APPENDIX 24-A
2009 AND 2010 VISUAL QUALITY BASELINE REPORT

Seabridge Gold Inc.

KSM PROJECT
2009 and 2010 Visual Quality Baseline Report

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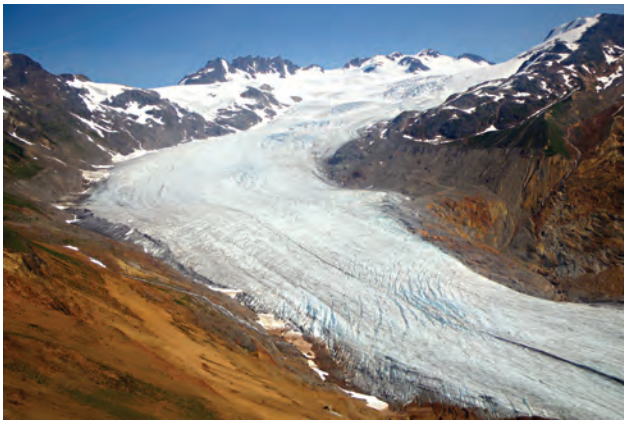

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KSM PROJECT
2009 AND 2010 VISUAL QUALITY BASELINE REPORT

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Prepared for:

SEABRIDGE GOLD

Seabridge Gold Inc.

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Executive Summary

This report presents the visual quality baseline study for the KSM (Kerr-Sulphurets-Mitchell) Project.

The proposed KSM Project is in the mountainous terrain of northwestern British Columbia, approximately 950 kilometres northwest of Vancouver, British Columbia, and approximately 65 kilometres north of Stewart, British Columbia. The proposed Project area lies approximately 20 kilometres southeast of Barrick Gold's now closed Eskay Creek Mine and within 30 kilometres of the Alaska border.

Proposed access to the open pit mining area will be from the existing Eskay Creek mine road via a new road to be constructed across the Unuk River and up the Sulphurets Creek Valley. Proposed mine site infrastructure will be near the confluence of Mitchell Creek and Sulphurets Creek and in the Mitchell Creek Valley adjacent to the proposed Mitchell Pit. A 14 km access road will be constructed from Highway 37 along Teigen Creek Valley to the proposed plant site.

The visual quality study used procedures developed by the British Columbia Ministry of Forests and Range (BC MOFR) to take "visual values into account in resource management planning, forest operations, and timber supply" (2001). These procedures are adapted here to guide collection of visual quality baseline information for the KSM Project.

Two land use plans encompass parts of the Project study area. The western part of the study area lies within the Cassiar Iskut-Stikine Land and Resource Management Plan (LRMP). The LRMP includes visual quality as a resource value and identifies and describes areas that are visually sensitive. A small part of the proposed Project, near the tunnel portals approaching the divide between the Unuk River and Treaty Creek drainages, lies within the area defined by the Nass South Sustainable Resource Management Plan (SRMP). The SRMP addresses visual quality in its General Management Direction. At the time of writing, the SRMP was under public review in a draft form.

The Recreational Features Inventory (RFI) was used to identify and locate potentially visually sensitive areas. The RFI delineates the provincial land base into recreation feature polygons (RFPs) based on recreation features and the activities those features support. It then classifies those polygons in terms of their local significance for providing or supporting recreation opportunities and their sensitivity to alteration (BC ILMB 2004b). Geographic Information System (GIS) data layers were collected from the provincial government's Land and Data Resource Warehouse.

Using this information, a viewshed analysis was performed to identify the areas from where the proposed Project works are potentially visible. The process was completed in ESRI ArcView 9.3.1 Spatial Analyst, using 1:20,000 scale Terrain Resource Information Management (TRIM) Digital Elevation Model (DEM).

Based on the review of the Cassiar Iskut-Stikine LRMP, the draft Nass South SRMP, land use information, the RFI data, results of the viewshed analysis and field observations by other field crews collecting baseline data for the environmental assessment, four key areas were selected for visual quality field data collection. These areas included the Unuk River, Teigen Creek, Mitchell Creek Valley and the crest of the ridge between Teigen Creek and Treaty Creek. Photographs were taken from both the Project development area and viewpoints within each of the four areas identified to create a photographic inventory of the visually sensitive landscapes within the study area. For each viewpoint, Global Positioning System (GPS) coordinates and bearing information were collected, and weather conditions and visibility were recorded.

Four locations were visited along the Unuk River. The visibility at these viewpoints was partially obstructed by trees along the river banks and by nearby slopes. At the two viewpoints along Teigen Creek, the view towards proposed Project infrastructure was considerably obstructed by surrounding vegetation and slopes. A photograph was taken upstream of Teigen Creek, near Hodkin Lake. The view from this viewpoint towards the proposed tailing management facility (TMF) was clear and the view of the proposed access road was obstructed by the surrounding topography. Photographs were also taken from the air of the Mitchell Creek Valley. The areas above the proposed Mitchell Pit had little vegetation. Photographs were taken from the ridge between Teigen Creek and Treaty Creek. The view from this viewpoint towards the proposed location of Project infrastructure was unobstructed by vegetation and only partially obstructed by the surrounding topography.

KSM PROJECT
2009 AND 2010 VISUAL QUALITY BASELINE REPORT

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Acronyms and Abbreviations

BC	British Columbia
CIS	Cassiar Iskut-Stikine
DEM	Digital elevation model
GIS	Geographic Information System
GMD	General Management Direction
GPS	Global positioning system
ILMB	Integrated Land Management Bureau
ILRR	Integrated Land and Resource Registry
KSM	Kerr–Sulphurets–Mitchell
LRMP	Land and Resource Management Plan
MoF	Ministry of Forests
MoFR	Ministry of Forests and Range
Rescan	Rescan Environmental Services Ltd.
RFI	Recreational Features Inventory
RFP	Recreational Feature Polygons
RMZ	Resource Management Zone
SRMP	Sustainable Resource Management Plan
the Project	KSM Project or KSM (Kerr–Sulphurets–Mitchell) Project
TMF	Tailing management facility
TRIM	Terrain Resource Information Management

1. Introduction

1.1 PROJECT PROPONENT

The proponent for the KSM (Kerr-Sulphurets-Mitchell) Project is Seabridge Gold Inc. (Seabridge), a publicly traded junior gold company with common shares trading on the Toronto Stock Exchange in Canada and on the American Stock Exchange in the United States.

1.2 KSM PROJECT LOCATION

The KSM Project is a gold/copper project located in the mountainous terrain of northwestern British Columbia, approximately 950 km northwest of Vancouver, British Columbia, and approximately 65 km northwest of Stewart, British Columbia (Figure 1.2-1). The proposed Project lies approximately 20 km southeast of Barrick Gold's recently-closed Eskay Creek Mine and 30 km northeast of the Alaska border. The proposed processing plant and tailing management facility will be located about 15 km southwest of the community of Bell II on Highway 37.

The north and west parts of the Project area drain towards the Unuk River, which crosses into Alaska and enters the Pacific Ocean at Burroughs Bay. The eastern part of the Project area drains towards the Bell-Irving River, which joins the Nass River and empties into the Canadian waters of Portland Inlet. Elevations in the Project area range from under 240 m at the confluence of Sulphurets Creek with the Unuk River, to over 2,300 m at the nearby peak of the Unuk Finger.

1.3 KSM PROJECT DESCRIPTION

The KSM Project is a large proposed gold-copper mining project. Reserve figures released in a preliminary feasibility study announced on March 31, 2010 include 1.6 billion tonnes of ore containing 30.2 million ounces of gold, 7 billion pounds of copper, 133 million ounces of silver and 210 million pounds of molybdenum in the proven and probable categories. This environmental baseline study was designed to address a wide range of alternatives that have been assessed from engineering and cost perspective at various times during the baseline studies. The following project description is the base case for the March 2010 Preliminary Feasibility Study. Maps in subsequent sections of this baseline report may depict slightly different footprint configurations relating to earlier designs that prevailed at the time the fieldwork was completed.

