

Appendix 19-C

Visual Aesthetics Baseline Report



NWP COAL CANADA LTD

Visual Aesthetics Baseline Report

Crown Mountain Coking Coal Project



April 2021 – 12-6231

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Acronyms and Abbreviations

AIR	Application Information Requirements
BC	British Columbia
BC EAO	British Columbia Environmental Assessment Office
BC MOF	British Columbia Ministry of Forests
BMP	Best Management Practices
CEAA	Canadian Environmental Assessment Act
CDEM	Canadian Digital Elevation Model
e.g.	For example
ESRI	Environmental Systems Research Institute
ERDZ	Enhanced Resource Development Zone
FLNRO	Ministry of Forest, Lands and Natural Resource Operations
GIS	Geographic information system
i.e.	That is
km	Kilometres
LSA	Local Study Area
m	Metres
mASL	Metres above sea level
RSA	Regional Study Area
Teck	Teck Coal Limited
TEM	Terrestrial Ecosystem Mapping
VLI	Visual Landscape Inventory
VQO	Visual Quality Objective
VSU	Visual Sensitivity Unit

Definitions

Alluvial Soil or earth material which has been deposited by running water, as in a riverbed floodplain, or delta.

Background Greater than 5 km up to 10 km viewing distance from the Project footprint.

Baseline Represents current or existing conditions (or a temporal period specifically defined to represent baseline [e.g., the year 2010]) and serves as a reference point to which future conditions can be compared. Unless otherwise noted, baseline refers to a surveyed or measured condition, rather than one predicted through the use of models.

Baseline Viewpoints Viewpoints selected from inventoried viewpoints which are determined to be most representative of the range of viewing opportunities and used for baseline assessment and reporting.

Biophysical Rating A measure of the degree to which the biophysical characteristics of a Visual Sensitivity Unit (VSU) create visual interest and draws people's attention.

Coal Refuse A by-product of coal mining; the material consists primarily of non-combustible rock, with some attached carbon material that cannot be effectively separated.

Cumulative Effects The effects of a development in combination with the effects of other past, present or reasonably foreseeable future developments.

Cutblock A specific area of land identified on a forest development plan, or in a licence to cut, road permit or Christmas tree permit, within which timber is to be or has been harvested.

Digital Elevation Model A three-dimensional grid representing the height of a landscape above a given datum.

Existing Visual Condition A measure of the present level of landscape alteration caused by human activities and contributes to the baseline from which additional landscape alterations would be measured.

Footprint The proposed development area that directly affects the soil and vegetation components of the landscape.

Foreground Less than 1 km viewing distance from the Project footprint.

Geographic Information System Computer software designed to develop, manage, analyze and display spatially referenced data.

Hydrographic Features Physical features such as waterbodies and watercourses.

Inventoried Viewpoints Viewpoint locations used to capture photographic and viewing condition information during photographic field surveys.

Key Viewpoints One or a series of points on a travel route or at a use area or a potential use area, where the view of the Project would be most revealing.

Land Cover The surface cover on the ground, whether vegetation, urban infrastructure, water, bare soil or other.

Middle ground A 1 km to 5 km viewing distance from the Project footprint.

Polygon The spatial area delineated on a map to define one feature unit (e.g., one type of ecosite phase).

Recreation Viewpoints Viewpoints identified in the BC Visual Landscape Inventory and used for determine visual sensitivity units from which VSU are rated and photos taken.

Regional Study Area Represents the geographic study area for the assessment of cumulative (combined) effects of the Project and other past, existing, planned or reasonably foreseeable developments.

Scenic Quality Evaluation A measure of the visual appeal of a landscape based on rating criteria for the scenic landscape elements of landform, vegetation, water, colour, adjacent scenery, scarcity and cultural modifications.

Scenic Quality Ratings The range of maximum to minimum values for rating criteria for scenic landscape elements based on characterization of visual patterns.

Scenic Value Evaluation of scenic quality in relationship to the natural landscape and combined with a measure of public concern for scenic quality.

Sensitivity Level Evaluation A measure of viewer's sensitivity to visual change by analyzing various indicators of public concern for scenic quality including dimensions of patterns of use and adjacent land use or management context.

Sensitive Receptors Potential locations where there may be viewers with visibility of the Project.

Viewer Rating A measure of the number of people likely to view the Visual Sensitivity Unit (VSU) and the preferences, expectations or concerns they have about how they would like the VSU to look.

Viewing Condition A measure of the condition measured outward from the Project footprint to help define the influence of viewing distance.

Viewshed The area of the landscape that can be seen from one or more source points. Therefore, according to the model, a person standing at any area identified in the viewshed would be able to see at least one of the source points.

Visibility Modelling Visibility modelling identifies areas across a landscape that can be seen from one or more observation points, often called a 'viewshed'.

Visual Aesthetic Resources Natural and cultural features of the landscape that can be seen and that contribute to the public's appreciative enjoyment of the environment.

Visual Aesthetics The study of the psychological responses to appearances.

Visual Character Distinguishing visual physical aspects of a landscape.

Visual Inventory Data Based on a review of existing environmental baseline data and photographic field surveys.

Visual Quality The visual aesthetic characteristics and value of a landscape.

Visual Resource Inventory The identification, classification and recording of visual resource related values and their geographic location.

Visual Sensitivity Class A measure of the sensitivity of the visual sensitivity unit to visual alteration.

Visual Sensitivity Unit A distinct topographical unit as viewed from one or more viewpoints and is delineated based on the homogeneity of the landform and of biophysical elements.

Waste Rock Rock moved and discarded to access coal resources.

Waste Rock Spoils Rock with no commercial value which must be removed from a mine to access coal resources, and which is then placed near the site, often in vast quantities.

Waterbody A general term that refers to rivers, streams, and lakes.

Watercourse A general term that refers to riverine systems such as creeks, brooks, streams and rivers.

Watershed The area of land bounded by topographic features that drains water to a larger waterbody such as a river, wetlands or lake. Watershed can range in size from a few hectares to thousands of kilometres.

Executive Summary

NWP Coal Canada Ltd (NWP) is proposing to develop the Crown Mountain Coking Coal Project (the Project), an open pit metallurgical coal mine in the East Kootenay region of southeastern British Columbia (BC). The Project is expected to produce approximately 10,150 tonnes per day and up to 4.0 million run-of-mine tonnes per year for 15 years. The Project is located in the Front Ranges Rocky Mountains of BC, an area of steep terrain, and is accessed by several local roads. The Project is in the Alexander and Grave Creek Watersheds, and is located within the asserted traditional territory of the Ktunaxa Nation.

To fulfill the Application Information Requirements (AIR) set out by the BC Environmental Assessment Office (BC EAO), Dillon Consulting Limited (Dillon) conducted a visual aesthetic baseline study for the proposed Project site. Baseline visual aesthetic information will be applied to the environmental assessment process to determine the potential impacts of the proposed Project on local and regional visual quality.

This report provides the baseline inventory of visual aesthetic resources and a summary of the visual aesthetic effects for the Project study areas. The scope of work for the visual aesthetics baseline included a literature review to determine the regulatory context for visual resource management and to identify key locations predicted to have a view of the Project area.

A review of existing relevant BC Visual Landscape Inventory (VLI; Province of BC, 2020), resource management guidelines and strategic planning documents was conducted to understand the policy context for visual aesthetic management within the LSA. The VLI database rating identifies that the Project footprint is in a zone that is 'not visually sensitive' (Province of BC, 2020), and does not include defined visual quality ratings or Visual Quality Objectives (VQOs). This is to be expected because the footprint and a significant part of the LSA is in the Coal Enhanced Resource Development Zone (ERDZ) that recognizes that coal exploration, development and production activities can be anticipated on these lands (Kootenay Inter-Agency Management Committee, 1997). However, it is also expected that through long term maintenance and innovative reclamation and mitigation, that visual aesthetics can be retained.

The *Kootenay/Boundary Land Use Plan Implementation Strategy* (Kootenay Inter-Agency Management Committee, 1997) provides objectives for visual quality through specific zoning. Coal ERDZs signify a long-term, priority commitment of those areas to coal mining exploration and development. This sub-category is located exclusively in the East Kootenays and it encompasses areas of known coal reserves, existing coal mining facilities and infrastructure as well as areas for potential expansion. The Project footprint is located within the Coal ERDZ and subject to Class 3 Management Guidelines for front country landscapes (Kootenay Inter-Agency Management Committee, 1997). The guidelines focus on

reducing visual effects of mining by ensuring that remediation is implemented and any displaced uses, including recreational trails, are, where appropriate and practicable, relocated.

The Visibility Mapping demonstrates that the Project is screened from view with few exceptions. The Project footprint is situated between the Mount Erickson Ridge and the Great Divide range along the BC-Alberta border. Crown Mountain's peak is approximately 2,200 mASL and the plant is situated approximately 1,910 mASL. The peak of the Mount Erickson Ridge is 2,500 mASL and the Great Divide is 2,700 mASL. These ridges screen the Project footprint from the west and east. The likelihood of having discernible views from the north and south are also very low because of the dense evergreen forests in the valleys and the relatively low profile of Crown Mountain. There are limited potential sightlines to the clean coal haul road; however, there are no sensitive receptors in those locations. The rail loadout area was also modeled with similar results. There are potential sightlines to the rail loadout area; however, forest cover and the local landscape screen the views.

Based on the Visibility Mapping, the landforms associated with surrounding ridges and the dense evergreen forest effectively block views to the Project in locations where there are sensitive receptors that include residences, institutions and recreational properties. There are impacts to recreational trails that are currently in the Project footprint. Reclamation of the mine site and the relocation of recreational trails may provide effective mitigation of these effects.

The reclamation plan for the Project has been developed based on the process of assisting the natural recovery of ecosystems that have been damaged, using surrounding areas to guide the recovery. Restoration will also mitigate the visual effects of the mining operation over time. The restoration process will be ongoing during mining with the objective of phasing restoration as the site evolves. The ecological treatment approach is based on reinstating ecotypes that are consistent with the adjacent, undisturbed landforms and species found on the site prior to mining. This approach is consistent with the Class 3 Management Guidelines for the Front Country Visual Management Area in the *Kootenay/Boundary Land Use Plan Implementation Strategy* (Kootenay Inter-Agency Management Committee, 1997).

