23 Land Use

This chapter assesses the potential effects of the KSM Project (the Project) on land uses (including resource use). This includes consideration of potential effects on land management objectives and access, commercial and non-commercial interests (e.g., Crown-granted tenures and licences and recreation uses), subsistence harvest use, and the traditional value of the land. The potential effect on subsistence and the traditional value of the land relates primarily to Aboriginal groups.

23.1 Land Use Setting

The KSM Project is located in an area of northwest British Columbia (BC) known as the "Golden Triangle" due to its high mineral potential and the occurrence of a number of high-profile gold projects in the area (Resource Opportunities 2012). Throughout the past and continuing to this day, land and resource uses in northwest BC have largely been driven by mining and mineral exploration, as well as forestry activity throughout the past century. These activities led to the development of communities throughout the region. Commercial and non-commercial recreation that occurs in the region—including hunting, trapping, fishing, heli-skiing, hiking, and camping—is limited as northwest BC is relatively isolated from other areas of the province. The following sections describe land use activities within defined study areas.

23.1.1 Study Areas

Land use was characterized during baseline studies within a local study area (LSA) and regional study area (RSA) between 2008 and 2013. The LSA covers the terrestrial ecosystem mapping (TEM) area identified in Chapter 17 of the Application for an Environmental Assessment Certificate/Environmental Impact Statement (Application/EIS; Rescan 2010a; Appendix 17-B). It includes a buffer extending at least to the height of land or 1.5 km around the outer limits of Project infrastructure and linear developments, whichever comes first (Figure 23.1-1). The LSA provides a representative area that allows for the assessment of potential direct impacts related to activities associated with the Mine Site, access roads, and the Processing and Tailing Management Area (PTMA). The LSA covers an area of approximately 55,187 ha.

The RSA corresponds to the outer boundary of the baseline study areas. It is 338,008 ha in size and parallels the RSA utilized in both the Wildlife and Wildlife Habitat and Terrestrial Ecosystems Baseline Reports (Figure 23.1-1; Rescan 2010a (Appendix 18-A); Rescan 2010b (Appendix 17-A). Species information, including home range sizes, habitat use, and seasonal movement patterns, was considered when selecting the RSA boundary. Both human land uses and wildlife activities are influenced by terrain. Consequently, naturally occurring barriers (e.g., major mountain ranges and watersheds) define subsets of different human land use and movement (i.e., trapping, hunting, guide outfitting, etc.). The boundaries consider other ecological factors, including distinctive ecosystems, the species with the largest habitat range, and natural landform barriers (such as mountain ranges) beyond which effects diminish considerably. Land uses in the baseline description below (Section 23.1.4) will be described as being present in either or both the LSA or RSA.

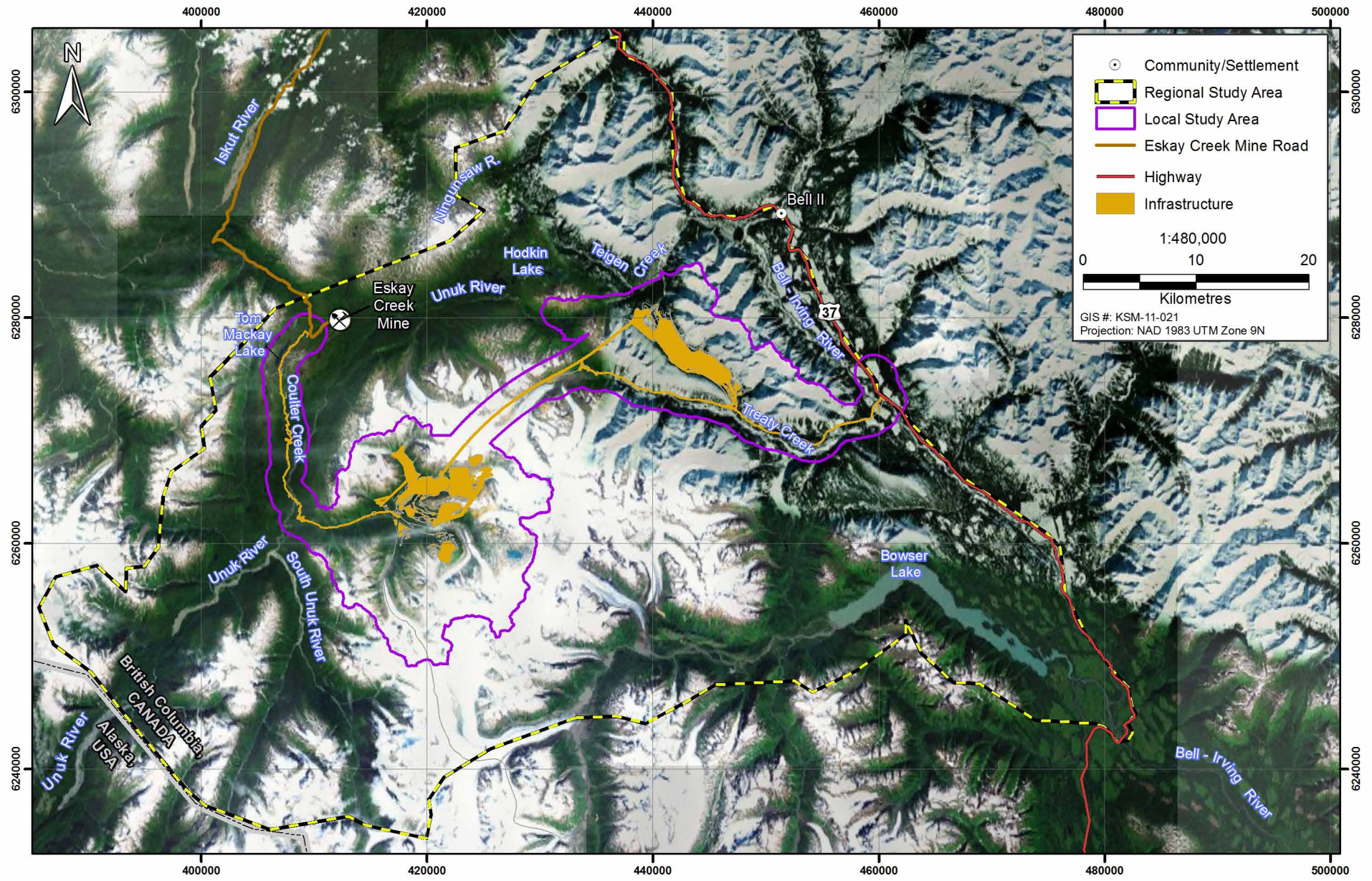

Figure 23.1-1

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KSM PROJECT

KSM Land Use Study Areas

Figure 23.1-1

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23.1.2 Legislative Framework

Land uses in the Project's study areas are governed by two regional land and resource management plans: the Cassiar Iskut-Stikine Land and Resource Management Plan (CIS LRMP; BC ILMB 2000b), and the Nass South Sustainable Resource Management Plan (Nass South SRMP; BC MFLNRO 2012b).

The CIS LRMP is the result of three years of work by a planning table composed of the Tahltan Nation, public, stakeholders, and government representatives. The development of the Nass South SRMP was completed in partnership with the Gitanyow First Nation, Nisga'a Nation, government agencies, and key stakeholders. For a description of land use planning objectives from the CIS LRMP and Nass South SRMP, see Section 23.3.

Table 23.1-1 provides an overview of the land use legislative and regulatory framework.

Table 23.1-1. Land Use Regulatory and Legislative Framework

Legislation/Policies/Guidelines/ Best Practices	Description
(BC) *Mines Act* (1996g)	Applies to mineral exploration and mine development, including construction, production, closure, reclamation, and abandonment activities. Before starting any work, the owner, agent, manager, or any other person must hold a permit, and must have filed a plan outlining the details of the proposed work, and a program for the conservation of cultural heritage resources and for the protection and reclamation of land, watercourses and cultural heritage resources affected by the mine.
(BC) *Mineral Tenure Act* (1996f)	Authorizes the registration of mineral and placer titles within the province and provides the framework for tenure administration.
(BC) *Forest and Range Practices Act* (2002a)	Governs forestry activities including logging, road building, reforestation, and riparian area management. The Act requires that forestry development be conducted in accordance with the rules and regulations identified in the Act to ensure the protection of environmental values. Areas that are important or critical to ungulates and sensitive wildlife, such as Ungulate Winter Ranges (UWRs) and Wildlife Habitat Areas (WHAs) are protected and managed for forest and range practices.
(Canada) *Species at Risk Act* (SARA; 2002c)	Identifies wildlife species considered at risk, categorizing them as threatened, endangered, extirpated or of special concern, and prohibits a number of specific activities related to listed species, including killing or harming the species, as well as the destruction of critical habitat which has been identified in any of the plans required under the Act.
(BC) *Wildlife Act* (1996j)	Provides a system for the regulation of hunting, angling, and for the protection and management of the province's fish and wildlife resources. The Act enables the BC Ministry of Environment to acquire and administer land, improvements on land and timber, timber rights and other rights on private land. Specific responsibilities outlined in the Act include: establishing and protecting wildlife management and critical wildlife areas; declaring and protecting endangered species; regulating import and export of wildlife; regulating the conditions under which wildlife can be killed for recreational reasons and for the protection of property; enforcing the Act; granting, suspending and cancelling licenses; establishing and enforcing quotas; and establishing and operating appeal procedures.

(continued)

Table 23.1-1. Land Use Regulatory and Legislative Framework (continued)

Legislation/Policies/Guidelines/ Best Practices	Description
(BC) *Environmental Management Act* (2003)	Specific legislated responsibilities include: developing policies, strategies, objectives and standards for the protection and management of the environment; preparing environmental plans for flood control, drainage, soil conservation, water resource management, fisheries and aquatic life management, wildlife management, waste management, and air management; requiring and regulating certain environmental assessments; issuing environmental protection orders; declaring environmental emergencies, allocating resources to control them, and recovering moneys spent during an emergency from the responsible party; enforcing the Act; and establishing and operating the Environmental Appeal Board.
(Canada*) Fisheries Act* (1985a)	Enacted to protect Canada's fisheries as a natural resource by safeguarding both fish and fish habitat. While much of the Act is aimed at regulating harvesting, it also provides protection for waters "frequented by fish" or areas constituting fish habitat. The Act applies to both coastal and inland waters, and is generally administered by Fisheries and Oceans Canada, although the environmental protection parts of the Act are administered by Environment Canada.
(BC*) Fish Protection Act* (1997)	Provides protection to fish and fish habitat by prohibiting bank-to-bank dams on provincially significant rivers and establishing special rules in relation to water licences on "sensitive streams" where the sustainability of fish habitat is at risk. The Act also provides for the development of recovery plans for "sensitive streams", and allows "water for fish" stream flow protection licences to be issued to community-based organizations. Further, temporary reduction in water use rights during periods of drought when the sustainability of fish is threatened can be authorized. Regulations that accompany the Act are the Sensitive Streams Designation and Licensing Regulation, and the Streamside Protection Regulation, which is administered by the BC Ministry of Forests, Lands and Natural Resource Operations (BC MFLNRO).
(BC) *Park Act* (1996i)	Provides for the establishment, classification and management of provincial parks and recreation areas dedicated to preservation of the natural environment for the inspiration, use and enjoyment of the public. Under the Act, the Minister of Environment has decision-making powers concerning the issuance of park use permits to applicants wishing to conduct commercial enterprises in a park (including those that operate and maintain campgrounds on behalf of BC Parks). Activities such as mining and forestry are usually prohibited within provincial parks.
(Canada) *Migratory Birds Convention Act* (1994)	Enacts an international agreement between Canada and the US for the protection of migratory birds. Although most of the statute regulates harvesting or hunting, it also contains some environmental protection provisions. The Act prohibits the deposit of oil, oil waste or other substances harmful to migratory birds in any waters or areas frequented by migratory birds, except as authorized by regulation. It also prohibits the disturbance of the nests of migratory birds.

(continued)

Table 23.1-1. Land Use Regulatory and Legislative Framework (continued)

Legislation/Policies/Guidelines/ Best Practices	Description
(BC) *Water Act* (1996a)	Creates a system for the regulation of the province's freshwater systems. Provisions and legislated responsibilities covered by the Act include the granting and management of water licenses; entertaining objections to licences; apportioning rights under licences; authorising licensees' rights with respect to compensation and expropriation; reserving and removing bodies of water from being used under the Act; and issuing certificates incorporating water users' communities.
(BC) *Land Act* (1996c)-amended 2003	Governs the disposition, management and administration of Crown land in the province, as well as the surveying of Crown land. Decision-making powers provided for under the Act include: determining whether a disposition of Crown land is in the public interest; temporarily reserving Crown land from disposition, designating Crown land for a particular use or prohibiting certain uses of Crown land; making a disposition of Crown land by temporary permit, licence of occupation, lease, right-of-way or easement or by Crown grant in fee simple; disposing of Crown land in accordance with the terms and conditions the minister considers advisable; and undertaking trespass actions regarding the unauthorized use of Crown land. Specific regulations cover fees, the creation of land reserves, and the prohibition of certain recreational vehicles in certain areas. Administered by the BC MFLNRO.
Protected Areas of British Columbia Act (2000)	Establishes a number of parks, ecological reserves, and places that are listed in schedules to the Act. It also transfers existing Class "A" parks and ecological reserves previously established by orders-in-council to schedules to the Act. The *Protected Areas Forests Compensation Act* (2002b) provides for compensation to forest licence holders who have suffered a loss because of a reduction in their allowable annual cut, deletion of land from their licence area, or the establishment of a protected area that includes all or part of the area under the licence. Administered by the BC Ministry of Environment.
(BC) *Land Title Act* (1996d)	Provides the legal framework for the BC land registry system and is a modified version of the Torrens System, which establishes security and simplicity of legal title through registration of conveyancing documentation in a public register. Administered by the BC MFLNRO and the BC Ministry of Environment.
Develop with Care: Environmental Guidelines for Urban and Rural Land Development in British Columbia (BC MOE 2006a)	This document has been prepared for use by local government planners, the development community, and others as a comprehensive guide to maintaining environmental values during the development of urban and rural lands. It sets out the program priorities of the BC MFLNRO, the BC Ministry of Environment, and other provincial and federal agencies, promoting ways to retain and create environmental function and resilience as communities grow.

(continued)

Table 23.1-1. Land Use Regulatory and Legislative Framework (completed)

Legislation/Policies/Guidelines/ Best Practices	Description
Environmental Best Management Practices for Urban and Rural Land Development (BC MWLAP 2004)	The BC Ministry of Water, Land and Air Protection (now the BC Ministry of Environment) prepared this document to assist people who are involved in planning, implementing, reviewing, and/or approving land developments in BC's urban and rural areas. Its primary purpose is to provide province-wide guidelines for the maintenance of environmental values during the development of urban and rural lands. It also provides information on ways that environmental protection and stewardship can benefit the community, the property owner and the developer, as well as the natural environment.
Wildlife Guidelines for Backcountry Tourism/ Commercial Recreation (BC MOE 2006b)	These guidelines were developed to ensure that backcountry recreation activities are conducted in a manner that does not compromise the current distribution of wildlife, the sustainability of their populations, or the integrity of their habitats. These guidelines define results, desired behaviours, indicators, and limits for backcountry activities in relation to wildlife and their habitats. These guidelines are intended for use by commercial tourism operators tenured under the *Land Act* when conducting activities on Crown land, including water-based activities. However, it is anticipated that the guidelines will provide useful guidance for all backcountry recreational users.
Land Use Objectives Regulation: Policy and Procedures (BC ILMB 2008)	Details the requirements that the Minister of Forests, Lands and Natural Resource Operations or his delegate must follow when establishing land use objectives for the purposes of the *Forest and Range Practices Act* (2002a). Land use objectives only have legal effect within the Act, and are recognized as the highest order of objectives within this legislative framework. This document provides administrative guidance and advice for establishing, amending, or cancelling land use objectives through a legal order under the regulation. It is intended to complement detailed operational procedures that some Integrated Land Management regional offices have developed.

23.1.3 Study Methods

Information for the land use baseline study was collected between May 2008 and June 2013 through desk-based and field research aimed at identifying potential stakeholders and characterizing land uses, including the type and frequency of land use within the LSA and RSA. Land uses were identified by various methods, including the use of the provincial Integrated Land and Resource Registry (ILRR); site visits; helicopter fly-overs; and engagement of government agencies, stakeholders, and Aboriginal groups. Potentially affected tenure holders were contacted and asked to participate in the land and resource-use baseline study.

A review of relevant regional land and resource management plans was conducted, including the CIS LRMP and Nass South SRMP. A number of government sources and databases were reviewed, as well as private sector agencies and organizations. Table 23.1-2 summarizes the main databases and information sources reviewed.

Table 23.1-2. Information Sources Reviewed

Source	Database or Reference
Province of BC	Data Distribution Service https://apps.gov.bc.ca/pub/dwds/home.so (accessed June 2012)
BC Integrated Land Management Bureau (BC ILMB)	Nass South Sustainable Resource Management Plan http://ilmbwww.gov.bc.ca/slrp/srmp/south/nass/index.html (accessed June 2012) Cassiar Iskut - Stikine Land and Resource Management Plan http://ilmbwww.gov.bc.ca/slrp/lrmp/smithers/cassiar/index.html (accessed July 2010) Integrated Land and Resource Registry https://webmaps.gov.bc.ca/imfs/imf.jsp?site=libc_ilrr (accessed June 2012)
BC Ministry of Environment	Big game harvest statistics for resident and non-resident hunters from hunter sample and guide declarations 1976-2008 British Columbia Freshwater Angling Guides 2012/2013 http://www.env.gov.bc.ca/fw/fish/guide/docs/angling_guides_list.pdf (accessed June and December 2012) Guide Outfitters in British Columbia 2010-2011 http://www.env.gov.bc.ca/fw/wildlife/hunting/non_resident/docs/guide_outfitters.pdf (accessed May and December 2012) Water licences query http://a100.gov.bc.ca/pub/wtrwhse/water_licences.input (accessed June and December 2012)
BC Ministry of Forests, Lands, and Natural Resource Operations (BC MFLNRO)	Nass Timber Supply Area (TSA) http://www.for.gov.bc.ca/hts/tsa/tsa43/index.htm (accessed October 2012) Cassiar Timber Supply Area (TSA) http://www.for.gov.bc.ca/hts/tsa/tsa04/#documents (accessed October 2012)
Department of Fisheries and Oceans Canada	Region 6 – Skeena http://www.pac.dfo-mpo.gc.ca/fm-gp/rec/fresh-douce/region6-eng.htm (accessed November 2010)
BC Parks (also part of BC Ministry of Environment)	Recreation – Park Finder http://www.env.gov.bc.ca/bcparks/explore/explore.html (accessed November 2012)
BC Ministry of Transportation and Infrastructure (BC MOTI)	Highway 37 North: Route information http://www.th.gov.bc.ca/popular-topics/driver_info/route-info/hwy37/hwy37.htm (accessed December 2012)
BC Environmental Assessment Office (BC EAO)	Project Information Center (e-PIC) http://www.eao.gov.bc.ca/epic/output/html/deploy/epic_project_list_report.html (accessed December 2012)
Guide Outfitters Association of BC Member List	Guide Outfitters Association of BC - Outfitter Directory http://www.goabc.org (accessed June 2012)
Airports	Air Broker Center - List of Airports in British Columbia http://www.aircraft-charterworld.com/airports/northamerica/britishcolumbia.htm (accessed June 2009)

23.1.4 Description of Existing Land Uses

This section provides an overview of land management plans and objectives, as well as Crown-granted tenures and land and resource uses relative to the LSA and RSA. There are no communities or applicable Official Community Plans (OCPs) within the land use RSA.

Table 23.1-3 summarizes the land and resource-use activities conducted within the LSA and RSA. Appendix 23-A (*Non-traditional Land Use Baseline Report*) provides details on the methods and results for Project-related studies. Additional information below pertaining to Treaty and First Nations' traditions, practices, and customs in and near the LSA and RSA (traditional/heritage value of the land) was derived from the NFA (NLG, Province of BC, and and Government of Canada 1998) as well as the results of the *Tahltan Nation Traditional Knowledge and Use Desk-based Research Report* (Appendix 30-A), *Skii km Lax Ha Traditional Knowledge and Use Research Report* (Appendix 30-B), *Gitanyow First Nation Traditional Knowledge and Use Desk-based Research Report* (Appendix 30-C), and *Gitxsan Nation Traditional Knowledge and Use Desk-based Research Report* (Appendix 30-D).

Table 23.1-3. Designated Lands, Crown Tenures, and Resource Uses within the Local and Regional Study Areas

Designated Lands, Crown Tenures, and Resource Uses	Land and Resource Use Description
Communities, Official Community Plans, Bylaws	None.
Provincial Parks and Ecological Reserves	Ningunsaw Provincial Park, Ningunsaw River Ecological Reserve, Border Lake Provincial Park, and Lava Forks Provincial Park are located within or adjacent to the RSA.
Nass Area	The Project's PTMA and western portion of the RSA is located within the Nass Area. Nisga'a treaty rights and interests in the Nass Area are defined in the Nisga'a Final Agreement.
First Nations Territories and Communities	Tahltan Nation: Part of the RSA and LSA, including the Project's PTMA, fall within the southern portion of Tahltan traditional territory. The closest Tahltan community to the RSA is Iskut over 150 km to the north of the Treaty Creek access road. Skii km Lax Ha: Traditional territory overlaps the LSA and RSA. Most members live in the Hazelton area, approximately 300 km southeast of the RSA. Gitxsan Nation: Traditional territory attributed to wilp Skii km Lax Ha falls within the eastern portion of the RSA and adjacent to the LSA. Most members live in the Hazelton area, approximately 300 km southeast of the RSA. Gitanyow First Nation: A small portion of traditional territory falls within the southern edge of the RSA. The village of Gitanyow is located approximately 200 km south of the RSA.
Guide Outfitting	Three registered guide outfitting tenures partially overlap the RSA, one of which also overlaps the LSA.
Hunting	The RSA is located within three different WMUs, two of which overlap the LSA, where various species are hunted. Moose is the most desired species among resident hunters, ranging between 65 to 84 kills per year within the broader WMU areas.
Trapping	Seven trapping licences overlap the RSA, three of which also overlap the LSA. Two licence areas are owned by members of the Skii km Lax Ha. Three licence areas within the RSA have no reported trapping activity.

(continued)

Table 23.1-3. Designated Lands, Crown Tenures and Resource Uses within the Local and Regional Study Areas (completed)

Designated Lands, Crown Tenures and Resource Uses	Land and Resource Use Description
Commercial Recreation	Six commercial recreation licences intersect or lie within the RSA (heli-skiing, river rafting, fishing, lodging, and backcountry expeditions). Five of these licences also intersect the LSA.
Forestry	The RSA falls within the Cassiar and Nass Timber Supply Areas. Four forestry licences are located within the RSA, two of which are in the LSA and attributed to or pending issuance to Seabridge Gold Inc.
Mineral	In addition to Seabridge Gold Inc., 40 mineral claim holders and 4 placer claim holders are located within the LSA and RSA.
Water licences	Two water licences are located in the LSA. Eleven water licence applications are located within the RSA, including three in the LSA.
Recreation	Potential recreational activities exist within the LSA and RSA (hiking, camping, snowmobiling, and riding ATVs), although these occur on an informal and non-registered basis.
Agriculture Land Reserves	None.
Oil and Gas	None.
Transportation and Utilities	Highways and Roads: Highway 37 is on the eastern edge of the RSA. A small number of forest service roads are located within the RSA near Highway 37. Highway 37A to Stewart lies to the south of the RSA. Airports/airstrips: There are no airstrips within the RSA. The closest airstrip is at Bob Quinn north of the RSA. Electrical Transmission Lines: Once built, the Northwest Transmission Line will extend along the eastern border of the RSA. Telecommunications Sites: None.

23.1.4.1 Land and Resource Management Plans

The RSA is divided approximately equally between two provincial land and resource management plans: the CIS LRMP and the Nass South SRMP (Figure 23.1-2). The CIS LRMP, which encompasses approximately 5.2 million ha, was completed in October 2000 with the support of the Tahltan joint councils, representing the Tahltan and Iskut bands (BC ILMB 2000b, 2000a). Land management within the CIS LRMP includes objectives intended to preserve the physical, aesthetic, and cultural characteristics of the region. The CIS LRMP created 14 new protected areas, in addition to existing provincial parks and ecological reserves. There are three provincial parks and one ecological reserve within or adjacent to the RSA (see Section 23.1.4.2). None of the protected areas created as a result of the CIS LRMP is located in the RSA or LSA. The CIS LRMP acknowledges the mineral and energy resource potential within the plan area. Under the plan, exploration and development of mineral deposits, as well as construction of access roads, are allowable activities, except within protected areas.

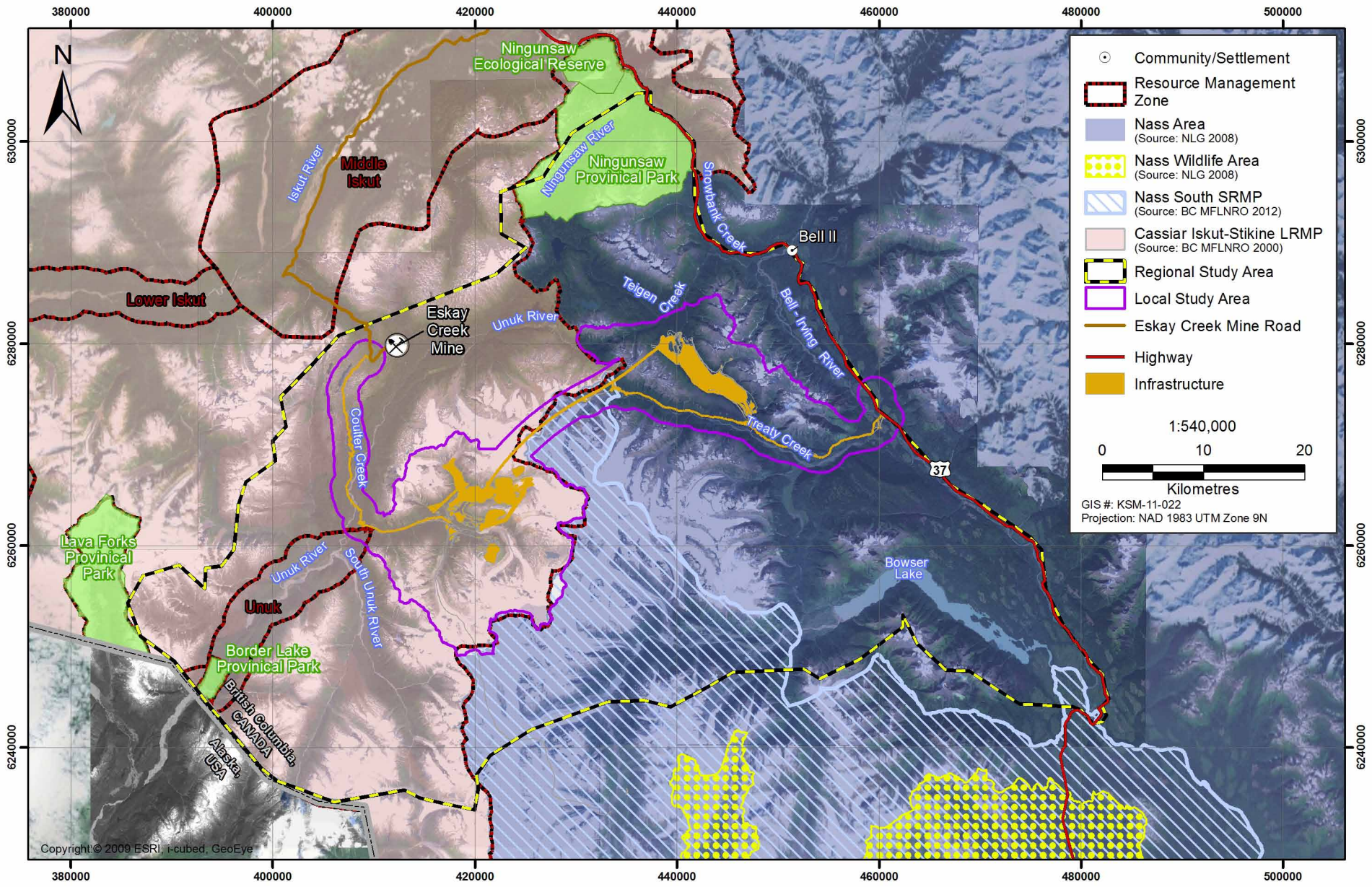

Figure 23.1-2

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Land and Resource Management Plans in the Land Use Study Areas

Figure 23.1-2

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Land management goals within the Nass South SRMP were developed in partnership with Nisga'a Nation (as represented by NLG), the Gitanyow First Nation, stakeholders, and government agencies, with the goal of guiding development and conserving environmental and cultural resources within the southern portion of the Nass Timber Supply Area (TSA). Approved in June 2012, the Nass South SRMP provides guidance on permitted land use, and addresses sustainable management issues for land, water, and resources, while aiming to facilitate economic opportunities (BC MFLNRO 2012b). Mineral resource activity, timber harvesting, commercial recreation and tourism, guide outfitting, hunting, fishing, trapping, and cultural land uses are all allowable activities.

Resource Management Zones (RMZs) provide area-specific and focused management strategies within each management plan. Fifteen RMZs are defined within the CIS LRMP and seven are defined within the Nass South SRMP. Of these, only the Unuk River RMZ, within the CIS LRMP, overlaps the LSA including portions of the Coulter Creek access road. The management goals for the Unuk River RMZ are focused on preserving grizzly bear habitat and maintaining visual quality of the terrain from the Unuk River, while allowing for adjacent logging and mineral development. Section 23.3 provides a more detailed description for both the CIS LRMP and Nass South SRMP.

23.1.4.2 Provincial Parks and Ecological Reserves

Three provincial parks are located within or adjacent to the RSA: the Ningunsaw and Border Lake provincial parks are within the RSA boundaries, and the Lava Forks Provincial Park is located southwest of the RSA. None is located within the LSA or near Project infrastructure (Figure 23.1-2). Ningunsaw Provincial Park is located approximately 7 km southeast of Bob Quinn Lake and encompasses over 15,000 ha of land. A large portion of Ningunsaw Provincial Park is located within the northern area of the RSA while Ningunsaw River Ecological Reserve, which is adjacent to the park, is located outside of the RSA. The park and ecological reserve were established to help preserve the biogeoclimatic zone sequences found within its boundaries, including grizzly bear and moose habitats. Land use opportunities offered within the park include hunting, fishing, and camping.

Border Lake Provincial Park is located within the southwest boundaries of the RSA, along the Unuk River at the Alaska/BC border. The 800 ha park was established in 2001 with the goal of protecting fish and grizzly bear habitat, and wetland plant communities. Land use opportunities offered within Border Lake Provincial Park include river recreation, fishing, and camping.

Lava Forks Provincial Park lies immediately west of the LSA between the Unuk River and the Craig River Valley, and adjoins the Alaskan border. The park stretches over 7,000 ha and was established in 2001 to "conserve Canada's most recent lava flow in a spectacular mountain setting" (BC MWLAP 2003). Land use opportunities offered within Lava Forks Provincial Park include fishing and camping.

Information on visitation rates is not available due to the remote location of these parks, limited staffing capacity, and lack of traffic counters or other means of maintaining visitor statistics (J. Kittmer, pers. comm.).

23.1.4.3 Nisga'a Nation and First Nations

Project components, notably the PTMA, fall within the northern portion of the Nass Area, as defined in the *Nisga'a Final Agreement* (NFA; NLG, Province of BC, and and Government of Canada 1998), and the southern portion of the Tahltan Nation traditional territory, as well as the western portion of wilp Skii km Lax Ha's traditional territory (culturally linked to the Gitxsan Nation). The traditional territory of the Gitanyow First Nation also overlaps to a small degree with the RSA, though not with any Project infrastructure. Nisga'a Nation and First Nations communities are all located over 200 km to the south of the RSA, except for the Tahltan communities, which are located over 150 km to the north.

23.1.4.3.1 Nisga'a Nation

The eastern portion of the RSA overlaps a section of the Nass Area; an area designated by the NFA that encompasses the Nass watershed. Under the NFA, three areas were designated: the Nass Area, Nass Wildlife Area (NWA), and Nisga'a Lands. There is no overlap of the RSA with the NWA or Nisga'a Lands, which are located downstream of the Project (see Figure 23.1-3).

The Nass Area is a designation representing 26,838 km² of the Nass watershed and does not refer to any specific land or resource management area. Nisga'a land use planning applies to Nisga'a Lands and does not extend into the Nass Area including areas within the Project LSA and RSA. During pre-Application stage consultations for the Project, NLG expressed concerns about potential effects related to Project activities in the PTMA, including potential effects on fish and fish habitat in lower Teigen and North Treaty creeks; effects on moose, goats and grizzly bears; the loss of wildlife habitat; as well as general fishing and hunting pressures on harvest resources. During discussions, Nisga'a did not identify specific activities occurring within the RSA (Rescan 2013b). Furthermore, no fishing, hunting, or trapping activities by Nisga'a citizens were identified in the RSA during baseline studies.

23.1.4.3.2 First Nations

Tahltan Nation

The Tahltan Nation's traditional territory covers approximately 93,500 km^2 of northwestern BC and includes the Stikine River basin, the Stikine tributaries (including the Iskut River), and the northern sources of the Nass and Skeena rivers (TCC 2010). The RSA overlaps approximately 1.2% of total Tahltan Nation traditional territory (Figure 23.1-4).

Wildlife species such as moose, black bear, grizzly bear, mountain goat, and caribou are important subsistence sources for Tahltan communities and are found throughout their traditional territory (SD 87 2000; Tahltan Heritage Resources Environmental Assessment Team 2009). Currently, moose is an important aspect of the Tahltan diet.