The proposed Project as defined for the purposes of this environmental baseline study will be comprised of two distinct and geographically separate areas (the mining area and processing plant and tailing management area), shown in Figure 1.3-1. The proposed mining area is located in the drainage basin of Sulphurets Creek, a major tributary of the Unuk River. The proposed location of the processing plant and tailing management facility is in the headwaters of tributaries of Teigen and Treaty Creeks, which flow to the Bell-Irving River. The two areas will be connected by a pair of parallel tunnels. An overview of these proposed mine components is provided in the following two Sections.

1.3.1 Mining Area

It is proposed that the mining area will be accessed by a new road to be constructed from the current Eskay Creek mine road. The access road will be used to transport personnel, heavy mining equipment, mining supplies, and explosives. This new road will trend southwestwards to the headwaters of Coulter Creek and then follow the general course of Coulter Creek to the Unuk River. After crossing the Unuk

FIGURE 1.2-1

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KSM Project Location

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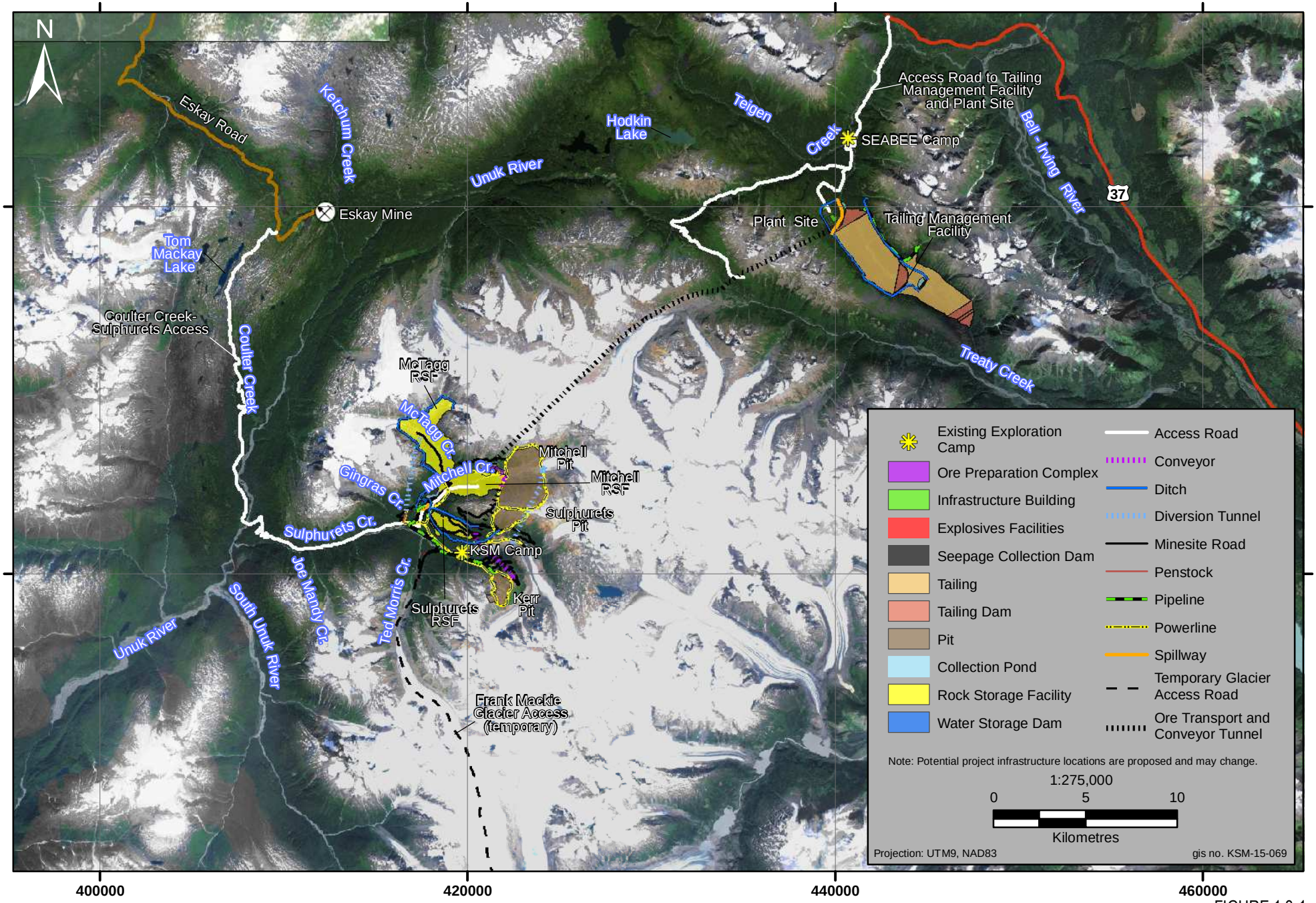

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KSM Project Layout and Road Access

FIGURE 1.3-1

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River it will follow the north side of the Sulphurets Creek Valley and cross Mitchell Creek. The Unuk River is considered navigable water under the *Navigable Waters Protection Act*. Branch roads will lead to each of the Kerr, Sulphurets and Mitchell deposits. Another branch road will head south parallel to Ted Morris Creek towards the toe of the north flowing tongue of Frank Mackie Glacier to provide access to the explosives manufacturing plant and related explosives magazines.

The support facilities for the mining area are proposed in the vicinity of the confluence of Sulphurets and Mitchell creeks. They will include accommodation for mine employees and administration and maintenance facilities.

The ore deposits will be bulk mined with large shovels and trucks and will use conventional drilling and blasting methods. The Kerr deposit is located on a ridge south of Sulphurets Lake. It is proposed that ore and non-ore mined rock will be transported from the Kerr deposit by conveyor to a tunnel portal (Sulphurets Mitchell tunnel) on the north side of Sulphurets Creek. These materials will be transported through the tunnel by conveyor to the Mitchell Creek Valley where they will be transported to the ore preparation complex or the Mitchell-McTagg rock storage facilities, respectively.

The Sulphurets deposit is located on the south side of the ridge north of Sulphurets Lake. It is proposed that ore will be transported by truck to the Sulphurets Mitchell tunnel and then by conveyor to the ore preparation complex. Non-ore mined rock will be transported to the Sulphurets rock storage facility on the south side of the ridge between the Mitchell Creek and Sulphurets Creek valleys, or to the Mitchell-McTagg rock storage facilities.

The Mitchell deposit straddles the Mitchell Creek Valley in an area recently exposed by the recession of the Mitchell Glacier. Mining of the deposit is proposed on both sides of the valley and to a depth of over 400 m below the current valley bottom. Seabridge proposes to construct a diversion tunnel from near the toe of the Mitchell Glacier, southwards towards the Sulphurets Creek Valley upstream of Sulphurets Lake to divert the flow of Mitchell Creek away from the proposed open pit area. It is proposed that the significant hydraulic head created by this tunnel will be used to drive a hydro-electric plant to generate a small portion of the electricity requirements of the Project.

Large volumes of low grade or barren rock will be removed in order to access the ore in each of the deposits. Non-ore rock removed to access ore will consist of both potentially acid generating (PAG) and not potentially acid generating (not PAG) rock. Rock storage areas have been defined in the Mitchell Creek and McTagg Creek valleys and on the south-facing side of the ridge between Sulphurets Creek and Mitchell Creek valleys. Runoff and seepage from the rock storage areas will be collected in a water storage facility contained behind a dam, to be located in the lower reaches of Mitchell Creek, and treated prior to discharge to the environment. The piped flow from the storage facility to the water treatment plant may be used to drive a hydro-electric plant.

A second diversion tunnel is proposed to direct the flow of McTagg Creek to the Sulphurets Creek Valley, thus avoiding the rock storage areas. The discharge from this tunnel will be available to drive a hydro-electric plant.

A run-of-river hydro-electric plant is proposed to harness the hydraulic head of the cascade in the lower reaches of Sulphurets Creek.

