Blackfly Gulch

Assessment Report 2013

PRE-2013-BF001C

Name:	Blackfly Gulch
Commodities:	Ag-Au-W-Bi-As-Sb-Mo
Minfile:	N/A
Status:	Prospect
Deposit Type:	Intrusion Related Gold System (IRGS)
Map Sheet:	082L/12
Latitude:	5618318N
Longitude:	11317535E
Elevation:	1520 metres
Mining Division:	Kamloops
Regional District:	Thompson Nicola

Geoff W. Head

Ptarmigan Range
Exploration

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In Pocket:

Regional Geology

Local Geology

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Abstract

Blackfly Gulch is a grassroots exploration project where previous sampling of four surface showings indicated that the project hosts potentially economic styles of intrusion related gold and silver mineralization. The current program focuses on determining the character of different intrusives phases and styles of mineralization on the project while expanding the precious metal halo around the initial discovery. The project encompasses a trend of Paleozoic oceanic and volcanoclastic rocks hosting a small suite of highly variable intrusives including monzodiorite and syenite. The intrusives are located at the intersection of two regional faults adjacent to a Cretaceous granodiorite intrusion. Several styles of mineralization with a tungsten-bismuth-antimony-arsenic signature are found on the project, including intrusive-hosted sheeted quartz veins, proximal stockworks and skarn with distal veins and replacement mineralization that is being related to other intrusion related gold systems along a1600km trend that includes the Tintina gold province. The project is located in the Vernon map area south of Shuswap lake and is included within the Monashee decollement at the western margin of the Omineca crystalline boundary near the Intermontane terrane contact. The area has complicated geology where gold and silver are associated with regional-scale structures and intrusive trends.

Keywords:
Intrusion-Related, Paleozoic, Cretaceous, Omineca, Intermontane, Bayonne, Granodiorite, Monzodiorite, Syenite, Gold, Silver, Tungsten, Bismuth, Arsenic, Veins, Stockworks, Replacement, Skarn.

1. Introduction

1.1 Terms of Reference

This report comprises field observations and associated technical data, local Minfile abstract data, technical reports on similar deposits and other related public documents. Data has been verified where possible but the author cannot guarantee the accuracy or completeness of all supporting documentation. The interpretive views expressed are those of the author and do not directly reflect the views of the British Columbia Geological Survey or the Geological Survey of Canada.

1.2 Summary

The Blackfly Gulch project is an early stage exploration project targeting low grade, bulk tonnage, intrusion related gold and silver. Several different styles of mineralization are being discovered on the project including; intrusive hosted sheeted quartz veins, proximal stockworks, replacement and skarn, with distal veins and replacement mineralization. The system is associated with the Cretaceous Bayonne suite intrusives with a metal suite that includes gold, silver, bismuth, tungsten, antimony, lead and tellurium. Several deposits in this class contain >10 million oz of gold, illustrating the potential of this system.

1.3 Scope of work

The current exploration program is focussed on defining the character of local intrusives and expanding the footprint of mineralization beyond the zone of the initial discovery. Bedrock mapping and whole rock analysis of significant occurrences across the work area contributed to establishing structural and metallogenic trends. The system is readily compared to more well known Cretaceous age intrusion related gold systems throughout the Cordillera. All current activities are also intended to aid in determining where additional exploration should be focussed and to establish a targeted survey plan.

Fig.1 The Blackfly project area viewed looking north across Charcoal Creek.

2. Claims and Property Description

2.1 Location, Access, Infrastructure

The project is located in south-central British Columbia, 50km east of Kamloops at an elevation of 1650 metres (5000 feet). The work area is 1200 hectares in size, comprising nine claims located entirely on crown land. Access to the property by logging roads is fair, 20km south of the Trans-Canada Highway and Rail line. Electricity service exists within 1km of the property.

2.2 Physiography, Habitat

The project is located in the Shuswap Highlands, a plateau-like hilly area of 14,511 km. The Highlands are a essentially a foothill between the broad interior plateaus to the west (Intermontane Terrane) and the mountainous terrain of the Monashee and Cariboo Mountains to the east (Omineca Terrane). The highland is not a unified range, but a combination of small uplands broken up by the valleys of the Clearwater, North Thompson and Adams Rivers and also by the lowlands southwest of Shuswap Lake, bordered by the towns of Falkland, Westwold, and Monte Creek along Highway 97. This area also includes the Spa Hills (Bolean and Silver Creeks), the Ptarmigan Hills (Charcoal and Chase Creeks) and the other isolated pockets of hills and mini-plateaus. The climate is temperate, ranging from sub-alpine in the mountains to the northeast (1800m), to semi-arid around the Thompson Rivers in the southwest (500m). The work area receives average rainfall with annual snowfall of 60cm. Old growth fir and pine forests cover half of the property and half has been clear-cut and replanted. A few small ponds support no fish but a large amphibious population. The property is also bear, white-tail deer, cougar, bobcat and moose habitat.

2.3 Adjacent Properties

There are no contiguous properties or Minfile occurrences. A generic occurrence, 7km to the northeast, shows geochemically similar(>Bi, Sb, Sr) molybdenum and zinc mineralization. Another generic showing 6km further northeast hosts chalcedonic sulfide breccias with fluorite veins in granite. The Tappen Ck occurrence 3km further east, hosts fluorite veins. A generic showing 9km to the south shows elevated gold in stream sediments(BCGS) near Cretaceous granodiorite. The past producing Falkland gypsum mine 15km to the south hosts Kuroko mineralization. The Cedar Sheeted Veins occurrence of the Fennel formation, north of the South Thompson river, hosts structural and geochemical similarities with Blackfly. The Nox Fort occurrence south of Salmo, also hosts structural and geochemical similarities with Blackfly. All of these occurrences are located on the Paleozoic cratonic margin hosting Cretaceous intrusives.

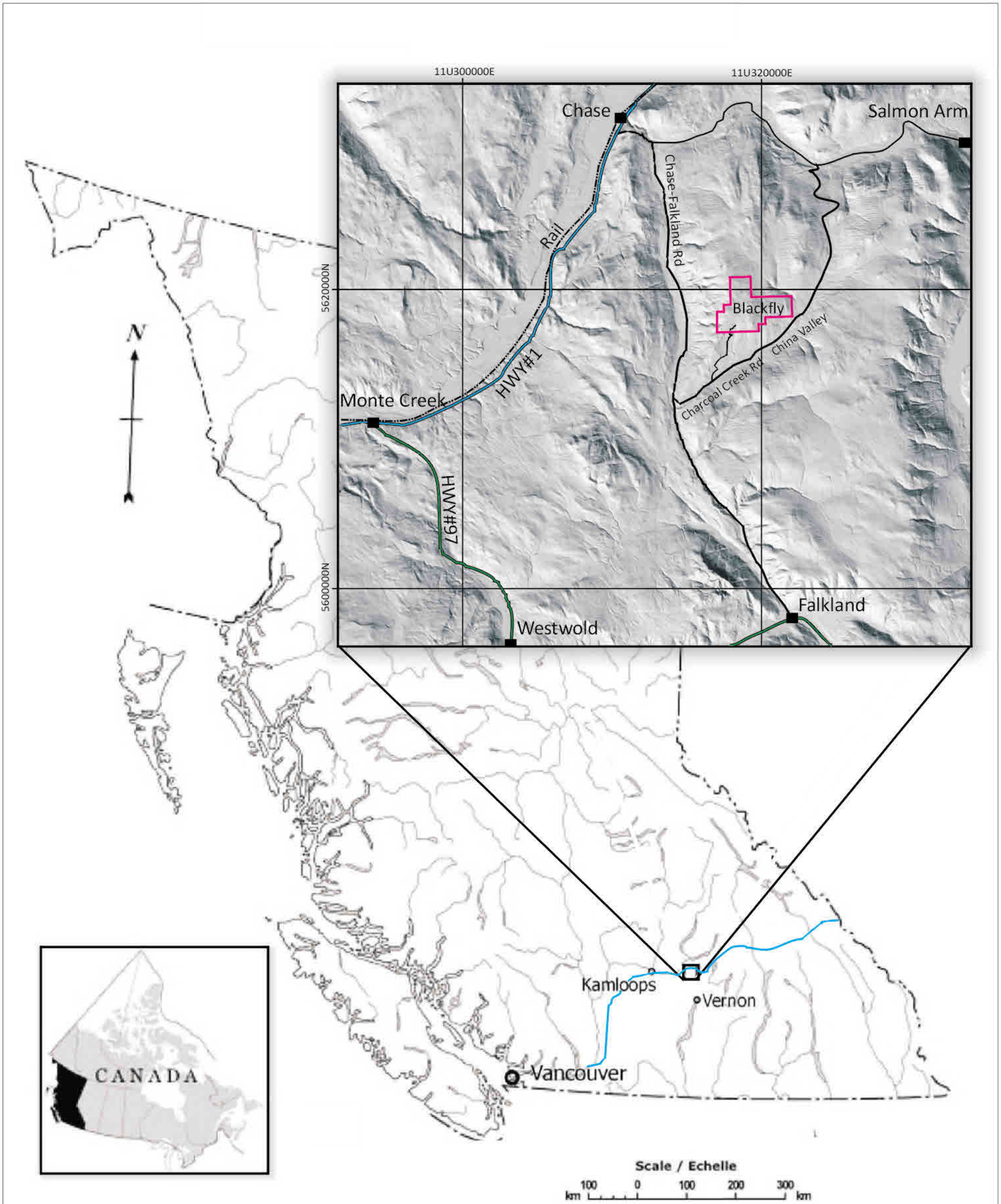


Fig.2 Location

2.4 History

The area around Blackfly has been prospected for uranium since the 1960s with no encouraging results. Placer scheelite was discovered by Peatfield in a stream north of the work area in 1983 (aris14147). Other than sampling, there has been no significant placer mining of any kind in the area. The sheeted quartz veins of the Blackfly central zone were identified by Head during regional reconnaissance in 2005(aris29031). No significant work was accomplished until the 2010 program identified four intrusion-related gold and silver showings over 500metres in the central and southwest zones(aris32613).