There are insignificant visual aesthetic Project effects and low cumulative effects. The Project is located within the Coal ERDZ and will comply with the Class 3 Management Guidelines.

1.0 Introduction

1.1 Project Overview

NWP Coal Canada Ltd (NWP) is proposing to develop the Crown Mountain Coking Coal Project (the Project) which is intended as an open pit metallurgical coal mine located within the Elk Valley coal field in the East Kootenay Region of southeastern British Columbia (BC; **Figure 1**). NWP is a subsidiary of Jameson Resources Limited and Bathurst Resources Limited (Canada). The Project comprises ten coal licences, covering a total area of approximately 5,630 hectares (ha).

The Project is located between several existing metallurgical coal mines in the Elk Valley and Crowsnest coal fields, the nearest being Teck Coal Limited's (Teck) Elkview Operations (8 kilometres [km] to the southwest) and Line Creek Operations (12 km to the north). The Elk Valley and Crowsnest coal fields are home to 4 of Canada's 8 producing coking coal mines. The coal mines in the area produce approximately 21 million tonnes per annum of export quality metallurgical and thermal coal and represent over 70% of Canada's total coal exports annually, making the Elk Valley coal field the most productive in the country. Exploration activities have indicated that the coal at the Project site is typical of coking coals produced from existing mines in the Elk Valley. The Project is expected to produce approximately 10,150 tonnes per day (tpd) and up to 4.0 million run-of-mine tonnes per year for 15 years. The high quality metallurgical coal would be transported via railway to coastal BC, where it would be shipped overseas to be used in steelmaking.

The centre of the Project property (i.e., coal licences) is located approximately 12 km northeast of the District Municipality of Sparwood, British Columbia at 114°43.6'W and 49°48.4'N (**Figure 1**). By road, the Project is situated approximately 30 km from Sparwood. The Project is accessed by several local roads, including Grave Creek Road in the northwest and Alexander Creek Road from the south.

Key components of the proposed Project include, but are not limited to:

- Surface extraction areas (3 pits – north pit, east pit, and south pit);
- Mine rock management areas;
- Plant area (includes raw coal stockpile area, a processing plant, and site support facilities);
- Clean coal transportation route (via an overland conveyor and haul road);
- Rail loadout facility and rail siding;
- Power supply;
- Natural gas supply;
- Explosives storage;
- Fuel storage;
- Sewage treatment; and
- Water supply.

The Project is subject to both the *Canadian Environmental Assessment Act (CEAA) 2012* and the *British Columbia Environmental Assessment Act (BC EAA) 2002*. Under the project-specific provincial Application Information Requirements (AIR) for the Project's environmental assessment, characterization of baseline visual aesthetics is required to assess potential effects on the visual aesthetics Valued Component as a result of Project activities (BC Environmental Assessment Office [EAO], 2018). The purpose of the visual aesthetics baseline study is to describe the existing visual aesthetic conditions within the Project study area, which can ultimately serve as the basis for which potential impacts related to the Project activities can be identified and evaluated.

1.2 Purpose, Scope and Applicable Standards

The purpose of this baseline report is to describe the existing visual aesthetics resources in the Project area. A baseline study is required to determine the visibility of the Project and describe how the visible landscape will be altered. The visibility of the Project can have differing effects depending on the physical and social setting, as well as the proximity to the Project footprint. The visual baseline study inventories and classifies the physical conditions of the contextual landscape and sensitivities of viewers (receptors) to visible changes in the landscape. The visual baseline assessment includes a description of the regulatory requirements and relevant policies, including the *Kootenay/Boundary Land Use Plan Implementation Strategy* (Kootenay Inter-Agency Management Committee, 1997). Engagement with regulators, stakeholders, community members and the Ktunaxa Nation was used in the identification of visual values, issues and sensitive receptors.

The applicable standards and guidelines used in the collection of baseline data on visual aesthetics include the *Kootenay/Boundary Land Use Plan Implementation Strategy* (Kootenay Inter-Agency Management Committee, 1997), BC Ministry of Forests (2001) *Visual Impact Assessment Guidebook* and BC Parks (2005) *Draft Best Management Practices (BMP) for Activities Adjacent to Parks and Protected Areas*.

The visual aesthetic assessment baseline report is organized into the following sections:

- **Section 2.0** describes the study areas and the existing setting of the Project;
- **Section 3.0** provides a summary of relevant background information and methodology; and
- **Section 4.0** presents the results of the visual aesthetics baseline assessment.

2.0 Study Areas

The study area for the visual aesthetic baseline assessment defines the spatial limits for which potential environmental impacts related to the project will be evaluated. The overall study area is defined as the Project footprint, Local Study Area (LSA) and Regional Study Area (RSA).

The visual aesthetics RSA includes all areas within 20 km of the Project and is shown on **Figure 1**. This includes foreground, middle-ground and background viewing distances of the Project (BC Ministry of Forests [MOF], 1997). From foreground (less than 1 km from the Project), middle-ground (1 km up to 5 km) and background (5 km to 10 km) from the Project, viewers can observe a discernable level of detail, texture and contrast in the landscape that diminishes as the distance increases. From background viewing distances that are more than 10 km to 20 km, viewers have the potential for distant views towards the Project that include a larger contextual landscape, but have little or no discernable detail of the Project. The LSA includes receptor sites in the District of Sparwood, as well as recreation sites and transportation corridors that also have potential views of other existing coal mines in the Elk River Valley, including the Elkview and Line Creek Operations.

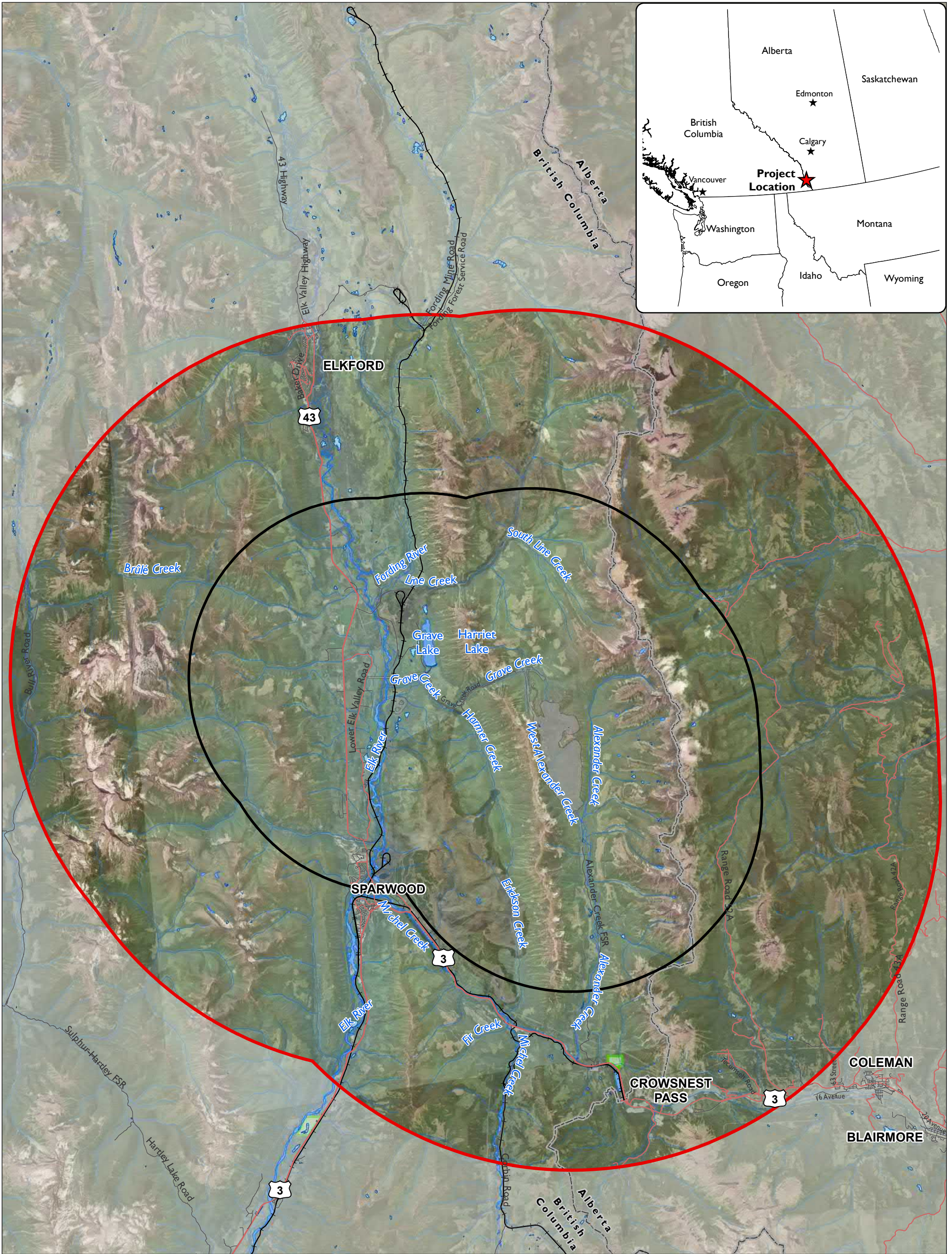
2.1 Project Footprint

The Project footprint covers approximately 1,300 ha and is positioned approximately 12 km northeast of Sparwood and approximately 5 km west of the provincial boundary between BC and Alberta (**Figure 1**). By road, the Project is situated approximately 30 km from Sparwood. The Project site is visually contained by two high mountain ridges that shield the mine, the Mount Erickson Ridge to the west (elevation approximately 2,500 mASL) and the 'Great Divide' to the east along the BC-Alberta boundary (elevation approximately 2,700 mASL).