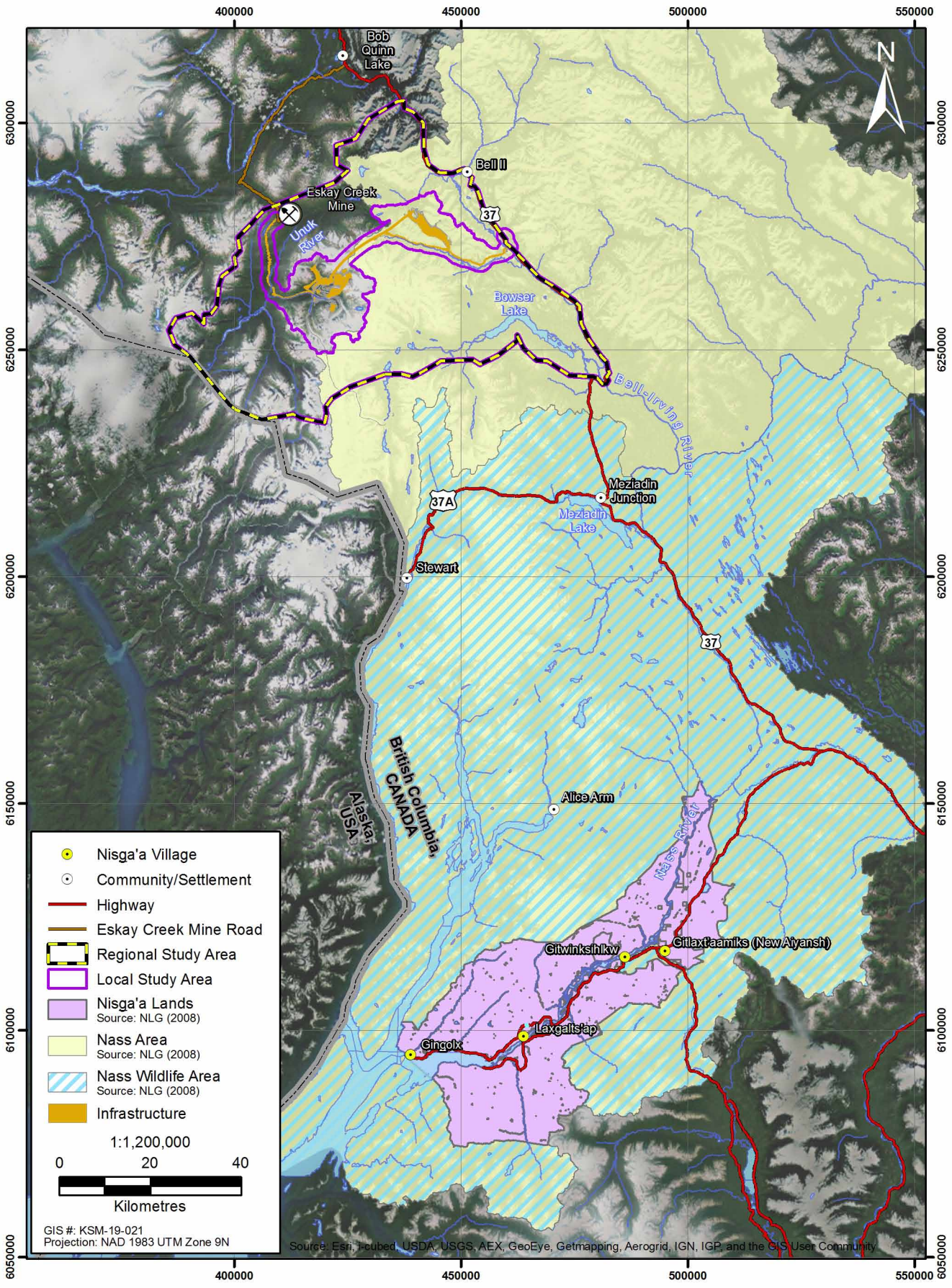

Figure 23.1-3

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Nisga'a Lands, the Nass Wildlife Area and the Nass Area in Relation to the Land Use Study Area

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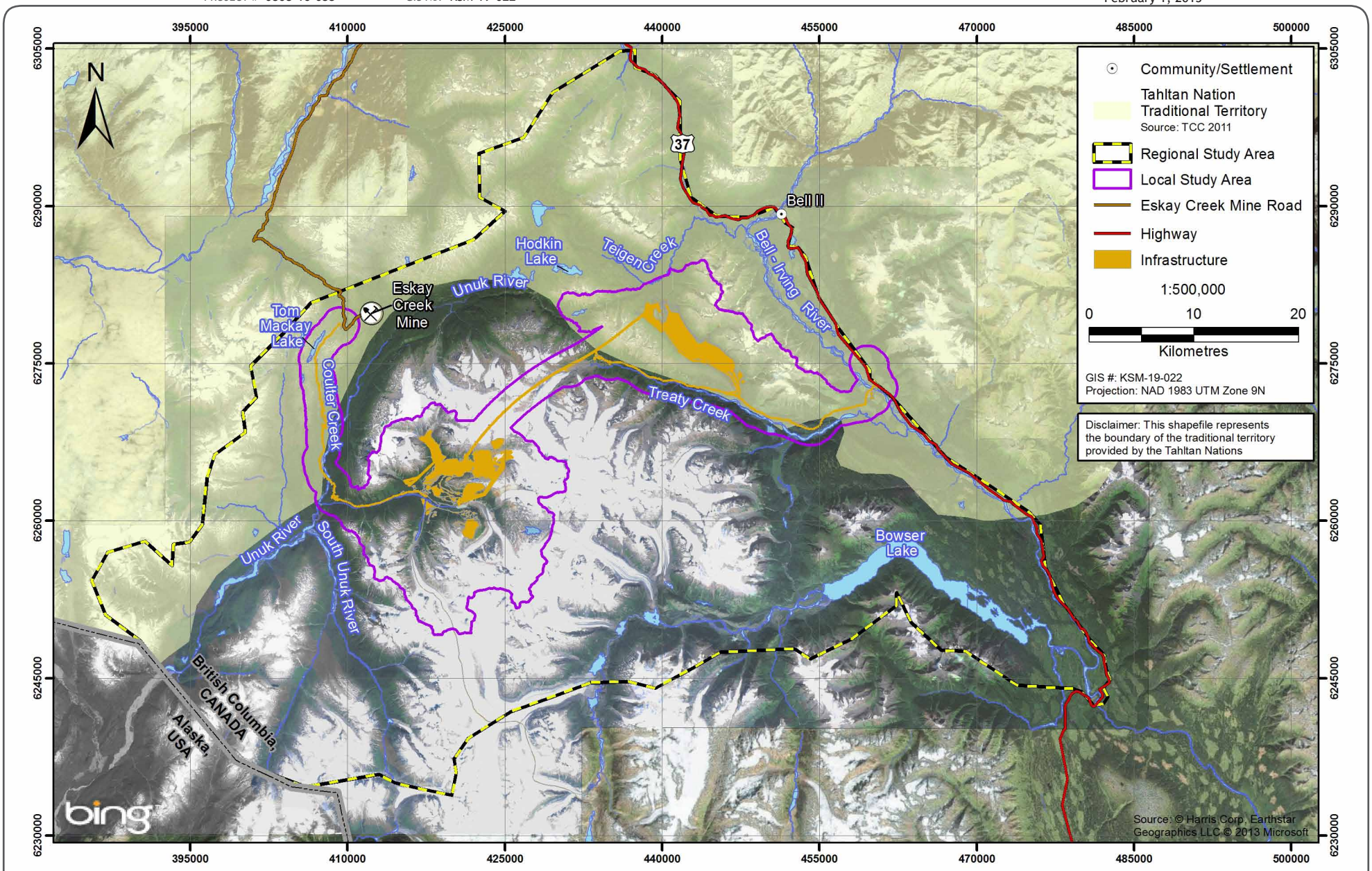

Figure 23.1-4

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Land Use Study Areas and Tahltan Nation Traditional Territory

Figure 23.1-4

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Fishing is an important activity for the Tahltan, who have numerous fish-bearing river systems running through their traditional territory. These include the Skeena, Stikine, Bell-Irving, Tahltan, Nass, Nahlin, and Ningunsaw watersheds. Parts of the Bell-Irving River are located within the RSA. Issues raised by the Tahltan during pre-Application stage included concerns about potential effects of the Project on salmon in Teigen and Treaty creeks, moose and moose habitat, hoary marmots (groundhogs), as well as concerns about increased hunting pressure on wildlife (Appendix 3-N; Rescan 2013a). The Tahltan did not identify areas within the RSA where they hunt or fish. Publicly available data on current Tahltan hunting and fishing activities within the RSA are unavailable. The Tahltan do not hold traplines within the RSA (BC MOE 2012b).

Mushroom picking, primarily for pine mushrooms, is also a common traditional activity within the Tahltan community. Pine mushrooms are picked for both consumption and commercial sale. Areas along the Eskay Creek Mine road are anecodotally reported to be accessed by the Tahltan for mushroom harvesting (D. Drinnan, pers. comm.; R. Green, pers. comm.).

Skii km Lax Ha

The Skii km Lax Ha are identified in the Project's Section 11 Order issued by the BC Environmental Assessment Office under the BC *Environmental Assessment Act* (2003) as a wilp of the Gitxsan Nation. The Skii km Lax Has are claiming a territory, independent from the Gitxsan. Figure 23.1-5 shows the asserted traditional territories of the Skii km Lax Ha and Gitxsan Nation in relation to the Project.

The Skii km Lax Ha traditionally and currently fish, camp, hunt, trap and harvest plants, berries and mushrooms in their traditional territory. Due to the Skii km Lax Ha's involvement in projects within their traditional territory since 2009, they have not had time to hunt and trap (see the *Skii km Lax Ha Traditional Knowledge and Use Research Report* [Appendix 30-B]). During pre-Application stage consultations, the Skii km Lax Ha raised concerns related to potential effects of the Project on subsistence activities, including hunting, trapping, and plant harvesting along the Highway 37 corridor and the Treaty Creek and Teigen Creek watersheds (Appendix 3-N; Rescan 2013a).

In the LSA, a travel corridor passes through the Unuk River valley in the vicinity of the Mine Site. There is a trail located in the vicinity of the Mitchell-Treaty Twinned Tunnels and a harvesting area spans the Treaty Creek headwaters to Teigen Lake. The proposed Treaty Creek access road will parallel Treaty Creek, which is an important travel corridor and hunting and trapping area for the Skii km Lax Ha. Cabins were located along Treaty Creek at the North Treaty Creek confluence and at Gilbert Lake. The Gilbert Lake harvesting areas are also located along the proposed Treaty Creek access road route. The PTMA overlaps the North Treaty Creek travel corridor and harvesting area.

The eastern limit of the LSA, which crosses over the Bell-Irving River, overlaps with the Awiijii area, which is currently used by the Skii km Lax Ha for hunting, trapping, fishing, and gathering. A Skii km Lax Ha cabin and smokehouse are located within the eastern limit of the LSA and are used to support harvesting activities.

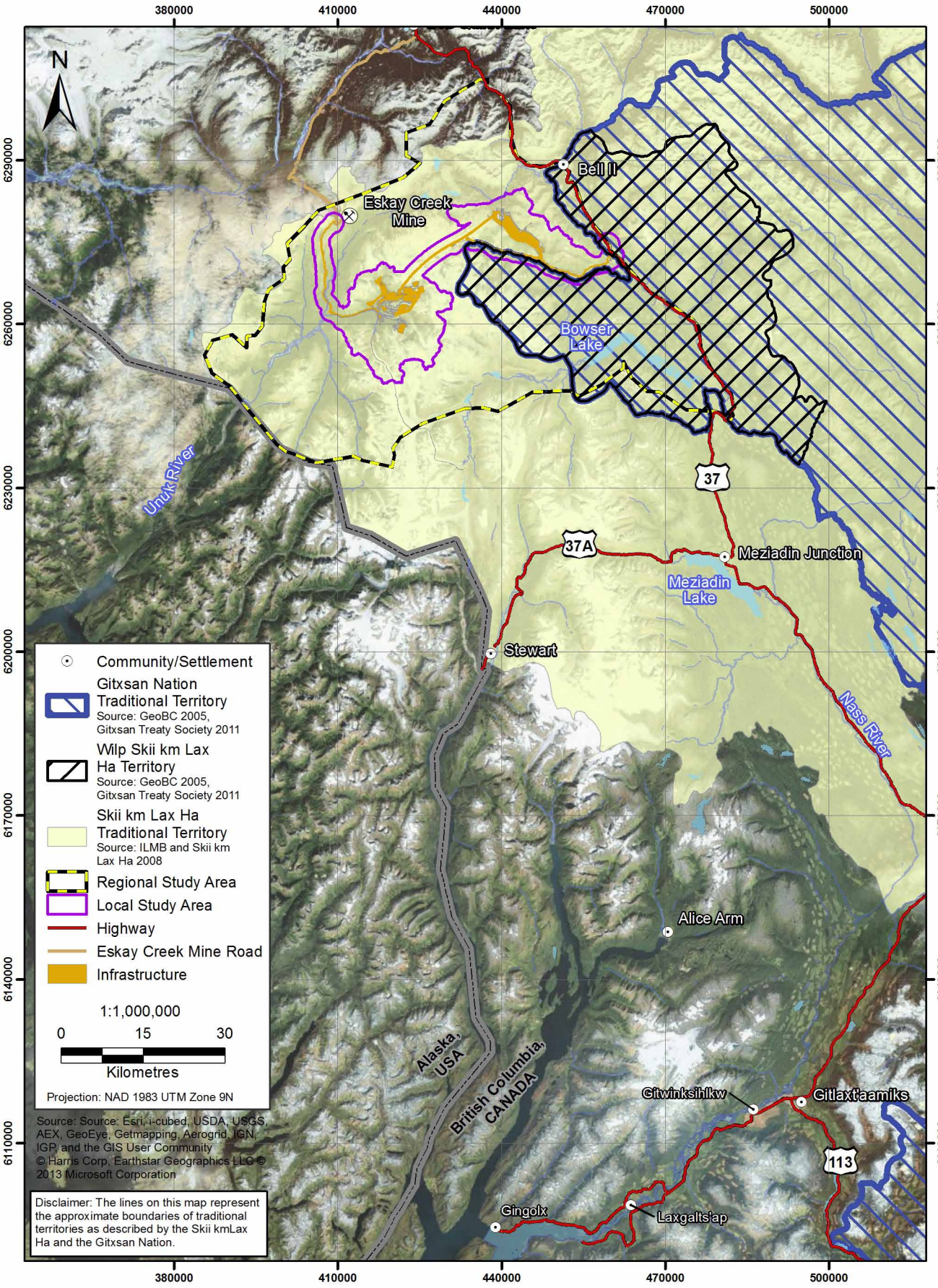

Figure 23.1-5

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Land Use Study Areas and Skii km Lax Ha and Gitxsan Nation Traditional Territory

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One of the most important harvesting routes for the Skii km Lax Ha is along the north side of Mount Anderson, which overlooks Bowser Lake. A trail from Bowser Lake through this area passes by Todedada Lake, where a cabin is also located. The trail continues north along Todedada Creek to Gilbert Lake and the Treaty Creek valley.

The RSA and LSA overlap two Skii km Lax Ha-held traplines (TR 616 T011 and TR 617 T015) and trapping by the Skii km Lax Ha focuses on marten, beaver, and wolf. Traplines are accessed by road, then by foot or skidoo. Traplines are moved throughout the trapline area to avoid over-harvesting in one place. The Skii km Lax Ha report noted there has been limited trapping since 2009 (Appendix 30-B).

Gitxsan Nation

Gitxsan society is organized into 45 to 65 huwilp representing four clans and using territory that encompasses a 33,000 km^2 area in northwestern BC. Gitxsan traditional territory within the RSA is restricted to the traditional territory attributed to wilp Skii km Lax Ha (see Figure 23.1-5). No other Gitxsan wilp territory overlaps with the LSA or RSA. The RSA overlaps with approximately 2.3% of the total Gitxsan Nation territory.

Hunting and trapping are important elements of Gitxsan traditional culture. However, according to Gitxsan governance, hunting and trapping in these areas are limited to the Skii km Lax Ha as they are the only Gitxsan wilp with asserted territory within the Project RSA (Vescor 2009). Pre-application stage consultations with the Gitxsan did not identify specific activities undertaken by the Gitxsan within the RSA (Appendix 3-N; Rescan 2013a). No Gitxsan fisheries are located within the LSA or RSA.

Gitanyow First Nation

The Gitanyow huwilp comprises eight houses, of which the traditional territory of wilp Wii'litsxw overlaps to a small extent with the RSA (Figure 23.1-6). There is no overlap with the LSA. The land use RSA with approximately 0.2% of the Gitanyow First Nation traditional territory. During pre-Application stage consultations, the Gitanyow raised concerns related to potential impacts of the Project on subsistence and cultural land use harvests, moose and moose habitat, mountain goats, American martens, grizzly bears, hoary marmots, as well as fish and water quality in the Nass drainage. Interviews with wilp Wii'litsxw did not reveal any current land-based activities within the RSA (Appendix 3-N; Rescan 2013a).

Wilp Wii'litsxw's traditional territory is located in the Meziadin Lake area, adjacent to Highways 37 and 37A. Wilp Wii'litsxw focuses its harvests within the Hanna-Tintina watershed, located north of Meziadin Lake and outside of the downstream environment of the Project (GHCO 2008). The Gitanyow currently use, and have historically used, the Nass watershed within their traditional territory to support subsistence needs, primarily focusing on sockeye, chinook, and coho species (GFA 2012). Specific fishing locations are maintained within each wilp, and the right to use fishing areas is preserved for members. The Gitanyow have two agreements with Fisheries and Oceans Canada: one concerning salmon for food, social, and ceremonial purposes and the other to secure an economic allocation of salmon on the Nass River in their traditional territory (Appendix 23-A).

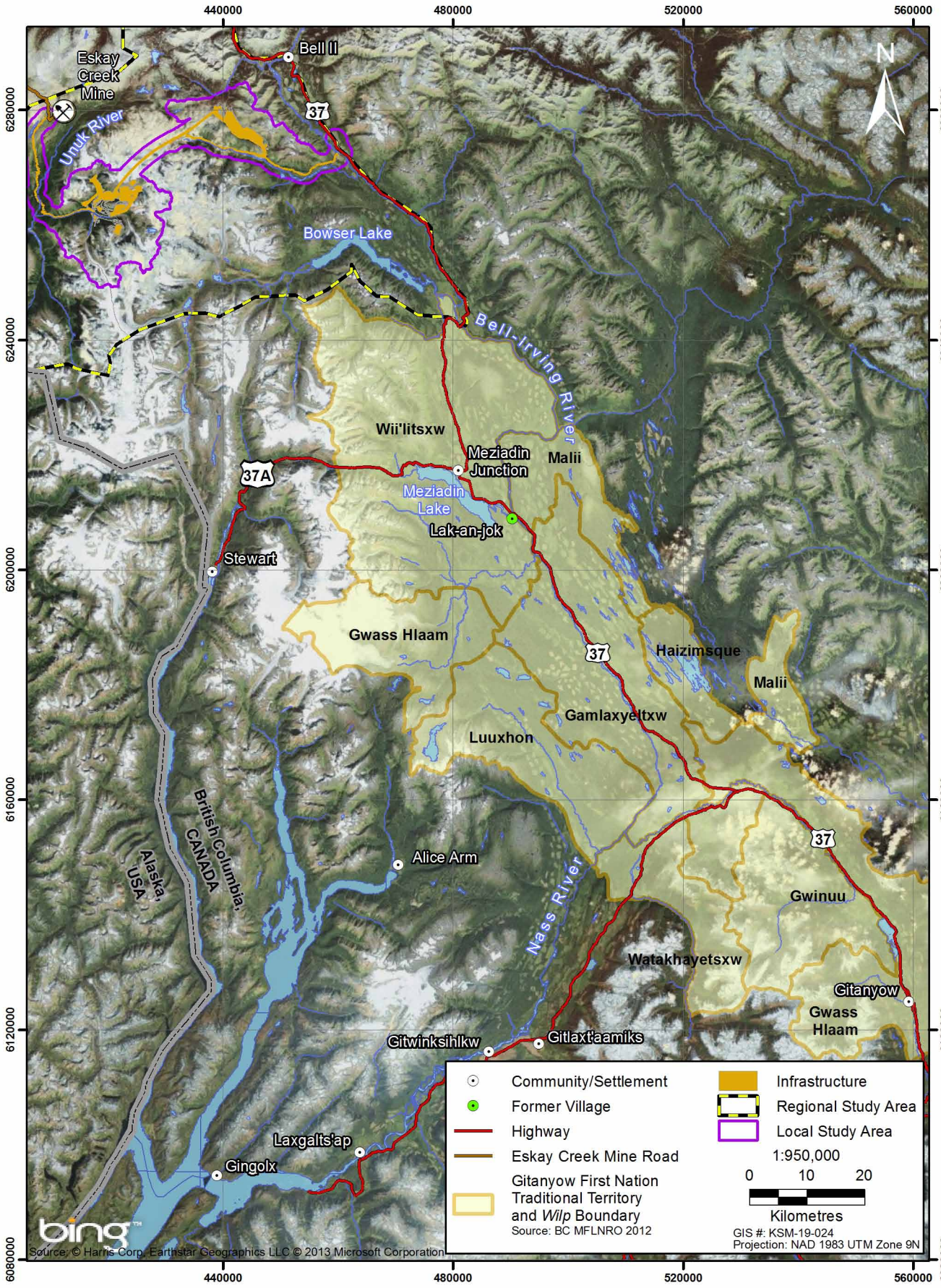

Figure 23.1-6

Land Use Study Areas and Gitanyow First Nation Traditional Territory

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Finally, the Gitanyow were involved in developing the Nass South SRMP. The Gitanyow huwilp are also developing land use plans specific to each house territory, including interests related to fisheries.

23.1.4.4 Hunting and Guide Outfitting

The LSA and RSA both overlap sections of three provincial Wildlife Management Units (WMU) that serve to regulate resident and non-resident hunters. Approximately half of the RSA is within WMU 6-16 (North Coast) and the other half within WMU 6-21 (Stikine), and the eastern borders of the LSA and RSA slightly cross into Upper Skeena WMU 6-17. WMU 6-16 also overlaps with the eastern (PTMA) portion of the LSA, whereas WMU 6-21 overlaps with the western (Mine Site) portion of the LSA.

Historically, WMUs that overlap the RSA were consistently used by resident hunters between 1976 and 2008, with WMU 6-16 being the most active, recording nearly 200 hunters in 1993 (BC MOE 2012a). The primary species harvested by resident hunters is moose, but hunters have also harvested black bear, wolf, goat, sheep, and grizzly bear. Between 1995 and 2008, the number of annual moose hunters have ranged from between 47 (WMU 6-17) and 100 (WMU 6-21). Data about First Nation hunters active in the RSA remain unavailable, although some Aboriginal hunters may choose to obtain licences and, thus, would be included in resident hunter statistics.

Three guide outfitting licence areas partially overlap the WMUs and the land use RSA (Table 23.1-4), two of which also overlap the LSA (Figure 23.1-7). The guide outfitters are Coast Mountain Outfitters, Northwest Ranching and Outfitting, as well as a new licence holder under licence number 601066 (acquired in Spring 2012). Licence number 601066 overlaps with most of the LSA and the overlap approximates 8.0% of the licence area. As of August 2012, the current licence holder had not yet visited his tenure area and guide outfitting activities were delegated to McCowan's Sporting Adventures (G. Brown, pers. comm.). Northwest Ranching and Outfitting has indicated that they are not currently active within the portions of their licence area that overlap the RSA. Their licence area also overlaps a small portion of the existing Eskay Creek Mine road within the LSA. Coast Mountain Outfitters, whose licence area falls to the south of the LSA, has indicated that they have no issues with the proposed Project in the areas of the RSA that overlap their licence. Areas identified to be of importance to these businesses include terrain along the Treaty Creek and Unuk River valleys, and in the Bowser Lake area. The most commonly hunted species are grizzly and black bear, stone sheep, and mountain goat, as well as some moose and wolf.

Table 23.1-4. Guide Outfitting Licence Areas in Relation to the Project

Licence Number	Company	Proportion of Guide Outfitting Licence Areas in RSA/LSA boundary (%)	Location of Tenure in Relation to the Project
601066	n/a	23.1% / 8.0%	Tenure area overlaps the LSA, including Project footprint and access roads
600502	Northwest Ranching and Outfitting	10.2% / 0.06%	Tenure area overlaps a small portion of the LSA near the existing Eskay Creek Mine road
601036	Coast Mountain Outfitters/Milligan Outfitting Ltd.	2.8% / 0.0%	Tenure area is south of the LSA Project infrastructure and overlaps with the Temporary Frank Mackie Glacier access route

Source: Government of British Columbia (2012a), GOABC (2012), Grand Slam Outfitters & Advertisers (2012), Milligan Outfitting Ltd. (2012).
n/a = Not available.

PROJECT # 868-016-33 GIS No. KSM-11-054 January 18, 2013

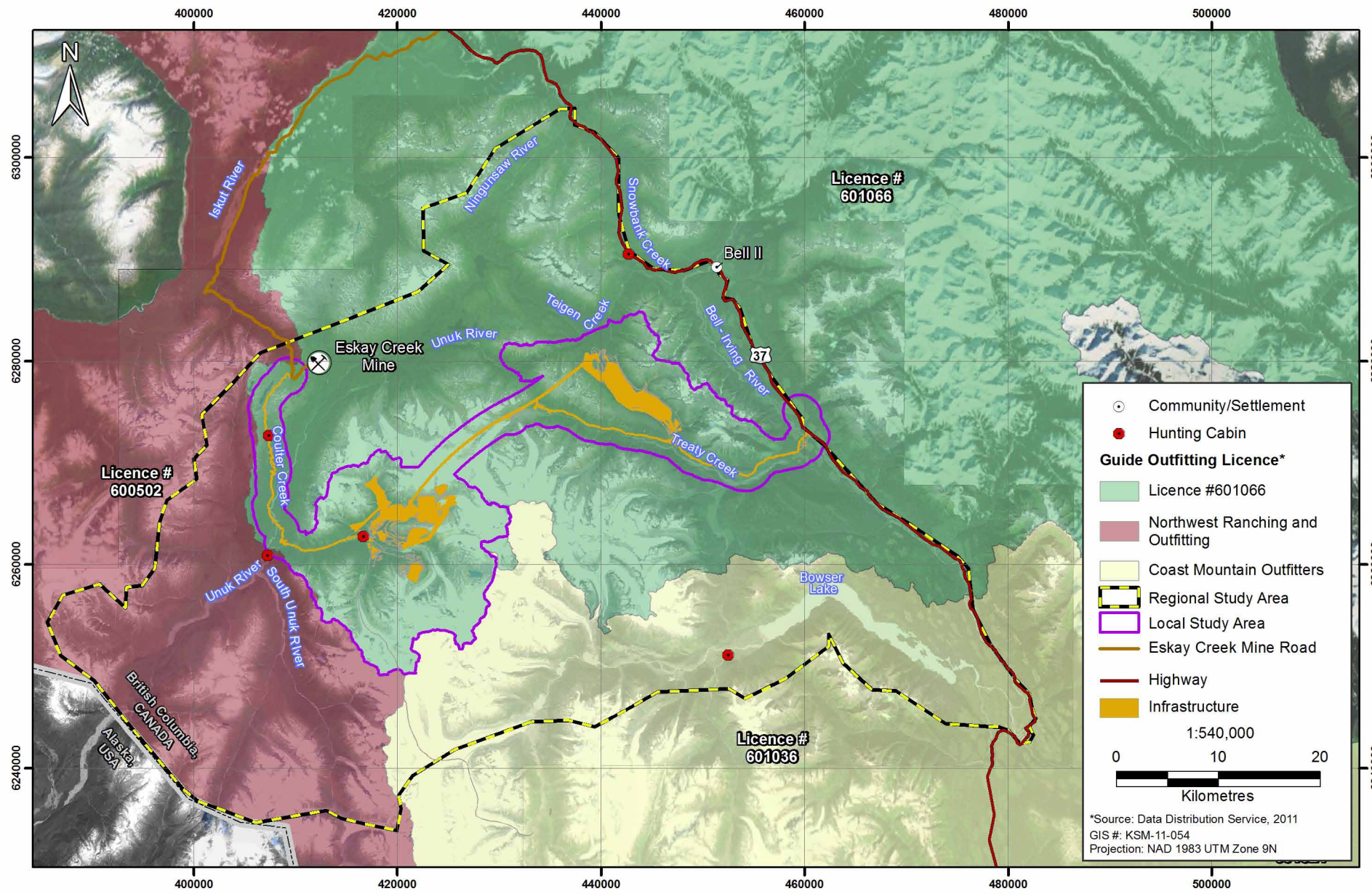

Figure 23.1-7

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Guide Outfitting Licence Areas in the Land Use Study Areas

Figure 23.1-7

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23.1.4.5 Trapping

There are seven registered traplines within the RSA, including three within the LSA (Table 23.1-5; Figure 23.1-8). Traplines TR 617 T015 and TR 616 T011 belong to members of the Skii km Lax Ha. In 2009, trapline TR 616 T013, which intersects slightly with the eastern edge of the RSA, was amalgamated with TR 616 T011, which overlaps with the eastern portion of the LSA.

Table 23.1-5. Trapline Licences in Relation to the Project

Trapline Number	Proportion of Trapline Area in RSA/LSA Boundary (%)	Active	Trapline Area Location relative to the Project
TR 621 T003	96.4% / 51.4%	N	Overlaps Mine Site infrastructure in the LSA.
TR 617 T015	32.3% / 9.4%	Y	Encompasses the northern portion of the PTMA in the LSA.
TR 616 T011	46.6% / 8.1%	Y	Overlaps the LSA near the southern portion of the PTMA, a portion of the Mitchell-Treaty Twinned Tunnels between the Mine Site and PTMA, as well as the Treaty Creek access road.
TR 616 T012	35.5% / 0.3%	N	Includes Todd Creek and Bowser River, both of which drain into Bowser Lake. Located adjacent to the LSA to the south of Project infrastructure.
TR 621 T001	67.7% / 0.9%	Y	Adjacent to the western portion of the LSA with no infrastructure overlap. Located approximately 10 km to the southwest of the Mine Site.
TR 621 T004	18.2% / 0.0%	N	Overlaps small portion of RSA and no overlap with LSA. Located approximately 15 km north of the PTMA.
TR 621 T005	0.6% / 0.0%	N	Overlaps small part of RSA and no overlap with the LSA. Located approximately 22 km north of the Mine Site.

Source: BC MOE (2012b).

According to the number of individual harvests reported to BC Ministry of Environment (BC MOE) since 1985, only three traplines have been used consistently. Traplines with the highest level of activity are TR 616 T011 (2,145 individuals), TR 617 T015 (1,431 individuals), and TR 621 T001 (1,676 individuals) for all years between 1985 to 2009 (BC MOE 2012b). Trapline TR 617 T015 and TR 616 T011 overlap Project infrastructure within the LSA, whereas TR 621 001 is located adjacent to the western-edge of the LSA (Table 23.1-5). There are no species-specific harvest data available for these three traplines; however, the Skii km Lax Ha report that they have trapped as many as 160 marten in one year on TR 616 T011 (Appendix 30-B). Pelts sold from harvested furbearers would pay for the cost of the trapping trip, as well as for moose hunting trips.

Areas of concentrated use by tenure holders include the Unuk River and its headwaters, and the Eskay Creek Mine site and road. Trappers in the LSA primarily collect marten. Trapline holders have identified the remoteness of their licence areas and their wilderness environment as important aspects of their use.

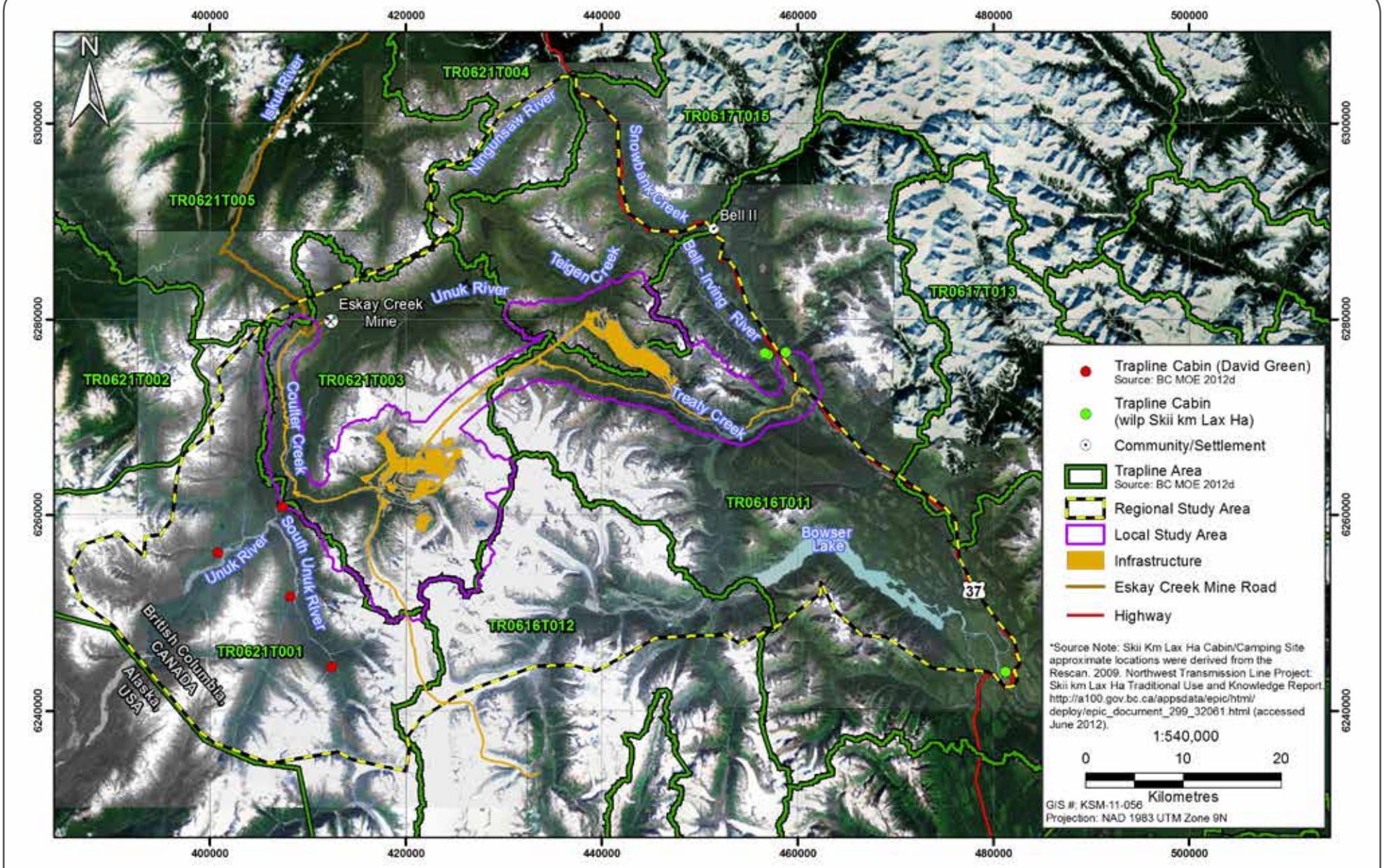

Figure 23.1-8

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Trapline Licences and Cabins in the Land Use Study Areas

Figure 23.1-8

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23.1.4.6 Commercial and Public Recreation

There are six commercial recreation licences within the RSA, five of which also overlap with the LSA (Government of BC 2012b), including guided mountaineering, guided rafting, accommodation, and angling and heli-skiing operations (Table 23.1-6; Figure 23.1-9). Guided hunting is addressed above (Section 23.1.4.4). Bell 2 Lodge offers lodging to travellers along Highway 37 through their parent company, Rivers West Enterprises. Spey Lodge offers angling activities and lodging (at Boundary Lodge) adjacent to the LSA along the Bell-Irving River south of Bell 2 Lodge. The Explorer's League offers tours down the Unuk River on an on-demand basis, typically limited to one trip every two years. Bear Enterprises offers guided mountaineering and hiking, and Last Frontier Heliskiing, based out of Bell 2 Lodge, offers helicopter-based ski expeditions throughout the RSA and the surrounding areas. The heli-skiing tenure area includes over 904,000 ha of terrain in northwest BC, of which 61,450 ha (or 6.8%) overlaps the LSA. Guided angling is offered through the Bell 2 Lodge by independent operators. Commercial recreation stakeholders ascribe a high value for the natural environment within the RSA.

Table 23.1-6. Commercial Recreation Licence Holders within the LSA and RSA

Company Name	Type Of Commercial Licence	In LSA	In RSA
Gary Brown	Multiple Use Commercial Recreation	Y	Y
Last Frontier Heliskiing	Heli-ski	Y	Y
Rivers West Enterprises Ltd.	Multiple Use Commercial Recreation	N	Y
Walter Faetz (Spey Lodge)	Fishing Camps	Y	Y
Bear Enterprises	Guided Mountaineering	Y	Y
The Explorers League: World and Wilderness Rafting Expeditions Ltd.	Guided Freshwater Recreation	Y	Y

Source: Government of BC (2012b).

Recreational tourism is common in the region; however, due to the lack of public road access and difficulty accessing the terrain, it is primarily confined to areas accessible from Highway 37. Activities associated with tourism in the area include hiking, wildlife viewing, photography, horseback riding, canoeing/kayaking, snowmobiling, and all-terrain vehicle use. Public recreation may take place on an informal and non-registered basis, as there are no formal hiking trails, snowmobile routes, or other recreational sites within the RSA. Support infrastructure along Highway 37 is available for tourism but it is separated by long distances. This infrastructure includes Bell 2 Lodge, as well as other lodges located outside of the RSA, such as Tatogga Lake Lodge, and Bear Paw Ranch.

PROJECT # 868-016-33 GIS No. KSM-11-055 January 18, 2013

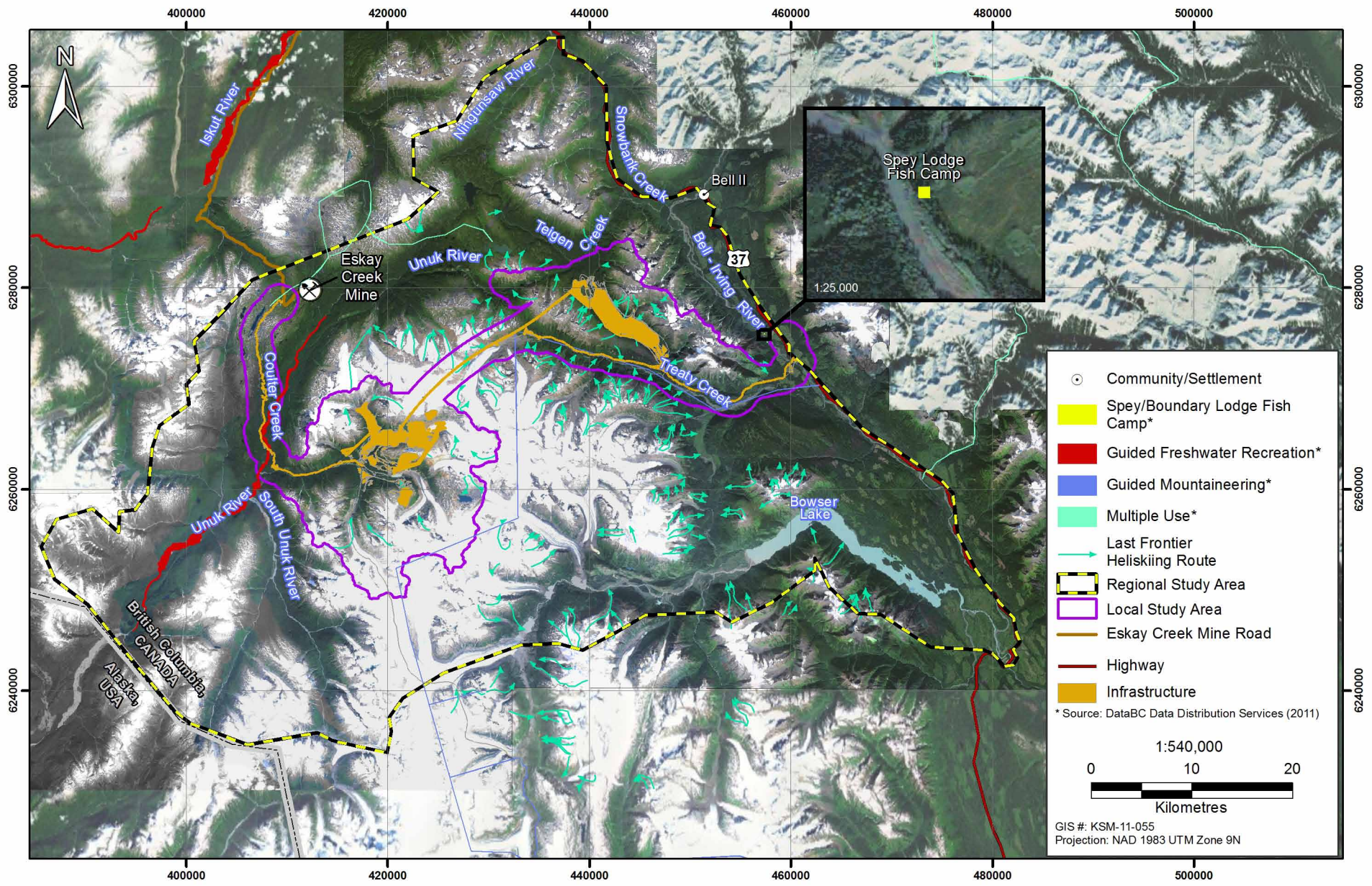

Figure 23.1-9

SEABRIDGE GOLD
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Commercial Recreation Licences in the Land Use Study Areas

Figure 23.1-9

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23.1.4.7 Forestry

The RSA and LSA overlap both the Cassiar and the Nass TSAs. Four registered forest licences are located in the RSA, two of which also fall within the LSA (Table 23.1-7). Figure 23.1-10 highlights the location of forest licences within the RSA. The RSA overlaps with only about 0.6% of the Cassiar TSA. About 25% of the Cassiar TSA (approximately 3.7 million ha) is considered productive forest area managed by the Crown. For the 2001 to 2006 period, the last date range for which data are available, approximately 1.46 million m^3 of undercut volume was reported; in other words, five years of harvesting totalled about 61,000 m^3, or 20% of the current annual allowable cut (AAC; BC MFLNRO 2012a).