3. Regional Geology, Model and Setting

3.1 Geological Model

Intrusive Related Gold Systems (IRGS) are a recently defined class of epithermal gold systems that are associated with mid-high level fractionated, mantle-derived liquids intruding a deformed margin sequence. Most of the known IRGS occurrences in western NA occurred in the Cretaceous and Paleogene. The systems are defined by Hart and Goldfarb(2005) by their; 1)Regional location in post-deformed shelf sequences, generally on the inboard side of a series of accreted terranes. 2)In terranes that also contain significant tin and/or tungsten deposits. 3)Local spacial association of ore with cupolas and contact aureoles of alkaline leaning, but also fractionated and highly variable, volatile-rich plutons. 4)Generally low sulfide content (<1%) of ores within igneous bodies and throughout the outward zoning to distal base-metal rich veins. 5)Low gold grades (<1gpt) of sheeted vein systems in and around plutons. In addition and maybe not exclusive to IRGS is the gold in medium-low temperature quartz veinlets sometimes occurs as fracture controlled free gold associated with native silver, bismuth, arsenic, antimony and lead, or is refractory with arsenopyrite, bismuthinite, stibnite and galena. Outside the veins, much gold often occurs as fine grain disseminations within the intensely altered wall rocks.

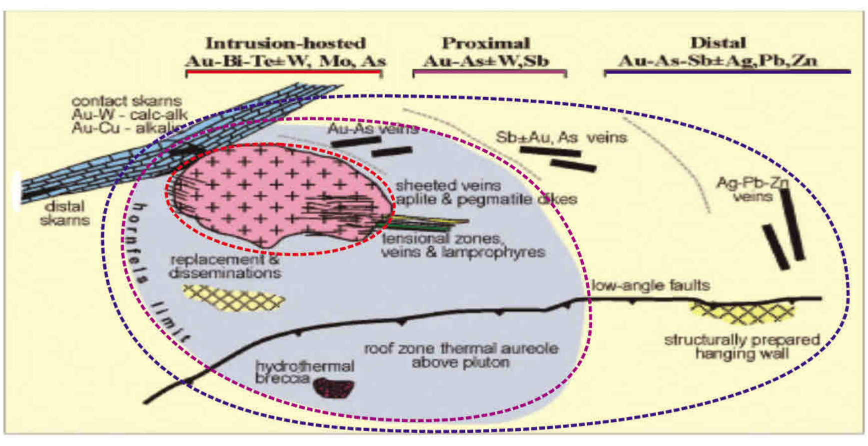


Fig. 3 General plan model of intrusion-related gold systems from the Tintina Gold Province. Note the wide range of mineralization styles and geochemical variations that vary predictably outward from a central pluton. From Hart et al. (2002).

3.2 Geological Setting

The cordillera of North America is divided into five geological terrane belts (fig.4). From east to west these are the Foreland, Omineca, Intermontane, Coast and Insular belts. Each belt is comprised of many small terranes and volcanic arcs that amassed under similar circumstances at roughly the same time. These belts can have sharp steep contacts or they can overlap where thin oceanic terranes were thrust over the cratonic margin before being imbricated by dextral shear and intruded by Jurassic-Cenozoic plutons and volcanics.

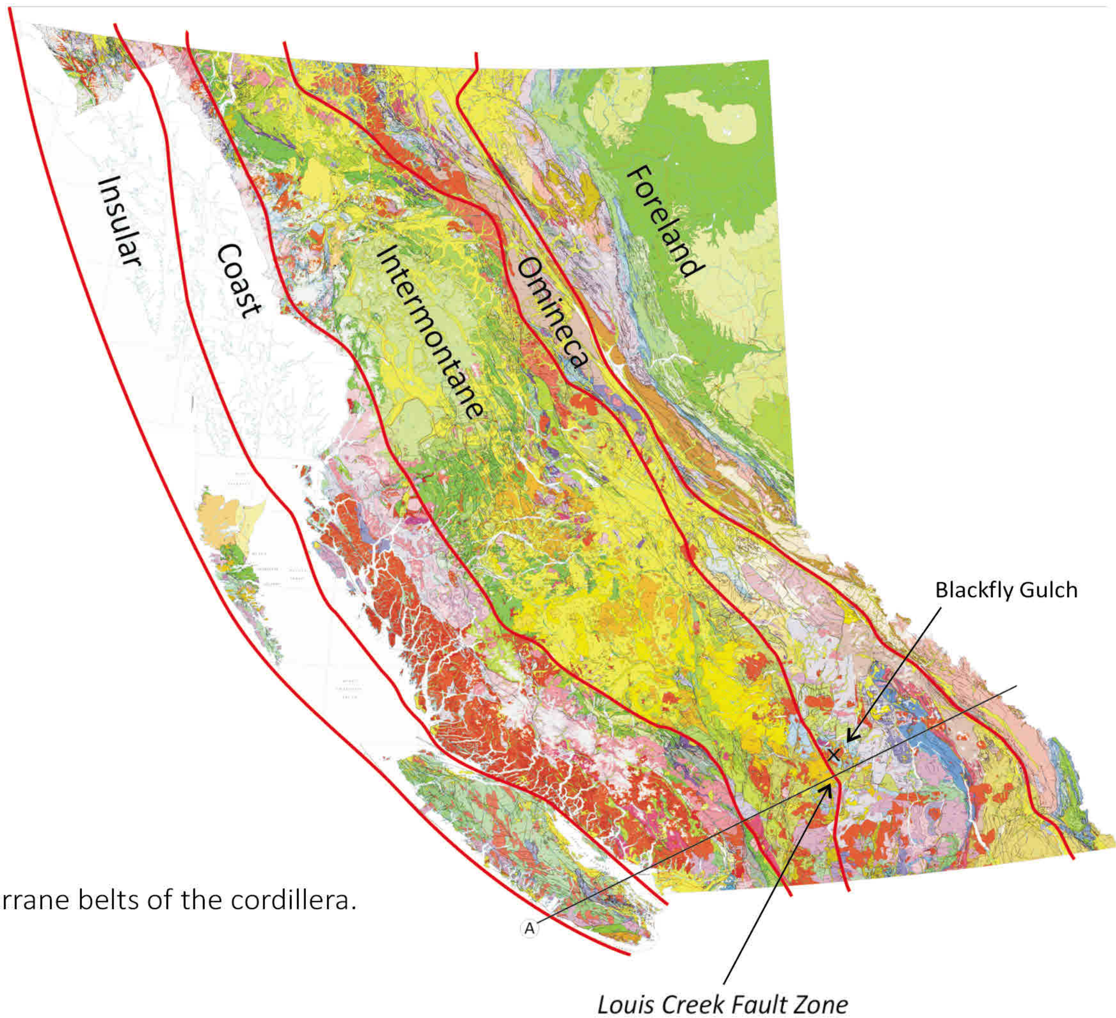


Fig. 4 Terrane belts of the cordillera.

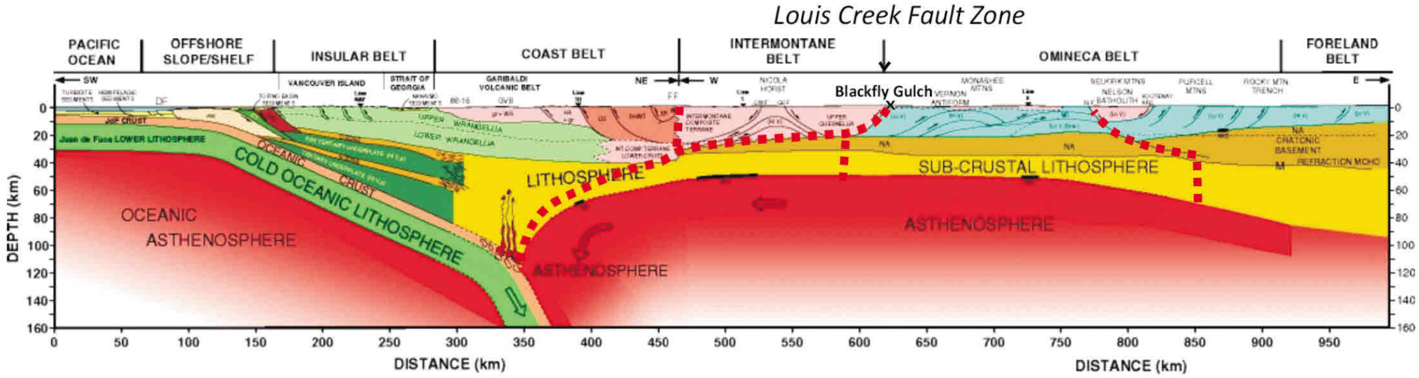


Fig.5 Cross-Section A) The modern setting of the Louis Creek fault zone and the crustal unconformities that channelled local Cretaceous intrusions to their current setting. Modified from Massey, MacIntyre, Desjardins, Cooney and Clover Point Cartographics Ltd. 2005

Several Cretaceous intrusive trends are recognised in the Canadian Cordillera, mainly in the Coast and Omineca belts. The plutons of these two belts differ significantly(Logan, 2001). The granodiorite to tonalite batholiths of the Coast belt were emplaced in a large subduction related magmatic arc complex. The volumetrically smaller granodiorite and high-K granites of the Omineca belt intruded deep into deformed alkaline continental margin rocks in a trend that extends the length of the Cordillera from Alaska to the Canada-US border. There is a molybdenum-tungsten-tin metallogenic province associated with the Cretaceous plutons of the Omineca belt (Fig.6).