The Project footprint consists of the mine site, the transportation corridor, and the rail loadout facility. The mine site, including the extraction zone (top elevation approximately 2,200 mASL) and plant area (elevation approximately 1,910 mASL), includes the raw coal stockpile area and processing plant and ancillary facilities (i.e., water supply, power supply, natural gas supply, water, sewage treatment, fuel storage and explosives storage).

2.2 Local Study Area

The LSA includes the Project footprint and the surrounding landscape area where potential impacts associated with Project activities could directly be affected by visual aesthetic conditions. The LSA covers an area of approximately 690 km², which encompasses the Project footprint and extends in a 10 km radius from the Project footprint.



Crown Mountain Coking Coal Project

FIGURE I
Visual Aesthetics Baseline Study Areas

LEGEND

- | | |
|---------------------------------------|-------------------|
| Visual Aesthetics Local Study Area | Waterbody |
| Visual Aesthetics Regional Study Area | Wetland |
| Project Footprint | Provincial Park |
| Highways | BC/Alberta Border |
| Arterial Roads | |
| Local/Resource Roads | |
| Railway (Canadian Pacific) | |
| Watercourse | |

0 1 2 3 4 Kilometers

SCALE 1:200,000

Map Drawing Information: Data Provided by Province of British Columbia, NWP Coal Canada Ltd., Dillon Consulting Limited

Map Created By: JFC/LMM
Map Checked By: EMN
Map Projection: NAD 1983 UTM Zone 11N



PROJECT: 12-6231
STATUS: FINAL
DATE: 2021-04-30

2.3 Regional Study Area

The RSA comprises the area where environmental conditions could potentially be indirectly impacted by the Project. The RSA generally encompasses the Elk River watershed and Alexander Creek watershed that drains the majority of the Project site. The RSA extends in a 20 km radius from the Project footprint and covers a total geographic area of approximately 1,960 km².

3.0 Relevant Background Information and Methodology

3.1 Data Compilation and Review of Background Information

Existing information for use in the background review was compiled from a wide range of sources including, but not limited to:

- Province of British Columbia, GeoBC Open Data. (2020a). *Baseline Thematic Mapping Present Land Use Version 1*;
- Province of British Columbia, GeoBC Open Data. (2020b). *Vegetation Resources Inventory - Forest Vegetation Composite Rank 1 Layer (R1)*;
- Province of British Columbia, GeoBC Open Data. (2020c). *Visual Landscape Inventory – Ministry of Forests, Lands, Natural Resource Operations and Rural Development*;
- Keefer Ecological Services Ltd. (2020). *Terrestrial Ecosystem Mapping Report – Crown Mountain Coking Coal Project*;
- Kootenay Inter-Agency Management Committee. (1997). *Kootenay/Boundary Land Use Plan Implementation Strategy*; and
- Visual aesthetics baseline studies completed for other projects in the area.

3.2 Delineate/Verify Visual Study Area

















The visual aesthetic assessment identifies potential effects, supported by mapping, to characterize the existing conditions and post-construction impacts. The Project is located in a remote area that is not easily accessed by the public or in view of local municipalities; however, the site and surrounding area is currently used by recreationists (e.g., snowmobiling, hiking, camping, all-terrain vehicles [ATVs]), as well as by hunters. Although the RSA extends 20 km from the Project footprint, the visibility of the Project and the assessment for changes to visual aesthetics is impactful up to 10 km and this distance was selected by Dillon to serve as the basis for this evaluation. The impact of visual changes is dependent on proximity, with the greatest impact to sensitive receptors that are in the foreground (0-1 km) and mid-ground (1-5 km) and to a lesser degree in the background (5-10 km) from which changes to the visual landscape may be observed.

This report provides the baseline inventory of visual aesthetic resources (**Figure 2**) and a summary of the visual aesthetic information for the Project study areas.

The Project is located within the Elk Valley, east of the Mount Erickson Ridge, and northeast of the community of Sparwood, BC. The RSA is characterized as the southeast Rocky Mountain physiography of rocky peaks, parallel trending ridges and valleys containing meandering rivers and streams. The Project encompasses a complex of high ridges and contains Crown Mountain and Alexander Creek (west

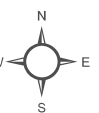
FIGURE 2
Land Use Map

LEGEND

-  Visual Aesthetics Local Study Area
-  Project Footprint
-  Highways
-  Arterial Roads
-  Local/Resource Roads
-  Railway (Canadian Pacific)
-  Watercourse
-  BC/Alberta Border
-  Agriculture
-  Alpine; Sub alpine Avalanche Chutes; Permanent Ice and Snow
-  Barren Surfaces; Exposed Soil
-  Closed Upland Shrub; Open Upland Shrub; Fescue Grassland; Range Lands; Wetlands
-  Closed Aspen/Balsam Poplar/Birch; Open Engelmann/White Spruce; Closed Undifferentiated Coniferous; Old Forest; Young Forest
-  Residential Agriculture Mixtures
-  Recently Burned; Undifferentiated Burn; Recently Logged; Selectively Logged
-  Urban; Urban and Industrial; Mining
-  Water
-  Wetland
-  No Data



SCALE 1:120,000

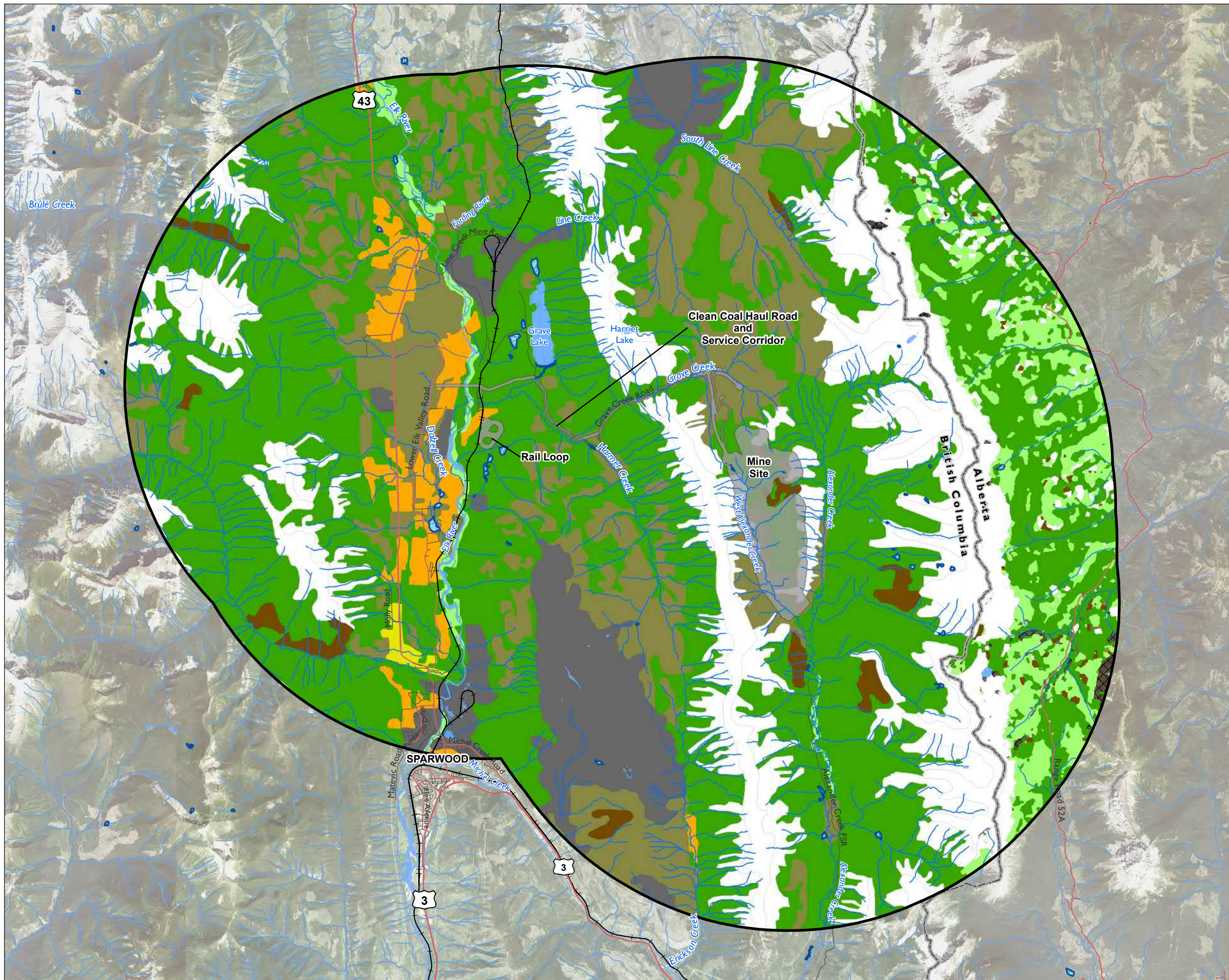


Map Drawing Information:
Data Provided By NWP Coal Canada Ltd.,
Dillon Consulting Limited, Province of British Columbia,
Government of Alberta.

Map Created By: JFC/LMM
Map Checked By: EMN
Map Projection: NAD 1983 UTM Zone 11N



PROJECT: 12-6231
STATUS: FINAL
DATE: 2021-04-30



and east tributaries). The Elk River valley is west of the Project footprint but within the LSA. It is a large, meandering, alluvial watercourse and wide valley that contains the rail loadout facility and rail siding. The clean coal transportation route is located within the Grave Creek valley.

In the LSA, land cover comprises Montane spruce forests in the valleys, and Engelmann spruce and subalpine fir at higher elevations. Cultivated field crops and pasture lands are also evident near the rail loadout facility and along Highway #43 (**Figure 2**). Industrial uses in the area include several open-pit coal mines that have visibly modified the Elk Valley landscape northeast of Sparwood. Previous logging activity is also visible on both sides of the Elk River. Vegetation regeneration is established at various stages in these areas, producing a landscape with a variation of textures and patterns reflecting past and current timber harvesting and coal extraction activities. Recreational uses in the RSA include year-round outdoor activities, such as golfing, wildlife viewing, camping, hiking, hunting, fishing, ATV trails, snowmobiling and skiing.

