rationale for Selection of the Visual Resources Valued Component (VC) and Subcomponent and Their Linkages

Subcomponent	Rationale for Inclusion	Source of Information	VC Linkages	
Visual Quality	Visual Resources identified as a management objective in the province and in the regional LRMP and SRMP, and as a concern by the BC EAO Working Group and public stakeholders. The Project has the potential to interact with scenic resources and visual aesthetics, which have been identified as a high priority in the area.	▪ Bulkley Valley LRMP ▪ Bulkley Valley SRMP ▪ BC EAO Working Group ▪ Smithers Mountain Bike Association ▪ Private land owners	**Dependent on:** ▪ Land and Resource Use	**Supporting:** ▪ Economic Development ▪ Avian and Wildlife ▪ Land and Resource Use ▪ Community Well-being

Notes: *BC EAO=BC Environmental Assessment Office; LRMP= Land and Resource Management Plan; SRMP=Sustainable Resource Management Plan; VC=Valued Component*

3.2.3 Indicators

Indicators are measures employed to describe existing conditions and to evaluate potential Project effects on a VC. The indicator selected for the Visual Quality subcomponent, and the rationale for selection, is summarized in **Table 3.2-2**.

Table 3.2-2: Indicators for Visual Resources Valued Component (VC) and Visual Quality Subcomponent

Indicator	Rationale for Selection
Visual Quality	
Change in visual disturbance from selected receptor sites.	Project activities have the potential to change the visual quality of the landscape. A Final Visual Effect Rating (FVER) characterises the overall visual disturbance of the Project as measured from specific viewpoints (selected to represent receptor sites) through a rating system called a Hassell Matrix.

Visual Quality reflects the aesthetic value of a landscape placed on it by viewers, so to understand how visual disturbances such as the Project affect Visual Quality, it is necessary to understand the physical characteristics of the disturbance as it appears to those who can see it, as well as the experience and expectations of those viewers (Sheppard 2004; British Columbia Ministry of Forests [BC MOF] 1997). Specific viewpoints were selected to represent receptor sites.

The Final Visual Effect Rating (FVER) is the ultimate outcome of a Hassell Matrix analysis, a rating system designed to characterise these core elements of Visual Quality effects using a combination of empirical measurements, known key land uses and locations, and professional judgement. The analysis is conducted on a set of viewpoints identified through a review of land uses in the surrounding area (including residential areas, recreation sites, and transportation corridors), and a FVER is produced for each one. Considered in aggregate, the FVERs of all viewpoints characterise the severity of the effect of the disturbance on Visual Quality.

This approach is an adaptation from Hassell (2005), which was initially developed for wind energy projects (e.g., Finavera Wind Energy Inc. 2011), but has since been adapted for the assessment of visual effects for other projects in BC, including mining projects (Seabridge 2013; Harper Creek Mining Corporation [HCMC] 2015) and transmission lines (British Columbia Transmission Corporation [BCTC] 2010; New Gold 2017).

The FVER methodology is presented in detail in **5.2.1** below.

3.2.4 Assessment Boundaries

This subsection identifies the boundaries for the analyses of potential changes to the Visual Resources VC. Analysis boundaries define the maximum limit of expected Project-related interactions with the Visual Resources VC. They encompass the areas within, and times during which, the Project is expected to interact with the Visual Resources VC, as well as the constraints that may be placed on the assessment of those interactions due to political, social, and economic context (administrative boundaries), and limitations in measuring changes (technical boundaries).

3.2.4.1 Spatial Boundaries

Given the spatial and temporal scale of the Project as shown in **1.0 Overview of Project and Proponent Description** of the **EAC Application**, it is reasonable to assume that any location in the surrounding landscape that has a direct line-of-sight to the Project could potentially experience a change to visual quality and should therefore be included in the Visual Quality LSA. However, as outlined in the Visual Landscape Inventory Procedures and Standards Manual (BC MOF 1997), the further away from development the viewer is, the more difficult it is to identify patterns, shapes, and colours as distinct from the surrounding landscape. The distance at which landscape-level visual disturbances become too difficult to distinguish from the background is not clear, though some research for wind energy developments, outlined in A Visual Effects Assessment Guidebook for Wind Energy Developments in British Columbia (BC Ministry of Forests, Lands and Natural Resource Operations [MFLNRO] 2016), suggests effects should be assessed for distances up to 35 kilometres (km). It is reasonable to conclude that while the visual disturbance of these developments is not as concentrated as the Project, they typically span larger portions of the field of view, and could therefore be considered disturbances of a scale similar to the Project. Therefore, the furthest the LSA extends from the Project is 35 km.

The size and scale of the Tenas Access Corridor (TAC) and Rail Infrastructure are substantially smaller than the proposed Minesite and, therefore, less visible from long distances. Therefore, their maximum visible distances fall within the LSA as measured from the Minesite.

Per **2.0 Regulatory Context**, areas within the Morice LRMP are scoped out of this assessment. Any portions of the Morice LRMP that fall within the 35 km visibility limit are excluded from the LSA.

Based on the above discussion, the Visual Resources LSA is defined as all locations within 35 km of the Minesite, excluding all locations in the Morice LRMP. The total area of the LSA is 2,723 square kilometres (km^2) (**Figure 3.2-1**).

The Bulkley LRMP is clear that views of the landscape should be the primary consideration in assessing visual quality, as opposed to specifying landscapes that should be managed for visual effects. Understanding the Project's influence on visual effects in the region should, therefore, focus on areas that could have a view of the Project, which are limited to areas within the LSA. LUPs outside the LSA have no potential view of the Project and thus cannot interact with it, so they can be scoped out of the assessment altogether. Therefore, the Regional Study Area (RSA) is defined as the amalgamation of all Bulkley LRMP LUPs that have any portion of the plan area fall within the LSA. The total area of the RSA is 4,201 km^2 (**Figure 3.2-1**).The RSA also corresponds with the Cumulative Effects Assessment Area within which Project-related residual effects may interact with other land uses and activities (i.e., past, present, and reasonably foreseeable future).

Table 3.2-3 and **Figure 3.2-1** summarize the spatial boundaries for the analysis of changes to the Visual Resources VC.

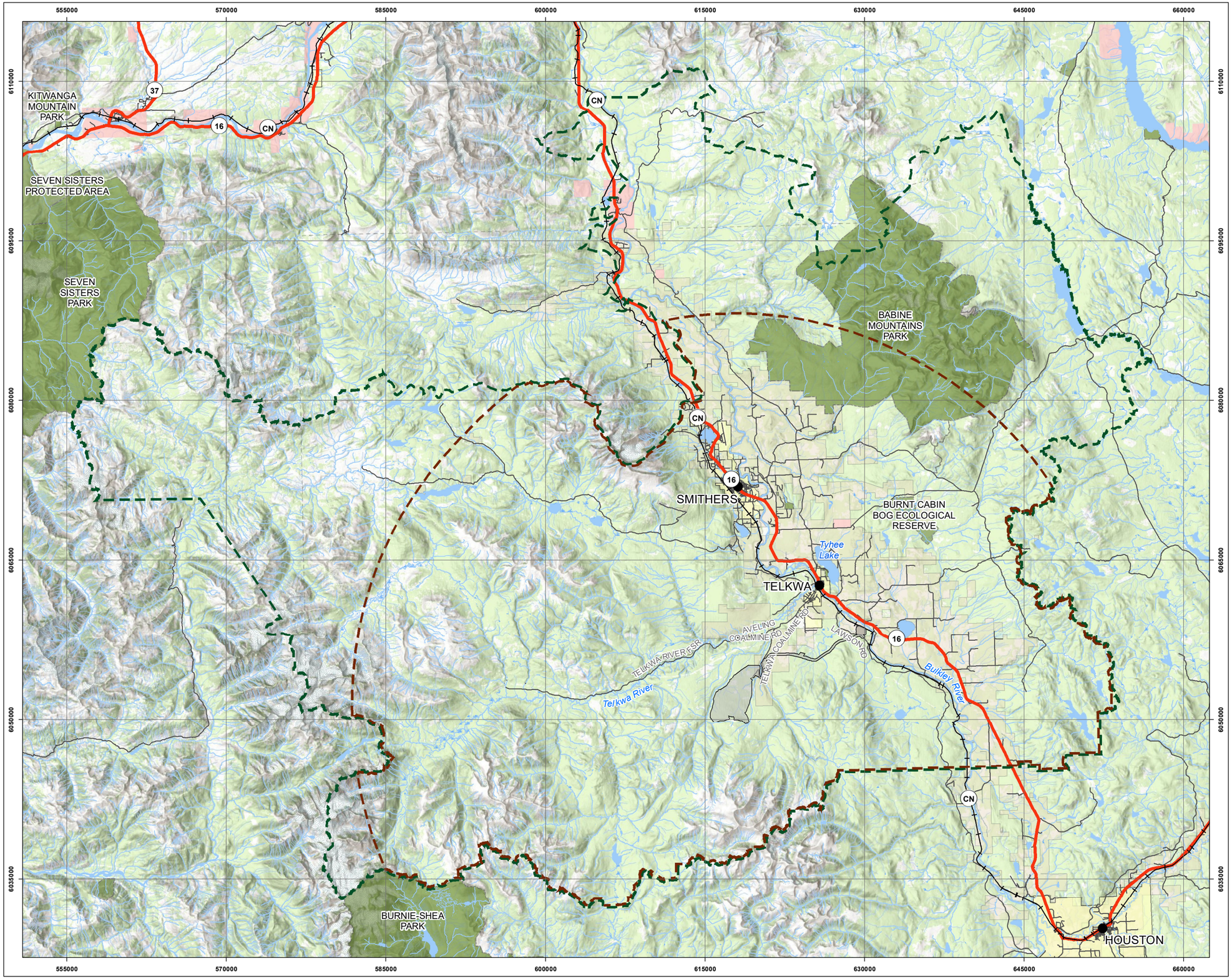
Table 3.2-3: Spatial Boundary Definitions for the Visual Resources Valued Component (VC)

Spatial Boundary	Description of Study Area
Local Study Area (LSA)	Any location within the limit of visibility from the Minesite (35 km per BC MFLNRO 2016), within the Bulkley LRMP.
Regional Study Area(RSA)	Amalgamation of all LUPs within the Bulkley LRMP that have any portion of the plan area fall within the LSA.

Notes: *km=kilometre; BC MFLNRO=British Columbia Ministry of Forests, Lands and Natural Resource Operations; LRMP=Land Resource Management Plan; LSA=Local Study Area; LUP=Landscape Unit Plan*

Tenas Project

Visual Resources Local and Regional Study Areas



Path: T:\01-projects\TelkwaCoal\Project_MXD\TLC-21-024.mxd

Legend

- City/Town
- Rail Line
- Highway
- Road
- Watercourse
- Wetland
- Waterbody
- Park or Protected Area
- First Nation Reserve
- Municipal Area
- Telkwa Coal Private Land
- Private Land
- Project Area
- Local Study Area
- Regional Study Area

Notes

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

Sources

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

N

1:350,000

0 4 8 12 16 20

Kilometres

NAD 1983 UTM Zone 9N

Page Size: 11" x 17"

0403488-0311	Production Date: Jun 25, 2021	Figure 3.2-1

TELKWA COAL LIMITED

ERM

3.2.4.2 Temporal Boundaries

Temporal boundaries reflect periods of time during which Project activities could reasonably be expected to potentially affect Visual Resources. These include the Construction, Operation, Decommissioning and Reclamation, and Post-closure phases (**Table 3.2-4)**:

Table 3.2-4: Temporal Boundaries for the Tenas Project

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

For the purposes of this analysis, the Construction, Operation, and Decommissioning and Reclamation phases will be assessed together, and the term “Active Phases” will be used when referring to all three phases simultaneously. Across each phase, the visual character of the Project will change and evolve as vegetation is cleared and subsequently replanted, or as Project components are constructed and subsequently removed or reclaimed. The most dramatic of these changes are expected to happen during the Construction and Decommissioning and Reclamation phases. The pace of change during these phases

introduces uncertainty in the prediction of the size and character of the visual disturbance created by the Project, as small changes in scheduling or design are potentially more impactful over these short phases (1.5 and 4 years) than they are over the Operation Phase (21 years). It is, therefore, assumed that the maximum visual disturbance exists during all three phases, regardless of when it may actually occur. This represents the most conservative assumption with respect to the potential effects of the Project on the Visual Resources VC.

The Post-closure Phase will be assessed independently, as the appearance of the Project during this phase will be substantially altered from that of the Active Phases. Many mine components will have been either removed or reclaimed, including revegetation of large parts of the Project. The visual character of the Project in Post-closure Phase will therefore be considerably different than any other phase and should therefore be assessed separately.

3.2.4.3 Administrative Boundaries

As noted in **3.2.4.1**, the RSA is defined as being an amalgamation of all Bulkley LRMP LUPs that have any portion of the plan area fall within the LSA. The Bulkley LRMP boundary and the boundaries of each of the constituent LUPs are administrative boundaries.

3.2.4.4 Technical Boundaries

No technical boundaries were identified for the Visual Resources VC.

4. EXISTING CONDITIONS

This subsection describes the existing conditions of the Visual Resources VC in the landscape around the Project, using information from desktop analyses of land use and topography, as well as field-based observations recorded in Chapter 12.0 of **Appendix 4.1-C**. This subsection also describes the contribution of Traditional Knowledge (TK) to the description of the existing conditions, the availability of existing scientific information.

4.1 Background Information and Studies

4.1.1 Traditional Knowledge (TK)

The Visual Resources VC study areas are situated within the Wet'suwet'en Traditional Territory. TK for the Project was obtained through engagement with the Office of the Wet'suwet'en as well as the Cultural Use Study (CUS; **Appendix 7.1-B** of **S7.0-C1 Heritage Resources VC** of the **EAC Application**) which compiled a baseline inventory of cultural heritage resources pertaining to Wet'suwet'en communities by examining pre-existing cultural, social, historic, and economic data (Crossroads Cultural Resource Management [Crossroads] 2021).

TK specific to the Visual Resources VC was not reported in the CUS. However, during a 2018 Working Group meeting, a member of the OW identified a cabin site north of Telkwa as a potential viewpoint.

4.1.2 Scientific and Other Information

Existing scientific and other information relevant to the Visual Resources VC assessment was researched. Within the RSA, only one Environmental Assessment for Visual Quality has been conducted: the Davidson Project in 2008 (Blue Pearl 2008). The project was situated on the east slopes of Hudson Bay Mountain, nine (9) km northwest of Smithers, and had a very small overall footprint of 12 hectares (ha). The assessment focused on viewpoints from Smithers and the immediate surrounding area, none of which were more distant than 10 km. The results of this study were not relevant to the Project because the Project is not visible from any of the viewpoints selected for the Davidson study, and the overall size and scale of the Davidson Project footprint is several orders of magnitude smaller than the Project.

No other studies or reports on Visual Resources that may be relevant to this assessment were identified.

4.1.3 Baseline Studies

The purpose of the Visual Quality Baseline Program was to document the existing visual conditions in the landscape on which the Project will be situated (**Table 4.1-1**). The study included a desktop analysis of the potential visibility of the Project from the surrounding area, the selection of viewpoints, and field visits of those viewpoints to establish the existing visual condition of the landscape. The primary output of the study is the determination of the existing visual condition of the landscape as seen from each viewpoint. The baseline report can be found in Chapter 12 of **Appendix 4.1-C**. Details from the baseline report are summarized in **4.2** below.

Table 4.1-1: Summary of Desktop and Field Studies Related to the Visual Resources Valued Component (VC) and Visual Quality Subcomponent

Study Name	Study Purpose, Duration and Spatial Boundaries
Visual Quality Baseline Program (Chapter 12.0 of **Appendix 4.1-C**)	This study documented the current visual conditions of the landscape on which the Project will be situated, as seen from 19[1,2] viewpoints within the LSA. Field visits to each site were conducted in the fall of 2017 and 2019, where photographs towards the Tenas Project site were taken.

Note: *Appendix 4.1-C=**Appendix 4.1-C Tenas Project 2017 to 2019 Baseline Report** of **S4.0-C1 Atmospheric Environment VC** of the EAC Application; LSA=Local Study Area; VC=Valued Component*

[1]Two (2) viewpoints at the Hudson Bay Mountain Resort were visited but were combined into a single viewpoint for the purposes of this assessment.

[2]An additional site along Webster Lake Trail was established after the Visual Quality Baseline had been completed.

4.2 Description of Existing Conditions

This subsection describes the existing conditions of the visual landscape based on the baseline study of Visual Quality, which uses desktop- and field-based methods to understand the current levels of visual disturbance in the landscape around the Project. Refer to Chapter 12.0 of **Appendix 4.1-C.** Key viewpoints are identified within the LSA based on an analysis of locations that may have a view of the Project, and each was visited to document the visual condition of the landscape in which the Project will be situated.