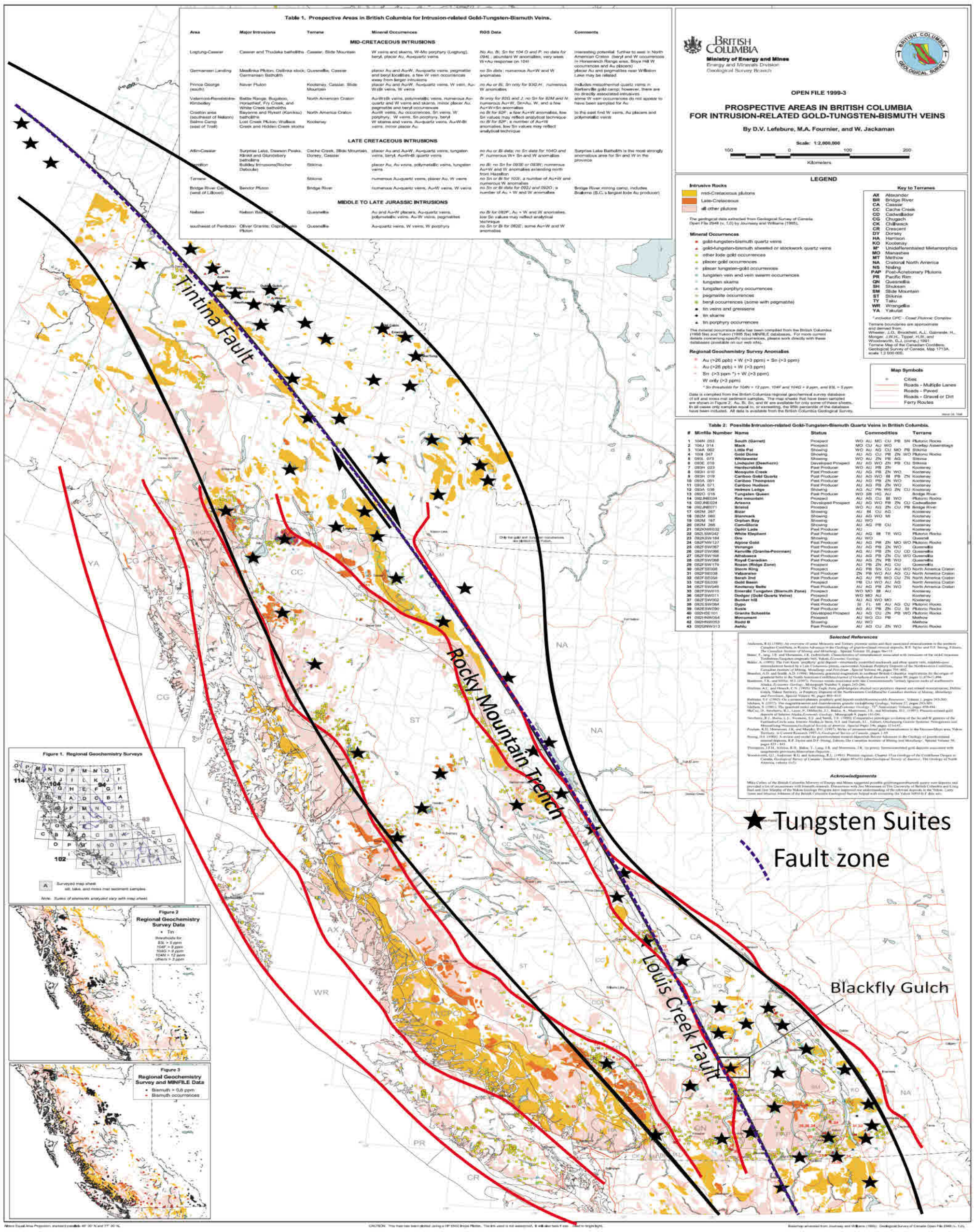


Fig.6 Cretaceous mineral belts of the Omineca terrane appear to be associated with a trend of crustal scale dextral faults and unconformities outboard of ancestral North America in the accreted terranes of the Cordillera. In the Tintina province near the foreland margin this zone is said to be locus of up to 400km of dextral slip displacement (Hart 2005). In B.C. the zone transects the Omineca terrane to the Intermontane margin. Modified from Lefebure, Fournier, Jackaman 1999.

The Blackfly work area is located in the Omineca terrane, near the Intermontane boundary, in an area where the tectonic boundary is commonly marked by mafic volcanics of the Slide Mountain Terrane (Williams,2008). This modified image from Okulitch(1984) shows the Ptarmigan Hills and Slate Creek units relative to the Slide Mountain groups in marginal tectonics (fig.6).

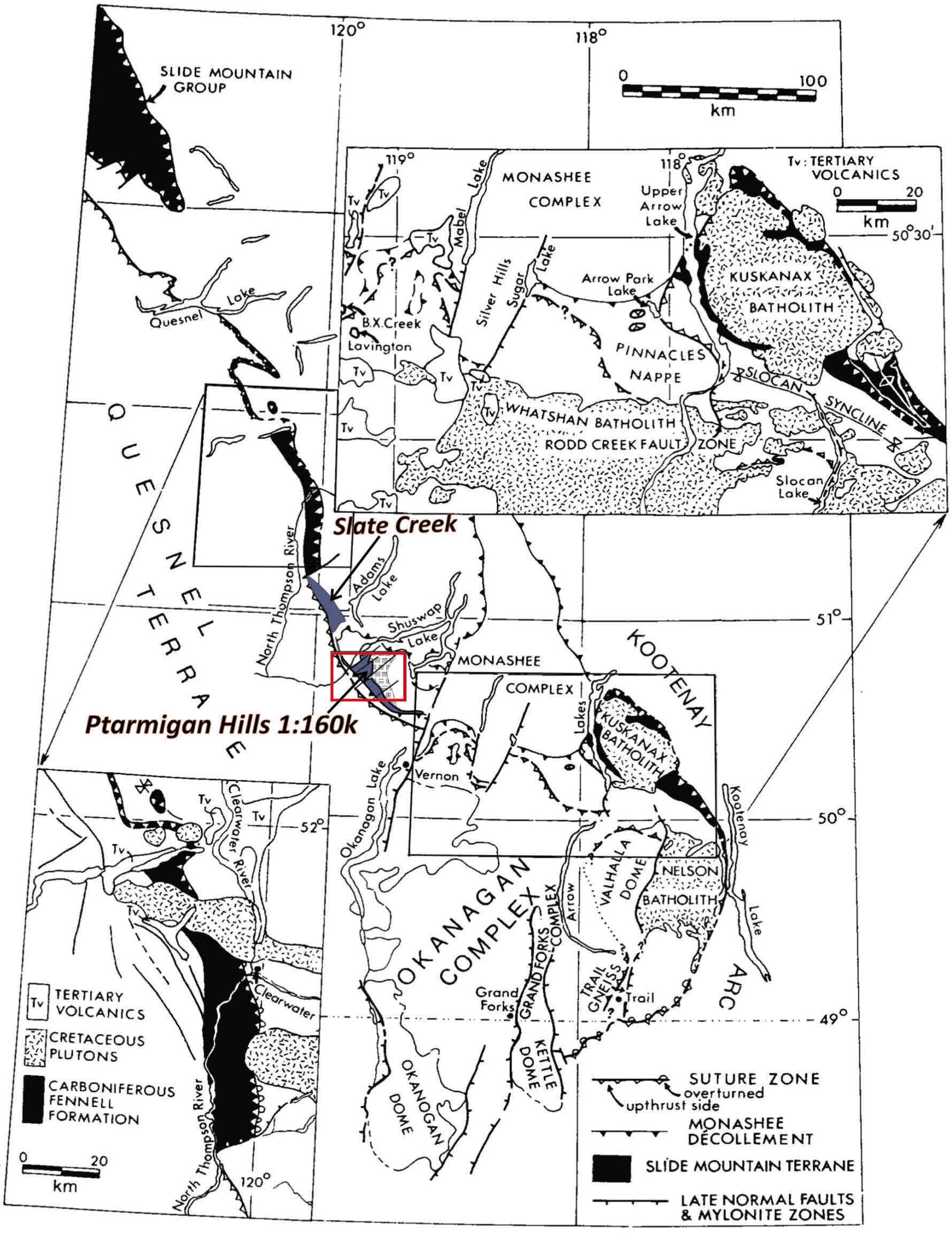


Fig.7 Ptarmigan Hills and the Slate Creek unit of the Eagle Bay assemblage within the Slide Mountain trend.
Modified from Okulitch, 1984.

The Omineca terrane is a composite terrane of mainly Paleozoic strata that was thrust up onto the Precambrian North American margin in pieces beginning in the Paleozoic through the Mesozoic. During the accretion; folding, thrusting and stacking of the allochtonous strata resulted in significant crustal shortening and thickening. The terranes' thickness increases from 5-10km thick at its eastern margin, to over 20km thick at the western margin (fig.4).

Dominating the regional trends around the work area is the Omineca-Intermontane margin, 8km southwest of the project (Louis Creek Fault, locally Raspberry creek). All of the local trends on both sides of this fault have been arranged generally NW-SE according to this fault. This crustal scale fault is thought to be implicated in sourcing the intrusives in the work area.