3.2.1 Terrestrial Ecosystem Mapping of the Project Footprint and Local Landscape

Terrestrial ecosystem mapping (TEM) prepared by Keefer Ecological Services Ltd. (2020) supported the characterization of the Project footprint and immediate surroundings by providing data on the composition and density of the forest. The mapping is based on the Biogeoclimatic Ecosystem Classification (BEC) system which was developed in British Columbia to classify and manage sites based on ecosystem features. This mapping provides the condition assessment pre-development and guides the restoration planning post-extraction. The visibility aesthetics assessment used the TEM for habitat modeling, effects assessment, mitigation and management planning. Four Biogeoclimatic units were found in the Project footprint and within 1 km radius of the licenced area and are discussed in the following sub-sections.

3.2.1.1 Dry Warm Montane Spruce (MSdw)

The Dry Warm Montane Spruce subzone is located at low to mid-elevations from valley bottom to the Engelmann Spruce-Subalpine Fir zone (about 1,600 mASL; Keefer Ecological Services Ltd., 2020). It is characterised by dry, cool winters and dry, warm summers and autumns. Winter snowpacks are moderately deep and persist from late November through March. The MSdw covers a wide range of ecosystems from isolated warm aspect grasslands to rock outcrops, wetlands, and forests. Common tree species include hybrid white spruce, Douglas-fir, lodgepole pine, western larch, trembling aspen, and black cottonwood.

3.2.1.2 Elk Dry Cool Engelmann Spruce-Subalpine Fir (ESSFdk1)

Above the Montane Spruce zone is the Engelmann Spruce-Subalpine Fir zone, which is the uppermost forested zone in the interior of BC Subalpine fir and white spruce dominate climax zonal forests. Following fire, lodgepole pine is a common seral species. Whitebark and limber pine may also occur in this zone, typically on dry sites. Avalanche tracks are widespread north and south of Gaff Peak

immediately west of Crown Mountain and on the east facing slopes of Crown Mountain (Keefer Ecological Services Ltd., 2020). This zone is found between roughly 1,600 mASL to 1,900 mASL. Over 80% of the ESSFdk1 is comprised of forested ecosystems.

3.2.1.3 Dry Cool Woodland Engelmann Spruce-Subalpine Fir (ESSFdkw)

The Dry Cool Woodland Engelmann Spruce-Subalpine Fir subzone occurs above the Elk Dry Cool variant at elevations between about 1,900 mASL and 2,200 mASL (Keefer Ecological Services Ltd., 2020). A substantial portion of Crown Mountain proposed infrastructure is found within this subzone. This zone is similar the ESSFdk1, but due to its higher elevation, it is generally characterized by shorter growing seasons and lower productivity. Considerably less area is found in productive forest compared to lower elevations. This subzone is typically at the upper limits of, or beyond, the merchantable forest with respect to timber harvest.

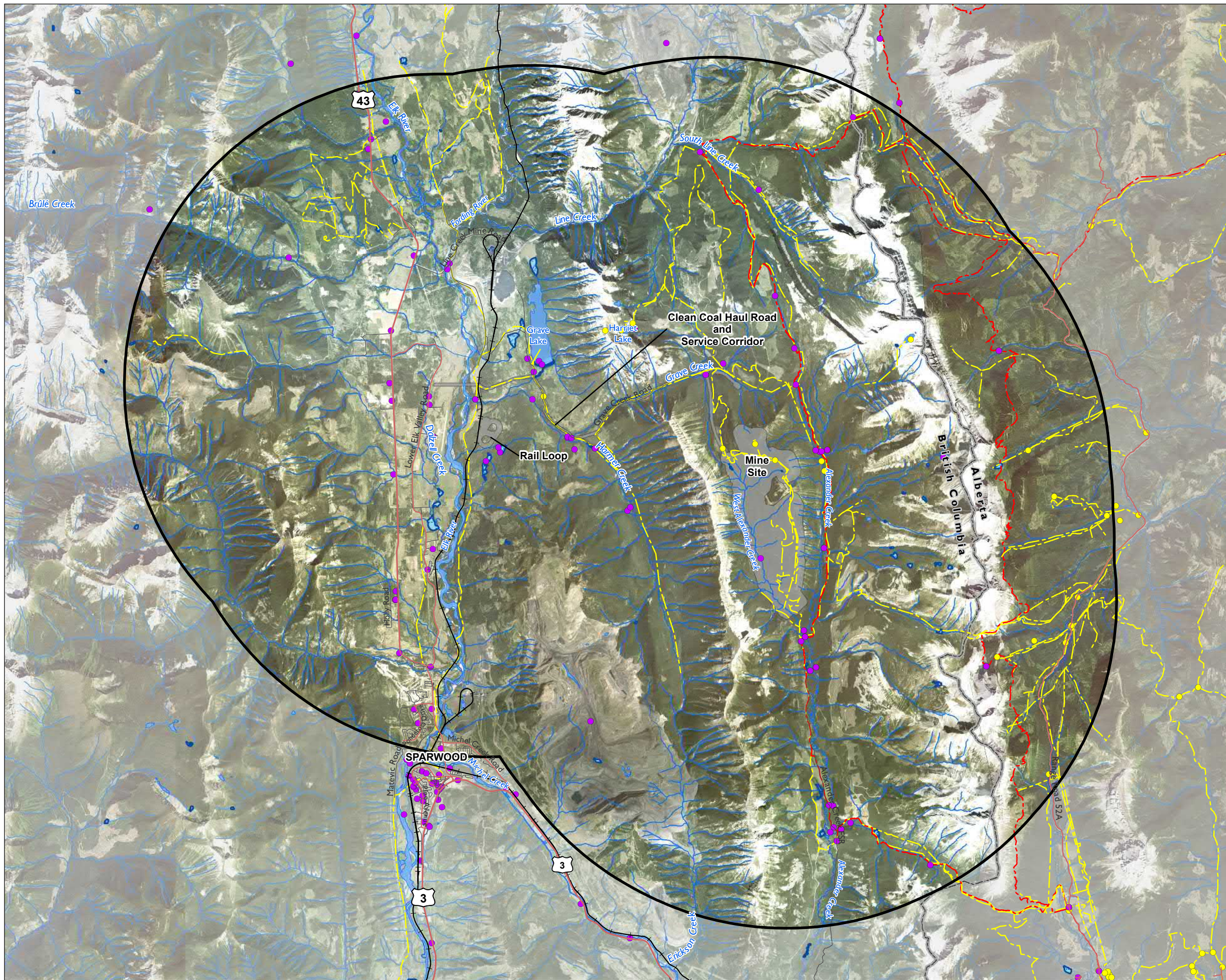
3.2.1.4 Dry Cool Parkland Engelmann Spruce-Subalpine Fir (ESSFdkp)

The Dry Cool Parkland Engelmann Spruce-Subalpine Fir subzone occurs above the Dry Cool Woodland subzone on the highest ridges around Gaff Peak and Mount Erickson Ridges to the west of Crown Mountain at elevations greater than 2,100 m (Keefer Ecological Services Ltd., 2020). Trees are typically of low stature and are found in tree islands, as is found frequently on west aspects of the ridges of Gaff Peak.

3.3 Integration of Consultation Input

A primary data collection program was conducted in 2020 to support the socio-economic and land use baseline studies and effects assessments and is summarized in the *Socio-Economic Baseline Report* (Dillon, 2021). Through the primary data program, current land uses within the Project footprint were identified that include ATV and hiking trails on Crown Mountain that are used by the Elkford ATV Club, the Crowsnest Pass Quad Squad, the Alberta Off-Highway Vehicle Association and the Great Divide Trail Association and others. Sensitive receptor locations were identified through the primary data collection program and through consultation with the Ktunaxa Nation and from open source data available from the Province of BC (**Figure 3**). These sensitive receptors include residential, commercial, recreational and institutional uses. The closer the use to the Project, the more significant the disturbance to visual aesthetics. Visual changes in the foreground (within 1 km) are the most disruptive. The impact diminishes with distance and the complexity of the surrounding landscape.

FIGURE 3
Consultation Input/Sensitive Receptor Map



- LEGEND**
- Visual Aesthetics Local Study Area
 - Project Footprint
 - Highways
 - Arterial Roads
 - Local/Resource Roads
 - Railway (Canadian Pacific)
 - Watercourse
 - Waterbody
 - Wetland
 - BC/Alberta Border
 - Receptors from Background Data
 - Receptors from Consultation
 - Recreation Trails from Consultation
 - Great Divide Trail

0 1 2 3 4 Kilometers

SCALE 1:120,000



Map Drawing Information:
Data Provided By NWP Coal Canada Ltd., Dillon Consulting Limited, Province of British Columbia, Government of Alberta.
Receptor data from Province of British Columbia, GeoBC Open Data, Dillon Consulting Limited, Consultations

Map Created By: JFC/LMM
Map Checked By: EMN
Map Projection: NAD 1983 UTM Zone 11N



PROJECT: 12-6231
STATUS: FINAL
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3.4 Visual Resource Management Context

A review of the existing relevant BC Visual Landscape Inventory (VLI), resource management guidelines and strategic planning documents was conducted to understand the policy context for visual aesthetic management within the LSA. The VLI data identifies sensitivity and viewer ratings (**Figure 4**) within the LSA, based on inventories of existing visually sensitive areas and management objectives to maintain visual quality within the Elk Valley.

The *Kootenay/Boundary Land Use Plan Implementation Strategy* (Kootenay Inter-Agency Management Committee, 1997) provides objectives for visual quality through specific zoning. A significant part of the LSA is located in the Coal Enhanced Resource Development Zone (ERDZ) that recognizes that coal exploration, development and production activities can be anticipated on these lands (Kootenay Inter-Agency Management Committee, 1997). This sub-category is located exclusively in the East Kootenays and encompasses areas of known coal reserves, existing coal mining facilities and infrastructure, as well as areas for potential expansion. The Project footprint is located within the Coal ERDZ and subject to Class 3 Management Guidelines for front country landscapes (Kootenay Inter-Agency Management Committee, 1997).