4.2.1 Project Setting

The Project is located in the northern foothills of the Telkwa Mountain Range, approximately 25 km south of the Town of Smithers (population 5,401 as of 2016) and 7 km southwest of the Village of Telkwa (population 1,327 as of 2016). It is situated on a remnant land terrace between Goathorn Creek and Tenas Creeks and is positioned such that it overlooks the Telkwa and Bulkley river valleys. Most of the area immediately surrounding the Project is sub-boreal forest composed primarily of lodgepole pine, interior spruce, and subalpine fir, with some deciduous forest stands mixed in at lower elevations near the Telkwa River.

Forestry, mining, agriculture, and tourism and recreation comprise most of the economic base of the region (GovBC 1998). The area has a long history of forest harvesting, with a substantial portion of the economic activity of the Bulkley LRMP area dependent on the forest industry. This is reflected in the mosaic of forest cut blocks surrounding the Project, showing evidence of harvesting over the last 40 years. In addition, tourism and recreation is a growing industry, with ample opportunities for hunting, fishing, hiking, rock climbing, mountain biking, snowmobiling, and other activities that have attracted tourists and residents alike to the area. In particular, the Bulkley LRMP identifies four (4) specific locations of heaviest recreational use: the provincial park at Tyhee Lake, the day use parks at Smithers Landing and Driftwood Canyon, and the Babine Mountains Recreation Area.

4.2.2 Viewshed Analysis

The purpose of a viewshed analysis is to identify all locations within the LSA that have a line-of-sight to any portion of the Project. The analysis was conducted using the Viewshed Tool in the Spatial Analyst extension of ArcGIS 10.7.1, based on the 20 metre (m) resolution Canadian Digital Elevation Model (CDEM) dataset published by Natural Resources Canada (NRCAN), with the 3-dimensional (3D) Project design superimposed on it. No consideration was given to the screening effects of vegetation or buildings in the viewshed analysis; thus, the results should be considered a conservative estimate of visibility.

The combined results of the viewshed analyses as conducted from the Minesite and the Rail Infrastructure are shown in **Figure 4.2-1**. Most of Telkwa falls within the viewshed of the Project, as does most of the Bulkley Valley east of the Bulkley River between Smithers and Round Lake, including the Highway 16 corridor. The Project is also visible at many locations in the Telkwa River Valley north of the Telkwa River, and on south-facing slopes of Hudson Bay Mountain overlooking the Telkwa River Valley. The Project is not visible from the Town of Smithers and Highway 16 north of Smithers because of natural topographic screens. The Project is also not visible from most of the shorelines or watercourses of the Bulkley or Telkwa rivers. Most of the LSA and RSA are south of the Project and have no view of the Minesite, except for the north-facing slopes of the Telkwa Mountain Range foothills.

4.2.3 Selection of Viewpoints

Within the LSA, a spatial database was populated with the following land uses that are generally considered sensitive to changes in Visual Resources:

- residences;
- travel corridors;
- recreation sites and protected areas;
- cultural and historic sites; and
- commercial tourism operations.

The database included specific viewpoints identified in the Bulkley LRMP and the various applicable LUPs (**2.0** and **Table 2-2**) (GovBC 1998), as well as those identified during the consultation and engagement process (e.g., Piper Recreation Area; cabin site north of Telkwa) (**S11.0-C1 Wet'suwet'en Rights and Interests and S12.0-C1 Public Consultation**).

These viewpoints were overlaid on the final results of the viewshed analysis. The locations without a line-of-sight of the Project were screened out, as no effects on Visual Resources from those sites will occur due to the Project. The remaining areas and viewpoints were mapped based on use type, and a final set of viewpoints were established that were representative of the concerns noted during consultation, as well as the types and locations of land uses that had a potential view of the Project. Locations clustered near each other were amalgamated into a single representative viewpoint, and any land uses that had unique locations away from others (e.g., Hudson Bay Mountain Resort) were included as viewpoints as well.

Upon review of the results of the viewshed analysis, the following general areas were screened out of further analysis:

- Town of Smithers;
- Bulkley and Telkwa rivers;
- Highway 16 south of Round Lake and north of Smithers;
- areas of Telkwa Mountain Range; and
- Zymoetz River Valley.

Furthermore, all viewpoints identified in the various LUPs (**Table 2-2**) fell outside the viewshed except for the Hubert Rest Stop on Highway 16.

Overlaying spatial databases of private land, recreation, commercial land use, and cultural sites revealed that most views of the landscape are concentrated to the north and east of the Project, in and around Smithers and Telkwa. **Table 4.2-1** and **Figure 4.2-1** show the final set of 19 viewpoints in relation to the

viewshed analysis. These viewpoints effectively represent a sample of the different land uses and viewing angles in the area surrounding the Project.

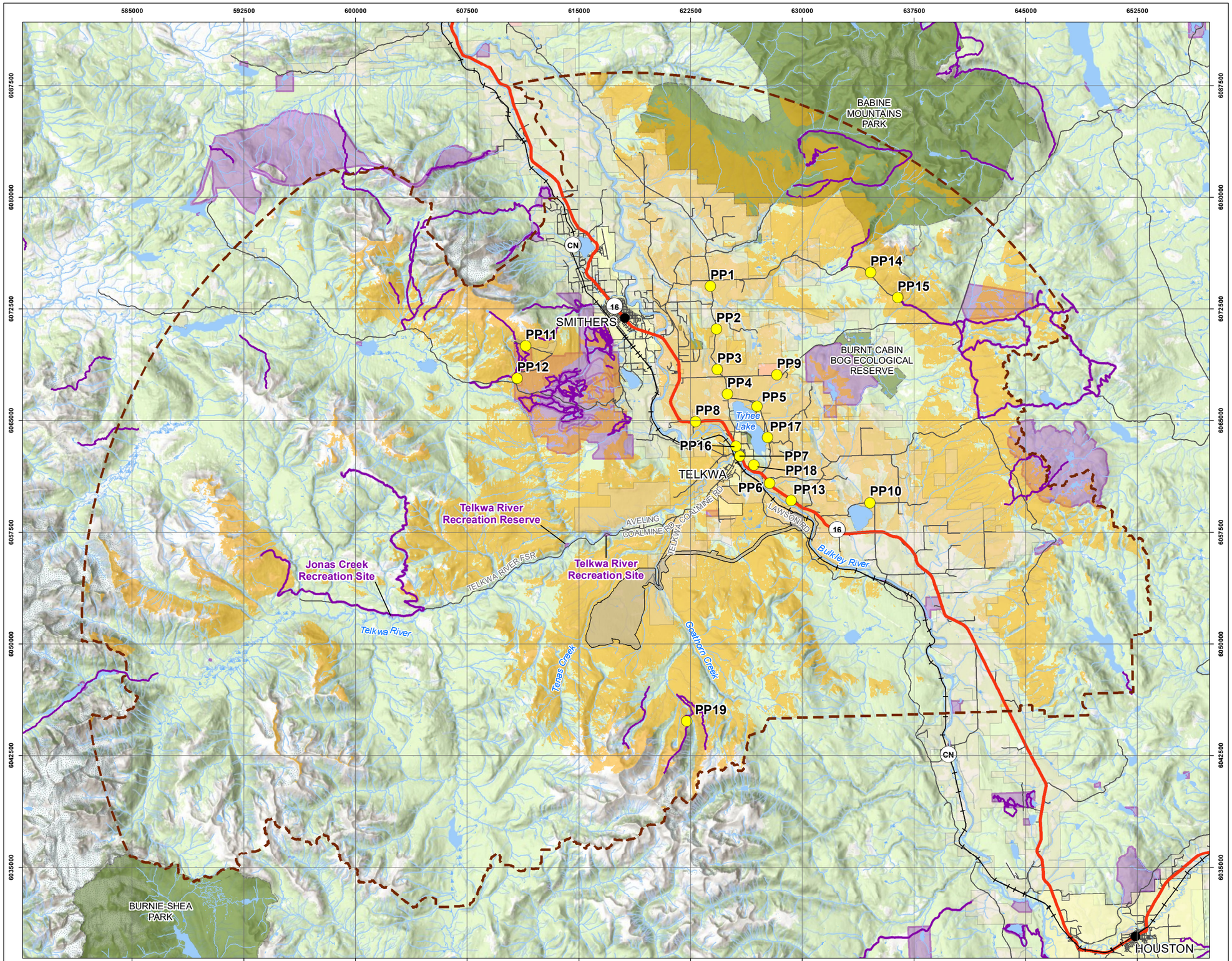
Table 4.2-1: Viewpoints Selected for the Visual Quality Subcomponent

ID	Location	Type	Easting	Northing	Elevation (metre)
PP1	Telkwa High Road at Old Babine Lake Road	Residential	623840	6074024	631
PP2	Telkwa High Road at Jollymore Road	Residential	624228	6071134	592
PP3	Telkwa High Road at Babine Lake Road	Residential	624304	6068409	598
PP4	Telkwa High Road at Tyhee Lake Road	Residential	624982	6066770	579
PP5	Tyhee Lake	Residential	626956	6065943	567
PP6	Highway 16 at Woodmere Road	Transportation	627811	6060778	546
PP7	Highway 16 at Tower Street	Transportation	625813	6062595	525
PP8	Highway at Good Road	Transportation	622840	6064926	508
PP9	Babine Lake Road at Hillcrest Road	Transportation	628306	6068057	799
PP10	Round Lake	Recreation	634544	6059475	619
PP11	Hudson Bay Mountain Resort Main Lodge	Recreation	611424	6070000	1430
PP12	Piper Recreation Area	Recreation	610857	6067831	924
PP13	Highway 16 at Hubert Rest Stop	Transportation	629245	6059643	553
PP14	Onion Mountain Trail	Recreation	634578	6074958	1006
PP15	Onion 2	Recreation	636405	6073240	1031
PP16	Eddy Park	Residential	625548	6063282	501
PP17	Tyhee Lake Road and Hislop Road	Residential	627655	6063860	524
PP18	Cabin Site	Residential	626745	6062016	578
PP19[1]	Webster Lake Trail[1]	Recreation	622250	6044821	1140

Note: *1. Viewpoint representative of the Hunter Basin/Webster Plateau*

Tenas Project

Visual Resources Viewpoints and Viewshed Analysis



Legend

- Viewpoint
- City/Town
- Rail Line
- Highway
- Road
- Watercourse
- Wetland
- Waterbody
- Recreation Trail
- Recreation Area
- Park or Protected Area
- First Nation Reserve
- Municipal Area
- Telkwa Coal Private Land
- Private Land
- Project Area
- Local Study Area
- Areas where Project is Visible

Notes

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

Sources

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

N

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4.2.4 Field Visits and Existing Conditions

Sites were visited in October to November 2017 and October 2019 to collect photographs of the landscape on which the Project would be situated. Photographs were collected in accordance with the guidelines outlined in Appendix 3 of the Visual Impact Assessment Guidebook (BC MOF 2001). Photographs were examined and compared with other spatial data of visual disturbances (e.g., forest cutblocks).

Of the 18 sites photographed, four (4) had obstructed views of the Minesite where field crews were unable to find clear views towards the Project:

- PP12 Piper Recreation Area – vegetative screening;
- PP14 Onion Mountain Trail – vegetative/terrain screening;
- PP15 Onion 2 – vegetative/terrain screening; and
- PP17 Tyhee Lake Road and Hislop Road – vegetative screening.

Several attempts were made to visit PP19 (Webster Lake Trail), but unsafe conditions at the crossing of Goathorn Creek prevented field crews from accessing the site.

The details regarding field visits, including photographs taken from those sites can be found in Chapter 12 of **Appendix 4.1-C.** Examples of photos are shown in **Figures 4.2-2** to **4.2-7**.

Figure 4.2-2: Current view from PP4

Figure 4.2-3: Current view from PP5

Figure 4.2-4: Current view from PP9

Figure 4.2-5: Current view from PP10

Figure 4.2-6: Current view from PP11

Figure 4.2-7: Current view from PP13

Field photos show that visual landscape disturbance surrounding the Project site is almost exclusively in the form of forest cut blocks. The forest industry has been a key economic driver within the Bulkley Valley, and that is evident within the LSA, where there are over 10,000 ha of cut blocks less than 20 years old. Land has also been cleared for agriculture in some areas, particularly around the Bulkley River, though those are relatively small and generally difficult to see from most of the viewpoints looking in the direction of the Project. Roads and transmission lines are generally not visible from most viewpoints as they are screened by trees, though there may be some locations from which the linear clearing for these features would be identifiable (i.e., where the view aligns directly with the direction of the linear clearance).

Information gathered in the baseline work informs the indicator chosen for the Visual Quality subcomponent. All 19 veiwpoints are carried over for assessment in **5.0 Assessment of Project-related Effects**.

4.2.5 Ambient Light

Within the LSA, sources of existing ambient light include streetlights and residential lighting within the Village of Telkwa, lighting of rural residential properties and farms, roadway lighting along Highway 16, the Smithers – Telkwa transfer station, and tree farms nurseries. As described in **4.2.1** above, most of the area immediately surrounding the Project is forested. With the exception of the one private residential property, owned by TCL, there are currently no sources of ambient light within the Project Area. The Telkwa Coal Recreation Camp (TCRC), located within the Project Area does not have power or lighting as part of the facility, but sources of ambient light could come from recreational vehicles using the camp during the summer.

5. ASSESSMENT OF PROJECT-RELATED EFFECTS

This subsection identifies and analyses potential Project-related interactions with the Visual Resources VC to understand whether those interactions are likely to result in changes to Visual Resources. Mitigation measures are proposed to control and minimize those changes, and a determination is made regarding whether residual changes to Visual Resources are expected following implementation of those measures.

5.1 Potential Project-related Interactions with Visual Resources Valued Component (VC)

The purpose of this subsection is to focus the analysis on interactions with the potential to result in adverse changes to the Visual Resources VC. It is expected that the Visual Resources of the landscape will interact with all constructed Project components over the life of the Project. Each potential interaction is rated using the terms provided in **Table 5.1-1**. Based on this evaluation, potential interactions between the Project and the Visual Resources VC were carried forward into the assessment to determine the potential effects of the interaction.

Table 5.1-1: Potential for an Interaction between the Visual Resources Valued Component (VC) and the Tenas Project

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

Notes: *VC=Valued Component*

Table 5.1-2 identifies the potential interaction of each component and activity in relation to the Visual Resources VC. Note that for the purposes of the Visual Quality subcomponent, the interaction is dependent on whether the Project component on which the activity is occurring could be considered a visual disturbance. All interactions identified in **Table 5.1-2** expected to result in potential effects are discussed further in **5.2 Potential Project-related Effects**.

Table 5.1-2: Interactions between Visual Resources Subcomponent and the Tenas Project

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

Project Activities	Visual Resources Subcomponent
	Visual Quality
Operate Coal Preparation Plant	X
Maintain fuel and lubricant storage facilities	X
Maintain administration buildings (first aid, maintenance, mine dry, warehouse, laboratory, and vehicle wash facilities)	X
Maintain 25 kV powerline and a 600 V substation adjacent to the Coal Processing Plant	X
Transportation of equipment, materials, and personnel	
Maintain and use Rail Infrastructure including Rail Loop and Loadout connecting to the existing main Canadian National Railway line	X
Operate water supply wells, storage, and distribution system	X
Operate the water discharge infrastructure	X
Maintain storage piles for overburden, rock separated from coal in Coal Processing Plant, and stockpiles for topsoil and vegetation management	X
Operate material handling systems for Minesite, including run-of-mine coal, processed coal, process rock conveyors, and stockpiles	X
Operate solid waste management systems including recycling and composting facilities	X
Maintain Explosives Magazine (storage facilities)	X
Progressive reclamation	X
Employment and labour	
Decommissioning and Reclamation	
Dismantle and remove mining equipment and facilities (including powerline, Rail Infrastructure)	X
Transportation of equipment, materials, and personnel	
Reclamation and closure activities at Minesite	X
Reclamation and closure of Bypass Road and haul roads, including quarries	
Reclamation and closure of permanent bridge over Goathorn Creek	X
Reclamation and closure of powerline	X
Reclamation and closure of Rail Infrastructure	X
Implement post-mining systems and monitoring	X
Employment and labour	
Post-closure	
Maintain post-mining systems and ongoing monitoring	X
Transportation of equipment, materials, and personnel	
Employment and labour	

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

5.2 Potential Project-related Effects

This subsection considers potential adverse Project-related effects on Visual Resources arising from potential interactions, as identified in **Table 5.1-2**, and in relation to the indicator listed in **Table 3.2-2**. The Visual Resources is comprised a single subcomponent, Visual Quality. Potential effects are expected to vary during the life of the Project; however, at all stages, the Project represents a visual disturbance in a natural landscape, which can adversely affect the experience of those living, working, and recreating in the surrounding area.