Ore from the deposits will be transported to an ore preparation complex, consisting of crushing and grinding facilities and related ore storage stockpiles, located on the north side of the Mitchell Creek Valley west of the Mitchell pit. Prepared ore will be mixed with water and pumped through one of two parallel 23 km-long tunnels to the process plant, proposed to be located in the drainage of a north-

flowing tributary of Teigen Creek. The tunnels will daylight for a short distance near the divide between the Unuk River drainage and Treaty Creek before proceeding to the plant site in the Teigen Creek drainage. They will accommodate two pipelines to transport ore slurry as well as a return water pipeline, a diesel fuel pipeline, and a transmission line. The tunnels will slope towards Mitchell Creek so that all drainage can be controlled at the mine site and treated as necessary prior to release to the environment.

1.3.2 Processing and Tailing Management Area

The tunnel from the Mitchell Creek Valley will terminate on the south side of the valley formed by a north flowing tributary of Teigen Creek (South Teigen Creek) and a south flowing tributary of Treaty Creek (North Treaty Creek Tributary), adjacent to the plant site.

The plant will use a conventional grinding and flotation flowsheet to produce separate copper/gold and molybdenum concentrates, gold doré and tailing. It will process up to 120,000 tonnes per day of ore to produce an average of 1,200 tonnes per day of concentrate. The concentrate will be dried and transported to the port of Stewart by truck. It is anticipated that approximately 20 to 30 round trips per day will be required using 40 tonne payload trucks.

Vehicle access to the plant site will be by a 14 km long road along Teigen Creek from Highway 37. This road will require bridges to cross Teigen creek, which may be considered to be navigable water, and smaller tributaries.

The tailing will be pumped through pipelines to the tailing management facility located in the upper reaches of the Teigen Creek Valley, extending southeast over the divide into a tributary of the Treaty Creek drainage. The facility will be constructed in two phases: the north cell will be developed between a north dam, to be located across the valley of the south tributary of Teigen Creek near the plant site, and a south dam, to be located near the crest of the valley floor; and a south cell that will be retained by a southeast dam, to be located in the headwaters of the north tributary of Treaty Creek. The proposed facility will have storage capacity for the life of the Project within an area about 8 km long and 1.5 km wide. Seepage from the south and southeast dams will be pumped back into the impoundment to reduce any potential impact on the Treaty Creek drainage. Water diversion channels will be constructed on both flanks of the impoundment, where feasible, to divert clean water away from the impoundment. Supernatant water will be recovered from the impoundment using barge mounted pumps and recycled to the plant for process water. In the event that discharge is required, the excess water in the impoundment will be pumped over the northern dam towards the Teigen Creek drainage. Treatment of discharge water may be required to meet permit conditions.

It is assumed that electricity to power the plant and mine site will be obtained from the provincial electricity grid. A secondary transmission line will be constructed from a switching station, to be located near the point where Highway 37 crosses Snowbank Creek. The secondary line will follow the general alignment of the access road, to the plant site, and then pass through the tunnel to the mine site.

2. Objectives

The visual quality baseline study describes the areas throughout the Project study area that may be visually sensitive. Following BC MOFR's visual impact procedures described in the *Visual Impact Assessment Guidebook* (BC MOF 2001), the objective of this report was to complete the first two steps:

1. Planning and pre-field trip preparation.
2. Conducting fieldwork.

Completing these steps required:

- reviewing BC MOFR's guidelines and relevant literature;
- reviewing and describing previously established visual quality objectives near the Project study area, and existing GIS data;
- identifying existing landscapes and visual resources in the study area that may be sensitive to visual disturbance by conducting a viewshed analysis; and
- describing the potentially sensitive areas by accounting for terrain, vegetation, and other natural features that may act as visual obstructions when conducting fieldwork.

This information will be used to inform the Visual Quality Chapter of the proposed Project's Environmental Assessment Certificate Application. Locations identified as being potentially sensitive to visual disturbance may be used to develop Project design options, and to prepare visual simulations to assess potential effect of the Project on visual quality.

3. Study Area

The study area was determined during development of the draft Application Information Requirements (dAIR) by considering access limitations, as well as tourism and recreational land uses near the Project.

A radius of 8 km around the proposed Project infrastructure was used as a study area boundary which will encompass the foreground and mid-ground view of the landscape (BC MOF 1997). Beyond 8 km the viewer will 'see outlines of general shape and patterns with little discernible texture and color, and sense of overall perspective' (BC MOF 1997). The visibility will be limited and fragmented by the surrounding topography. The study area will also encompass areas that are potentially used for recreation, determined during development of the dAIR and during early research into commercial and recreational tenure holders through the government database and communication with tenure holders (Rescan 2010).

4. Methods

Methods used for this study are guided by the BC MOFR's visual impact assessment procedures, which use the following five step procedure found in the *Visual Impact Assessment Guidebook* (BC MOF 2001):

1. Planning and pre-field trip preparation.
2. Conducting fieldwork.
3. Developing design options and preparing visual simulations.
4. Assessing visual simulations.
5. Preparing a visual impact assessment report.

To complete the first step in this procedure, baseline information was gathered through reviewing relevant literature and GIS data sources including:

- Recreation Features Inventory Procedures and Standards Manual (BC MOF 1998);
- Visual Impact Assessment Guidebook (BC MOF 2001);
- the Cassiar Iskut-Stikine LRMP (BC ILMB 2000);
- the draft Nass South SRMP (BC ILMB 2009);
- the 2009 KSM Land Use Baseline Report (Rescan 2010); and
- the Recreational Features Inventory (BC ILMB 2004b).

Geographic Information Systems (GIS) software was used to delineate and record the information. Using ArcGIS software and the data collected, potentially sensitive areas were identified through a viewshed analysis.

The second step was completed based on the results of the viewshed analysis, which determined the potentially sensitive locations where field investigations were required.

4.1 PLANNING AND PRE-FIELD TRIP PREPARATION

The purpose of the planning and pre-field trip preparation step is to gather and transfer onto maps all known information before performing fieldwork (BC MOF 2001).This step involved conducting a review of existing literature and GIS data. Literature reviewed included relevant BC MOFR sources, the Cassiar Iskut-Stikine LRMP (BC ILMB 2000), and the draft Nass South SRMP (BC ILMB 2009). Data layers collected included recreation use areas, parks and protected areas, road/highway corridors, and RFI data.[1]

A viewshed analysis was completed. This analysis identifies key areas within the study area from which the Project infrastructure could be seen. ArcGIS Viewshed analysis tools are used to asses which objects might be visible from different significant and/or sensitive locations. The analysis was performed in ESRI ArcView 9.3.1 Spatial Analyst using the viewshed analysis tool.

[1] All datasets listed in this section were downloaded from the Land and Data Resource Warehouse.

Data used for the analysis included:

- the height of proposed infrastructure including roads, the TMF, the pits, the rock storage facility, and the plant site;
- a digital elevation model that was created by the Base Mapping and Geomatic Services Branch of the Ministry of Sustainable Resource Management (BC MSRM) for the Province of British Columbia with an approximate resolution of 20 metres (BC MSRM 2002); and
- vegetation height above ground level data taken from Vegetation Resources Inventory, which was created by the Resource Branch of the Ministry of Sustainable Resource Management and retrieved through the Integrated Land Management Bureau (BC ILMB).

4.2 CONDUCTING FIELDWORK

The purpose of the fieldwork was to gain familiarity with the study area from a visual perspective (BC MOFR 2001). As suggested by the BC MOFR (2001), pre-selected viewpoints were determined based on professional interpretation of the viewshed analysis output. These specific viewpoints were visited and data were gathered.

The majority of the field information was collected during site visits undertaken on August 3, 2009, and August 4, 2009. The remaining field information was collected on later visits undertaken on August 9, 2009 and August 14, 2010. For each viewpoint, information gathered consisted of:

- GPS coordinates for the viewpoint (using a Garmin 60CX - Accuracy 3-5 metres 95% typical – Wide Area Augmentation System (WAAS) accuracy in North America or <10 metres 95% typical where WAAS not available);
- current weather conditions;
- photographs from each viewpoint in the direction of proposed KSM Project development; and
- the compass bearing in which the photograph was taken.