The Coal ERDZ designation signifies an assurance of long-term security of access and tenures to these lands for coal mining exploration and development purposes, contributing to investor confidence and general coal industry viability. Within the Coal ERDZs, it is recognized that ecosystem and visual function may be temporarily compromised by coal exploration, development and production or use activities on these lands. It is expected that through long term maintenance and innovative reclamation and mitigation technologies, visual aesthetics can be retained. The Class 3 Management Guidelines in the Front Country Visual Management Area state:

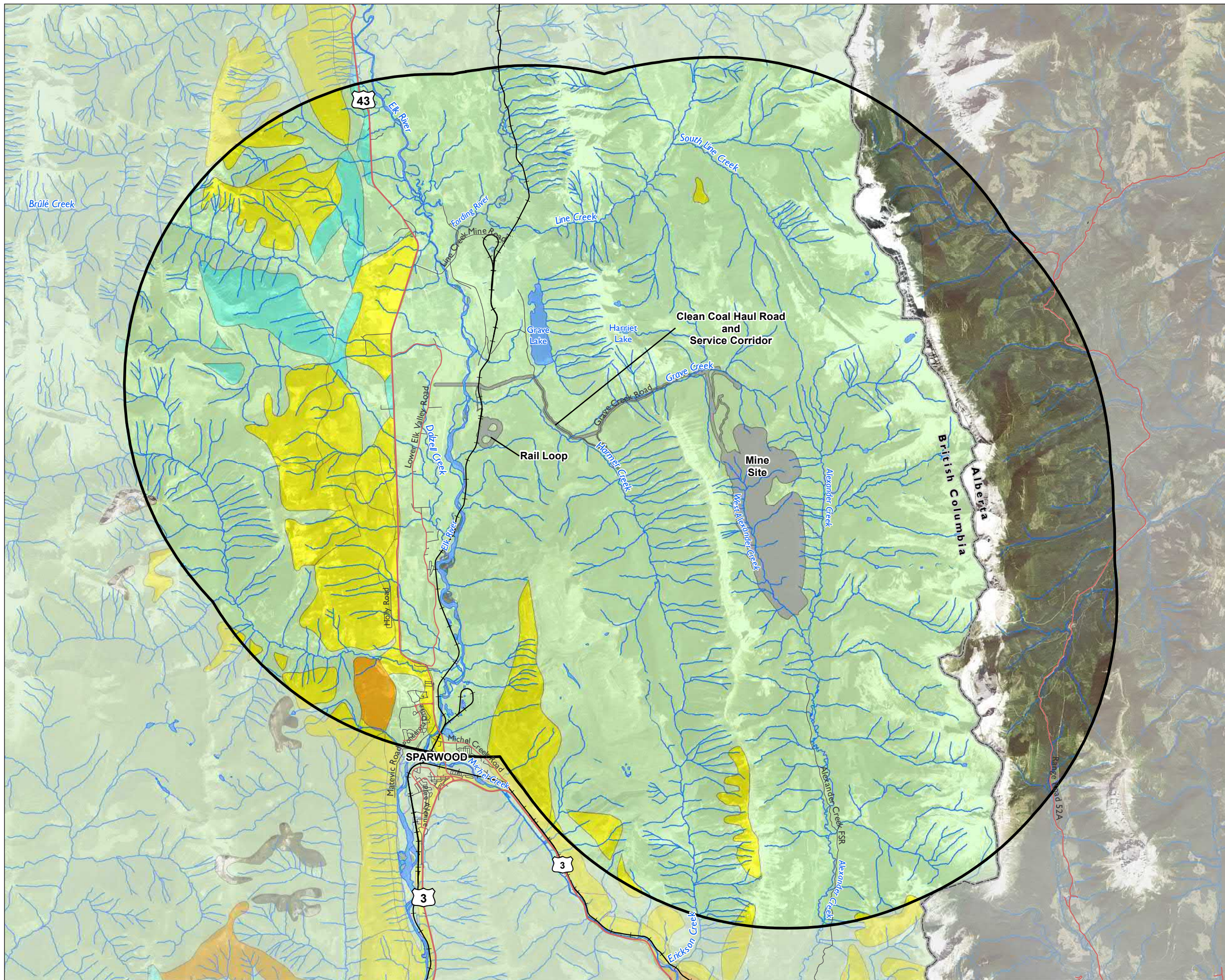
- *In most foreground areas, disturbance should be subordinate in the landscape; and*
- *In less important or prominent foreground areas, and in mid-ground and background areas, landscape alterations may be visually apparent, but should be designed to blend into the landscape in form and colour* (Kootenay Inter-Agency Management Committee, 1997).

The Project footprint is located in a sensitivity class that is determined to be not visually sensitive.














3.5 Identification of Baseline Visual Ratings

The Visual Landscape Inventory database indicates that the Project footprint is located outside of Visually Sensitive Unit (VSU) boundaries and does not include defined visual quality ratings or Visual Quality Objectives (VQOs; **Figure 5**). This is to be expected because the footprint and a significant part of the LSA is in the Coal ERDZ that recognizes that coal exploration, development and production or use activities can be anticipated on these lands; however, it is also expected that through long term maintenance and innovative reclamation and mitigation technologies, that visual aesthetics can be retained.

FIGURE 4
Visual Sensitivity Map



LEGEND

-  Visual Aesthetics Local Study Area
-  Project Footprint
-  Highways
-  Arterial Roads
-  Local/Resource Roads
-  Railway (Canadian Pacific)
-  Watercourse
-  Waterbody
-  BC/Alberta Border
- Visual Sensitivity Class**
-  High
-  Moderate
-  Low
-  Not Visually Sensitive



SCALE 1:120,000



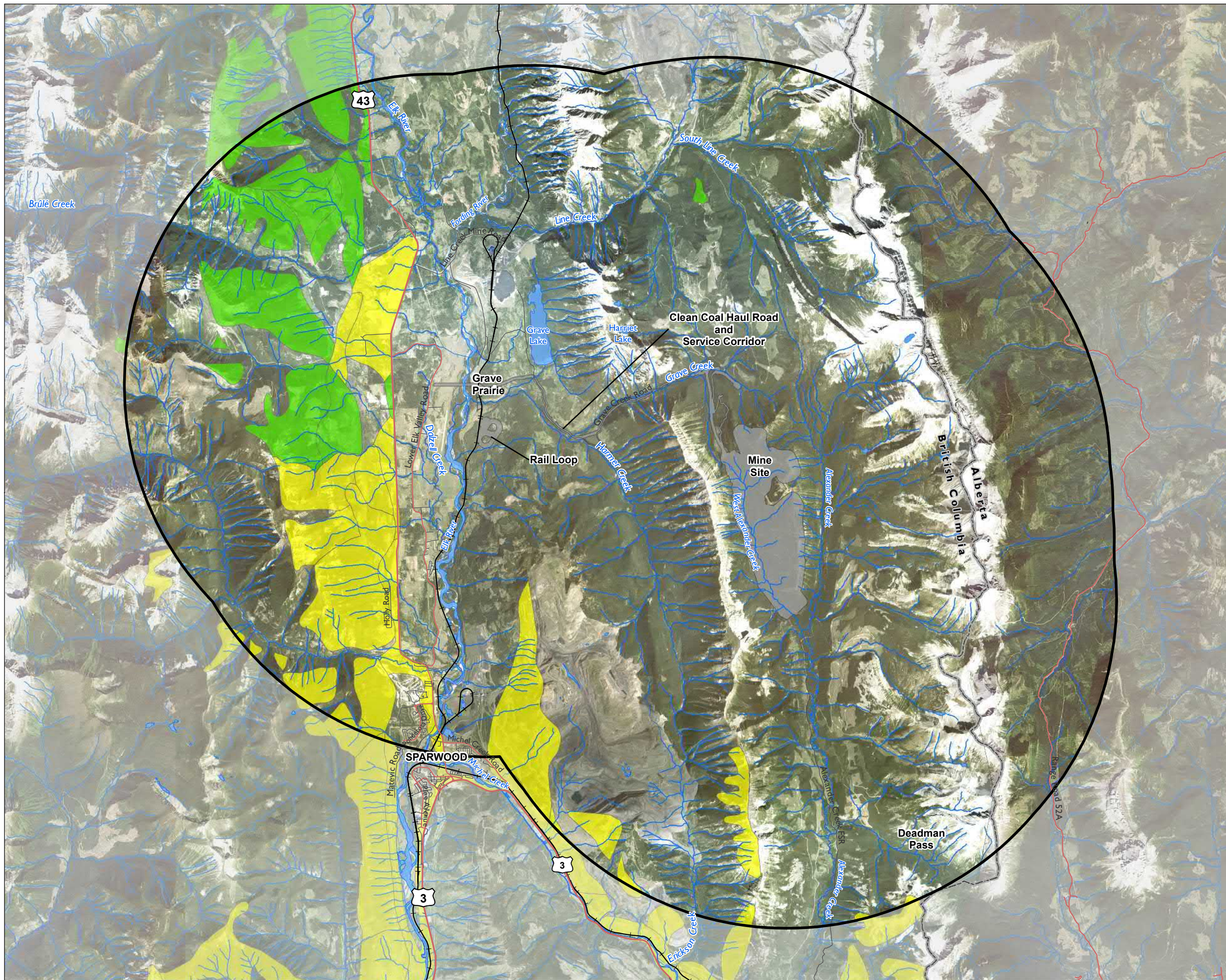
Map Drawing Information:
Data Provided By NWP Coal Canada Ltd.,
Dillon Consulting Limited, Province of British Columbia,
Government of Alberta.

Map Created By: JFC/LMM
Map Checked By: EN
Map Projection: NAD 1983 UTM Zone 11N














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FIGURE 5
Viewer Rating Map



LEGEND

-  Visual Aesthetics Local Study Area
-  Project Footprint
-  Highways
-  Arterial Roads
-  Local/Resource Roads
-  Railway (Canadian Pacific)
-  Watercourse
-  Waterbody
-  BC/Alberta Border
- Viewer Rating**
-  Moderate
-  Low



SCALE 1:120,000



Map Drawing Information:
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Dillon Consulting Limited, Province of British Columbia,
Government of Alberta.