Table 23.1-7. Forest Licence Holders in the Local and Regional Study Areas

Licensee	Licence Number	District	Area Overlap
BC Hydro and Power Authority	L48982	Cassiar and Nass TSA	RSA - Adjacent to Highway 37
District Manager Skeena-Stikine	L48499	Cassiar TSA	LSA - Mine Site
Seabridge Gold Inc.	L48517	Nass TSA	LSA - PTMA
Pretium Resources Inc.	L48433	Nass TSA	RSA -Southwest of the PTMA

Source: BC ILMB (2012b).

The RSA overlaps with approximately 5.4% of the Nass TSA. Crown-owned productive forest land managed by the Crown equals 39% of the total TSA area. The current AAC for this TSA is 865,000 m^3, a 24% reduction from the previous AAC. A 2007 Chief Forester Order states that current harvesting levels only represent 25% of the AAC (BC MFLNRO 2012c). A limited number of forest roads are located within the RSA. Most of the timber harvest to date has occurred in the eastern part of the RSA with the closest logging activity along Highway 37 approximately 8 km east of the PTMA.

The licence held by the BC Hydro and Power Authority is linked to the ongoing construction of the Northwest Transmission Line (NTL). The licence held by the District Manager Skeena-Stikine is located within the LSA at the Mine Site. This licence is linked to a *Mines Act* (1996g) permit and has been approved for Seabridge Gold Inc. (Seabridge), though it remains temporarily attributed to the District Manager Skeena-Stikine pending issuance (W. Foster, pers. comm.). Seabridge holds a forestry licence that overlaps with the PTMA within the LSA. Pretium Resources Inc. (Pretivm) holds a licence to the southwest of the LSA and away from any Project infrastructure.

23.1.4.8 Mining and Mineral Exploration

Surface rights in the Project area are held by the Crown, while the Proponent holds subsurface rights in the form of mineral tenures granted under the BC *Mineral Tenure Act* (1996e). The KSM property comprises three discontinuous claim blocks totalling 170 mineral claims, including both cell and legacy claims, and a total area of 73,611 ha (Chapter 1, Section 1.5).

PROJECT # 868-016-33 GIS No. KSM-11-058 January 18, 2013

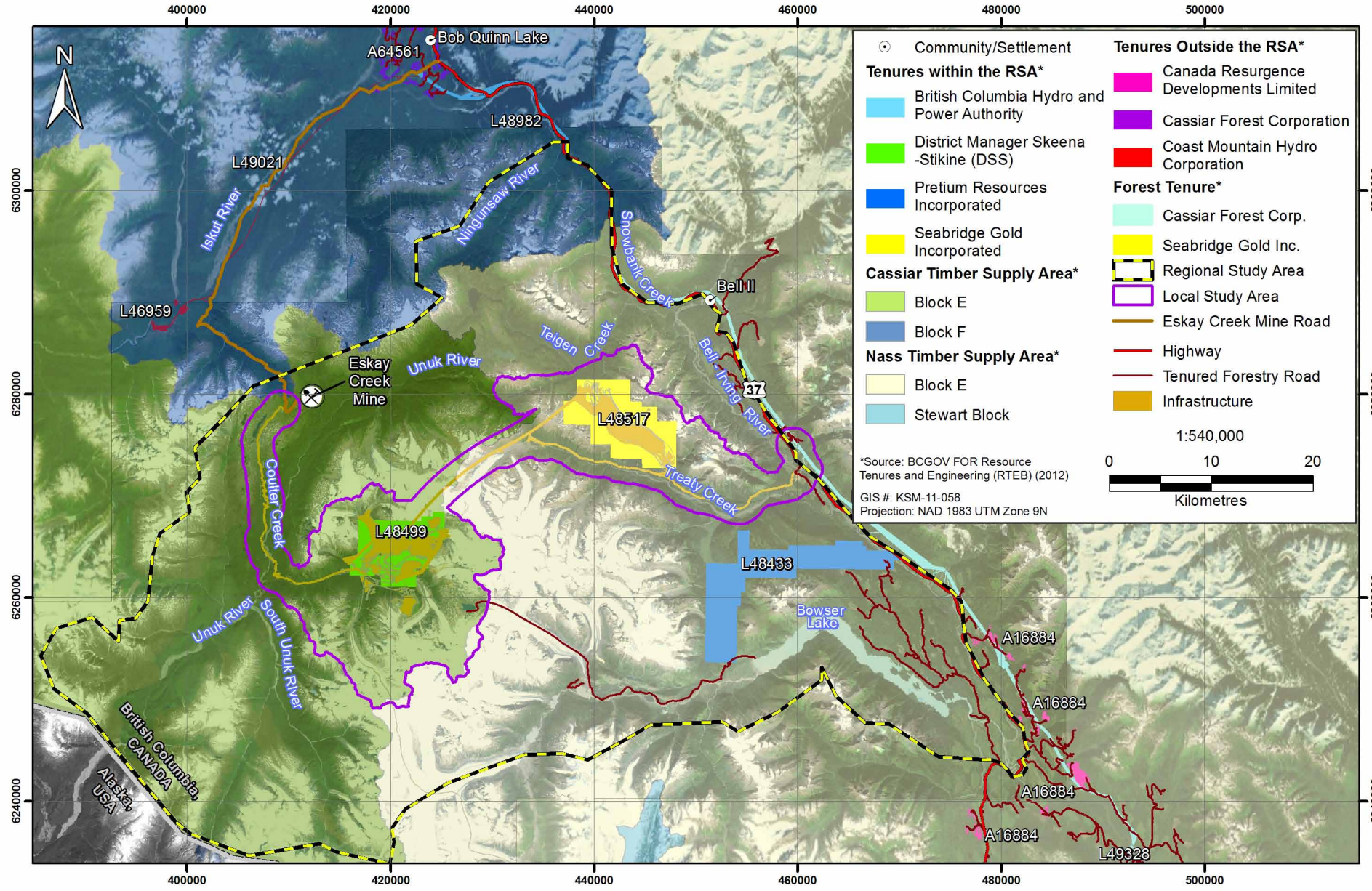

Figure 23.1-10

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Forest Licences In and Near the Land Use Study Areas

Figure 23.1-10

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In addition to Seabridge, there are 40 mineral claims holders within or adjacent to the RSA (Government of BC 2012a). Mineral claims are held by individuals and corporations, with the largest claim holdings belonging to Seabridge, Pretium Exploration Inc., Eskay Mining Corp., Teuton Resources Corp., and St. Andrews Goldfields Ltd. The 14 largest mineral claim holdings and their location in relation to the LSA and RSA are noted in Table 23.1-8 and Figure 23.1-11.

Table 23.1-8. Mineral Claim Holdings in Relation to the LSA

Mineral Claim Holder	Located in the LSA
Pretium Exploration Inc.	Y (Mine Site and PTMA)
Seabridge Gold Inc.	Y
Teuton Resources Corp.	Y (Mitchell-Treaty Twinned Tunnels)
St. Andrew Goldfields Ltd.	Y (Mine Site)
Kenrich-Eskay Mining Corp.	Y (Coulter Creek access road)
Estate of Rodney Victor Kirkham	N
Geofine Exploration Consultants Ltd.	Y (Treaty Creek access road)
John Chrisostom Bot	N
Matthew John Mason	N
Joel Gillham	N
Barrick Gold Inc.	Y (Coulter Creek access road)
Cache Minerals Inc.	N
Kelly Brent Funk	Y (Treaty Creek access road)
North Bay Resources Inc.	N

Source: Government of BC (2012a).

The former Eskay Creek Mine (Barrick Gold Inc.) operated within the RSA and closed in 2008. Advanced exploration work has also been carried out, first by Silver Standard Resources Inc. and, since 2011, by Pretium Exploration Inc., on the Snowfields property located immediately east of the Mitchell deposit and at the Brucejack deposit located east of the Kerr deposit (see Chapter 1 for more details).

As at December 2012, there were five placer claim holders located within the Mine Site area of the LSA (Government of BC 2012a). Placer claims held by Seabridge include 21 claims covering an area of 5,749.2 ha and are adjacent to most of the mineral claims within the KSM claim group (see Appendix 4-B for more detailed claims information). In addition to Seabridge, placer claims in the LSA are held by (see Figure 23.1-12):

- Lyncorp Mining Services Ltd.;
- Lawrence Edward Brulotte;
- Pretium Exploration Inc.; and
- Allan Robert Schindel.

PROJECT # 868-016-33 GIS No. KSM-11-057 January 18, 2013

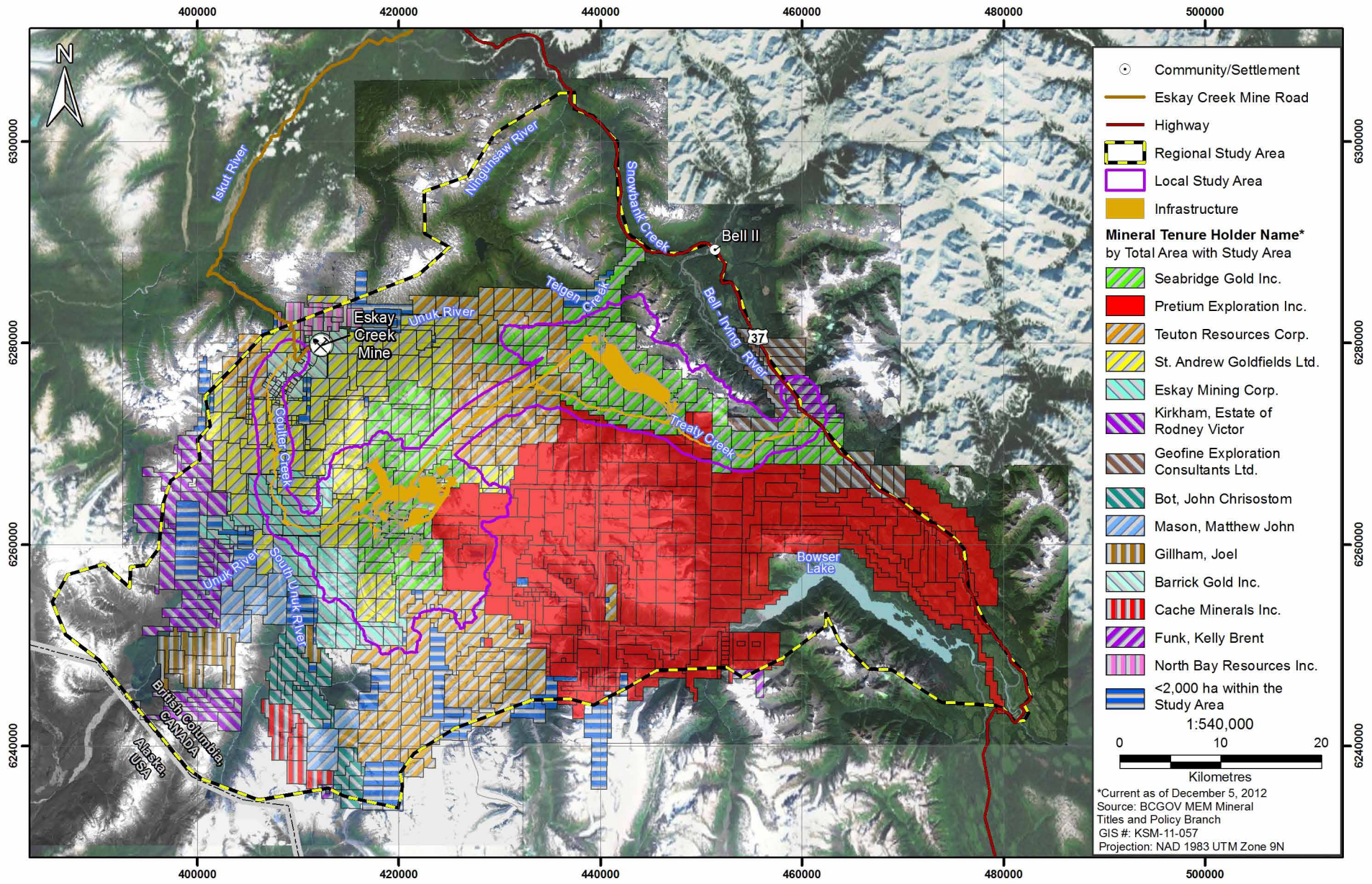

Figure 23.1-11

SEABRIDGE GOLD
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Mineral Claims in the Land Use Study Areas (as at December 2012)

Figure 23.1-11

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PROJECT # 868-22-33 GIS No. KSM-11-063 January 22, 2013

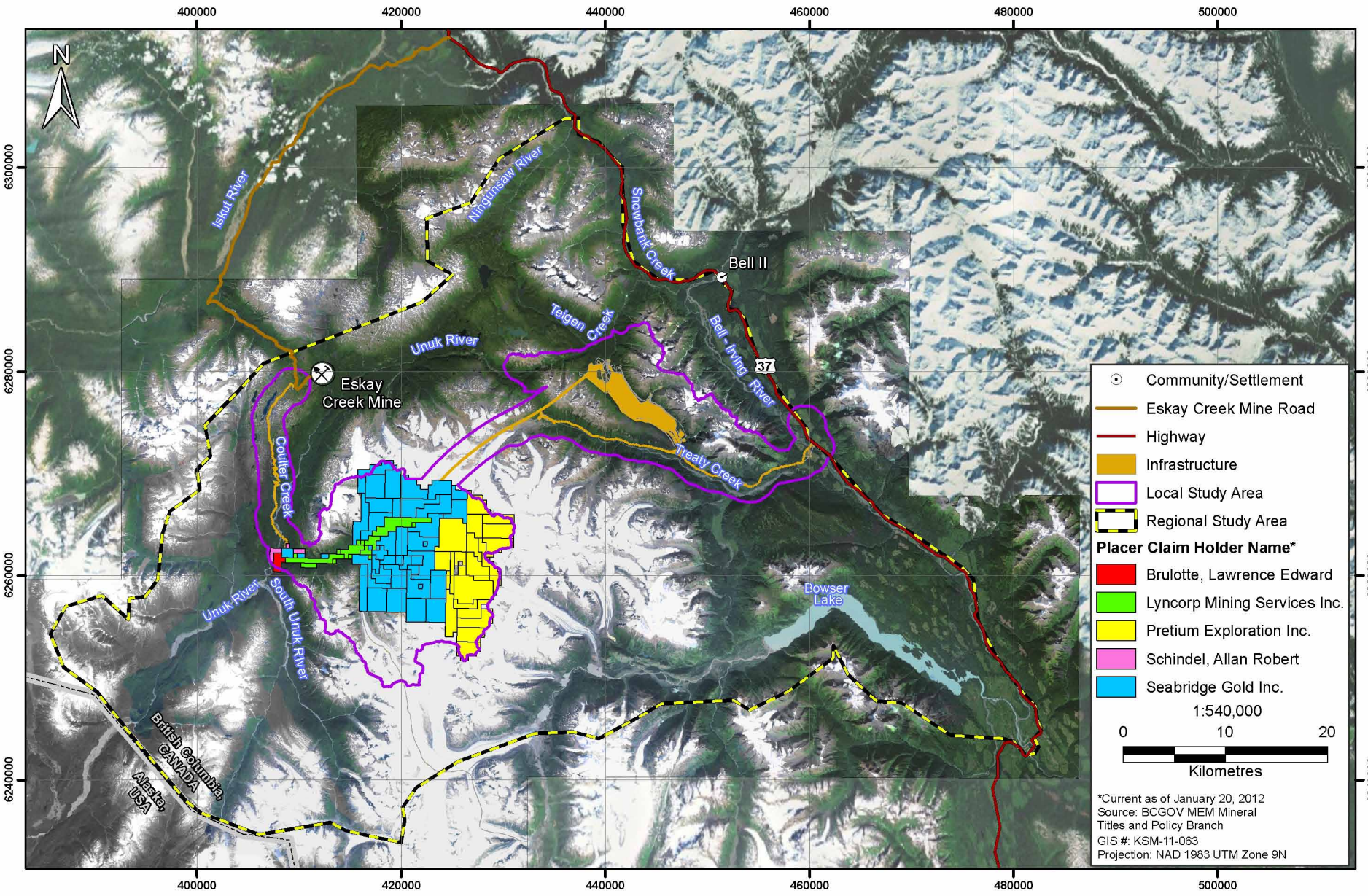

Figure 23.1-12

SEABRIDGE GOLD
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Placer Claims in the Land Use Study Areas (as at December 2012)

Figure 23.1-12

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23.1.4.9 Water Licences

There are two water licences (C107796 and C114327) within the LSA approximately 10 km north of the Mine Site and both held by Barrick Gold Inc. (Figure 23.1-12). These water licences are held for the purposes of camp and mining equipment use at the Eskay Creek Mine as well as overburden disposal. The licence allows for water withdrawal from Eskay and Carberry creeks and Tom MacKay Lake (Table 23.1-9).

Table 23.1-9. Water Licence and Water Licence Applications in the Regional Study Area

Licence Number	LSA/RSA location	Licensee	Stream	Licence Status
C107796	LSA	Barrick Gold Inc.	Eskay Creek/Carberry Creek	Current
C114327	LSA	Barrick Gold Inc.	Tom MacKay Lake	Current
Z123211	RSA	6167047 Canada Limited	ZZ Creek (PD81131)	Application
Z123537	LSA	6167047 Canada Limited	Sulphurets Creek	Application
6001374	RSA	Northern Hydro Limited	Tim Williams Creek	Application
6001372	RSA	Northern Hydro Limited	Unnamed Creek	Application
6001373	RSA	Northern Hydro Limited	Scott Creek	Application
6001355	RSA	Northern Hydro Limited	Todedada Creek	Application
6001376	RSA	Northern Hydro Limited	Wildfire Creek	Application
6001356	LSA	Northern Hydro Limited	Treaty Creek	Application
6001375	LSA	Northern Hydro Limited	Unnamed Creek	Application
6001354	RSA	Northern Hydro Limited	Unnamed Stream	Application
6001379	LSA	Pretium Resources Inc.	Brucejack Lake	Application

Source: BC MOE (2012c).

In addition to the two issued water licences, there are 11 applications for water licences within the RSA (Table 23.1-9; Figure 23.1-13). Northern Hydro Limited has submitted eight applications, each for potential power generation projects, two of which fall within the LSA: one on Treaty Creek (6001356) and another on an unnamed creek to the east of the PTMA (6001375). Water licence application Z123537, submitted by 6167047 Canada Limited, is also located in the LSA immediately south of the proposed Coulter Creek access road. The company has submitted a second application (Z123211) outside of the LSA, located to the west of Bowser Lake. Pretivm has applied for a water licence (6001379) within the LSA on Brucejack Lake to the east of the Mine Site.

23.1.4.10 Transportation and Utilities

With the exception of Highway 37, there are no paved roads, air strips, utilities, or communications infrastructure within the RSA. The nearest air strip is located at Bob Quinn to the north of the RSA. Highway 37 (the Stewart-Cassiar Highway) runs along the eastern edge of the RSA. The route is part of the proposed haul route for concentrate from the Process Plant to the port in Stewart (via Highway 37A). The highway runs north to south through northwestern BC for a total distance of approximately 724 km, is one of only two overland routes to Alaska, and connects a number of small, rural settlements in northwestern BC.

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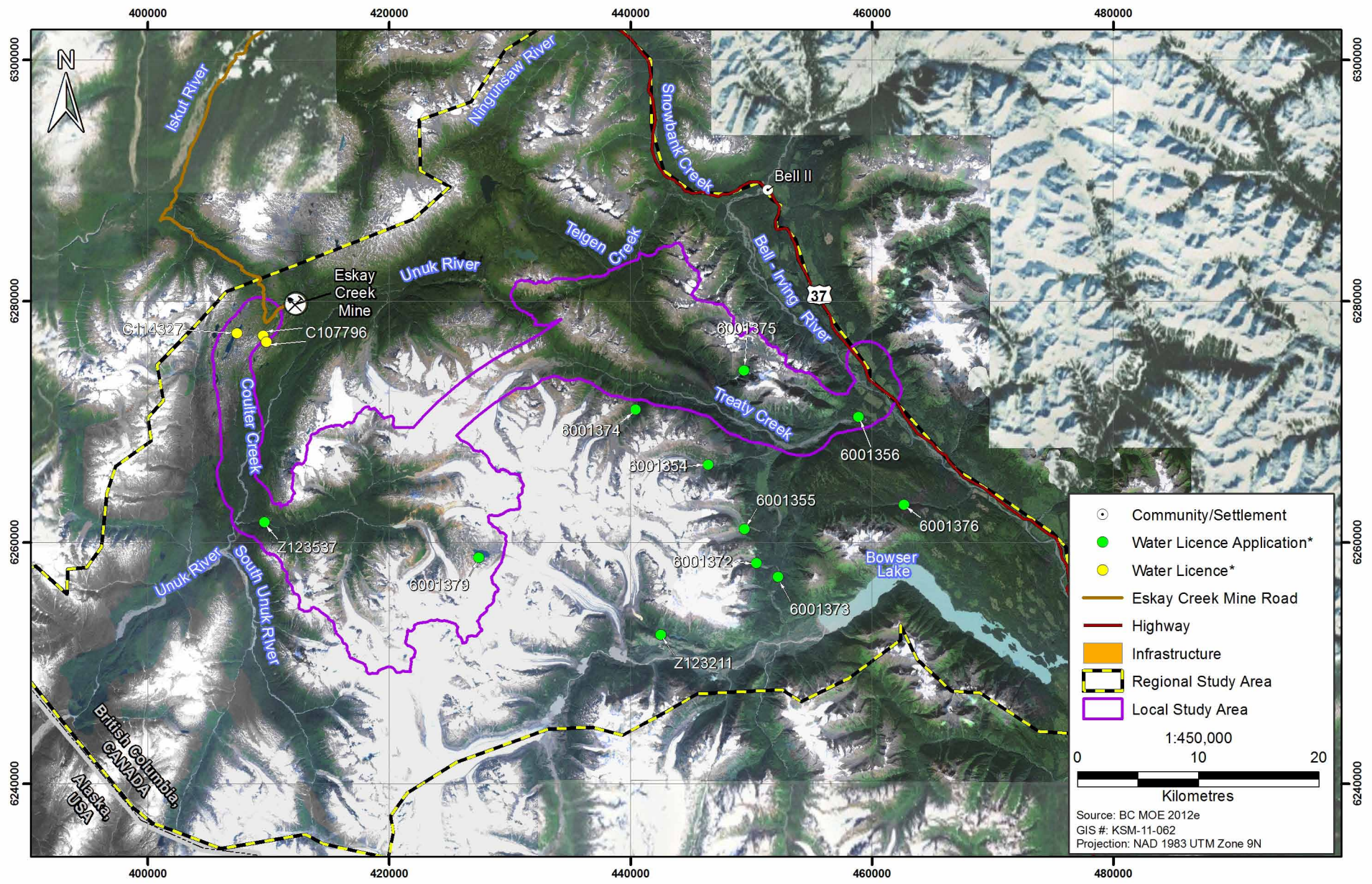

Figure 23.1-13

SEABRIDGE GOLD
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Water Licences and Applications in the Land Use Study Areas

Figure 23.1-13

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A number of forestry roads are located within the RSA and can potentially be accessed via Highway 37 (Figure 23.1-14). Based on mapping information, one road intersects with the LSA near the proposed Treaty Creek access road, with most other roads located at some distance from Project infrastructure. The Eskay Creek Mine road also falls within a small portion of the RSA to the northwest.

BC Hydro's NTL project is under construction with completion anticipated in 2014. Once built, the NTL will run along the eastern border of the RSA and near Highway 37 outside of the LSA. The NTL involves the construction of a 335 km 287 kilovolt transmission line connecting the Skeena Substation, near Terrace, to a new substation near Bob Quinn Lake (BC Hydro 2012). Finally, the Forrest Kerr run-of-river hydro facility, currently under construction along Forrest Kerr Creek and the Iskut River, will be located adjacent to the RSA, northwest of the Eskay Creek Mine site.

23.1.4.11 Navigable Waters

The *Navigable Waters Protection Act* (NWPA) states that "navigable water" includes "a canal and any other body of water created or altered as a result of the construction of any work" (1985b). In Canada, the definition of a navigable water has also been developed by jurisprudence applicable under common law. This section includes a brief description of navigable waters within the land use LSA and RSA. A detailed description, methodology, and effects assessment is provided in Chapter 31, Navigable Waters. Streams, river systems, and lakes within the RSA were also characterized as part of the Fish and Fish Habitat Baseline Report (Appendix 15-I).

The Mine Site is situated within the Unuk River watershed, interacting with several smaller tributaries including Sulphuret, Gingras, Ted Morris, Mitchell, and McTagg creeks. The Unuk River flows west from the Project region into Alaska and discharges into Burroughs Bay. The PTMA is located within the Bell-Irving River watershed, which includes tributaries, Teigen and Treaty creeks. The terrain within these watersheds ranges in elevation from under 240 m at the confluence of Sulphurets Creek with the Unuk River, to over 2,300 m at the peak of the Unuk Finger, 8 km away.

The general Project area is bounded by several river systems that lie well outside the Project footprint: the Stikine River to the north (over 100 km away, with its tributary, the Iskut River, roughly 50 km away), the Nass River (about 100 km away from the Project) to the east and south (into which the Bell-Irving River flows), and the Skeena River even further east and south (roughly 150 km from the Project). Bowser Lake and the Bowser River, southeast of the Project footprint (about 20 to 30 km away), are also part of the Bell-Irving watershed. Use of streams and rivers within these regional watersheds for navigation purposes (i.e., traditional, commercial, and/or recreational) has historically been, and still is, limited because of the remoteness and ruggedness of the terrain as well as due to glaciation.

Baseline studies indicate that nine Project crossings (i.e., culverts and bridges) along the Coulter Creek access road affecting nine different waterways (five unnamed waterbodies, Coulter Creek, Unuk River, Gingras Creek, and Mitchell Creek) do not fit the criteria for minor works or waters and could be considered navigable (Chapter 31, Navigable Waters). Within the Mine Site, the

Sulphurets, Mitchell, Ted Morris, and McTagg creeks, all of which are tributaries to the Unuk River, interact with Project works and are potentially navigable. Along the Treaty Creek access road, 11 crossings (i.e., bridges, culverts, and overhead transmission lines) affecting nine unnamed waterbodies, North Treaty Creek, and the Bell-Irving River are potentially navigable. Further, within the TMF, 14 stream reaches represent unnamed South Teigen watershed tributaries and mainstem, and unnamed North Treaty Creek watershed tributaries and mainstem—all of which are tributaries to the Bell-Irving River, which are potentially navigable. Finally, fish habitat compensation sites identified along Teigen Creek, Glacier Creek, Treaty Creek, and Taft Creek may affect navigation at these sites. Project works associated with the Temporary Frank Mackie Glacier access route were identified as minor.

Baseline studies identified limited current navigation within the RSA. The Explorer's League offers guided river rafting tours down the Unuk River on an on-demand basis, typically limited to one trip every two years (Section 23.1.4.6). The Skii km Lax Ha also seasonally use the Bell-Irving River, as well as Bowser Lake and the Bowser River, for navigation to harvest areas (Appendix 30-B, *Skii km Lax Ha Traditional Knowledge and Use Research Report*).

23.2 Historical Activities

23.2.1 Mining and Forestry

Northwestern BC is a region characterized by rugged, remote mountainous terrain and relatively harsh and long winters that pose difficulties for development of road access. The Project is located in an area known as the "Golden Triangle" due to its high mineral potential and the occurrence of a number of high profile gold projects in the area (Resource Opportunities 2012). The area has been subject to mining and mineral exploration activity throughout the past century. Resources-related activities have contributed to the development of Highway 37 and Highway 37A, as well as the settlements of Stewart, Bob Quinn, Meziadin Junction, Dease Lake (unincorporated), and the former community of Cassiar.

Within the RSA, mineral exploration has historically focused in the mountainous Knipple Glacier and Eskay Creek areas. Placer claims are present in a number of areas including Mitchell and Sulphurets Creek. One mine has operated within the RSA since the 1990s. The Eskay Creek Gold/Silver Mine operated between 1994 and 2008. The Sulphurets Lake Gold Project was an advanced exploration underground development that closed in 1993. It did not go into commercial production. Developments associated with the former Eskay Creek Mine include an access road connecting Highway 37 to the Eskay Creek area, a mill site, and other support facilities and roads.

The area surrounding the Project is covered by mineral tenures. Silver Standard Resources Inc. has carried out exploration work on the Snowfields property located immediately east of the Mitchell deposit and at the Brucejack deposit located east of the Kerr deposit. In 2010, Pretivm purchased these two properties. The Brucejack deposit has since been consolidated into two mineralized zones: Valley of the Kings and West Zone. Pretivm has released a Preliminary Economic Assessment for the Brucejack Project and has started a feasibility study.

PROJECT # 868-016-33 GIS No. KSM-11-059 January 22, 2013

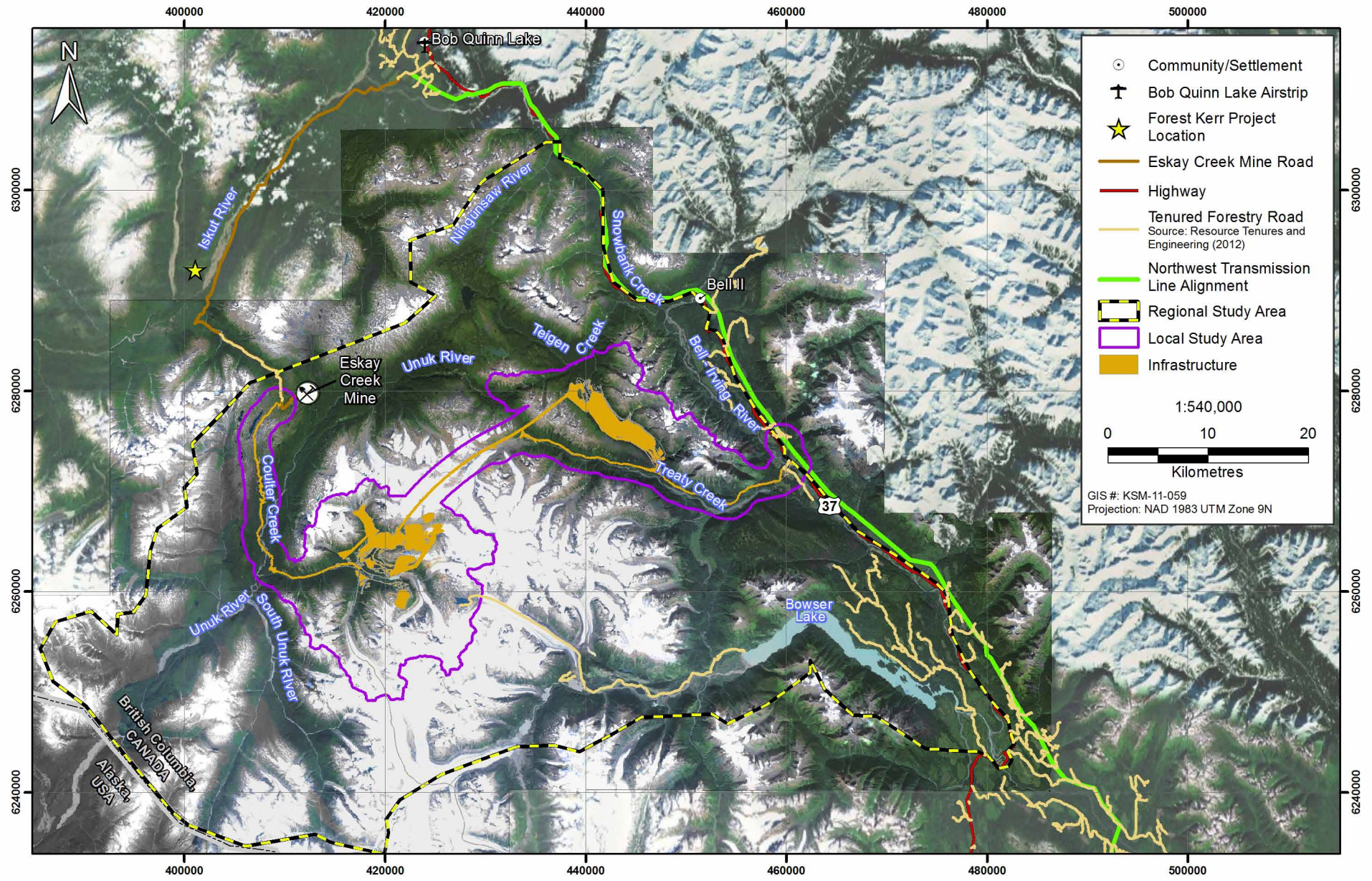


Figure 23.1-14

SEABRIDGE GOLD
KSM PROJECT

Transportation and Utilities in the Land Use Study Areas

Figure 23.1-14

Rescan
Engineers & Scientists

Limited timber harvesting has occurred within the RSA. Former companies operated in the Nass TSA along the Bell-Irving River and Highway 37. Timber harvesting contributed to the establishment of Meziadin Junction, with most of the harvesting activities occurring to the south of the RSA. Cut blocks within and immediately surrounding the RSA have provided logs for the pulpwood market. Logs are transported to Stewart for shipping to overseas markets, or trucked to Terrace and Smithers (NDIT 2010, 2012).

23.2.2 Hunting, Trapping, and Fishing

There has been hunting and fishing by First Nations throughout the RSA. The Skii km La Ha have cabins in the LSA and RSA as described above in Section 23.1.4.3. Resident hunting within the RSA has typically focused on moose within WMU 6-21, and black bear and grizzly bear in WMU 6-16 and 6-17.

Trapping for fur-bearing animals has also influenced land use within the RSA for both Aboriginals and non-Aboriginals. Hunting and fishing cabins associated with trapping activities are located along the Unuk and Bell-Irving River valleys, as well as in the Treaty Creek headwaters north of Mount Anderson,. The province has records for registered traplines dating back to 1985, though anecodotal evidence indicates that the areas were used before 1985. Three traplines in the area are held by First Nations trappers. Areas near Treaty and Snowbank creeks are used for guide outfitting and angling operations.

23.2.3 Recreation

Recreation, both commercial and public, such as guided mountaineering, guided river rafting, and heli-skiing, has occurred in areas within the RSA. There are a limited number of commercial operators within the RSA due to its ruggedness and access challenges. The lack of road access in the RSA means that encounters with other individuals are infrequent, and the sense of isolation is part of the experience offered to clients. Areas near the Bell-Irving River—such as the Snowslide Range and Treaty Creek—see higher public use, because these areas are accessible from Highway 37. Additionally, the Unuk River is used for commercial rafting adventures, and is accessible from the Eskay Creek Mine road or from Alaska. Recreational activities, particularly fishing and heli-skiing, have contributed to the establishment of lodges, including Bell 2 and Spey/Boundary Lodge. Activities associated with these lodges are seasonal in nature and of short duration. There are no organized recreational trails, roads, or other infrastructure outside of the aforementioned lodges.

23.3 Land and Resource Management Plans

Two land and resource management plans partially overlap the LSA and are considered in this effects assessment: the CIS LRMP and the Nass South SRMP.

23.3.1 Cassiar-Iskut Stikine Land and Resource Management Plan

The CIS LRMP encompasses an area of 5.2 million hectares in northwestern BC and overlaps the western portion of the RSA. The LRMP, developed with the support of the Tahltan joint councils, defines specific land and resource management objectives for this area, aiming to balance environmental, economic, and social objectives with local economic development.

23.3.1.1 Management Strategies

The CIS LRMP is composed of three management categories: General Management Direction, Area-specific Management, and Protected Area Management. General Management Directions focus on managing 10 key resource values and activities and, with the exception of protected areas, apply to the entire LRMP (BC ILMB 2000b). General Management Directions for the CIS LRMP are presented in Table 23.3-1.

Table 23.3-1. Cassiar Iskut-Stikine Land Resource Management Plan: General Management Directions

General Management Direction	Desired Future State
Access Management	Access is managed to respect the area's ecological and cultural heritage values while providing for the full range of user needs.
Biodiversity/Ecosystem Health	A land-base (including air and water) that contains the indigenous diversity of plants, animals, and other living organisms in all their forms and levels of organization throughout the Cassiar Iskut-Stikine LRMP area. This includes the diversity of genes, species, and ecosystems, as well as the evolutionary and functional processes that link them.
Botanical Forest Products and Medicinal Plants	A sustainable supply of botanical forest products (mushrooms, berries, and medicinal plants).
Hunting, Trapping, Guide Outfitting, and Fishing	Viable fish, game, and furbearer populations that continue to support the sustenance, cultural, economic, and recreational needs of First Nations and local residents.
Mineral and Energy Resources	A world-class mining and energy industry based on the area's globally significant mineral and energy resources, supported by well-designed infrastructure. An economically and environmentally sound mining industry that provides long-term benefits to the local community. Certainty of access to support a viable exploration industry. Responsible mineral and energy projects approved in an efficient and timely manner and carried out with high standards of environmental management, including mine reclamation.
Cultural Heritage Resources	Recognize and respect the heritage and cultural values of archaeological sites, First Nations traditional use sites, and pioneer heritage sites in planning and management of all resource development activities.
Recreation and Tourism	A world-class tourism destination based on the area's globally significant natural features, supported by well-designed tourism/recreation infrastructure. A viable local tourism industry. Sustainable recreation and tourism activities sensitive to environmental and cultural values. Resource planning and management compatible with tourism needs. Opportunities for a wide range of recreation activities. Certainty of land base for recreation and tourism activities.

