



APPENDIX 8.0-B
Land and Resource Use Baseline Report

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ACRONYMS, ABBREVIATIONS AND DEFINITIONS

Abbreviation	Definition
AAC	Allowable Annual Cut
Application (the)	The proponent's Application for an Environmental Assessment Certificate for the proposed Project, made under section 16 of the British Columbia <i>Environmental Assessment Act</i>
ATV	All Terrain Vehicle
BC	British Columbia
BC EAO	BC Ministry of Environment
BC ILMB	BC Integrated Land Management Bureau
BC MAL	BC Ministry of Agriculture and Lands
BC MARR	BC Ministry of Aboriginal Relations and Reconciliation
BC MEM	BC Ministry of Energy and Mines
BCMFLNRO	BC Ministry of Forests, Lands and Natural Resource Operations
BC MFML	BC Ministry of Forests, Mines and Lands
BC MNRO	BC Ministry of Natural Resource Operations
BC MOE	BC Ministry of Environment
BC MOFR	BC Ministry of Forest and Range
BC MSRM	BC Ministry of Sustainable Resource Management
BCTS	British Columbia Timber Sales
BMTA	Biodiversity, Mining and Tourism Areas
CEA	cumulative effects assessment
CESA	Cumulative Effects Study Area
CFCI	Coast Forest Conservation Initiative
CIT	Coast Information Team
CN Rail	Canadian National Rail
Corp.	Corporation
CWS	Canadian Wildlife Service
DFO	Fisheries and Oceans Canada
EA	Environmental Assessment
EBM	Ecosystem Based Management
EC	Environment Canada
e-PIC	Electronic Project Information Center
ESRI	Environmental Systems Research Institute
FSP	Forest Stewardship Plan
FSR	Forest Service Road
FUP	Free Use Permit
GIS	Geographic Information Systems
Hwy	Highway
ILRR	Integrated Land and Resource Registry
INAC	Indian and Northern Affairs Canada

Abbreviation	Definition
KPUE	Kill Per Unit Effort
LEH	Limited Entry Hunt
LRF	Land and Resource Forum
LRMP	Land and Resource Management Plan
LSA	Local Study Area
n.d.	no date
NFA	Nisga'a Final Agreement
NI	National Instrument
NLG	Nisga'a Lisims Government
NWA	Nass Wildlife Area
NWPA	<i>Navigable Waters Protection Act</i>
OGMA	Old Growth Management Area
PC	Parks Canada
PNCIMA	Pacific North Coast Integrated Management Area
proponent (the)	Avanti Kitsault Mine Ltd.
proposed Project (the)	Kitsault Mine Project
Rescan	Rescan Environmental Services Ltd.
RSA	Regional Study Area
SC	Statistics Canada
SRMP	Sustainable Resource Management Plan
SUP	Special Use Permit
TC	Transport Canada
TSA	Timber Supply Area
US	United States
WMU	Wildlife Management Unit

UNITS OF MEASUREMENT

Abbreviation	Definition
cm	centimetre
ha	hectare
kg	kilogram
km	kilometre
km ²	kilometres squared
m	metre
m ²	squared metre
m ³	cubic metre
oz	ounce
%	percent

EXECUTIVE SUMMARY

The information contained in this Land and Resource Use baseline appendix supports the environmental, social and economic, and cumulative effects assessment (CEA) for the proposed Kitsault Mine Project (proposed Project). A land and resource baseline study was prepared by Rescan Environmental Services Ltd. (Rescan) in 2010, which presented a comprehensive overview of the land and resource use context within the area in which the proposed Project is located. Information from the “Kitsault Project: Land Use and Resource Baseline Report” prepared by Rescan (2010b) was summarised and updated where necessary in order to determine which land use components would be carried forward into the effects assessment. The Land Use Regional Study Area (RSA) was based on the Wildlife RSA.

On 7 February 2006, the province of British Columbia (BC) joined with Aboriginal groups, industry, conservationists, communities, and other stakeholders to announce new land use decisions for the Central Coast and North Coast that would protect a total of 1,800,000 hectares (ha), (BC Ministry of Agriculture and Land (BC MAL) 2006). The three land use zones identified in the Central Coast and North Coast Land Use Decision include:

- Protected areas;
- Biodiversity;
- Mining and tourism areas; and
- Ecosystem Based Management (EBM) operating areas (BC Integrated Land Management Bureau (BC ILMB) 2009b).

The Land Use Agreements between BC and Aboriginal groups define EBM as an “adaptive, systematic approach to managing human activities that focuses on the co-existence of healthy, fully functioning ecosystems and human communities” (BC ILMB 2009b).

Two communities, the Kitsault Townsite, a now privately-owned abandoned mining town, and the town of Alice Arm, are located within the Land Use RSA. Several other communities and Nisga’a Villages are located outside the Land Use RSA but are connected by a variety of provincial roads and Forest Service Roads (FSR).

From a federal perspective, there are no designated National Parks, National Historic Sites, National Marine Conservation Areas, National Wildlife Areas, Migratory Bird Sanctuaries or Marine Wildlife Areas within the proposed Project study area (Canadian Wildlife Service (CWS) 2009; Parks Canada (PC) 2008). Other than two Biodiversity, Mining and Tourism Areas (BMTAs), Ksi Galsgiist / Stagoo, which overlaps the site and Gits’oohl, located 3 kilometres (km) north of the site, the nearest protected area is Ksi Xts’at’kw / Stagoo, located 18 km south of the site. BMTAs are located adjacent to existing conservancies and protected areas to contribute to species and ecosystem diversity and conservation.

The former Kitsault Mine was first staked for silver in 1911. Molybdenum mining commenced in 1968 and continued until 1982, at which time the mine was closed due to low

metal prices. The property changed hands several times and was purchased by Avanti Kitsault Mine Ltd. (proponent) in 2008. There are no active mines within the Land Use RSA. Six past producers and six exploration projects were identified within the Land Use RSA. In addition to the proponent, who holds 310 mineral tenures with a total area of 43,121 ha and 35 mining leases totalling 547.22 ha, three companies and seven private owners hold 91 claims / tenures totalling 28,584 ha.

There is one active forest tenure held by the proponent, in the total area of 7792 ha that surrounds the proposed Project, and there are no active forestry operations within the Land Use RSA. A Free Use Permit is located on the eastern edge of the Land Use RSA (Rescan 2010b). Pine has not been found to be a major component of the local stands and mountain pine beetle is not a significant issue in the area (BC Ministry of Forests and Range (BC MOFR) 2009). There are no active forestry camps located within the Land Use RSA. There are signs of a historical camp along the access road, including an old air strip (Rescan 2010b).

The proposed Project falls within the Skeena Region (Region 6), and overlaps predominately with Wildlife Management Unit (WMU) 6-14 and to a smaller degree with WMU 6-16. The study area has moderate value for wildlife harvest compared to other areas of the Skeena Region. Coast Mountain Outfitters, which is also known as Milligan's Outfitting, is owned and operated by Robert Milligan who holds the Guiding Territory Certificate for the entire study area. Registered trapline #0614T-088 encompasses the entire proposed Project area and has been owned and trapped by Charlie and Dana Fleenor since 1994.

A basic recreational fishing licence allows a person to angle, down-rig, ice fish, set line (in certain areas), including lakes in Region 6. Available information indicates that Coho fishing is prohibited in the Illiance River between 21 September and 31 December upstream of signs near the river mouth, and in the Kitsault River and its tributaries between 1 October and 31 December upstream of signs near the river mouth. Chinook fishing is prohibited all year in the Kitsault River and tributaries.

Recreation values within the study area range from low sensitivity and significance to moderate sensitivity and high significance (Rescan 2010b). Gwunya Falls, located on the northern boundary of the Land Use RSA, is the only recreation site located in the land use RSA. Lisims Backcountry Adventures holds a commercial recreation license in Nisga'a Nation's commercial recreation area (Ksi Galsglist) that overlaps the Land Use RSA.

Several crown grants, wind power permits and water power licences are actively held in the immediate vicinity and to the northeast and southeast of Alice Arm. There are 10 active water licence applications and three current water licences located within the Land Use RSA. One groundwater well is located proximate to the site of the historical open pit mine.

The proposed Project is only accessible by land by FSRs. Alice Arm is accessible by floatplane or boat from Observatory Inlet. The Silver City Water Aerodrome is located in Alice Arm. There are no airports or rail within the land use RSA.

1.0 LAND AND RESOURCE USE

1.1 Introduction

The information contained in this baseline appendix will support the environmental, social and economic, and cumulative effects assessment (CEA) for the proposed Kitsault Mine Project (proposed Project). A land and resource baseline study was prepared by Rescan Environmental Services Ltd. (Rescan) in 2010, which presented a comprehensive overview of the land and resource use context within the area in which the proposed Project is located. The information from the Rescan (2010b) report is summarised below and updated where necessary in order to determine which land use components will be carried forward into the effects assessment. This Land and Resource Use baseline appendix provides a summary of the publicly available baseline data describing land use activities that occur near the proposed Project. A description of applicable land use management objectives for the proposed Project area is presented at the beginning of the section to provide the background for the area. Land uses considered in this section include:

- Local communities;
- Protected areas and parks;
- Mining, prospects, exploration and mineral tenures;
- Forestry;
- Hunting;
- Trapping;
- Fishing;
- Recreation and tourism;
- Permits, licenses and land tenures;
- Transportation and access;
- Marine uses; and
- Other land uses.

Land use associated with the Nisga'a Nation and other Aboriginal groups is discussed in Parts C and D of Avanti Kitsault Mine Ltd.'s the Application for an Environmental Assessment Certificate for the proposed Project, made under section 16 of the British Columbia *Environmental Assessment Act* (Application), respectively.

1.2 Information Sources and Methods

Three methods were used to compile the baseline information:

- Information from various government websites and reports was summarised and referenced;
- Information from Geographic Information Systems (GIS) databases was sorted, summarised and mapped where available; and

- Individuals and companies familiar with the proposed Project area were contacted and requested to provide comment.

1.2.1 Desktop Data Compilation

The land and resource use information for the baseline appendix was compiled from baseline reports from other disciplines, such as Vegetation and Plant Communities and Wildlife, as well as from existing databases. Table 1.2-1 summarises the main databases reviewed.

Table 1.2-1: Example Databases or References Reviewed

BC Ministry, Reference or Database	
BC Integrated Land Management Bureau (BC ILMB)	Central and North Coast EBM Implementation http://archive.ilmb.gov.bc.ca/slrp/lrmp/nanaimo/central_north_coast/index.html
	BC ILMB Discovery Service. http://apps.gov.bc.ca/pub/geometadata
	Integrated Land and Resource Registry (ILRR). https://apps.gov.bc.ca/apps/ilrr/html/ILRRWelcome.html
BC Ministry of Natural Resource Operations (BC MNRO) - North Coast Forest District	http://www.for.gov.bc.ca/dnc/
BC Ministry of Energy, Mines and Petroleum Resources (BC MEMPR)	Minfile Mineral Inventory. http://www.empr.gov.bc.ca/Mining/Geoscience/MINFILE/Pages/default.aspx
	Exploration and Mining in British Columbia 2008, 2009 and 2010 http://www.empr.gov.bc.ca/Mining/Geoscience/PublicationsCatalogue/ExplorationinBC/Pages/default.aspx
BC Ministry of Finance	Major Projects Inventory. September 2010. 142 pp. http://www.fin.gov.bc.ca/small_business/MPI_Report_Sept2010.pdf
BC Environmental Assessment Office (BC EAO)	Electronic Project Information Center (e-PIC). http://www.eao.gov.bc.ca/epic/output/html/deploy/epic_project_list_report.html
Nass Valley Profile	http://www.britishcolumbia.com/regions/towns/index.asp?townID=4149
Coast Forest Conservation Initiative (CFCI)	Collaborative effort of five British Columbia forest products producers committed to developing an ecosystem based conservation and management plan for Central and North Coast. http://www.coastforestconservationinitiative.com/
Backroad Mapbook: Northern BC	Backroad Mapbooks 2009. Second Edition. 165 pp. (Mussio, Russel and Wesley 2009)

BC Ministry, Reference or Database

Hunting, Trapping and Guide Outfitting	Hunting and Trapping Regulations Synopsis (2010 – 2012) http://www.env.gov.bc.ca/fw/wildlife/hunting/regulations/
	Guide Outfitters Association of BC Member List. Guide Outfitters Association of BC. http://www.goabc.org .
	Coast Mountain Outfitters/ Milligan's Outfitting http://www.coastmountainoutfitters.com/

Note: BC - British Columbia; EBM - Ecosystem Based Management

1.2.1.1 North Coast LRMP Final Recommendations Review

The final recommendations produced by the North Coast Land and Resource Management Plan (LRMP) Planning Table (British Columbia Ministry of Sustainable Resource Management (BC MSRM) 2005) summarise comprehensive resource information and technical resource analysis that address issues and values within the plan area. Although these recommendations are not legislated, they provide valuable information specific to the study area which were considered important to the North Coast LRMP Planning Table members (Jakobsen pers. comm. 2011). Recommendations associated with various land and resource uses were reviewed and summarised to provide additional guidance with respect to potential land use planning priorities.