The stratigraphy in the work area is comprised of ocean basin sediments and mafic volcanics that are officially part of the lower Paleozoic Silver Creek formation, Mount Ida assemblage. In this study the rocks are referred to as part of the Devonian-Permian Slide Mountain group overlying a Silurian-Carboniferous Harper Ranch group basement. These rocks host significant mid-Cretaceous Bayonne suite granodiorite-syenite intrusions. Nicola group volcanics are sporadic but show with increasing frequency to the southwest of the work area.

A large Cretaceous granodiorite body is centred 2km east of the work area, and forms the epicentre of regional intrusive activity. This granodiorite is the northernmost phase in a trend that produced elevated tungsten during regional soil geochem sampling(Lefebure 1999). Associated with the main intrusion are several smaller intrusive phases and apophyses with diverse characteristics that include monzodiorite and syenite with aplite and lamprophyre dikes. East of the granodiorite, is the upper Proterozoic - lower Paleozoic Mount Ida Assemblage Silver Creek formation siltstone, shale and clastic sedimentary rocks.

North of the work area is the Chase Antiform, a large dome with outward dipping contacts (Monger 1983). At its centre Ordovician Mount Ida Assemblage metamorphic rocks and granite are exposed around Shuswap lake. On the south flank of the dome lies the work area. On the north flank of the dome is the Mississippian Eagle Bay Assemblage-Slate Creek unit clastic sediments and the Pennsylvanian-Permian mafic volcaniclastics of the Fennel formation (Fig.8).

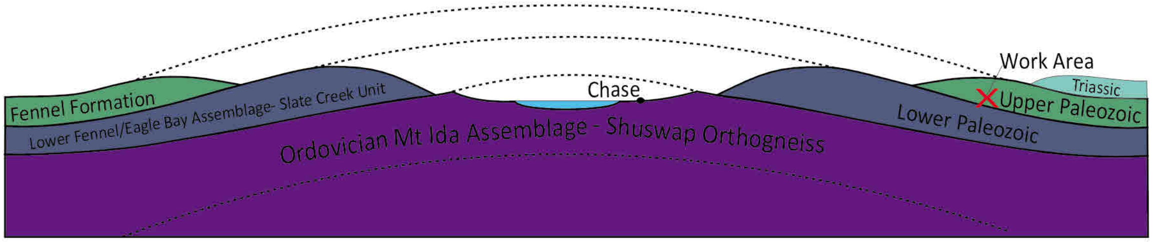
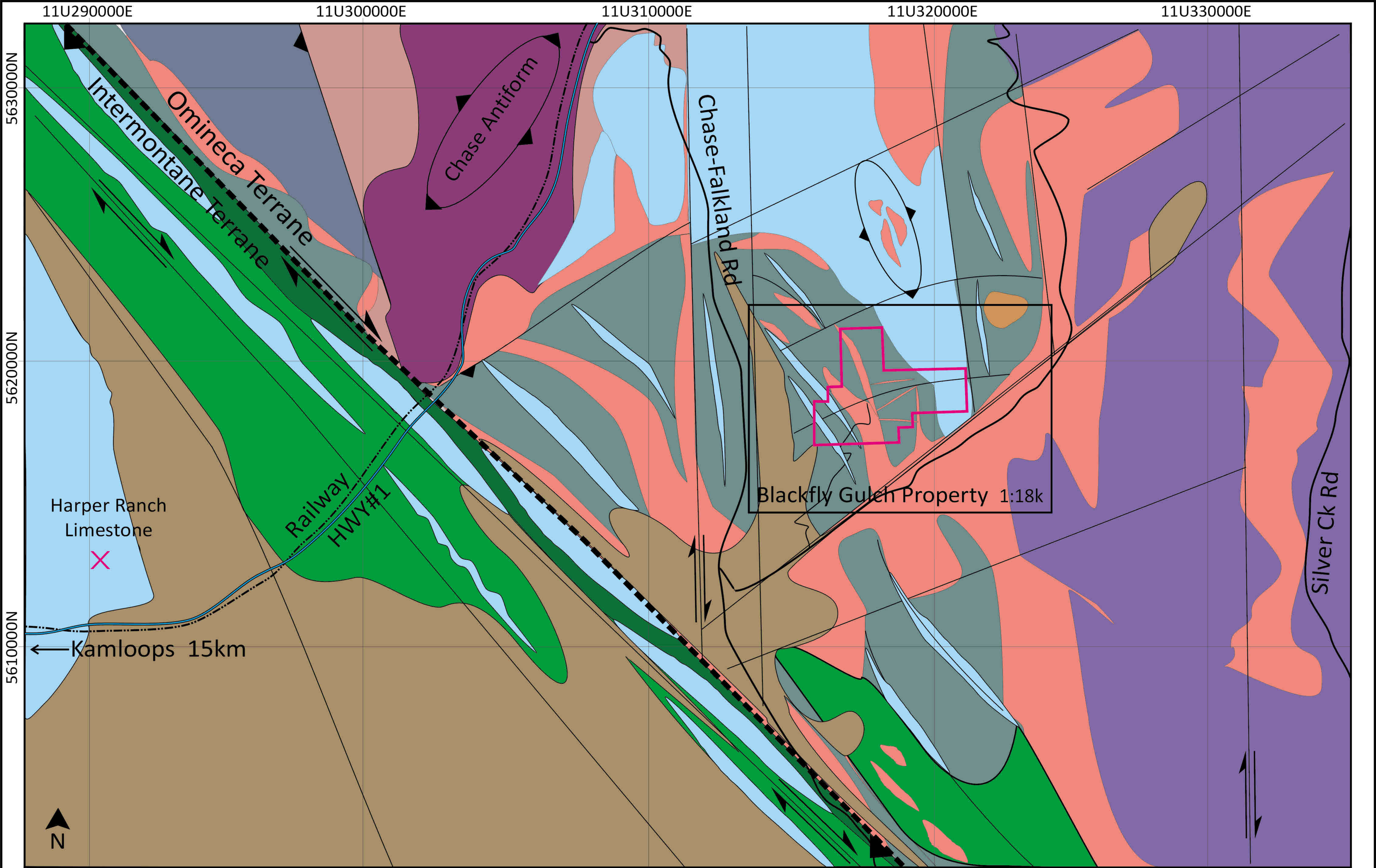


Fig.8 Interpreted N-S section of the Chase Antiform upwelling and the erosion of Paleozoic strata.



Ptarmigan Range Exploration

Blackfly Gulch Property

Regional Geology

Scale 1:160,000

Km 1 2 4

Legend

- Blackfly Project
- Omineca Boundary
- Slip Strike Fault
- Plunge / Thrust

Geology

Paleogene
- *Kamloops Group* — *Undivided Volcanics*

Cretaceous
- *Bayonne Suite* — *Granodiorite-Syenite*

Devonian- Permian
- *Harper Ranch Group* — *Limestone-Sediments*
- *Nicola Group* — *Undivided Volcanics*
- *Harper Ranch Group* — *Basalt-Greenschist*
- *Slide Mtn Terrane* — *Volcanics-Sediments*

Lower Paleozoic
- *Mount Ida Assemblage* — *Clastic Sediments*
- *Mount Ida Assemblage* — *Granite Gneiss*
- *Mount Ida Assemblage* — *Orthogneiss-Schist*

4.2 Geophysical Setting

The geophysical data was collected and supplied by the BCGS on the Mapplace website. It provides a good regional scale picture of the project in relation to the Cretaceous intrusive suite and related hydrothermal activity.

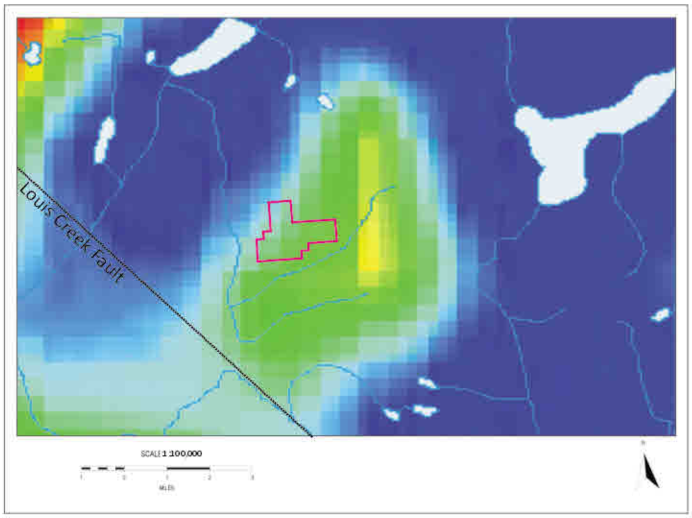


Fig.9 Gravity

The gravity data indicates the work area is located within the aureole of the Charcoal intrusive suite. The data shows the primary intrusive centre is immediately east of the project and that the suite is rooted in the Louis creek fault (Omineca-Intermontane contact) 8km to the southwest. This would indicate the project is located in a hanging-wall structure.

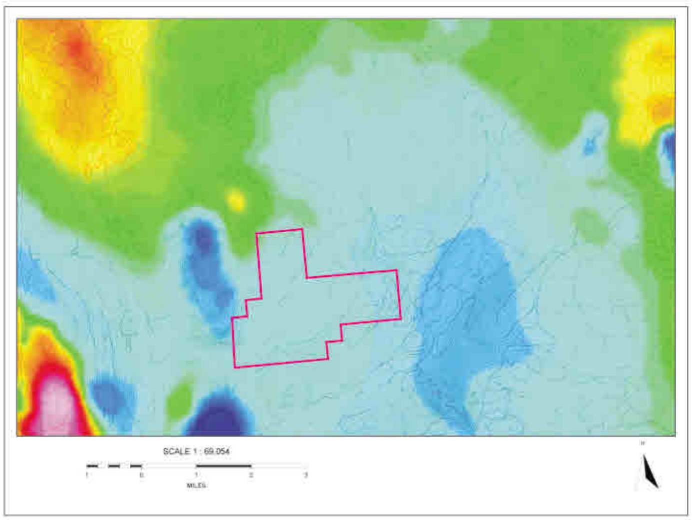


Fig.10 Total Magnetic

The total magnetic data shows the core of the intrusive suite is immediately east of the work area, while indicating the entire work area is within the intrusions hydrothermal alteration aureole.