(continued)

Table 23.3-1. Cassiar Iskut-Stikine Land Resource Management Plan: General Management Directions (completed)

General Management Direction	Desired Future State
Settlement, Agriculture, and Range	Communities that provide the quality of life valued by their residents, including the ability to enjoy traditional and historic lifestyles, diverse opportunities for employment for existing and future generations, and access to and enjoyment of surrounding Crown lands. Opportunities for food production and a viable sustainable agriculture sector on lands with suitable soil/climate combinations for cultivated crops. Opportunities for livestock grazing integrated with management for other resource values such as rare and endangered plant communities and ungulate winter range.
Timber	A locally viable and sustainable timber industry. A small-scale timber industry that is primarily based locally and provides local jobs and benefits. An industry that is based on harvesting practices that are ecologically sound and sustainable.
Visual Quality	A scenic landscape that supports world-class tourism and recreation potential. Scenic natural viewscapes from communities.

Source: (BC ILMB 2000b)

Mineral and energy resources with high economic potential exist within the CIS LRMP. As such, mineral exploration, mine development, and access road construction are permitted activities throughout most of the LRMP area, providing they occur in accordance with relevant legislation and outside of provincial parks and protected areas. The CIS LRMP includes several past-producing mines such as the Eskay Creek Gold/Silver Mine, over 30 mineral exploration sites, and other prospective geological units (BC ILMB 2000b).

Area-specific management is implemented through the RMZ and designates further objectives and strategies designated for specific areas within the CIS LRMP. Of the 15 RMZs that have been defined within the LRMP, the Unuk River RMZ falls entirely within the RSA, covering an area of 10,000 ha south of Sulphurets Creek along the Unuk River Valley (BC ILMB 2000b). A small segment of this RMZ overlaps the LSA near the proposed Coulter Creek access road (CCAR). Management objectives for the Unuk River RMZ are to maintain high-value grizzly bear habitat and visual quality from the Unuk River, while also allowing for adjacent logging and mineral development. Management strategies for the Unuk River RMZ are listed in Table 23.3-2.

Protected area management applies to LRMP land and water resources of high ecological and cultural value. The CIS LRMP created 14 new protected areas for which resource conservation is emphasized. Some areas comprise whole ecosystems. Aboriginal traditional uses and rights are respected and maintained in protected areas. Activities such as mining, logging, hydro dams, and oil and gas development are precluded from these areas (BC ILMB 2000b). The Project is not located in or adjacent to any protected areas.

Table 23.3-2. Unuk River Resource Management Zones' Management Strategies (2000)

Management Category	Strategies
Biodiversity	Maintain linkages of continuous mature old forest cover with Misty Fjords National Monument.
Wildlife	Identify and maintain contiguous high quality and quantity of grizzly bear habitat.
Aquatic Ecosystems and Riparian Habitat	Manage all activities along the Unuk River and its tributaries to achieve no net loss of fish habitat. Apply best management practices to wetlands, floodplains, and riparian habitat.
Hunting, Trapping, Guide-outfitting, Fishing	As per the General Management Direction.
Recreation and Tourism	Encourage low-impact recreation/tourism. Minimize human-bear interaction. Design commercial facilities to minimize environmental impacts. Maintain opportunities for public camping at the confluence of the South Unuk and Unuk Rivers.
Visual Quality	Designate views from the Unuk River as a known scenic area. Design logging and road building to minimize natural landscape line, form, colour, and texture.
Access Management	Air or water access is strongly encouraged for mineral exploration. Apply timely hunting and/or access restrictions when there is substantiated evidence that grizzly or other wildlife populations are at risk or declining. Develop access management plans for any new 2- and 4-wheel drive accessible roads, including plans for road use and deactivation, and need for access controls (e.g., gates, removal of temporary bridges). Limit main stem road development so that the road is on one side of a valley at any one location. Combine infrastructure development with existing or planned roads. Reclaim mineral exploration trails in a timely manner.
Mineral and Energy Resources	As per the General Management Direction. See Access Management.
Timber	Commercial timber harvesting is prohibited on the active floodplain of the Unuk River. Monitor alteration to habitat suitability and effects, and develop preventative mitigative or restorative management practices to maintain the quality of grizzly habitat. Consider closing access to forestry operations for extended periods following first pass harvesting and once silviculture obligations are complete to minimize impacts to grizzly populations.
Research and Inventory Priority	Undertake baseline studies of grizzly bear populations and habitat.

Source: BC ILMB (2000b).

23.3.2 Nass South SRMP

The Nass South SRMP was developed in partnership with Nisga'a Nation (as represented by NLG), the Gitanyow First Nation, local stakeholders, and government agencies (BC MFLNRO 2012b). The Nass South SRMP overlaps a portion of the RSA, as well as the Mitchell-Treaty Twinned Tunnel in the LSA.

The SRMP's main function is to address sustainable management issues concerning land, water, and resources in the southern portion of the Nass TSA. However, the plan also aims to facilitate a wide variety of economic opportunities while conserving high value cultural and environmental resources. Resource use and permitted development activities include mineral resource activity, timber harvesting, commercial recreation and tourism, guide outfitting, hunting, fishing, trapping, and cultural land uses (BC MFLNRO 2012b).

23.3.2.1 Management Strategies

The SRMP provides management direction in seven areas: water, biodiversity, botanical forest products, wildlife, fisheries, cultural heritage resources, and timber. Table 23.3-3 summarizes management objectives for each of these areas.

Table 23.3-3. Nass South Sustainable Resource Management Plan Management Direction

Resource	Management Objective
Water	Limit potential for surface soil erosion.
	Manage human activities to maintain the hydrologic stability of watersheds.
	Maintain the ecological functioning of streams, rivers, wetland complexes, and lakes, including those that do not have fish populations.
	Maintain functional integrity of floodplains and alluvial fans.
	Restore the water quality and hydrologic integrity of damaged watersheds.
Biodiversity	Maintain a landscape pattern of patchiness that, over the long term, reflects the natural disturbance pattern.
	Maintain or recruit structural attributes of old forests to support stand-level biodiversity.
	Preserve red-listed plant communities.
	Conserve blue-listed plant communities.
	Maintain a diversity of coniferous and deciduous species that represent the natural species composition at the landscape and stand level.
	Maintain a range of forest seral stages by Biogeoclimatic Ecosystem Classification variant within each landscape unit that reflects the natural disturbance regime.
	Maintain structural connectivity in the ecosystem.
Botanical Forest Products	Maintain productive pine mushroom sites.
Wildlife	*Moose*
	Maintain, enhance, or restore the moose winter range habitats.
	Through access management, minimize mortality and disturbance to moose within and adjacent to the moose winter ranges.

(continued)

Table 23.3-3. Nass South Sustainable Resource Management Plan Management Direction (continued)

Resource	Management Objective
Wildlife *(cont'd)*	*Mountain Goats*
	Minimize adverse disturbance to goats within mountain goat winter range.
	Minimize the number of roads within 500 m of mountain goat winter range and 1,000 m of canyon-dwelling mountain goat winter range.
	Minimize adverse disturbance to mountain goat winter range from helicopter logging activities.
	Grizzly Bears
	Preserve the highest value grizzly bear habitat.
	Maintain the quality and effectiveness of grizzly bear foraging habitat.
	Minimize human-bear conflicts.
	Minimize long-term displacement of grizzly bear from industrial access development.
	Fur-bearers
	Minimize impact to known high-value fisher and wolverine habitat.
	Goshawks
	Maintain nesting and post-fledgling or known goshawk nest areas to support continued use and reproduction in those areas.
	Maintain foraging habitat around known goshawk nest and post-fledgling areas.
	General Wildlife
	Maintain effectiveness of riparian habitats adjacent to wetlands.
Fisheries	Maintain habitat for indigenous fish populations.
	Protect and monitor salmon and bull trout populations
	Restore habitat for indigenous fish populations.
Cultural Heritage Resources	Preserve cultural sites.
	Preserve cultural heritage resources.
	Address Gitanyow and Nisga'a interests in access to cultural sites.
	Identify and record locations of Culturally Modified Trees; minimize impacts to these where appropriate.
	Maintain a sustainable source of cedar for Gitanyow traditional, cultural, and subsistence use.
Timber	Dedicate and maintain a productive timber-harvesting land base that promotes an economically sustainable forest industry.
	Avoid timber harvesting within proposed treaty settlement lands.
	Manage the forest harvest to represent the timber quality and terrain profile.
	Maintain the long-term health and site productivity of the timber harvesting land base.
	Limit conversion of the available productive forest land base for non-timber purposes.
	Develop long-term plans that respect Gitanyow and Nisga'a interests in the forest resource.

Source: BC MFLNRO (2012b).

Water management units are included in the Nass South SRMP as special RMZs. The nearest RMZ to the RSA is the Hanna-Tintina area, which is located south of the RSA.

The SRMP indicates that mineral exploration and development activity, along with related road development, is permitted in all zones (except parks and protected areas), providing necessary regulatory approval processes and conditions are satisfied. Existing mineral tenures are upheld and new mineral tenures may be acquired on all mineral lands as permitted by the *Mineral Tenure Act* (1996e).

23.4 Spatial and Temporal Boundaries

23.4.1 Spatial Boundaries

In order to consider both immediate and farther reaching potential effects of the Project on land and resource use, an LSA and RSA, which are the same as those defined for the baseline studies (see Section 23.1 for rationale), are used for the effects assessment. The LSA covers approximately 55,187 ha and the RSA is 338,008 ha in size. The LSA and RSA are the same areas used in both the Wildlife and Wildlife Habitat and Terrestrial Ecosystems Baseline reports (Figure 23.1-1; Rescan 2010a (Appendix 18-A), Rescan 2010b (Appendix 17-A)).

23.4.2 Temporal Boundaries

The temporal boundaries for land uses in the LSA and RSA vary, depending on the activity in question. Land use activities are primarily short-term and seasonal. Various land users use the LSA at different times throughout the year, although there are overlapping tenures and many land use activities occur at similar times. Land users, such as resident hunters, have seasonal restrictions on hunting conducted within each WMU within the LSA. All land users within the RSA typically have a specific active season in which their activities are conducted. For the effects assessment, temporal boundaries are chosen to encompass the phases of the KSM Project, during which potentially affected land use activities may occur.

The temporal boundaries for the land use effects assessment include the following phases:

- construction phase (5 years);
- operation phase (51.5 years);
- closure phase (3 years); and
- post-closure phase (250 years).

23.5 Valued Components

Determination of land use valued components (VCs) involved several steps, including:

- review of the Application Information Requirements (AIR);
- review of the issues identified from pre-Application stage consultations on the Project;
- land user interviews; and
- consultations with Nisga'a and First Nations.

VCs were identified by integrating information from a number of key data sources including Nisga'a Nation, the NFA, First Nations, government policy, scientific literature, and professional expertise, as well as from government, public, and stakeholder input during the engagement process conducted as part of Project planning and in support of the environmental assessment. Concerns were identified and integrated within specific VCs through comments received from the Environmental Assessment (EA) Working Group during reviews of the draft AIR, as well as communications with Nisga'a Nation, First Nations, and stakeholders in person or by phone (Table 23.5-1).

Table 23.5-1. Identification and Rationale for Land Use Valued Component Selection

Valued Component	Subgroup (Wildlife, Veg., Human)	Identified by*				Rationale for Inclusion
		AG	G	P/S	O	
Commercial Recreation, Guide Outfitting, and Trapping	Visual and Aesthetic Resources; Noise; Wildlife and Wildlife Habitat	X	X	X	X	Access to tenures within the LSA and RSA may be affected by Project infrastructure. The proposed Project may also affect availability of resources harvested by land users as a result of potential habitat loss, increased access, and nuisance for animals. Project development may alter the local visual environment and could affect the existing character of the landscape.
Recreational Hunting and Fishing	Wildlife and Wildlife Habitat; Fish and Aquatic Resources	-	X	X	X	The proposed Project may open up new areas, which could cause an increase in unregulated hunting and fishing.
Subsistence	Wildlife and Wildlife Habitat; Noise; Fish and Aquatic Resources; Human Health; Traditional Knowledge	X	X	-	X	Potential subsistence activities carried out by Nisga'a Nation, Skii km Lax Ha, Tahltan, and Gitanyow may be altered as a result of changes in the availability of resources. Subsistence activities include the harvesting of fish, wildlife, and plants such as pine mushrooms.
Traditional or Heritage Value of Land	Traditional Knowledge; Visual and Aesthetic Resources; Heritage	X	X	-	X	Nisga'a and First Nation practices, traditions or customs may be affected due to Project development and activities, and/or any changes in the availability of resources and access.
Water Licences	Surface Water Quantity	-	-	-	X	Existing water licences may be affected by Project components or activities. Water licence applications were identified during baseline studies downstream of creeks that could experience a change in water flows associated with the Project.
Mining and Mineral Exploration	Terrain, Surficial Geology, and Soils	-	-	-	X	Project infrastructure and activities may sterilize mineral resources.
Navigable Waters	Health and Socioeconomic conditions	-	X	-	X	Existing water courses which are navigable may be affected by Project components or activities. Navigable waters are considered and assessed separately in Chapter 31, Navigable Waters.

***AG = Aboriginal Group; G = Government; P/S = Public/Stakeholder; O = Other/professional expertise.**

Each VC was considered against non-traditional land use baseline study results (Appendix 23-A) as well as results from the *Tahltan Nation Traditional Knowledge and Use Desk-based Research Report* (Appendix 30-A), *Skii km Lax Ha Traditional Knowledge and Use Research Report* (Appendix 30-B), *Gitanyow First Nation Traditional Knowledge and Use Desk-based Research Report* (Appendix 30-C), and *Gitxsan Nation Traditional Knowledge and Use Desk-based Research Report* (Appendix 30-D). Finally, information and results from relevant EA chapters were also considered, including Air Quality (Chapter 7); Terrain, Surficial Geology and Soils (Chapter 8); Fish and Aquatic Resources (Chapter 15); Terrestrial Ecosystems (Chapter 17); Noise (Chapter 19); Wildlife and Wildlife Habitat (Chapter 18); Visual and Aesthetic Resources (Chapter 24); and Human Health (Chapter 25).

23.5.1 Valued Components Included in Assessment

The Project has the potential to change land uses within the LSA and RSA because of activities during all Project phases. Seven VCs were selected to assess the potential effects on land use based on consideration of the issues identified by Nisga'a Nation and First Nations, government agencies, the general public and stakeholders, as well as professional judgement. Selected VCs include: commercial recreation, guide outfitting and trapping; recreational hunting and fishing; subsistence; traditional/heritage value of the land; water licences; mining and mineral exploration; and navigable waters.

The VCs and their rationale for selection are presented in Table 23.5-1, including the source of identification. The table also identifies VC subgroups where associated data are referenced when potential effects to a particular land use VC are tied to other Project-related VCs.

23.5.2 Valued Components Excluded from Assessment

Seven additional VCs were considered for the evaluation of land and resource use effects but were not carried further in the assessment, either due to a lack of potential effects or because the VCs are assessed in another chapter. Certain VCs were also excluded to avoid duplication as the issues related to these VCs are discussed in detail as potential effects on the VCs included in Table 23.5-1. Land and resource use VCs excluded from the assessment are listed in Table 23.5-2, along with a description of the rationale for exclusion.

23.6 Scoping of Potential Effects for Land Use

Potential effects on land use by the Project have been raised during EA Working Group meetings by Aboriginal groups and government, and have been identified through baseline research (including stakeholder interviews), scientific literature, and technical expertise/professional judgment (Section 23.5). How these potential effects may arise due to the Project are detailed in Appendix 23-B and summarized in Tables 23.6-1 to 23.6-6 below. Potential effects are also discussed in Sections 23.6.1 to 23.6.4.

Table 23.5-2. Rationale for Land Use VCs Considered and Excluded from Further Analysis

Valued Component	Identified by*				Rationale for Exclusion
	AG	G	P/S	O	
Land Management Objectives	-	X	-	X	The VCs selected in Table 23.5-2 collectively cover the key CIS LRMP and Nass South SRMP objectives that are applicable to the land and resources that could be potentially affected by the Project. Further, Project development does not undermine other planning objectives as the existing land management objectives in the CIS LRMP, including the Unuk River RMZ, as well as the Nass South SRMP allow for mineral exploration and development to occur. The Project is also located away from any protected area such as parks or ecological reserves. Land Management Objectives are therefore excluded as a VC, as Project activities comply with existing land and resource management plans.
Access	X	X	X	X	Access is excluded as a VC as issues related to any change or restriction to access are discussed as potential effects, as opposed to a VC. Potential changes are reflected in the assessments of other VCs, including subsistence; commercial recreation, guide outfitting and trapping; traditional/heritage value of the land; and mining and mineral exploration.
Quantity of Resources	X	X	X	X	Quantity of resources is excluded as a VC because issues related to potential changes in the amount of available resources are discussed as potential effects, as opposed to a VC. These potential effects are reflected in the assessments of other VCs, including subsistence; commercial recreation, guide outfitting and trapping; and traditional/heritage value of the land.
Quality of Experience	-	X	X	-	Quality of experience is excluded as a VC because potential effects are reflected in the assessments of other VCs, including commercial recreation, guide outfitting and trapping, and traditional/heritage value of the land, as well as Chapter 24, Visual and Aesthetic Resources.
Timber Supply		X	-	X	Timber supply is excluded as a VC because current and historical timber activities are not located near the Project footprint. Timber supply is not anticipated to be affected as harvesting activities in both the Cassiar TSA and Nass TSA have historically been significantly below defined AAC quantities. Even with improved access, timber values are not likely to attract commercial harvesting interests.
Agriculture	-	-	-	X	Agriculture is excluded as a VC because there is no agricultural activity in the LSA or RSA, and no activity was identified during baseline studies.
Oil and Gas	-	X	-	X	Oil and gas is excluded as a VC because there are no oil and gas rights in the LSA or RSA.

***AG = Aboriginal Group; G = Government; P/S = Public/Stakeholder; O = Other/professional expertise.**

Table 23.6-1. Potential Effects from Project on Commercial Recreation, Guide Outfitting and Trapping

Project Region	Project Area	Restrictions on Access	Change in Sensory Disturbances	Change in the Amount of Resources
Mine Site	Camp 3: Eskay Staging Camp	X	X	X
	Camp 7: Unuk North Camp	X	X	X
	Camp 8: Unuk South Camp	X	X	X
	Coulter Creek access road	X	X	X
	Mitchell Operating Camp	X	X	X
	McTagg Rock Storage Facility	X	X	X
	McTagg Twinned Diversion Tunnels			
	McTagg Power Plant	X	X	X
	Mitchell Rock Storage Facility	X	X	X
	Camp 4: Mitchell North Camp (for MTT construction)	X	X	X
	Mitchell Ore Preparation Complex	X	X	X
	Mine Site Avalanche Control	X	X	
	Iron Cap Block Cave Mine			
	Mitchell Pit	X	X	X
	Mitchell Block Cave Mine			
	Mitchell Diversion Tunnels			
	Upper Sulphurets Power Plant	X	X	X
	Mitchell Truck Shop	X	X	X
	Water Storage Facility	X	X	X
	Camp 9: Mitchell Initial Camp	X	X	X
	Camp 10: Mitchell Secondary Camp	X	X	X
	Water Treatment and Energy Recovery Area	X	X	X
	Sludge Management Facilities	X	X	X
	Sulphurets laydown area	X	X	X
	Sulphurets-Mitchell Conveyor Tunnel			
	Sulphurets Pit	X	X	X
	Kerr rope conveyor	X	X	X
	Kerr Pit	X	X	X
	Camp 2: Ted Morris Camp	X	X	X
	Explosives Manufacturing Facility	X	X	X
	Temporary Frank Mackie Glacier access route	X	X	X
	Camp 1: Granduc Staging Camp	X	X	X

(continued)

Table 23.6-1. Potential Effects from Project on Commercial Recreation, Guide Outfitting and Trapping (completed)

Project Region	Project Area	Restrictions on Access	Change in Sensory Disturbances	Change in the Amount of Resources
Processing and Tailing Management Area	Mitchell-Treaty Twinned Tunnels construction access adit	X	X	X
	Mitchell-Treaty Saddle Area	X	X	X
	Camp 6: Treaty Saddle Camp	X	X	X
	Camp 5: Treaty Plant Camp	X	X	X
	Treaty Operating Camp	X	X	X
	Treaty Ore Preparation Complex	X	X	X
	Concentrate Storage and Loadout	X	X	X
	North Cell Tailing Management Facility	X	X	X
	East Catchment Diversion	X	X	X
	Centre Cell Tailing Management Facility	X	X	X
	South Cell Tailing Management Facility	X	X	X
	Treaty Creek access road	X	X	X
	Camp 11: Treaty Marshalling Yard Camp	X	X	X
	Camp 12: Highway 37 Construction Camp	X	X	X
Off-site Transportation	Highway 37 and 37A		X	X
Workforce	Employment	X	X	

X = interaction between component and effect

Table 23.6-2. Potential Effects from Project on Recreational Hunting and Fishing

Project Region	Project Area	Restrictions on Access	Change in Sensory Disturbances	Change in the Amount of Resources
Mine Site	Camp 3: Eskay Staging Camp	X	X	X
	Camp 7: Unuk North Camp	X	X	X
	Camp 8: Unuk South Camp	X	X	X
	Coulter Creek access road	X	X	X
	Mitchell Operating Camp	X	X	X
	McTagg Rock Storage Facility	X	X	X
	McTagg Twinned Diversion Tunnels			
	McTagg Power Plant	X	X	X
	Mitchell Rock Storage Facility	X	X	X

(continued)

Table 23.6-2. Potential Effects from Project on Recreational Hunting and Fishing (continued)

Project Region	Project Area	Restrictions on Access	Change in Sensory Disturbances	Change in the Amount of Resources
Mine Site *(cont'd)*	Camp 4: Mitchell North Camp (for MTT construction)	X	X	X
	Mitchell Ore Preparation Complex	X	X	X
	Mine Site Avalanche Control	X	X	
	Iron Cap Block Cave Mine			
	Mitchell Pit	X	X	X
	Mitchell Block Cave Mine			
	Mitchell Diversion Tunnels			
	Upper Sulphurets Power Plant	X	X	X
	Mitchell Truck Shop	X	X	X
	Water Storage Facility	X	X	X
	Camp 9: Mitchell Initial Camp	X	X	X
	Camp 10: Mitchell Secondary Camp	X	X	X
	Water Treatment and Energy Recovery Area	X	X	X
	Sludge Management Facilities	X	X	X
	Sulphurets laydown area	X	X	X
	Sulphurets-Mitchell Conveyor Tunnel			
	Sulphurets Pit	X	X	X
	Kerr rope conveyor	X	X	X
	Kerr Pit	X	X	X
	Camp 2: Ted Morris Camp	X	X	X
	Explosives Manufacturing Facility	X	X	X
	Temporary Frank Mackie Glacier access route	X	X	X
	Camp 1: Granduc Staging Camp	X	X	X
Processing and Tailing Management Area	Mitchell-Treaty Twinned Tunnels construction access adit	X	X	X
	Mitchell-Treaty Saddle Area	X	X	X
	Camp 6: Treaty Saddle Camp	X	X	X
	Camp 5: Treaty Plant Camp	X	X	X
	Treaty Operating Camp	X	X	X
	Treaty Ore Preparation Complex	X	X	X
	Concentrate Storage and Loadout	X	X	X
	North Cell Tailing Management Facility	X	X	X
	East Catchment Diversion	X	X	X

(continued)

Table 23.6-2. Potential Effects from Project on Recreational Hunting and Fishing (completed)

Project Region	Project Area	Restrictions on Access	Change in Sensory Disturbances	Change in the Amount of Resources
Processing and Tailing Management Area *(cont'd)*	Centre Cell Tailing Management Facility	X	X	X
	South Cell Tailing Management Facility	X	X	X
	Treaty Creek access road	X	X	X
	Camp 11: Treaty Marshalling Yard Camp	X	X	X
	Camp 12: Highway 37 Construction Camp	X	X	X
Off-site Transportation	Highway 37 and 37A		X	X
Workforce	Employment	X	X	

X = interaction between component and effect

Table 23.6-3. Potential Effects from Project on Subsistence

Project Region	Project Area	Restrictions on Access	Change in Sensory Disturbances	Change in the Amount of Resources
Mine Site	Camp 3: Eskay Staging Camp	X	X	X
	Camp 7: Unuk North Camp	X	X	X
	Camp 8: Unuk South Camp	X	X	X
	Coulter Creek access road	X	X	X
	Mitchell Operating Camp	X	X	X
	McTagg Rock Storage Facility	X	X	X
	McTagg Twinned Diversion Tunnels			
	McTagg Power Plant	X	X	X
	Mitchell Rock Storage Facility	X	X	X
	Camp 4: Mitchell North Camp (for MTT construction)	X	X	X
	Mitchell Ore Preparation Complex	X	X	X
	Mine Site Avalanche Control	X	X	
	Iron Cap Block Cave Mine			
	Mitchell Pit	X	X	X
	Mitchell Block Cave Mine			
	Mitchell Diversion Tunnels			
	Upper Sulphurets Power Plant	X	X	X
	Mitchell Truck Shop	X	X	X
	Water Storage Facility	X	X	X
	Camp 9: Mitchell Initial Camp	X	X	X

(continued)

Table 23.6-3. Potential Effects from Project on Subsistence (completed)

Project Region	Project Area	Restrictions on Access	Change in Sensory Disturbances	Change in the Amount of Resources
Mine Site *(cont'd)*	Camp 10: Mitchell Secondary Camp	X	X	X
	Water Treatment and Energy Recovery Area	X	X	X
	Sludge Management Facilities	X	X	X
	Sulphurets laydown area	X	X	X
	Sulphurets-Mitchell Conveyor Tunnel			
	Sulphurets Pit	X	X	X
	Kerr rope conveyor	X	X	X
	Kerr Pit	X	X	X
	Camp 2: Ted Morris Camp	X	X	X
	Explosives Manufacturing Facility	X	X	X
	Temporary Frank Mackie Glacier access route	X	X	X
	Camp 1: Granduc Staging Camp	X	X	X
Processing and Tailing Management Area	Mitchell-Treaty Twinned Tunnels construction access adit	X	X	X
	Mitchell-Treaty Saddle Area	X	X	X
	Camp 6: Treaty Saddle Camp	X	X	X
	Camp 5: Treaty Plant Camp	X	X	X
	Treaty Operating Camp	X	X	X
	Treaty Ore Preparation Complex	X	X	X
	Concentrate Storage and Loadout	X	X	X
	North Cell Tailing Management Facility	X	X	X
	East Catchment Diversion	X	X	X
	Centre Cell Tailing Management Facility	X	X	X
	South Cell Tailing Management Facility	X	X	X
	Treaty Creek access road	X	X	X
	Camp 11: Treaty Marshalling Yard Camp	X	X	X
	Camp 12: Highway 37 Construction Camp	X	X	X
Off-site Transportation	Highway 37 and 37A		X	X
Workforce	Employment	X	X	X

X = interaction between component and effect

Table 23.6-4. Potential Effects from Project on Traditional/Heritage Value of the Land

Project Region	Project Area	Restrictions on Access	Change in Sensory Disturbances	Change in the Amount of Resources
Mine Site	Camp 3: Eskay Staging Camp	X	X	X
	Camp 7: Unuk North Camp	X	X	X
	Camp 8: Unuk South Camp	X	X	X
	Coulter Creek access road	X	X	X
	Mitchell Operating Camp	X	X	X
	McTagg Rock Storage Facility	X	X	X
	McTagg Twinned Diversion Tunnels			
	McTagg Power Plant	X	X	X
	Mitchell Rock Storage Facility	X	X	X
	Camp 4: Mitchell North Camp (for MTT construction)	X	X	X
	Mitchell Ore Preparation Complex	X	X	X
	Mine Site Avalanche Control	X	X	
	Iron Cap Block Cave Mine			
	Mitchell Pit	X	X	X
	Mitchell Block Cave Mine			
	Mitchell Diversion Tunnels			
	Upper Sulphurets Power Plant	X	X	X
	Mitchell Truck Shop	X	X	X
	Water Storage Facility	X	X	X
	Camp 9: Mitchell Initial Camp	X	X	X
	Camp 10: Mitchell Secondary Camp	X	X	X
	Water Treatment and Energy Recovery Area	X	X	X
	Sludge Management Facilities	X	X	X
	Sulphurets laydown area	X	X	X
	Sulphurets-Mitchell Conveyor Tunnel			
	Sulphurets Pit	X	X	X
	Kerr rope conveyor	X	X	X
	Kerr Pit	X	X	X
	Camp 2: Ted Morris Camp	X	X	X
	Explosives Manufacturing Facility	X	X	X
	Temporary Frank Mackie Glacier access route	X	X	X
	Camp 1: Granduc Staging Camp	X	X	X

(continued)

Table 23.6-4. Potential Effects from Project on Traditional/Heritage Value of the Land (completed)

Project Region	Project Area	Restrictions on Access	Change in Sensory Disturbances	Change in the Amount of Resources
Processing and Tailing Management Area	Mitchell-Treaty Twinned Tunnels Construction Access Adit	X	X	X
	Mitchell-Treaty Saddle Area	X	X	X
	Camp 6: Treaty Saddle Camp	X	X	X
	Camp 5: Treaty Plant Camp	X	X	X
	Treaty Operating Camp	X	X	X
	Treaty Ore Preparation Complex	X	X	X
	Concentrate Storage and Loadout	X	X	X
	North Cell Tailing Management Facility	X	X	X
	East Catchment Diversion	X	X	X
	Centre Cell Tailing Management Facility	X	X	X
	South Cell Tailing Management Facility	X	X	X
	Treaty Creek access road	X	X	X
	Camp 11: Treaty Marshalling Yard Camp	X	X	X
	Camp 12: Highway 37 Construction Camp	X	X	X
Off-site Transportation	Highway 37 and 37A		X	X
Workforce	Employment	X	X	X

X = interaction between component and effect

Table 23.6-5. Potential Effects from Project on Water Licences and Applications

Project Region	Project Area	Restrictions on Access	Change in Sensory Disturbances	Change in the Amount of Resources
Mine Site	Camp 3: Eskay Staging Camp			
	Camp 7: Unuk North Camp			
	Camp 8: Unuk South Camp			
	Coulter Creek access road			
	Mitchell Operating Camp			
	McTagg Rock Storage Facility			
	McTagg Twinned Diversion Tunnels			
	McTagg Power Plant			
	Mitchell Rock Storage Facility			

(continued)

Table 23.6-5. Potential Effects from Project on Water Licences and Applications (continued)

Project Region	Project Area	Restrictions on Access	Change in Sensory Disturbances	Change in the Amount of Resources
Mine Site *(cont'd)*	Camp 4: Mitchell North Camp (for MTT construction)			
	Mitchell Ore Preparation Complex			X
	Mine Site Avalanche Control			
	Iron Cap Block Cave Mine			
	Mitchell Pit			
	Mitchell Block Cave Mine			
	Mitchell Diversion Tunnels			
	Upper Sulphurets Power Plant			
	Mitchell Truck Shop			
	Water Storage Facility			X
	Camp 9: Mitchell Initial Camp			
	Camp 10: Mitchell Secondary Camp			
	Water Treatment and Energy Recovery Area			
	Sludge Management Facilities			X
	Sulphurets laydown area			
	Sulphurets-Mitchell Conveyor Tunnel			
	Sulphurets Pit			
	Kerr rope conveyor			
	Kerr Pit			
	Camp 2: Ted Morris Camp			
	Explosives Manufacturing Facility			
	Temporary Frank Mackie Glacier access route			
	Camp 1: Granduc Staging Camp			
Processing and Tailing Management Area	Mitchell-Treaty Twinned Tunnels			
	construction access adit			
	Mitchell-Treaty Saddle Area			
	Camp 6: Treaty Saddle Camp			
	Camp 5: Treaty Plant Camp			
	Treaty Operating Camp			X
	Treaty Ore Preparation Complex			X
	Concentrate Storage and Loadout			
	North Cell Tailing Management Facility			X
	East Catchment Diversion			X

(continued)

Table 23.6-5. Potential Effects from Project on Water Licences and Applications (completed)

Project Region	Project Area	Restrictions on Access	Change in Sensory Disturbances	Change in the Amount of Resources
Processing and Tailing Management Area *(cont'd)*	Centre Cell Tailing Management Facility			X
	South Cell Tailing Management Facility			X
	Treaty Creek access road			
	Camp 11: Treaty Marshalling Yard Camp			
	Camp 12: Highway 37 Construction Camp			
Off-site Transportation	Highway 37 and 37A			
Workforce	Employment			

X = interaction between component and effect

Table 23.6-6. Potential Effects from Project on Mining and Mineral Exploration

Project Region	Project Area	Restrictions on Access	Change in Sensory Disturbances	Change in the Amount of Resources
Mine Site	Camp 3: Eskay Staging Camp			
	Camp 7: Unuk North Camp			
	Camp 8: Unuk South Camp			
	Coulter Creek access road			
	Mitchell Operating Camp			
	McTagg Rock Storage Facility			
	McTagg Twinned Diversion Tunnels			
	McTagg Power Plant			
	Mitchell Rock Storage Facility			
	Camp 4: Mitchell North Camp (for MTT construction)			
	Mitchell Ore Preparation Complex			
	Mine Site Avalanche Control			
	Iron Cap Block Cave Mine			
	Mitchell Pit	X		
	Mitchell Block Cave Mine	X		
	Mitchell Diversion Tunnels			
	Upper Sulphurets Power Plant			
	Mitchell Truck Shop			
	Water Storage Facility			

(continued)

Table 23.6-6. Potential Effects from Project on Mining and Mineral Exploration (completed)

Project Region	Project Area	Restrictions on Access	Change in Sensory Disturbances	Change in the Amount of Resources
Mine Site *(cont'd)*	Camp 9: Mitchell Initial Camp			
	Camp 10: Mitchell Secondary Camp			
	Water Treatment and Energy Recovery Area			
	Sludge Management Facilities			
	Sulphurets laydown area			
	Sulphurets-Mitchell Conveyor Tunnel			
	Sulphurets Pit			
	Kerr rope conveyor			
	Kerr Pit			
	Camp 2: Ted Morris Camp			
	Explosives Manufacturing Facility			
	Temporary Frank Mackie Glacier access route			
	Camp 1: Granduc Staging Camp			
Processing and Tailing Management Area	Mitchell-Treaty Twinned Tunnels	X		
	construction access adit			
	Mitchell-Treaty Saddle Area			
	Camp 6: Treaty Saddle Camp			
	Camp 5: Treaty Plant Camp			
	Treaty Operating Camp			
	Treaty Ore Preparation Complex			
	Concentrate Storage and Loadout			
	North Cell Tailing Management Facility			
	East Catchment Diversion			
	Centre Cell Tailing Management Facility			
	South Cell Tailing Management Facility			
	Treaty Creek access road			
	Camp 11: Treaty Marshalling Yard Camp			
	Camp 12: Highway 37 Construction Camp			
Off-site Transportation	Highway 37 and 37A			
Workforce	Employment			

X = interaction between component and effect

Three potential effects were identified during the scoping assessment. These potential effects include: 1) restrictions on access to land and resources; 2) change in sensory disturbances; and 3) change in the amount of resources, and are defined as follows:

- **Restrictions on access to land and resources** – Public access to the Project area will be restricted for safety and jurisdictional reasons which may impact tenure holders, and subsistence hunters, and recreational hunters and fishers.
- **Change in sensory disturbances** – The Project is located in a remote area with limited ongoing activity. Project-related noise, vibrations, visual/aesthetic changes, and light may affect wildlife as well as land and resource users accustomed to a remote wilderness experience in the LSA. Aboriginal groups, guide outfitters, resident hunters, commercial recreation, and trapline holders may be affected.
- **Change in the amount of resources** – The presence of the Project, as well as staff and contractors, in a formerly remote area may open up wildlife, fish, and vegetative resources to increased pressures that could result in a change in the amount of these harvest resources. Increased pressure may result from the loss of vegetation and habitat from infrastructure development, wildlife mortality due to increased traffic volume, as well as barriers for wildlife movement. The Project's presence may open up resources to pressures by facilitating hunting, trapping, and fishing pursuits. Water licences may be affected by any change in water flow or quantity as a result of Project development. Aboriginal groups, who use the area for subsistence purposes, as well as guide outfitters, resident hunters, commercial recreation, traplines, and water licences, may be affected.

Potential effects are expected to persist during all Project phases, though some, such as restrictions on public access, will affect land uses differently in different areas and during different phases of the Project. The detailed assessment of each potential effect is provided in Section 23.7. Ultimately, effects are evaluated VC by VC for their potential to affect land users and/or their ability to pursue their activities within the effects assessment boundaries. Table 23.6-7 provides an overview of the interactions of each identified potential Project effect on the land use VCs.