1.2.2 Mapping

Environmental Management Systems Research Institute's (EMSRI) ArcView 9.3.1 software was used to create all maps. The data used to generate the maps came from a variety of sources, including: pre-existing shape files and geodatabases within the local GIS department; and additional shape files downloaded in March 2011 from the British Columbia (BC) Government's Land and Resource Data Warehouse and Integrated Land and Resource Registry.

1.2.3 Interviews

Individuals and businesses familiar with the study area were contacted and requested to provide comments regarding the proposed Project. Specific information was compiled where possible regarding historical, current, and potential future land and resource use in the area. Interviews were conducted with a variety of individuals familiar with the site and the surrounding area. Where applicable, relevant information compiled during an interview is presented with the associated reference to a personal communication.

1.2.4 Study Area

The following three study areas (Figure 1.2-1) were used in the land and resource use assessment:

- Local Study Area (LSA);
- Regional Study Area (RSA); and

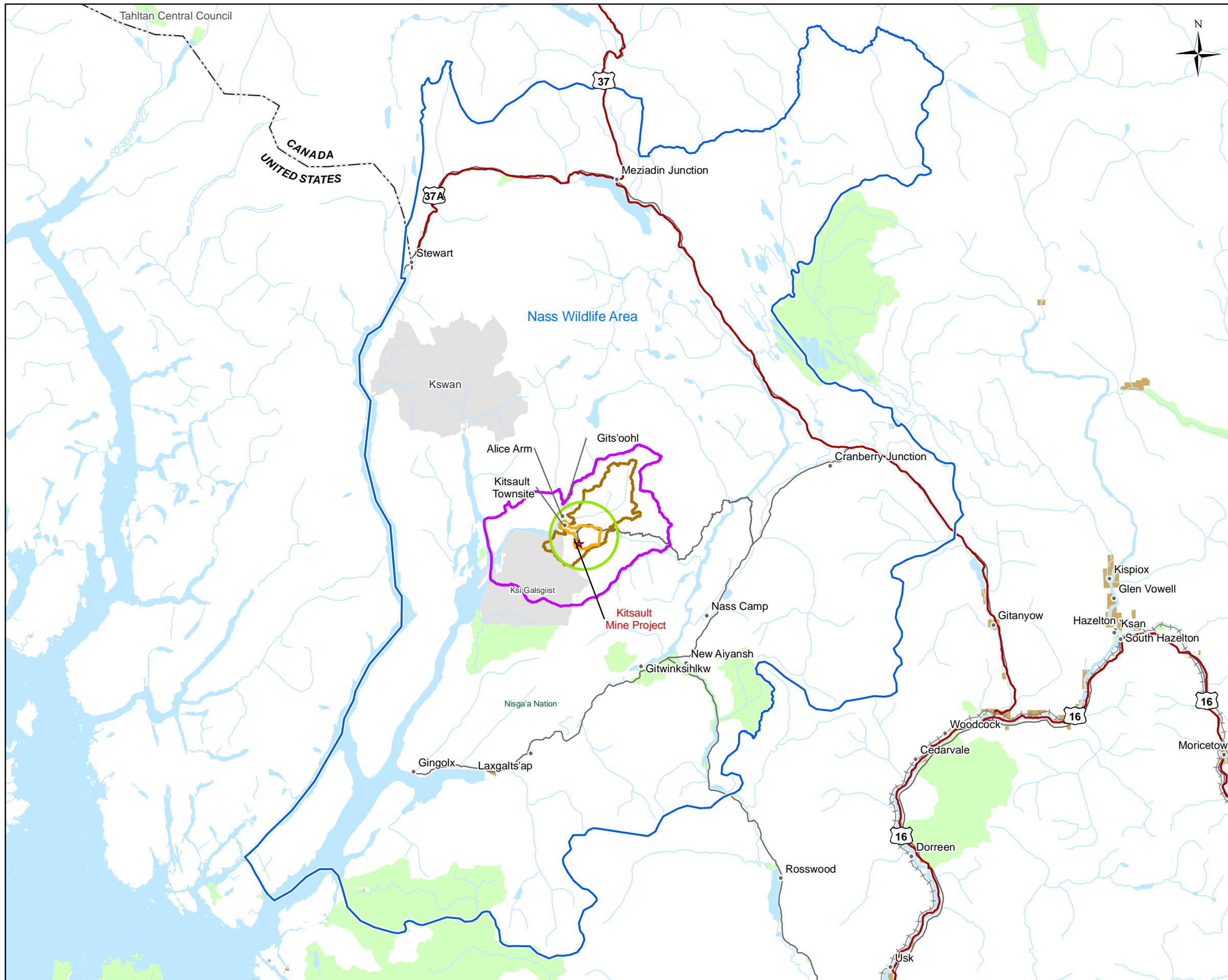
- Cumulative Effects Study Area (CESA).

Study area rationalisation was primarily based on other study areas including aquatics, terrestrial vegetation, soils, and wildlife study areas, which consider unique ecosystems, natural landform barriers and the requirements for species with large home ranges and key seasonal habitat use (e.g., grizzly bear, moose, and mountain goat) (Figure 1.2-1).

The LSA was adopted to ensure consistency and the ability to compare results between the various baseline studies (i.e., vegetation and soils). The LSA is based on potential direct impacts (i.e., disturbance) from the proposed Project which may affect land use. The LSA is therefore defined to include the proposed Project infrastructure including the haul road along Lime Creek with a 500 metre (m) buffer (to include any contiguous effects from activities causing land use disturbance). This provides a reasonable assessment area based on the planned activities in the mine.

The Land Use RSA, which is based on the Wildlife RSA, includes the south side of Chaloner Ridge, Mount Theophilus, Ksi Gwinhatal, and Dawson Ridge (Rescan 2010b). It also overlaps with Alice Arm, Bessie Lake, Patsy Lake, Shishilabet Lakes, the Kitsault and Illiance Rivers, and a number of creeks including Roundy, Lime, Clary, Falls, Wilauks, Morley, Foxy, Hoan, Kelskiist, and Theophilus. Natural barriers such as waterbodies and mountain ranges are influenced by human activity. Land uses such as hunting and trapping, are related to wildlife. The RSAs for air quality, noise and water resources are also captured within the land use RSA.

The CESA area is that area where cumulative effects from multiple activities may occur. The Nass Wildlife Area (NWA), which was selected as the CESA, has defined requirements for land use in the area. The Nisga'a Nation are required to prepare an annual management plan for their wildlife harvest. A wildlife committee, with representatives from the Nisga'a Nation, BC and Canada, make recommendations respecting the Nisga'a Nation harvest and wildlife management in the NWA. The NWA represents an area that ensures relevant land use activities are addressed and provides a fixed area for the inclusion of foreseeable projects.



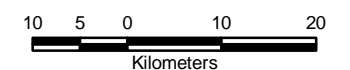
Legend

- Populated Place
- International Border
- Road
- Highway
- ++ Rail
- Stream
- Waterbody
- Indian Reserve
- Parks, Protected Areas and Convergencies
- Biodiversity, Mining And Tourism Area
- Land and Resource Use Regional Study Area
- Land and Resource Use Local Study Area
- Air Regional Study Area
- Aquatics Regional Study Area
- Nass Wildlife Area / Cumulative Effects Study Area

KEY MAP





Scale: 1:800,000



Reference

Base Data
 Geobase 1:20,000 (TRIM)
 Land and Resource Data Warehouse 1:20,000 (TRIM)
 Atlas of Canada scale 1:1,000,000.

CLIENT:  Avanti Kitsault Mine Ltd.		
PROJECT: Kitsault Mine Project		
Land and Resource Use Study Area Rationale		
DATE: March 2011	ANALYST: MY	Figure 1.2-1
JOB No: VE51988	QA/QC: MY	PDF FILE: 17-50-002_project_location.pdf
GIS FILE: 17-50-002.mxd		
PROJECTION: UTM Zone 9	DATUM: NAD83	

1.3 Land and Resource Management

The Land Use RSA overlaps the following management areas (Figure 1.3-1):

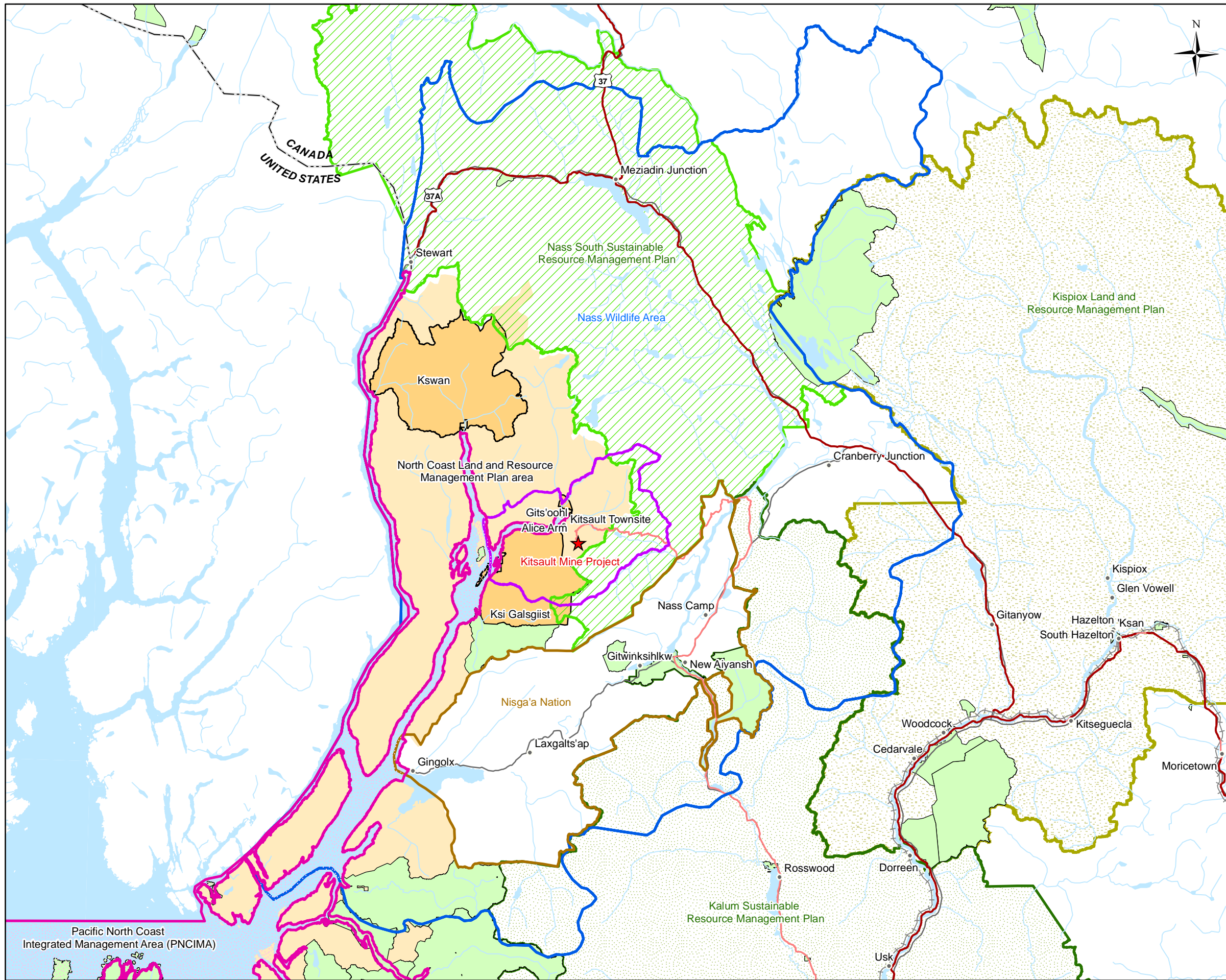
- Former North Coast LRMP area, which was combined with the Central Coast LRMP in the Coast Land Use Decision of 2006;
- Nass South Sustainable Resource Management Plan (SRMP);
- Pacific North Coast Integrated Management Area (PNCIMA); and
- NWA.