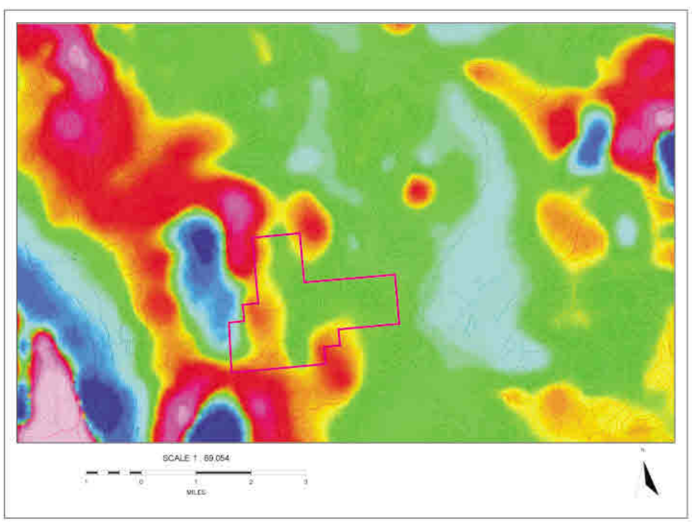


Fig.11 First Vertical Derivative

The first vertical derivative data indicates the host rocks produce a variable magnetic response, while the primary intrusives and associated hydrothermal alteration produce a characteristically low response. There is extensive geological co-mingling across the work area that is not differentiated by large scale aerial magnetics.

4. Local Geological Setting, Mineralization

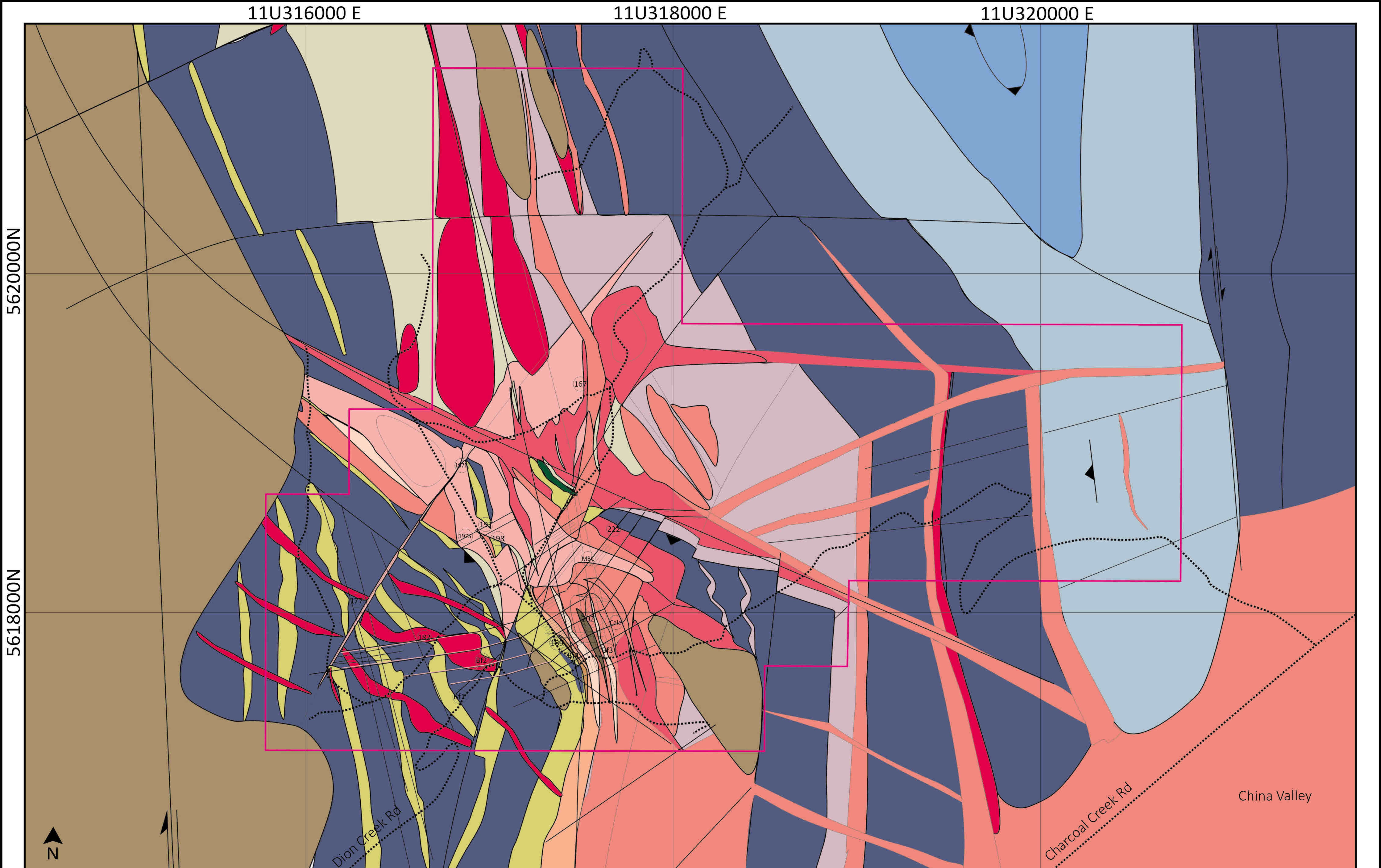
4.1 Local Geological Setting

The local geology is characteristic of being located near an active margin during intense activity. Paleozoic age oceanic and volcanic rocks are regionally deformed by accretionary tectonics and locally altered by volatile Cretaceous intrusives.

The local structure comprises two units of Paleozoic rocks folded into a SE dipping anticline, parallel to the terrane margin (Louis Creek fault, locally Raspberry creek). A lower limestone-psammite unit is interpreted as (Silurian-Devonian) Harper Ranch, and an upper unconformable marine sedimentary-volcanoclastic unit is interpreted as (Carboniferous-Permian) Slide Mountain. The Louis Creek fault has been a reoccurring active fault zone and locus to many cycles of compression, thrusting and dextral slip displacement. The local area is geographically referred to as the Ptarmigan Hills, so the anticline is designated the Ptarmigan Hills anticline, measuring approximately 17km north-south by 9km east-west, from the (Ordovician) Silver Creek formation orthogneiss in the north, to the (Triassic) Nicola group volcanics in the south.

The work area is within the southwest dipping limb of the anticline, centred on a small suite of intrusives hosted in the upper unit of marine-volcanoclastic rocks, with the lower limestone member exposed at the eastern margin of the property. The limestone is fine to medium grained, mainly white to cream coloured with bands of grey and black. It contains minor amounts of quartz and muscovite and is locally skarnified with garnet, vesuvianite, actinolite and tremolite(fig.12). Overlying the limestone is quartzite, calcareous siltstone, cherty argillite and volcanoclastic strata(fig.13). These rocks become increasingly stratified and incompetent near the centre of the property, where they host small intrusive apophyses. The intrusive phases are variably peraluminous-peralkaline and change in composition by their depth and pressure of emplacement, distance from associated plutons and the composition of host rocks which locally have variable effects on the character of intrusives.

The geological structure and metallogeny of the work area is estimated to be the result of at least seven simultaneous factors; 1)the proximity to a crustal scale unconformity capable of sourcing volatile mantle-derived intrusives (Louis Creek fault-Intermontane contact), 2)regional basement structures (Chase Antiform) upwelling while 3)dextral slip created oblique compression and thrusting created regional scale cross-faulting in surface units (Ptarmigan Hills anticline), and 4) brittle surface units that fracture in sets of parallel and anastomosing micro faults relative to regional trends, 5)locally reactive alkaline stratigraphy conducive to capturing and reducing 6)multiple phases of Cretaceous intrusives in sub-parallel and cross-faulted unconformities, and 7)the repetition of such sequential factors maintaining a migrating, overprinting mafic front across an evolving host environment.