This subsection considers potential adverse Project-related changes to Visual Quality, and mitigation measures for each effect are described in **5.3 Mitigation Measures**. As noted in **3.2.4.2 Temporal Boundaries,** the Construction, Operation, and Decommissioning and Reclamation phases are combined and assessed together as the "Active Phases". The Post-closure phase is assessed independently and for the Minesite only; the Rail Infrastructure will be completely decommissioned and removed, with the expectation of leaving no visible features following closure.

All interactions identified in **Table 5.1-2** are expected to act as visual disturbances and therefore potentially result in an adverse effect on Visual Resources, specifically a reduction in Visual Quality. Assessing the effect of all interactions requires considering them in aggregate to understand the magnitude of the visual disturbance attributable to the Project. The only activity assessed individually is the Rail Infrastructure, which is visually separate and distinct from the rest of the Project.

5.2.1 Final Visual Effect Rating

The FVER is the primary outcome of a Hassell Matrix analysis, a rating system designed to evaluate the physical characteristics of a visual disturbance from a specific viewpoint, both in the context of the surrounding landscape, and within the expectations of the typical viewer from that location. There are six ratings that comprise the Hassell Matrix analysis for each viewpoint:

1. sensitivity of viewers to changes in the existing landscape;
2. existing visual condition;
3. proximity to the infrastructure;
4. horizontal angle subtended by infrastructure;
5. vertical angle subtended by infrastructure; and
6. degree of visual modification.

The sensitivity of a viewpoint to changes in the visual landscape captures how that viewpoint is valued by viewers. Consideration was given for the type, frequency, and duration of viewing, as well as the importance of the view; for example, residential viewers are likely to be more sensitive to adverse changes more than a viewer driving along Highway 16. Criteria for rating the sensitivity for each viewpoint are shown in **Table 5.2-1**. The more sensitive a viewpoint is to changes in the view, the higher the score.

Table 5.2-1: Sensitivity Viewpoint Ratings

Rating	Description	Score
Low	Typically a transportation corridor (highway or river), frequency of viewing is rare to occasional, viewing duration is short (i.e. less than 1 hour), and sometimes dependent on season.	1

Rating	Description	Score
Moderate	Typically a recreation site or other area of public gathering, where the landscape is viewed occasionally for medium to long durations (i.e. up to four hours). Can be seasonal.	2
High	Typically a residence, where the landscape is viewed frequently for long periods of time (i.e. more than 4 hours), irrespective of season. Economic value may also be tied to the view.	3

Existing Visual Condition (EVC) is a qualitative measure of visual disturbance determined by examining the photographs taken from each viewpoint in the Visual Quality Baseline Report (refer to Chapter 12.0 of **Appendix 4.1-C**). Criteria for rating the EVC from the perspective of the viewpoint are shown in **Table 5.2-2**. The higher the disturbance shown in the photographs, the lower the EVC score.

Table 5.2-2: Existing Visual Condition Viewpoint Ratings

Rating	Description	Score
Low	Landscape has been modified by development not related to the pre-disturbance land base (e.g., agriculture, rights-of-way for energy corridors or transportation, urban/suburban development).	1
Moderate	Landscape has been modified by development but are still recognizable and associated with their natural origins (e.g. forest cutblocks in a forest landscape).	2
High	Landscapes that have been minimally affected by development and retain their natural character.	3

Per the Visual Landscape Inventory Procedures and Standard Manual (BC MOF 1997), proximity to a visual disturbance greatly influences a viewer's perception of that disturbance. Details, textures, and colours are very discernable in close proximity to the disturbance, but the further away the viewer is from the disturbance, the more difficult it becomes to discern these visual attributes. Furthermore, atmospheric conditions such as aerosols (e.g. suspended particulate matter), weather conditions, and lighting conditions can subdue the visual effects as a function of distance. Criteria for rating the proximity of the viewpoint from the Project are adapted from the Visual Landscape Inventory Procedures and Standard Manual (BC MOF 1997), and are shown in **Table 5.2-3**, where the closer a viewpoint is to the Project, the higher the score.

Table 5.2-3: Proximity Viewpoint Ratings

Rating	Description	Score
Low	Project is greater than 8 km distant (background).	1
Moderate	Project is between 1 and 8 km distant (midground).	2
High	Project is within 1 km (foreground).	3

Note: *km=kilometre*

The total amount of visual disturbance created by the Project can be measured directly as the portion of the human field of view. In the horizontal direction, this is defined as the angle subtended by the Project infrastructure as a proportion of the typical human binocular field of view (i.e. the field of view visible by both eyes), or 114 degrees (°) (Howard and Rogers 1995). This calculation is intended to measure the horizontal scale of the Project infrastructure as seen from each viewpoint. Criteria for rating the horizontal angular disturbance for each viewpoint are shown in **Table 5.2-4**, where the larger the proportion of the horizontal field of view, the higher the score.

Table 5.2-4: Horizontal Angular Disturbance Viewpoint Ratings

Rating	Description	Score
Low	Project subtends less than 7% of the horizontal field of view.	1
Moderate	Project subtends between 7% and 18% of the horizontal field of view.	2
High	Project subtends more than 18% of the horizontal field of view.	3

Note: *%= percent*

The thresholds identified (less than 7 percent [%], between 7% and 18%, and greater than 18%) correspond to the VQOs Partial Retention, Modification, and Maximal Modification (**Table 2-1**). These thresholds apply to the Partial Retention and Modification VQOs that the Project overlies. In forestry visual impact assessments, the visual effect of a cutblock is measured as a percentage of the specific landform (or visual landscape unit) it occupies (e.g. a hillside) as seen from a single viewpoint. Larger resource development activities (such as the Project) are typically larger in scale than individual cutblocks and can occupy multiple landforms, suggesting that the visual assessment of these types of projects consider the entire field of view as a single visual unit. Furthermore, for viewpoints where the landforms on which a project is situated are in the background (greater than 8 km distant), it is unlikely that topographic patterns that make those landforms distinct would be discernable, thus suggesting the larger landscape could be considered a single visual unit.

In conjunction with the horizontal angular disturbance, disturbance in the vertical orientation is also calculated. The typical human vertical field of view is 135°, but in any landscape view, a substantial amount of that view is of the sky, which should not be included in the calculation as it is not considered a visual resource inherent to a particular landscape. Analysis of viewing geometry of all viewpoints in the direction of the Project suggests that the landscape subtends approximately 70° in the vertical field of view. Therefore, vertical angular disturbance is defined as the angle subtended by the Project infrastructure as a proportion of the total angle subtended by the landscape, or 70°. Criteria for rating the vertical angular disturbance for each viewpoint are shown in **Table 5.2-5**, where the larger the proportion of the vertical field of view, the higher the rating.

Table 5.2-5: Vertical Angular Disturbance Viewpoint Ratings

Rating	Description	Score
Low	Project subtends less than 7% of the vertical field of view.	1
Moderate	Project subtends between 7% and 18% of the vertical field of view.	2
High	Project subtends more than 18% of the vertical of view.	3

Note: %= percent

The final characteristic represents the visual impact of the Project, i.e. extent to which the Project is visually distinct from the surrounding landscape. This is a qualitative measure dependent on a variety of factors, including the scale of visible Project features relative to the discernable surrounding landforms, the expected contrast in colour and texture between the Project and the background and surrounding landscapes, and the magnitude of the difference in shape and form of Project infrastructure as compared to the discernable surrounding landforms. For example, if a viewpoint has a substantial view of the pit wall (which would be visually distinct from the surrounding landscape), the visual impact of that view would be higher than a viewpoint that can only see the vegetated topsoil stockpile. Criteria for rating the degree of

visual impact for each viewpoint are shown in **Table 5.2-6**, where the more distinct the Project is from the background landscape, the higher the Visual Impact Rating. This rating takes the mitigations measures outlined in **5.3** into consideration, where some of the visual contrast of the Project from the surrounding landscape has been reduced through measures such as progressive revegetation and contouring of slopes.

Table 5.2-6: Degree of Visual Impact Rating

Rating	Description	Score
Low	The development is noticeable within the landscape but discernable Project features blend into the background and are not out of scale with the surrounding landscape.	1
Moderate	The development is noticeable in the landscape with individual Project features becoming somewhat distinct from the surrounding landscape due to discernable differences in colour, texture, or scale relative to nearby discernable landforms.	2
High	The development is prevalent in the landscape with individual Project features dominating the surrounding landscape due to very clear contrast in colour or texture.	3

The FVER provides an overall description of the potential changes to the landscape. The FVER is a cumulative score of the ratings for each viewpoint visual characteristic shown in **Tables 5.2-1** to **5.2-6**. The higher the score, the higher the potential change to the visual landscape (**Table 5.2-7**).

Table 5.2-7: Final Visual Effect Rating (FVER)

Rating	Score
Negligible	6 to 8
Slight	9 to 10
Moderate	11 to 13
Substantial	14 to 15
Severe	16 to 18

5.2.2 Visual Simulations

Visual simulations of the Project were developed in Visual Nature Studio 3, a landscape visualization software, and superimposed on a photograph taken from the viewpoint. The purpose of the simulation is to act as an input for the Visual Impact Rating, provide an overall representation on how the Project could be expected to appear in the landscape, and to act as verification of the FVER. Six (6) representative viewpoints were chosen for the simulations, as many of the viewpoints are relatively close together and thus have similar views of the Project. Simulations at additional viewpoints would produce nearly identical results and would provide little or no additional value to the assessment.

5.2.3 Reduction in Visual Quality - Minesite

5.2.3.1 Active Phases

The results of the Hassell Matrix analysis for the Active Phases are shown in **Table 5.2-8**.

The ratings for Sensitivity were based on the viewpoint type shown in **Table 5.2-1** and according to the definitions in **Table 5.2-1**. Residential viewpoints were given a rating of 3, recreation viewpoints were given a rating of 2, and transportation corridors a rating of 1.

The ratings for EVC were based on the baseline field visits and photographs taken at each viewpoint. The existing disturbances in the landscape are almost exclusively the result of forest cut blocks that have been harvested within the last several decades, along with the access roads built to service those cut blocks. Per **Table 5.2-2**, an EVC rating of Moderate describes a landscape that is disturbed by development associated with its natural origins. Therefore, for all viewpoints, EVC was rated as Moderate (rating value of 2), as all visual disturbances to the landscape around the Project are forestry related.

All viewpoints identified in this assessment were more than 8 km from the Minesite except PP19, which is approximately 6 km away. Therefore, Proximity (**Table 5.2-3**) was given a rating of 1 for all viewpoints except PP19, which received a rating of 2.

At most sites, the Project is predicted to subtend between 9% and 14% of the typical horizontal field of view, receiving a rating of 2 for Horizontal Angular Disturbance **(**definitions in **Table 5.2-4)**. The variance is explained by the viewpoint's proximity to the Minesite and the angle from which it was viewed. The only exceptions were viewpoints PP14, PP15, and PP19. PP14 and PP15 were far enough from the Minesite that the Project is expected to appear much smaller than from other viewpoints, and therefore received a rating of 1. PP19 is closer to the project than most other viewpoints.

In no cases did the Minesite subtend more than 7% of the typical vertical field of view, so all viewpoints received a Vertical Angular Disturbance rating of 1 (definitions in **Table 5.2-5**).

The Visual Impact rating was determined based on the criteria set out in **Table 5.2-6**. It is expected that there will be substantial shape, colour, and textural differences between the Minesite and the surrounding landscape, but none of these differences are expected to dominate the landscape considering the following Project design measures:

- The Minesite is designed to be compact, so many of the Project features will be overlapping and obscure each other; this effectively limits the overall contrast of the Minesite because no one component can stand out;
- Many of the Project components will be vegetated during the Active Phases, limiting textural and colour differences from the surrounding landscape; and
- The open pit will be obscured by components like the dams for the management ponds and will be backfilled as sections of the pit are retired.

For these reasons, a Visual Impact rating of 2 is assigned to most viewpoints (**Table 5.2-8**). Two viewpoints, PP11 and PP12, have substantially elevated views of the Minesite. These views are expected to bring the extent of most of the Minesite components into view and negate many of the advantages of the compact design of the Project. These sites were assigned a Visual Impact rating of 3. For viewpoints PP14 and PP15, a Visual Impact rating of 1 was assigned simply due to the extreme distance between these viewpoints and the Minesite (more than 25 km). At that distance, resolving colour, texture, and shape differences between the Minesite and the surrounding landscape would likely be difficult even in ideal viewing conditions.

Table 5.2-8: Hassell Matrix Scores and Final Visual Effect Rating for the Active Phases

ID	Name	Sensitivity	Existing Visual Condition	Proximity	Horizontal Angular Disturbance	Vertical Angular Disturbance	Visual Impact Rating	Total Score	Final Visual Effect Rating
PP1	Telkwa High Road at Old Babine Lake Road	3	2	1	2	1	2	11	Moderate
PP2	Telkwa High Road at Jollymore Road	3	2	1	2	1	2	11	Moderate
PP3	Telkwa High Road at Babine Lake Road	3	2	1	2	1	2	11	Moderate
PP4	Telkwa High Road at Tyhee Lake Road	3	2	1	2	1	2	11	Moderate
PP5	Tyhee Lake	3	2	1	2	1	2	11	Moderate
PP6	Highway 16 at Woodmere Road	1	2	1	2	1	2	9	Slight
PP7	Highway 16 at Tower Street.	1	2	1	2	1	2	9	Slight
PP8	Highway at Good Road	1	2	1	2	1	2	9	Slight
PP9	Babine Lake Road at Hillcrest Road	1	2	1	2	1	2	9	Slight
PP10	Round Lake	2	2	1	2	1	2	10	Slight
PP11	Hudson Bay Mountain Resort Main Lodge	2	2	1	2	1	3	11	Moderate
PP12	Piper Recreation Area	2	2	1	2	1	3	11	Moderate
PP13	Highway 16 at Hubert Rest Stop	2	2	1	2	1	2	10	Slight
PP14	Onion Mountain Trail	2	2	1	1	1	1	8	Negligible
PP15	Onion and Dome Mountain Snowmobile Trails Entrance	2	2	1	1	1	1	8	Negligible
PP16	Eddy Park	3	2	1	2	1	2	11	Moderate
PP17	Tyhee Lake Road at Hislop Road	3	2	1	2	1	2	11	Moderate
PP18	Cabin Site	3	2	1	2	1	2	11	Moderate
PP19	Webster Lake Trail[1]	2	2	2	3	1	2	12	Moderate

Note: *1. Viewpoint representative of the Hunter Basin/Webster Plateau*

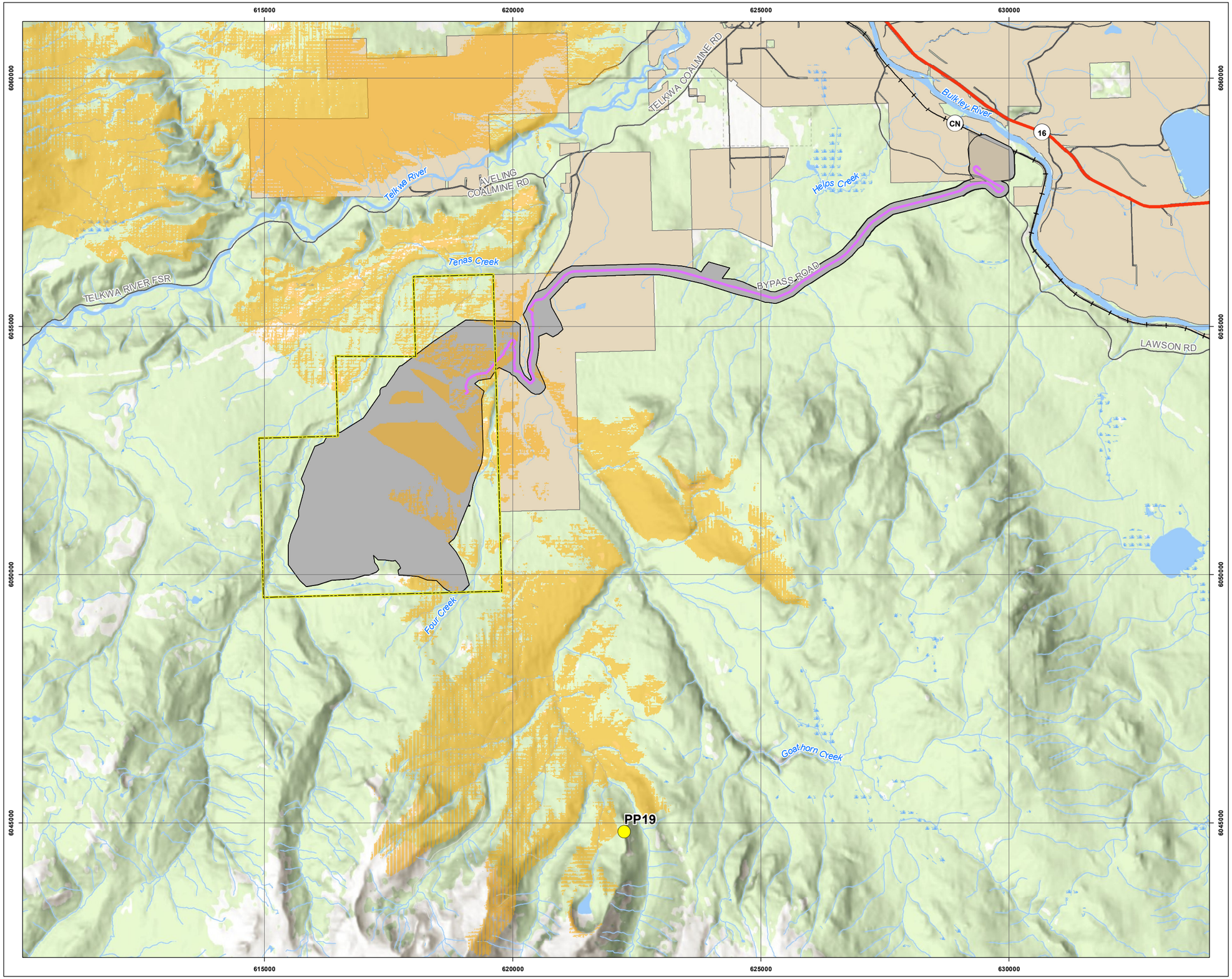
In total, eleven (11) viewpoints reported FVERs of Moderate (58%), six viewpoints report Slight (32%), and two viewpoints report Negligible (10%) (**Table 5.2-8**). No viewpoints reported a FVER of Substantial or Severe, largely because most viewpoints are a long distance from the Project (greater than 8 km). This distance effectively limits the maximum FVER as the ratings for proximity and angular disturbance remain low for all viewpoints.