Table 23.6-7. Overview Summary

	Restrictions on Access		Change in Sensory Disturbances		Change in the Amount of Resources	
Valued Component	**Project**	**Cumulative Influence**	**Project**	**Cumulative Influence**	**Project**	**Cumulative Influence**
Commercial Recreation, Guide Outfitting and Trapping	X	X	-	-	-	-
Recreational Hunting and Fishing	X	X	X	X	X	X
Subsistence	X	X	X	X	X	X
Traditional/Heritage Value of the Land	X	X	X	X	X	X
Water Licences	-	-	-	-	X	-
Mining and Mineral Exploration	X	-	-	-	-	-

23.6.1 Construction

Project construction will involve major activity within the LSA, including land clearing, increased traffic to transport equipment and materials, noise and vehicle emissions, blasting, and infrastructure development. The PTMA, access roads, tunnels, and transmission line will be developed at the same time as the Mine Site. As a result, land and resource users during this phase could be affected by restrictions on access to land and resources, change in sensory disturbances, and any real or perceived change in the amount of resources. Potential effects would occur in association with construction activities within the LSA (Appendix 23-B), and in some cases extend into the RSA. Potential Project-related effects during construction that are assessed include:

- **Restrictions on access to land and resources –** Public access to the Project area will be restricted which may impact tenure holders, subsistence harvesters and recreational hunters and fishers.
- **Change in sensory disturbances –** Sensory disturbance to land users, as well as wildlife and fishing resources (whose presence or lack thereof can influence certain land use activities), could occur from Project noise, visual, light and vibration disturbances. Land users may also experience a lessened enjoyment of the natural environment within the LSA and RSA.
- **Change in the amount of resources –** The amount of wildlife, fish, and vegetative resources may be reduced or degraded as a result of the Project. The Project will contribute to an increase in truck and other vehicular traffic along Highway 37. Higher traffic volumes in the LSA and the RSA could potentially disrupt wildlife movement and increase wildlife mortality. A potential reduction in resources may result from the loss of vegetation and habitat from infrastructure development. The Project's presence may also open up harvest resources to pressures by facilitating hunting, trapping and fishing pursuits. Water licences may be affected by any change in surface water resources as a result of Project development.

23.6.2 Operations

Project activities at the Mine Site and PTMA will be continuous during operations. There will be an average of approximately 82 vehicles per day, including trucks, using the Treaty Creek access road, and a further three vehicles per day on the Coulter Creek access road. Potential effects initiated during the construction phase are anticipated to continue and/or vary to an incremental degree. During operation, land and resource users could continue to be affected by restrictions on access to land and resources, change in sensory disturbances, and any real or perceived change in the amount of resources within the LSA and RSA (Appendix 23-B). Potential Project-related effects during operation that were assessed include:

- **Restrictions on access to land and resources –** Public access to the Project area will be restricted which may impact tenure holders, subsistence harvesters and recreational hunters and fishers.

- **Change in sensory disturbances –** Sensory disturbance to land users, as well as wildlife and fishing resources (whose presence or lack thereof can influence certain land use activities), could occur from operation-related noise, visual, light, and vibration disturbances. Land users may also experience a lessened enjoyment of the natural environment within the LSA and RSA.
- **Change in the amount of resources –** The amount of wildlife, fish, and vegetative resources may be reduced or degraded as a result of operations. The Project will contribute to a further increase in truck and other vehicular traffic from the construction phase. Higher traffic volumes in the LSA and the RSA could potentially disrupt wildlife movement and increase wildlife mortality. A potential reduction in resources may result from the loss of vegetation and habitat from ongoing infrastructure development, notably the TMF. The Project's presence may continue to open up harvest resources to pressures by facilitating hunting, trapping, and fishing pursuits. Water licence holders and water applications may be affected by any change in surface water resources as a result of Project activities.

23.6.3 Closure

During closure, Project activities will be ramped down substantially and focused on the removal of infrastructure, closing of the CCAR, and re-sloping of the terrain. Truck traffic will be mostly limited to on-site trucks to complete the work, with limited truck traffic remaining to transport personnel and lime to the site; consequently, the decrease in vehicle-related traffic is anticipated to result in a decrease in adverse effects compared to operation. Project-related effects during the closure phase are primarily related to elements and activities within the Project footprint, as well as the remaining road infrastructure and right-of-ways. Restrictions on access to land and resources, change in sensory disturbances, and change in the amount of resources were identified as potential effects during closure that could impact land and resource use (Appendix 23-B). Effects that are assessed include:

- **Restrictions on access to land and resources** – Public access to the Project area will be restricted which may impact tenure holders, subsistence harvesters and recreational hunters and fishers.
- **Change in sensory disturbances** – Sensory disturbance to land users, as well as wildlife and fishing resources (whose presence or lack thereof can influence certain land use activities), could occur from closure phase-related noise and visual, light, and vibration disturbances. Perceived aesthetic disturbances in areas associated with reclamation activities may discourage land and resource users from using RSA areas that could otherwise be used. Although noise and traffic will continue through this Project phase, occurrences will be considerably reduced from operations. As such, adverse effects from changes in sensory disturbances are expected to be reduced, depending on the specific land user and the characteristics of the land use activity.
- **Change in the amount of resources** – The amount of wildlife, fish, and vegetative resources may be affected as a result of closure activities. Lower traffic volumes as compared to operation phase levels could potentially reduce incidences of wildlife mortality and disruption of wildlife movement. The reduced presence of Project staff and infrastructure may lead to wildlife resources returning to the LSA and RSA.

However, the Project's remaining access corridors may continue to open up harvest resources to pressures by facilitating hunting, trapping, and fishing pursuits.

23.6.4 Post-closure

Activities related to post-closure will be limited to ongoing reclamation activities (during the first five years), followed by ongoing environmental monitoring, as well as traffic and personnel activities related to water treatment. Project-related traffic is estimated to be approximately six vehicles per day; these low levels are not expected to cause an adverse effect. Overall, potential effects on land use during the post-closure phase are notably diminished as compared to closure and will be related to elements within the Project footprint that will remain open or partially active for maintenance and monitoring activities. During post-closure, restrictions on access to land and resources, change in sensory disturbances, and change in the amount of resources were identified as potential effects that could impact land and resource use within the LSA and RSA (Appendix 23-B). Potential Project-related effects during post-closure that are assessed include:

- **Restrictions on access to land and resources** – Public access to some areas of the Project may be restricted which may impact tenure holders, subsistence harvesters and recreational hunters and fishers.
- **Change in sensory disturbances** – Sensory disturbances to land users, as well as wildlife resources—noise, visual, light or vibrations—will continue through this Project phase, albeit considerably reduced from closure. As such, sensory disturbances are anticipated to decrease significantly.
- **Change in the amount of resources** – A reduction in the presence of Project staff and infrastructure, as well as re-vegetation activities during this phase, may lead to wildlife resources returning to the LSA and RSA. However, adverse effects may persist as compared to baseline conditions, including the ongoing opening up of harvest resources due to remaining access roads and right-of-way corridors potentially facilitating hunting, trapping, and fishing pursuits in the LSA and RSA.

23.7 Potential for Residual Effects for Land Use

The following sections (23.7-1 to 23.7-4) assess the potential Project-related effects on each VC. The assessment considered results of the *Non-traditional Land Use Baseline Report* (Appendix 23-A), First Nations *Traditional Knowledge and Use Research Reports* (Appendices 30-A to 30-D), the *Nisga'a Social, Economic, Resource Use, and Cultural Survey Statistical Report* (Appendix 29-A), the *Nisga'a Guidelines Focus Group Report* (Appendix 29-C), regional planning documents, and professional judgement. Three potential effects were identified for land use during the scoping assessment for land and resource use VCs. These include: 1) restrictions on access to land and resources, 2) change in sensory disturbances, and 3) change in the amount of resources (Appendix 23-B and Tables 23.6-1 through 23.6-6). Four potential residual effects are identified below for two VCs, some of which occur during all Project phases (see Tables 23.7-2 to 23.7-4). Another four residual effects are predicted for Navigable Waters, as summarized in Section 23.7.1.8 and discussed in Chapter 31, Navigable Waters.

23.7.1 Restrictions on Access to Land and Resources

The BC *Mines Act* (1996g) regulates access on mine sites primarily for safety and jurisdictional reasons. Public access to the Project area during construction, operation, closure, primarily within the LSA, will be restricted for safety and jurisdictional reasons. Post closure, it is anticipated that access restrictions will still apply to some of the Project area.

Access restriction may take the form of gates and signs installed at the entrance of Project access roads and the transmission line right-of-way. Access roads and rights-of-way will likely also be manned and/or monitored to restrict unauthorized use.

Effects on access are constrained, as the Mine Site and PTMA are located in geographic areas that are currently inaccessible to the public (except by helicopter) due to lack of roads and rugged terrain. Some limited access to the PTMA exists to trails used for trapping and other types of subsistence harvesting, primarily by Skii km Lax Ha. Due to access restrictions under the *Mines Act*, residual access effects to land use by low numbers of tenure holders, subsistence harvesters and recreational hunters and fishers. For instance, it is anticipated that access restrictions will prevent tenure holders from travelling through the Project to access their tenures, and subsistence harvesters from harvesting in the Project area.

All land use VCs, except water licences, may be affected. These are summarized below, highlighted in Table 23.7-1, and described in more detail in Sections 23.7.1.3 to 23.7.1.7.

23.7.1.1 Mitigation for Restrictions on Access

Seabridge will attempt to reach an agreement with the Skii km Lax Ha relating to potential impacts on their traplines in the Project area. Seabridge will also discuss with the Skii km Lax Ha and Tahltan regarding their interests relating to the use of TCAR and/or CCAR.

Project mitigation measures to minimize any potential adverse indirect effects on navigational safety or access are planned prior to Project commencement through engineering design and during the life of the Project through management practices (e.g., control and/or reduction techniques such as temporary access restrictions and signage).

23.7.1.2 Potential for Residual Effects

Potential effects related to restrictions on access to land and resources were assessed with respect to six land use VCs (all except water licences). Two residual effects are predicted following mitigation for commercial recreation, guide outfitting and trapping, and for subsistence. The assessment of each potential residual effect is presented in Table 23.7-1 and discussed in Section 23.7.1.3 to 23.7.1.8. Another four residual effects are predicted for navigable waters, as summarized in Section 23.7.1.8 and discussed in more detail in Chapter 31, Navigable Waters.

23.7.1.3 Commercial Recreation, Guide Outfitting, and Trapping: Potential Residual Effects due to Public Access Restrictions

Under the *Mines Act*, public access is not permitted at mine sites. During construction, operation and closure, the public will be restricted from the Project site.

The development of structures and roads will potentially affect the way in which land users physically access the environment within the LSA. The presence of infrastructure and barriers within the LSA may also decrease the total land area that certain land users could access within their licence area. Project-related activities, including land clearing and vehicle traffic, may also cause land users to restrict or alter their normal access to land use areas.

These effects are anticipated to continue for the operation phase once infrastructure is fully developed, Project activities begin, and vehicle traffic within the LSA increases. Altered or restricted access for certain stakeholders may also occur within the RSA. These land users may be using areas within the LSA in order to gain access to regions of their licence area located in the RSA. Consequently, any change in access to the LSA would affect their ability to access the RSA as well. Evidence of land user access was noted along the Treaty Creek forest service road during baseline studies. Hence, land users accustomed to this route as an access corridor within the RSA will be required to alter their route due to the proposed development of the Treaty Creek access road.

During closure, altered access to licence areas is anticipated to continue, albeit to a lessened extent, as a result of site clearing and remediation activities. For post-closure, the extent will lessen further as remediation will be complete, buildings removed, and fewer trucks present. A change in access is anticipated to continue due to remaining infrastructure, such as the TMF. Altered or decreased access is likely to affect commercial recreation, guide outfitting, trapline holders, and subsistence users. Effects related to restricted access on subsistence users is discussed below in Section 23.7.1.5.

Baseline interviews with guide outfitters, anglers, commercial recreation, and trapline land users indicated that access to the RSA is currently accessed either by helicopter, boat, the Eskay Creek Mine road, snowmobile (in the winter), or by traversing through difficult terrain (Appendix 23-A, Appendix 30-B).

Three commercial recreation licence holders are likely to change how they access their tenures due to the development of the Project: Bear Mountaineering, Last Frontier Heliskiing, and guide outfitter licence holder #601066. Last Frontier Heliskiing will likely be unable to use ski routes located within the PTMA and Mine Site area due to proposed Project developments, resulting in a shift of use within their licence area. The LSA overlaps with 6.8% of the tenure area for Last Frontier Heliskiing. The Mine Site and process plant overlap four ski runs (Oh Be Gosh, Mitchell Creek, Lakeside, and Empress). The PTMA intersects approximately 11 additional ski runs. Likewise, Bear Enterprises, who operate a guided mountaineering route through the RSA and LSA, will likely adjust their route in order to avoid contact with any Project areas.

Guide outfitters licence holder #601066 will likely be unable to use the LSA or regions within the RSA adjacent to the LSA. Approximately 8% of the guide outfitting licence area overlaps with the LSA and would no longer be accessible, and 23% overlaps with the RSA. The area surrounding the PTMA was noted during baseline interviews to be a frequently used for wildlife hunting by Misty Mountain Outfitters, the former guide outfitter for this licence area (D. Drinnan, pers. comm.). Neither of the other two guide outfitters operating in the area currently use the regions of their licence areas that overlap with the RSA (H. Gutfrucht; R. Milligan, pers. comm.).

Table 23.7-1. Potential Residual Effects on Land Use Valued Components due to Restriction on Access to Land and Resources

VC	Timing Start	Project Area(s)	Component(s)	Description of Effect due to Component(s)	Type of Project Mitigation	Project Mitigation Description	Potential Residual Effect	Description of Residuals
Commercial Recreation, Guide Outfitting and Trapping	All	All	All	Altered or diminished access to land and resources for commercial and recreation licence areas overlapping the LSA.	Management Practices, Monitoring and Adaptive Management	Access Management Plan; Monitoring and Adaptive Management; Negotiated Agreements	Yes	Access to certain areas within commercial license tenures will remain restricted.
Recreational Hunting and Fishing	All	All	All	Altered or diminished access to land and resources for recreational purposes.	Management Practices, Monitoring and Adaptive Management	Access Management Plan; Monitoring and Adaptive Management	No	
Subsistence	All	All	All	Subsistence land users will avoid, or have restricted access to the LSA for harvesting purposes.	Management Practices, Monitoring and Adaptive Management	Access Management Plan; Monitoring and Adaptive Management; Negotiated Agreements	Yes	Access to certain subsistence areas, including traplines 617T015 and 617T011, will remain restricted.
Traditional/Heritage Value of the Land	All	All	All	Aboriginal practices, traditions or customs may be affected within the LSA and RSA as a result of access restrictions.	Management Practices, Monitoring and Adaptive Management	Access Management Plan; Monitoring and Adaptive Management	No	
Mining and Mineral Exploration	Construction	Mitchell-Teigen Tunnel Saddle Area; Mitchell-Teigen (South) Tunnel Portal and Ore Preparation Complex Area	East Saddle Portal and West Saddle Portal	Sterilization of mineral and placer claims due to development Project infrastructure.	Management Practice	Negotiated agreements	No	

Four trapline holders may experience restrictions in access to their tenure areas. Development of the Coulter Creek access road may alter access for Trapline 621T001 which overlaps 0.9% of the LSA. The RSA also overlaps with almost 68% of trapline 621T001; however, there is no overlap with any Project infrastructure. The Mine Site area will also alter access for trapline 621T003; however, this trapline showed no evidence of use in recent years (Appendix 23-A). Trapline holders will still be able to access areas within their tenures outside of the LSA. Finally, portions of traplines registered to the Skii km Lax Ha, including 617T015 and 616T011, will be inaccessible due to the construction of the Treaty Creek access road and the PTMA. Potential effects on these two traplines are discussed in Section 23.7.1.5, Subsistence.

Residual adverse effects are anticipated on two commercial recreation licence holders:

- Guide outfitting licence #601066 will lose access to 8% of their licence area, including overlap with the PTMA and access roads, which were indicated to be frequented regions for hunting purposes.
- Last Frontier Heliskiing will lose access to approximately 61,450 ha (6.8%) of their total licence area (904,355 ha), or 15 ski runs. However, their licence area includes over 400 runs in northwest BC, some of which are added to and/or modified each year.

Although commercial recreation licence holders will be unable to access some of their tenure, their geographic area is enough for them to carry out activities in other parts of their tenure. Commercial recreation licences do not provide a tenure holder with exclusive rights to the area covered by the tenure.

No residual adverse effects are anticipated on Bear Mountaineering and trapline holders as follows:

- Trapline 621T001 does not overlap with Project infrastructure and has a nominal (0.9%) overlap with the LSA. Trapline 621T003 has not registered any activity in over 10 years.
- Based on baseline interviews, Bear Mountaineering rarely use the RSA for hiking activities and could pursue these activities elsewhere within their licence area. Commercial interests for Bear Mountaineering were not contingent on exclusive uses within the RSA or LSA.

23.7.1.4 Recreational Hunting and Fishing: Potential Residual Effects due to Public Access Restrictions

Development of the proposed Project during construction will potentially affect access by recreational and non-tenured land users, including hunters and fishers (anglers) within the LSA. The presence of infrastructure and barriers within the LSA may decrease the total land area that certain land users could access. The RSA also overlaps between 1 and 26% of WMUs 6-16, 6-17, and 6-21. Resident hunters in the WMUs have typically focused on moose hunting, with some bear hunting also occurring (Appendix 23-A).

As noted in Section 23.7.1.3, baseline interviews indicated that the RSA is currently accessed either by helicopter, boat, the Eskay Creek Mine road, snowmobile (in winter), or by traversing through difficult terrain (Appendix 23-A, Appendix 30-B). Baseline studies did not identify

specific resident hunting activities occurring within the LSA or RSA; however, these activities are possible given the prevalence of moose and bear hunting in the WMUs, which overlap with the RSA. Angling occurs along the Bell-Irving River in the RSA. Both Spey Lodge and independent operators located out of Bell 2 Lodge offer recreational angling opportunities.

Residual effects to recreational hunting and fishing are not anticipated following mitigation. Although a restriction on access may occur for hunters, current data suggest negligible usage of the RSA with access corridors difficult to predict. Further, resident hunters are also not anticipated to be adversely affected as moose and bear hunting can be pursued elsewhere within the larger WMU areas. Finally, Project infrastructure will not limit access to the Bell-Irving River, or other fish bearing streams of recreational interest (Fish and Aquatic Habitat, Chapter 15).

23.7.1.5 Subsistence: Potential Residual Effects due to Public Access Restrictions

A change in access can potentially affect subsistence users directly and indirectly. Direct effects to subsistence users could occur if access is restricted to prevent harvest activities from taking place. Effects may include diminished harvestable resources due to the presence of proposed Project components, and the requirement to avoid certain areas due to barriers or safety hazards.

Subsistence users in the LSA and RSA include members of the Skii km Lax Ha. The Skii km Lax Ha currently harvest fish (steelhead and salmon) and wildlife, and have a total of 18 traditional and current use sites within the LSA, nine of which directly overlap potential Project infrastructure. No cabin sites, however, lie within the infrastructure footprint. An additional 22 traditional and current use sites fall within the boundaries of the RSA. (see the *Skii km Lax Ha Traditional Knowledge and Use Research Report*, Appendix 30-B).

There is a trail in the area of the Mitchell-Treaty Twinned Tunnels and a harvesting area spans the Treaty Creek headwaters to Teigen Lake. However, as the tunnel would be 1 km under the ground, harvesting areas on the ground should not be affected. The Treaty Creek access road runs along Treaty Creek, which is an important travel corridor and hunting and trapping area. Cabins were located along Treaty Creek at the North Treaty Creek confluence and at Gilbert Lake. The Gilbert Lake harvesting areas are also located along the Treaty Creek access road. The PTMA overlaps the North Treaty Creek travel corridor and harvesting area.

The eastern limit of the LSA, which crosses over the Bell-Irving River, overlaps with the Awiijii area, which is still used by the Skii km Lax Ha for hunting, trapping, fishing, and gathering. A Skii km Lax Ha cabin and smokehouse is located within the eastern limit of the LSA and are used to support harvesting activities; however, neither will be affected by any infrastructure components.

One of the most important harvesting routes for the Skii km Lax Ha is along the north side of Mount Anderson, which overlooks Bowser Lake. A trail from Bowser Lake through this area passes by Todedada Lake where a cabin is also located. The trail continues north along Todedada Creek to Gilbert Lake and the Treaty Creek valley.

The RSA overlaps approximately 47 and 32% of traplines 616T011 and 617T015, respectively, including portions of the PTMA and access road in the LSA. Both traplines are currently held by members of the Skii km Lax Ha, though they have not actively trapped in these areas since 2009 (Appendix 30-B).

The Project's RSA is also partially located within the traditional territory of the Tahltan Nation and Gitanyow First Nation, as well as the Nass Area (see Section 23.1.4.3). Baseline studies did not reveal subsistence activities by members of these Aboriginal groups within the RSA, although activities could occur in the future. Anecdotal observations from land use licence holders suggest that areas near the Eskay Creek Mine road may be utilized by Tahltan members for pine mushroom harvesting (D. Drinnan; R. Green, pers. comm.).

Mitigation measures, including monitoring and adaptive management, will help to reduce potential adverse effects on subsistence users. The Skii km Lax Ha will continue to be affected by restricted access as Project-related infrastructure, roads, vehicles and access restrictions within the LSA will result in Skii km Lax Ha members moving elsewhere to pursue harvesting activities. In addition, trapline areas of overlap with the PTMA and access roads will no longer be accessible. Although a residual effect is predicted, subsistence harvest areas identified within the RSA would continue to be accessible.

23.7.1.6 Traditional/Heritage Value of Land: Potential Residual Effects due to Access Restrictions

Traditional/heritage value of the land relates to Aboriginal practices, customs, and traditions that may occur within a certain land area. Subsistence activities, although linked to cultural practices and customs, are discussed separately in Section 23.7.2.5. Potentially affected groups include Nisga'a Nation, Gitanyow First Nation, Tahltan Nation, and Skii km Lax Ha, as the land use RSA overlaps with portions of the Nass Area as well as the respective traditional territories for these Aboriginal groups (see Section 23.1.4.3).

Baseline studies did not identify any Aboriginal practices, customs, or traditions outside of subsistence use within the land use study areas (Appendices 23-A, and 30-A to 30-D). However, potential effects also relate to the possibility that such customs and practices may be pursued within their traditional territories at some point in the future.

Restrictions on access to land and resources are not anticipated to result in a residual effect on the above land users as traditional and current uses by subsistence users were not identified. Further, the Treaty Creek site (Borden number HdTj-1), located to the south of the proposed Treaty Creek access road, is designated as a provincial Heritage Site and is subject to protection under the *Heritage Conservation Act* (1996b). As such, the site will remain accessible. No residual effect is predicted for traditional/heritage value of the land as a result of restrictions on access to land and resources.

23.7.1.7 Mining and Mineral Exploration: Potential Residual Effects due to Public Access Restrictions

In addition to Seabridge, the RSA includes 40 existing mineral claims holders, as well as four placer claims (Figures 23.1-11 and 23.1-12 respectively). The Proponent and Pretivm have an agreement in place to offset potential adverse impact to Pretivm's claims as a result of Project

infrastructure and activities. If required, the Proponent will attempt to reach agreements with other mineral tenures holders whose claims are impacted by the Project.

No negative residual adverse effects of change in access are predicted on mining and mineral exploration.

23.7.1.8 Navigable Waters: Potential Residual Effects due to Restrictions on Access

The following section provides a summary of the results from the Navigable Waters Effects Assessment (Chapter 31). Restricted or lost access to navigable waters occurs as a result of the elimination of a stream or stream reaches due to the presence of Project infrastructure or significant diversion of water flows. Waterbodies will be completely or partially eliminated at both the Mine Site and PTMA.

Four residual effects on navigation for the Project on the Bell-Irving and Unuk rivers are anticipated following mitigation (Table 31.7-2). Navigation on the Unuk River will be affected by building (during construction) and decommissioning (post-closure) activities of the Coulter Creek access road bridge, associated with temporary access restrictions and safety obstacles at the site. The bridge may also create residual safety effects during infrequent periods of high flow, during which mid-bridge supports would act as in-stream works and obstacles. These residual effects are most likely to be experienced by river rafters with the Explorers League—the single identified commercial recreation user—and any other potential future users, but these safety effects are unlikely as most rafting would be done during warm months with lower flows. No other commercial, recreational, or subsistence user groups were identified during baseline studies as being potentially affected by these temporary residual effects.

Construction of the Treaty Creek access road bridge crossing over the Bell-Irving River is expected to create similar residual effects on navigation related to access and safety as the Unuk River bridge. However, as this crossing will be permanent it will not have temporary effects during decommissioning. Recreational and commercial anglers along the Bell-Irving River, Aboriginal users, and other potential commercial users may be adversely affected by any temporary changes in navigation at this crossing.

23.7.2 Change in Sensory Disturbances

The Project will contribute to a change in sensory disturbances in the LSA during construction, operation, and closure due to the presence of noise and light from vehicles and facilities (see Chapter 19, Noise). A change in sensory disturbances may also extend to areas of the RSA due to the presence of road and helicopter traffic, heavy equipment operation, and blasting activities in the LSA which will also be audible in areas of the RSA. Sensory disturbances from Project-related activities may alter the behaviour of land users as well as the behavioural patterns of wildlife species that influence certain land use activities (see Chapter 18, Wildlife and Wildlife Habitat). Four VCs may be affected by a change in sensory disturbances, including: commercial recreation, guide-outfitting, and trapping; recreational hunting and fishing; subsistence; and traditional/heritage value of the land (Table 23.7-2). Sensory disturbances are not predicted to be an effect for water licences, mining and mineral exploration, or navigable waters VCs as these land use activities are not predicated on the presence or absence of such disturbances.

Table 23.7-2. Potential Residual Effects on Land Use Valued Components due to Change in Sensory Disturbances

VC	Timing Start	Project Area(s)	Component(s)	Description of Effect due to Component(s)	Type of Project Mitigation	Project Mitigation Description	Potential Residual Effect	Description of Residuals
Commercial Recreation, Guide Outfitting, and Trapping	Construction, Operations, Closure	All	All	Noise, traffic and visibility of project-related infrastructure may decrease quality of experience for land users and lead to reduced economic opportunities for commercial licence holders. Sensory disturbances may affect wildlife resources which influence commercial recreation harvest activities.	Management Practices, Monitoring, and Adaptive Management	Traffic Management Plan; Noise Management Plan; Visual Quality Mitigation	Yes	Noise and visibility of project-related infrastructure and traffic in the landscape could alter practice areas and/or reduce economic opportunities for commercial licence holders due to a perceived reduction in the quality of the land user experience.
Recreational Hunting and Fishing	Construction, Operations, Closure	All	All	Noise, traffic and visibility of project-related infrastructure may decrease quality of experience for land users. Sensory disturbances may affect wildlife resources.	Management Practices, Monitoring, and Adaptive Management	Traffic Management Plan; Noise Management Plan; Visual Quality Mitigation	No	
Subsistence	Construction, Operations, Closure	All	All	Sensory disturbances (noise, visual) may affect wildlife resources which subsistence harvest activities rely on.	Management Practices, Monitoring, and Adaptive Management	Traffic Management Plan; Noise Management Plan; Visual Quality Mitigation	No	
Traditional/Heritage Value of the Land	Construction, Operations, Closure	All	All	Aboriginal practices, traditions, or customs may be affected as a result of sensory disturbances to land users and wildlife.	Management Practices, Monitoring, and Adaptive Management	Traffic Management Plan; Noise Management Plan; Visual Quality Mitigation	No	

The three main forms of sensory disturbance associated with the Project are noise, light, and visual/aesthetic. The wildlife and wildlife habitat effects assessment (Chapter 18) identified eight species that could be affected by sensory disturbances, including four which are hunted by guide outfitters, First Nations, and resident hunters within the RSA. These include moose, mountain goats, grizzly bears, and black bears. Other potentially affected wildlife species are not actively harvested by land users within the LSA or RSA and are, therefore, not considered further in this assessment.

Noise

During construction, potential sources of Project noise include vehicle traffic, vegetation clearing, and infrastructure development. Instantaneous noise includes construction blasting and helicopter overflights. During operation, potential sources of Project noise include vehicle and haul traffic, the Treaty Process Plant, and industrial day-to-day operations, while instantaneous noise includes helicopter overflights, blasting in pits, explosives, and avalanche control. Noise during the closure phase relates to vehicle traffic and land clearing efforts during reclamation.

Land users are not anticipated to be affected by regular Project-related noise within the LSA, as they will no longer have access to this area. Within the RSA, human receptors will not be affected by continuous Project noise related to vehicles and equipment since the levels are equivalent to the assumed baseline noise levels (L_d 35 dBA and L_n 25 dBA; Chapter 19, Noise Effects Assessment). However, helicopter and blasting events are expected to be audible off-site and within the RSA, though noise levels are predicted to be below the 120 dB L_{peak} guideline outside the Mine Site during both the construction and operation phases. Health Canada (2011) considers that adequate speech communication and minimal activity interference can be obtained with outdoor L_{dn} noise levels of 55 dBA.

With respect to wildlife, the disturbance may cause animals to abandon a portion of their current range and relocate elsewhere within the RSA or further (Chapter 18, Wildlife and Wildlife Habitat). However, in some rare cases, habituation and adaptation can allow wildlife to accommodate the presence of noise in their environment. Noise can also mask the sounds that animals use to find prey, mates, and avoid predators.

Light

Potential effects related to lights are predicted to be restricted to amphibians and birds (Chapter 18, Wildlife and Wildlife Habitat) which, according to baseline studies (Appendix 23-A), are not harvested by land users within the LSA or RSA. Further, artificial lighting will primarily be used for nocturnal activities, during which land users do not typically access or use their licence areas. Sensory disturbances related to light is, therefore, not anticipated to result in an adverse effect on land users and consequently not considered further in this assessment.

Visual/Aesthetic

Visual/aesthetic disturbances relate to the visibility of Project-infrastructure within the RSA (Chapter 24, Visual and Aesthetic Resources). Certain commercial recreation land users, including rafters, heli-skiers, anglers, and hunters choose to pursue their activities within the RSA due to the nature of the existing wilderness. During baseline studies, stakeholders identified the experience of undeveloped wilderness as an important element to their personal and

commercial use of areas within the RSA. Consequently, it is expected that disturbances due to the presence of Project infrastructure, as well as road and helicopter traffic, will have an adverse effect on the quality of the recreational experience.

23.7.2.1 Mitigation for Sensory Disturbances

Potential adverse effects to land users within the LSA as a result of a change in sensory disturbances is not predicted as access to this area will be closed to the public and use monitored and controlled. As such, the mitigation identified for changes in sensory disturbances relate to wildlife mortality and disruption of movement, as well as land user access within the RSA.

Management plans, monitoring, and adaptive management will be implemented to mitigate the adverse effects due to changes in sensory disturbances, including a Noise Management Plan (Section 26.22), Traffic and Access Management Plan (Section 26.25), and Visual Quality Management Plan (Chapter 26, Section 26.24).

During construction and operation, wildlife may be disturbed by traffic noise and mine operation noise (e.g., blasting, haul trucks, and Treaty Process Plant). A Noise Management Plan (Chapter 26.22) will be developed with the objective to ensure that noise levels during all phases of the Project are acceptably low for human and wildlife receptors and receptors of concern in the vicinity of the Project, as per human health guidelines (Health Canada 2011).

Noise that may affect land users (outside of activities at the Mine Site and PTMA) will be produced by transportation activities along Highway 37 and 37A and access roads. Noise reduction is directly related to the operation and type of vehicles used for the Project as noise concerns are mainly attributable to engine type and size. Potential noise effects from the Project will be mitigated by:

- minimizing the number of trips required;
- reducing speeds to 50 km/hour near settlement areas (i.e., Bell II);
- adhering to a truck maintenance program;
- following maintenance procedures and schedules provided by vehicle manufacturers;
- using vehicle noise suppression technologies where possible;
- avoiding the use of engine brakes and reversing alarms near communities; and
- providing noise awareness training for Project transportation personnel.

Access to the Project site and the immediate area will also be restricted; therefore, land users should not experience effects from noise created by mining activities. More details on the elements contained as part of the Traffic and Access Management Plan are provided in Section 26.25.

Project development and operation, as well as the road and the transmission lines, will alter the visual quality within the RSA. A number of visual quality mitigation measures will be implemented:

- Road designs will reduce effects on the appearance of natural landscape wherever practical.
- Tree buffers will be maintained on either side of the access roads, where possible.
- Tree buffers will be maintained around major infrastructure when infrastructure is potentially in view of land user areas, where possible.
- Non-essential roads and infrastructure will be reclaimed and re-vegetated during closure.

23.7.2.2 Potential for Residual Effects

Four of the six land and resource use VCs are potentially affected by change in sensory disturbances: commercial recreation, guide outfitting and trapping; recreational hunting and fishing; subsistence; and traditional/heritage value of the land (Sections 23.7.2.3 to 23.7.2.5). Based on information about location, seasonality, and frequency of land use collected during land use baseline studies, and following the implementation of mitigation and management plans, a residual effect is predicted for commercial recreation, guide outfitting, and trapping (Table 23.7-2).

23.7.2.3 Commercial Recreation, Guide Outfitting, and Trapping: Potential Residual Effects due to Change in Sensory Disturbances

Trapline, commercial recreation, and guide outfitting stakeholders interviewed during baseline studies cited the undeveloped wilderness as an important aspect to their use of areas within the RSA. Trapline stakeholders also cited this as an important aspect of the enjoyment of their licence areas, whereas commercial recreationists and guide outfitters noted the reliance of their business on the RSA's relatively undeveloped natural landscape (Appendix 23-A).

Sensory disturbances due to the presence of road and helicopter traffic, as well as Project infrastructure components, are expected to have a negative effect on the quality of the natural environment. Such disturbances to wildlife may disrupt wildlife movement or facilitate the abandonment of their current range, thereby indirectly affecting hunters and trappers who have come to rely on their predictive knowledge of their licence areas. Potentially affected species include, but are not limited to, moose, black bears, grizzly bears, and mountain goats (Chapter 18, Wildlife and Wildlife Habitat). Change in sensory disturbances due to Project development is therefore anticipated to induce these stakeholders to alter or abandon use of certain areas in order to preserve the wilderness perspective of their customers.

Five commercial stakeholder tenure holders may alter how they access their licence areas due to sensory disturbances related to the Project. These include guide outfitting licence #601066, Last Frontier Heliskiing, Spey Lodge, Bear Enterprises (mountaineering), and The Explorer's League. Potential effects for these stakeholders relate to changes in noise and aesthetic disturbances.

Noise

During construction and operation, off-site human receptors within the RSA are not predicted to be affected by Project noise since the levels are equivalent to the assumed baseline noise levels (L_d 35 dBA and L_n 25 dBA; Chapter 19, Noise Effects Assessment). Trucks hauling concentrates, mine supplies, and personnel along the highways will be a source of noise.

Project-related noise will continue during closure because of clearing and reclamation activities, and periodic helicopter traffic. The rate at which this truck noise will attenuate along the highway will depend to some extent on ground cover and atmospheric conditions. Moose and bears—species of interest for resident hunters and guide outfitters—have been shown to be sensitive to sensory disturbances (Chapter 18, Wildlife and Wildlife Habitat). The likelihood of sensory disturbance to moose is possible, but the severity is negligible, as no detectable change is expected. Bears can likely habituate to road traffic noise over time (McLellan and Shackleton 1989), particularly if the traffic patterns are predictable and consistent. The likelihood of sensory disturbance to bears is possible, but the severity is negligible, as no detectable change in bear distribution or behaviour is expected. Fish are not predicted to be affected by Project-related change in sensory disturbances (Chapter 15, Fish and Aquatic Habitat).

Event noise levels associated with blasting and helicopter flybys were not shown to significantly increase the noise levels when combined with the total continuous Project noise to the extent that off-site human receptors are likely to become annoyed or complain (Chapter 19, Noise). In addition, the Noise Management Plan (Section 26.22) will help ensure that noise levels during all phases of the Project are acceptably low for human receptors onsite and in the vicinity of the Project. Mountain goats however—another species of hunting interest—are anticipated to be adversely affected as a result of blasting and avalanche control within the LSA (Chapter 18, Wildlife and Wildlife Habitat).

An adverse effect due to a change in sensory disturbances related to noise is not anticipated during post-closure as Project-related activities will have largely ceased.

Mitigation measures are identified to address potential adverse effects on wildlife. Mitigation efforts in the Wildlife Management Plan (Section 26.21), including measures aimed at the avoidance of critical habitat by helicopter traffic, as well as the Noise Management Plan (Section 26.22), and the Traffic and Access Management Plan (Section 26.25) will reduce the effects of a change in sensory disturbances on local wildlife resources. Following mitigation and monitoring, no residual adverse effect is predicted for moose, grizzly bears, and black bears; however, a potential residual adverse effect is predicted for mountain goats (Chapter 18, Wildlife and Wildlife Habitat Effects Assessment). Consequently, no residual adverse effect as a result of change in sensory disturbances is expected for guide outfitters as predicted residual effects are limited to one species, mountain goats, within the LSA (Appendix 23-A). Further, sensory disturbances will not directly affect mountain goat mortality, and mountain goats can also be found in other areas within the Project RSA and are only hunted on an occasional basis by one guide outfitter (Appendix 23-A).

Visual and Aesthetic Resources

A number of aesthetic disturbances are predicted which could affect land users differently at different times. These include (Chapter 24, Visual and Aesthetic Resources):

- Explorers League rafting on the Unuk River will be able to see the bridge and Coulter Creek access road, as well as related traffic, during their rafting expeditions (typically occurring about once every two years). Both the bridge and the road will be removed and reclaimed at closure and post-closure.