Map Created By: JFC/LMM
Map Checked By: EN
Map Projection: NAD 1983 UTM Zone 11N



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DATE: 2021-04-30

3.6 Assemble GIS Data to Prepare Visibility Map/Model

To prepare the visibility mapping for the Project, ESRI ArcGIS Pro software was used to create a surface that represented the Project infrastructure, including: the mine site; coal processing plant; overflow coal stockpile and equipment; overland conveyor and service corridor; offices and shop; ROM stockpile area; waste rock dump; dam and diversion ditches; main sediment pond and spillway; clean coal stockpile; rail loadout buildings and conveyor; service corridor; access\haul road; power lines; explosive storage facility; rail loop and rail load bin.

A surface offset of 1.5 m was used to represent the viewing height of a person. Once the model was generated, 'areas of visibility' results were further refined to exclude unlikely observation areas such as tree tops or roof tops.

3.6.1 Topographic Surface – Digital Elevation Model (DEM)

The base surface for the visibility mapping was a bare earth Airborne LiDAR 5m resolution DEM dataset, covering 97% of the visual aesthetic study LSA. The remaining base surface incorporated the 20 m Canadian Digital Elevation Model (CDEM). The resulting surface was used as the reference for the process environment; resolution of 5 m, coordinate system of NAD 1983 UTM Zone 11, and an extent of the 10 km for the LSA (**Figure 6**).

3.6.2 Surface Compilation - Digital Surface Model (DSM)

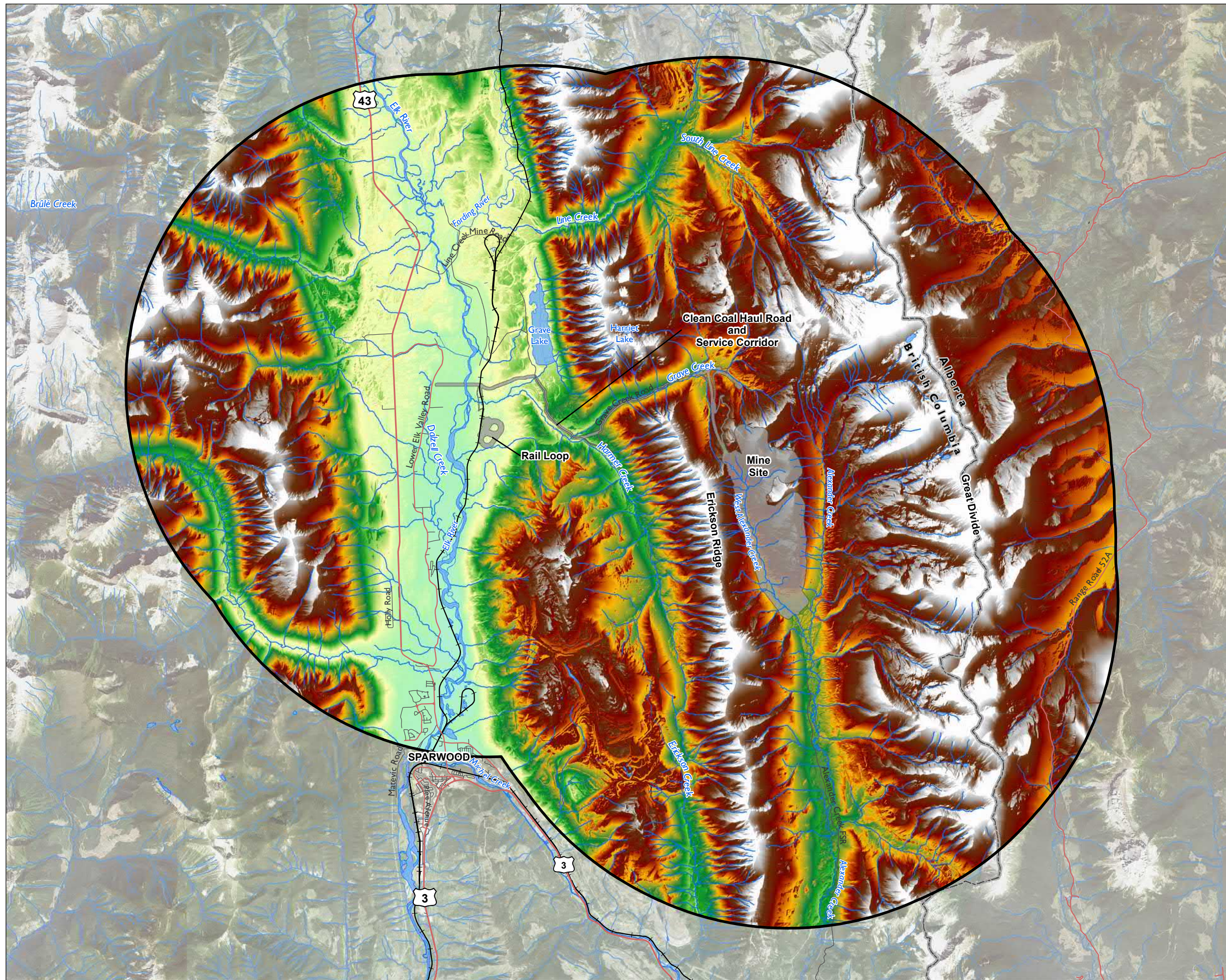
To accurately depict the natural and built features that depicted existing land use, forest cover/vegetation, cut blocks, buildings, and linear infrastructure areas, the heights were incorporated into the surface. Land use and vegetation datasets were layered onto the bare earth DEM to create the DSM. The land use dataset was obtained from the GeoBC Open Data online catalogue and Keefer Ecological Services Ltd. *Terrestrial Ecosystem Mapping Report (2020)*, including estimated heights for each category of vegetation, specifically for data that was not available from GeoBC Open Data. Estimated vegetation heights were further supplemented with Dillon field observations.

Local residential and commercial buildings and linear infrastructure (hydro corridors) were added to the DSM. Data for the buildings, roads, trails, railway and water features were sourced from BC Open Street Map (OSM). The OSM buildings dataset did not have heights, so these were generalized to be 1 to 3 stories based on dimensions of the building footprint and open source digital mapping.










3.6.3 Exclusion Areas

Once the DSM was compiled, the analysis was checked to confirm that local vegetation or buildings did not obscure the viewer. Linear infrastructure (roads, railway and trails) were not considered exclusion areas if they transected the vegetation.

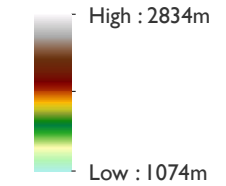
FIGURE 6
Digital Elevation Map



LEGEND

-  Visual Aesthetics Local Study Area
-  Project Footprint
-  Highways
-  Arterial Roads
-  Local/Resource Roads
-  Railway (Canadian Pacific)
-  Watercourse
-  Waterbody
-  BC/Alberta Border

Elevation



SCALE 1:120,000



Map Drawing Information:
Data Provided By NWP Coal Canada Ltd., Dillon Consulting Limited, Province of British Columbia, Airborne Imaging Inc. Digital Terrain Model, Government of Canada Natural Resources Canada, Canadian Digital Elevation Model

Map Created By: JFC/LMM
Map Checked By: EMN
Map Projection: NAD 1983 UTM Zone 11N



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3.6.4 View/Observation Points to the Project

The DSM for the Project footprint depicts the site cleared of vegetation with all of the supporting infrastructure and buildings in place. The extraction pit/mine site is depicted with pre-extraction elevations. Each building or component was assigned a height based on data from Project design documents, in particular the CADD and 3D designs from Stantec and Sedgman.

4.0

Results of the Visual Aesthetic Baseline Assessment

The Visibility Maps (**Figures 7, 8, 9**) illustrate the absence of visibility of the Project within the LSA. Three scenarios were modeled, with the 'pink' zones indicating locations that will have a view (observation point) of the Project and the 'green' zones indicating locations that do not have views (observation points) of the Project because views are blocked by topography, vegetation or structures:

1. **Figure 7** depicts the visibility from the entire Project footprint;
2. **Figure 8** depicts visibility from the mine site only; and
3. **Figure 9** depicts only the visibility of the rail loadout facility.