Viewpoints rated as Moderate generally exhibited one of two characteristics: either the viewpoint was located in a residential area and thus received a High Sensitivity rating, or the degree of Visual Impact rating was High, where the viewpoint had a substantially elevated view of the entire Project site. Viewpoints PP1, PP2, PP3, PP4, PP5, PP16, PP17, and PP18 are concentrated in and around Telkwa. Their proximity to residences, municipal parks, and commercial areas resulted in High Sensitivity ratings, which raised the FVER rating.

Viewpoint PP19, located partway up the Webster Lake Trail, is the closest viewpoint to the Project. Despite its elevated position, the trail largely does not offer an expansive view of the Bulkley Valley owing to topographic obstructions to the west and north. The hill to the west of the viewpoint, on the west side of Cabinet Creek, obscures much of the Project from view, though enough of the Minesite remains visible to result in the maximum Horizontal Angular Disturbance rating. However, this view is only of the main Mine Infrastructure Complex (MIC), water management ponds and storage piles; the pit is anticipated to be completely obscured, thus limiting the Visual Impact rating, and resulting in a FVER of Moderate. As the site was inaccessible for photographs to be taken, a viewshed analysis showing what is visible from the site towards the Project is shown in **Figure 5.2-1** .

Tenas Project

Locations within the View from PP19



Legend

- Viewpoint
- Rail Line
- Highway
- Tenas Access Corridor
- Road
- Watercourse
- Wetland
- Waterbody
- Park or Protected Area
- Municipal Area
- Private Land
- Telkwa Coal Private Land
- Project Area
- Tenas Coal Licenses
- Location Visible from PP19

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

N

1:75,000

0 1 2 3 4 5

Kilometers

NAD 1983 UTM Zone 9N

Page Size: 11" x 17"

0403488-0339	Production Date: Jun 25, 2021	Figure 5.2-1

TELKWA COAL LIMITED

ERM

Path: T:\01-projects\Telkwa\Coal\Project_MXD\TLC-21-0238.mxd

Viewpoints PP11 and PP12, on the southern slopes of Hudson Bay Mountain have an elevated and unobstructed view of the Project, where they are expected to be able to see all of the Project components simultaneously. Given that each visible component (e.g., the pit walls, rock storage piles, overburden piles, etc.) can be expected to have different visual characteristics such as colour, texture, and shape, the rating for Degree of Visual Impact is higher than other viewpoints, resulting in the FVER of Moderate.

The visual simulations (**Figures 5.2-2 to 5.2-7**) for the Active Phases represent the expected design of the Project at ultimate Project build-out. Note that the Project is called out in the images as the visibility conditions when the photographs were taken were not ideal, and the Project would be somewhat obscured as a result.

Viewpoint PP4 (Telkwa High Road at Tyhee Lake Road; FVER of Moderate due to High Sensitivity of nearby residences) sits at approximately the same elevation as the Project, and as such has a “head-on” view of the Project components (**Figure 5.2-2**). The Project appears compact, with individual components overlapping each other, and only small strips of the pit wall visible.

Viewpoints PP5 (Tyhee Lake; FVER of Moderate due to a Sensitivity Rating of High, owing to nearby residences and Tyhee Lake Provincial Park) and PP9 (Babine Lake Road at Hillcrest Road; FVER of Slight) look southwest towards the Project from a slightly elevated vantage point. All large Project components are visible (**Figures 5.2-3** and **5.2-4**). However, the typically flat profiles of the various storage piles are somewhat muted, as the visual interface with the surrounding landscape is not a straight line. The pit wall and backfill provide a silhouette against the background that is slightly more contoured, resulting in a softer visual transition from the Project to the natural landscape.

Viewpoints PP10 (Round Lake; FVER of Slight) and PP13 (Highway 16 at Hubert Rest Stop; FVER of Slight) have a “side-on” view of the Project, looking west at elevations slightly below the Project (**Figures 5.2-5** and **5.2-6**). The pit wall is almost completely hidden, and the other components appear compact, particularly in the vertical field of view. However, the visual effect is somewhat magnified due to the flat profile of the various storage piles standing out against the background landscape.

Viewpoint PP11 (Hudson Bay Mountain Resort Main Lodge; FVER of Moderate due to the High Visual Impact rating) has an elevated view of the Project, and as a result, the visual impact of the components is magnified (**Figure 5.2-7**). Though 20 km distant, the entire layout of the site is visible, including substantial portions of the pit wall and all of the storage piles.

In total, 17 of the 19 viewpoints report Slight (six [6] sites) or Moderate (11 sites) FVERs, with the remaining two (2) reporting FVERs of Negligible. While no viewpoints report a FVER of Substantial or higher, these results indicate that the Project will not only be visible but can be expected to have an adverse effect on the Visual Quality of the landscape. The overall effect is limited largely by the distance most viewers will be looking from, which reduces the apparent size and contrast with the surrounding landscape. However, the scale and extent of visual disturbance caused by Project, along with its elevated position in the landscape, indicates it will remain identifiable from many locations in the LSA.

Figure 5.2-2: Visual simulation of view from Viewpoint PP4 during Active Phases

Figure 5.2-3: Visual simulation of view from Viewpoint PP5 during Active Phases

Figure 5.2-4: Visual simulation of view from Viewpoint PP9 during Active Phases

Figure 5.2-5: Visual simulation of view from Viewpoint PP10 during Active Phases

Figure 5.2-6: Visual simulation of view from Viewpoint PP13 during Active Phases

Figure 5.2-7: Visual simulation of view from Viewpoint PP11 during Active Phases

5.2.3.2 Post-closure Phase

The results of the Hassell Matrix analysis for the Post-closure Phase are shown in **Table 5.2-9**. For the Minesite, 11 viewpoints report FVERs of Slight, and eight (8) viewpoints report Negligible. No viewpoints reported a FVER of Moderate, Substantial or Severe.

At the beginning of the Post-closure Phase, all Project components with the exception of an access road, utility corridors, and maintenance infrastructure required for reclamation and monitoring activities, are expected to have either been reclaimed, or filled with water (including the open pit as much of the open pit will be backfilled, the rest filled with water). It is also proposed that the open pit high wall and footwall will be revegetated to reduce visual effects. Revegetation will be designed to mimic local ecosystems where possible, resulting in vegetation colours and textures that blend in well with the surrounding area. The end land use goals will reflect current and past land uses, most of which will be based around multiple-use forest ecosystems and to support existing Indigenous land uses. Where feasible, Project components will also have been contoured where possible, with straight lines and sharp edges smoothed out to resemble natural landforms.

These reclamation activities will limit or eliminate the differences in contrast, pattern, and shape from the surrounding landscape, but it is possible that during this phase, some components of the Project will still be identifiable while vegetation regrowth is ongoing, much like forest cutblocks as they green-up following replanting.

With respect to the Hassell Matrix, the ultimate effect of reclamation activities will be to: a) reduce the Visual Impact rating to 1 for all viewpoints, as the contrasting colours, textures, and shapes of the Project components should be minimized, and b) reduce the Horizontal Angular Disturbance rating to 1 for all viewpoints, as the extent of those components that are visible are very likely to be reduced or eliminated completely (the Vertical Angular Disturbance would also be smaller, but all viewpoints already report a value of 1). All other ratings remain unchanged from the Active Phases. Therefore, FVERs for all viewpoints are expected to be either Slight or Negligible in this phase. Any remaining permanently disturbed areas are expected to be small in scale and difficult to see from the viewpoints.

A comparison of the visual simulations and the results of the Hassell Matrix analysis indicate that the FVERs represent a reasonable assessment of the impact of the Project on Visual Quality (**Figures 5.2-8 to 5.2-13;** Note that the Project is called out in the images as the visibility conditions when the photographs were taken were not ideal, and the Project would be somewhat obscured as a result). The overall size of the disturbances are smaller, as many of the Project components are removed (e.g., stockpiles, storage piles) and the pit is backfilled. Furthermore, once vegetation has taken hold over most of the Project site, much of the contrast in colour and pattern should be limited or completely eliminated. The simulations do suggest that the overall shape of some of the Project components may be noticeable, as there may be some unnatural-looking shapes that appear out of place; however, with minimal differences in colour and texture from the surrounding area, FVERs of Slight or Negligible appear to be rating the visual disturbance appropriately.

Table 5.2-9: Hassell Matrix Ratings for the Post-closure Phase

ID	Name	Sensitivity	Existing Visual Condition	Proximity	Horizontal Angular Disturbance	Vertical Angular Disturbance	Visual Impact	Total Score	Final Visual Effect Rating
PP1	Telkwa High Road at Old Babine Lake Road	3	2	1	1	1	1	9	Slight
PP2	Telkwa High Road at Jollymore Road	3	2	1	1	1	1	9	Slight
PP3	Telkwa High Road at Babine Lake Road	3	2	1	1	1	1	9	Slight
PP4	Telkwa High Road at Tyhee Lake Road	3	2	1	1	1	1	9	Slight
PP5	Tyhee Lake	3	2	1	1	1	1	9	Slight
PP6	Highway 16 at Woodmere Road	1	2	1	1	1	1	7	Negligible
PP7	Highway 16 at Tower Street	1	2	1	1	1	1	7	Negligible
PP8	Highway at Good Road	1	2	1	1	1	1	7	Negligible
PP9	Babine Lake Road at Hillcrest Road	1	2	1	1	1	1	7	Negligible
PP10	Round Lake	2	2	1	1	1	1	8	Negligible
PP11	Hudson Bay Mountain Resort Main Lodge	2	2	1	1	1	1	9	Slight
PP12	Piper Recreation Area	2	2	1	1	1	1	9	Slight
PP13	Highway 16 at Hubert Rest Stop	2	2	1	1	1	1	8	Negligible
PP14	Onion Mountain Trail	2	2	1	1	1	1	8	Negligible
PP15	Onion and Dome Mountain Snowmobile Trail Entrance	2	2	1	1	1	1	8	Negligible
PP16	Eddy Park	3	2	1	1	1	1	9	Slight
PP17	Tyhee Lake Road and Hislop Road	3	2	1	1	1	1	9	Slight
PP18	Cabin Site	3	2	1	1	1	1	9	Slight
PP19	Webster Lake Trail[1]	2	2	2	1	1	1	9	Slight

Note: *1. Viewpoint representative of the Hunter Basin/Webster Plateau*

Figure 5.2-8: Visual simulation of view from Viewpoint PP4 during Post-closure Phase

Figure 5.2-9: Visual simulation of view from Viewpoint PP5 during Post-closure Phase

Figure 5.2-10: Visual simulation of view from Viewpoint PP9 during Post-closure Phase

Figure 5.2-11: Visual simulation of view from Viewpoint PP10 during Post-closure Phase

Figure 5.2-1: Visual simulation of view from Viewpoint PP13 during Post-closure Phase

Figure 5.2-2: Visual simulation of view from Viewpoint PP11 during Post-closure Phase

With some viewpoints still reporting an FVER of slight in the Post-closure Phase, there is a likely adverse effect on Visual Quality. Even though much of the site is expected to be reclaimed and revegetated with the intent to mimic the appearance of the nearby landscape, some unnatural shapes may remain that disturb the otherwise natural landscape. Additionally, there are some areas of disturbance that will likely remain indefinitely, such as access roads, utility corridors, and monitoring infrastructure that may be visible from some locations.

5.2.4 Reduction in Visual Quality - Rail Infrastructure

5.2.4.1 Active Phases

The results of the Hassell Matrix analysis for the Rail Infrastructure are shown in **Table 5.2-10**. The Rail Infrastructure is only assessed for the Active Phases of the Project, as it will be completely removed prior to the Post-closure Phase. Note that PP19 (Webster Lake Trail) is excluded from this part of the assessment as the Rail Infrastructure is not visible from that location.

The Sensitivity and EVC ratings remain unchanged for each of the viewpoints. Six viewpoints (PP6, PP7, PP10, PP13, PP16, and PP17) are within 8 km resulting in a Proximity rating of 2; all remaining viewpoints are assigned a rating of 1. The Rail Infrastructure is small enough that the total angle subtended by it is calculated to be less than 7% in all orientations for all viewpoints except PP13, so the Horizontal and Vertical Angular Disturbance ratings are set to 1. At PP13, the Rail Infrastructure subtends approximately 9% in the horizontal, so a Horizontal Angular Disturbance Rating of 2 is assigned.

With respect to the Visual Impact rating, the total disturbed area within the Rail Infrastructure is relatively small. The land inside the Rail Loop will remain untouched, and the area to be cleared for the coal stockpile and associated infrastructure is around 10 ha with a gravel pad. The coal stockpile itself is only expected to be a few metres tall. Given the small disturbance and no constructed features of substantial height or visual contrast, the Visual Impact rating is 1 for all sites except PP13, which is close enough (less than one [1] km) that the Rail Infrastructure is likely to be very distinct.

With the exception of PP13 (Hubert Rest Stop), which reported a FVER of Moderate, all sites reported FVERs of Slight (11 sites) or Negligible (6 sites). The relatively small visual disturbance of the Rail Infrastructure combined with no need for substantial clearing or alteration of vegetation is expected to limit the overall visual effect apparent from locations beyond 2 km. Furthermore, there are no large buildings or other features that will be prominent or otherwise visually distinct, so from most viewpoints in the surrounding area, the Rail Infrastructure is not expected to stand out as a significant visual disturbance.

PP13 is within one (1) km from the site, and thus will be subject to some visual disturbance as demonstrated by a FVER of Moderate (**Table 5.2-10**; **Figure 5.2-14**). Of particular note is the Visual Impact Rating of 2, which is due to the presence of clean coal stockpile and the frequent presence of train cars in the Rail Loop. However, the visual simulation shows that most of the site is obscured by trees lining the opposite bank of the Bulkley River, a condition the FVER rating does not consider. Furthermore, the simulation shows the conditions during winter when there are no leaves on the trees, so for much of the year, a majority of the Rail Loop will be completely obscured by trees. Given the screening effect of the trees near the , it can be concluded that the FVER likely overestimates the true visual effect of the Rail Infrastructure on the view at PP13 during much of the year.

Despite the relatively small visual disturbance, 11 of 19 viewpoints report FVERs of at least Slight. Therefore, it is still anticipated that the Rail Infrastructure will result in an adverse effect on Visual Quality.