- The Treaty Creek access road, bridge, and transmission line right-of-way will be visible from Highway 37 and from adjacent areas of the Bell-Irving River where anglers, including Spey Lodge and operators our of Bell 2 Lodge, may currently fish.
- Last Frontier Heliskiing and Bear Enterprises will have visual access from ski runs and hiking trails to Project components, though these will be viewed from several kilometres away and limited to areas near Knipple Glacier and Treaty Creek. Bear Enterprises and Last Frontier Heliskiing may alter their access areas in order to avoid visual and audible contact with any proposed Project areas.
- Guide outfitters licence holder #601066 may be affected as guide outfitting businesses rely on providing a wilderness landscape experience to clients and will likely be unable to use the LSA or areas within the RSA where Project infrastructure may be visible.

Trappers are not anticipated to be affected, as wildlife species harvested through trapping activities in the RSA are not predicted to be affected by a change in sensory disturbances (Chapter 18, Wildlife and Wildlife Habitat).

Mitigation measures proposed in the visual and aesthetic resources effects assessment (Chapter 24) and noise effects assessment (Chapter 19) will also diminish potential effects from a change in sensory disturbances for Bear Enterprises, the Explorers League, and Last Frontier Heliskiing. However, a potential residual adverse effect is predicted for these commercial licence holders as economic interests in their licence areas is directly linked to the quality of the natural environment. Project components will remain visible within certain areas of the RSA following mitigation, which may cause these stakeholders to reduce, alter, or otherwise change their use of the area. However, commercial recreation licences are not based on exclusive rights to use the area within their tenures.

23.7.2.4 Recreational Hunting and Fishing: Potential Residual Effects due to Change in Sensory Disturbances

Hunters and fishers who pursue these activities on a recreational basis may be indirectly affected by a change in sensory disturbances because of potential behavioural and movement changes to wildlife resources. Direct noise effects on these land users are not predicted, as individuals will be restricted from accessing the LSA and, within the RSA, will be exposed to noise levels equivalent to the assumed baseline noise levels (Chapter 19, Noise; Section 23.7.3). Further, due to the large area in which recreational land users may pursue their activities, as well as the temporary nature of their activities, a residual adverse effect from direct exposure to noise is unlikely. Aesthetic disturbances in the landscape are not predicted to adversely affect recreational hunting and fishing activities (Chapter 24, Visual and Aesthetic Resources).

Hunting resources of interest to resident hunters, notably moose (Appendix 23-A), may be affected by Project-related change in sensory disturbances, as defined in the wildlife and wildlife habitat effects assessment (Chapter 18). Fish are not predicted to be affected by Project-related change in sensory disturbances (Chapter 15, Fish and Aquatic Habitat).

Mitigation has been identified to address potential adverse effects on wildlife. Mitigation efforts in the Wildlife Management Plan (Section 26.21), including measures aimed at the avoidance of critical habitat by helicopter traffic, as well as the Noise Management Plan (Section 26.22), and Traffic and Access Management Plan (Section 26.25) will reduce the effects of a change in sensory disturbances on local wildlife resources. As a result, following mitigation and monitoring, no residual adverse effect is predicted for moose, grizzly bears, and black bears (Chapter 18, Wildlife and Wildlife Habitat). Consequently, no residual effect because of change in sensory disturbances is expected for recreational hunting and fishing in the RSA.

23.7.2.5 Subsistence: Potential Residual Effects due to Change in Sensory Disturbances

Similar to commercial hunters and trappers, subsistence users may be indirectly affected by a change in sensory disturbances because of potential behavioural and movement changes to wildlife and fish resources. Direct noise effects on subsistence users outside of the LSA are not predicted as individuals will be exposed to noise levels equivalent to the assumed baseline noise levels (Chapter 19, Noise; Section 23.7.3). Helicopter and road traffic necessary during all Project phases, though concentrated during the construction and operation phases, will be focused around specific components. Event noise levels associated with blasting and helicopter flybys were not shown to significantly increase the noise levels to the extent that off-site human receptors are likely to become annoyed or complain (Section 23.7.3.3). Further, due to the large area in which subsistence users may harvest, as well as the temporary nature of their activities, a residual adverse effect from direct exposure to noise is unlikely. Aesthetic disturbances in the landscape are not predicted to adversely affect subsistence activities (Chapter 24, Visual and Aesthetic Resources).

Harvest resources of interest to subsistence users, including moose, grizzly bears, black bears, American marten, and hoary marmots, may be affected by Project-related change in sensory disturbances, as defined in the wildlife and wildlife habitat effects assessment (Chapter 18). Moose, in particular, is the big-game species of high value to subsistence users (Appendices 30-A to 30-D). Fish are not predicted to be affected by Project-related change in sensory disturbances (Chapter 15, Fish and Aquatic Habitat).

Mitigation has been identified to address potential adverse effects on wildlife. Mitigation efforts in the Wildlife Management Plan (Section 26.21), including measures aimed at the avoidance of critical habitat by helicopter traffic, as well as the Noise Management Plan (Section 26.22), and Traffic and Access Management Plan (Section 26.25) will reduce the effects of a change in sensory disturbances on local wildlife resources. As a result, following mitigation and monitoring, no residual adverse effect is predicted for moose, grizzly bears, and black bears (Chapter 18, Wildlife and Wildlife Habitat). Further, based on wildlife habitat and range, American marten and hoary marmots are also not anticipated to be adversely affected. No residual adverse effect because of change in sensory disturbances is expected for subsistence users in the RSA.

23.7.2.6 Traditional/Heritage Value of Land: Potential Residual Effects due to Change in Sensory Disturbances

Baseline studies did not identify any Aboriginal practices, customs, or traditions outside of subsistence use within the land use study areas (Appendix 23-A; Appendices 30-A to 30-D). However, potential effects from a change in sensory disturbances also relate to the possibility that such customs and practices may be pursued at some point in the future. Land users that may be potentially affected by a change in sensory disturbances include Nisga'a Nation, Gitanyow First Nation, Tahltan Nation, and Skii km Lax Ha as the land use RSA overlaps with portions of the Nass Area as well as the respective traditional territories for these Aboriginal groups (Section 23.1.4.3).

In all cases, the presence of the proposed Project may create a negative effect on the traditional/heritage values due to the perceived interaction with the Project through sensory disturbances. Mitigation measures, including strategies directed at reducing the presence of noise and visual encounters, are detailed within the Noise Management Plan (Section 26.22), and Visual and Aesthetic Resources Effects Assessment (Chapter 24).

Direct noise effects on these Aboriginal groups are not predicted as individuals will be exposed to noise levels equivalent to the assumed baseline noise levels (Chapter 19, Noise; Section 23.7.3). Event noise levels associated with blasting and helicopter flybys were not shown to increase significantly the noise levels to the extent that off-site human receptors are likely to become annoyed or complain (Section 23.7.3.3). Further, due to the large area in which cultural or traditional practices may occur, as well as the temporary nature of their activities, a residual adverse effect from change in sensory disturbances, including noise and aesthetic, is not predicted.

23.7.3 Change in the Amount of Resources

The proposed Project will be developed in an area that is characterized by remote and relatively undeveloped wilderness. Land users in the Project study areas—including subsistence users, commercial recreationists, and hunters and trappers—rely on the wildlife, fish, and aquatic and vegetative resources provided by the wilderness environment in order to carry out their activities. Development of the Project will likely contribute to a change in the quantity of these harvest resources due to a number of related factors. For instance, the development of Project roads and infrastructure in the LSA during construction will contribute to a loss or degradation of habitat, decrease in vegetative ecosystems, and disruption of wildlife movement. Finally, the Project's presence could also contribute to a change in the amount of resources by opening up wildlife resources to increased pressures by facilitating hunting, trapping, and fishing pursuits and through wildlife mortality as a result of vehicle collisions. Change in the amount of resources is not expected to have an effect on navigable waters. Sensory disturbances in both the LSA and RSA—including noise, visual, and light—may also alter the behaviour and presence of certain wildlife species and is assessed separately in Section 23.7.2.

Habitat Loss/Vegetative Ecosystems

Potential effects related to habitat loss or degradation, including the loss of vegetative ecosystems, are predicted to be most present during construction and operation due to ongoing Project activities, and continue during closure as a result of reclamation activities

(see Chapter 17, Terrestrial Ecosystems; Chapter 18, Wildlife and Wildlife Habitat). Potential effects may carry through the post-closure phase, albeit to a diminished degree, in areas where Project components are not reclaimed. However, in post-closure a potential increase in the quantity of resources is likely compared to operation, as many Project areas are re-vegetated.

Opening Up of Resources

The Project may open up resources to increased pressures through the development of new roads, the upgrading and year-round maintenance of existing roads, as well as the development of new rights-of-ways, in areas of the LSA with little existing infrastructure. The proposed Project design includes the development of three new access roads: Treaty Creek (from Highway 37), Coulter Creek (from the existing Eskay Creek Mine road), and the Temporary Frank Mackie Glacier access route (from the abandoned Granduc Mine mill site). Project-related service and maintenance roads will also connect to these corridors. Each of these new roads may facilitate access to proposed Project development areas as well as other regions within the LSA or RSA. Further, the development of a transmission line right-of-way will also involve clearing a forest corridor from Highway 37, potentially facilitating access to areas within the RSA via snowmobiles, ATVs, or on foot. The opening up of resources to increased pressures may also occur during construction and operation phases due to the presence of Project staff and contractors in formerly remote areas, as well as non-licensed or non-registered land users who may choose to ignore Project signs and bypass barriers in order to gain entrance to the RSA via LSA corridors.

The opening up of resources is predicted to continue during closure and post-closure despite the reduction in Project-related staff and activities. The Treaty Creek access road and Treaty Creek Transmission Line right-of-way will continue to provide access corridors for non-licenced land users in both the LSA and RSA during these phases. Further, non-licenced land users may continue to access the LSA and RSA because of the decreased presence of Project staff and vehicles to act as a deterrent, thereby facilitating hunting, trapping, and fishing pursuits. Interviews conducted with trapline owners during baseline studies, for instance, indicated that resident hunters and trappers currently use the Eskay Creek Mine road for harvest access despite the presence of barriers (D. Drinnan; D. Green pers. comm.).

The opening up of resources has been identified as a concern by Nisga'a Nation, First Nations, and tenured land users because the RSA has historically been a remote and relatively inaccessible environment. The opening up of resources during all phases could affect wildlife and fishing resources in remote areas, as well as land users who harvest them, by facilitating hunting, trapping, and fishing pursuits.

Vehicle Traffic

The Project is anticipated to contribute to a change in traffic volume within the RSA along Highway 37, as well as both access roads within the LSA. Potential effects relate to adverse traffic impacts on wildlife harvest resources, including disruption of movement and direct mortality, as many land users, particularly hunters and trappers, adapt their activities based on the presence and habits of wildlife resources. Species that are harvested in the LSA or RSA, which could be affected by a change in traffic, include mountain goat, black bear, grizzly bear,

and moose (Chapter 18, Wildlife and Wildlife Habitat). Potential effects to land user safety because of an increase in vehicle traffic are assessed in Chapter 25, Human Health.

The Project will contribute to a change in traffic volume, as it will require the use of vehicles during the construction, operation, and closure phases 365 days a year and 24 hours per day. The estimated number of vehicles on each road per day and per hour are summarized in Table 23.7-3.

Table 23.7-3. KSM Project Vehicle Traffic (One-way Trips) during Construction, Operation, Closure, and Post-closure Phases

	Number of KSM Project Vehicles per Day and per Hour (Traffic 365 Days/Year and 24 Hours/Day)					
	Coulter Road		Treaty Road		Highway 37	
Project Phase	#/day	#/hr	#/day	#/hr	#/day	#/hr
Construction (Average)	8	0.3	14	0.6	22	0.9
Operation (Average)	3	0.1	82	3.4	85	3.5
Closure (Average)	0	0	16	0.7	16	0.7
Post-closure (Average)	0	0	6	0.3	6	0.3

During construction, the project will add an average annual 22 trips per day within the RSA along Highway 37, including flat-deck trucks, enclosed trailers, bulk tankers, as well as bus and passenger vehicles (Appendix 22-C, Highway 37 and 37A Traffic Effects Assessment). Within the LSA, an estimated 14 vehicles will turn off and use the Treaty Creek access road daily, and the remaining eight vehicles will travel along the Eskay Creek Mine road/Coulter Creek access road (Table 23.7-3).

For operations, an estimated 85 average annual trips per day will occur along Highway 37, with 82 vehicles within the LSA using the Treaty Creek access road, and the remaining 3 vehicles on the Eskay Creek Mine road/Coulter Creek access road (Table 23.7-3). Vehicles will include flat-deck trucks, enclosed trailers, bulk tankers, Super-B trains and trucks, Bulk-B trains, as well as bus and passenger vehicles.

A change in traffic is also anticipated during the closure phase, although to a reduced degree. Total average annual trips per day are estimated to drop from 85 during operation to 16 at closure, of which all vehicles will use the Treaty Creek access road (Table 23.7-1). The Coulter Creek access road will be closed to vehicles and partially reclaimed during this phase.

Vehicle traffic at the post-closure phase is anticipated to drop further to an estimated six trucks per day along Highway 37 and the Treaty Creek access road. The change in traffic from an estimated 16 vehicles per day to 6 vehicles per day at the onset of post-closure is not anticipated to have an effect and is therefore not assessed further.

23.7.3.1 Mitigation for Change in the Amount of Resources

A change in the amount of resources is dependent on a number of Project factors that could potentially affect land users as well as wildlife, fish, and vegetative resources within the Project study areas. A number of inter-related management plans as well as monitoring and adaptive management and negotiated agreements, if necessary, will be implemented to mitigate changes in the quantity of resources.

Potential effects from Project development and traffic on wildlife, fish, and aquatic resources will be mitigated through the Wildlife Management Plan (Section 26.21), as well as the Fish and Aquatic Habitat Management Plan (Section 26.18), a Noise Management Plan (Section 26.22; Section 23.7.2.2), and the Vegetation Clearing Management Plan (Section 26.20.1). Added pressures on harvest resources (fish, vegetative, and wildlife) due to a potential increase in access to the study areas will be mitigated through the Traffic and Access Management Plan (Section 26.25).

23.7.3.1.1 Access Management and Traffic and Access Management Plans

Both the Access Management and Traffic and Access Management Plans (Section 26.25) focus on minimizing adverse effects on fish and wildlife from increased harvesting pressure by controlling: 1) LSA access by unauthorized users (including Aboriginal land users once construction commences); 2) the behaviour of authorized LSA users (i.e., Project staff and contractors); and 3) minimizing wildlife mortality and disruption of movement. Specifically:

Local Study Area Access by Unauthorized Users

- Access points to the LSA are minimized and controlled.
- Number of unauthorized users of Project roads and corridors is minimized (working towards zero unauthorized users).
- Minimal disruption of current land use activities within the RSA.

Control of access points and minimization of the number of unauthorized users of Project roads and corridors may be achieved through the following actions:

- install gates and signs at entranceways to the Treaty Creek access road, Coulter Creek access road, Temporary Frank Mackie Glacier access route, and transmission line corridors to prohibit the entry by non-authorized vehicles (including snowmobiles and ATVs);
- require all authorized users of roads to immediately report any observed unauthorized users, and respond by appropriate personnel to notify unauthorized users of trespass; and
- deactivate all non-essential roads (e.g., Temporary Frank Mackie Glacier access route) following construction and at closure (Coulter Creek access road).

Behaviour of Authorized Users in the Local Study Area

The behaviour of authorized users in the LSA will be controlled through the following actions:

- implement and enforce a no hunting and no fishing policy for employees and contractors;
- prohibit the possession of personal firearms within the Project area by employees and contractors;
- set and enforce speed limits along Project-controlled roads; and
- bus personnel from communities or central collection sites during mine construction and operation.

Monitoring will consist of a surveillance and reporting program to regulate use of roads and transmission line corridors, as well as the tracking of communications with stakeholders that is to occur through the life of the Project.

In spite of mitigation measures including signage and barriers, new access corridors may potentially increase access to Treaty Creek and its connecting valleys, as well as areas near the Unuk River. The Coulter Creek access road already has two locked gates on it: one for Forest Kerr, and one at km 33 for the Eskay Creek Mine. Land users in these remote areas have not historically been accustomed to access restrictions and may opt to overlook and bypass barriers in order to pursue land use activities.

Disruption to Wildlife Movement

A number of mitigation strategies may be used to reduce the disruption to wildlife movement because of change in traffic volumes. A description of mitigation and management to address disruption of movement to wildlife is presented in the Wildlife and Wildlife Habitat Management Plan (Section 26.21.1). Strategies may include, but are not limited to:

- managing roadside vegetation (e.g., clearing along the edges and planting vegetation that is unattractive to wildlife) to minimize attractiveness to wildlife and for providing good line of sight to avoid potential wildlife encounters;
- managing snow bank height and creating escape pathways (i.e., gaps) in snow banks to facilitate wildlife movement;
- creating and maintaining road culverts to facilitate wildlife movement/habitat connectivity;
- incorporating wildlife passages into road and bridge design over river and creek crossings to allow wildlife to move underneath;
- applying reduced speed limit restrictions on traffic in parts of the Coulter Creek and Treaty Creek access roads that bisect potential movement corridors;
- educating employees to assess and adaptively manage driving activities during crepuscular hours (i.e., dawn and dusk), which are periods of high wildlife activity; and
- busing or shuttling staff to the site to limit traffic disturbance over the course of a day.

Vehicle-related Wildlife Mortality

Vehicle-related wildlife mortality will be mitigated during construction and operation through the following measures along either Project roads or highways (Section 26.21):

- adhering to speed limits along roads (Project roads and highways);
- yielding to wildlife observed along roads (Project roads and highways);
- communicating locations of wildlife observed along roads (Project roads and highways);
- documenting cases and locations where collisions between wildlife and vehicles have occurred or have a higher likelihood of occurring and adapting mitigation strategies;

- appropriate provisions will be made along Project roads to facilitate wildlife (e.g., toad) movement without risk of collisions;
- creating breaks in snow banks along ploughed Project roads; and
- providing signage along Project roads in high-value wildlife areas or known wildlife travel corridors to warn vehicle operators of the potential to encounter wildlife.

23.7.3.2 Potential for Residual Effects

Effects related to change in the amount of resources were assessed against all land use VCs except mining and mineral exploration. Mining is not predicted to be affected, as any potential change in the amount of resources relates to restrictions on access to land and resources and was assessed in Section 23.7.1. The assessment of each potential residual effect is discussed in Sections 23.7.3.3 to 23.7.3.7. Following the implementation of mitigation and management plans, residual adverse effects are predicted for three VCs: commercial recreation, guide outfitting, and trapping; recreational hunting and fishing; and subsistence (Table 23.7-4).

23.7.3.3 Commercial Recreation, Guide Outfitting and Trapping: Potential Residual Effects due to Change in the Amount of Resources

A change in the amount of resources may occur because of Project development and increased pressures on a number of wildlife and fish species within the LSA and RSA. Species of potential harvest interest for land users include moose, black bear, grizzly bear, mountain goat, American marten, salmon. and steelhead. Four commercial stakeholders could be adversely affected by a change in the amount of resources, including guide outfitting licence holder #601066, Spey Lodge, independent anglers operating out of Bell 2 Lodge, and trapline holder 621T001. Traplines held by members of the Skii km Lax Ha, including 616T011 and 617T015, are assessed in Section 23.7.3.6 (Subsistence).

23.7.3.3.1 Habitat Loss or Degradation/Vegetative Ecosystems

Loss of vegetative resources because of Project infrastructure and activities is unlikely to affect directly commercial recreationists, as current land use activities do not include plant harvesting. The loss of vegetation, however, may affect commercially harvested wildlife species in the LSA and RSA who rely on plants for food. Resource quantity in the LSA is predicted to be affected as follows:

- Wildlife habitat loss and alteration will occur as a result of Project development, including the area surrounding the PTMA, which was noted during baseline interviews to be a high-value area and used for wildlife hunting by the former guide outfitter (Misty Mountain Outfitters; D. Drinnan, pers. comm.). The Project LSA will result in an estimated 4,050 ha area of disturbed vegetated ecosystems (Chapter 19, Terrestrial Ecology Effects Assessment). Additional habitat will be affected by degradation and fragmentation as a result of barriers such as roads and infrastructure, thereby affecting a number of wildlife species (Chapter 18, Wildlife and Wildlife Habitat Effects Assessment). A number of wildlife species will be affected by habitat loss, all of which are predicted to have adverse effects following mitigation. These include:

Table 23.7-4. Potential Residual Effects on Land Use Valued Components due to Change in the Amount of Resources

VC	Timing Start	Project Area(s)	Component(s)	Description of Effect due to Component(s)	Type of Project Mitigation	Project Mitigation Description	Potential Residual Effect	Description of Residuals
Commercial Recreation, Guide Outfitting, and Trapping	Construction, Operation, Closure	All	Project infrastructure	Wildlife resources diminished for stakeholders due to vehicle collisions and disruption of movement. Project infrastructure leading to habitat loss and degradation. Increased strain on wildlife population by unauthorized hunters and fishers.	Management Practices, Monitoring, and Adaptive Management	Traffic Management Plan; Noise Management Plan; Fish and Aquatic Habitat Management Plan; Terrestrial Ecosystems Management and Monitoring Plans; Wildlife Management Plan	Yes	Wildlife resources diminished for guide outfitters due to effects related to habitat loss, vehicle collisions and disruption of movement.
Recreational Hunting and Fishing	Construction, Operation, Closure	All	All	Wildlife resources diminished for resident hunters due to vehicle collisions and disruption of movement. Project infrastructure leading to habitat loss and degradation. Increased strain on wildlife population by unauthorized hunters and fishers.	Management Practices, Monitoring, and Adaptive Management	Access Management Plan; Monitoring and Adaptive Management	Yes	Wildlife resources diminished for resident hunters due to effects related to habitat loss, vehicle collisions and disruption of movement.
Subsistence	Construction, Operation, Closure	All	Project infrastructure	Wildlife resources diminished for subsistence users due to vehicle collisions and disruption of movement. Project infrastructure leading to habitat loss and degradation. Increased strain on wildlife population by unauthorized hunters and fishers.	Management Practices, Monitoring, and Adaptive Management	Traffic Management Plan; Noise Management Plan; Fish and Aquatic Habitat Management Plan; Terrestrial Ecosystems Management and Monitoring Plans; Wildlife Management Plan	Yes	Wildlife resources diminished for subsistence users due to effects related to habitat loss, vehicle collisions and disruption of movement.
Traditional/Heritage Value of the Land	All	All	Project infrastructure	Aboriginal practices, traditions or customs may be affected as a result of a potential change in the quantity of wildlife, fish, aquatic and vegetative resources.	Management Practices, Monitoring, and Adaptive Management	Traffic Management Plan; Noise Management Plan; Fish and Aquatic Habitat Management Plan; Terrestrial Ecosystems Management and Monitoring Plans; Wildlife Management Plan	No	
Water Licences	All	Access roads and PTMA	Coulter Creek access road, Treaty Creek access road, TMF	Water flows may be affected as a result of Project development.	Management Practices, Monitoring, and Adaptive Management	None	No	

- Moose – A total of 7 and 42% of available high-quality moose winter habitat is predicted to be lost or altered within the RSA and LSA, respectively, the majority of which is associated with the PTMA.
- Mountain goats – A total of 2.2% of available high-quality summer and winter mountain goat habitat within the RSA will be lost or altered, the majority of which is associated with the Mine Site. This is equivalent to the alteration of an average of 37 home ranges.
- Grizzly bears – 6.3% of high-quality grizzly bear habitat within the RSA (39.3% within the LSA) will be lost or altered due to Project development.
- Black bears – 6.4% of high-quality black bear habitat within the RSA (39.5% within the LSA) will be lost or altered due to Project development.
- American martens – 7.4% of high-quality habitat in the RSA and 45.8% in the LSA will be lost or altered as a result of Project development.
- Hoary marmots – 29.6% of habitat in the LSA will be lost or altered due to the Project. Two hoary marmot colonies directly overlap with the Project footprint.

- Residual adverse effects are predicted for mountain goats due to disruption of movement as a result of infrastructure and direct mortality from avalanche controls.
- Non-significant salmon habitat loss and mortality may occur due to bridge building during construction for bridges over the Unuk and Bell-Irving rivers (Chapter 15, Fish and Aquatic Habitat Effects Assessment). The Tailing Management Facility (TMF) will be constructed over Dolly Varden habitat, which is not a fish species of recreational or commercial value. Further, the area is currently difficult to access.

23.7.3.3.2 Opening Up of Resources

The Project may open up resources to increased pressures through the development of new roads, the upgrading and year-round maintenance of existing roads, as well as the development of new rights-of-ways, in areas of the LSA with little existing infrastructure. The Project's presence may continue to open up harvest resources to pressures by facilitating hunting, trapping, and fishing pursuits by both authorized and unauthorized land users.

23.7.3.3.3 Vehicle Traffic

Increased traffic volumes along the access roads and Highway 37 may disrupt wildlife movement by decreasing the crossing of certain hunted and trapped species, including moose, grizzly bears, and black bears (Chapter 18). In turn, adverse effects on these harvest species may indirectly affect commercial recreation, hunting, and trapping activities within the RSA. Comments from Nisga'a Nation and First Nations representatives at working group meetings and incidental observations during wildlife baseline studies suggest that the Treaty and Treaty drainages may act as north to south and east to west travel corridors, respectively, for wildlife. As the Treaty Creek access road extends north to south along Treaty Creek, increased traffic volume could also affect wildlife movement.

According to the wildlife and wildlife habitat effects assessment (Chapter 18), moose movements are not predicted to be adversely affected along access roads as a result of traffic volumes. However, increased traffic along Highway 37 near the Bell-Irving River is expected to act synergistically with Project infrastructure in the PTMA as a barrier to movement for moose.

Further, when traffic volume rises above a threshold point, bears—particularly female grizzlies—may avoid a particular road, making it a barrier to movement. During operation, the maximum traffic volume will increase by approximately four vehicles per hour along Highway 37. Bears were reported to cross roads when traffic volumes are less than ten vehicles per hour (Waller and Servheen 2005). Given the current traffic volume (approximately nine vehicles per hour), the additional four vehicles per hour along Highway 37 may result in a barrier to movement for bears. In contrast, traffic volume along access roads is not predicted to exceed four vehicles per hour (Table 23.7-3). As such, bear movements are not anticipated to be affected by traffic volume along access roads within the LSA.

Direct mortality of moose and bears could also occur as a result of change in vehicle traffic. Potential project-related vehicle interactions with bears and moose would be mitigated through adherence to road and traffic signs and the Traffic and Access Management Plan (Section 26.25.1).

The Highways 37 and 37A traffic effects assessment (Appendix 22-C) reported the average number of moose- and bear-vehicle collisions per year along the southern and northern segments of Highway 37 to be 5.8 and 5.7, respectively. Although collision estimates specific to the land use RSA could not be predicted, direct mortality from vehicle-moose collisions was identified as a residual adverse effect following mitigation and management plan implementation. Areas identified as a high risk for vehicle-moose interactions include along Highway 37 and the Treaty Creek access road, particularly during the winter, due to the high density of moose in these areas.

Conversely, following the implementation of mitigation measures in the Wildlife Management Plan (Section 26.21), no residual effect was predicted on black or grizzly bears as a result of vehicle-wildlife collisions. Further, there is no risk of vehicles colliding with bears in winter, as bears are in their dens during winter months. Other harvest resources of interest to land users, including hoary marmots, American marten, salmon, steelhead and mountain goats, are not predicted to be adversely affected by vehicle collisions. As such, angling and trapping land users are not predicted to be affected by a change in vehicle traffic.

In summary for wildlife resources:

- residual adverse effects are predicted for moose, black bears, and grizzly bears due to disruption of movement as a result of traffic and infrastructure (Chapter 18, Wildlife and Wildlife Habitat);
- residual adverse effects are predicted for moose due to direct mortality from vehicles; and
- other wildlife and fish species harvested in the RSA have no residual effect.

23.7.3.3.4 Mitigation and Conclusions

A number of mitigation measures will be implemented to address potential adverse effects on change in the amount of resources, including a Noise Management Plan, a Traffic and Access Management Plan, a Wildlife and Wildlife Habitat Management Plan, a Fish and Aquatic Habitat Management Plan, and a Vegetation Clearing Management Plan (see Section 23.7.3.2). Mitigation will help to address potential adverse effects on commercial land use stakeholders. However, residual adverse effects due to a change in the amount of resources are predicted for guide outfitting licence #601066 because hunting species of interest, including moose, grizzly bears, black bears and mountain goats, are anticipated to be adversely affected in the LSA and RSA by the Project (Chapter 18, Wildlife and Wildlife Habitat).

No residual adverse effects from a change in the amount of resources are anticipated for Spey Lodge, angling operators out of Bell 2 Lodge, or trapline 621T001 for the following reasons:

- no permanent loss of habitat for fish species of commercial or recreational interest is predicted, and any temporary effect is limited to bridge building during construction; and
- trapline 621T001 does not overlap with Project infrastructure.

23.7.3.4 Recreational Hunting and Fishing: Potential Residual Effects due to Change in the Amount of Resources

Recreational hunters and anglers may also be affected by a change in the amount of resources as a result of habitat loss, loss of vegetative ecosystems, opening up of resources and increase in vehicle traffic due to Project development. The RSA also overlaps between 1 and 26% of WMUs 6-16, 6-17, and 6-21. Resident hunters are not restricted to hunting within the Project RSA and are free to pursue their activities in areas further afield from the Project. Based on reported kills for these WMUs, resident hunters have typically focused on moose hunting (Appendix 23-A), although black bears and grizzly bears are also hunted.

As discussed in Section 23.7.3.4, moose, black bears, and grizzly bears are predicted to be adversely affected as a result of habitat loss, disruption of movement, and vehicle collisions. Mitigation will help to address potential adverse effects on recreation land use stakeholders, including a Noise Management Plan, a Traffic and Access Management Plan, a Wildlife and Wildlife Habitat Management Plan, a Fish and Aquatic Habitat Management Plan, and a Vegetation Clearing Management Plan (see Section 23.7.3.2). However, residual adverse effects due to a change in the amount of resources are predicted for resident hunters as hunting species of interest, notably moose, are likely to be adversely affected in the LSA and RSA by the Project (Chapter 18, Wildlife and Wildlife Habitat). Anglers and other recreational fishers are not predicted to be affected as no permanent loss of habitat for fish species of recreational interest is predicted (Chapter 15, Fish and Aquatic Habitat).

23.7.3.5 Subsistence: Potential Residual Effects due to Change in the Amount of Resources

Project development, vehicle traffic, and the opening up of resources within the RSA may increase pressures on wildlife and fish resources, which are harvested by subsistence users. Subsistence users in the LSA and RSA include members of the Skii km Lax Ha (Section 23.1.4.3). Moose, black bear, and grizzly bear are hunted; salmon and steelhead are harvested; and edible plants are collected (Appendix 30-B). Hunting and trapping areas in the LSA and RSA include the Treaty and Teigen Creek valleys and headwaters, Gilbert Lake, and Todedada Lake and Mount Anderson on the north shore of Bowser Lake. Both abandoned and still-utilized cabins are located in these areas. Moose is the most commonly hunted big game species. Members of the Skii km Lax Ha also have two traplines in the RSA, traplines 616T011 and 617T015. The RSA overlaps approximately 47 and 32% of these trapline areas, respectively (8.5 and 9.4% respectively within the LSA), including portions of the PTMA and Treaty Creek access road. American marten is among the species trapped.

Subsistence activities by members of Tahltan Nation, Nisga'a Nation, and Gitanyow First Nation were not identified during baseline studies, although activities could occur in the future. Moose is also a primary food source for Tahltan members; however, no Tahltan hunting activities were identified within the RSA. Similarly, certain Tahltan members access remote areas along the Eskay Creek Mine road outside of the RSA for mushroom harvesting (Coast Mountain Hydro Corp 2002). Use of this area for this purpose may be primarily due to the access provided by the Eskay Creek Mine road. Notably, this road is currently gated and any access gained via the Eskay Creek Mine road is likely bypassing road use control structures. Throughout the remainder of Tahltan territory overlap with the RSA, it is unlikely that mushroom picking is a common activity due to the difficult terrain (A. Callbreath, pers. comm.).

The Skii km Lax Ha currently harvest salmon and steelhead along the Bell-Irving River. Salmon habitat loss and mortality is not considered significant as it is limited to bridge-building during the construction phase for bridges over the Unuk and Bell-Irving rivers (Chapter 15, Fish and Aquatic Habitat Effects Assessment). The effect is also limited in terms of the duration of the effect and will be mitigated for as described in the Fish and Aquatic Habitat Management Plan (Section 26.18). The TMF will be constructed over Dolly Varden habitat, which is not a fish species of value for the Skii km Lax Ha. Consequently, the quantity of subsistence harvest fish species are not predicted to be adversely affected (Chapter 15, Fish and Aquatic Habitat).

Vegetation loss and vegetation degradation could adversely affect plant harvesting for subsistence users. The terrestrial ecosystems effects assessment (Chapter 17) predicts that the LSA will result in a 4,050 ha area of disturbed vegetated ecosystems because of Project development. Potential pine mushroom habitat was as a terrestrial ecosystem VC due to First Nations interest in this resource. There are no known collection sites within the LSA; however, some use is documented along the Eskay Creek Mine road to the north of the LSA (Chapter 19; D. Drinnan; R. Green, pers. comm.). Within the LSA, a loss of approximately 65.8 ha (6% of baseline potential habitat) and degradation of approximately 235 ha (21% of baseline potential habitat) of potential pine mushroom habitat was estimated. However, a residual adverse effect is not predicted for subsistence users as there are no known collection sites within the LSA, and pine mushroom harvesting can occur elsewhere within the RSA.

Mitigation practices, monitoring, and adaptive management will be implemented to mitigate the potential Project effects to subsistence users. These include mitigation identified in the Wildlife Management Plan (Chapter 26.21), the Noise Management Plan (Chapter 26.22), the Traffic and Access Management Plan (Chapter 26.25), and the Terrestrial Ecosystems Management and Monitoring Plan (Chapter 26.20).

Following mitigation, a change in the amount of resources within the RSA for moose, black bears, and grizzly bears is predicted as discussed in Section 23.7.3.4. No change in the amount of American marten, salmon, or steelhead is predicted. As such, no residual adverse effect to subsistence-related trapping is predicted despite the LSA overlap with current traplines. However, due to the importance of moose to Aboriginal subsistence users whose traditional territory overlaps with the Project LSA, an adverse residual effect is anticipated for any change in the amount of resources for subsistence users, notably the Skii km Lax Ha.

23.7.3.6 Traditional/Heritage Value of Land: Potential Residual Effects due to Change in the Amount of Resources

Concerns related to the traditional/heritage value of the land for potential Nisga'a Nation, Tahltan, Gitanyow, and Skii km Lax Ha land users relate to the practices, traditions, or customs that may be affected within the LSA and RSA due to a change in traffic over the Project's lifecycle. Baseline studies did not identify any Aboriginal practices, customs, or traditions aside from some subsistence use within the land use study areas (see Heritage [Appendix 21-A], Non-Traditional Land Use [Appendix 23-A] and the traditional knowledge and use reports completed for the Tahltan Nation, Skii km Lax Ha, Gitanyow First Nation, and Gitxsan Nation [Appendices 30-A to 30-D]). Subsistence activities, although linked to cultural practices and customs, are discussed separately in Section 23.7.3.6. However, potential adverse effects from a change in the amount of resources also relate to the possibility that such customs and practices may be pursued at some point in the future. Aboriginal groups that may be potentially affected by a change in the amount of resources include Nisga'a Nation, Tahltan Nation, and Skii km Lax Ha as the land use RSA overlaps with portions of the Nass Area as well as the traditional territories claimed by these Aboriginal groups (Section 23.1.4.3). No effect is predicted for the Gitanyow First Nation due to the limited overlap within the RSA and the distance of this overlap area from proposed Project activities.

The Treaty Creek site (Borden number HdTj-1) is of spiritual and historical significance to Nisga'a Nation and the Tahltan. It is a historically significant battle site and the location of a subsequent peace treaty resulting in the establishment of territorial boundaries between Nisga'a and Tahltan (Seip et al. 2012). The site, listed as a Provincial Heritage Site as part of the NFA, is located within the LSA to the south of the proposed Treaty Creek access road on the southern side of the confluence of the Bell-Irving River and Treaty Creek and will not be affected by the Project.

Other than subsistence harvest, Aboriginal groups harvest fish species—notably salmon—for cultural purposes. The Skii km Lax Ha currently harvest salmon along the Bell-Irving River, and Nisga'a also fish in the Nass Area, though baseline studies did not identify current activities in the RSA. Salmon habitat loss and mortality is assessed as not significant as it is limited to bridge building during construction for bridges over the Unuk and Bell-Irving rivers (Chapter 15, Fish

and Aquatic Habitat). The effect is also limited in terms of the duration of the effect and will be compensated for as part of the Fish and Aquatic Habitat Management Plan (Chapter 26.18). The TMF will be constructed over Dolly Varden habitat, which is not a fish species of cultural or recreational value. Consequently, the quantity of culturally significant fish species are not predicted to be affected (Chapter 15, Fish and Aquatic) and no potential residual effect is anticipated.

23.7.3.7 Water Licences: Potential Residual Effects due to Change in Quantity of Resources

Water licences could be potentially affected within the LSA by any potential change in the quantity of surface water and water flows. There are two water licences and three water licence applications within the LSA (Figure 23.1-13). However, both water licences, held by Barrick Gold Inc., are located upstream of any Project development area near the former Eskay Creek Mine. Water licence applications (i.e., applications submitted but not approved) are located as follows:

- Application Z123537 held by 6167047 Canada Limited is located south of the Coulter Creek access road;
- Application 6001356 held by Northern Hydro is near the Treaty Creek access road; and
- Application 6001375 also held by Northern Hydro is located upstream of the TMF.