Ptarmigan Range Exploration

Blackfly Gulch *PRE-2013-BF001C*

Local Geology

Scale 1:18,000

Metres 500 1Km

Legend

- Blackfly Project
- Roads
- Slip Strike Fault
- Plunge / Thrust

Geology

Lower Paleozoic
Harper Ranch
- Limestone- Psammite
- Slate-Quartzite

Upper Paleozoic
Slide Mtn Terrane
- Carbonaceous Sediments
- Quartzose Sediments
- Siliceous & Mafic Clastics
- Mafic Volcanics

Cretaceous
Bayonne Suite
- Monzogabbro
- Granodiorite-Monzonite
- Monzonite-Syenite
- Aplite-Camptonite

Paleogene
Kamloops Group
- Undivided Volcanics

Mesozoic
- Granite

Fig.12 Generic examples of the lower unit: A) *calcareous psammite and limestone with thin skarnified layers.* B) *close-up of skarn with vesuvianite.* C) *undefined ferrous quartzite approximately between the lower and upper units.*

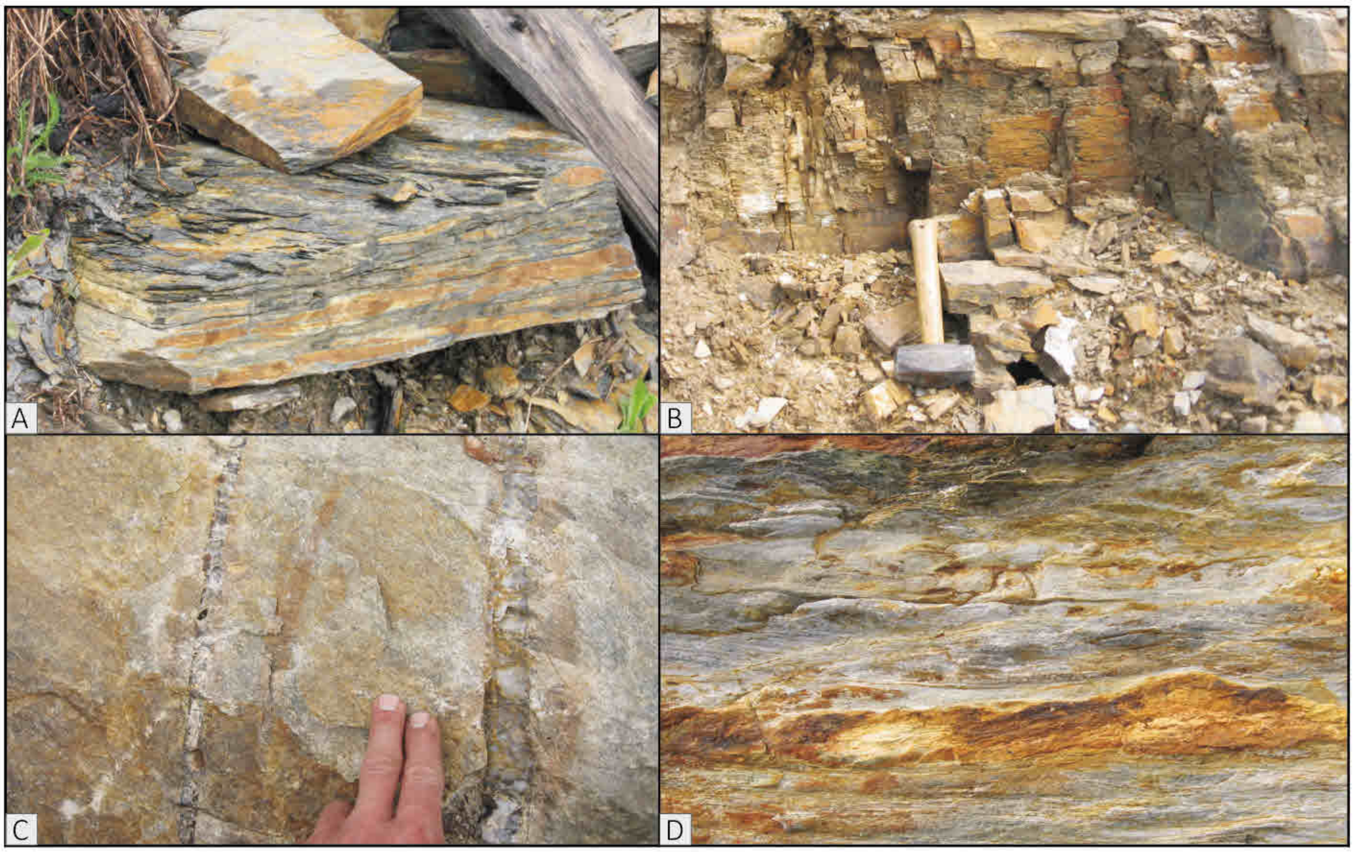


Fig.13 Generic examples of the upper unit: A) *Cherty argillite in the 182 area.* B) *Fractured volcanoclastic sediments east of 182.* C) *Cherty sandstone-pyroxene hornfels near Bf2.* D) *Banded calcareous-alkali skarn south of 177.*

4.2 Mineralization

Three kinds of mineralization are being sought on the property based on the metallogenic zoning typical to this kind of deposit. Zoning is affected by the depth of emplacement and distance from the causative intrusion (Flanigan etal, 2000; Hart etal, 2000; Lang and Baker, 2001), along with other factors like the host rock permiability, alkalinity and overall reduction capacity. Intrusion-hosted ore, proximal deposits and distal assemblages usually change from *U, Sn, W, Mo* to *Au-Bi-As-Sb* to *Ag-Pb-Zn* from deeper to shallower levels and from intrusion-pegmatite hosted to distal structurally controlled veins or replacements(fig.3). Each type of mineralization sought on the property is found at least one other location along the modern Paleozoic cratonic margin(fig.6).

Intrusion-hosted deposits comprise low grade, large tonnage sheeted and stockwork vein systems characterized by metal assemblages containing Au-Bi-As±Te±Mo±W(Fort Knox).

Proximal deposits are located in the host rocks adjacent to the intrusion within the contact metamorphic aureole. Deposits of this group include; contact skarn assemblages of W-Au±Bi and W-Mo±Au±Cu(Dublin Gulch property), disseminated carbonate replacements, tin and copper-rich breccias and vein deposits.

Distal deposits are located beyond the limits of the contact aureole. They include; auriferous vein-filled fault zones(True North), breccias, Ag±Au rich base metal veins and disseminated replacement of carbonaceous and calcareous rocks(Brewery Creek). Metal assemblages for distal deposits are characterized by either a Au-Ag-As-Sb±Hg signature or Pb-Zn-Au-As-Sb ±W quartz-carbonate veins (Ruth Vermont, McMurdo).

The southern end of the Omineca belt corresponding to the Bayonne Magmatic belt contains extensive magmatic-hydrothermal mineral deposits (Fyles and Hewlett, 1959; Logan, 2001). Many contain primarily base metals with only minor precious metals but are still important exploration tools that may be used to direct exploration. The metal assemblages and metal ratios associated with distal vs. proximal mineralization is important in establishing the position of the causative intrusion.

Preliminary work indicates metal zoning on the Blackfly property seems to reflect the model. Peraluminous-metaluminous intrusions at the centre of the property form the epicentre of intrusive activity hosting mesothermal stockworks with gold, silver, lead, bismuth, tungsten, antimony and tellurium. West of the central intrusive zone, the hanging wall zone volcanoclastic metasediments and pyroxene hornfels host meso-epithermal silver, lead, bismuth and arsenic. East of the central zone, the footwall zone psammite-limestone is selectively skarnified near unmineralized potassic dykes. Intrusives outwardly exhibit variably alkaline characteristics and are all enriched in large-ion lithophile elements, such as barium and strontium and are relatively depleted in copper and zinc.

Central Zone

The central zone hosts the interpreted core of the metallogenic complex on the property and is located at the geographic south-centre of the property. Intrusive hosted and proximal mineralization is predominant. The zone hosts a >600 metre wide northwest trend of mainly metaluminous but variable intrusives and hornfels with associated mineralization. Compositions are highly differentiated; including monzodiorite, syenite, aplite, camptonite.

Fig.14) *Stockworks in pyroxene hornfels in the 189/Bf4 area,* 2)*syenite in the 167 area of the north central zone,* 3)*dirty monzosyenite in the MBC area,* 4)*aplite & camptonite at Bf3.*

The central intrusives trend northwest relatively parallel with stratigraphy and are interpreted by contacts and flow banding to dip near vertical, sub-parallel to the strata concordant with interpreted regional faults. Pennants and inclusions of gneissic-marblized host rocks are common.

The intrusives and hanging-wall hornfels host significant mineralization in several forms including disseminated, quartz vein, anastomosing stockworks, replacement & skarn. There are significant stockworks in the central zone area traversing perpendicular to the intrusive trend.

189 *5617862N 11317382E 1492m*

Rock Type: *Quartz aluminosilicate* Style: *Mesothermal stockworks*

Orientation: *Strike 10-90 / dip 0-45*

Primary Minerals: *Quartz, albite, orthoclase +Ba, Sr*

Secondary Minerals: *Bismuthinite, Pb, Sb, Cd, Mn, 2670ppm Ag, 0.033ppm Au*

Alteration: *Hypogene*

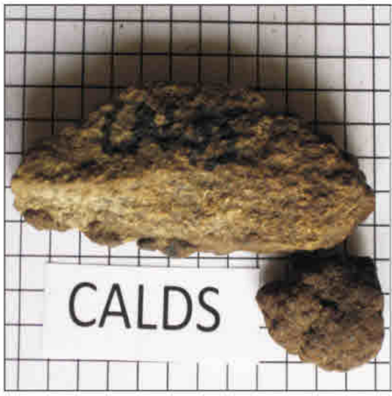
Description: *Medium temperature parallel and anastomosing fractures in pyroxene hornfels, 1-10cm vein width w/1-90cm spacing over 30+metres.*

The stockworks trend near parallel to regional cross-faulting and plunge variably. They are exposed by erosion in the hornfels zone (*189*) trend northeast through the intrusive zone(*202,222,MBC*) with the most intense fracturing observed in the hornfels zone near the intrusive zone contact.