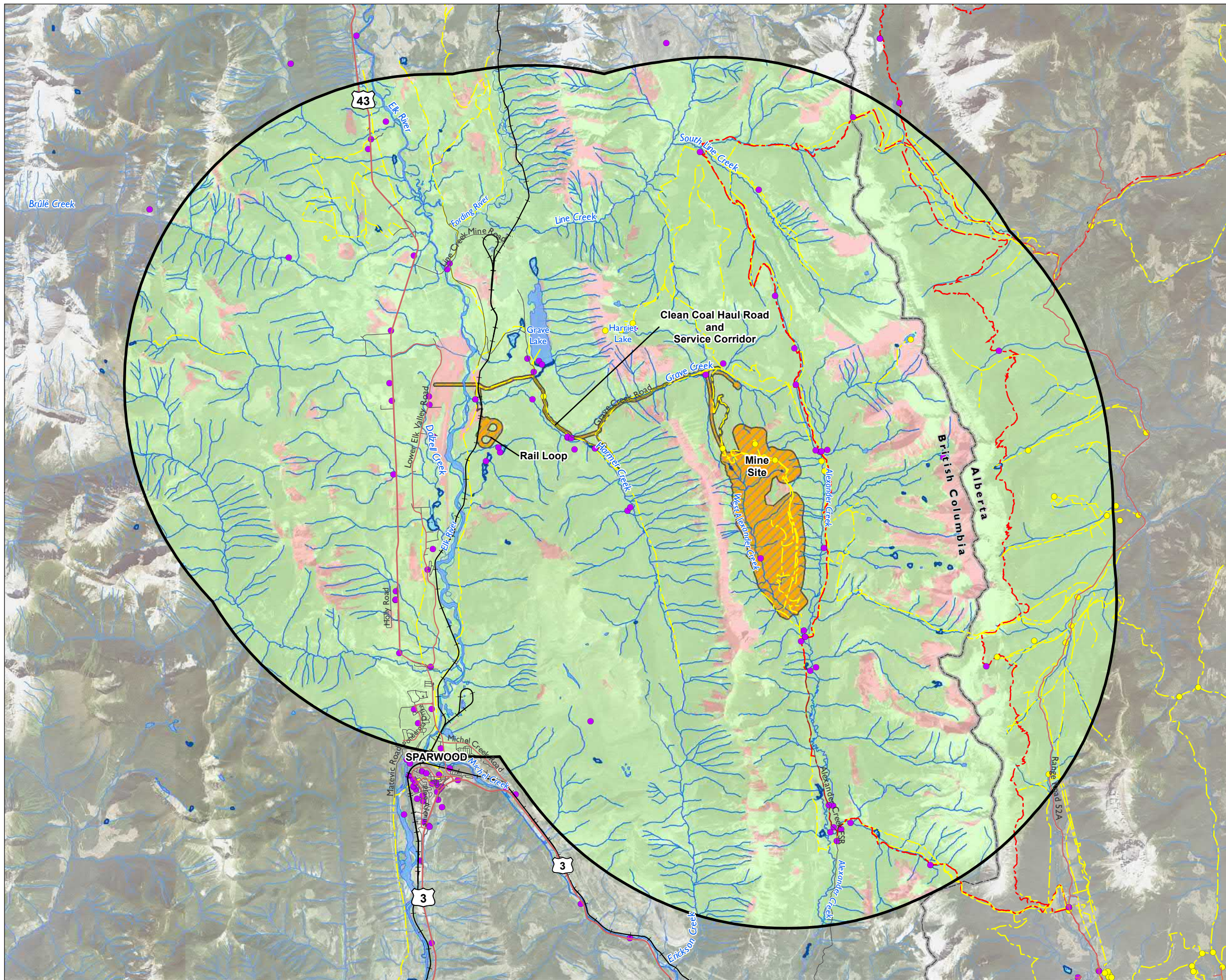
The Visibility Mapping demonstrates that the Project is screened from view with few exceptions. The Project footprint is situated between the Mount Erickson Ridge and the Great Divide range along the BC-Alberta border. Crown Mountain's peak is approximately 2,200 mASL and the plant is situated at approximately 1,910 mASL. The peak of the Mount Erickson Ridge is 2,500 mASL and the Great Divide is 2,700 mASL. These ridges screen the Project footprint from the west and east.

There are limited potential sightlines to the clean coal haul road; however, there are no sensitive receptors in this locations (**Figure 9**). The rail loadout area was also modeled with similar results. There are potential sightlines to the rail loadout; however, forest cover and local landscape screens the views.

The likelihood of having discernible views from the RSA is very low because of the dense evergreen forest, complex landscape (high visual absorption capacity) that is comprised of steep ridges and the relatively low profile of Crown Mountain.

The conclusion, based on the visibility model, is that the landform associated with surrounding ridges and the dense evergreen forest effectively block views to the Project in locations where there are sensitive receptors that include residences, institutions and recreational properties. There are impacts to recreational trails that are currently in the Project footprint. Mitigation involving closure and post-closure reclamation of the mine site and the relocation of recreational trails is addressed in **Section 5.0**.

FIGURE 7
Visibility Mapping - Project Footprint



LEGEND

- Visual Aesthetics Local Study Area
 - Project Footprint
 - Highways
 - Arterial Roads
 - Local/Resource Roads
 - Railway (Canadian Pacific)
 - Watercourse
 - Waterbody
 - Wetland
 - BC/Alberta Border
 - Receptors from Background Data
 - Receptors from Consultation
 - Recreation Trails from Consultation
 - Great Divide Trail
- Visibility**
- Not Visible
 - Visible
 - Visibility Processing Point Coverage



SCALE 1:120,000



Map Drawing Information:
Data Provided By NWP Coal Canada Ltd., Dillon Consulting Limited,
Keefe Ecological Services Ltd., Province of British Columbia,
Airborne Imaging Inc. Digital Terrain Model Government of Canada
Natural Resources Canada, Canadian Digital Elevation Model

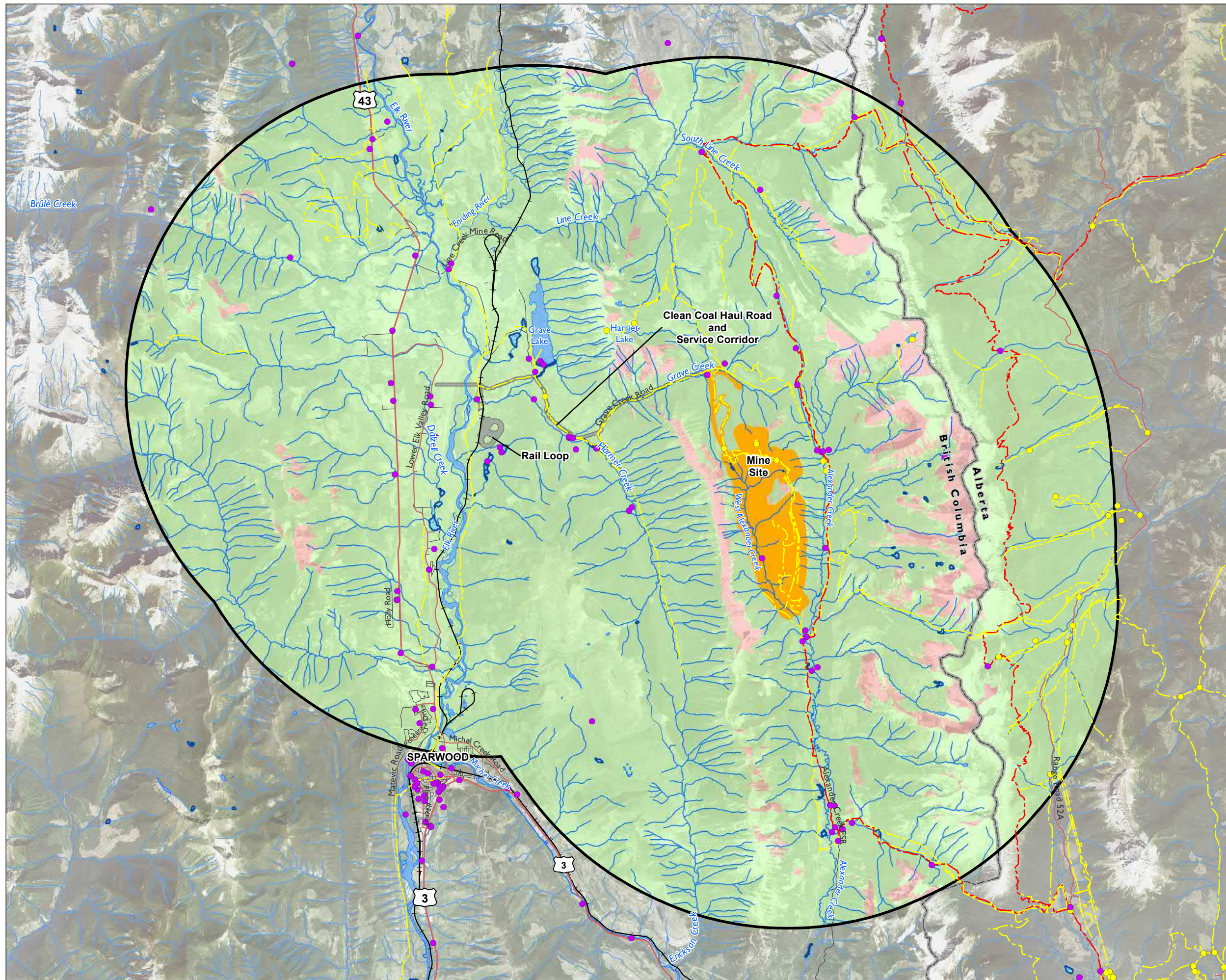
Receptor data from Province of British Columbia, GeoBC Open
Data, Dillon Consulting Limited, Consultations

Map Created By: JFC/LMM
Map Checked By: EMN
Map Projection: NAD 1983 UTM Zone 11N



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FIGURE 8
Visibility Mapping - Mine Site



LEGEND

- Visual Aesthetics Local Study Area
 - Project Footprint
 - Highways
 - Arterial Roads
 - Local/Resource Roads
 - Railway (Canadian Pacific)
 - Watercourse
 - Waterbody
 - Wetland
 - BC/Alberta Border
 - Receptors from Background Data
 - Receptors from Consultation
 - Recreation Trails from Consultation
 - Great Divide Trail
- Visibility**
- Not Visible
 - Visible
 - Visibility Processing Point Coverage



SCALE 1:120,000



Map Drawing Information:
Data Provided By NWP Coal Canada Ltd., Dillon Consulting Limited,
Keefe Ecological Services Ltd., Province of British Columbia,
Airborne Imaging Inc. Digital Terrain Model Government of Canada
Natural Resources Canada, Canadian Digital Elevation Model