1.3.1 Combined Central Coast and North Coast LRMP

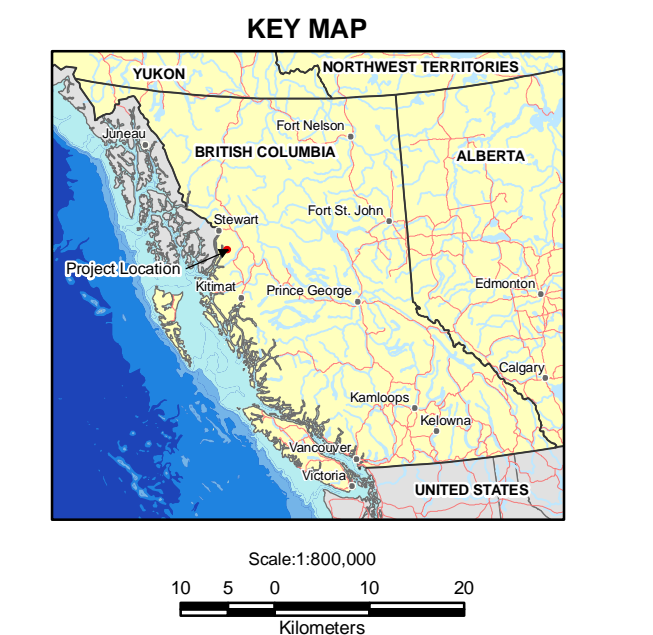
Land use planning processes began on the Central Coast in 1997 and on the North Coast in 2001. Consensus agreements were reached in both areas in 2004 and 2005 and were finalised through consultations between the provincial government and Aboriginal groups.

On 7 February 2006, the province of BC joined with Aboriginal groups, industry, conservationists, communities, and other stakeholders to announce new land use decisions for the Central Coast and North Coast that would protect a total of 1,800,000 hectares (ha) (BC Ministry of Agriculture and Land (BC MAL 2006). The combined Central Coast and North Coast LRMP areas are approximately 6.4 million ha.

A variety of organisations, including Greenpeace, ForestEthics and the Sierra Club of Canada, BC Chapter, were involved in building this collaborative solution for more than five years and they support the land use decisions reached between Aboriginal groups and the province. The Coast Land Use Decision protects vast areas of temperate rainforest, while providing a framework called Ecosystem Based Management (EBM) for the forest industry to work in (BC MAL 2006).



- Legend**
- Populated Place
 - ★ Kitsault Mine Project
 - - International Border
 - Highway
 - Road
 - Stream
 - Waterbody
 - Land and Resource Use Regional Study Area
 - Nisga'a Nation
 - Nass Wildlife Area / Cumulative Effect Study Area
 - Parks, Protected Areas and Convergencies
 - Kalum Sustainable Resource Management Plan
 - Kispiox Land and Resource Management Plan
 - Nass South Sustainable Resource Management Plan
 - Pacific North Coast Integrated Management Area (PNCIMA) Boundary
 - Biodiversity, Mining and Tourism Area
 - Ecosystem-Based Management (EBM) Area



Reference

Base Data
 Geobase 1:20,000 (TRIM)
 Land and Resource Data Warehouse 1:20,000 (TRIM)
 Atlas of Canada scale 1:1,000,000.

CLIENT:
 Avanti Kitsault Mine Ltd.

PROJECT:
 Kitsault Mine Project

Land and Resource Use Management Areas near the Kitsault Mine Project

DATE: March 2011	ANALYST: MY	Figure 1.3-1
JOB No: VE51988	QA/QC: MY	PDF FILE: 17-50-014_management_plan.pdf
GIS FILE: 17-50-014.mxd		
PROJECTION: UTM Zone 9	DATUM: NAD83	

Y:\GIS\Projects\VE51988_Kitsault\Mapping\17_non-traditional-res\Baseline\17-50-014_v2.mxd

1.3.2.1 Land Use Objectives and Implementation

The Central and North Coast order outlines a number of specific objectives, which are organised under the categories of Aboriginal groups, aquatic habitats, and biodiversity (BC MAL 2009). The Central and North Coast order utilises portions of land use objectives outlined in existing legislation such as the *Land Act* (Government of BC 1996c), *Forest and Range Practices Act* (Government of BC 2002) and *Land Use Objective Regulation* (Government of BC 2005). The land use objectives outlined in the Central and North Coast order support implementation of Ecosystem Based Management (EBM). The implementation of EBM will be monitored to ensure ecosystem integrity is maintained. The implementation committees listed below were established to oversee the implementation of the Central and North Coast order.

Land and Resource Forums (LRF): Three LRFs, one of which pertains to the northern portion of the North Coast, were formed to oversee the implementation of land use agreements, the land use decision, and EBM. A Joint LRF was established in 2008 to address region-wide issues. The Joint LRF is made up of representatives from various province of BC Ministries (BC Ministry of Forests, Land and Natural Resource Operations (BCMFLNRO), BC Ministry of Environment (BC MOE), BC Integrated Land and Management Bureau (BC ILMB)), the Nanwakolas Council, Tsimshian Stewardship Committee, and Coastal First Nations. The Nisga'a Nation and Haisla are, at times, invited to participate on the Tsimshian Stewardship Committee (BC ILMB 2009b). The Joint LRF ensures implementation of land and resource agreements, provides recommendations to participating Aboriginal groups and the province of BC, and guides and monitors implementation of the Coast Land Use Decision and EBM (BC ILMB 2009b).

Adaptive Management Steering Committee: This committee consists of representatives of First Nations (Nanwakolas Council, Coastal First Nations, North Coast Skeena First Nations Stewardship Society), major stakeholders (e.g., Rainforest Solutions Project, Coast Forest Conservation Initiative), and provincial agencies (BCMFLNRO, BC MOE, BC ILMB). It oversees the adaptive management program, systematic research, and monitoring that aims at improving land and resource management policies, objectives, and practices over time (BC ILMB 2009b).

Technical Liaison Committee: This committee consists of technical representatives from stakeholders and government, and provides recommendations to the LRFs (BC ILMB 2009b).

1.3.2.2 Land Use Zones

The three land use zones identified in the Central Coast and North Coast Land Use Decision include: protected areas; Biodiversity, Mining and Tourism Areas (BMTA); and EBM operating areas (BC ILMB 2009b).

Protected Areas: Provincial parks, conservancies, and ecological reserves were included.

BMTA: The provincial government legally established BMTAs, which contribute to species and ecosystem, diversity and conservation, in January 2009. BMTAs are located adjacent to existing conservancies and other protected areas and land uses are restricted within these areas. Commercial hydro-electric development and commercial timber harvesting are prohibited in these areas. BMTAs only apply to public land within BMTA boundaries (BC ILMB 2009b).

EBM Operating Areas: Those areas within North Coast and Central Coast LRMP area that are not defined as protected areas or BMTAs are known as EBM Operating Areas. Legal objectives under the *Forest and Range Practices Act* apply to commercial forestry operations in these areas and all land uses are possible in these areas.

1.3.2.3 Ecosystem Based Management Framework

The Coast Land Use Decision was an EBM decision representing collaboration between Aboriginal groups, industry (e.g., forestry, forest products), environmentalists, government, and other stakeholders (BC MAL 2006). The Coast Information Team (CIT) was established to provide independent information for the central and north coasts of BC and Haida Gwaii / Queen Charlotte Islands using the best available scientific, technical, traditional, and local knowledge.

The EBM system, which was established for the Central and North Coast area by 31 March 2009 as committed to under “The Coast Land Use Decision,” marked the beginning of a new phase of government to government implementation of EBM on the Central and North Coast (CIT 2004). The focus of implementation shifted to developing strategies to improve human well-being and a strategic landscape reserve design, designating Grizzly bear no-hunting areas, concluding conservancy management planning, and improving Land Use Objectives with results from an adaptive management program. The technical team comprises nine project teams consisting of scientists, practitioners, and traditional and local experts (CIT 2004). The agreed definition, principles, and goals of EBM have been appended to the North Coast LRMP Terms of Reference (CIT 2004).

EBM as defined in the Land Use Agreements between the province and Aboriginal groups is an “adaptive, systematic approach to managing human activities that focuses on the co-existence of healthy, fully functioning ecosystems and human communities”. The “EBM Planning Handbook”, prepared by the CIT is part of an EBM Framework developed by CIT. Full implementation of EBM will be achieved by ensuring the following are goals are defined and implemented: governance framework; human well-being; ecological integrity; and adaptive management (Joint Land and Resource Forums 2007).

The intent of the Coast Land Use Decision was to “preserve some of the most spectacular, ecologically diverse regions in the world, including critical Spirit Bear habitat”. The study area also overlaps the areas covered by Nass South SRMP (March 2009 draft) and the PNCIMA initiative (PNCIMA 2010).

1.3.3 Nass South Sustainable Resource Management Plan

The eastern portion of the land use RSA falls within the (draft) Nass South SRMP area (Figure 1.3-1), which was issued for public review in March 2009 (BC ILMB 2009a). The primary purpose of the SRMP is to address sustainable management issues concerning land, water, and resources in a 662,500 ha area of the southern portion of the Nass Timber Supply Area (TSA). The Nass South SRMP provides management objectives in the following seven areas (BC ILMB 2009a):

- Water;
- Biodiversity;
- Botanical forest products;
- Wildlife;
- Fisheries;
- Cultural heritage resources; and
- Timber.

1.3.4 Pacific North Coast Integrated Management Area

The land use RSA overlaps the PNCIMA, an 88,000 kilometres squared (km²) marine and coastal area that extends from the Canadian border with Alaska, to Bute Inlet, to Campbell River, to the Brooks Peninsula, to the base of the continental shelf slope (Rescan 2010b). The Canadian government has selected this area as one of five pilot areas for integrated management planning through stakeholder engagement (PNCIMA 2009).

The management planning process for PNCIMA began recently. The first PNCIMA Forum took place in 2009 and included Fisheries and Oceans Canada (DFO), Coastal First Nations, and the North Coast-Skeena First Nations Stewardship Society. Potential stakeholders include Aboriginal groups, other coastal communities, industries (e.g., commercial and recreational fishing, aquaculture, marine transport, recreation, tourism, and energy), non-governmental organisations, and researchers (e.g., academic, government) (PNCIMA 2009).

1.3.5 Nass Wildlife Area

The proposed Project is located within the NWA as defined by the Nisga'a Final Agreement (NFA) (BC Ministry of Aboriginal Relations and Reconciliation (BC MARR) 2000). The Nisga'a Nation and Nisga'a Lisims Government (NLG) hold a number of rights in these areas that are defined in the NFA, including rights to lands and resources.

NLG, together with their treaty partners, Canada and BC, provides advice about wildlife management and harvest within the 16,101 km² NWA. The provincial government uses this information to establish the total annual hunting quotas and approves the annual Nass Wildlife Management Plan (NLG 2011b).

NLG manages wildlife for long-term health and vitality. Moose, mountain goat, and grizzly bear have been identified as "Initial Designated Species" and the Nisga'a Nation receives an annual hunting allocation of these species (BC MARR 2000). The Nisga'a Nation have the right to hunt other wildlife species in accordance with the NFA and holders of trap lines, both outside and within Nisga'a Lands, continue to exercise their trapping rights in accordance with federal and provincial laws of general application.