Most sample photographs were taken from ground positions using a 10 megapixel digital camera with a 35 mm lens. Access to viewpoints was gained initially by helicopter. The helicopter landed at the closest safe landing area to the viewpoint, which was then accessed by foot. When ground viewpoints were not accessible, photographs were taken from a helicopter for reference.

On the ground, the viewpoint was adjusted slightly to ensure it was sampled as close as possible to potential human activity. (e.g., for activities on rivers a location close to the water was chosen).

One remote location that required more extensive travel by foot was sampled on August 4, 2009, by a field crew conducting a wildlife survey. This crew used the same methodology to collect data as the visual quality crew. Subsequently, on August 9, 2009, and August 14, 2010, field crews collecting archaeological data and fisheries data were able to obtain photographs for two other locations that were not visited during the initial trip.

5. Results

5.1 PLANNING AND PRE-FIELD TRIP PREPARATION

As described above, planning and pre-field trip preparation involved gathering information and GIS data related to the study area, and completing a viewshed analysis to identify key areas that are potentially sensitive to development.

5.1.1 Literature Review and GIS Data Collection

The information from the following sources was considered, and where possible, recorded and delineated using GIS software. All datasets listed in this section were downloaded from the Land and Data Resource Warehouse (LDRW).

5.1.1.1 Cassiar Iskut-Stikine LRMP and Nass South SRMP

Visual quality objectives (VQOs) are resource management objectives established by the BC MOFR district manager or contained in a higher level plan, which reflect the desired level of visual quality based on the physical characteristics and social concern for the area (BC MOF 2001). District managers consider information on the character or condition of a landscape and may identify scenic areas and establish VQOs under the *Forest Practices Code* (BC MOF 2001). The purpose of reviewing LRMPs and SRMPs is to determine VQOs that have been previously established within the study area. The Project study area is within the following land planning areas (Figure 5.1-1):

- the Cassiar Iskut-Stikine LRMP; and
- the Nass South SRMP.

The LRMP for Cassiar Iskut-Stikine is completed and approved (BC MSRM 2002); while the Nass South SRMP is still in a draft form (BC MSRM 2009). Both plans list visual quality as a resource value or management objective, and identify and describe areas that are visually sensitive.

<u>The Cassiar Iskut-Stikine LRMP</u>

The Cassiar Iskut-Stikine LRMP is a sub-regional land use plan covering approximately 5.2 million hectares of northwestern British Columbia. Recommendations have been developed to direct the management of public lands and resources for the Canadian portions of the Stikine and Unuk River watersheds (BC ILMB 2000). The LRMP has set management guidelines for mining activities within its boundaries and management direction statements related to visual quality (BC ILMB 2000).

The LRMP's General Management Direction (GMD) guides resource activities on all Crown land outside of protected areas. Area-specific management refers to geographic resource management zones (RMZs) with distinct biophysical characteristics and resource issues (BC MOF 2001). The GMD applies in these RMZs, except where area-specific objectives and strategies have been developed to address certain resource values or activities for the RMZ (BC MOF 2001). Visual quality is one resource value addressed in the GMD: "The scenery and visual quality along travel corridors is highly valued, including areas along popular trails, roadways, and rivers used by kayakers, rafts, power boats and canoes" (BC ILMB 2000).

One RMZ in the LRMP, the Unuk River, overlaps the study area. An area-specific objective for this RMZ is to maintain visual quality from the Unuk River, while allowing commercial timber harvesting and mineral exploration and development to occur. The strategy for visual quality in this area designates views from Unuk River as a known scenic area, and states that "wherever possible, design logging and road building to mimic natural landscape line, form, colour, and texture" (BC ILMB 2000). Because of its remoteness and undeveloped character, the Unuk River area is used occasionally for commercial wilderness rafting trips (BC ILMB 2000; BC EAO 2009).

The Nass South SRMP

The Nass South SRMP is "a landscape level plan developed to address sustainable management of land, water and resources in the southern portion of the Nass Timber Supply Area" (BC ILMB 2009).

The draft SRMP uses VQOs as one of many variables in its timber supply analysis. The analysis output is used to "create updated yield tables and forest management constraints and objectives that are current to today's MOFR forest management initiatives and objectives" (BC ILMB 2009). The draft SRMP suggests visual screens to obscure moose and bear ranges from high-use transportation corridors. The purpose for the screens is to minimize disturbance and enhance the sense of security for the animals.

The draft Nass South SRMP does not specifically identify areas near the Project as important for visual quality management.

5.1.1.2 Commercial Recreation Tenures

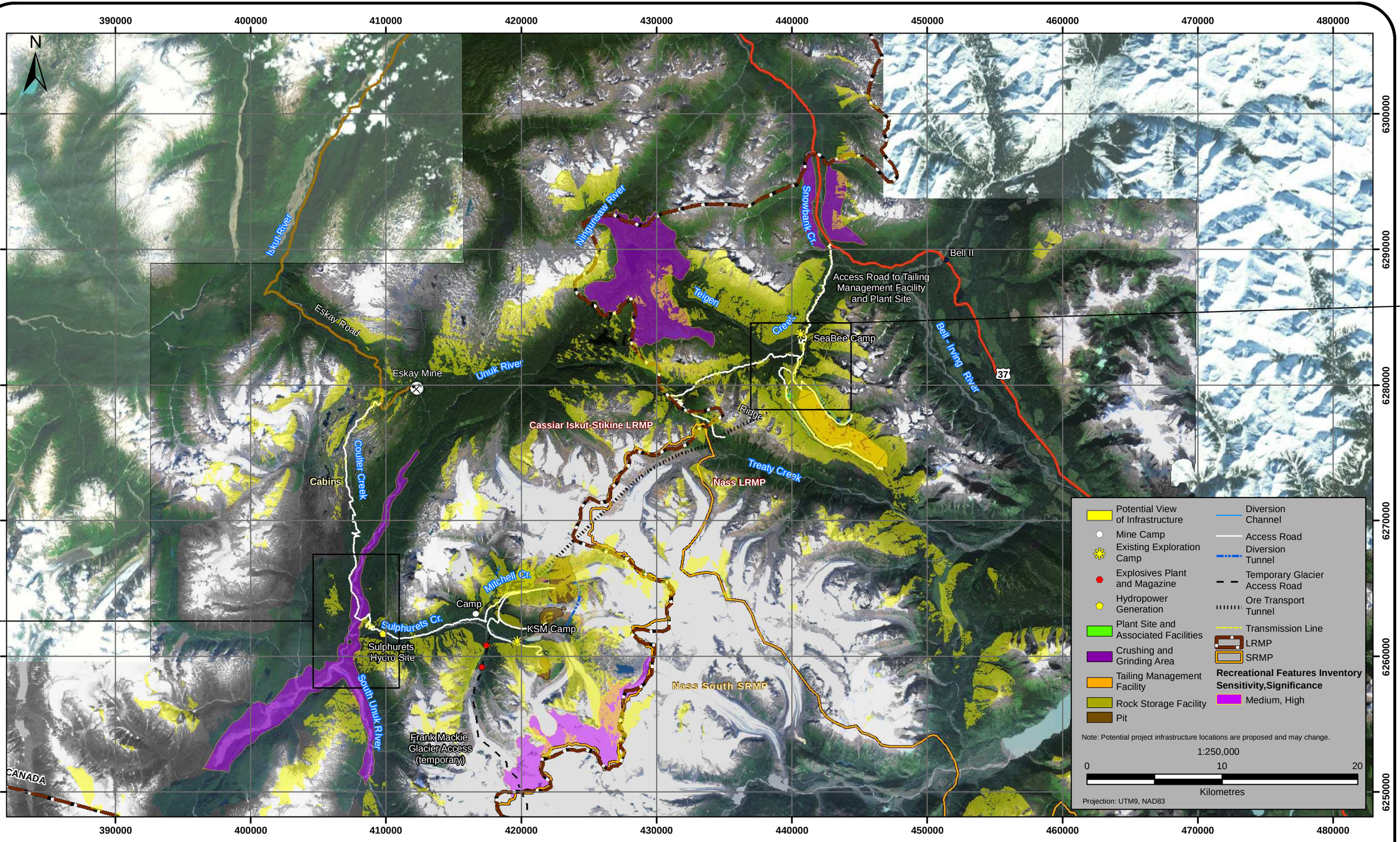
Active commercial recreation tenures can provide important information when identifying potentially visually sensitive areas and can help identify areas that are valued as visual resources. During the KSM Land Use Baseline studies (Rescan 2010), seven commercial recreation tenures were identified near the Project. Between 2008 and 2010, Rescan (2010) collected information through personal communications with some of these tenure holders. Identified areas of active commercial recreation use adjacent to the Project included terrain southwest of Bell II Lodge (Brackenhofer, 2008, *pers. comm.* in Rescan 2010); near Knipple Glacier, Teigen Creek, and Hodkin Lake (Dietzfelbinger, 2010 *pers. comm.* in Rescan 2010*);* and the Unuk River from near Storie Creek into Alaska (Thomson 2010 *pers. comm.* in Rescan 2010). The Crown Tenure data included commercial recreation licenses for Heli Skiing, Guided Water Recreation and Guided Mountaineering. Three guide outfitting tenure overlap the study area.