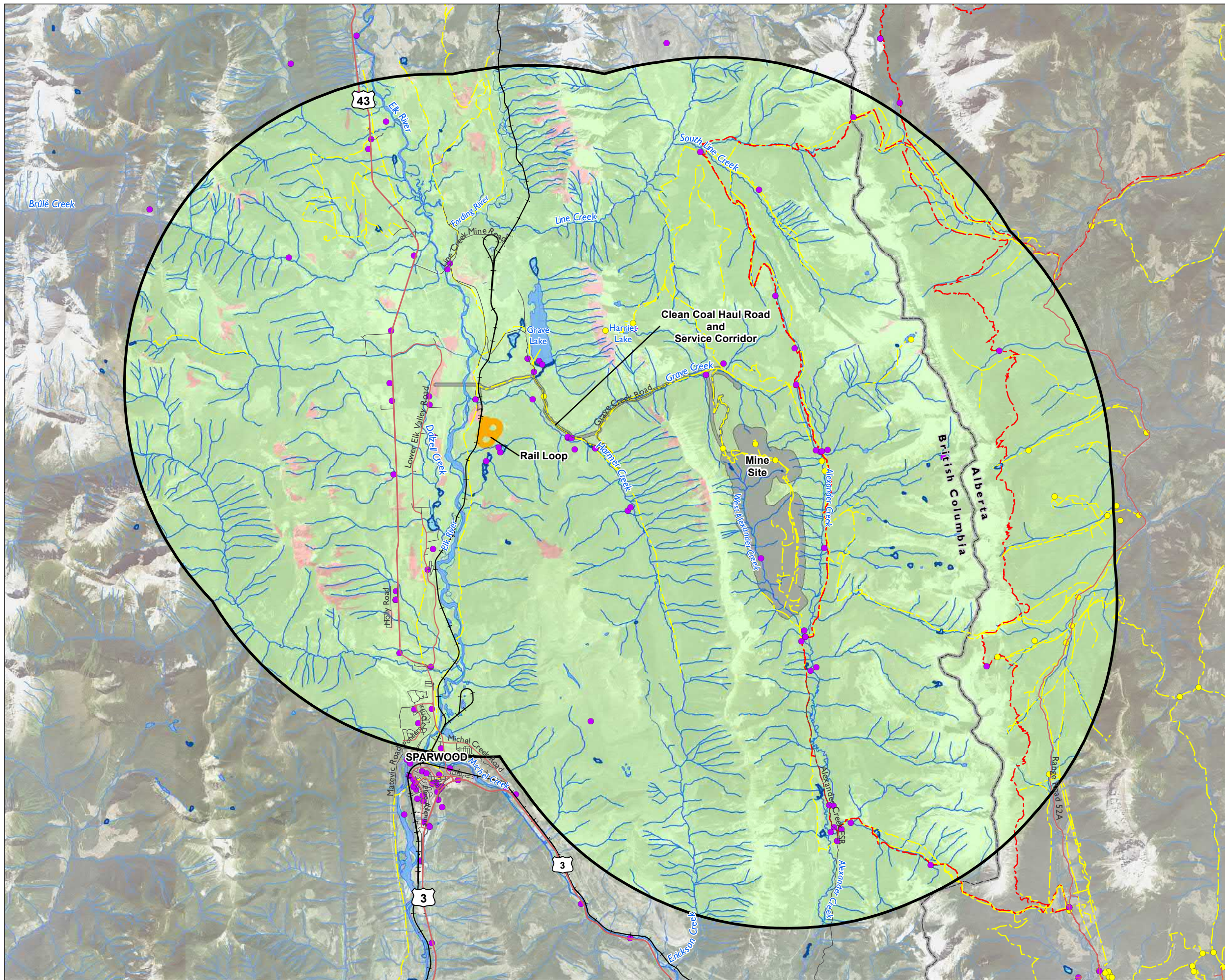
Receptor data from Province of British Columbia, GeoBC Open
Data, Dillon Consulting Limited, Consultations

Map Created By: JFC/LMM
Map Checked By: EMN
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FIGURE 9
Visibility Mapping - Rail Loadout Area



LEGEND

- Visual Aesthetics Local Study Area
 - Project Footprint
 - Highways
 - Arterial Roads
 - Local/Resource Roads
 - + Railway (Canadian Pacific)
 - Watercourse
 - Waterbody
 - Wetland
 - BC/Alberta Border
 - Receptors from Background Data
 - Receptors from Consultation
 - Recreation Trails from Consultation
 - Great Divide Trail
- Visibility**
- Not Visible
 - Visible
 - Visibility Processing Point Coverage



SCALE 1:120,000



Map Drawing Information:
Data Provided By NWP Coal Canada Ltd., Dillon Consulting Limited,
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5.0 Approach to Mitigation

A mine closure and ecological restoration plan (MCERP) for the Project (**Figure 10**) has been developed by Keefer Ecological Services Ltd. (2021). The restoration process will be ongoing during mining operations with the objective of progressively phasing in restoration as the site evolves. The ecological treatment approach is based on reinstating ecotypes that are consistent with the adjacent, undisturbed landforms and species found on the site prior to mining. This approach is consistent with the Class 3 Management Guidelines for the Front Country Visual Management Area in the *Kootenay/Boundary Land Use Plan Implementation Strategy* (Kootenay Inter-Agency Management Committee, 1997). The approach to reclamation includes removing all infrastructure and reclaiming and repurposing salvaged soil for enhancing natural habitats to pre-mining conditions and progressively reclaiming exhausted areas of the mine.

The post mine ecological treatment will include three biogeoclimatic units that were present in the mine site, rail loadout and haul roads prior to disturbance. The mine site reclamation will support 15 reclamation treatment units that correspond to the full range of ecotypes found in the pre-mine site.

The approach to reclamation includes the creation of key habitats:

- Deciduous-leading forest with lodgepole pine and spruce;
- Warm aspect wildlife forage habitat (e.g., grasslands);
- Cooler aspect shrub land to forest;
- Wetlands;
- Riparian habitats; and
- Footwall escape terrain for ungulates (e.g., bighorn sheep and mountain goat).

The restoration plan uses natural processes to steer long term restoration, using all native plants in the ecological associations that occur in the region. The goal is to have a vegetated post-mine environment that minimizes post-mining effects and reduces the impact to visual aesthetics. Replacement of pre-mining recreational trails following decommissioning should be considered and implemented in consultation with the stakeholders.

The *Kootenay/Boundary Land Use Implementation Plan Strategy* (Kootenay Inter-Agency Management Committee, 1997) provides guidance for areas where extraction activities interfere with recreational trails. The guidelines suggest that where substantial disruption to hiking and motorized recreational trails is unavoidable, licensees should relocate/re-establish trails to avoid mineral extraction sites. Through consultation, new trail alignments that avoid the mine site should, where appropriate and practicable, be established.

Monitoring is one of the tools to assess the degree to which mitigation strategies are effective in successfully achieving reclamation and cumulative effects. Monitoring is one of the primary adaptive

management tools and should be used to indicate adjustments in mitigation strategies used for the Project.

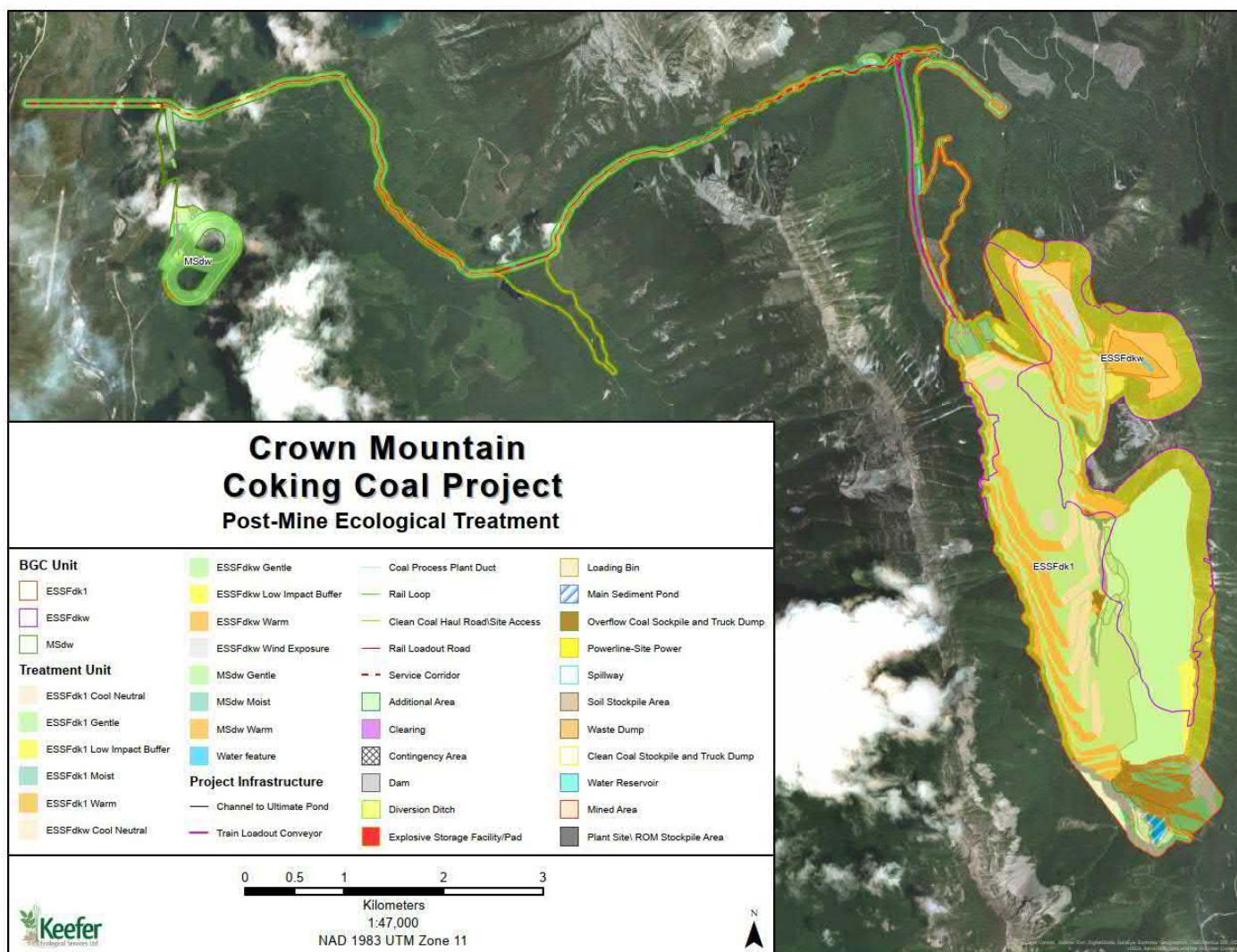


Figure 10: Remediation Plan - Ecological Treatment

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