The Nisga'a Nation have a treaty entitlement to harvest different wildlife species and inland fish for domestic purposes in the NWA, an area comprising the Nisga'a Lands and some surrounding Crown land. They have specific allocations for moose, mountain goat and grizzly bear. The Nisga'a Nation can harvest migratory birds according to an international convention and applicable laws of general application.

Nisga'a Nation hunting is subject to conservation, public health and public safety requirements, and does not interfere with other authorised uses of Crown land or the ability of the Crown to dispose of Crown land. The Nisga'a Nation are required to prepare an annual management plan for their harvest which must be approved by the Minister of the Environment. A wildlife committee, with representatives of the Nisga'a Nation, BC and Canada, make recommendations respecting the Nisga'a harvest and wildlife management in the NWA. The Nisga'a Nation cannot sell wildlife, but can continue to trade and barter among themselves or with other Aboriginal groups. The Nisga'a Nation who hunt wildlife outside the NWA are subject to provincial laws.

1.4 Local Communities

There are two communities located near the proposed Project site within the land use RSA: the Kitsault Townsite, a now privately-owned abandoned mining town; and the town of Alice Arm. The location of these two communities with respect to the proposed Project is shown in Figure 1.2-1.

1.4.1 Kitsault Townsite

The Kitsault Townsite is located 8 kilometres (km) northwest of the proposed Project by road (5.5 linear km). The Kitsault Townsite was built in 1978 to support the molybdenum mining operation of AMAX, a United States (US) based mining company. The Kitsault Townsite was designed to mimic southern Canadian towns from which workers and their families would be brought (Kitsault Resorts Ltd. 2011). The plan included over 100 single-family homes and duplexes and seven apartment buildings containing 202 suites. A modern hospital and a shopping centre, restaurants, banks, a theatre and a post office were constructed. All the services were underground, including cablevision and phone lines. The cleanest running water in the province was provided, as well as a state-of-the-art sewage treatment plant. For entertainment there was a pub, a pool, a library and two recreation centres with jacuzzis, saunas and a theatre. People began to inhabit the town in 1980.

After 18 months of operation, prices collapsed under the pressures of the 1982 recession and the arrival of molybdenum by-product production from copper. The mine closed and the Kitsault Townsite became a ghost town (Kitsault Resorts Ltd. 2011).

Mr. Krishnan Suthanthiran purchased the Kitsault Townsite in 2005 and created Kitsault Resorts Ltd. His vision for the area involves cooperation with Aboriginal groups and environmental conservation by promoting sustainable eco-tourism. Plans include an eco-village and educational facility that honour different cultures and promote wellness (e.g., training for health care specialists, with the aim of providing health care to Pacific Northwest communities) (Kitsault Resorts Ltd. 2011).

A representative from Kitsault Resorts Ltd. was contacted and provided the following information regarding current and future plans for the Kitsault Townsite (Mathew pers. comm. 2011). There have been no visitors or vacationers to the Kitsault Townsite due to maintenance. Maintenance crews commute to the site by road (ten on and four off shifts) when access is clear. During the winter months, the crew reside at the Kitsault Townsite fulltime. The Kitsault Townsite is gated and visitors have to contact the owners (phone number is located on a sign on the gate) to get permission to enter. It was expected that the first overnight visitors would be arriving during the summer of 2011.

1.4.2 Alice Arm

Silver, lead, zinc, and copper had been mined at the end of the Observatory Inlet for close to a century at the boom town of Alice Arm (Kitsault Resorts Ltd. 2011). Alice Arm was a booming mining town in the 1920s and 1930s until the nearby silver mine shut down when the price of silver crashed (Rescan 2010b). In the late sixties workers commuted by boat from Alice Arm across the fiord to work the neighbouring mines. Between 1967 and 1972, a total of 9,000,000 tonnes of ore was mined producing xx million pounds of molybdenum contained in concentrate. Mining stopped in the early seventies when prices softened. By the eighties almost everyone had moved out of Alice Arm, which had become a ghost town.

Alice Arm currently has a seasonally fluctuating population of approximately 20 people, with the highest populations in the summer months. The one residence that is occupied fulltime also maintains the only trapline (predominately during the winter months) that overlaps with the proposed Project (Fleenor pers. comm. 2011). Alice Arm Lodge, located in Alice Arm, provides lodging for mining exploration companies working in the area. The lodge utilises Inlet Express Services Ltd., a marine freight and passenger service that operates out of Prince Rupert, to mobilise equipment and personnel as required (Turpin pers. comm. 2011; Inlet Express Services Ltd. 2011).

Observatory Inlet is popular in the summer for boaters from Prince Rupert and other areas. Small boat access is available at the dock (Rescan 2010b).

1.4.3 Communities and Nisga’a Villages Located Within the Cumulative Effects Study Area

Table 1.4-1 provides a summary of several communities and Nisga’a Villages which are located within the CESA (Figure 1.2-1).

Table 1.4-1: Communities and Nisga’a Villages Located Within the Cumulative Effects Study Area

Community	General Description	Approximate Distance from Proposed Project (km)
Stewart	Located approximately 315 km north of Terrace with a population of approximately 500. Described as "Canada's most northerly ice free port" Stewart maintains close ties with Hyder, Alaska (District of Stewart 2011).	67
Meziadin Junction	Located 156 km north of Kitwanga (Gitwangak) and 65 km east of Stewart at the junction of Highway 37A. A small population supports a gas station and a grocery store and restaurant (RoadSideThoughts.com 2011).	76
Cranberry Junction	Located approximately 150 km north of Terrace at the junction of Highway 37 (Stewart-Cassiar Highway) and Highway 113 (Nisga'a Highway) (RoadSideThoughts.com 2011).	60
Nass Camp	Nass Camp, which used to provide lodging for the various loggers that logged the Nass Valley through the years, is located 125 km north of Terrace along Highway 113 (Nisga'a Highway). Nass Camp now has a lodging facility called the Bil-Nor Tillicum Lodge (OurBC.com 2011). Nass Camp has recently been purchased by XX a wholly owned company of the Nisga'a Nation.	30
Gitlakdamix (New Aiyansh)	The community in which the NLG is headquartered, is located approximately 97 km northwest of Terrace, and on the eastern side of the Nisga'a Memorial Lava Bed Park. Its population is approximately 1,800 people (OurBC.com 2011).	32
Gitwinksilkw	Located 100 km northwest of Terrace and has a population of approximately 390. It is located centrally to the Nisga'a Memorial Lava Bed Park (NLG 2011c).	30
Laxgalts'ap	Located 29 km from the Nass River mouth and 150 km north of Terrace. Its population is approximately 1,700 (Laxgalts'ap.com 2011).	43
Gingolx	Located at the mouth of the Nass River, the population of Gingolx is approximately 1,900. The population and economic growth of the community is steadily increasing due to the recent highway extension coming into Gingolx and because of recent initiatives to develop more activities around the growing area of Eco and Cultural tourism (Gingolx.ca 2011).	57

Note: Total registered population numbers from Aboriginal Canada Portal (INAC 2011); CESA - Cumulative Effects Study Area; km - kilometre; NLG - Nisga’a Lisims Government

1.5 Protected Areas and Parks

A review of the following types of protected areas is provided below:

- National (federal) protected areas;
- Provincial protected areas:
 - Provincial parks;
 - Ecological reserves;
 - Conservancies;
 - Biodiversity areas; and
 - Other important areas.

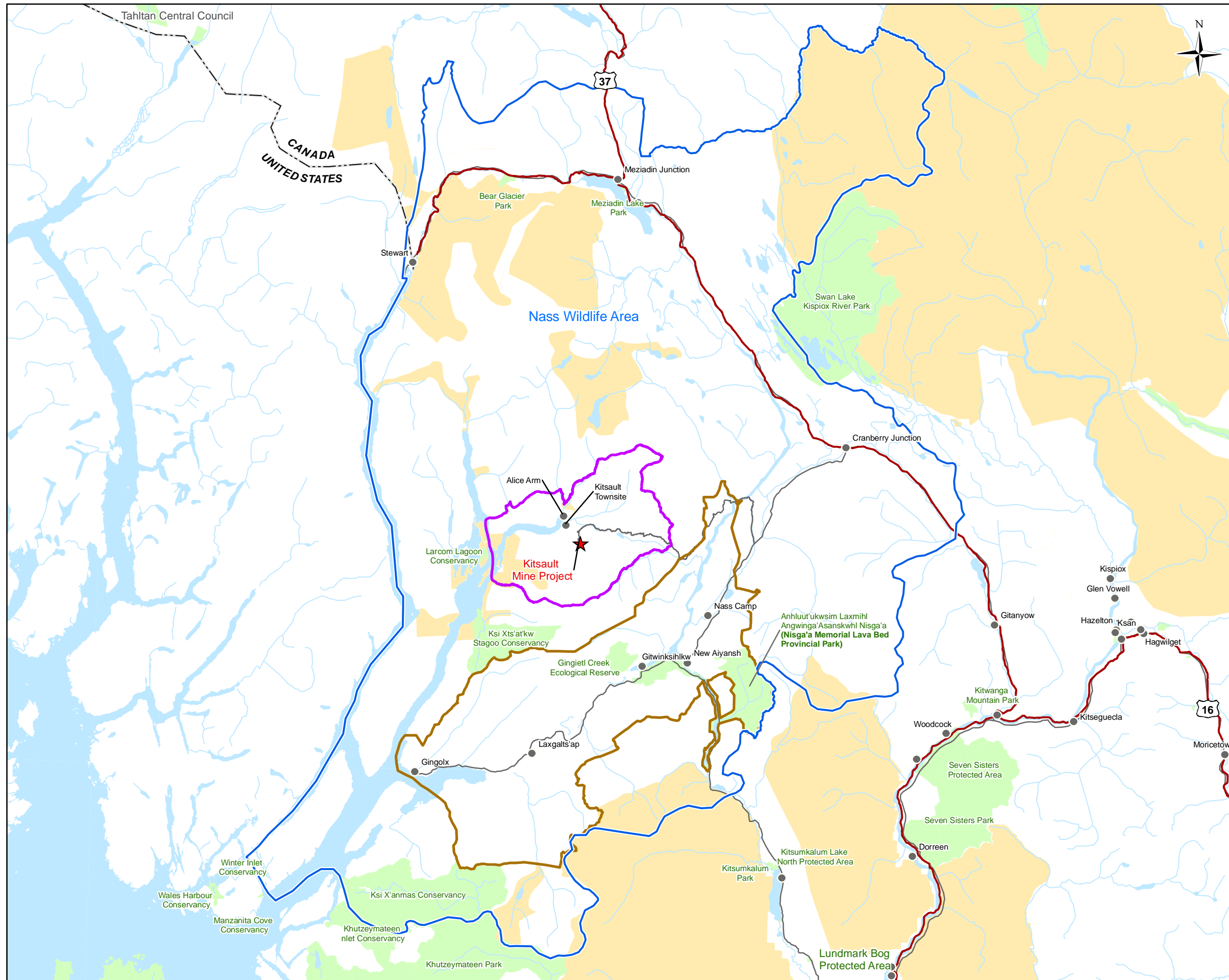
From a federal perspective, there are no designated National Parks, National Historic Sites, National Marine Conservation Areas, National Wildlife Areas, Migratory Bird Sanctuaries or Marine Wildlife Areas within the proposed Project study area (Canadian Wildlife Service (CWS) 2009; Parks Canada (PC) 2008). Table 1.5-1 provides a summary of the types of provincial parks and protected areas that occur near the study area (BC Parks 2010a). Figure 1.5-1 shows the location of the provincial parks and protected areas with respect to the proposed Project.