No mitigation is required and no residual effect is predicted on water licences due to their upstream location. Further, no water licence application is anticipated to be affected because no more than 1.5% reduction in surface water quantity is anticipated as a result of the Project (Chapter 13, Surface Water Quantity).

23.8 Significance of Residual Effects for Land Use

Six residual adverse Project effects on land use have been identified for three VCs: commercial recreation, guide outfitting and trapping; recreational hunting and fishing; and subsistence. Three residual effects are predicted for commercial recreation, guide outfitting, and trapping; one is predicted for recreational hunting and fishing; and two residual effects are anticipated for subsistence. Residual effects for all other land use VCs are not anticipated, except for on navigation. Two residual effects on navigational safety and access are predicted and are assessed separately in Chapter 31, Navigable Waters.

23.8.1 Residual Effect Descriptors for Land Use

The following sections (23.8.2 to 23.8.4) assess the significance of Project-related residual effects on commercial recreation, guide outfitting, and trapping; recreational hunting and fishing; as well as subsistence. The duration and frequency of each effect was considered when determining the potential effects of greatest concern. For example, an effect that occurs over a longer-term (e.g., continuously beyond the life of the Project) is likely to be of greater concern than a short-term effect that is confined to a shorter, discrete time period (Table 23.8-1). Within each section, the residual effects of the Project on land use are characterized and discussed, and significance assessed.

Table 23.8-1. Definition of Significance Criteria for Land Use Residual Effects

Timing *What phase of the Project is the effect associated with?*	**Magnitude** *(negligible, low, medium, high)*	**Geographic Extent** *(local, landscape, regional, beyond regional)*	**Duration** *(short-term, medium-term, long-term, far future)*	**Frequency** *(once, intermittent, regular, continuous)*	**Reversibility** *(reversible short-term, reversible long-term, or irreversible)*	**Context** *(ecological resilience and/or unique attributes) (low, neutral, high)*	**Probability** *(low, medium, high)*	**Confidence** *(low, medium, high)*	**Significance** *(Not Significant: minor, moderate; Significant: major)*	**Follow-Up Monitoring** *(not required, required)*
Construction	**Negligible.** There is no detectable change from baseline conditions.	**Local.** The effect is limited to the project footprint.	**Short term**. The effect lasts approximately 1 year or less.	**Once.** The effect occurs once during any phase of the project.	**Reversible short-term:** An effect that can be reversed relatively quickly.	**Low**. The valued component is considered to have little to no unique attributes and/or there is low resilience to imposed stresses.	**Low.** An effect is unlikely but could occur.	**Low** (< 50% confidence). The cause-effect relationship between the project and its interaction with the environment is poorly understood; data for the project area may be incomplete; uncertainty associated with synergistic and/or additive interactions between environmental effects may exist. High degree of uncertainty.	**Not Significant (minor).** Residual effects have no or low magnitude, local geographical extent, short or medium-term duration, and occur intermittently, if at all. There is a high level of confidence in the conclusions. The effects on the VC (at a population or species level) are indistinguishable from background conditions (i.e., occur within the range of natural variation as influenced by physical, chemical, and biological processes). Land use management objectives will be met. Follow-up monitoring is not required.	**Not Required**
Table	**Low.** The magnitude of effect differs from the average value for baseline conditions, but is within the range of natural variation and well below a guideline or threshold value.	**Landscape.** The effect extends beyond project footprint to within an area a few kilometres of the project footprint.	**Medium term.** The effect lasts from 1- 11 years.	**Intermittent.** The effect occurs at sporadic, intermittent, intervals during any phase of the project.	**Reversible long-term:** An effect that can be reversed after many years.	**Neutral.** The valued component is considered to be valuable by people living in potentially affected communities in the region.	**Medium.** An effect is likely but may not occur.	**Medium.** (50 – 80% confidence): The cause-effect relationship between the project and its interaction with the environment is not fully understood, or data for the project area is incomplete: moderate degree of uncertainty.	**Not Significant (moderate).** Residual effects have medium magnitude, local, landscape or regional geographic extent, are short-term to chronic (i.e., may persist into the far future), and occur at all frequencies. Residual effects on VCs are distinguishable at the population, community, and/or ecosystem level. Ability of meeting land use management objectives may be impaired. Confidence in the conclusions is medium or low. The probability of the effect occurring is low or medium. Follow-up monitoring of these effects may be required.	**Not Required, Required**
Closure	**Medium.** The magnitude of effect differs from the average value for baseline conditions and approaches the limits of natural variation, but below or equal to a guideline or threshold value.	**Regional.** The effect extends across the Regional Study Area.	**Long term.** The effect lasts between 12 and 70 years.	**Regular.** The effect occurs on a regular basis during, any phase of the project.	**Irreversible.** The effect cannot be reversed.	**High.** The effect is highly valued by people living in potentially affected communities or the region.	**High**. An effect is highly likely to occur.	**High**. There is greater than 80% confidence in understanding the cause-effect relationship between the project and its interaction with the environment, and all necessary data is available for the project area. There is a low degree of uncertainty.	**Significant (Major).** Residual effects have high magnitude, regional or beyond regional geographic extent, are chronic (i.e., persist into the far future), and occur at all frequencies. Residual effects on VCs are consequential (i.e., structural and functional changes in populations, communities and ecosystems are predicted). Ability to meet land use management objectives is impaired. Probability of the effect occurring is medium or high. Confidence in the conclusions can be high, medium, or low. Follow-up monitoring is required.	**Required**
Post-Closure	**High.** The magnitude of effect is predicted to differ from baseline conditions and exceed guideline or threshold values so that there will be a detectable change beyond the range of natural variation (i.e., change of state from baseline conditions).	**Beyond Regional**: The effect extends possibly across or beyond the province.	**Far Future: The** effect lasts more than 70 years.	**Continuous.** An effect occurring constantly during, and potentially beyond, the project life.						

A detailed description of the effects assessment methodology, logic, variables, and criteria are provided in Chapter 5. Definitions for criteria used in this assessment are provided in Table 23.8-1.

23.8.2 Residual Effects Assessment for Commercial Recreation, Guide Outfitting and Trapping

As summarized in Table 23.8-2, the Project is predicted to have adverse residual effects on commercial recreation, guide outfitting, and trapping during all Project phases. The predicted residual effects include 1) restriction on access to land and resources; 2) change in sensory disturbances; and 3) change in the amount of resources.

23.8.2.1 Restriction on Access to Land and Resources

Project development, infrastructure, fencing, and access restrictions will reduce or alter the access for land users in the LSA and RSA. This effect during construction and operation would occur throughout the LSA for all Project activities. During closure and post-closure, the effect is predicted to be restricted to the Treaty Creek access road and PTMA. Specifically, two commercial recreation licence holders are predicted to be affected, including Last Frontier Heliskiing and guide outfitters licence holder #601066. The residual effects on these land users are described in Sections 23.7.1.3.

Project infrastructure, notably bridges, will reduce the accessibility of navigable waters at the same portions of the Unuk and Bell-Irving rivers. Similarly, this effect would occur at both rivers only in the early periods of construction, as well as at the Unuk River bridge crossing during post-closure decommissioning activities.

During construction and closure, the effect is assessed to be medium in magnitude, local in extent, of medium duration, with a continuous frequency. The effect is similar for operation, though long in duration. For post-closure, the effect is assessed to be negligible in magnitude, local in extent, far future in duration, with frequency continuous. The effect for all phases is predicted to have a high probability of occurrence, with a high level of confidence in the assessment for all phases. The adverse effect of the Project on change in access is predicted to be **not significant (minor)** for all phases.

23.8.2.2 Change in Sensory Disturbances

The quality of experience within the RSA for commercial recreation, guide outfitting, and trapping lies largely in the sense of wilderness provided by the landscape. The visual effects of the proposed Project on the landscape are examined in detail in the visual and aesthetic resources effects assessment (Chapter 24) and noise effects assessment (Chapter 19). The development of the Project will represent a change to baseline conditions in sensory disturbances and is predicted to result in a residual effect to the perceived quality of experience. Although proposed mitigation measures will effectively reduce the residual effect for tenure holders that have a primarily economic stake in the RSA, residual effects will nevertheless remain, as these stakeholders will likely have to adjust their land use patterns to maintain the wilderness experience that their licence area relies on. This is expected to affect commercial recreation stakeholders, including

The Explorer's League, Bear Mountaineering, and Last Frontier Heliskiing, as well as guide outfitter #61006.

This residual effect is assessed to occur as a result of all Project components during construction, operation, and closure, though limited to the vehicle-traffic along the Treaty Creek access road during post-closure. During construction and operation, the effect is assessed to have a medium magnitude, given the change from baseline conditions that would be experienced by these stakeholders, while the extent would be regional with a continuous frequency. Duration for construction would be medium, and long for operation. For closure, the effect is assessed as medium in magnitude, landscape in extent, medium in duration, with frequency diminishing to regular. For post-closure, a negligible magnitude is anticipated, the extent is limited to local, with the duration in the far future, though sporadic in frequency. The probability is anticipated to be high for construction and operation, though it diminishes in closure and post-closure, as land use activities will have potentially adapted over time. A medium confidence is applied to this assessment, as it is difficult to predict how each stakeholder will choose to respond to this effect. As a result, this residual effect is assessed as **not significant (minor)** for all Project phases.

23.8.2.3 Change in the Amount of Resources

Wildlife species of harvest interest are predicted to be affected in the LSA and RSA, resulting in a change in the amount of resources for guide outfitter #601066. This residual effect is predicted to occur for all Project components during construction, operation, and closure.

For construction and operation the effect is assessed to be medium in magnitude, regional in extent, medium duration for construction, and long for operation, with a continuous frequency. For closure, the effect is assessed to be low magnitude, landscape in extent, medium in duration, with a regular frequency. The effect for construction and operation is predicted to have a medium probability of occurrence, with a high level of confidence in the assessment. This residual effect is given a low probability during closure as wildlife resources and land users in the LSA and RSA may have adapted to the presence of the Project at that time. A high level of confidence is provided for all phases. The adverse effect of the Project on this change in the amount of resources is predicted to be **not significant (moderate)** for construction and operation, and **not significant (minor)** during closure.

23.8.3 Residual Effects Assessment for Recreational Hunting and Fishing

A change in recreational hunting and fishing within the RSA is predicted to have one residual effect during construction, operation, and closure due to a change in the amount of resources (Table 23.8-3).

23.8.3.1 Change in the Amount of Resources

Wildlife species of harvest interest—notably moose, black bears, and grizzly bears—are predicted to be affected in the LSA and RSA, resulting in a change in the amount of resources for resident hunters. This residual effect is predicted to occur for all Project components during construction, operation, and closure.

Table 23.8-2. Summary of Residual Effects on Commercial Recreation, Guide Outfitting, and Trapping*

Description of Residual Effect	Project Component(s)	Timing of Effect	Magnitude	Extent	Duration	Frequency	Reversibility	Context	Likelihood of Effects		Significance Determination	Follow-up Monitoring
									Probability	Confidence Level		
Restricted access to certain areas within commercial licence tenures .	All	Construction	Medium	Local	Medium	Continuous	Reversible short-term	Neutral	High	High	Not Significant (Minor)	Not Required
	All	Operations	Medium	Local	Long	Continuous	Irreversible	Neutral	High	High	Not Significant (Minor)	Not Required
	All	Closure	Medium	Local	Medium	Continuous	Irreversible	Neutral	High	High	Not Significant (Minor)	Not Required
	PTMA	Post-closure	Negligible	Local	Far future	Continuous	Irreversible	Neutral	High	High	Not Significant (Minor)	Not Required
Noise, traffic and visibility of project-related infrastructure in the landscape could alter practice areas and/or reduce economic opportunities for commercial licence holders due to a perceived reduction in the quality of the land user experience.	All	Construction	Medium	Regional	Medium	Continuous	Reversible short-term	Neutral	High	Medium	Not Significant (Minor)	Not Required
	All	Operations	Medium	Regional	Long	Continuous	Reversible short-term	Neutral	High	Medium	Not Significant (Minor)	Not Required
	All	Closure	Medium	Landscape	Medium	Regular	Reversible short-term	Neutral	Medium	Medium	Not Significant (Minor)	Not Required
	Treaty Creek Access Road	Post-closure	Negligible	Local	Far future	Sporadic	Reversible short-term	Neutral	Low	Medium	Not Significant (Minor)	Not Required
Wildlife resources diminished for guide outfitters and trappers due to habitat loss and increased strain on harvest resources.	All	Construction	Medium	Regional	Medium	Continuous	Reversible long-term	Neutral	Medium	High	Not Significant (Moderate)	Not Required
	All	Operations	Medium	Regional	Long	Continuous	Reversible long-term	Neutral	Medium	High	Not Significant (Moderate)	Not Required
	All	Closure	Low	Landscape	Medium	Regular	Reversible long-term	Neutral	Low	High	Not Significant (Minor)	Not Required

*** Residual effects on navigation are listed in Chapter 31 – Navigation in Table 31.7-2.**

Table 23.8-3. Summary of Residual Effects on Recreational Hunting and Fishing*

Description of Residual Effect	Project Component(s)	Timing of Effect	Magnitude	Extent	Duration	Frequency	Reversibility	Context	Likelihood of Effects		Significance Determination	Follow-up Monitoring
									Probability	Confidence Level		
Wildlife resources diminished for resident hunters due to habitat loss and increased strain on harvest resources.	All	Construction	Medium	Regional	Medium	Continuous	Reversible long-term	Neutral	Medium	High	Not Significant (Moderate)	Not Required
	All	Operations	Medium	Regional	Long	Continuous	Reversible long-term	Neutral	Medium	High	Not Significant (Moderate)	Not Required
	All	Closure	Low	Landscape	Medium	Regular	Reversible long-term	Neutral	Low	High	Not Significant (Minor)	Not Required

*** Residual effects on navigation are listed in Chapter 31 – Navigation in Table 31.7-2.**

For construction and operation the effect is assessed to be medium in magnitude, regional in extent, medium duration for construction, and long for operation, with a continuous frequency. For closure, the effect is assessed to be low magnitude, landscape in extent, medium in duration, with a regular frequency. The effect for construction and operation is predicted to have a medium probability of occurrence, with a high level of confidence in the assessment. This residual effect is given a low probability during closure as wildlife resources and land users in the LSA and RSA may have adapted to the presence of the Project at that time. A high level of confidence is provided for all phases. The adverse effect of the Project on this change in quantity of resources is predicted to be **not significant (moderate)** for construction and operation, and **not significant (minor)** during closure.

23.8.4 Residual Effects Assessment for Subsistence

Restrictions on access to land and resources, as well as changes in the amount of resources within the RSA are predicted to have a number of residual effects for subsistence during all Project phases (Table 23.8-4).

23.8.4.1 Restricted Access to Land and Resources

Project development, infrastructure, fencing, and access restrictions will reduce or alter the access for subsistence harvesters in the LSA and RSA. This effect during construction and operation would occur throughout the LSA for all Project activities, and parts of the RSA due to an increase in traffic. During closure and post-closure, the effect is predicted to be restricted to the Treaty Creek access road and PTMA.

Specifically, traplines 0617T15 and 0616T011 are predicted to be affected. The residual effects on subsistence users are described in Sections 23.7.1.5.

During construction and closure, the effect is assessed to be low in magnitude, local in extent, of medium duration with a continuous frequency. The effect is similar for operation, though long in duration. For post-closure, the effect is assessed to a low magnitude, local in extent, far future in duration, with frequency continuous. The effect for all phases is predicted to have a high probability of occurrence, with a high level of confidence in the assessment for construction and operation. Again, given the long-term outlook and difficulty in predicting the actions of future land users, this residual effect is given a medium confidence rating for closure and post-closure. The adverse effect of the Project on subsistence users is predicted to be **not significant (minor)** for all phases.

23.8.4.2 Change in the Amount of Resources

Wildlife species of subsistence interest are predicted to be affected in the LSA and RSA, resulting in a change in the amount of resources for resident hunters. Moose, in particular, are of harvest interest for both the Skii km Lax Ha and Tahltan. This residual effect is predicted to occur for all Project components during construction, operation, and closure.

For construction and operation the effect is assessed to be medium in magnitude, regional in extent, medium duration for construction, and long for operation, with a continuous frequency. For closure, the effect is assessed to be low in magnitude, landscape in extent, medium in

duration, with a regular frequency. The effect for construction and operation is predicted to have a medium probability of occurrence, with a high level of confidence in the assessment. This residual effect is given a low probability during closure as wildlife resources and land users in the LSA and RSA may have adapted to the presence of the Project at that time. A high level of confidence is provided for all phases. The adverse effect of the Project on subsistence users is predicted to be **not significant (moderate)** for construction and operation, and **not significant (minor)** during closure.

23.9 Potential Cumulative Effects for Land Use

Project-related residual effects are anticipated for three identified effects (i.e., restricted access on land and resources, change in sensory disturbances, and change in the amount of resources) for three land use VCs (commercial recreation, guide outfitting and trapping; recreational hunting and fishing; as well as subsistence). For each of these residual Project effects, cumulative effects may occur. No overall cumulative effects are anticipated on navigation as per the assessment conducted in Chapter 31, Navigable Waters.

23.9.1 Scoping of Cumulative Effects

Cumulative effects on land users can occur when potential KSM Project effects combine with effects caused by other projects. When effects from the Project and other activities combine, the effect of the initial effect can increase due to cumulative or synergistic responses. This section identifies the past, present, and/or potential and reasonably foreseeable future activities that, along with the KSM Project, were assessed with respect to the potential cumulative effect on land uses in the LSA and RSA.

23.9.1.1 Spatial Linkages with other Projects and Human Actions

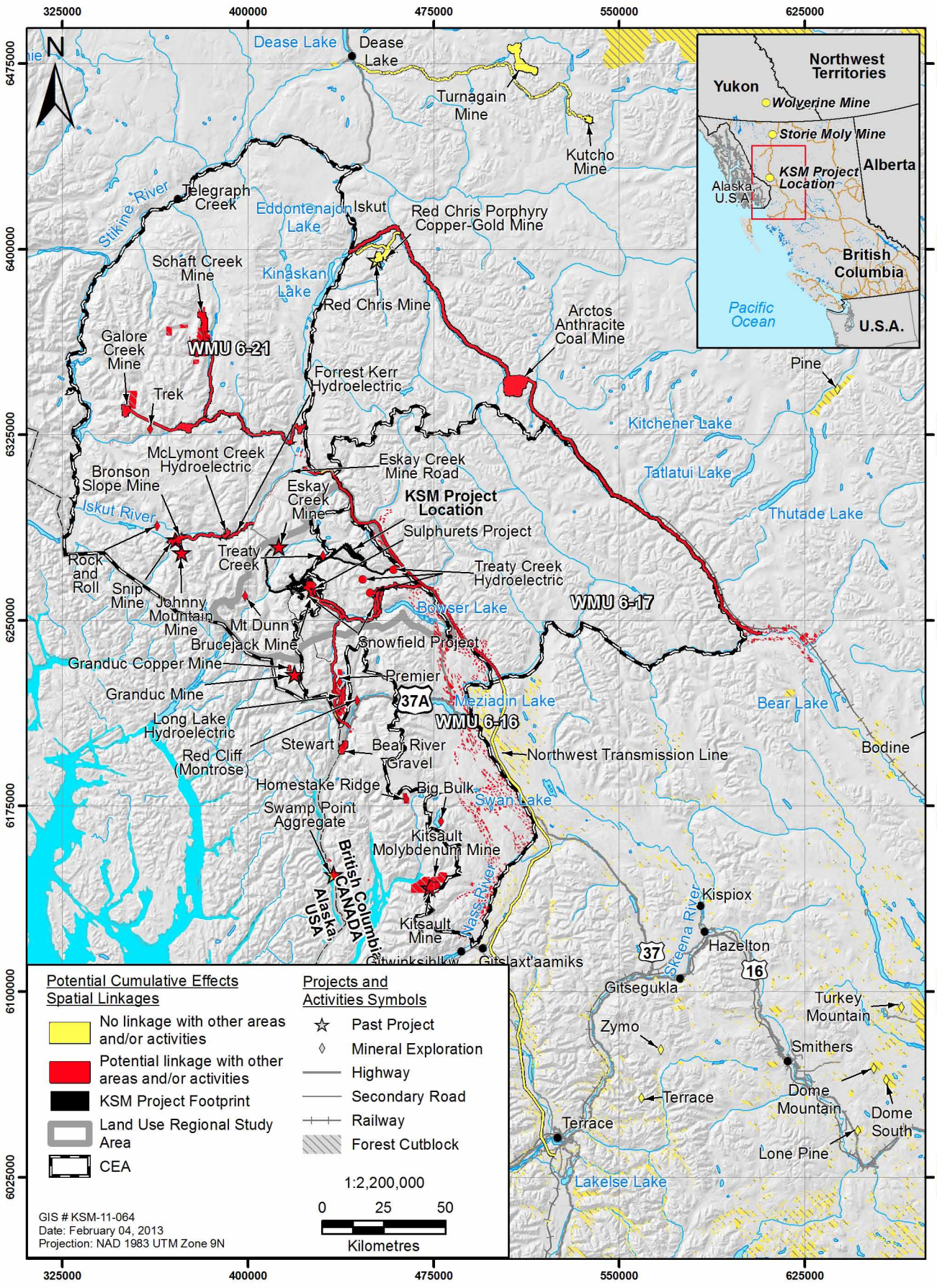
The spatial boundary for the land use cumulative effects assessment is based on the RSA used for the Project-specific land use effects assessment. A number of projects and activities may interact spatially with the KSM Project on land use. The past projects and activities that may affect land users and spatially overlap with residual effects from the KSM Project are (Figure 23.9-1):

- Eskay Creek Mine;
- Granduc Mine;
- Snip Mine;
- Johnny Mountain Mine;
- Sulphurets Project;
- fishing;
- traffic and roads; and
- past forestry activities.

Table 23.8-4. Summary of Residual Effects on Subsistence*

Description of Residual Effect	Project Component(s)	Timing of Effect	Magnitude	Extent	Duration	Frequency	Reversibility	Context	Likelihood of Effects		Significance Determination	Follow-up Monitoring
									Probability	Confidence Level		
Access to subsistence areas, including traplines 617T015 and 617T011, will remain restricted for certain land users.	All	Construction	Low	Local	Medium	Continuous	Reversible short-term	Neutral	High	High	Not Significant (Minor)	Not Required
	All	Operations	Low	Local	Long	Continuous	Irreversible	Neutral	High	High	Not Significant (Minor)	Not Required
	PTMA, Treaty Creek access road	Closure	Low	Local	Medium	Continuous	Irreversible	Neutral	High	Medium	Not Significant (Minor)	Not Required
	TMF, Treaty Creek access road	Post-closure	Low	Local	Far future	Continuous	Irreversible	Neutral	High	Medium	Not Significant (Minor)	Not Required
Wildlife resources diminished for subsistence harvesters due to habitat loss and increased strain on harvest resources.	All	Construction	Medium	Regional	Medium	Continuous	Reversible long-term	Neutral	Medium	High	Not Significant (Moderate)	Not Required
	All	Operations	Medium	Regional	Long	Continuous	Reversible long-term	Neutral	Medium	High	Not Significant (Moderate)	Not Required
	All	Closure	Low	Landscape	Medium	Regular	Reversible long-term	Neutral	Low	High	Not Significant (Minor)	Not Required

*** Residual effects on navigation are listed in Chapter 31 – Navigation in Table 31.7-2.**



KSM Project Cumulative Effects Issue Scoping: Potential Spatial Linkages for Land Use

Figure 23.9-1

SEABRIDGE GOLD
KSM PROJECT

Rescan
Engineers & Scientists

Present and potential, reasonably foreseeable future projects and human activities with potential effects to land users that overlap spatially with residual effects from the KSM Project include:

- NTL (access corridor overlaps);
- Forest Kerr Hydroelectric (access corridor overlaps);
- Arctos Anthracite Coal Project;
- Schaft Creek Mine;
- Galore Creek Mine;
- Bronson Slope Mine;
- Brucejack Mine (access corridor overlaps);
- Snowfield Project (access corridor overlaps);
- Granduc Copper Mine (access corridor overlaps);
- McClymont Creek Hydroelectric (access corridor overlaps);
- Treaty Creek Hydroelectric (access corridor overlaps);
- Long Lake Hydroelectric;
- fishing;
- guide outfitting;
- resident and Aboriginal harvest;
- current and possible future mineral and energy resource exploration;
- current and possible future forestry activities; and
- traffic and roads.

23.9.1.2 Temporal Linkages with other Projects and Human Actions

Effects to land users from past projects and human activities may temporally overlap with residual effects from the KSM Project changes if the activities persist in the land use environment or if habitat has not had sufficient time to recover from past effects. Past projects and human activities that may overlap temporally with KSM Project are:

- Eskay Creek Mine;
- Granduc Mine;
- Sulphurets Project;
- Snip Mine;
- Johnny Mountain Mine;
- fishing;
- guide outfitting;

- resident and aboriginal harvest;
- mineral exploration;
- traffic and roads; and
- forestry activities.

Present and reasonably foreseeable future projects and human activities with potential effects to land users that could overlap temporally with residual effects from the KSM Project are previously listed in Section 23.9.1.1.

Table 23.9-1 summarizes the linkages between the KSM Project and other human activities in regards to land and resource use.

Table 23.9-1. Summary of Potential Linkages between KSM Project and Other Human Actions in Regards to Land Use

Action/Project		Past	Present	Future
Past Projects	Eskay Creek Mine	X	NL	NL
	Granduc Mine	X	NL	NL
	Johnny Mountain Mine	X	NL	NL
	Kitsault Mine (Closed)	NL	NL	NL
	Snip Mine	X	NL	NL
	Sulphurets Project	X	NL	NL
	Swamp Point Aggregate Mine	NL	NL	NL
Present Projects	Forrest Kerr Hydroelectric	NL	X	X
	Long Lake Hydroelectric	NL	X	X
	Northwest Transmission Line	NL	X	X
	Red Chris Mine	NL	X	X
	Wolverine Mine	NL	NL	NL
Reasonably Foreseeable Future Projects	Arctos Anthracite Coal Project	NL	NL	X
	Bear River Gravel	NL	NL	NL
	Bronson Slope Mine	NL	NL	X
	Brucejack Mine	NL	X	X
	Galore Creek Mine	NL	X	X
	Granduc Copper Mine	NL	X	X
	Kitsault Mine	NL	NL	NL
	Kutcho Mine	NL	NL	NL
	McLymont Creek Hydroelectric	NL	X	X
	Schaft Creek Mine	NL	NL	X
	Snowfield Project	NL	X	X
	Storie Moly Mine	NL	NL	NL
	Turnagain Mine	NL	NL	NL
	Treaty Creek Hydroelectric	NL	X	X

(continued)

Table 23.9-1. Summary of Potential Linkages between KSM Project and Other Human Actions in Regards to Land Use (completed)

Action/Project		Past	Present	Future
Land Use Activities	Agricultural Resources	NL	NL	NL
	Fishing	X	X	X
	Guide Outfitting	X	X	X
	Resident and Aboriginal Harvest	X	X	X
	Mineral and Energy Resource Exploration	X	X	X
	Recreation and Tourism	NL	NL	NL
	Timber Harvesting	X	X	X
	Traffic and Roads	X	X	X

NL = No linkage (no spatial and temporal overlap, or potential effects do not act in combination).
X = Potential spatial and temporal linkage with project or action.

23.9.2 Cumulative Effects Assessment for Commercial Recreation, Guide Outfitting and Trapping

The Project is predicted to have a number of non-significant residual effects on commercial recreation, guide outfitting, and trapping during all Project phases. Past mining projects, future mine and hydroelectric projects, and commercial land use activities such as energy and mineral resource exploration and timber harvesting, have the potential to interact cumulatively with this effect (Table 23.9-2). This interaction is due to the additional restrictions on access to land and resources, as well as additional noise, traffic, and infrastructure disturbances and change in the amount of harvested resources. Activities such as fishing, guide outfitting, and resident/Aboriginal harvest are also expected to act cumulatively with the KSM Project due to the associated use of harvested resources.

23.9.2.1 Cumulative Effect of Restrictions on Access to Land and Resources

How and where licence holders currently access land and resources within the LSA/RSA may be altered or decreased because of Project infrastructure and the presence of staff and contractors. The presence of infrastructure, barriers including gates and fencing, as well as Project-related sensory disturbances, will discourage or restrict land users from accessing LSA/RSA areas that may currently be used. Other present and foreseeable future mining, hydroelectric, and other commercial activities such as mineral exploration or timber harvesting have the potential to act cumulatively in the RSA by restricting access along roads that have been or will be constructed, or by the presence of infrastructure in current wilderness areas. Aboriginal groups, guide outfitters, resident hunters, commercial recreation stakeholders, and trapline holders may be affected.

With respect to access to navigable waters, none of the considered projects in Table 23.9-1 involves infrastructure or components (such as towers or bridges) which could be developed on or near the Unuk River. While fishing, guide outfitting, local and Aboriginal harvest, and recreation and tourism occur on or in the vicinity of the Unuk River, none of these activities directly affects safe navigation. Consequently, no cumulative effects to safe navigation on the Unuk River are expected due to the lack of spatial overlap.

Table 23.9-2. Summary of Projects and Activities with Potential to interact Cumulatively with Expected Project-specific Residual Effects on Commercial Recreation, Guide Outfitting and Trapping; Recreational Hunting and Fishing; and Subsistence*

Description of KSM Residual Effect	Potential for Cumulative Effect: Relevant Projects and Activities												
	Eskay Creek Mine	**Granduc Mine**	**Johnny Mountain Mine**	**Snip Mine**	**Kitsault Mine (Closed)**	**Sulphurets Project**	**Fishing**	**Guide Outfitting**	**Resident/ Aboriginal Harvest**	**NTL**	**Forest Kerr Hydroelectric**	**Schaft Creek Mine**	**Galore Creek Mine**
Access to commercial land user licence areas will remain restricted.	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction	No Interaction	Possible Interaction	No Interaction	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction
Access to subsistence harvest areas will remain restricted for certain land users.	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction	No Interaction	No Interaction	No Interaction	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction
Noise, traffic and observation of project-related infrastructure in the landscape could alter practice areas and/or reduce economic opportunities for commercial licence holders due to a perceived reduction in the quality of the land user experience.	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction	No Interaction	No Interaction	No Interaction	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction
Wildlife resources diminished for guide outfitters due to habitat loss and increased strain on harvest resources.	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction	No Interaction	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction
Wildlife resources diminished for resident hunters due to habitat loss and increased strain on harvest resources.	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction	No Interaction	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction
Wildlife resources diminished for subsistence users due to habitat loss and increased strain on harvest resources.	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction	No Interaction	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction

(continued)

Table 23.9-2. Summary of Projects and Activities with Potential to interact Cumulatively with Expected Project-specific Residual Effects on Commercial Recreation, Guide Outfitting and Trapping; Recreational Hunting and Fishing; and Subsistence (completed)*

Description of KSM Residual Effect	Potential for Cumulative Effect: Relevant Projects and Activities (cont'd)										
	Bronson Slope Mine	**Brucejack Project**	**Snowfield Project**	**Arctos Anthracite Coal Project**	**Granduc Copper Mine**	**McClymont Creek Hydroelectric**	**Treaty Creek Hydroelectric**	**Long Lake Hydroelectice**	**Mineral and Resource Exploitation**	**Traffic and Roads**	**Timber Harvesting**
Access to commercial land user licence areas will remain restricted.	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction	No Interaction	Possible Interaction
Access to subsistence harvest areas will remain restricted for certain land users.	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction	No Interaction	Possible Interaction
Noise, traffic and observation of project-related infrastructure in the landscape could alter practice areas and/or reduce economic opportunities for commercial licence holders due to a perceived reduction in the quality of the land user experience.	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction
Wildlife resources diminished for guide outfitters due to habitat loss and increased strain on harvest resources.	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction
Wildlife resources diminished for resident hunters due to habitat loss and increased strain on harvest resources.	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction
Wildlife resources diminished for subsistence users due to habitat loss and increased strain on harvest resources.	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction	Possible Interaction

*** Summary of potential cumulative residual effects on navigation are listed in Chapter 31 – Navigation in Table 31.9-2.**

Of the projects considered, the Eskay Creek Mine, Sulphurets Project, the NTL, Brucejack Mine, Snowfield Project, and Treaty Creek Hydroelectric hold the potential to interact with the Bell-Irving River. However, four of these projects are unlikely to create effects to navigation: roads associated with the Eskay Creek Mine and Sulphurets Project are already in place, the NTL crossing will be at a height sufficient to avoid interaction, and Treaty Creek Hydroelectric will likely use the same bridge as the KSM Project due to its proximity with the proposed road and bridge crossing.

The Brucejack Mine and the Snowfield Project could interact cumulatively, as these proposed developments would likely require road and bridge access from Highway 37, which would cross over the Bell-Irving River. However, construction of this bridge would not overlap temporally with the bridge-building activities of the KSM Project.

23.9.2.1.1 Project-specific Cumulative Effects Mitigations for Altered/Restricted Access

Access restrictions will be limited to access corridors and the Project footprint. Negotiated agreements designed to offset potential economic or subsistence-related losses from reduced access to the land and resources due to the Project may be pursued on a case-by-case basis with identified adversely impacted land users.

23.9.2.1.2 Other Project or Activity Mitigations to Address Altered/Restricted Access

There are no specific mitigation or management measures expected from other projects or activities to address the effect of altered or restricted access. However, it is expected that other large resource development projects would adopt mitigation and management measures similar to those of the KSM Project.

23.9.2.1.3 Determination of Potential for Residual Cumulative Effect and Significance

With the additional effects of past projects, future mine and hydroelectric projects, and commercial land use activities, the magnitude is predicted to remain medium as access restrictions will affect different land users to varying degrees depending on the extent of their tenure area, though could potentially increase from negligible to low for post-closure. The extent and duration of the effect of restricted access is predicted to increase for all project phases, while all other residual effects ratings will remain the same (Table 23.9-3). The cumulative adverse effect of the Project on altered or restricted access is predicted to be **not significant (minor)** during all Project phases due to the small footprint of Projects in the broader region and the limited number of commercial recreation licence holders potentially affected.

23.9.2.2 Cumulative Effect of Sensory Disturbances

The Project will contribute to a change in sensory disturbances in the LSA during construction, operation, and closure due to the presence of noise, traffic, and light from operation of equipment and facilities. A change in sensory disturbances may also extend to areas of the RSA due to the presence of road and helicopter traffic, blasting, and heavy equipment operation (Chapter 19, Noise), as well as aesthetic disturbances due to the Project's presence in a wilderness landscape. Sensory disturbances from Project-related activities may alter the behaviour of land users as well as the behavioural patterns of wildlife species that influence certain land use activities.

The two main forms of sensory disturbances associated with the Project are noise and visual/aesthetic. The wildlife and wildlife habitat effects assessment (Chapter 18) identified eight species that could be affected by sensory disturbances, including four that are hunted by guide outfitters, First Nations, and resident hunters within the RSA: moose, mountain goats, grizzly bears, and black bears. Other present and foreseeable future mining, hydroelectric, and other commercial activities such as mineral exploration or timber harvesting have the potential to act cumulatively in the RSA by increasing noise and light from vehicle traffic, blasting, equipment operation, and disturbance of the wilderness landscape.

23.9.2.2.1 Project-specific Cumulative Effects Mitigations for Sensory Disturbances

Management plans, monitoring, and adaptive management will be implemented to mitigate sensory disturbances, including a Noise Management Plan (Section 26.22), Traffic and Access Management Plan (Section 26.25), and Visual Quality Management Plan (26.24).

The objective of the Noise Management Plan is to ensure that noise levels during all phases of the Project are acceptably low for human and wildlife receptors and receptors of concern in the vicinity of the project, as per human health guidelines (Health Canada 2011). Details regarding mitigation with respect to the Traffic and Access Management Plan are provided in Chapter 26.25.

A number of visual quality mitigation measures will be implemented as part of direct Project effects, including:

- design of roads will reduce effects on appearance of natural landscape wherever practical;
- tree buffers will be maintained on the side of access roads, where possible;
- tree buffers will be maintained around major infrastructure when infrastructure is potentially in view of land use areas where possible; and
- during closure, non-essential roads and infrastructure will be reclaimed and re-vegetated.

No additional mitigation measures are anticipated for cumulative effects.

23.9.2.2.2 Other Project or Activity Mitigations to Address Sensory Disturbances

There are no specific mitigation or management measures expected from other projects or activities to address the effects of sensory disturbances. However, it is expected that other large resource development projects would adopt mitigation and management measures similar to those of the KSM Project. It is also expected that all other projects will comply with relevant government legislation with respect to noise and other emissions.

23.9.2.2.3 Determination of Potential for Residual Cumulative Effect and Significance

With the additional effects of past projects, future mine and hydroelectric projects, and commercial land use activities, the magnitude and duration of the effect of sensory disturbance is predicted to increase, while all other residual effects ratings are predicted to remain the same (Table 23.9-3). The cumulative effect of sensory disturbance is assessed as **not significant (minor)** for all Project phases.