5.1.1.3 Recreational Features Inventory

Information and GIS data from the RFI were used to identify and locate potentially visually sensitive areas. The RFI delineates the provincial land base into recreation feature polygons (RFPs) based on recreation features and the activities those features support. It then classifies those polygons in terms of their "local significance" for providing recreation opportunities and supporting recreation activities, and sensitivity to alteration (RFI 1998).

RFI significance is a subjective rating used to indicate the relative importance of the polygon to recreation (BC MOF 1998) and uses the following rating codes:

- Very high;
- High;
- Moderate; and
- Low.



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Areas with Potential View of Project Infrastructure

FIGURE 5.1-1

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RFI sensitivity is a subjective rating indicating the relative vulnerability of the recreation features to potential alterations caused by resource development (BC MOF 1998). The sensitivity codes are:

- High: if development occurred it would likely result in a major impact to recreation resources and/or public concern.
- Moderate: if development occurred it would likely result in moderate impact to recreation resources and/or public concern.
- Low: if development occurred it would likely result in little impact to recreation resources and/or public concern.

The RFI polygon dataset that was accessed using GIS software had significance and sensitivity codes. The data in the study area did not describe the rationale that was used to assign the codes for each polygon. To identify potentially visually sensitive areas within the study area, significance rating codes of High to Very high importance and sensitivity codes of High were used as selection criteria.

The Unuk River, Teigen Lake, Teigen Creek, and Mitchell Glacier were all listed with significance ratings of High, indicating a higher potential for development to result in an adverse effect to recreation resources and/or public concern. No area within or next to the study area had a sensitivity rating greater than Moderate (Table 5.1-1).

Table 5.1-1. RFI Ratings in Study Area

Scenic Area	RFI Sensitivity Rating	RFI Significance Rating
Unuk River	Moderate	High
Teigen Creek/ Lake	Moderate	High
Teigen Creek to Bell-Irving River	Low	Low
Mitchell Glacier	Moderate	High
Mitchell Creek Valley	Low	Low/Moderate
The crest of the ridge between Treaty Creek and Teigen Creek	Low	Low

Source: (ILMB 2009)

5.1.1.4 Parks and Protected Areas

The Parks and Protected Areas dataset contained outlines for all provincial park boundaries and protected areas designated by Order in Council or legislation (BC ILMB 2004a). There are no parks or protected areas within 5 km of the access road to the TMF and plant site. The closest park is over 14 km from the TMF.

5.1.2 Viewshed Analysis

Using the information and GIS data layers collected, the viewshed analysis was conducted with a focus on the scenic areas listed in Table 5.1-1. The model uses frequency values to determine whether or not an observer could see Project infrastructure. The model output represents locations with a potential view of Project infrastructure (Figure 5.1-1).

The completed analysis identified several locations from which Project infrastructure could be seen. These visually sensitive areas formed a basis for subsequent field investigations.

The results of the analysis indicated that there was a high likelihood that the Project could be seen from the following key areas:

- Unuk River near the mouths of Sulphurets and Coulter creeks;
- Teigen Lake and Teigen Creek; and
- Mitchell Creek Valley.

5.2 CONDUCTING FIELD WORK

Viewpoints within the three key areas were determined based on professional interpretation of the output of the viewshed analysis (Figure 5.1-1). Viewpoints with a high likelihood of having an unobstructed view of the Project infrastructure were selected for fieldwork.

In addition to the areas identified by the viewshed analysis, a fourth key area was identified during the field trip, based on evidence of recreational land use that was discovered on the crest of the ridge between Treaty Creek and Teigen Creek.

Photographs were taken from multiple viewpoints within each of these four key areas identified as potentially sensitive:

- Unuk River near the mouths of Sulphurets and Coulter creeks;
- Teigen Lake and Teigen Creek;
- Mitchell Creek Valley; and
- Crest of the ridge between Treaty Creek and Teigen Creek.

Photographs were also taken at site-specific points around the KSM Project area for reference. Figure 5.2-1 shows the locations of each photograph viewpoint.

5.2.1 Unuk River

The Unuk River is a large river that flows into Alaska approximately 24 km downstream of the point where it is joined by Sulphurets Creek. The lower elevations of the valley walls surrounding the river are heavily forested. On both sides of the river, slopes rise steeply from the valley floor. The proposed Coulter Creek Access Road will commence from the existing Eskay Creek mine road, passing Tom Mackay Lake and then descending generally parallel to Coulter Creek towards the Unuk River. As it approaches the valley bottom the proposed alignment turns and descends at a gentle angle, running sub-parallel to the Unuk River. It will cross the river at a single location with a 67 m long two-span bridge before climbing through a series of switchbacks into Sulphurets Canyon onwards to Mitchell Creek (McElhanney 2010).

As described in Section 5.1, the Cassiar Iskut-Stikine LRMP requires protecting visual quality, particularly on wilderness rivers that support tourism and recreation. The LRMP specifically addresses visual quality along the Unuk River, which has local significance because of occasional use by commercial rafting guides (BC EAO 2009) in the summer months. The Explorers League relies on the pristine and remote wilderness to attract clients (Thomson 2010 pers. comm. in Rescan 2010).

In the RFI classification, the Unuk River is listed with a sensitivity rating of Moderate, and a significance rating of High, indicating that if development occurs it could result in an adverse effect to recreation resources/public concern.

390000 400000 410000 420000 430000 440000 450000 460000 470000 480000

6300000 6290000 6280000 6270000 6260000 6250000

N

Iskut River
Eskay Road
Eskay Mine
Unuk River
Coulter Creek
Cabins
Nitlingumsaw River
Viewpoint 08
Telgen
Viewpoint 05
Viewpoint 06
Creek
Viewpoint 07
SeaBee Camp
Snowbank Cr.
Bell II
Access Road to Tailing Management Facility and Plant Site
Bell - Irving River
37
Ridge
Cassiar Iskut-Stikine LRMP
Viewpoint 11
Treaty Creek
Nass LRMP
Viewpoint 09
Mitchell Cr.
Camp
KSM Camp
Viewpoint 10
Nass South SRMP
Viewpoint 02
Viewpoint 01
Sulphurets Cr.
Viewpoint 03
Sulphurets Hydro Site
Viewpoint 04
South Unuk River
Frank Mackie Glacier Access (temporary)
Unuk River
Viewpoint 02
Viewpoint 01
Viewpoint 03
Viewpoint 04
1:100,000
Viewpoint 07
Viewpoint 06
1:100,000

- Photograph Site
- Mine Camp
- Existing Exploration Camp
- Explosives Plant and Magazine
- Hydropower Generation
- Plant Site and Associated Facilities
- Crushing and Grinding Area
- Tailing Management Facility
- Rock Storage Facility
- Pit
- Diversion Channel
- Access Road
- Diversion Tunnel
- Temporary Glacier Access Road
- Ore Transport Tunnel
- Transmission Line
- LRMP
- SRMP

Recreational Features Inventory Sensitivity,Significance

- Medium, High

Note: Potential project infrastructure locations are proposed and may change.