Table 1.5-1: Provincial Parks and Protected Areas Description

Provincial Park or Protected Area	Description
Provincial park	Three classes of provincial parks (BC Parks 2010a): Class A park - a use permit must not be issued respecting an interest in land or natural resources unless it is the Minister's opinion that issuing the permit is necessary to preserve or maintain the park's recreational values. Commercial logging, mining or hydroelectric development is not allowed. Class B park - may permit a broader range of activities and uses if the Minister's opinion is that they would not be detrimental to the recreational values of the park. Class C park - must be managed by a local board appointed by the Minister.
Ecological reserve	Intended to be the most highly protected areas in the province, they preserve representative and special (e.g., unique, rare, endangered) natural ecosystems, plant and animal species, features and phenomena (BC Parks 2010a). They contribute to maintaining biodiversity and gene pools, and can be used for scientific research. All extractive activities are prohibited in ecological reserves. Recreational use is not encouraged. Commercial use may consist of limited educational tours consistent with the Ecological Reserve Act (Government of BC 1996a) and the Ecological Reserve itself. In many cases, however, ecological reserves are unmarked and protection measures are not enforced, meaning that they face the same impacts as neighbouring unprotected areas.

Provincial Park or Protected Area	Description
Conservancies	Designated under the BC Park Act (Government of BC 1996e) or the Protected Areas of British Columbia Act (Government of BC 2000), and managed under the Park Act (Government of BC 1996e; BC Parks 2010a). Created to protect and maintain biological diversity and natural environments; preserve and maintain Aboriginal groups social, ceremonial and cultural uses; protect and maintain recreational values; and ensure sustainable development or use. Permits are required and commercial logging, mining, and hydroelectric power generation, other than local run-of-the-river projects, are prohibited.
Biodiversity mining and tourism areas	In consultation with Aboriginal groups and stakeholders, the BC government legally established BMTAs in January 2009 (BC ILMB 2009b). BMTAs are located adjacent to existing conservancies and protected areas to contribute to species, ecosystem and seral stage diversity and conservation. Land uses are also limited within these areas. Commercial hydro-electric development and commercial timber harvesting are prohibited.
Other important areas	<p>Wildlife Habitat Areas and Ungulate Winter Ranges – Defined under the BC MOFR Practices Act that manage specific wildlife habitat and ungulate winter range areas (BCMFLNRO 2011a).</p> <p>OGMAs - There are two types of OGMAs, legal and non-legal. Legal OGMAs are legally established and spatially defined during landscape unit planning or operational planning processes (BC ILMB 2011a). Legal OGMAs do not occur within the study area. Non-legal OGMAs are similar however forest licensees are not required to follow direction provided by non-legal OGMAs when preparing forestry plans, and may choose to manage old growth biodiversity targets in other ways (BC ILMB 2011b).</p>

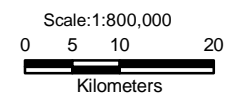
Note: BC - British Columbia; BCMFLNRO - BC Forests, Lands and Natural Resource Operations; BC ILMB - BC Integrated Land Management Bureau; BC MOFR - BC Ministry of Forests and Range; BMTA - Biodiversity, Mining and Tourism Area; OGMA - Old Growth Management Area



Legend



- ★ Kitsault Mine Project
- Road
- Highway
- ▭ Land and Resource Use Regional Study Area
- ▭ Nisga'a Lands Boundary
- ▭ Nass Wildlife Area
- ▭ Commerical Recreation Licenses (CRL)
- ▭ Parks, Protected Areas and Conservancies

KEY MAP



Reference

Base Data
 Geobase 1:20,000 (TRIM)
 Land and Resource Data Warehouse 1:20,000 (TRIM)
 Atlas of Canada scale 1:1,000,000.

CLIENT:  Avanti Kitsault Mine Ltd.		
PROJECT: Kitsault Mine Project		
Parks, Protected Areas, and Conservancies Near the Kitsault Mine Project		
DATE: March 2011	ANALYST: MY	Figure 1.5-1
JOB No: VE51988	QA/QC: MY	PDF FILE: 17-50-005_license_parks.pdf
GIS FILE: 17-50-005.mxd		
PROJECTION: UTM Zone 9	DATUM: NAD83	

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No provincial parks or protected areas overlap the Land Use RSA. The Ksi Galsgiist Biodiversity Area overlaps the southern limits of the land use RSA (Figure 1.5-1). The Gits'ooihl Biodiversity Area overlaps the northern limits of the RSA. Several provincially protected areas, which are described below in Table 1.5-2, are located within the CESA. There are no wildlife habitat areas or ungulate winter ranges located within the Land Use RSA.

Table 1.5-2: Description of Provincial Parks and Protected Areas Located Within the Cumulative Effects Assessment Study Area

Provincial Park or Protected Area	Type	General Description	Approximate Distance from Proposed Project (km)
Meziadin Lake Park	Provincial park	Class A provincial park established in 1987 located 3 km from Meziadin Junction along Highway 37.	75
Bear Glacier Park	Provincial park	Class A provincial park established in 2000 located approximately 13 km from Meziadin Junction on Highway 37A towards Stewart.	75
Nisga'a Memorial Lava Bed Park	Provincial park	Class A provincial park - a use permit must not be issued respecting an interest in land or natural resources unless it is the Minister's opinion that issuing the permit is necessary to preserve or maintain the park's recreational values. Commercial logging, mining or hydroelectric development are not allowed.	30
Gingietl Creek	Ecological reserve	Established in 1995 "to conserve an undisturbed coastal watershed with a wide elevational range for forest ecology, vegetation, wildlife ecology and hydrology studies" (BC Parks 2010b).	23
Ksi Xts'at'kw / Stagoo	Conservancy-under development as of February 2011	11,555 ha area situated on the east side of Observatory Inlet, within the Nass Wildlife Area and the Metlakatla First Nation's asserted territory. A range of ecosystems from coastal to alpine, including low elevation productive forests, estuaries, riparian areas, representative fauna and flora and species at risk are protected. Nisga'a Nation and Metlakatla First Nation have interests in the area. A number of facilities available and recreation, fishing and hunting are permitted. Comments were being collected in October 2008 in support of the development of the Ksi Xts'at'kw / Stagoo Conservancy Management Plan (BC Parks 2010c).	18

Provincial Park or Protected Area	Type	General Description	Approximate Distance from Proposed Project (km)
Larcom Lagoon	Conservancy	311 ha area located within the Nass Wildlife Area and the Metlakatla asserted territory, at the confluence of Observatory Inlet, Hastings Arm and Alice Arm. It protects a harbour on Larcom Island. Draft Management Plan under development (BC Parks 2010d).	19
Gits'oohl	BMTA	Also known as Kitsault. Official Plan dated 30 September 2008. (BC ILMB 2008a).	3
Ksi Galsgiist / Stagoo	BMTA	Also known as Dawson / Stagoo. Official Plan dated 30 September 2008. (BC ILMB 2008b).	3

Note: BC ILMB - BC Integrated Land Management Bureau; BMTA - Biodiversity Tourism Area; ha - hectare; km - kilometre

The Nisga'a Memorial Lava Bed Park has 16 vehicle accessible campsites on a first-come, first-served basis. Wilderness or backcountry camping is permitted in the alpine areas. The park has no sani-station / dump facilities and does not have electrical hook-ups. The Nisga'a Visitor Centre is open from June to September and has a gift shop. Five short interpretive trails, Crater Creek, Beaupre Falls, Tree Mould Trail, Vetter Creek Trail and the Fish Wheel Trail provide easy access to several of the park's special features. Guided volcanic hiking tours offer the park visitor a chance to hike 3 km through a scenic old growth forest and past a variety of volcanic features to a viewpoint on the volcano's cone overlooking the crater. Canoeing and kayaking are permitted, and a boat launch accessing the Nass River can be found at the park's north end. A boat launch accessing the Lava Lake can be found at the park's south end. The park also offers sport fishing, backcountry excursions, and an extension bridge across the Nass River (BritishColumbia.com 2010b). Three year average attendance and revenue at Nisga'a Memorial Lava Bed Park from 2006 / 2007 to 2008 / 2009 was 8,000 visitors and \$4,499, respectively (Rescan 2010b).

Recreation activities in Ksi Xts'at'kw / Stagoo Conservancy include hiking, swimming, canoeing, fishing, interpretive programs, wildlife viewing, cycling, waterskiing, windsurfing, scuba diving, horseback riding, climbing or repelling, caving, hunting, camping, and winter recreation (BC Parks 2010c).

All of Larcom Island, including the Larcom Lagoon Conservancy, is within a Nisga'a Nation commercial recreation area recognised in the NFA, and depicted in Appendix E of the NFA (BC MARR 2000).

1.6 Mining, Prospects, Exploration and Mineral Tenures

Mineral exploration and development in the North Coast LRMP area has continued for over 100 years (BC MSRM 2005). Many companies reduced their spending on exploration as a result of the economic downturn in 2008 (BC Ministry of Forests, Mines and Lands (BC MFML) 2009). The reduced level of activity in the exploration and mining industry continued in early 2009, as part of the world slowdown resulting from tight financial markets (BC MFML 2010). Activity in the exploration and mining industry in northwest BC increased to a near-record level in 2010. Mine development expenditures amounted to \$241,500,000 and exploration totalled about \$172,000,000 (BC MFML 2011).

There are no active mines within the land use RSA. There is one (Anyox Slag Heap) in the CESA (see Section 1.6.3). Land use planning objectives associated with mining development and historical and current mining and exploration activities are described below.

1.6.1 Land Use Planning

A wide range of metallic minerals such as gold, silver, copper, lead, zinc, and molybdenum, have been produced from mines located at Anyox, Alice Arm, and up the Kitsault River. There are 27 known deposits with metallic mineral resources and four with non-metallic mineral resources in the North Coast plan area (BC MSRM 2005). The potential for finding additional deposits is considered very high. Metal market prices, certainty of tenure, and access are strong factors influencing exploration and development. Exploration will likely increase as economic factors improve and stabilise. This, in turn, would increase the likelihood of discovery and subsequent development, with economic returns locally and provincially.