202 *5617991N 11317531E 1518m*
Rock Type: *Anorthoclase* Style: *Mesothermal vein, subhedral*
Orientation: *Strike 315, dip 0*
Primary Minerals: *Orthoclase, plagioclase*
Secondary Minerals: *Pyrite, arsenopyrite, Ba, Sr, Bi, 1.4ppm Silver*
Alteration: *Hypogenic pseudomorph*
Description: *Medium-high temperature fractures in a thin north trending 'sill' of albite schist.*

222 *5618503N 11317672E 1528m*
Rock Type: *Quartz aluminosilicate* Style: *Meso-epithermal vein, anhedral*
Orientation: *Strike 315 / Plunge 0*
Primary Minerals: *Quartz, plagioclase, orthoclase*
Secondary Minerals: *Pyrite, Mn, Zn, V, Ti, Cr, Sc, Ba, Sr, Cu, Mo*
Alteration: *Hypogene w/supergene*
Description: *Medium temperature parallel fractures,1-10cm wide w/10-90cm spacing, unknown breadth, in monzosyenite.*

MBC *5618318N 11317535E 1521m*
Rock Type: *Monzodiorite* Style: *Mesothermal sheeted fractures*
Orientation: *Trend n/a, fractures strike 35-55, dips variable*
Primary Minerals: *Plagioclase, orthoclase, pyroxene*
Secondary Minerals: *Pyrite, bismuthinite, W, As, Ba, Sr, Mo, 210ppm Ag*
Alteration: H*ypogene, mesogene, w/supergene*
Description: *Medium temperature parallel fractures in monzodiorite southwest of a metasediment contact. Width 0.1-5cm, variable spacing.*



CAL *5617952N 11317685E 1499m*
Rock Type: *Trachyte/latite* Style: *Massive, subhedral*
Orientation: *Foliation strikes ~345, dip 0*
Primary Minerals: *Plagioclase, orthoclase, biotite*
Secondary Minerals: *Ba, Sr, Mn, Zn, Co, V, Ti, Cr, Sc, P*
Alteration: *Hypogene, supergene*
Description: *Late manganese gossan. Rock is incompetent within a geographic depression.*

The intrusive trend continues northwest where it is a calcareous monzosyenite(*197N*) which crossed by a southwest fault with associated fracturing (*197,197S*) . East of this area is a northwest striking zone of calciphyre believed to be a contact metamorphosed limestone or a fractionated metasomatic byproduct(*198*).

197N *5618880N 11316850E 1505m*

Rock Type: *Monzosyenite* Style: *Massive subhedral*

Orientation: *Trend NW / Plunge 0*

Primary Minerals: *Plagioclase, orthoclase, amphibole*

Secondary Minerals: *Pyroxene, mica, Fe, Mg, Mn, Zn, V, Ti, Cr, Sc, Ba, Sr, 0.03% sulfur, 0.6ppm silver*

Alteration: *Hypogene pseudomorphic*

Description: *A semi-homogenous example of the most predominant intrusive phase in the NW Central zone. The least potassic alteration of the 197area.*

197 *5618529N 11316952E 1517m*

Rock Type: *Monzosyenite* Style: *Massive sub-anhedral, fractured*

Orientation: *Trend NW, plunge n/a, fractures anastomosing, strike W, dip 0*

Primary Minerals: *Plagioclase, orthoclase, amphibole*

Secondary Minerals: *Pyroxene, sericite, Fe, Mg, Mn, Zn, V, Ti, Cr, Sc, Ba, Sr, 0.2% sulfur, 6.3ppm silver*

Alteration: *Hypogene pseudomorphic w/ argillic*

Description: *A westerly fracture zone cuts the intrusive trend. Fractures are mostly irregular hairline with argillic alteration penetrating up to two inches.*

197S *5618480N 11316860E 1512m*

Rock Type: *Monzosyenite* Style: *Sub-anhedral, fractured*

Orientation: *Trend NW, plunge n/a, fractures strike W*

Primary Minerals: *Quartz, plagioclase, orthoclase*

Secondary Minerals: *Pyrite, molybdenite, Mn, Zn, V, Ti, Cr, Sc, Ba, Sr, 0.1% sulfur, 4.7ppm silver*

Alteration: *Hypogene argillic*

Description: *Medium temperature fractures, variable anastomosing widths. Increasing potassium, decreasing aluminum with alteration.*

198 *5618421N 11317004E 1511m*

Rock Type: *Alkali calciphyre* Style: *Anhedral metasome*

Orientation: *Trend 345 / Plunge SW*

Primary Minerals: *Quartz, plagioclase, mica*

Secondary Minerals: Fe, Mg, *Co, La, Ba, Sr, Be, Cd, Cu, Mn, Zn, V, Ti, Cr, Zn*

Alteration: *Hypogene*

Description: *Calcic metasomitization or fractionated (albitization) byproduct displaying schistose banding. From the hot (liquified) side of (intrusive)197 contact with volcanoclastic metasediments.*

The northernmost phase of the central intrusive trend, a relatively clean syenite(fig.14b) with a relic foliage perimeter, outcrops in the 167 area.

West of the central intrusive trend, the southwest hanging wall zone forms the western limit of the metallogenic complex on the property. The zone comprises southwest dipping volcanoclastic metasediments. Previous sampling low in the tectonic pile in areas Bf1 and BF2, showed structures and elements characteristic of proximal mineralization. Higher in the pile, quartz(*182*), and ferromagnesian silicate veins(*172*) were observed.

167 *5619243N 11317525E 1498m*

Rock Type: *Syenite var. transitional* Style: *Massive plutonic subhedral*

Orientation: *Foliation trends N-S & fractures E-W*

Primary Minerals: *Plagioclase, orthoclase, amphibole*

Secondary Minerals: *Ilvaite, +Ba, Sr, Mn, -0.01% sulfur*

Alteration: *Hypogene, supergene*

Description: *High temperature low-sulfide alkali intrusive with relic foliation. Weathering orbicular.*

177 *5618083N 11316277E 1487m*

Rock Type: *Amphibolite* Style: *Vein, sub-anhedral*

Orientation: *Strike NW, plunge 0, width 3cm*

Primary Minerals: *Amphibole*

Secondary Minerals: *Pyroxene, +Ba, Co, Cr, La, Mn, Ni, Sr, Ti, V, Zn*

Alteration: *Hypogene*

Description: *Semi-aphanitic, 3-4cm wide fracture in metasediments. No alteration adjacent. Strikes NE towards the 167 zone.*

182 *5617868N 11316653E 1481m*

Rock Type: *Quartz aluminosilicate* Style: *Quartz vein, anhedral*

Orientation: *Strike 340, plunge 0*

Primary Minerals: *Quartz, sodic plagioclase, orthoclase*

Secondary Minerals: *Pyrite*

Alteration: *Hypogene*

Description: *Quartz vein material with aphanitic feldspar, from a fracture zone 90cm wide in metasediments. Accompanied by minor argillic alteration.*

Further north on the property older granitic intrusives in quartzite and greenschist with silicified muscovite-albite gneiss with traces of molybdenite along with Cenozoic volcanics were observed.

4.3 Sampling and Analysis

Method and Approach

All samples were chosen to be representative of the average composition of a specific rock, mineral occurrence, zone or structural element. Samples that were judged to have the most significance in defining the metallogenic model were submitted to a qualified assayer for analysis with the results plotted in plan view(Blackfly Geochemistry-in pocket).

Sample Preparation and Analysis

Collection and Preparation

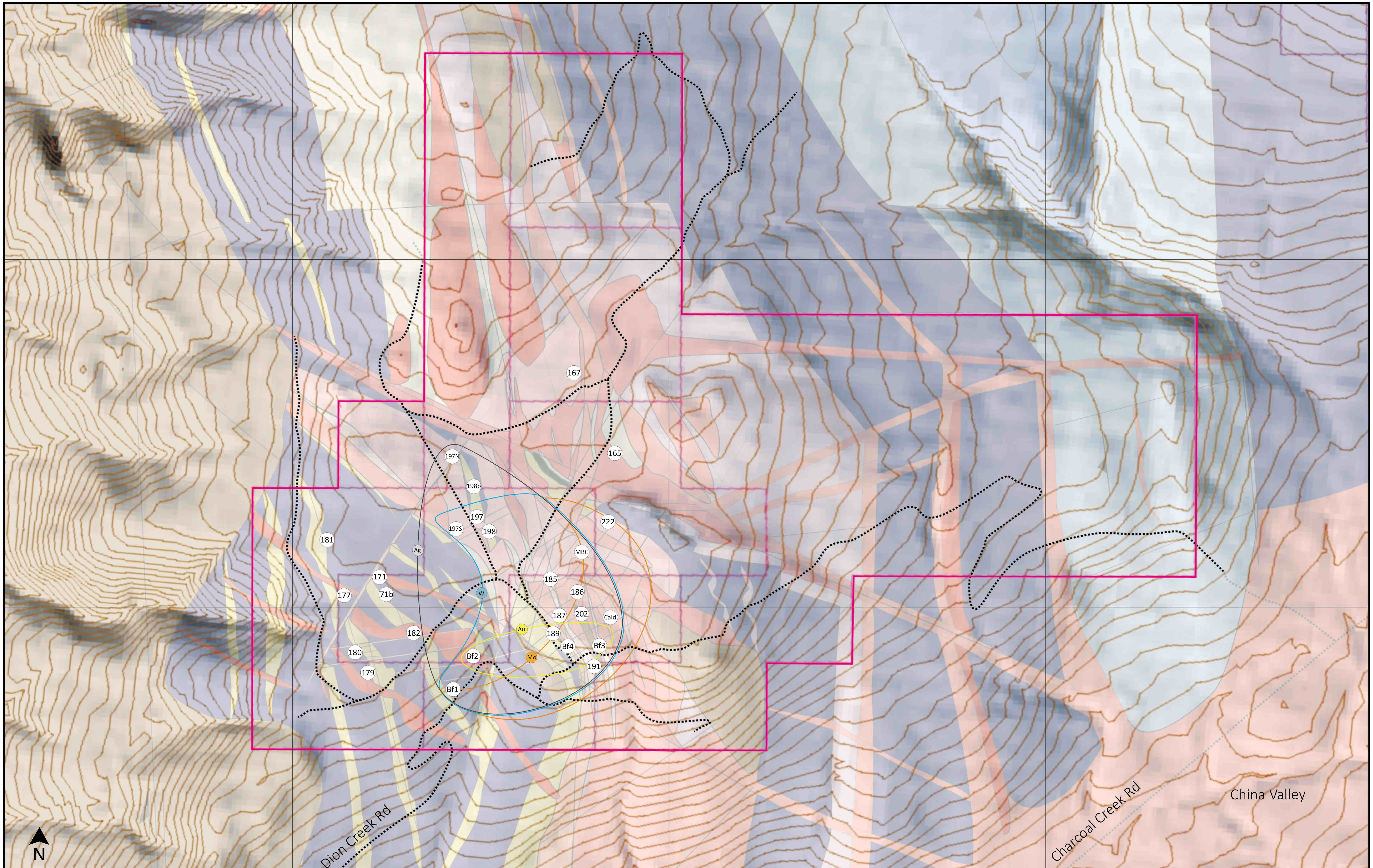
In the field, samples were collected and logged, labelled, photographed, sealed in plastic bags, then temporarily stored in a secure facility before being transported to a regional field office.