1:250,000

0 10 20

Kilometres

Projection: UTM9, NAD83

SEABRIDGE GOLD

FIGURE 5.2-1

Visual Quality Viewpoints, 2009 and 2010

Rescan™

Photographs were taken at several locations along the river on August 3 and 4, 2009. The visibility was limited on August 3, 2009 by smoke from a forest fire in the region. The weather was otherwise sunny with scattered clouds. The visibility on August 4, 2009 was good, with sunshine and only sporadic clouds. A series of photographs were taken from gravel bars along the river at locations close to where the recreational users of the river would pass.

View 1, View 2, and View 3 photographs were taken from a gravel bar approximately 110 m upstream from the proposed bridge crossing on August 4, 2009. Photographs were taken facing north, east, and south. The view towards the proposed road was partially restricted by trees along the river bank. No pre-existing development could be seen from this location (Plates 5.2-1a to 5.2-1d).

Plate 5.2-1a. View 1 – Viewpoint 1 - Looking south from Unuk River, August 4, 2009.

Plate 5.2-1b. View 2 – Viewpoint 1 - Looking east from Unuk River, August 4, 2009.

Views 4 and 5 photographs were taken at a location approximately 3 km upstream of the proposed bridge crossing on August 3, 2009. The viewpoint is on a gravel bar along the Unuk River approximately 500 m east of a section of the proposed Coulter Creek Access Road. The Eskay Creek Mine is over 14 km north of this location, and approximately 530 m higher in elevation. The view towards the proposed Coulter Creek Access Road was partially restricted by trees along the river bank. No pre-existing development could be seen from this location (Plates 5.2-2a to 5.2-2c).

Plate 5.2-1c. View 3 - Viewpoint 1 - Looking north from Unuk River, August 4, 2009.

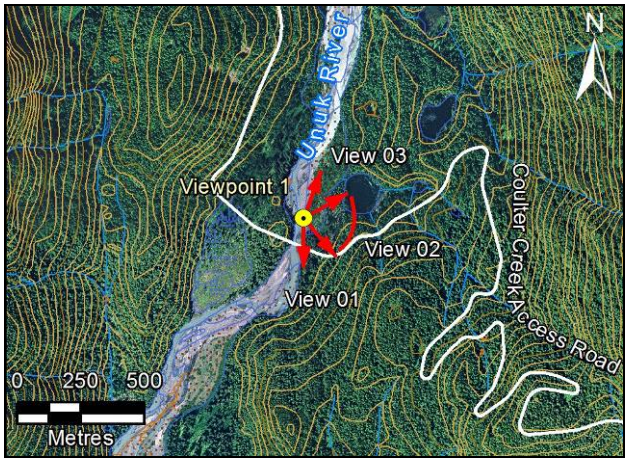

Plate 5.2-1d. Viewpoint 1 - Location and bearings, Unuk River, August 4, 2009.

View 6 photograph was taken at a location north of the confluence of Sulphurets Creek with the Unuk River on August 3, 2009. The photograph was taken facing in the direction of the proposed Coulter Creek Access Road and bridge crossing. The view towards the proposed development was partially restricted by trees along the river bank and the surrounding slopes. No pre-existing development could be seen from this location (Plates 5.2-3a and 5.2-3b).

Plate 5.2-2a. View 4 - Viewpoint 2 - Looking northeast from Unuk River, August 3, 2009.

Plate 5.2-2b. View 5 - Viewpoint 2 - Looking south from Unuk River, August 3, 2009.

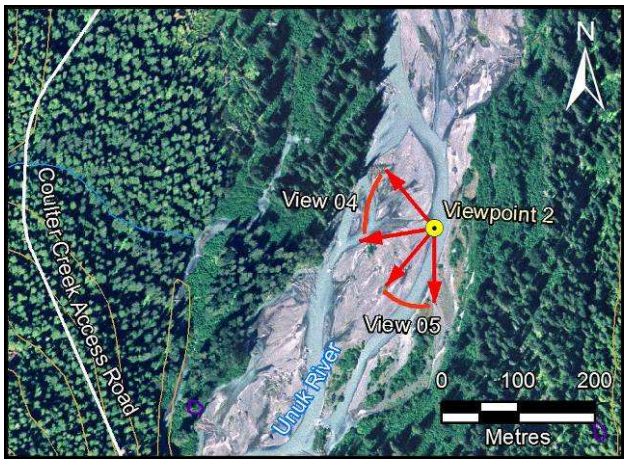

Plate 5.2-2c. Viewpoint 2 - Location and bearings, Unuk River, August 3, 2009.

Plate 5.2-3a. View 6 – Viewpoint 3 - looking north from Unuk River, August 3, 2009.

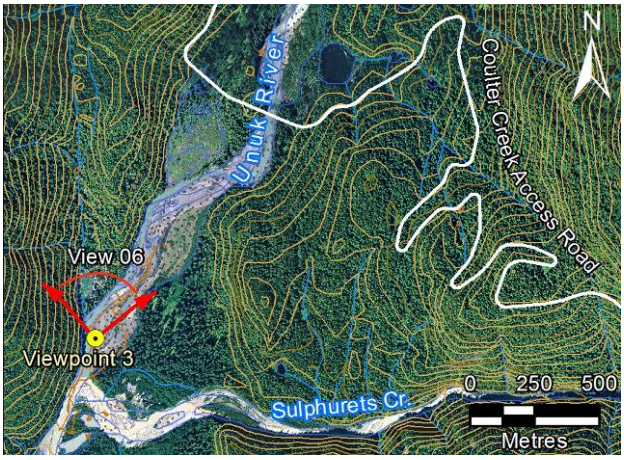

Plate 5.2-3b. Viewpoint 3 - Location and bearing, Unuk River, August 3, 2009.

View 7 photograph was taken on a gravel bar at the confluence of the Unuk and the South Unuk rivers, facing towards the proposed Project development. No pre-existing development could be seen from this location (Plates 5.2-4a and 5.2-4b).

A field crew conducting an archaeological impact assessment found evidence of a cabin approximately 220 metres from the proposed Coulter Creek Access Road alignment. The location was far upslope to the west of the Unuk River. The cabin was in a state of collapse and was not in condition to be used (Plates 5.2-5a and 5.2-5-b).

Plate 5.2-4a. View 7 – Viewpoint 4 - Looking north from Unuk River/South Unuk River confluence, August 3, 2009.

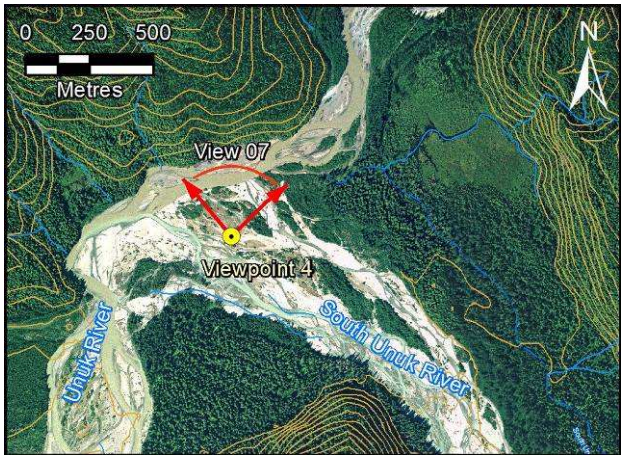

Plate 5.2-4b. Viewpoint 4 - Location and bearing, Unuk River/South Unuk River confluence, August 3, 2009.

Plate 5.2-5a. Cabin - Cabin near Coulter Creek Access Road, August 14, 2009.