Table 5.2-10: Hassell Matrix Ratings for the Rail Infrastructure

ID	Name	Sensitivity	Existing Visual Condition	Proximity	Horizontal Angular Disturbance	Vertical Angular Disturbance	Visual Impact	Total Score	Final Visual Effect Rating
PP1	Telkwa High Road at Old Babine Lake Road	3	2	1	1	1	1	9	Slight
PP2	Telkwa High Road at Jollymore Road	3	2	1	1	1	1	9	Slight
PP3	Telkwa High Road at Babine Lake Road	3	2	1	1	1	1	9	Slight
PP4	Telkwa High Road at Tyhee Lake Road	3	2	1	1	1	1	9	Slight
PP5	Tyhee Lake	3	2	1	1	1	1	9	Slight
PP6	Highway 16 at Woodmere Road	1	2	2	1	1	1	8	Negligible
PP7	Highway 16 at Tower Street	1	2	2	1	1	1	8	Negligible
PP8	Highway at Good Road	1	2	1	1	1	1	7	Negligible
PP9	Babine Lake Road at Hillcrest Road	1	2	1	1	1	1	7	Negligible
PP10	Round Lake	2	2	2	1	1	1	9	Slight
PP11	Hudson Bay Mountain Resort Main Lodge	2	2	1	1	1	1	8	Slight
PP12	Piper Recreation Area	2	2	1	1	1	1	8	Slight
PP13	Highway 16 at Hubert Rest Stop	2	2	2	2	1	2	11	Moderate
PP14	Onion Mountain Trail	2	2	1	1	1	1	8	Negligible
PP15	Onion and Dome Mountain Snowmobile Trail Entrance	2	2	1	1	1	1	8	Negligible
PP16	Eddy Park	3	2	2	1	1	1	10	Slight
PP17	Tyhee Lake Road and Hislop Road	3	2	2	1	1	1	10	Slight
PP18	Cabin Site	3	2	1	1	1	1	9	Slight
PP19	Webster Lake Trail[1]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Notes: *Viewpoint PP19 has no view of the Rail Infrastructure as it is obscured by topography.*

1. Viewpoint representative of the Hunter Basin/Webster Plateau

Figure 5.2-3: Visual simulation of view of the Rail Infrastructure from Viewpoint PP13

5.2.5 Ambient Light

5.2.5.1 All Active Phases

Ambient light will be generated from operating equipment and light sources required for safety during limited daylight conditions. Potential effects with regards to light trespass, sky glow and glare are not expected as unintentional light effects will be managed using BMPs and engineering. Over the past few decades, advances have been made to lighting designs (i.e., horizontal cut-off fixtures) such that there is minimal fugitive light emissions outside of work areas requiring light. The nearest residents to the Rail Loop are over 500 m away, and over four (4) km from the open pit. Given the BMPs and the distances between source and receiver, Project-related effects from ambient lighting are expected to be limited.

5.3 Mitigation Measures

This subsection describes the mitigation measures for the Visual Resources VC and is consistent with the definition provided by BC EAO (2013). TCL has incorporated several mitigation measures in the Project design and/or operational procedures to reduce the magnitude, duration, and extent of effects due to the Project. These mitigation measures are outlined in **S1.0 Overview of Project Proponent Description** of the **EAC Application.** Project mitigation measures relevant to minimizing potential Project-related effects on the Visual Resources VC are described in **5.3.1** to **5.3.3**. As the effects will not be fully eliminated, additional mitigation measures specific to the Visual Resources VC are described in **5.3.4** and **5.3.5**.

Although there are no specific prescriptive regulatory standards or guidelines for large resource development projects, the measures identified here are consistent with those put forward in past applications and management plans and are typical measures for many mining projects in BC (e.g., Teck 2016, HCMC 2015, KGHM 2015).

Given the proximity of the Project to Smithers and Telkwa, as well as the rising importance of the recreation and tourism industry in the region, Visual Quality is a key resource management consideration. Historically a balance has been struck between maintaining Visual Quality and encouraging natural resource development, so it is important to manage the effects of the Project on Visual Quality to ensure this balance is maintained. This subsection describes five main strategies that will be implemented to mitigate the effects of the Project on Visual Quality and help preserve that balance: Project layout and component design measures, progressive reclamation, revegetation of the Project infrastructure and cleared areas, and utilizing site-specific vegetation screening. These measures apply across all phases for all Project components. The mitigation measures are discussed below and summarised in **Table 5.3-1**. A more detailed discussion regarding mitigation measures can be found in the **Visual Resources Management Plan (S13.0-C19) (VRMP)**.

5.3.1 Limit Project Footprint and Project Area

A key mitigation measure incorporated into the design of the Project is the limiting of the overall size of the footprint to minimize the apparent size and scale of the Project. As laid out in the Hassell Matrix, the Horizontal and Vertical Angular Disturbance are important inputs into the FVER, so keeping size of the disturbance as small as possible can be expected to be effective in limiting the effect of the Project on Visual Quality. This mitigation measure will be implemented at all stages of the Project for both the Minesite and the Rail Infrastructure. To limit the Project footprint and Project Area the Project has been designed to:

- Cluster Project components, including the pit, stockpiles for run-of-mine (ROM) coal, processed coal and processed rock, Coal Processing Plant (CPP), management ponds, and ancillary facilities such as the Maintenance Facility and Administration Building;

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

5.3.2 Reclamation Measures

The large Project components (e.g., the open pit, stockpiles, etc.) will be responsible for most of the visual effect of the Project. A highly effective mitigation measure to reduce visual effects typically employed by mining projects in BC (e.g., Teck 2016, HCMC 2015, KGHM 2015) is the progressive reclamation of disturbed areas no longer in use within the Minesite, wherein disturbed areas are either seeded with appropriate plant species designed to achieve specific management goals (e.g., erosion control), or are permitted and encouraged to be colonized naturally by native plant species.

The following reclamation measures have been incorporated into the mine design:

- Use progressive reclamation techniques including to limit the amount of disturbance at any given time by sequencing the open pit and stockpiles to the extent feasible, backfilling of open pit, where possible, directly placing reclamation materials, and placing excavated materials on previously disturbed areas;
- Salvage reclamation materials (surface soil, woody debris, and overburden), for later use in accordance with the **Reclamation and Closure Plan (S13.0-C15) (RCP);**
- Vegetate all temporary surface soil and overburden stockpiles to minimize the potential for erosion and sediment generation, to prevent subsequent potential effects on water quality, and to prevent losses of surface soils;
- Implement progressive reclamation on embankments, buttresses, backfills, TAC cut and fill slopes, and other Project components where possible to minimize fugitive dust emissions and reduce erosion and sediment generation;
- The reclaimed landscape will be shaped and contoured to achieve variations of slope steepness, slope length, aspect, and form to assist in creating landform diversity suitable for the establishment of varied plant communities and to reduce visual effects; and

- PAG material deposited in the management ponds will be flooded to prevent acid mine drainage but will also be covered with an engineered cover consisting of non-PAG rock, overburden, and surface soils to allow for terrestrial revegetation;
- Majority of open pit features (e.g., highwalls and footwalls) are covered/resurfaced/recontoured with non-potentially acid generating (PAG) rock and overburden; and
- Revegetate with native plant species appropriate for the target ecosystems, which will include species for merchantable timber, subsistence foods, and ceremonial purposes in consultation with the Wet'suwet'en.

These mitigation measures will be implemented at all stages of the Project for the Minesite.

5.3.3 Project Component Design

There are several opportunities to mitigate the effect of the Project on Visual Quality at the level of individual Project components. Although most of the visual disturbance resulting from the Project is expected to result from the large Project components, buildings and other erected structures will be similarly designed to limit their visual disturbance. The following apply to Project component design:

- select tonal values and low chroma colours to paint buildings and related infrastructure to create low contrast to existing background conditions throughout the spring, summer, and fall months when viewers are more likely to be outdoors.
- select tonal values best suited for the dominant building face when seen from the priority viewpoints;
- select non-reflective building and infrastructure surfaces to eliminate glare from reflected sunlight;
- avoid sharp and linear changes in the slope or aspect of the stockpile, pile, embankments, buttresses, and excavated surfaces;
- contour benches within backfilled material and embankments and buttresses to prevent obvious and easily discernable linear shapes;
- landscape (e.g., add small hills, swallows) to the tops of material stockpiles to create non-linear silhouettes;
- manage light effects using BMPs and engineering design.
- TCL will also incorporate the following mitigations associated with effects from lighting:
  - for areas visible to the public from sensitive viewpoints investigate eliminating night lighting of buildings and structures and block light from windows where possible considering safety requirements;
  - direct lighting shall be directed towards the ground and have appropriate covers to avoid fugitive light emissions; and
  - lighting should be sensitive to environmental conditions and automatically shut off during daylight hours.

These mitigation measures will be implemented at all stages of the Project for the Minesite and Rail Infrastructure.

5.3.4 Revegetation of Disturbed Areas Relevant to Visual Resources

Revegetation has two (2) primary benefits on Visual Resources: a more natural appearance that mimics the surrounding forested landscape; and to reduce the visibility of Project components that have visually distinct shapes. This revegetation would be expected to gradually homogenize the colours and textures of disturbed areas with surrounding and background areas, softening the linear appearance of the large Project components, including the open pit, management and Tenas Control ponds and stockpiles. Where possible, material storage piles (e.g., overburden storage piles, surface soil stockpiles) and embankments and buttresses associated with the management and Tenas Control ponds will be progressively revegetated during the Construction, and Operation phases when portions of those components are completed (refer to **5.3.3** above).

During the Operation Phase some portions of the TAC, management and control pond embankments, buttresses and covers, and backfills are reclaimed. The remaining developed areas are revegetated by the end of the Decommissioning and Reclamation Phase.

With respect to the Rail Infrastructure, components will be removed, and the land allowed to return to its pre-development state, with revegetation occurring both naturally and assisted through soil replacement, seeding, and fertilization efforts during the Decommissioning and Reclamation Phase.

At the Post-closure Phase, most of the Project's components (at both the Minesite and Rail Infrastructure) will have already been reclaimed and/only small visual features related to access roads, utility corridors, and maintenance infrastructure such as monitoring stations will remain. The end land use goal for the Project after the Post-closure Phase is multiple use forested ecosystems that are ecologically like the surrounding area, which can provide wildlife habitat, recreation opportunities, traditional land uses such as subsistence food gathering and feasting, as well as potential for forest harvesting in some areas.

5.3.5 Targeted Vegetation Screening

In Project phases for both the Minesite and Rail Infrastructure, where there are small, high-contrast features that cannot be painted or otherwise camouflaged, or where it is cost prohibitive to do so, vegetation screens might be erected to effectively hide that feature if practical (i.e., onsite vegetative screening). These typically involve the planting of low maintenance native shrubs and/or fast-growing tree species such as aspen; the specific planting layout and species mix will be dependent on the size and extent of the feature(s) to be screened. This measure for small- to medium-sized Project components (e.g. hydrocarbon tanks, processed coal and ROM coal stockpiles), is expected to be effective, though it may take several years for the vegetation to grow to sufficient height and foliage density to provide the full desired screening effect.

In some isolated cases, strategically placed vegetation screens may be erected at a viewpoint to hide the portions of the Project from direct view. The viewpoints where these screens would be effective are typically close to the Project where the view towards the Project is not generally considered scenic (i.e., the view is limited to the Project and the immediate surroundings), and the viewpoints are characterized by a specific, limited area where people will gather (e.g. picnic areas, private residences). Potential locations for these vegetation screens must be evaluated on a case-by-case basis to determine if the screen would be effective and accepted, and if so, how the screen should be deployed to maximize its effectiveness. Once locations are selected, a consultation and engagement process with local stakeholder and Indigenous groups would be undertaken to incorporate their concerns and support for the locations selected.

5.3.6 Summary of Mitigation Measures

Table 5.3-1 summarizes the proposed mitigation measures for all potential effects of the Project on the Visual Resources VC. For the Visual Quality subcomponent, after the implementation of these measures, all effects are expected to result in residual effects and will be carried forward in this assessment.

Table 5.3-1: Summary of Potential Effects and Mitigation Measures for the Visual Quality Subcomponent

Potential Effect	Contributing Activities within the Project Phases (C, O, D, P)	Proposed Mitigation Measure	Applicable VC Subcomponent	Residual Effect (Yes/No)
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**)	Visual Quality	Yes
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**)	Visual Quality	Yes
Reduction in Visual Quality (Rail Infrastructure)	All activities (C, O, D)	▪ Limit Project footprint and Project Area ▪ Targeted vegetation screening (Refer to **VRMP**)	Visual Quality	Yes

Notes: *C,O,D,P represent Project Phases: (C)onstruction, (O)peration, (D)ecomissioning and Reclamation, (P)ost-closure; VRMP=Visual Resources Management Plan (S13.0-C19)*
*See **Table 5.1-2** for list of applicable activities for each listed Project phase, unless otherwise noted in this table.*

5.4 Residual Effects and Significance of Residual Effects

This section describes the likely residual effects of the Project on the Visual Resources VC. Residual effects are adverse effects that remain after the implementation of all mitigation measures and management strategies and are the expected consequences of the Project for the Visual Resources VC. The approach to assessing residual Project effects on the Visual Resources VC follows the methodology outlined in **3.0 Assessment Methodology** of the **EAC Application**. Each residual effect is assessed in the context of the Project activities that will occur within each Project phase. Based on the potential Project-related effects listed in **5.2**, the assessment focuses on Construction, Operation, Decommissioning and Reclamation, and Post-closure phases. Residual effects are then characterised based on the combined predicted residual

effect for these Phases. The assessment includes a determination of Likelihood, Significance and the Level of Confidence associated with the prediction.

5.4.1 Description of Evaluation Criteria

5.4.1.1 Residual Effects Characteristics

Although the mitigation measures are likely to reduce the effects of the Project on Visual Quality, they cannot be fully eliminated. Large Project components that are active, such as pit walls, haul roads, and some stockpiles, cannot be fully mitigated because the design measures and revegetation mitigations can only be applied to components that will no longer be in use. Furthermore, targeted vegetation screening is only feasible for smaller, specific onsite components such as the Rail Infrastructure, or for specific viewpoints that would benefit from vegetation screens; these could include viewpoints close to the Project or sensitive sites such as residential areas or municipal parks.

Considering the prediction that mitigations will not be fully effective, a residual effect on Visual Quality is expected. This subsection describes and justifies the characterisation of the residual effects of the Project on Visual Quality. **Table 5.4-1** summarizes the terms and ratings for the characterisation of the Project-related residual effects on Visual Quality. These ratings have been developed based on similar significance characterizations from past Environmental Assessments (e.g., Seabridge 2013, KGHM 2015, Harper Creek Mining Corporation 2015) and professional judgement.

Table 5.4-1: Effect Characteristics Considered when Determining the Significance of Residual Effects on Visual Quality Subcomponent

Residual Effect Characteristic	Definition	Rating
Magnitude	Severity of the residual effect on Visual Quality, as determined by the FVER ratings from all viewpoints	**High** – 50% or more of viewpoints report FVERs of Substantial or Severe **Moderate** – 50% or more of the viewpoint report FVERs of Moderate OR 25% or more of viewpoints report FVERs of Substantial or Severe **Low** – Less than 50% of viewpoints report FVERs of Moderate AND less than 25% of viewpoints report FVERs of Substantial or Severe
Geographic Extent	Spatial scale over which the residual effect on Visual Quality is expected to occur	**Project Area** – Visual effect is limited to the Project Area only **Local** – Visual effect is limited to the LSA **Regional** – Visual effect is limited to the RSA **Beyond Regional** – Visual effect occurs beyond the RSA
Duration	Length of time over which the residual effect on Visual Quality is expected to persist	**Short-term** – Visual disturbance that persists for less than one year **Medium-term** – Visual disturbance that persists for up to the total duration of the Project phases over which the effect is being assessed **Long-term** – Visual disturbance that persists for the life of the Project or beyond

Residual Effect Characteristic	Definition	Rating
Frequency	How often the residual effect on Visual Quality is expected to occur	**Infrequent** – Visual disturbance is periodic and rarely occurs **Frequent** – Visual disturbance is periodic and occurs often **Continuous** – Visual disturbance persists at all times
Reversibility	Whether or not the residual effect on Visual Quality can be reversed once the activity causing the residual effect ceases	**Fully Reversible** – No visible trace of the visual disturbance is discernable in the landscape **Mostly Reversible** – Some visible trace of the visual disturbance is discernable (i.e. by shape or texture), but it is in character with the surrounding landscape, and it is difficult to identify the true extent of the disturbance **Partially Reversible** – The visual disturbance is somewhat distinguishable, but some portions of the disturbance blend in with the surrounding landscape, and the true extent of the entire disturbed area is not apparent **Irreversible** – The visual disturbance is clearly distinguishable, and the full extent of the disturbance is readily apparent
Context	The extent to which Visual Quality has been affected by past and present environmental and socio-economic processes and conditions, its potential sensitivity to the Project-related residual effect, and its ability to recover from that effect (i.e. resilience)	**Low** – There is substantial existing visual disturbance in the landscape OR the area is not sensitive to changes in the landscape **Moderate** – There is some existing visual disturbance in the landscape OR the area is somewhat sensitive to changes in the landscape **High** – There is little to no existing visual disturbance in the landscape OR the area is very sensitive to changes in the landscape

Note: *%=percent; FVER= Final Visual Effect Rating*

5.4.1.2 Likelihood

Likelihood considers the probability that the residual effect will occur, including consideration of the likelihood that the mitigation will be successful. The likelihood of the residual effects on Visual Quality are evaluated based on the following criteria:

- the probability that mitigations measures are fully effective; and
- the probability of the visual effect of the Project being substantially smaller than assessed.