Table 23.9-3. Summary of Cumulative Residual Effects on Commercial Recreation, Guide Outfitting, and Trapping*

Description of Residual Effect	Other Project(s)/ Activity(ies)	Timing of Effect	Magnitude	Magnitude Adjusted for CE	Extent	Extent Adjusted for CE	Duration	Duration Adjusted for CE	Frequency	Frequency Adjusted for CE	Reversibility	Reversibility Adjusted for CE	Context	Context Adjusted for CE	Likelihood of Effects				Significance Determination	Significance Determination Adjusted for CE	Follow-up Monitoring	Follow-up Monitoring Adjusted for CE
															Probability	Probability Adjusted for CE	Confidence Level	Conf. Level Adjusted for CE				
Access to certain areas within commercial licence tenures will remain restricted	Past mining projects; present and foreseeable future mining and hydroelectric projects; commercial land use activities	Construction	Medium	Medium	Local	Landscape	Medium	Long	Continuous	Continuous	Reversible short-term	Reversible short-term	Neutral	Neutral	High	Medium	High	Medium	Not Significant (Minor)	Not Significant (Minor)	Not Required	Not Required
		Operations	Medium	Medium	Local	Landscape	Long	Long	Continuous	Continuous	Irreversible	Irreversible	Neutral	Neutral	High	Medium	High	Medium	Not Significant (Minor)	Not Significant (Minor)	Not Required	Not Required
		Closure	Medium	Medium	Local	Landscape	Medium	Long	Continuous	Continuous	Irreversible	Irreversible	Neutral	Neutral	High	Medium	High	Medium	Not Significant (Minor)	Not Significant (Minor)	Not Required	Not Required
		Post-closure	Negligible	Low	Local	Landscape	Far future	Far future	Continuous	Continuous	Irreversible	Irreversible	Neutral	Neutral	High	Medium	High	Medium	Not Significant (Minor)	Not Significant (Minor)	Not Required	Not Required
Noise, traffic and observation of project-related infrastructure in the landscape could alter practice areas and/or reduce economic opportunities for commercial licence holders due to a perceived reduction in the quality of the land user experience.	Past mining projects; present and foreseeable future mining and hydroelectric projects; commercial land use activities	Construction	Medium	High	Regional	Regional	Medium	Long	Continuous	Continuous	Reversible short-term	Reversible short-term	Neutral	Neutral	High	Medium	Medium	Medium	Not Significant (Minor)	Not Significant (Minor)	Not Required	Not Required
		Operations	Medium	High	Regional	Regional	Long	Far future	Continuous	Continuous	Reversible short-term	Reversible short-term	Neutral	Neutral	High	Medium	Medium	Medium	Not Significant (Minor)	Not Significant (Minor)	Not Required	Not Required
		Closure	Medium	High	Landscape	Landscape	Medium	Long	Regular	Regular	Reversible short-term	Reversible short-term	Neutral	Neutral	Medium	Medium	Medium	Medium	Not Significant (Minor)	Not Significant (Minor)	Not Required	Not Required
		Post-closure	Negligible	Low	Local	Landscape	Far future	Far future	Sporadic	Regular	Reversible short-term	Reversible short-term	Neutral	Neutral	Low	Low	Medium	Medium	Not Significant (Minor)	Not Significant (Minor)	Not Required	Not Required
Wildlife resources diminished for guide outfitters and trappers due to habitat loss and increased strain on harvest resources.	Past mining projects; present and foreseeable future mining and hydroelectric projects; commercial land use activities; resident/Aboriginal harvest; guide outfitting activities	Construction	Medium	Medium	Regional	Regional	Medium	Long	Continuous	Continuous	Reversible long-term	Reversible long-term	Neutral	Neutral	Medium	Medium	High	Medium	Not Significant (Moderate)	Not significant (Moderate)	Not Required	Not Required
		Operations	Medium	Medium	Regional	Regional	Long	Far future	Continuous	Continuous	Reversible long-term	Reversible long-term	Neutral	Neutral	Medium	Medium	High	Medium	Not Significant (Moderate)	Not significant (Moderate)	Not Required	Not Required
		Closure	Low	Low	Landscape	Regional	Medium	Long	Regular	Continuous	Reversible long-term	Reversible long-term	Neutral	Neutral	Low	Medium	High	Medium	Not Significant (Minor)	Not significant (Moderate)	Not Required	Not Required

Note: CE = Cumulative Effect.
*** Cumulative residual effects on navigation are listed in Chapter 31 – Navigation in Table 31.9-2.**

23.9.2.3 Cumulative Effect of Change in the Amount of Resources

The proposed Project will be developed in an area that is characterized by remote and largely undeveloped wilderness. Many commercial land users rely on the wildlife, fish, aquatic, and plant resources provided by the wilderness environment in order to carry out their activities. Development of the Project will likely contribute to a change in the quantity of these harvest resources due to loss of habitat, decrease in vegetation, and disruption of wildlife movement from Project infrastructure. Finally, increased pressure on wildlife as a result of opening up resources to non-licences land users and wildlife collisions with vehicles in the RSA could also contribute to a change in the amount of resources.

Other present and foreseeable future mining, hydroelectric, and other commercial activities—such as mineral exploration or timber harvesting, as well as resident/Aboriginal harvesting and guide outfitting activities—have the potential to act cumulatively in the RSA by contributing to the further removal of habitat and increased harvest pressure.

23.9.2.3.1 Project-specific Cumulative Effects Mitigations for Amount of Resources

As part of Project effects mitigation, management plans related to sensory disturbances and their effects on resource quantity include a Noise Management Plan (Section 26.22), a Traffic and Access Management Plan (Section 26.25), and mitigation of aesthetic disturbances (see Section 23.7.3.1). Potential effects from Project development and traffic on wildlife, fish, and aquatic resources will be mitigated through the Wildlife and Wildlife Habitat Management Plan (Section 26.21), as well as the Fish and Aquatic Habitat Management Plan (Section 26.18), and the Vegetation Clearing Management Plan (Section 26.20.1). Added pressures on harvest resources (fish, vegetative, and wildlife) due to potentially increased access to the study areas will be mitigated primarily through the Traffic and Access Management Plan.

Monitoring and adaptive management will also be implemented to determine if additional measures are required for cumulative effects.

23.9.2.3.2 Other Project or Activity Mitigations to Address Amount of Resources

It is expected that other large resource development projects would adopt mitigation and management measures similar to those of the KSM Project. It is also expected that all other projects will comply with relevant government legislation with respect to noise, wildlife, and fish and fish habitat, among others.

23.9.2.3.3 Determination of Potential for Residual Cumulative Effect and Significance

With the additional effects of past projects, future mine and hydroelectric projects, and commercial land use activities, as well as resident/Aboriginal harvest and guide outfitting, the magnitude and duration of the effect on quantity of resources for resident hunters is predicted to increase, while all other residual effects ratings are predicted to remain the same (Table 23.9-3). The cumulative effect of change in the amount of resources from the Project in conjunction with the corresponding effects of other projects and activities is assessed as **not significant (moderate)** for all Project phases.

23.9.3 Cumulative Effects Assessment for Recreational Hunting and Fishing

Recreational hunting within the RSA is predicted to have a number of residual effects for resident hunters during all Project phases due to a change in the amount of resources (Table 23.8-3). Past mining projects; present and future mine and hydroelectric projects; and commercial land use activities, such as mineral and energy resource exploration and timber harvesting; have the potential to interact cumulatively with this effect (Table 23.9-2) due to additional loss of habitat, wildlife mortality, and opening up of resources to increased pressures. Activities such as fishing, guide outfitting, and resident/Aboriginal harvest are also expected to act cumulatively with the KSM Project.

23.9.3.1 Cumulative Effect of Change in the Amount of Resources

The proposed Project will be developed in an area that is characterized by remote and largely undeveloped wilderness. Resident hunters and anglers rely on the wildlife, fish, and aquatic resources provided by the wilderness environment in order to carry out their activities. Development of the Project will likely contribute to a change in the quantity of these harvest resources due to loss of habitat, decrease in vegetation, and disruption of wildlife movement from Project infrastructure. Increased pressure on wildlife is also predicted because of opening up of resources to non-licenced land users and wildlife collisions with vehicles in the RSA.

Other present and foreseeable future mining, hydroelectric, and other commercial activities—such as mineral exploration or timber harvesting, as well as resident/Aboriginal harvesting and guide outfitting activities—have the potential to act cumulatively in the RSA by contributing to the further removal of habitat and increased harvest pressure.

23.9.3.1.1 Project-specific Cumulative Effects Mitigations for Amount of Resources

As part of Project effects mitigation, management plans related to sensory disturbances and their effects on resource quantity include a Noise Management Plan (Section 26.22), a Traffic and Access Management Plan (Section 26.25), and mitigation of aesthetic disturbances (see Section 23.7.3.1). Potential effects from Project development and traffic on wildlife, fish, and aquatic resources will be mitigated through the Wildlife and Wildlife Habitat Management Plan (Section 26.21), as well as the Fish and Aquatic Habitat Management Plan (Section 26.18), and the Vegetation Clearing Management Plan (Section 26.20.1). Added pressures on harvest resources (fish, vegetative, and wildlife) due to potentially increased access to the study areas will be mitigated primarily through the Traffic and Access Management Plan.

Monitoring and adaptive management will also be implemented to determine if additional measures are required for cumulative effects.

23.9.3.1.2 Other Project or Activity Mitigations to Address Amount of Resources

There are no specific mitigation or management measures expected from other projects or activities to address quantity of resources. However, it is expected that other large resource development projects would adopt mitigation and management measures similar to those of the KSM Project. It is also expected that all other projects will comply with relevant government legislation with respect to noise, wildlife, and fish and fish habitat, among others.

23.9.3.1.3 Determination of Potential for Residual Cumulative Effect and Significance

With the additional effects of past projects, future mine and hydroelectric projects, commercial land use activities, as well as resident/Aboriginal harvest and guide outfitting, the duration of the effect on the amount of resources is predicted to increase, while all other residual effects ratings are predicted to remain the same (Table 23.9-4). Magnitude is also predicted to remain the same due to the limited number of commercial recreation holders affected. The cumulative effect of change in the amount of resources is assessed as **not significant (moderate)** for all Project phases.

23.9.4 Cumulative Effects Assessment for Subsistence

The Project is predicted to have a number of non-significant residual effects on subsistence harvest users, notably Skii km Lax Ha and potentially Tahltan members, during all Project phases. Past mining projects, future mine and hydroelectric projects, and commercial land use activities such as energy and mineral resource exploration and timber harvesting, have the potential to interact cumulatively with this effect (Table 23.9-2). This interaction is due to the additional restrictions on access to subsistence users, as well as additional changes in the amount of harvested resources due to habitat loss, wildlife mortality, and disruption of movement. Activities such as fishing, guide outfitting, and resident harvest are also expected to act cumulatively with the KSM Project due to the associated use of harvested resources.

23.9.4.1 Cumulative Effect of Restrictions on Access to Land and Resources

How and where subsistence users currently access land areas and resources within the LSA/RSA may be altered or decreased as a result of Project infrastructure and the presence of staff and contractors. The presence of infrastructure, barriers including gates and fencing, will discourage or restrict subsistence users from accessing LSA/RSA areas that may currently be used. Other present and foreseeable future mining, hydroelectric, and other commercial activities such as mineral exploration or timber harvesting have the potential to act cumulatively in the RSA by restricting access along roads that have been or will be constructed, or by the presence of infrastructure in current wilderness areas accessed for subsistence purposes. The Skii km Lax Ha and Tahltan Nation members, as well as Nisga'a citizens, may be affected.

23.9.4.1.1 Project-specific Cumulative Effects Mitigations for Altered/Restricted Access

Access restrictions will be limited to access corridors and the Project footprint. Negotiated agreements designed to offset potential economic or subsistence-related losses from reduced access to the land and resources due to the Project may be pursued on a case-by-case basis with identified adversely impacted subsistence users.

23.9.4.1.2 Other Project or Activity Mitigations to Address Altered/Restricted Access

It is anticipated that other large resource development projects would adopt mitigation and management measures similar to those of the KSM Project.

23.9.4.1.3 Determination of Potential for Residual Cumulative Effect and Significance

With the additional effects of past projects, future mine and hydroelectric projects, and commercial land use activities, the magnitude, extent and duration is predicted to increase for all phases, while all other residual effects ratings will remain the same (Table 23.9-5).

However, the cumulative adverse effect of the Project on altered or restricted access is predicted to remain **not significant (minor)** during all Project phases as effects are predicted to be limited to accessing traplines 617T015 and 617T011 (i.e., restricted access is not predicted to act cumulatively on other subsistence uses).

23.9.4.2 Cumulative Effect of Change in the Amount of Resources

Subsistence land users rely on the wildlife, fish, aquatic, and plant resources provided by the wilderness environment in order to carry out their activities. Development of the Project will likely contribute to a change in the quantity of these harvest resources due to loss of habitat, decrease in vegetation, and disruption of wildlife movement from Project infrastructure. Finally, increased pressure on wildlife as a result of opening up resources to non-licenced land users and vehicle-wildlife collisions in the RSA could also contribute to a change in the amount of resources.

Other present and foreseeable future mining, hydroelectric, and other commercial activities, such as mineral exploration or timber harvesting, as well as resident/Aboriginal harvesting and guide outfitting activities, have the potential to act cumulatively in the RSA by contributing to the further removal of habitat and increased harvest pressure.

23.9.4.2.1 Project-specific Cumulative Effects Mitigations for Amount of Resources

As part of Project effects mitigation, management plans related to sensory disturbances and their effects on resource quantity include a Noise Management Plan (Section 26.22), a Traffic and Access Management Plan (Section 26.25), and mitigation of aesthetic disturbances (see Section 23.7.3.1). Potential effects from Project development and traffic on wildlife, fish, and aquatic resources will be mitigated through the Wildlife and Wildlife Habitat Management Plan (Section 26.21), as well as the Fish and Aquatic Habitat Management Plan (Section 26.18), and the Vegetation Clearing Management Plan (Section 26.20.1). Added pressures on harvest resources (fish, vegetative, and wildlife) due to potentially increased access to the study areas will be mitigated primarily through the Traffic and Access Management Plan.

Follow-up monitoring and adaptive management will also be implemented to determine if additional measures are required for cumulative effects, notably on subsistence harvesting of wildlife. As such, the follow-up monitoring program as identified in the Wildlife and Wildlife Habitat Management Plan (Section 26.21) will be utilized to address potential cumulative effects on subsistence users.

23.9.4.2.2 Other Project or Activity Mitigations to Address Amount of Resources

It is expected that other large resource development projects would adopt mitigation and management measures similar to those of the KSM Project. It is also expected that all other projects will comply with relevant government legislation with respect to noise, wildlife, and fish and fish habitat, among others.

Table 23.9-4. Summary of Cumulative Residual Effects on Recreational Hunting and Fishing

Description of Residual Effect	Other Project(s)/ Activity(ies)	Timing of Effect	Magnitude	Magnitude Adjusted for CE	Extent	Extent Adjusted for CE	Duration	Duration Adjusted for CE	Frequency	Frequency Adjusted for CE	Reversibility	Reversibility Adjusted for CE	Context	Context Adjusted for CE	Likelihood of Effects				Significance Determination	Significance Determination Adjusted for CE	Follow-up Monitoring	Follow-up Monitoring Adjusted for CE
															Probability	Probability Adjusted for CE	Confidence Level	Conf. Level Adjusted for CE				
Wildlife resources diminished for resident hunters due to habitat loss and increased strain on harvest resources.	Past mining projects; present and foreseeable future mining and hydroelectric projects; commercial land use activities; resident/Aboriginal harvest; guide outfitting activities	Construction	Medium	High	Regional	Regional	Medium	Long	Continuous	Continuous	Reversible long-term	Reversible long-term	Neutral	Neutral	Medium	Medium	High	Medium	Not Significant (Moderate)	Not significant (Moderate)	Not Required	Not Required
		Operations	Medium	High	Regional	Regional	Long	Far future	Continuous	Continuous	Reversible long-term	Reversible long-term	Neutral	Neutral	Medium	Medium	High	Medium	Not Significant (Moderate)	Not significant (Moderate)	Not Required	Not Required
		Closure	Low	Medium	Landscape	Regional	Medium	Long	Regular	Continuous	Reversible long-term	Reversible long-term	Neutral	Neutral	Low	Medium	High	Medium	Not Significant (Minor)	Not significant (Moderate)	Not Required	Not Required

Note: CE = Cumulative Effect.

Table 23.9-5. Summary of Cumulative Residual Effects on Subsistence

Description of Residual Effect	Other Project(s)/ Activity(ies)	Timing of Effect	Magnitude	Magnitude Adjusted for CE	Extent	Extent Adjusted for CE	Duration	Duration Adjusted for CE	Frequency	Frequency Adjusted for CE	Reversibility	Reversibility Adjusted for CE	Context	Context Adjusted for CE	Likelihood of Effects				Significance Determination	Significance Determination Adjusted for CE	Follow-up Monitoring	Follow-up Monitoring Adjusted for CE
															Probability	Probability Adjusted for CE	Confidence Level	Conf. Level Adjusted for CE				
Access to subsistence areas, including trapline 617T015 and 617T011, will remain restricted for certain land users.	Past mining projects; present and foreseeable future mining and hydroelectric projects; commercial land use activities	Construction	Low	Medium	Local	Landscape	Medium	Long	Continuous	Continuous	Reversible short-term	Reversible short-term	Neutral	Neutral	High	Medium	High	Medium	Not Significant (Minor)	Not Significant (Minor)	Required	Not Required
		Operations	Low	Medium	Local	Landscape	Long	Long	Continuous	Continuous	Irreversible	Irreversible	Neutral	Neutral	High	Medium	High	Medium	Not Significant (Minor)	Not Significant (Minor)	Not Required	Not Required
		Closure	Low	Medium	Local	Landscape	Medium	Medium	Continuous	Continuous	Irreversible	Irreversible	Neutral	Neutral	High	Medium	Medium	Low	Not Significant (Minor)	Not Significant (Minor)	Not Required	Not Required
		Post-closure	Low	Medium	Local	Landscape	Far future	Far future	Continuous	Continuous	Irreversible	Irreversible	Neutral	Neutral	High	Medium	Medium	Low	Not Significant (Minor)	Not Significant (Minor)	Not Required	Not Required
Wildlife resources diminished for subsistence harvesters due to habitat loss and increased strain on harvest resources.	Past mining projects; present and foreseeable future mining and hydroelectric projects; commercial land use activities	Construction	Medium	High	Regional	Regional	Medium	Long	Continuous	Continuous	Reversible long-term	Reversible long-term	Neutral	Neutral	Medium	Medium	High	High	Not Significant (Moderate)	Not Significant (Moderate)	Not Required	Required
		Operations	Medium	High	Regional	Regional	Long	Far future	Continuous	Continuous	Reversible long-term	Reversible long-term	Neutral	Neutral	Medium	Medium	High	High	Not Significant (Moderate)	Not Significant (Moderate)	Not Required	Required
		Closure	Low	Medium	Landscape	Landscape	Medium	Long	Continuous	Continuous	Reversible long-term	Reversible long-term	Neutral	Neutral	Low	Medium	High	Medium	Not Significant (Minor)	Not Significant (Moderate)	Not Required	Required

Note: CE = Cumulative Effect.

23.9.4.2.3 Determination of Potential for Residual Cumulative Effect and Significance

With the additional effects of past projects, future mine and hydroelectric projects, commercial land use activities, as well as resident/Aboriginal harvest and guide outfitting, the magnitude and duration of the effect on the amount of resources is predicted to increase for construction, operation, and closure, while all other residual effects ratings are predicted to remain the same (Table 23.9-5). The cumulative effect of change in the amount of resources to subsistence users is assessed as **not significant (moderate)** for all Project phases.

23.10 Summary of Assessment of Potential Environmental Effects on Land Use

Table 23.10-1 summarizes the assessment of the potential environmental effects of the Project on land use.

23.11 Land Use Conclusions

The Project has the potential to change land and resource uses within the LSA and RSA because of activities during all Project phases. Seven VCs were selected to assess the potential effects on land and resource use based on consideration of the issues identified by Aboriginal groups, government agencies, and public stakeholders, as well as professional judgement. Selected VCs include: 1) commercial recreation, guide outfitting and trapping; 2) recreational hunting and fishing; 3) subsistence; 4) traditional/heritage value of the land; 5) water licences; 6) mining and mineral exploration; and 7) navigable waters.

Three potential effects on the land use VCs were identified for assessment: 1) restrictions on access to land and resources; 2) change in sensory disturbances; and 3) change in the amount of resources. Potential effects are expected to persist during all Project phases, though some, such as effects on restricted access, will affect land uses differently in different areas and during different phases of the Project. Ultimately, effects are evaluated for their potential to alter land user interests and/or their ability to pursue their activities within the effects assessment boundaries.

Mitigation practices, monitoring, and adaptive management will be implemented to mitigate the potential Project effects on land use. This includes current aspects of Project design and a Traffic and Access Management Plan (Section 26.25). Other mitigation as it applies to land use includes a Wildlife and Wildlife Habitat Management Plan (Section 26.21.1), a Noise Management Plan (Section 26.22), a Fish and Aquatic Habitat Management Plan (Section 26.18), and the Vegetation Clearing Management Plan (Section 26.20.1). Resource Use Negotiated Agreements designed to offset residual effects due to changes in the quantity of resources or access to resources may also be pursued on a case-by-case basis where warranted. In sum, the defined mitigation is focused on reducing adverse effects of the Project on land use activities, as well as on the environmental components on which the activities depend.

Five residual adverse Project effects on land use have been identified for three VCs: commercial recreation, guide outfitting, and trapping; recreational hunting and fishing; and subsistence. Three residual effects are predicted for commercial recreation, guide outfitting, and trapping; one is predicted for recreational hunting and fishing; and two residual effects are anticipated for subsistence. Residual effects on navigation are described in Chapter 31.

Residual effects for all other land use VCs are not anticipated.

- Altered/restricted access. Project development, infrastructure, and access restrictions will reduce or alter the access to land and resources for land users in the LSA and RSA. Specifically, two commercial recreation licence holders are predicted to be affected, including: Last Frontier Heliskiing and guide outfitters licence holder #601066. In addition, portions of traplines TR0617T15 and TR0616T011 are also predicted to be affected.
- Change in sensory disturbances. The quality of experience within the RSA for commercial recreation, hunting, and trapping lies largely in the sense of wilderness provided by the landscape. The visual effects of the proposed Project on the landscape are examined in detail in the Visual and Aesthetic Resources Effects assessment (Chapter 24) and Noise Effects Assessment (Chapter 19). Although proposed mitigation measures will effectively reduce the residual effect for tenure holders that have a primarily economic stake in the RSA, residual effects are predicted to nevertheless remain as these stakeholders will likely have to adjust their land use patterns to maintain the wilderness experience that their licence area relies on. This is expected to affect commercial recreation stakeholders, including The Explorer's League, Bear Mountaineering, Last Frontier Heliskiing, as well as guide outfitter #601066.
- Change in the amount of resources. Wildlife species of harvest interest are predicted to be affected in the LSA and RSA, resulting in a change in the quantity of resources for guide outfitter #601066 and Skii km Lax Ha subsistence activities (including moose hunting). This residual effect is predicted to occur for all Project components during construction, operation, and closure.

All identified residual adverse effects on land use are evaluated to be either **not significant (minor)** or **not significant (moderate)**.

The potential cumulative effects for each of the above residual Project effects, past mining projects, present and future mine and hydroelectric projects, and commercial land use activities—such as mineral and energy resource exploration and timber harvesting—have the potential to interact cumulatively with a change in access due the need to restrict access roads and infrastructure development areas for the purposes of public safety. With respect to sensory disturbances, other present and foreseeable future mining, hydroelectric, and other commercial activities such as mineral exploration or timber harvesting also have the potential to act cumulatively in the RSA by increasing noise and light from vehicle traffic, blasting, helicopter travel, and aesthetic disturbances of the wilderness landscape. With respect to potential cumulative effects on the amount of resources, other projects and activities similarly have the potential to act cumulatively by contributing to the further removal of habitat, disruption of wildlife movement, vehicle-wildlife mortality, and increasing harvest pressure and impacts on biological resources. All potential cumulative effects on land use are assessed as either **not significant (minor)** or **not significant (moderate)**.

Table 23.10-1. Summary of Assessment of Potential Environmental Effects: Land Use and Resources

Valued Component	Phase of Project	Potential Effect	Key Mitigation Measures	Significance Analysis of Residual Effects	Significance Analysis of Cumulative Residual Effects
Commercial Recreation, Guide Outfitting, and Trapping	Construction	Access to land user licence areas will remain restricted for certain land users.	Access Management Plan; Monitoring and Adaptive Management; Negotiated Agreements	Not Significant (Minor)	Not Significant (Minor)
	Operations			Not Significant (Minor)	Not Significant (Minor)
	Closure			Not Significant (Minor)	Not Significant (Minor)
	Post-closure			Not Significant (Minor)	Not Significant (Minor)
Commercial Recreation, Guide Outfitting, and Trapping	Construction	Noise, traffic and observation of project-related infrastructure in the landscape could alter practice areas and/or reduce economic opportunities for commercial licence holders due to a perceived reduction in the quality of the land user experience.	Traffic Management Plan; Noise Management Plan; Visual Quality Mitigation	Not Significant (Minor)	Not Significant (Minor)
	Operations			Not Significant (Minor)	Not Significant (Minor)
	Closure			Not Significant (Minor)	Not Significant (Minor)
	Closure			Not Significant (Minor)	Not Significant (Minor)
Commercial Recreation, Guide Outfitting, and Trapping	Construction	Wildlife resources diminished for guide outfitters due to habitat loss and increased strain on harvest resources.	Traffic Management Plan; Noise Management Plan; Fish and Aquatic Habitat Management Plan; Terrestrial Ecosystems Management and Monitoring Plans; Wildlife Management Plan	Not Significant (Moderate)	Not Significant (Moderate)
	Operations			Not Significant (Moderate)	Not Significant (Moderate)
	Closure			Not Significant (Minor)	Not Significant (Moderate)
Recreational Hunting and Fishing	Construction	Wildlife resources diminished for resident hunters due to habitat loss and increased strain on harvest resources.	Traffic Management Plan; Noise Management Plan; Fish and Aquatic Habitat Management Plan; Terrestrial Ecosystems Management and Monitoring Plans; Wildlife Management Plan	Not Significant (Moderate)	Not Significant (Moderate)
	Operations			Not Significant (Moderate)	Not Significant (Moderate)
	Closure			Not Significant (Minor)	Not Significant (Moderate)
Subsistence	Construction	Access to subsistence areas, including trapline 617T015 and 617T011, will remain restricted for certain land users.	Access Management Plan; Monitoring and Adaptive Management; Negotiated Agreements	Not Significant (Minor)	Not Significant (Minor)
	Operations			Not Significant (Minor)	Not Significant (Minor)
	Closure			Not Significant (Minor)	Not Significant (Minor)
	Closure			Not Significant (Minor)	Not Significant (Minor)
Subsistence	Construction	Wildlife resources diminished for subsistence harvesters due to habitat loss and increased strain on harvest resources.	Traffic Management Plan; Noise Management Plan; Fish and Aquatic Habitat Management Plan; Terrestrial Ecosystems Management and Monitoring Plans; Wildlife Management Plan	Not Significant (Moderate)	Not Significant (Moderate)
	Operations			Not Significant (Moderate)	Not Significant (Moderate)
	Closure			Not Significant (Minor)	Not Significant (Moderate)

Project works affecting navigable waters consist of several access roads, with the majority of effects occurring during construction and post-closure (Chapter 31, Navigable Waters). Any interruption in navigability due to construction or maintenance will be temporary in nature and mitigated using warning signs and other measures as directed by Transport Canada. Bridge and transmission line crossings will be designed and maintained to ensure navigability is preserved. No significant adverse residual environmental effects are predicted on health and socio-economic conditions (i.e., safety) of navigation, the public right to access a watercourse for the purposes of navigation for recreational or commercial use, or on traditional subsistence activities.

No significant adverse residual access and safety effects on navigation are expected from the Project and no cumulative effects of interactions with other projects on navigable waters are anticipated.

References

1985a. *Fisheries Act*, RS. C. F-14. s. 1.

1985b. *Navigable Waters Protection Act*, RSC. C. N-22.

1994. *Migratory Birds Convention Act*, C. 22.

1996a. *Ecological Reserve Act*, RSBC. C. 103.

1996b. *Heritage Conservation Act*, C. 187.

1996c. *Land Act*, RSBC 1996. C. 245.

1996d. *Land Title Act*, RSBC 1996. C. 250.

1996e. *Mineral Tenure Act*, SBC. C. 292.

1996f. *Mineral Tenure Act*, RSBC. C. 292.

1996g. *Mines Act*, RSBC 1996. C. 293.

1996h. *Mining Right of Way Act*, RSBC. C. 294.

1996i. *Park Act*, RSBC. C. 344.

1996j. *Wildlife Act*, RSBC. C. 488. s. 1.1.

1997. *Fish Protection Act*, SBC. C. 25.

2000. *Protected Areas of British Columbia Act*, RSBC. C. 17.

2002a. *Forest and Range Practices Act*, SBC. C. 69. s. 149.1.

2002b. *Protected Areas Forests Compensation Act*, SBC. C. 51.

2002c. *Species at Risk Act*, SC. C. 29. s. 15.3.

2003. *Environmental Management Act*, SBC. C. 53.

BC Hydro. 2012. *Northwest transmission Line Project*. http://www.bchydro.com/energy_in_bc/projects/ntl.html (accessed June 2012).

BC ILMB. 2000a. *Cassiar Iskut-Stikine Land and Resource Management Planning Process Completed (Press Release)*. http://archive.ilmb.gov.bc.ca/slrp/lrmp/smithers/cassiar/news/newsreleases/lrmp_completed.htm (accessed December 2012).

BC ILMB. 2000b. *Cassiar Iskut - Stikine Land and Resource Management Plan*. http://ilmbwww.gov.bc.ca/slrp/lrmp/smithers/cassiar/index.html (accessed July 2010).

BC ILMB. 2008. *Land Use Objectives Regulation: Policies and Procedures*. http://archive.ilmb.gov.bc.ca/slrp/lrmp/policiesguidelinesandassessements/docs/Approved_LUOR_Policies_and_Procedures_Feb_14_08.pdf (accessed January 2013).

BC MFLNRO. 2012a. *Cassiar Timber Supply Area (TSA)*. http://www.for.gov.bc.ca/hts/tsa/tsa04/#documents (accessed October 2012).

BC MFLNRO. 2012b. *Nass South Sustainable Resource Management Plan*. http://www.ilmb.gov.bc.ca/slrp/srmp/south/nass/index.html (accessed November 2012).

BC MFLNRO. 2012c. *Nass Timber Supply Area (TSA)*. http://www.for.gov.bc.ca/hts/tsa/tsa43/index.htm (accessed October 2012).

BC MOE. 2006a. *Develop with care: Environmental guidelines for urban and rural land development in British Columbia*. Prepared by the British Columbia Ministry of Environment: Victoria, BC.

BC MOE. 2006b. *Wildlife Guidelines for Backcountry Tourism/Commercial Recreation in British Columbia*. British Columbia Ministry of Environment Environmental Stewardship Division: Victoria, BC. www.env.gov.bc.ca/wld/twg/documents/wildlife_guidelines_recreation_may06_v2.pdf (accessed January 2013).

BC MOE. 2012a. Big game harvest statistics for resident & non-resident hunters from hunter sample and guide declarations 1976-2008. Excel datasheet. In Smithers, BC: Fish and Wildlife Branch, BC Ministry of Environment.

BC MOE. 2012b. Skeena trapline index. Excel datasheet. In Smithers, B.C.: Fish and Wildlife Branch, Ministry of the Environment.

BC MOE. 2012c. *Water licences query*. http://a100.gov.bc.ca/pub/wtrwhse/water_licences.input (accessed June 2012).

BC MWLAP. 2003. *Management direction statement for Border Lake Provincial Park*. http://www.env.gov.bc.ca/bcparks/planning/mgmtplns/ningunsaw/ningunsaw.pdf (accessed June 2009).

BC MWLAP. 2004. *Environmental Best Management Practices for Urban and Rural Land Development in British Columbia*. http://www.env.gov.bc.ca/wld/documents/bmp/urban_ebmp/EBMP%20PDF%201.pdf (accessed January 2013).

Coast Mountain Hydro Corp. 2002. *Forrest Kerr Hydro Project: Project Approval Certificate Application*. On file with BC EAO: Victoria, BC.

GFA. 2012. *Food, Social and Ceremonial Fishing*. http://www.gitanyowfisheries.com/fishing/food-social-and-ceremonial-fishing/ (accessed June 2012).

GHCO. 2008. *Report on the Potential Impacts of the NTL Project on Gitanyow Territories & Resources*. Prepared for BC Hydro, Aboriginal Relations and Negotiations. Report on file at the BC EAO, n.p.

GOABC. 2012. *Outfitter Directory*. http://www.goabc.org/outfitter-directory-and-hunt-guide-directory.aspx (accessed June 2012).

Government of BC. 2012a. *Data Distribution Service*. https://apps.gov.bc.ca/pub/dwds/home.so (accessed June 2012).

Government of BC. 2012b. *Integrated Land and Resource Registry*. https://webmaps.gov.bc.ca/imfs/imf.jsp?site=libc_ilrr (accessed June 2012).

Grand Slam Outfitters & Advertisers. 2012. *Sheep Hunting Outfitters*. http://www.wildsheep.org/directory/grand_slam_advertisers.htm (accessed June 2012).

Health Canada. 2011. *Guidance for Evaluating Human Health Impacts in Environmental Assessment: Noise. Environmental Health Bureau, Healthy Environments and Consumer Safety Branch*. Draft. Health Canada: Ottawa, ON.

McLellan, B. N. and D. M. Shackleton. 1989. Immediate Reactions of Grizzly Bears to Human Activities. *Wildlife Society Bulletin*, 17 (3): 269-74.

Milligan Outfitting Ltd. 2012. *Milligan Outfitting Ltd.* http://coastmountainoutfitters.com/ (accessed June 2012).

NDIT. 2010. *City of Terrace: Investment Ready Community Profile*. Terrace Economic Development Authority, City of Terrace, Invest BC and Northern Development Initiative Trust. http://www.teda.ca/files/2113/2682/7307/Terrace_-_Investment-Ready_Community_Profile.pdf (accessed August 2012).

NDIT. 2012. *Port of Stewart*. http://investnorthwestbc.ca/major-projects-and-investment-opportunities/map-view/stewart/port-of-stewart (accessed November 2012).

NLG, Province of BC, and and Government of Canada. 1998. *Nisga'a Final Agreement*. Nisga'a Lisims Government, Province of British Columbia, and Government of Canada: New Aiyansh, BC.

Rescan. 2010a. *KSM Project: 2009 Vegetation and Ecosystem Mapping Baseline Studies Report*. Report Prepared for Seabridge Gold Inc. by Rescan Environmental Services Ltd.: Vancouver, BC.

Rescan. 2010b. *KSM Project: 2009 Wildlife Characterization Baseline Report*. Prepared for Seabridge Gold Inc. by Rescan Environmental Services Ltd.: Vancouver, BC.

Rescan. 2013a. *KSM Project: First Nations Consultation and Issues Summary Report*. Prepared for Seabridge Gold Inc. by Rescan Environmental Services Ltd.: Vancouver, BC.

Rescan. 2013b. *KSM Project: Nisga'a Nation Consultation and Issues Summary Report*. Prepared for Seabridge Gold Inc. by Rescan Environmental Services Ltd.: Vancouver, BC.

Resource Opportunities. 2012. *British Columbia's Golden Triangle*. http://www.resourceopportunities.com/Articles/Company-Reports.html (accessed Accessed January 2013).

SD 87. 2000. *Tahltan Nation*. School District 87 and the Tahltan Band Council: n.p.

Seip, L., S. McKnight, D. Walker, M. Campbell, and K. Farquharson. 2012. *KSM Project: Archaeological Impact Assessment, Final Report - Heritage Inspection Permit 2008-0128*. Prepared for Seabridge Gold Inc. by Rescan Environmental Services Ltd.: Vancouver, BC.

Tahltan Heritage Resources Environmental Assessment Team. 2009. *Tahltan Traditional Use Study of the proposed Northwest Transmission Line Project - Interim Report*. Tahltan Transmission Line Project Team: N.p.

TCC. 2010. *Tahltan Central Council*. http://www.tahltan.org (accessed March 2011).

Vescor. 2009. *Gitxsan Wildlife Policy- Interim Report*. Prepared by Vescor Management Consulting Ltd. for the Gitxsan Treaty Society: South Hazelton, BC.

Waller, J. S. and C. Servheen. 2005. Effects of transportation infrastructure on grizzly bears in northwestern Montana. *Journal of Wildlife Management*, 69 (3): 985-1000.

Personal Communications

Callbreath, A. 2009. Vice President, Tahltan Central Council. Personal Communication: December 2, 2009.

Brown, G. 2012. Lawyer and Guide Outfitting Tenure Holder. Personal Communication: August 2012.

Drinnan, D. 2009. Misty Mountain Outfitters/11434 Yukon Ltd. Personal Communication: May 3 and 6, 2009.

Foster, W. 2012. Tenures Specialist, British Columbia Ministry of Forests, Lands, and Natural Resource Operations. Personal Communications: December 18, 2012.

Green, D. 2009. Trapline Owner, Stewart, BC. Interview: May 21, 2009.

Gutfrucht, H. 2010. Misty Northwest Ranching & Outfitting. Personal Communication: May 6, 2010.

Martin, T. 2010. Wilp Wii'litsxw wing Chief. Personal Communication. June 15, 2010.

Milligan, R. 2009. Coast Mountain Outfitters. Personal Communication: July 9, 2009.

Kittmer, J. 2009. Economic and Financial Analyst, BC Ministry of Environment, Parks and Protected Areas Division. Personal Communication: June 25, 2009.