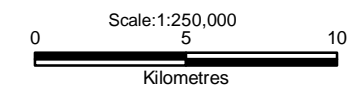
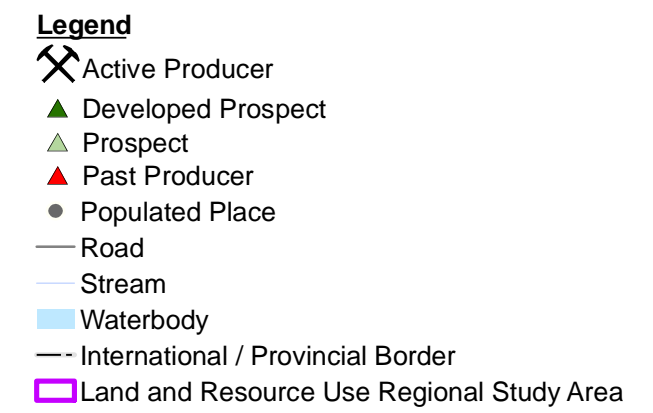
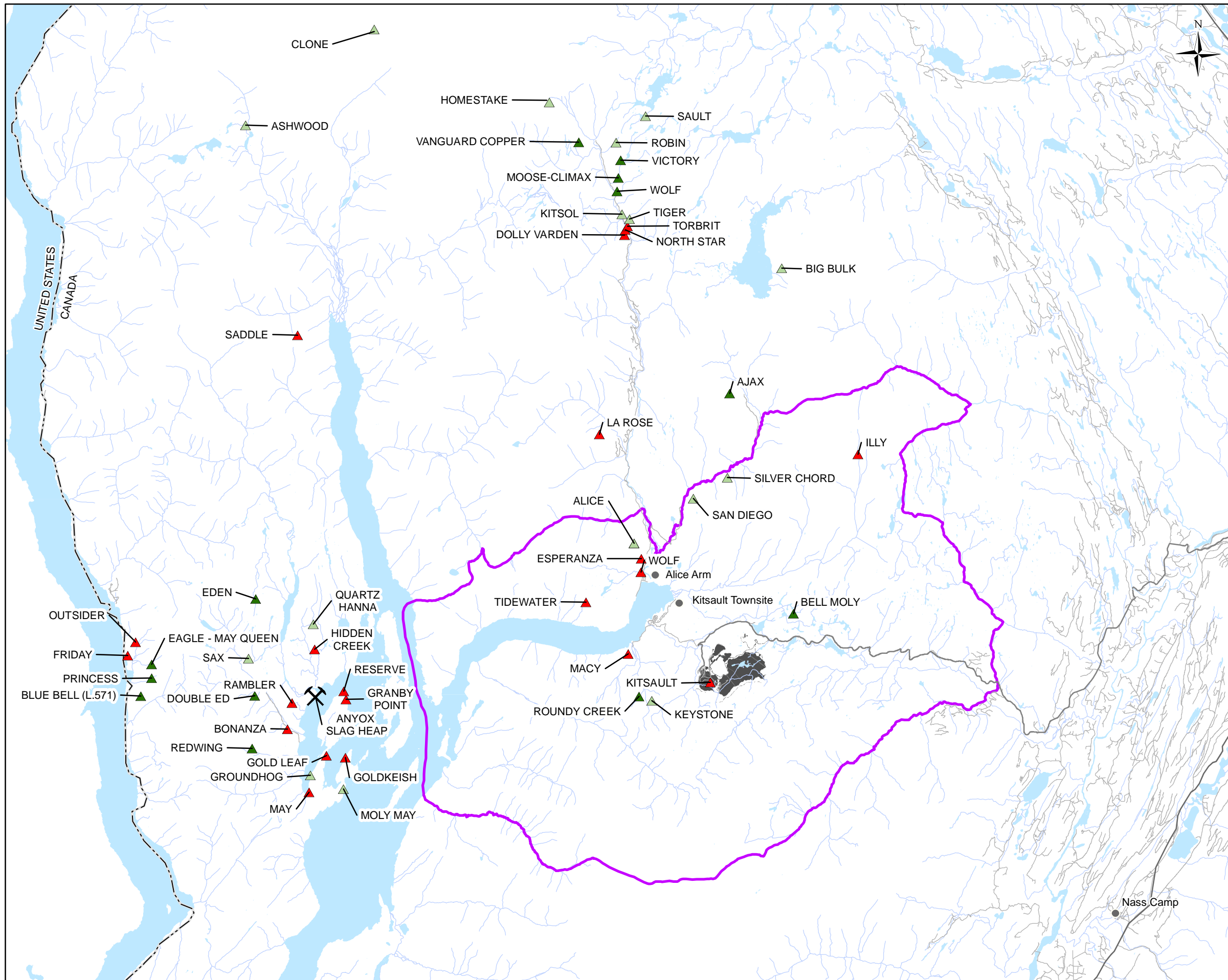
Access to mineral resources outside of protected areas is provided under section 14 (5) of the *Mineral Tenure Act* (Government of BC 1996d), which legislates a two-zone system of land management in BC (BC MSRM 2005). The two-zone system ensures that mining and mineral exploration applications are considered, subject to all applicable laws, in all areas except parks, ecological reserves, protected heritage properties or areas where mining has been prohibited. For tenuring and permitting activities related to mineral exploration and development, the LRMP recommendations would be used to ensure effective integration with other Crown land uses. It was suggested that the North Coast LRMP recommendations be considered when recommending modified mineral exploration or development procedures (BC MSRM 2005).

1.6.2 Previous Mining Activity

Figure 1.6-1 shows the location of historical, current and developed mining prospects in addition to current mine tenures held in the Land Use RSA.

There are a variety of past producers in the study area that were identified in a search of the Minfile database (BC MEM 2011). The former Kitsault Mine was first staked for silver in 1911, and Kennco Exploration (Western) Ltd. began substantial drilling in 1959 for

diamonds. Molybdenum mining took place from 1968 to 1972 with the Climax Molybdenum Company of BC taking over operations in 1973. Due to low metal prices, mining at the Kitsault mine was terminated in 1982. The property changed hands several times and was purchased by Avanti Kitsault Mine Ltd. (proponent) in 2008. Historical information for past mining activity within the land use RSA was compiled from the Minfile database (BC Ministry of Energy and Mines (BC MEM) 2011a) and is summarised in Table 1.6-1 below.



Reference
 Base Data
 Geobase 1:20,000 (TRIM)
 Land and Resource Data Warehouse 1:20,000 (TRIM)
 Atlas of Canada scale 1:1,000,000.

CLIENT: Avanti Kitsault Mine Ltd.		
PROJECT: Kitsault Mine Project		
Mining and Mineral Exploration Near the Kitsault Mine Project		
DATE: November 2011	ANALYST: MY	Figure 1.6-1
JOB No: VE51988	QA/QC: SB	PDF FILE: 17-50-006_mineral_exploration.pdf
GIS FILE: 17-50-006.mxd		
PROJECTION: UTM Zone 9	DATUM: NAD83	

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Table 1.6-1: Description of Historical Mining Activities Within the Proposed Project Land Use Regional Study Area

Past Producer	Ore	General Description	Distance from Proposed Project (km)
Kitsault	molybdenum, silver, lead, zinc, copper, tungsten	Between 1967 and 1972, a total of 9,329,669 tonnes grading 0.112% molybdenum were mined. During 1981-1982, 4,069,548 tonnes of stockpiled ore grading 0.076% molybdenum was milled. A total of 38,342,950 tonnes was mined and 13,399,217 tonnes was milled for a total recovery of 13,572,999 kg molybdenum recovered.	overlaps proposed project
Illy	lead, silver, zinc, copper, gold	Located along the west bank of the Illiance River, about 16 km northeast of Alice Arm. A small amount (33 tonnes) of high grade silver-lead-zinc ore was packed out by horse to Alice Arm in 1919 and 1923 from these showings.	18
Macy	silica	In the past, the mine produced silica flux for the copper smelter at Anyox. Large bodies of barren quartz were mined here from open cuts in 1916 and 1917 and from underground workings in 1918 and 1920 for silica flux. A total of 22,811 tonnes was mined (no milling occurred) for a total recovery of 22,810,252 kg silica recovered.	6
Esperanza	silver, gold, lead, copper, zinc	Located 1.25 km north of Alice Arm, produced high grade silver ore with associated gold, copper and lead between 1911 and 1948. In total, 4662 tonnes of ore with an average grade of 1.77 grams per tonne gold, 983.9 grams per tonne silver, 0.028% copper and 0.14% lead were mined.	9
Wolf	silver, gold, lead, copper, zinc	Located 400 m north-northwest of the centre of Alice Arm on Lot 3821. Three small shipments of high grade ore were made from this property in 1925, 1927 and 1953. A total of 45 tonnes of hand sorted ore was shipped with an average grade of 5.5 grams per tonne gold, 3419.9 grams per tonne silver, 0.24% copper, 1.74% lead and 2.19% zinc.	8
Tidewater	molybdenum, silver, gold, lead, zinc, copper	Located on the north side of Alice Arm Inlet, about 3.0 km southeast of Alice Arm. The deposit produced a limited amount of ore in 1916 and 1931. In 1916, 347.5 tonnes plus another 40.8 tonnes of tailings were shipped. In 1931, 1.22 tonnes of ore were shipped.	10

Note: kg - kilogram; km - kilometre; m - metre; % - percent

Mineral deposits and operations in the North Coast have been globally significant; for example, the pyritic copper smelter at Anyox (1911 to 1935) was one of the largest in the

British Empire (BC MSRM 2005). Mining and exploration activities within the RSA, both historical and current, are shown on Figure 1.6-1. Historical information for past mining activity within the CESA was compiled from the Minfile database (BC MEM 2011) and is summarised in Table 1.6-2. Figure 5.10-1 in the methods section, shows the historical and current exploration activities within the CESA.

Table 1.6-2: Description of Historical Mining Activities Within the Cumulative Effects Study Area

Past Producer	Ore	General Description	Distance from Proposed Project (km)
La Rose	silver, gold, zinc, lead	Located on the east flank of Tsimstol Mountain west of the Kitsault River, approximately 9.75 km north-northwest of Alice Arm. A few small shipments of high grade ore were made from this deposit between 1918 and 1927.	18
Dolly Varden	silver, zinc, lead, copper, gold	Located approximately 0.3 km west of the Kitsault River, 22.5 km north of Alice Arm. The mine produced high-grade silver ore periodically between 1919 and 1940. One glory hole, is located 300 m west of the Kitsault River, 22.5 km north of Alice Arm.	29
North Star	silver, zinc, lead, copper, gold	An adit portal is located on the west bank of the Kitsault River, 23 km north of the town of Alice Arm. Between 1919 and 1921 a small tonnage of silver ore was mined from this deposit.	30
Torbrit	silver, lead, zinc, gold, copper	The mine was located on the east bank of the Kitsault River, approximately 23.5 km north of the town of Alice Arm. Between 1949 and 1959 Torbrit Silver Mines Ltd. produced 1,249,942 tonnes of ore containing silver, lead, zinc and gold.	30

Note: km - kilometre

1.6.3 Active Mines

There are no active mines within the Land Use RSA. There is only one active mine located within the CESA. The Anyox Slag Heap (slag, silica), located at Anyox at the mouth of Granby Bay is listed as an active producer (Figure 1.6-1). This mine is outside the land use RSA but within the land use CESA. A quarrying permit was first issued to Tru-Grit Abrasives in July 1990 and the quarry was still active in 1998 (BC MEM 2011b). The BC Geological Survey gave a conservative estimate of 20 million tonnes of slag in 1998 (Alldrick 1998).

1.6.4 Exploration Activities

Historical exploration activities located within the Land Use RSA are summarised in Table 1.6-3 below and shown on Figure 1.6-1.

Table 1.6-3: Description of Exploration Activities and Prospects Within the Proposed Project Land Use Regional Study Area

Prospect	Ore	General Description	Distance from Proposed Project (km)
Keystone	gold, silver, zinc, lead, copper, cadmium	The Keystone occurrence is located about 8.0 km south of Alice Arm in the valley of Roundy Creek. The area was explored numerous times between 1916 and 1968 for base and precious metals.	4
Alice	silver, gold, lead, zinc and copper	The Alice occurrence, which was explored extensively during the 1920s and 1930s for the northward extension of the Esperanza vein, is located 1.75 km north-northwest of Alice Arm. This prospect is held by a private owner (Rescan 2010b).	10
Silver Cord	zinc, silver, lead	The Silver Chord showing is located on the Dak River, about 8.5 km northeast of Alice Arm. The area was sporadically but extensively investigated for zinc between 1919 and 1967. This prospect is held by a private owner (Rescan 2010b).	13
San Diego	copper, gold	The San Diego occurrence was tested by two drill holes in 1916. Exploration has been conducted sporadically by various companies between 1965 and 2003.	12

Note: km - kilometre

Bell Moly and Roundy Creek, two developed prospects owned by the proponent, are located within the Land Use RSA (Figure 1.6-1). Recent lava flows between Kitsault and Bell Moly, and extensive till or gravel underlying the basalt flow, hamper exploration for additional molybdenum resources (BC MEM 2009). The Roundy Creek deposit is located about 6 km south of Alice Arm. This deposit has been extensively explored in the past for its molybdenum mineralisation, resulting in the definition of several zones containing moderate historical resources including an area along and south of Sunshine Creek, a tributary of Roundy Creek. The Bell Moly occurrence is located about 10 km east of Alice Arm. Extensive exploration of this deposit in the past has resulted in the definition of considerable molybdenum historical resources (BC MEM 2011a).

Mining exploration activities have occurred within the area since the early 1900s. Many of the areas historically explored have sporadic on-going exploration activities today. "Exploration and Mining in BC" (BC MEM 2009; 2010a) was reviewed to determine current exploration activities occurring in the CESA. Table 1.6-4 provides a summary of the known historical prospects as well as an update regarding recent exploration activities in the area.