A rating of Unlikely would result if either of the above probabilities were considered High. A rating of Likely would result if both of the above probabilities were considered Low.

5.4.1.3 Significance Determination

FVER feeds into the Magnitude residual effects characteristic. It describes the two components of the effect of any visual disturbance on Visual Quality: the nature of the visual disturbance in the context of the

landscape and the expectations of the people who can see it. As these two components are integral to Visual Quality, any determination of Significance should rely heavily on Magnitude. Furthermore, the viewpoints selected in this assessment are intended to represent the range of viewing angles and land uses, so the FVER results can be interpreted as the predicted visual effect of the Project over the entire LSA.

Another important residual effect characteristic for Visual Quality is Context, which characterises the sensitivity of the landscape to visual disturbance. Pristine landscapes with little to no existing disturbance are highly sensitive to visual disturbances, as they will stand out and draw the eye; viewers of the landscape are likely to place higher aesthetic value on these landscapes. Heavily modified landscapes can absorb more frequent and larger visual disturbances as they are much less likely to stand out, and viewers are less likely to put high aesthetic value on those types of landscapes. Additionally, viewer expectations contribute to sensitivity to visual disturbances. Landscapes that have many residents who view the landscape frequently, or landscapes that support substantial recreational use, are more sensitive to visual disturbances than landscapes in transportation corridors or landscapes that are uninhabited and rarely visited.

The Reversibility of the residual effect is the final important consideration for the determination of Significance. Any effect on Visual Quality that is not Fully Reversible will result in a permanent visual effect on the landscape.

The remaining characteristics are consistent across all phases considered in this assessment. Geographic Extent is Local, as the effect will occur within the LSA boundary, which represents the maximum distance from which the Project can effectively be distinguished from the background landscape. Given that the LSA includes residences, recreation sites, and other locations where landscape views are considered important, a Local extent can still permit a significant residual effect depending on the size and visual distinctiveness of the Project.

The effects on Visual Quality are assumed to persist for the entire length of each of the phases assessed, so the Duration rating is always Medium-term. A Duration rating of Medium- or Long-term results in a residual effect that can be expected to last for up to 20 years or more. This facilitates a significant residual effect if the size and visual distinctiveness of the Project is large enough to be seen from the surrounding area.

The Frequency of visual disturbance for natural resource development projects are always Continuous, as the visual disturbance of the Project is not concealed or otherwise obscured at any point during the life of the Project. If the visual disturbance attributable to the Project is substantial enough to be seen from the surrounding area, the Frequency of the residual effect may contribute to a finding of a significant residual effect.

Based on the above characterisation of the residual effects of the Project on Visual Quality, and in combination with the Geographic Extent, Duration, and Frequency characteristics, the residual effect will be considered **Significant** if any of the following scenarios are true:

- Magnitude rating of High: This Magnitude rating would result where the Hassell Matrix analysis produces multiple FVERs of Substantial or higher, which would clearly indicate that the visual disturbance is visually dominant in the landscape and would have a substantial adverse effect on Visual Quality regardless of any other effect characterisation. The disturbance would be very visually distinct and would likely alter the overall character of the landscape;

- Magnitude rating of Moderate AND a Context rating of High or Moderate: A Magnitude rating of Moderate, where multiple viewpoints report FVERs of Moderate is not in itself a Significant effect. In a landscape with a similar scale of existing disturbance to the new disturbance, it is unlikely to stand out and influence the viewer's perception of the Visual Quality of the landscape. It is therefore dependent on Context, where a rating of Moderate suggests that the landscape is somewhat sensitive to visual disturbance, and the scale of that disturbance determines whether the effect is significant; and
- Context rating of High AND a Reversibility rating of Mostly Reversible, Partially Reversible, or Irreversible: In this case, the landscape is highly sensitive to visual disturbances in the landscape. Any permanent disturbance in such a landscape, whether it was a pristine landscape with a smaller number of viewers or a slightly modified landscape with many viewers, should be considered significant as these types of landscapes tend to be rare, particularly when in proximity to readily accessible populated areas and recreation or tourism sites.

Any other combination of characterisations would carry a determination of **Not Significant**. In those cases, the apparent size of the disturbance relative to where the Project will be viewed from, and the ability for that disturbance to be mitigated and remediated would not be expected to result in substantial residual effects.

The confidence of the prediction of residual effects on Visual Quality can be characterised as follows:

- **Low Confidence:** predictions are based solely on professional judgement with no empirical data, observations, or visual simulations to support the predictions;
- **Moderate Confidence**: predictions are based on professional judgement supported by interpretation of visual simulations, but no empirical data or observations to support the predictions; or
- **High Confidence:** predictions are based on empirical variables or observations and are supported by visual simulations and professional judgement.

Overall, the prediction of residual effects on the Visual Quality subcomponent are made with a High Level of Confidence. The Hassel Matrix analysis that feeds into the Magnitude characteristic is comprised of empirical variables (proximity, angular disturbance), observed values (existing disturbance, sensitivity), and only one variable that is estimated based on a qualitative measure based on experience and professional judgement (Visual Impact). The other ratings are based on logically identifiable characteristics, where there is little uncertainty regarding how the characteristics will be rated.

5.4.2 Reduction in Visual Quality During the Active Phases

Following mitigation, it is expected that during the Active Phases of the Project, there will be a residual adverse effect on the Visual Quality of the landscape. With the Project being situated in the foothills of the Telkwa Mountain Range, it is slightly elevated and, therefore, affords substantial portions of the surrounding area some view of it. Though the Project is compact in design, it will still result in a visual disturbance that almost any location in the LSA with a line of sight to the Project will be able to discern the Project, though the further away a viewer is, the less discernable the Project becomes from the background landscape.

Mitigation measures are likely to be only partially effective. As the Project components are expanded during Construction and Operation, the Project design measures are secondary considerations to the engineering design and safety considerations; as such, measures that involve earthworks to change the shape or silhouette of a component are unlikely to take place until that component is no longer in use. However, there will be ongoing and progressive reclamation efforts during the Construction and Operation of the Project, where active components will be partially revegetated. It will take time for the revegetation process

to get established and provide a mitigation to the overall visual effect of the Project, but near the end of the Active Phases, the mitigations will be more effective as vegetation will have had time to take hold.

5.4.2.1 Residual Effect Characteristics

The FVER ratings for the Active Phases are inclusive of the mitigation strategies, including partial revegetation and some contouring/shaping of Project components. With 11 of 19 viewpoints (58%) reporting FVER ratings of Moderate, the Magnitude of the effect is rated as Moderate.

As the LSA defines all areas from which the Project is visible and discernable (i.e., within 35 km), the Geographic Extent is limited to the LSA. The Duration is long-term as the Project is expected to be visible throughout the Active Phases. The Frequency is Continuous as the Project is expected to be visible at all times. The Reversibility is rated as Partially Reversible, as vegetation is predicted to gradually take hold and serve to reduce some of the visual effects of the Minesite, and some components will be landscaped to reduce the visual impact of unnatural shapes and lines.

The region has historically been a major centre of the forest industry, which has resulted in a patchwork of forest cut blocks throughout the Bulkley and Telkwa river valleys. These cut blocks constitute the majority of the visual disturbances in the landscape, and although they regenerate over time, they are typically replaced by new cut blocks at a steady rate. These disturbances are visible from a surrounding area that includes Smithers, Telkwa, and numerous recreation and tourism opportunities, which clearly suggests that the landscape is sensitive to changes in Visual Quality. However, over the long-term, the regrowth of forests in this heavily forested area is expected to ultimately allow Visual Quality to recover once the Project is complete and reclaimed. Considering these factors, the Context of the effect is rated as Moderate. **Table 5.4-2** summarises the characteristics of this residual effect.

Table 5.4-2: Summary of Residual Effects Characteristics Ratings for Visual Quality Subcomponent in the Active Phases

Residual Effect Characteristic	Rating	Rationale for Rating
Magnitude	Moderate	Per the Hassell Matrix analysis in **5.2.3 Reduction in Visual Quality - Minesite,** 11 viewpoints reported FVERs of Moderate.
Geographic Extent	Local	The LSA defines the furthest distance from which the Project is likely to be discernable.
Duration	Medium-Term	The residual effects are predicted to last for the duration of the Active Phases of the Project.
Frequency	Continuous	The Project is expected be visible at all times.
Reversibility	Partially Reversible	During the Active Phases, Project components that are no longer in use will be progressively reclaimed, where they will be revegetated and potentially reshaped to reduce their overall visual impact.
Context	Moderate	The area is a major centre of forestry activity, and there are many visual disturbances already present in the landscape in the form of cutblocks and access roads. Though these regenerate, they are expected to be replaced by new cutblocks. With the Town of Telkwa nearby and many recreation opportunities available in the Bulkley Valley, the area is sensitive to changes in Visual Quality. However, given that the region is heavily forested, over the long-term Visual Quality can be expected to recover from substantial visual disturbance as forests re-grow in disturbed areas.

Notes: *FVER=Final Visual Effect Rating; LSA=Local Study Area*

5.4.2.2 Likelihood

As described above, mitigation measures are expected to only be partially effective, with a Low probability that they will fully mitigate for the total visual disturbance of the Minesite. The Likelihood of the residual effect occurring is, therefore, rated as Likely. This rating is based on professional judgement and observations made of similar resource development projects across BC (e.g. Highland Valley Copper Mine, New Afton Mine).

5.4.2.3 Significance Determination

As described in **5.4.1** the determination of Significance is made based on whether combinations of the characteristics of the effect satisfy any of the following scenarios:

- Magnitude rating of High;
- Magnitude rating of Moderate AND a Context rating of High or Moderate; or
- Context rating of High AND a Reversibility rating of Mostly Reversible, Partially Reversible, or Irreversible.

As shown in **Table 5.4-2**, the Magnitude of the effect is rated as Moderate, the Context is rated as Moderate and Reversibility is rated as Partially Reversible, satisfying the second condition in the above list. In addition, the Geographic Extent is Local, where the effect takes place across all locations where the Project is visible from, the Duration is Medium-term, and the Frequency is Continuous. None of these characteristics constrain or prevent a significant residual effect from occurring, thus the residual effect is predicted to be **Significant**. This prediction is made with High Confidence.

5.4.3 Reduction in Visual Quality During the Post-closure Phase

Given the location of the Project on elevated terrain as described above, most viewpoints in the surrounding area are expected to have a view of the Project. In this phase, most Project components will either be removed (e.g., buildings, stockpiles, unnecessary roads, pipelines, etc.) and/or revegetated with forest ecosystems, with some components also contoured or reshaped where feasible. There may be some features (such as steep pit walls) that may not be conducive to revegetation, and other features that may remain visible such as access roads and maintenance infrastructure; however, these features would typically be relatively small and difficult to discern, especially once vegetation regrowth has progressed to a point where it is effective in reducing or eliminating most of the Project's visual disturbance. The mitigation measures in place during this phase are expected to be effective.

5.4.3.1 Residual Effects Characteristics

The FVER ratings consider the effects of these mitigations and indicates that the overall Magnitude of the effect is Low, as all viewpoints reported FVERs of Slight or Negligible. As the LSA defines all areas from which the Project is visible and discernable (i.e., within 35 km), the Geographic Extent is limited to the LSA. The Duration is Medium-term as the Project is expected to be visible throughout the Active Phases. The Frequency is Continuous as the Project is expected to be visible at all times. The Reversibility is rated as Partially Reversible, as vegetation is predicted to gradually take hold and serve to reduce some of the visual effects of the Minesite, and some components will be landscaped to reduce the visual impact of unnatural shapes and lines. Context is rated as Moderate per the description in **5.4.1.1**. **Table 5.4-3** summarises the characteristics of this residual effect.

Table 5.4-3: Summary of Residual Effects Characteristics Ratings for Visual Quality Subcomponent in the Post-closure Phase

Residual Effect Characteristic	Rating	Rationale for Rating
Magnitude	Low	Per the Hassell Matrix analysis in **5.2.3.2 Potential Effects to Visual Quality, Post-closure Phase** all viewpoints reported FVERs of either Negligible or Slight.
Geographic Extent	Local	The LSA defines the furthest distance from which the Project is likely to be discernable.
Duration	Medium-term	Any residual effects are expected to persist for the entire Post-closure phase.
Frequency	Continuous	The Project is expected to be visible at all times.
Reversibility	Mostly Reversible	Most Project components will either be reclaimed or revegetated, concealing much of the Project's visual disturbance from view. However, there are likely to be some components that may remain identifiable in the landscape (e.g. steep pit walls or components that cannot be feasibly reshaped).
Context	Moderate	The area is a major centre of forestry activity, and there are many visual disturbances already present in the landscape in the form of cutblocks and access roads. Though these regenerate, they are expected to be replaced by new cutblocks. With the Town of Telkwa nearby and many recreation opportunities available in the Bulkley Valley, the area is sensitive to changes in Visual Quality. However, given that the region is heavily forested, over the long-term Visual Quality can be expected to recover from substantial visual disturbance as forests re-grow in disturbed areas.

Notes: *FVER=Final Visual Effect Rating; LSA=Local Study Area*

5.4.3.2 Likelihood

As described above, mitigation measures are expected to be effective, with some probability that they will fully mitigate for the total visual disturbance of the Minesite. The ultimate orientation and design of the site may reduce the effect to minimal levels, potentially not discernable from most locations in the surrounding area. There is a Low probability that the size and extent of the visual disturbance will be substantially smaller than assessed. The Likelihood of the residual effect occurring is, therefore, rated as Unlikely. This rating is based on observations of other closed large resource development projects (e.g. Island Copper) and professional judgement.

5.4.3.3 Significance Determination

As described in **5.4.1**, the determination of Significance is made based on whether combinations of the characteristics of the effect satisfy any of the following scenarios:

- Magnitude rating of High;
- Magnitude rating of Moderate AND a Context rating of High or Moderate; or
- Context rating of High AND a Reversibility rating of Mostly Reversible, Partially Reversible, or Irreversible.

As shown in **Table 5.4-3**, none of the above scenarios are satisfied, as the Magnitude of the effect is rated as Low, and the Context is rated as Moderate. In addition, the Geographic Extent is Local, where the effect takes place across all locations where the Project is visible from, the Duration is Medium-term, and the Frequency is Continuous. None of these characteristics in and of themselves will result in a significant residual effect, thus the residual effect is determined to be **Not Significant**. This prediction is made with High Confidence.

5.4.4 Reduction in Visual Quality Due to the Rail Infrastructure

The footprint of the Rail Infrastructure is relatively small, with no large components present, so from distant sites (i.e. greater than two or three kilometres) the overall visual disturbance is limited. However, it is located near the banks of the Bulkley River, near some locations where landscape views are valued (e.g. the Hubert rest stop on Highway 16), and there are also locations in the surrounding area that have an elevated view of the site. The most effective mitigation measure will involve planted vegetation screens around the Rail Infrastructure, which will work in conjunction with the natural tree screens on the west bank of the Bulkley River, but these screens are expected to be only partially effective as sites elevated above the Rail Infrastructure may still have a view of the site, and they may take several years to reach a height and foliage density that is sufficient to screen the Rail Infrastructure from view. It is therefore expected that the Rail Infrastructure will reduce the Visual Quality of the landscape.

5.4.4.1 Residual Effects Characteristics

The FVER indicates that because the overall footprint of the Rail Infrastructure is relatively small, and there are no large components that may be visible from far away, the overall Magnitude of the effect is Low. As the LSA defines all areas from which the Project is visible and discernable (i.e. within 35 km), the Geographic Extent is limited to the LSA. The Duration is Medium-term as the is expected to be visible throughout the Active Phases. The Frequency is continuous as the Project is expected to be visible at all times. The Reversibility is rated as Partially Reversible, as vegetation is predicted to gradually take hold and serve to reduce some of the visual effects of the Minesite, and some components will be landscaped to reduce the visual impact of unnatural shapes and lines. Context is rated as Moderate per the description in **5.4.2.1 Residual Effect Characteristics. Table 5.4-4** summarises the characteristics of this residual effect.