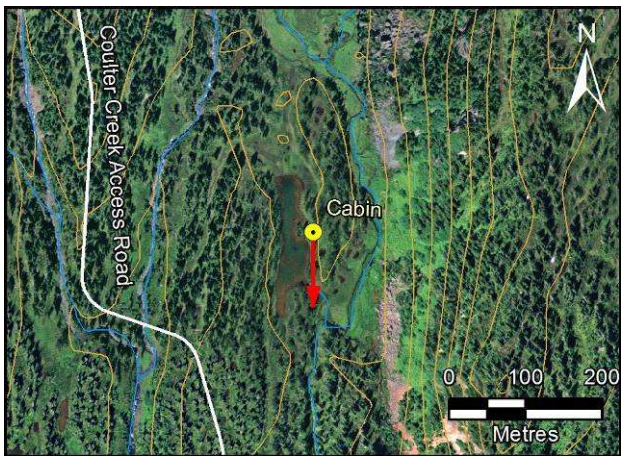

Plate 5.2-5b. Location and bearing of cabin near Coulter Creek Access Road, August 14, 2009.

5.2.2 Teigen Lake/Teigen Creek

The RFI identifies views from locations within the Teigen Lake area. Some of the upstream portions of Teigen Creek and adjacent north-facing slope have sensitivity rating of Moderate or High. The area is about 2 km from the proposed Teigen Access Road and about 7 km from the proposed TMF. Bear Enterprises commercial recreation tenure for Guided Mountaineering may operate in the area and some of the adjacent slopes have been used by Last Frontier Heliskiing (Rescan 2010). A photograph was taken of the view towards the proposed development from one of these slopes. The exploration camp near the confluence of Teigen Creek and the South Teigen tributary may be visible from Teigen Creek

in the nearby area. One of the viewpoint sites was close to the camp. The camp could possibly be seen from locations along the creek.

View 8 photograph was taken in an area of low alpine vegetation approximately 150 m north of the eastern end of Hodkin Lake, facing the proposed location of TMF and Teigen Access Road, during clear weather conditions on September 9, 2008, by a field crew collecting archaeological data. The proposed TMF location is approximately 9.5 km to the east. The vegetation screened only a small part of the view of the proposed TMF from this location. The surrounding topography blocked the view of Teigen Creek. No existing development could be seen from the viewpoint (Plates 5.2-6a to 5.2-6b).

Plate 5.2-6a. View 8 - Viewpoint 5 - Looking east from a point on north of Hodkin Lake, August 3, 2009.

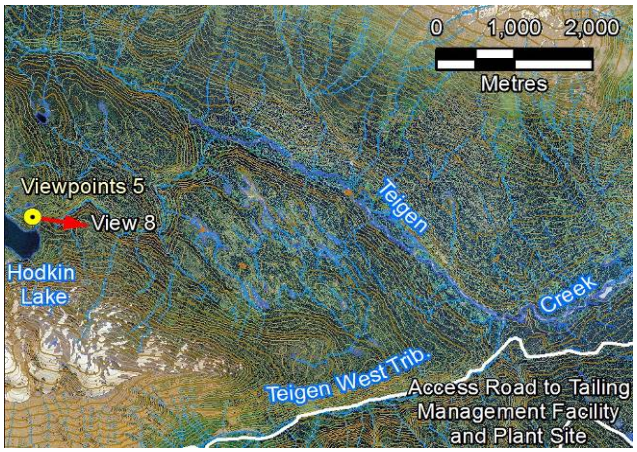

Plate 5.2-6b. Viewpoint 5 - Location and bearings from a point on Teigen Creek, September 9, 2008.

The downstream portions of Teigen Creek near the proposed Teigen Access Road have a Low sensitivity and significance rating. Therefore, data were not collected from downstream locations.

View 9 and View 10 photographs were taken on August 3, 2009 at the confluence of Teigen Creek and West Teigen Tributary. The creek banks at this location are covered by tall shrubs and forest that restrict the view from the creek. The photographed location was downstream from the area rated as Moderate sensitivity and High significance, and closer to proposed development. No existing development was seen from the viewpoint (Plates 5.2-7a to 5.2-7c).

View 11 and View 12 photographs were taken on August 3, 2009, downstream from the confluence of Teigen Creek and South Teigen tributary near the proposed road alignment. The exploration camp (SeaBee Camp) is approximately 600 m upstream from Viewpoint 7. The camp could not be seen from the viewpoint (Plate 5.2-8a). The stream banks are covered by tall shrubs and forest. From the creek the general visibility is significantly restricted (Plates 5.2-8a to Plate 5.2-8c).

View 13 and View 14 photographs were taken on August 14, 2010, on the northern shore of Teigen Lake. The photographed location was within the area rated as Moderate sensitivity and High significance. No existing development could be seen from the location. The lake is surrounded by tall shrubs and forest. From the lake the general visibility beyond the lake is significantly restricted (Plates 5.2-9a to Plate 5.2-9c).

Plate 5.2-7a. View 9 - Viewpoint 6 - Looking southeast from a point on Teigen Creek, August 3, 2009.

Plate 5.2-7b. View 10 - Viewpoint 6 - Looking south from a point on Teigen Creek, August 3, 2009.

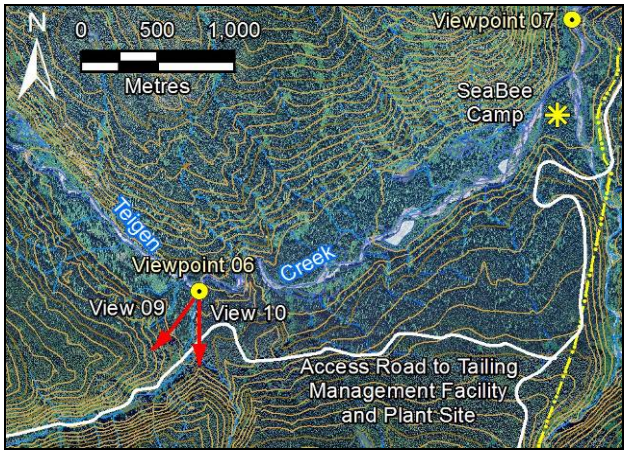

Plate 5.2-7c. Viewpoint 6 - Location and bearings from a point on Teigen Creek, August 3, 2009.

Plate 5.2-8a. View 11 - Viewpoint 7 - Looking south from a point on Teigen Creek, August 3, 2009.

Plate 5.2-8b. View 12 - Viewpoint 7 - Looking north from a point on Teigen Creek, August 3, 2009.

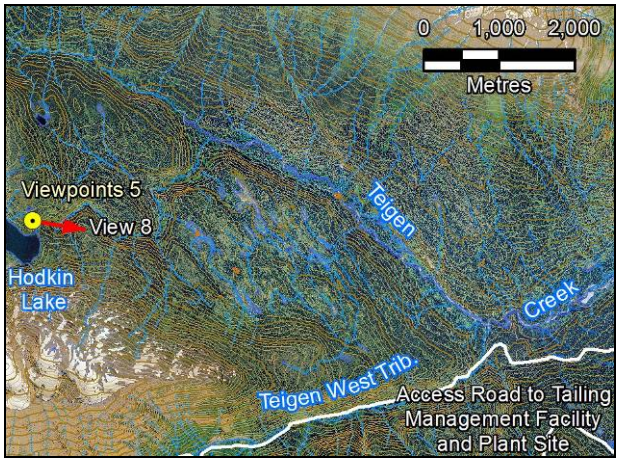

Plate 5.2-8c. Viewpoint 7- Location and bearings from a point on Teigen Creek, August 3, 2009.

Plate 5.2-9a. View 13 - Viewpoint 8 - Looking south from a point on Teigen Lake, August 14, 2010.

Plate 5.2-9b. View 14 – Viewpoint 8 – Looking southeast from a point on Teigen Lake, August 14, 2010

5.2.3 Mitchell Creek Valley

Development proposed for the Mitchell Creek Valley includes an open pit, rock storage facilities, water storage pond, ore preparation complex, diversion tunnels, and roads. The mine site infrastructure will likely extend from the toe of the glacier to the confluence of Mitchell and Sulphurets creeks. The Coulter Creek Access Road will be used to transport personnel, heavy mining equipment, mining supplies, and explosives (Seabridge 2009).