Table 1.6-4: Description of Exploration Activities Within the Cumulative Effects Study Area

Prospect	Ore	General Description	Distance from Proposed Project (km)
Homestake Ridge	silver, gold, copper	Located 1.5 km west of Homestake Creek in the Upper Kitsault Valley, 32 km north of Alice Arm. The prospect has been extensively explored since 1916 and advanced drilling took place in 2009 and 2010.	27
Clone	gold, silver, copper, cobalt	Located about 20 km southeast of Stewart, at the southern end of the Cambria Icefield. Drilling was on-going between 1995 and 2009.	47
Big Bulk	copper, gold	Located on the southeast shore of Kinskuch Lake, 22 km northeast of Alice Arm. The area has been explored extensively since 1938 for large tonnage, low grade copper deposits. Available information indicates drilling was last conducted in 2003.	27

Note: km - kilometre

Bravo Gold Corp. has a 100% interest in the Homestake Ridge Project. The project is being advanced as a potential high-grade underground mining operation with a current National Instrument (NI) 43-101 compliant Indicated Resource of 191,000 ounces (oz) gold and 1,350,000 oz silver plus an Inferred Resource of 348,000 oz gold and 7,990,000 oz silver (Bravo Gold Corp. 2011). Two deposits have been identified to date and multiple exploration targets remain to be tested on the large, 2585 ha property. Bravo Gold Corp returned to the Homestake Ridge gold-silver prospect, 35 km southeast of Stewart, to complete the 2010 drill program that expanded the overall "footprint" of the Homestake Silver deposit. The 2010 drill program also improved definition of the distribution of gold and silver within the Homestake Ridge deposit and the identification of a new higher-grade lens of mineralisation on the northwestern margin of the deposit. Late in the year, Bravo Gold Corp began work on the Silver Basin project, located 14 km southeast of Homestake Ridge.

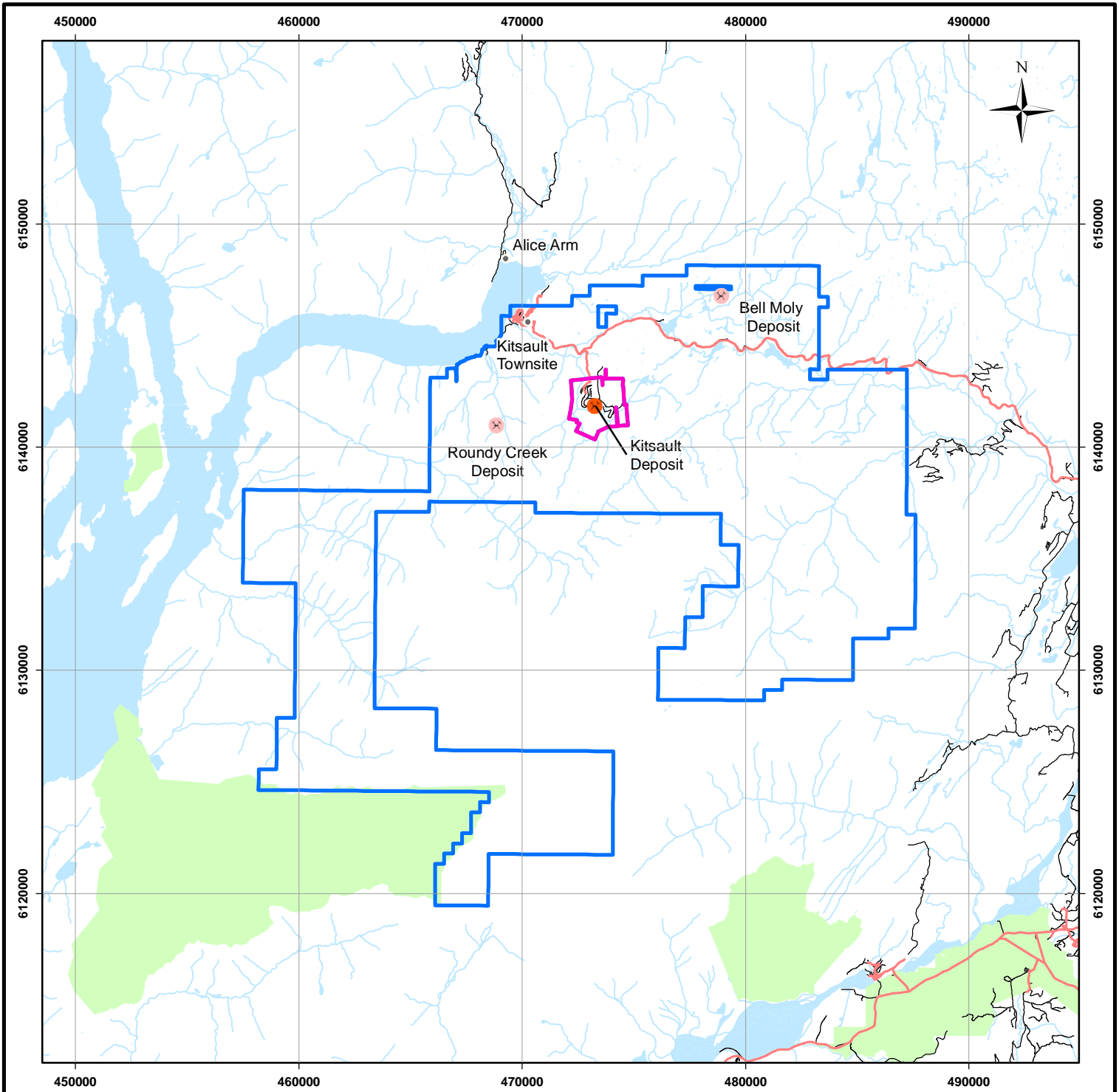
The Clone property is located 20 km southeast of Stewart and is jointly-owned by Teuton Resources Corp. and Silver Grail Resources Ltd. To date, \$3,000,000 has been spent on exploration of the Clone resource (Canasia Industries Corp. 2011). In November 2005 Canasia Industries Corp. entered into an option agreement with the owners of the Clone Property. Terms of the option require Canasia to spend a total of \$1,800,000 over five years to vest a 50% interest in the property. Teuton-Silver Grail will act as operator during the term of the option (Canasia Industries Corp. 2011). Drilling in 2009 amounted to 1675 m in 35 closely spaced holes. Several high-grade intercepts were reported; a resource estimate has not been prepared.

An option for the Big Bulk prospect near Kinskuch Lake, 50 km southeast of Stewart, was acquired by AngloGold Ashanti Holdings PLC, a major gold producing company (BC MEM

2010a). Due to the lack of roads in the area, helicopters are frequently used to access the Big Bulk claim. There is a logging-access road along the western claim boundary that extends from Alice Arm north to the Kitsault Power station. Also, logging roads up the Tchitin and Kinscutch Rivers provide road access to suitable locations for field camps along the eastern side of the Big Bulk claim (BC MEM 2010a).

1.6.5 Mineral Tenures

The proponent is the only mineral lease holder in the Land Use RSA consisting of 35 leases with a total area of 547.22 ha (Figure 1.6-2). In addition to the proponent, other mineral claim holders within the Land Use RSA include seven private owners, Dolly Varden Resources Inc., Hi Ho Silver Resources Inc. and Tenajon Resources Corp. Mineral tenures located within the land use RSA are presented in Figure 1.6-3 and Table 1.6-5.

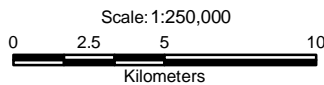




Legend

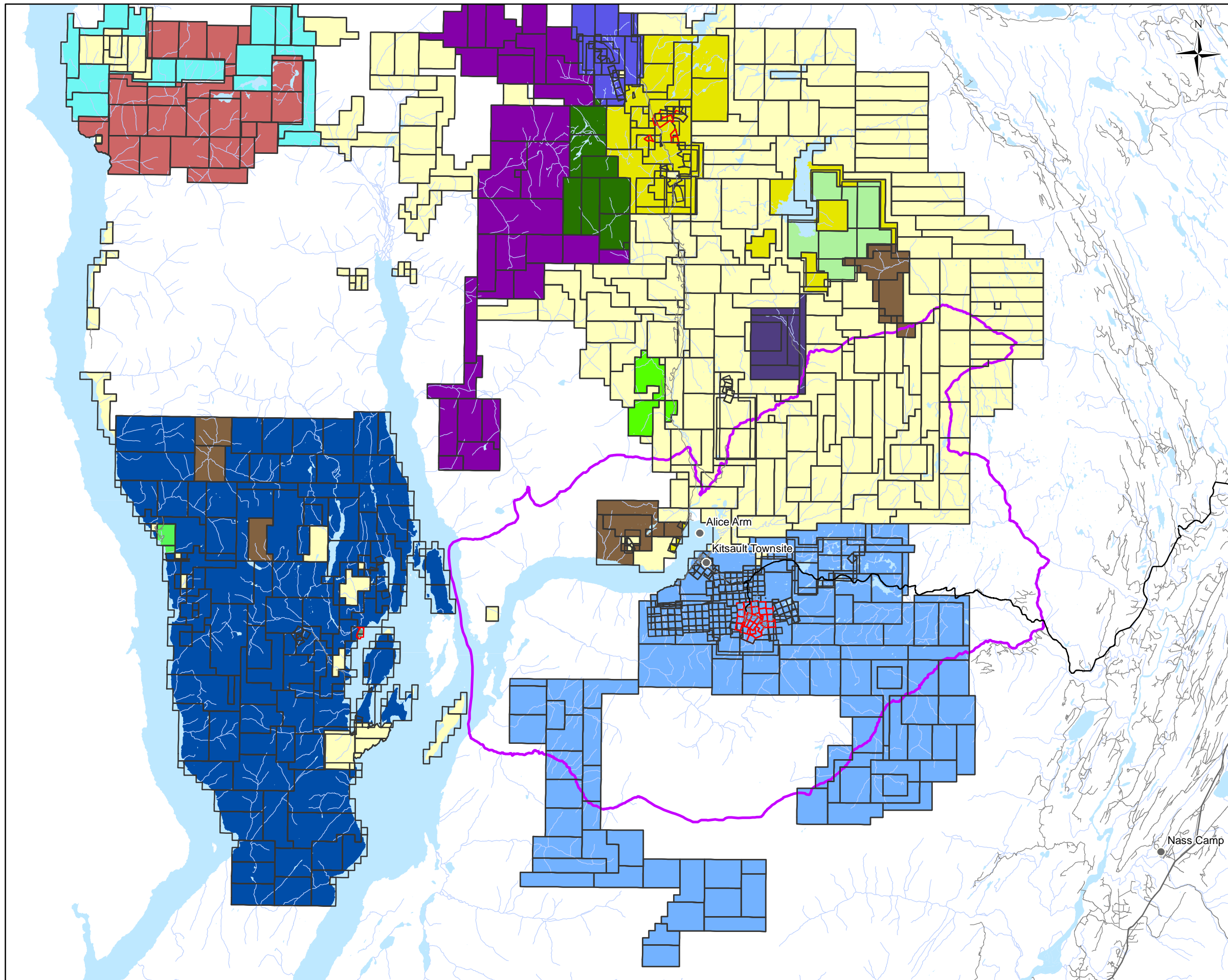
- ⊗ Kitsault Deposit
- ⊗ Bell Moly Deposit
- ⊗ Roundy Creek Deposit
- Avanti Kitsault Mine Ltd. Mineral Tenures
- Avanti Kitsault Mine Ltd. Mining Leases

Reference

Base Data: 1:50,000.
 Tenure Data: Date March 22, 2011



CLIENT:		
		Avanti Kitsault Mine Ltd.
PROJECT:		
Kitsault Mine Project		
Avanti Kitsault Mine Ltd. Mineral Tenures and Mining Leases		
DATE:	ANALYST:	Figure 1.6-2
March 2011	MY	
JOB No:	QA/QC:	PDF FILE:
VE51988	MY	Other-50-004_mineral_lease.pdf
GIS FILE:		
Other-50-004.mxd		
PROJECTION:	DATUM:	
UTM Zone 09	NAD83	



Legend

- Road
- Land and Resource Use Regional Study Area
- Mineral Lease
- Mineral Claim
- Mineral / Placer Claim Owner
- Overlaps or Falls within Land Use RSA
- AVANTI KITSULT MINE LTD.
- DOLLY VARDEN RESOURCES INC.
- HI HO SILVER RESOURCES INC.
- TENAJON RESOURCES CORP.
- Private Owner
- Not Falling within the Land Use RSA
- ASCOT RESOURCES LTD.
- AURAMEX RESOURCE CORP.
- BRAVO GOLD CORP.
- DOLLY SILVER CORPORATION
- LATEEGRA GOLD CORP.
- MINERAL HILL INDUSTRIES LTD.
- TA MINERAL RESOURCES LTD.
- TECK RESOURCES LIMITED
- TEUTON RESOURCES CORP.
- TRU-GRIT ABRASIVES INC.
- Private Owner

KEY MAP



Reference

Land and Resource Data Warehouse Date: March 21, 2011
 Atlas of Canada scale 1:1,000,000.