Table 5.4-4: Summary of Residual Effects Characteristics Ratings for Visual Quality Subcomponent Due to the Rail Infrastructure in the Active Phases

Residual Effect Characteristic	Rating	Rationale for Rating
Magnitude	Low	Per the Hassell Matrix analysis in **5.2.1.3 Potential Effects to Visual Quality, Rail Infrastructure**, **Visual Quality Subcomponent,** only one viewpoint reported an FVER of Moderate.
Geographic Extent	Local	The LSA defines the furthest distance from which the Project is likely to be discernable.
Duration	Medium-term	The Rail Infrastructure will only be present during the Active Phases and will be completely removed in the Post-closure Phase.
Frequency	Continuous	The Rail Infrastructure is expected to be visible at all times.
Reversibility	Fully Reversible	The Rail Infrastructure will be completely removed in the Post-closure phase and the landscape can revert to its natural state.

Residual Effect Characteristic	Rating	Rationale for Rating
Context	Moderate	The area is a major centre of forestry activity, and there are many visual disturbances already present in the landscape in the form of cutblocks and access roads. Though these regenerate, they are expected to be replaced by new cutblocks. With the Town of Telkwa nearby and many recreation opportunities available in the Bulkley Valley, the area is sensitive to changes in Visual Quality. However, given that the region is heavily forested, over the long term, Visual Quality can be expected to recover from substantial visual disturbance as forests re-grow in disturbed areas.

Notes: *FVER=Final Visual Effect Rating; LSA=Local Study Area*

5.4.4.2 Likelihood

As described above, mitigation measures are expected to be partially effective as there will be some delay between the construction of the Rail Infrastructure and the growth of trees to act as effective screens. The probability of fully mitigating the effects of the Rail Infrastructure are, therefore, Low. There is a Low probability that the size and extent of the visual disturbance will be substantially smaller than assessed. The Likelihood of the residual effect occurring is, therefore, rated as Likely. This rating is based on professional judgement.

5.4.4.3 Significance Determination

As described in **5.4.1**, the determination of Significance is made based on whether combinations of the characteristics of the effect satisfy any of the following scenarios:

- Magnitude rating of High;
- Magnitude rating of Moderate AND a Context rating of High or Moderate; or
- Context rating of High AND a Reversibility rating of Mostly Reversible, Partially Reversible, or Irreversible.

Per **Table 5.4-4**, none of the above scenarios are satisfied, as the Magnitude of the effect is rated as Low, and the Context is rated as Moderate. In addition, the Geographic Extent is Local, where the effect takes place across all locations where the Project is visible from, the Duration is Medium-term, and the Frequency is Continuous. None of these characteristics constrain or prevent a significant residual effect from occurring, thus the residual effect is therefore determined to be **Not Significant**. This prediction is made with High Confidence.

5.5 Summary of Project-related Residual Adverse Effects and Significance

Table 5.5-1 summarizes the residual adverse effects of the Project on Visual Resources. With respect to Visual Quality, the FVER estimates the expected visual effect of the Project from a set of viewpoints that represents the general types and distribution of viewpoints throughout the Bulkley and Telkwa River valleys. During the Active Phases of the Project, where the major Minesite components are being constructed or are otherwise in use, the Minesite is predicted to have an adverse effect on Visual Quality. These components are unnatural in shape, size, colour, and texture, which are likely to stand out from the

surrounding landscape. Ultimately, mitigation efforts are expected to only be partially effective during the Active Phases, as components that are in use are not expected to be fully revegetated or reshaped to reduce or eliminate the visual effects. The residual effect for the Minesite during the Active Phases was determined to be **Significant**.

During the Post-closure Phase, those mitigations implemented in the Active Phases are expected to eventually reach maximum effectiveness, substantially reducing the residual effects on Visual Quality as per the FVERs calculated for each viewpoint. Some components will need to remain present in the landscape to monitor and maintain the site, and others are unlikely to be fully mitigated for, due to the inability for vegetation to take hold at meaningful level (e.g. steep exposed pit walls). However, these areas are expected to be small and difficult to see from the surrounding area. A residual effect is likely to remain, but the Hassell Matrix analysis suggests that its Magnitude will be lower than during the Active Phases. The residual effect for the Minesite during the Post-closure Phase was determined to be **Not Significant**.

With respect to the Rail Infrastructure, the smaller overall size of the disturbance and relatively small components limit its overall effect on Visual Quality. However, viewpoints in close proximity to the Rail Infrastructure (e.g. the Hubert rest stop on Highway 16) are still likely to experience a reduction in Visual Quality, as are viewpoints that have an elevated view of the site. Though mitigation opportunities are limited, vegetation screens are expected to be partially effective in reducing the overall visual disturbance of the site, which is already somewhat screened from the opposite bank of the Bulkley River by trees along the east bank. Considering the small overall size of the Rail Infrastructure and the predicted effectiveness of the vegetation screens, the residual effect for the Rail Infrastructure was determined to be **Not Significant**.

Based on the determination that the Project is expected to result in a **Significant** residual effect on Visual Quality during the Active Phases (**Table 5.5-1**), it is concluded that there is a potential for a **Significant** residual effect on Visual Resources. Though there are numerous mitigation measures that will reduce the overall visual disturbance caused by the Project, the location of the Project in proximity to Smithers and Telkwa on a slightly elevated plateau above the Telkwa River valley ensures that the Project is likely visible from many locations in the surrounding area where viewers of the landscape will be.

All residual effects, **Significant** or **Not Significant**, are carried forward into the CEA for assessment.

Table 5.5-1: Summary of Residual Adverse Effects on the Visual Resources Valued Component (VC)

Residual Adverse Effects	Contributing Activities within the Project Phases (C, O, D, P)	Proposed Mitigation Measures	Residual Effects Characterisation								
			Magnitude	Geographic Extent	Duration	Frequency	Reversibility	Context	Likelihood	Significance	Level of Confidence
Reduction in Visual Quality during Active Phases (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**)	M	LSA	MT	CF	PR	M	L	S	H
Reduction in Visual Quality during the Post-closure Phase (Minesite)	All activities (P)	▪ Limit Project footprint and Project Area ▪ Reclamation measures (Refer to **RCP**) ▪ Revegetation of disturbed areas (refer to **VRMP**) ▪ Targeted vegetation screening (Refer to **VRMP**)	L	LSA	MT	CF	MR	M	UL	NS	H
Reduction in Visual Quality (Rail Infrastructure)	All activities (C,O,D)	▪ Limit Project footprint and Project Area ▪ Targeted vegetation screening (Refer to **VRMP**)	L	LSA	MT	CF	FR	M	L	NS	H

Notes: *C, O, D, P represent Project Phases: (C)onstruction, (O)peration, (D)ecomissioning and Reclamation, (P)ost-closure*
VRMP=Visual Resources Management Plan (S13.0-C19)

Magnitude: Low (L), Moderate (M), High (H)
Geographic Extent: Local (LSA), Regional (RSA), beyond Regional (beyond RSA)
Duration: Short-term (ST), Medium-term (MT), Long-term (LT)
Frequency: Infrequent (IF), Frequent (FF), Continuous (CF)
Reversibility: Fully reversible (FR), Mostly Reversible (MR), Partially reversible (PR), Irreversible (IR)
Context: Low (L), Moderate (M), High (H)
Likelihood: Unlikely (UL), Likely (L)
Significance: Not-Significant (NS), Significant (S)
Level of Confidence: High (H), Moderate (M), or Low (L)

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

6. CUMULATIVE EFFECTS ASSESSMENT (CEA)

This subsection presents an analysis of potential cumulative effects on the Visual Resources VC and the Project's contribution to these effects was conducted according to the methods set out in **3.0 Assessment Methodology** of this **EAC Application**. Cumulative effects result from interactions between Project-related effects and the incremental effects on Visual Resources of other past, present, and future project and activities. A complete list of potential activities can be found in **Table 6.2-1** in **3.0** of this **EAC Application**.

The spatial boundary for the Visual Resources cumulative change analysis is the same as the RSA identified in **3.2.4**, where the RSA is defined as the amalgamation of all Bulkley LRMP LUPs that have any portion of the plan area fall within the LSA. It is assumed that viewpoints within the RSA that have a view of the Project will also have a view of other visual disturbances, regardless of size or distance to the Project.

The temporal boundaries within which cumulative effects were considered include past, present, and reasonably foreseeable future activities inclusive of the life of the Project including Construction, Operation, Decommissioning and Reclamation, and Post-closure phases **(3.2.4.2)**, as residual effects were identified for all phases.

As outlined in **5.2**, the following Project-related residual effects were considered for their potential to interact cumulatively with the residual effects of reasonably foreseeable projects and activities identified within, or extending into the Visual Resources RSA:

- reduction in Visual Quality (Minesite) during the Active Phases;
- reduction in Visual Quality (Minesite) during the Post-closure Phases; and
- reduction in Visual Quality due to the Rail Infrastructure during Active Phases.

6.1 Potential Cumulative Effects

Baseline conditions for the CEA are represented by past and present projects and activities, including all disturbance. The list below identifies the projects and activities that are likely to interact cumulatively with the residual effects of the Project on Visual Quality during the Active Phases. Each one has the potential to visually disturb the landscape and may contribute to the reduced overall Visual Quality of the landscape within the RSA. This list is summarized in **Table 6.1-1**, and the locations of the projects/activities are shown in **Figure 6.1-1**. All Projects and activities listed in the Project and Activity Inclusion List in Section 3.0 of the EAC Application that are not listed below or in **Table 6.1 1** are not considered in the CEA for Visual Resources as the residual effects of these developments are not anticipated to overlap spatially or temporally with the residual effects of the Project and are not in proximity to the Visual Resources RSA.

Table 6.1-1: Projects Included in the Analysis of Visual Quality Subcomponent Based on Spatial and Temporal Interaction

Project/Activity Name	Interacts with Project-related Effects on the Valued Component as a Past, Present or Future Project/activity (Yes/No)	
	Past and Present	Future
Town of Smithers	Yes	Yes
Smithers Regional Airport Runway Expansion	Yes	Yes

Project/Activity Name	Interacts with Project-related Effects on the Valued Component as a Past, Present or Future Project/activity (Yes/No)	
	Past and Present	Future
Village of Telkwa	Yes	Yes
Hudson Bay Mountain Estates	Yes	Yes
Pacific Northern Gas Looping Pipeline	Yes	Yes
Transmission Lines	Yes	Yes
Forestry Activities	Yes	Yes
Transportation Corridors	Yes	Yes

The following projects and activities are expected to have residual effects on the Visual Resources VC, within or extending into the Visual Resources RSA, that act cumulatively with the residual effects of the Project (**Figure 6.1-1** depicts projects included in the CEA):

- Town of Smithers and Village of Telkwa: Urban development is a major source of visual disturbance in many landscapes. The Town of Smithers and Village of Telkwa account for 2,253 ha (0.5%) of the RSA. They include current areas of residential, commercial, and industrial development, as well as likely future development based on land use designations present in the respective official community plans (Smithers 2019; Telkwa 2011) and include all areas of disturbance within municipal boundaries that may fall into other categories, such as the Smithers Airport, municipal roads, and agriculture. Any land set aside for public parks or conservation purposes were excluded from this calculation. These areas are expected to continue indefinitely through all phases of the Project;
- Hudson Bay Mountain Estates: The Estates and ski hill are visible from many locations around the Bulkley Valley, and the linear shapes of vegetation clearing for ski runs, lifts, and accommodation is considered a visual disturbance. The ski hill and associated development accounts for 139 ha of visual disturbance in the RSA (<0.1%) and is expected to remain indefinitely though all phases of the Project;
- Pacific Northern Gas (PNG) Looping Pipeline: The pipeline right-of-way (ROW) remains clear of vegetation to provide maintenance and inspection access to the pipeline. Although the ROW is not very wide (approximately 17 m), the very linear nature of this disturbance makes it stand out as a visual disturbance in the landscape from certain viewpoints. The pipeline segment within the RSA is 69 km long, and accounts for a total visual disturbance of 207 ha (<0.1%) in the RSA. The ROW is expected to remain in place indefinitely through all phases of the Project;
- Transmission Lines: Two transmission lines run through the area, totalling 123 km in length. The transmission lines have a ROW 70 m wide, or 100 m wide where they parallel each other, wherein vegetation is routinely cut back or removed, resulting in a noticeable linear visual disturbance. In total, the transmissions lines account for 807 ha (0.2%) of visual disturbance in the RSA and are expected to remain in place throughout the life of the Project;
- Forestry Activities: Forestry is a very active industry in the region, resulting in substantial visual disturbances from cut blocks scattered throughout the RSA. The total visual disturbance of forest cutblocks within the RSA is 16,698 ha (4.0%). Forest cutblocks older than 20 years are assumed to have reached visually effective green-up, where tree heights are sufficient to have effectively

restored the visual character of the landscape (BC MOF 1998) and are therefore excluded from this calculation. Given the value of the forest industry to the area and the substantial amount of high-quality timber available, it can be expected that forest harvesting in the area will continue indefinitely through all phases of the Project; and

- Transportation Corridors: Transportation is a substantial source of visual disturbance in the RSA; this includes highways, resource/forestry roads, and railways. In total, there are 4,777 km of railways and roads of all types within the RSA, which results in a total visual disturbance of 8,417 ha (2.0%) of the RSA, with resource/forestry roads accounting for the majority of that disturbance. The major transportation corridors through the RSA are Highway 16 and the Canadian National Rail (CNR) line, both of which run in a north-south direction along the banks of the Bulkley River. With forestry activity expected to continue in the RSA, the construction of access roads will proceed at a similar rate. No additional major transportation corridors are expected to be added or expanded in the future. These corridors are expected to continue through all phases of the Project.

Tenas Project

Projects and Activities Included in the Cumulative Effects Assessment for the Visual Quality Subcomponent

555000 570000 585000 600000 615000 630000 645000 660000

6110000 6095000 6080000 6065000 6050000 6035000

KITWANGA MOUNTAIN PARK
SEVEN SISTERS PROTECTED AREA
SEVEN SISTERS PARK
BABINE MOUNTAINS PARK
BURNT CABIN BOG ECOLOGICAL RESERVE
BURNIE-SHEA PARK
SMITHERS
TELKWA
HOUSTON
Tyhee Lake
Telkwa River
Bulkley River
TELKWA RIVER SR
COALMINE ROAD
TELKWA COALMINE ROAD
LAWSON ROAD
CATELING
37
16
CN

Legend

- City/Town
- Rail Line
- Highway
- Road
- Watercourse
- Wetland
- Waterbody
- Park or Protected Area
- First Nation Reserve
- Municipal Area
- Telkwa Coal Private Land
- Private Land
- Project Area
- Regional Study Area

Project/Activity

- Forest Cutblocks
- Transportation Corridor
- Municipality
- Transmission Line
- PNG Looping Pipeline
- Hudson Bay Mountain Resort

Notes

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

Sources

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

N

1:350,000

0 4 8 12 16 20

Kilometres

NAD 1983 UTM Zone 9N

Page Size: 11" x 17"

0403488-0311	Production Date: Jun 25, 2021	Figure 6.1-1

TELKWA COAL LIMITED

ERM

Path: T:\01-projects\TelkwaCoal\Project_MXD\TLC-21-026.mxd

The assessment of cumulative effects on Visual Quality is based on the comparison of two scenarios:

- **Present and Future Case Without the Project** (the Without Project Case): This scenario considers the total amount of all residual effects on Visual Quality due to present and reasonably foreseeable projects and activities identified in **Table 6.1-1**. This was calculated as the total area of visual disturbance in the RSA; and
- **Present and Future Case with the Project (**the With Project Case): This scenario considers the total amount of residual effects on Visual Quality due to present and reasonably foreseeable projects and activities identified in **Table 6.1-1** with the Project included. This was calculated as the total area of visual disturbance in the RSA.

The cumulative effect of the Project on Visual Quality can then be calculated as the increase in total visually disturbed area within the RSA between the Without Project Case and the With Project Case.

As the methodology in this CEA is area-based, the residual effects of the Rail Infrastructure will be merged with the residual effects of the Minesite Active Phases to constitute a single effect. These were assessed separately in the effects assessment due to their physical and visual separation in the landscape, but because their effects occur concurrently, it is appropriate to consider their total effect in aggregate for the CEA.

The characteristics of the cumulative residual effect remain the same for the residual effects assessed in **Section 5.4**, except for the Magnitude characteristic. As the CEA uses an area-based method to calculate the Project's contribution to visual disturbance in the RSA, the Magnitude characteristic is redefined as the Project's contribution to the total visual disturbance in the RSA. This places the Project in the context of the overall scale of visual disturbance of the landscape, which considers not just the overall size of the Project footprint, but also the amount of existing disturbance in the RSA. Magnitude ratings are as follows:

- High: Project increases the total visual disturbance in the RSA by 15% or more. At this level of contribution to visual disturbance, the Project would be one of the largest visual disturbances in the RSA;
- Moderate: Project increases the total visual disturbance in the RSA by 5% or more. The Project is not among the largest sources of visual disturbance in the RSA, but the visual character of the Project may make it somewhat more distinctive than other more common visual disturbances; and
- Low: Project increases the total visual disturbance in the RSA by less than 5%. The Project is among the smaller sources of visual disturbance in the RSA, and the visual character of the Project is not sufficient to overcome the total visual disturbance from other sources.