Views 15, 16, and 17 photographs were taken on August 14, 2010, from a point upslope from the Sulphurets Creek. The photographed location was rated as Moderate sensitivity and High significance. The viewpoint was not obstructed by topography to the northwest, nor was it obstructed by any vegetation. From this point no existing development could be seen (Plates 5.2-10a to Plate 5.2-10d).

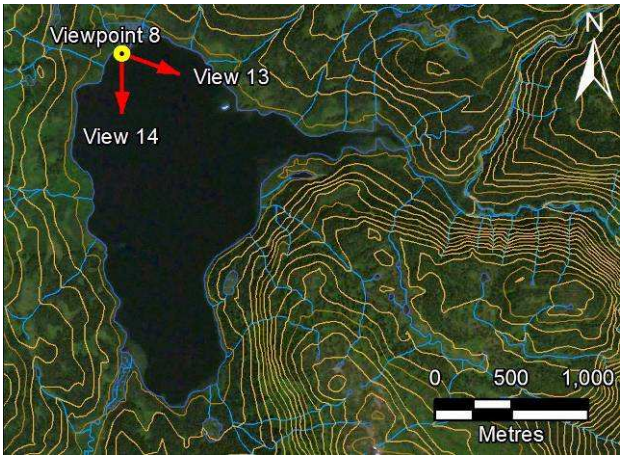

Plate 5.2-9c. Viewpoint 8- Location and bearings from a point on Teigen Lake, August 14, 2010.

Plate 5.2-10a. View 15 - Viewpoint 9 - Looking south from a point overlooking Sulphurets Glacier, August 14, 2010.

Plate 5.2-10b. View 16 - Viewpoint 9 - Looking southeast from a point overlooking Sulphurets Glacier, August 14, 2010.

View 18 photograph was taken from a helicopter for reference purposes. The area above Mitchell Creek Valley is clear of any view-obstructing vegetation (Plate 5.2-11a and 5.2-11b).

5.2.4 Crest of the Ridge Between Treaty Creek and Teigen Creek

During the field trip an additional location with evidence of recreational use was identified. Wooden stakes set by a heliskiing company during the previous winter season remained scattered at the top of a slope. The viewpoint was on a ridge between Treaty Creek and the south and west Teigen tributaries. The proposed TMF is planned in the valley at the bottom of the slope. Recreation feature polygons corresponding to this viewpoint were found in the RFI. The polygons had a Low sensitivity and significance ratings. Despite the Low ratings, given the evidence found and information gathered, the location was identified as a viewpoint and photographs were taken.

Plate 5.2-10c. View 17 – Viewpoint 9 – Looking southeast from a point overlooking Sulphurets Glacier, August 14, 2010.

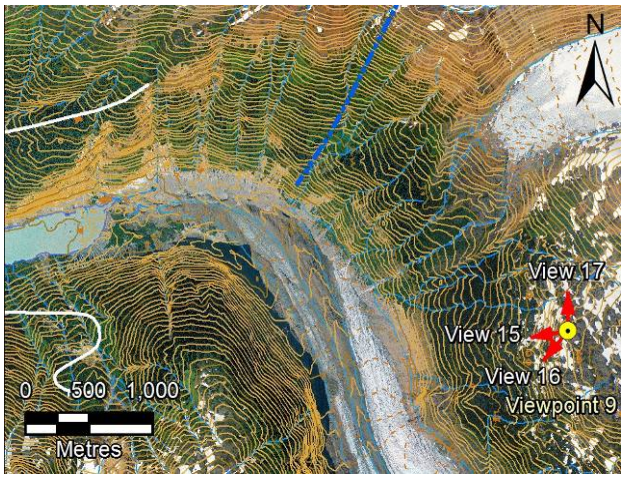

Plate 5.2-10d. Viewpoint 9- Location and bearings from a point overlooking Sulphurets Glacier, August 14, 2010.

Plate 5.2-11a. View 18 - Viewpoint 10 - Looking east from a helicopter up Mitchell Creek Valley, August 2009.

View 19 photograph was taken on August 4, 2009, at the top of the ridge, facing down the slope to the potential development. The survey location was rocky and clear of tall vegetation that could obstruct the view. Visibility was very good; the weather was sunny with scattered clouds. The slope only slightly obstructed the view from this viewpoint, and no current development could be seen (Plates 5.2-12a and 5.2-12b).

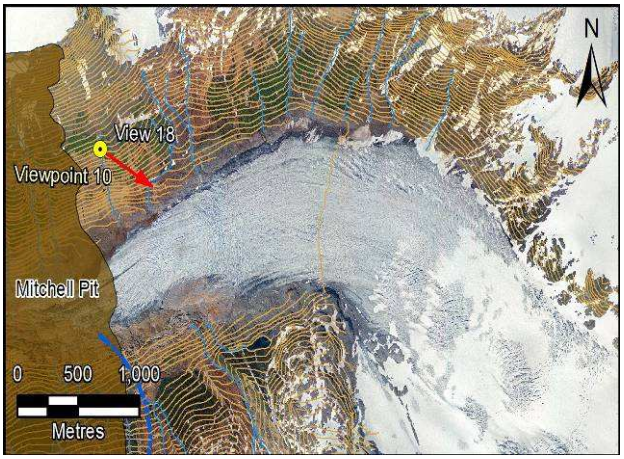

Plate 5.2-11b. Viewpoint 9 - Location and bearing from a helicopter up Mitchell Creek Valley, August 2009.

Plate 5.2-12a. View 19 - Viewpoint 11 - Looking north from the ridge between Treaty Creek and the south and west Teigen tributaries, August 2009.

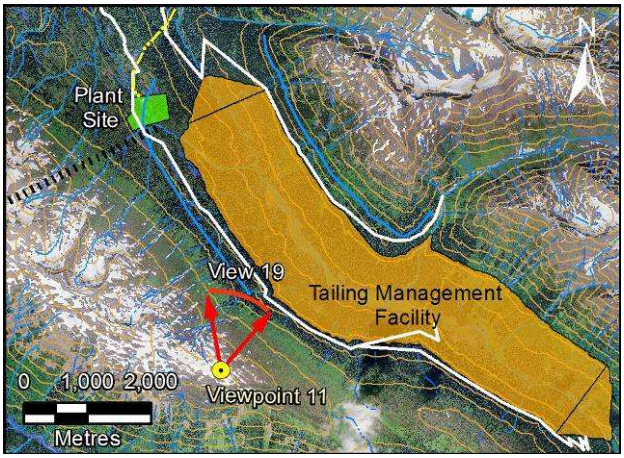

Plate 5.2-12b. Viewpoint 11 - Location and bearing from the mountain side, August 2009.

6. Conclusion

Although the proposed Project area is not heavily used, it has limited recreational value. Activities include commercial heliskiing, guided mountaineering, and rafting trips and guide outfitters. Given the Cassiar Iskut-Stikine LRMP objective to encourage recreation and tourism activities that have a minimal impact on the environment (BC ILMB 2000), it is expected that the area will continue to be used occasionally in the summer and winter for recreational purposes. The natural landscape is an important aspect of local recreational use.

For this baseline study a review of relevant literature was completed. This information provided inputs to conduct a viewshed analysis that helped to determine the key areas that are potentially sensitive to development. The model used locations where the visual quality of the landscape was sensitive to development, and delineated areas that would potentially have a direct view of the Project.

Four key areas within the study area were identified: the Unuk River near the mouths of Sulphurets and Coulter creeks; Teigen Lake and Teigen Creek; Mitchell Creek Valley; and the crest of the ridge between Treaty Creek and Teigen Creek. Viewpoints were selected and visited for field data collection. The resulting descriptions of potentially sensitive key areas in this baseline study account for terrain, vegetation, and other natural features that may act as visual obstructions. This information will be used to support the Project's visual quality environmental assessment.

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