CLIENT:



Avanti Kitsault Mine Ltd.

PROJECT:

Kitsault Mine Project

**Mineral Tenures Located
Near the Kitsault Mine Project**

DATE: March 2011	ANALYST: MY	Figure 1.6-3
JOB No: VE51988	QA/QC: MY	
GIS FILE: 17-50-016.mxd		PDF FILE: 17-50-016_mineral_claim.pdf
PROJECTION: UTM Zone 9	DATUM: NAD83	

Table 1.6-5: Mineral Claims and Tenures Within the Land Use Regional Study Area

Mineral Claim or Tenure Name	Number of Claims or Tenures	Total Hectares
Avanti Kitsault Mine Ltd.	345	43,668
Dolly Varden Resources Inc.	4	61
Hi Ho Silver Resources Inc.	10	1,705
Tenajon Resources Corp. (now Creston Moly Corp.)	1	256
Private Owners		
Ronald Ross Blusson	5	147
Clive Gerrard Brookes	2	987
Delbert Wells Ferguson	1	422
Kelly Brent Funk	3	55
Alexander Jeletzky	1	183
Craig Alvin Lynes	1	73
Clinton Paul Smyth	63	24,695
Total	91	28,584

Creston Moly Corp. holds claims along the northern boundary of the study area, one of which overlaps with the Land Use RSA. Tenajon Resources Corp. merged with Creston Moly Corp. in August 2009. Creston Moly Corp., one of the largest molybdenum explorers and developers in North America, owns the Ajax Molybdenum Deposit located on the east slope of Mount McGuire, located approximately 13 km northeast of the town of Alice Arm (Creston Moly Corp. 2011). Tenajon Resources Corp. explored the Ajax Property between 2005 and 2008. In January 2010, the proponent acquired 102 mineral tenures from TA Mineral Resources Ltd. (Avanti Mining Inc. 2011).

The mineral claims held by Dolly Varden Resources Inc. that fall within the Land Use RSA are located on the opposite side of Observatory Inlet (Figure 1.6-3). Dolly Varden Resources Inc. is a development-stage company based in Toronto that is undertaking mineral and oil exploration (InfoMine 2011). There are two mineral claim areas held by Hi Ho Silver Resources Inc., one located on the opposite side of Observatory Inlet and the other, referred to as the Silver Bullet Claim, slightly overlaps the northern land use RSA boundary (Hi Ho Silver Resources Inc. 2011). The objective of Hi Ho Silver Resources Inc., an exploration company based in Vancouver, BC, is to increase value through the acquisition and exploration of quality properties with historical grades, and / or production.

Mineral claims outside the Land Use RSA along the access road heading north from Alice Arm are held by private owners, Lateegra Gold Corp., Dolly Varden Resources Inc. and Bravo Gold Corp. Dolly Varden Resources Inc. also holds seven mineral leases north of the land use RSA within their mineral claim area (Figure 1.6-3).

1.7 Forestry

The North Coast TSA, which the proposed Project falls within, is administered by the BC MFLNRO joint North Coast and Kalum Forest District office located in the City of Terrace (BC Ministry of Forests, Lands and Natural Resource Operations (BC MFLNRO) 2011b). Approximately 8% of the North Coast Forest District is considered operable or available for logging over a 100 year rotation. The North Coast TSA covers 1,830,883 ha, of which, approximately 145,808 ha (8%) is classified as the timber harvesting land base. The remainder of the land base is considered non-productive, inoperable, or unavailable for timber harvesting for various reasons (BC MFLNRO 2011b).

Pine has not been found to be a major component of the local stands and mountain pine beetle is not a significant issue in the area (BC MOFR 2009). Vegetation studies have found that the area is predominated by young forest. Details associated with the forest and vegetation habitat within the Land Use RSA is presented in the Vegetation and Plant Communities baseline appendix (Appendix 6.10-A).

1.7.1 Land Use Planning

The consensus version of the North Coast LRMP, published in February 2005 (BC MSRM 2005), did not receive Cabinet approval, nor has it been designated as a “higher level plan” as defined in the *Forest Practices Code of BC Act* (Government of BC 1996b), nor in the *Forest and Range Practices Act*. Therefore, the North Coast LRMP does not provide any legal objectives, and as a result, no land-use objectives are listed in the Forest Stewardship Plan (FSP) document (BC Timber Sales (BCTS) 2009). However, aspects of the LRMP were made legal through the Central and North Coast Order (BC ILMB 2009b) and current FSP incorporate these legal objectives. Policy guidance has been provided from the BC Government indicating that EBM needs to be considered in forest planning. A summary of the apportionment of the 494,000 cubic metres (m³) per year Allowable Annual Cut (AAC) for the North Coast TSA is provided in Table 1.7-1 (BC MOFR 2011).

Table 1.7-1: Apportionment Summary for the AAC for the North Coast Timber Supply Area

Apportionment	Total m ³	%
Forest Licences Replaceable	212,016	50.97
Non Replaceable Forest Licence	104,075	25.02
BCTS Timber Sale Licence	79,799	19.18
Community Forest Agreement	15,000	3.61
Woodlot Licence	3,000	0.72
Forest Service Reserve	2,082	0.50

Note: AAC - Allowable Annual Cut; BCTS - British Columbia Timber Sales; m³ - cubic metre; TSA - Timber Supply Area; % - percent

1.7.2 Forestry Tenures and Activity

The proponent holds one Free Use Permit for Cutting associated with work in Patsy Creek, Roundy Creek and sites associated with the TMF. An FUP conveys the right to remove minor volumes of Crown timber for purposes including personal use (e.g., firewood, Christmas tree, traditional or cultural activity), developing land for agriculture, and using timber to develop a mining claim. One additional FUP, (Mines FUP -MC 251157), is located on the eastern edge of the land use RSA (Rescan 2010b).

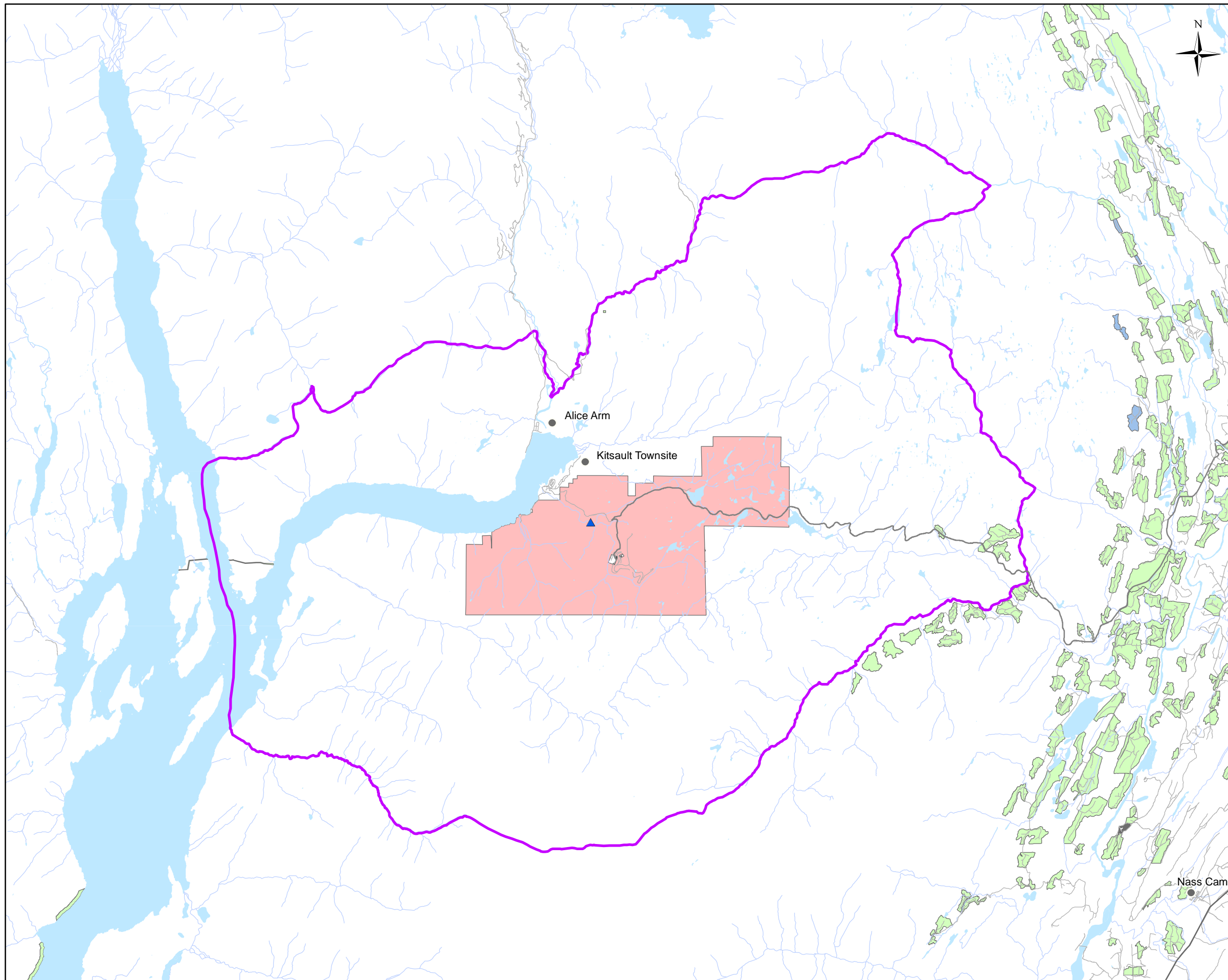
Previous cut blocks overlapping the study area are held by the Anyox Hydro Electric Corporation and Durango Capital Corporation in the North Coast Forest District, and Sim Gan Forest Corporation (managed by Interpac) in the Kalum Forest District (Lenardt 2010; Rescan 2010b). Other than the one active forest tenure held by the proponent, there are currently no active forestry operations within the Land Use RSA. Sim Gan Forest Corporation has requested an industrial license at the wharf area (Rescan 2010b). Logging also took place historically in the Alice Arm area.

1.7.3 Forest Service Roads

Several Forest Service Roads (FSR) are maintained in the study area. The details for these FSRs are provided in Section 1.13.2.

1.7.4 Forestry Camps

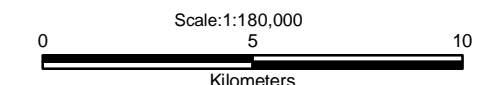
There are no active forestry camps located within the study area. There are signs of a historical camp along the access road, including an old air strip (Rescan 2010b).





Legend

- ▲ Mines FUP MC251157
- Populated Place
- Road
- Kitsault Mine Footprint
- Land and Resource Use Regional Study Area
- All Forest Tenure Cutblock
- Active Forest Tenure
- AVANTI KITSULT MINE LTD.
- WEST FRASER MILLS LTD.

KEY MAP



Reference
 Base Data
 FUP info provided by Rescan (2010)
 Geobase 1:20,000 (TRIM)
 Land and Resource Data Warehouse 1:20,000 (TRIM)
 Atlas of Canada scale 1:1,000,000.

 Avanti Kitsault Mine Ltd.		
PROJECT: Kitsault Mine Project		
Active Forest Tenures and Historical Forestry Operations Near the Kitsault Mine Project		
DATE: March 2011	ANALYST: MY	Figure 1.7-1
JOB No.: VE51988	QA/QC: HLA	PDF FILE: 17-50-008_active_forestry_v2.pdf
GIS FILE: 17-50-008.mxd		
PROJECTION: UTM Zone 9	DATUM: NAD83	