The definitions of all other characteristics are carried forwards from **Table 5.4-1**.

6.1.1 Potential Cumulative Effects – Active Phases Including Rail Infrastructure

Table 6.1-2 shows the area of visual disturbance for each project or activity considered in this assessment, and the total combined area of visual disturbance under the two (2) scenarios in the Active Phases. Note that the total combined area of visual disturbance is less than the sum of the individual projects and activities, as there is substantial spatial overlap among them.

Table 6.1-2: Total Area of Visual Disturbance for all Projects in the Visual Quality Subcomponent Regional Study Area (RSA) – Active Phases

Project/Activity Name	Area of Visual Disturbance (ha)	% of Total Visual Disturbance[1]	% of RSA[2]
Town of Smithers	1,576	5.8	0.4
Village of Telkwa	676	2.5	0.2
Hudson Bay Mountain Estates	139	0.5	< 0.1
Pacific Northern Gas Looping Pipeline	207	0.8	< 0.1
Transmission Lines	807	3.0	0.2
Forestry Activities	16,698	61.6	4.0
Transportation Corridors	8,417	31.1	2.0
Tenas Project	1,098	4.0	0.3
Total (Without Project Case)	**27,071[3]**	**-**	**6.4**
Total (With Project Case)	**27,979[3]**	**-**	**6.7**

Notes: *ha=hectare; %=percent; RSA=Regional Study Area*

[1]As a percentage of total area of visual disturbance from the Without Project Case
[2]The total area of the RSA is 420,115 ha.
[3]The total number may be smaller than the sum of the area of all projects and activities as there may be substantial spatial overlap between them.

In the Without Project Case, the total visual disturbance from all projects and activities is calculated at 27,071 ha (6.4% of the RSA). This number will fluctuate throughout the life of the Project as forest cutblocks achieve visually effective green-up and new cutblocks are created, and as the Town of Smithers and Village of Telkwa grow. However, the overall Magnitude of all visual disturbances in the RSA is unlikely to deviate substantially as the other visual disturbances will remain relatively static.

In the With Project Case, the total visual disturbance from all projects and activities including the Project is 27,979 ha (6.7% of the RSA), an increase of 908 ha over the Without Project Case (0.3% of the RSA). This value differs slightly from the visual disturbance attributable to the Project (1,098 ha [0.3% of the RSA] in **Table 6.1-2**) as the Project overlaps with existing disturbances, specifically forestry roads and cut blocks. The effect of the Project is therefore estimated to increase the total amount of visual disturbance in the RSA by 3.3% as measured by area, or 0.2% as measured as a proportion of the total area of the RSA.

6.1.2 Potential Cumulative Effects – Post-closure Phase

Table 6.1-3 shows the area of visual disturbance for each project or activity considered in this assessment, and the total combined area of visual disturbance under the two (2) scenarios in the Post-closure Phase. Following closure of the Project and the associated reclamation activities, the total visual disturbance in the With Project Case is expected to be substantially lower, where most of the Project has been reclaimed and revegetated, leaving only small visual disturbances for access roads, utility corridors, small clearings for monitoring stations, and some extent of the pit wall that is not covered by revegetated backfill.

Table 6.1-3: Total Area of Visual Disturbance for all Projects in the Visual Quality Subcomponent Regional Study Area (RSA) – Post-closure Phase

Project/Activity Name	Area of Visual Disturbance (ha)	% of Total Visual Disturbance[1]	% of RSA[2]
Town of Smithers	1,576	5.8	0.4
Village of Telkwa	676	2.5	0.2
Hudson Bay Mountain Estates	139	0.5	< 0.1
Pacific Northern Gas Looping Pipeline	207	0.8	< 0.1
Transmission Lines	807	3.0	0.2
Forestry Activities	16,698	61.6	4.0
Transportation Corridors	8,417	31.1	2.0
Tenas Project	120	0.4	<0.1
Total (Without Project Case)	**27,071[3]**	**-**	**6.4**
Total (With Project Case)	**27,191[3]**	**-**	**6.5**

Notes: *ha=hectare; %=percent; RSA=Regional Study Area*

[1]As a percentage of total area of visual disturbance from the Without Project Case

[2]The total area of the RSA is 420,115 ha.

[3]The total number may be smaller than the sum of the area of all projects and activities as there may be significant spatial overlap between them.

In the With Project Case, the total visual disturbance from all project and activities including the Project is calculated at 27,191 ha (6.5% of the RSA), an increase of 120 ha over the Without Project Case (less than [<] 0.1% of the RSA). The cumulative effect of the Project is therefore to increase the total amount of visual disturbance in the RSA by 0.4% as measured by area, and < 0.1% as measured as a proportion of the total area of the RSA.

6.1.3 Additional Mitigation Measures

No measures applicable to the Project in addition to those put forward in **5.3 Mitigation Measures** are proposed to reduce the adverse cumulative effects to Visual Quality due to the Project. All measures taken to mitigate effects due to the Project would have the same results on the Project's contribution to the cumulative effects.

6.1.4 Cumulative Effects and Characterisation of Significance

The definitions for the characterisation ratings set out in **Table 5.4-1**, are also applicable to the characterisation ratings for the CEA with the exception of Magnitude. For the CEA, Magnitude will be determined on the basis of the area calculations in this subsection, where a Magnitude rating of High will be assigned if the Project contributes at least 20% to the total visual disturbance in the RSA. This

The cumulative contribution of the Project during the Active Phases to the total visual disturbance in the RSA was calculated to be 3.4%. Though this represents the fourth largest contribution to visual disturbance, it is an order of magnitude lower than the most important contributors to visual disturbance, forestry activities and transportation corridors. Per the definition of the Magnitude rating in **Section 6.1**, a Magnitude rating of Low is assigned.

As explained in **5.4.1** the determination of Significance is made on the basis of the Magnitude, Context and Reversibility ratings where a determination of Significant is made if any of the following scenarios are true:

- Magnitude rating of High;
- Magnitude rating of Moderate AND a Context rating of High or Moderate; or
- Context rating of High AND a Reversibility rating of Mostly Reversible, Partially Reversible, or Irreversible.

With a Magnitude rating of Low, a Context rating as Moderate, and Reversibility rating of Partially Reversible, none of the criteria in the above list is satisfied. In addition, the Geographic Extent is Local, where the effect takes place across all locations where the Project is visible from, the Duration is Medium-term, and the Frequency is Continuous. None of these characteristics necessitate a finding of significance in and of themselves, thus the Significance of the cumulative effect is determined to be **Not Significant**. The likelihood of this cumulative effect is Low given that the contribution of the Project to total visual disturbance in the RSA is small. The confidence of this determination is High given that it is based on an empirical analysis of total area of visual disturbance, a methodology employed by other assessments (e.g. New Gold 2017).

The cumulative contribution of the Project during the Post-closure Phase to the total visual disturbance in the RSA was calculated at 0.4%. This represents the smallest contribution to visual disturbance among all sources. Given that the total additive visual disturbance is very small, a Magnitude rating of Low is appropriate to characterise the Project's expected cumulative effect on Visual Quality. As explained above, the determination of Significance is made on the basis of the Magnitude, Context, and Reversibility ratings. With a Magnitude rating of Low and a Context rating as Moderate, the Significance of the cumulative effect is determined to be **Not Significant**. The likelihood of this cumulative effect is Low given that the contribution of the Project to total visual disturbance in the RSA is small and unlikely to rise substantially in the event the Project increases in size beyond the design currently considered in this assessment. The confidence of this determination is High given that it is based on an empirical analysis of total area of visual disturbance, a methodology employed by other assessments (e.g. New Gold 2017). **Table 6.1-4** summarizes the cumulative effects for Visual Quality.

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

Cumulative Effects	Contributing Activities Within the Project Phases (C, O, D, P)	Cumulative Effects Characterisation								
		Magnitude	Geographic Extent	Duration	Frequency	Reversibility	Context	Likelihood	Significance	Level of Confidence
Reduction in Visual Quality during Active Phases including Rail Infrastructure	▪ Existing activities and reasonably foreseeable developments with potential for cumulative effects (see **6.1**): Town of Smithers and Village of Telkwa; Hudson Bay Mountain Estates; Pacific Northern Gas (PNG) Looping Pipeline; Transmission Lines; Forestry activities; and Transportation corridors. ▪ Project-related activities as outlined in **Table 5.1-2** (C, O, D).	L	RSA	LT	CF	PR	M	L	NS	H
Reduction in Visual Quality during the Post-closure Phase	▪ Existing activities and reasonably foreseeable developments with potential for cumulative effects (see **6.1**): Town of Smithers and Village of Telkwa; Hudson Bay Mountain Estates; Pacific Northern Gas (PNG) Looping Pipeline; Transmission Lines; Forestry activities; and Transportation corridors. ▪ Project-related activities as outlined in **Table 5.1-2** (P).	L	RSA	LT	CF	MR	M	L	NS	H

Notes: *C, O, D, P represent Project Phases: (C)onstruction, (O)peration, (D)ecomissioning and Reclamation, (P)ost-closure*
Magnitude: Low (L), Moderate (M), High (H)
Geographic Extent: Project Area (PA), Local (LSA), Regional (RSA), Beyond Regional (beyond RSA)
Duration: Short-term (ST), Medium-term (MT), Long-term (LT)
Frequency: Infrequent (IF), Frequent (FF), Continuous (CF)
Reversibility: Fully reversible (FR), Mostly Reversible (MR), Partially reversible (PR), Irreversible (IR)
Context: Low (L), Moderate (M), High (H)
Likelihood: Unlikely (UL), Likely (L)
Significance: Not-Significant (NS), Significant (S)
Level of Confidence: High (H), Moderate (M), Low (L)
*See **Table 5.1-2** for list of applicable activities for each listed Project phase, unless otherwise noted in this table. Includes all existing and reasonably foreseeable projects as outlined in **Table 6.1-1**.*

6.2 Summary of Cumulative Effects Assessment (CEA)

Two (2) scenarios were compared to understand the cumulative effects on the Visual Quality subcomponent, one (1) in which the total visual disturbance for all present and foreseeable projects and activities was calculated excluding the Project, and one in which the same measure was calculated including the Project. A comparison of those scenarios showed that the Project would contribute an additional 908 ha, or 3.3%, to the total visually disturbed area in the RSA during the Active Phases, and 120 ha or 0.4% to the total visually disturbed area in the RSA during the Post-closure Phase. In both the Active Phases and in the Post-closure Phase, the cumulative effect on Visual Quality was determined to be **Not Significant** (**Table 6.2-1**).

Table 6.2-1: Summary of Cumulative Effects on the Visual Resources Valued Component (VC)

VC Subcomponent	Potential Cumulative Effect	Contributing Project Phases (C, O, D, P)	Cumulative Effect (Yes/No)	Significant (Yes/No)
Visual Quality	Reduction in Visual Quality during Active Phases including Rail Infrastructure	▪ Existing activities and reasonably foreseeable developments with potential for cumulative effects (see **6.1**). ▪ Project-related activities as outlined in **Table 5.1-2** (C, O, D).	Yes	No
Visual Quality	Reduction in Visual Quality during the Post-closure Phase	▪ Existing activities and reasonably foreseeable developments with potential for cumulative effects (**Section 6.1** ▪ Project-related activities as outlined in **Table 5.1-2** (P).	Yes	No

Notes: *C, O, D, P represent Project Phases: (C)onstruction, (O)peration, (D)ecomissioning and Reclamation, (P)ost-closure; RSA=Regional Study Area; VC=Valued Components*
*See **Table 5.1-2** for list of applicable activities for each listed Project phase, unless otherwise noted in this table. Includes all existing and reasonably foreseeable projects as outlined in **Table 6.1-1**.*

7. SUMMARY OF EFFECTS ASSESSMENT FOR VISUAL RESOURCES VALUED COMPONENT (VC)

This chapter of the EAC Application assessed the potential effects and cumulative effects of the Project on the Visual Resources VC. Visual Resources was assessed under one subcomponent, Visual Quality.

To assess the effects of the Project on the Visual Quality subcomponent, 19 viewpoints were identified from which the assessment would be carried out (**Table 4.2-1**). Each viewpoint was subject to a set of ratings called a Hassell Matrix, which rated specific variables regarding the sensitivity of the viewpoint to changes in Visual Quality, the visual condition of the landscape, and several geographic and visual characteristics of the design of the Project (**Tables 5.2-1** to **5.2-6**). These variables were combined into a single rating called the FVER (**Table 5.2-7**), which was calculated to assess the effects for the Minesite during the Active Phases (Construction, Operation, and Decommissioning and Reclamation), the Minesite during the Post-closure Phase, and the Rail Infrastructure during the Active Phases. Mitigation strategies included Project component design measures to reshape some Project components to temper their unnatural shape, revegetation to blend the Project components into the surrounding landscape, and targeted vegetation screens that would hide or obscure the Project from specific viewpoints (**5.3 Mitigation Measures**). The FVER was used to predict that there would be potential residual effects on Visual Quality and was subsequently used in the characterisation of those effects (see **5.4**). The assessment determined that the effect on Visual Quality for the Minesite during the Active Phases would be **Significant**, the effect for the Minesite during the Post-closure Phase would be **Not Significant**, and the effect for the Rail Infrastructure during the Active Phases would be **Not Significant**. Overall, the effect of the Project on the Visual Resources VC was assessed as **Significant.**

All residual effects were carried forward into the Visual Quality CEA. Two (2) scenarios were compared to understand the cumulative effects on the Visual Quality subcomponent, one (1) in which the total visual disturbance for all present and foreseeable projects and activities within the RSA was calculated excluding the Project, and one in which the same measure was calculated including the Project. To appropriately account for cumulative effects, the residual effects for the Minesite and the Rail Infrastructure during the Active Phases were combined. A comparison of those scenarios for this combined effect predicted that the overall contribution of the Project during the Active Phases would be to add 908 ha (3.3%) of visual disturbance in the RSA, an effect that was determined to be **Not Significant.** In the Post-closure Phase, much of the visual disturbance would be removed, and only small, isolated disturbances would remain, resulting in a 0.4% increase in the total amount of visual disturbance in the RSA. This effect was also determined to be **Not Significant**.

8. FOLLOW-UP STRATEGY

With the Project situated in a location valued for its scenic qualities and in proximity to a variety of land uses that place value on those views, the visual disturbance created by the Project should be monitored to verify the predictions outlined in this assessment, assess the performance of the proposed mitigation strategies, and identify any unexpected visual disturbances. This subsection summarizes the monitoring and management strategies outlined in **VRMP**.

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.

The purpose of these audits is to:

- compare the characteristics and Magnitude of the Project's visual disturbance to the predictions in this assessment, including the Significance determinations;
- characterise the effectiveness of any mitigations to the effects on Visual Quality, including reclamation activities conducted on the Minesite or Rail Infrastructure, and any vegetation screening planted at specific viewpoints;
- if mitigations are not effective, understand why and propose actions to enhance effectiveness; and
- support the **Reclamation and Closure Plan (S13.0-C16) (RCP)** and confirm the end land use goals of that Plan are met.

To achieve the above goals, these Visual Quality audits will employ the following methodology:

- Complete desktop-based determination of the expected extent of visual disturbance and the mitigations proposed by the audit date based on the most recent RCP and mine plan information.
- Visit each viewpoint identified in this assessment to collect photographs of the Project site (including the Rail Infrastructure), as well as others that may be identified as important during the Project's life, based on input from stakeholders and the public.
- Use field photographs to characterize the existing landscape and visual disturbances associated with the Project (e.g., extent of the Project's visual disturbance, visual impact), and to evaluate the predictions put forward in this assessment.
- Identify areas of concern where visual disturbances are excessive as compared to this assessment and, if applicable, to the mine plan and/or RCP.
- Characterise the effectiveness of all mitigation efforts, describing whether they have either performed well or underperformed.
- Provide recommendations or strategies for additional mitigations to address areas of concern, and specific actions to improve mitigations deemed to be underperforming (i.e., adaptive management).

Audits will be conducted by teams with experience in Visual Quality for resource development projects; where appropriate or necessary, vegetation specialists and/or landscape designers may be included to provide input into mitigation recommendations. A report that states the findings and provides recommendations will be produced following each audit, along with all field data and results used to evaluate mitigations and develop recommendations, strategies, and actions.

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