Analysis

In-house, samples were examined, photographed and split into duplicates before being sealed in plastic bags, labelled and securely stored at the companies regional headquarters. Duplicates that were designated for further analysis were weighed to specifications (minimum 250g, maximum 500g), sealed in plastic bags, labelled, and delivered by company staff to the *ALS Canada Ltd.* laboratory in Kamloops, British Columbia.

ALS Canada Ltd. laboratory analyses included; weighing the sample, crushing to 70%<2mm, riffle splitting and pulverizing to 85%<75um before assaying by various techniques. All samples were designated to be checked by *50gram fire assay* for gold, while specific samples were split for a *4-acid 33element ICP-AES* analysis including silver, tungsten and molybdenum. Samples returning over 100ppm silver in the *ICP-AES* analysis were rechecked by a *4-acid w/HCl leach ICP-AAS* with an upper detection limit of 1500ppm. One sample returning over 1500ppm silver, was rechecked again by *30gram fire assay*. Due to a clerical error, two samples were not checked for gold.

No blanks or duplicates were submitted and no results were re-checked. Any samples that were tested returning zero data, were excluded from the discussion.



Ptarmigan Range Exploration

Blackfly Gulch Samples & Metallogeny

Au — Gold Ag — Silver W — Tungsten Mo — Molybdenum

Scale 1:18,000

Metres 500 1Km

ALS Minerals

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: 604 984 0221 Fax: 604 984 0218 www.alsglobal.com

CERTIFICATE KL13103232

SAMPLE PREPARATION	
ALS CODE	DESCRIPTION
WEI-21	Received Sample Weight
LOG-22	Sample login - Rcd w/o BarCode
CRU-QC	Crushing QC Test
PUL-QC	Pulverizing QC Test
CRU-31	Fine crushing - 70% <2mm
SPL-21	Split sample - riffle splitter
PUL-31	Pulverize split to 85% <75 um

ANALYTICAL PROCEDURES		
ALS CODE	DESCRIPTION	INSTRUMENT
Ag-GRA21	Ag 30g FA-GRAV finish	WST-SIM
Au-AA24	Au 50g FA AA finish	AAS
ME-ICP61	33 element four acid ICP-AES	ICP-AES
Ag-OG62	Ore Grade Ag - Four Acid	VARIABLE
ME-OG62	Ore Grade Elements - Four Acid	ICP-AES

This is the Final Report and supersedes any preliminary report with this certificate number. Results apply to samples as submitted. All pages of this report have been checked and approved for release.

***** See Appendix Page for comments regarding this certificate *****

Signature: Colin Ramshaw, Vancouver Laboratory Manager

Sample Description	Method / Analyte / Units / LOR	WEI-21 Recvd Wt. kg 0.02	ME-ICP61 Ag ppm 0.5	ME-ICP61 Al % 0.01	ME-ICP61 As ppm 5	ME-ICP61 Ba ppm 10	ME-ICP61 Be ppm 0.5	ME-ICP61 Bi ppm 2	ME-ICP61 Ca % 0.01	ME-ICP61 Cd ppm 0.5	ME-ICP61 Co ppm 1	ME-ICP61 Cr ppm 1	ME-ICP61 Cu ppm 1	ME-ICP61 Fe % 0.01
182	5617868N 11U316653E	0.29	<0.5	0.14	<5	10	<0.5	<2	0.01	<0.5	7	14	21	0.56
198	5618420N 11U317004E	0.31	<0.5	6.98	<5	560	62.3	<2	8.45	1.1	14	32	138	5.37
167	5619243N 11U317525E	0.34	<0.5	7.52	<5	1490	2.3	<2	1.51	<0.5	2	7	2	0.98
177	5618083N 11U316277E	0.41	<0.5	6.50	<5	1430	3.3	<2	3.12	<0.5	14	91	6	3.06
189	5617862N 11U317382E	0.34	>100	4.13	158	690	2.9	7180	0.07	9.1	6	27	82	4.04
197	5618529N 11U316952E	0.44	6.3	7.54	<5	1240	3.9	16	0.81	<0.5	5	29	26	1.50
197S	5618480N 11U316860E	0.25	4.7	7.22	<5	1490	3.6	15	0.11	<0.5	4	34	21	1.48
197N	5618881N 11U316858E	0.27	0.6	7.89	<5	1200	3.3	<2	0.55	0.8	5	25	20	1.59
202	5617991N 11U317531E	0.20	1.4	4.85	54	780	2.1	4	0.49	<0.5	7	26	5	2.71
222	5618503N 11U317672E	0.25	<0.5	6.58	<5	230	4.3	<2	3.38	<0.5	13	117	38	4.83
MBC	5618318N 11U317535E	0.26	>100	4.18	53	910	1.8	1375	0.50	0.7	16	23	15	2.86
CAL	5617952N 11U317685E	0.25	<0.5	6.09	<5	2550	2.0	4	1.99	0.7	82	55	5	6.09
165	5618894N 11U317820E	0.63												
171	5618202N 11U316473E	0.33												
171B	5618195N 11U316465E	0.36												
179	5617725N 11U316365E	0.41												
180	5617831N 11U316360E	0.28												
181	5618305N 11U316176E	0.26												
185	5618182N 11U317359E	0.27												
186	5618087N 11U317502E	0.36												
187	5617972N 11U317434E	0.41												
191	5617660N 11U317581E	0.41												
198B	5618636N 11U316965E	0.31												

Sample	ME-ICP61 Ga ppm 10	ME-ICP61 K % 0.01	ME-ICP61 La ppm 10	ME-ICP61 Mg % 0.01	ME-ICP61 Mn ppm 5	ME-ICP61 Mo ppm 1	ME-ICP61 Na % 0.01	ME-ICP61 Ni ppm 1	ME-ICP61 P ppm 10	ME-ICP61 Pb ppm 2	ME-ICP61 S % 0.01	ME-ICP61 Sb ppm 5	ME-ICP61 Sc ppm 1	ME-ICP61 Sr ppm 1	ME-ICP61 Th ppm 20	ME-ICP61 Ti % 0.01	ME-ICP61 Tl ppm 10	ME-ICP61 U ppm 10	ME-ICP61 V ppm 1	ME-ICP61 W ppm 10	ME-ICP61 Zn ppm 2	Ag-OG62 Ag ppm 1	Ag-GRA21 Ag ppm 5	Au-AA24 Au ppm 0.005
182	<10	0.03	<10	0.01	40	<1	0.06	6	<10	4	0.35	<5	<1	7	<20	0.01	<10	<10	1	<10	8			
198	30	0.68	80	0.91	1335	<1	2.62	21	1440	7	1.25	<5	11	2240	50	0.43	<10	<10	173	<10	137			
167	20	2.90	10	0.21	566	<1	3.33	<1	170	18	<0.01	<5	2	1300	<20	0.09	<10	<10	19	<10	37			<0.005
177	20	3.20	80	1.38	999	<1	3.09	71	340	9	<0.01	<5	9	2280	<20	0.31	<10	<10	79	<10	76			<0.005
189	10	2.24	10	0.07	583	7	1.64	11	350	5280	0.36	106	3	890	<20	0.06	<10	<10	26	640	22	>1500	2670	0.033
197	20	4.06	10	0.41	708	<1	4.27	7	310	25	0.20	<5	5	1740	<20	0.13	<10	<10	52	10	26			<0.005
197S	30	4.40	<10	0.47	281	<1	4.09	3	300	20	0.10	<5	4	1215	<20	0.08	<10	<10	58	10	19			<0.005
197N	20	3.36	20	0.21	827	<1	3.60	11	220	11	0.03	<5	4	1195	<20	0.14	<10	<10	33	<10	40			<0.005
202	10	1.83	10	0.24	368	<1	2.62	7	260	13	1.36	<5	3	1140	<20	0.09	<10	<10	24	<10	20			<0.005
222	20	1.65	30	2.47	999	13	0.92	41	300	25	0.60	<5	13	320	<20	0.26	<10	<10	108	<10	149			<0.005
MBC	10	2.80	10	0.14	91	2	1.38	4	210	902	0.28	19	2	895	<20	0.05	<10	<10	17	>10000	47	210		<0.005
CAL	20	3.56	10	0.82	42400	3	2.31	31	530	25	0.01	5	8	2090	<20	0.27	<10	10	65	40	115			<0.005
165																								<0.005
171																								<0.005
171B																								<0.005
179																								<0.005
180																								<0.005
181																								<0.005
185																								<0.005
186																								<0.005
187																								<0.005
191																								<0.005
198B																								<0.005

5. Conclusion, Interpretations, Discussion and Recommendations

5.1 Interpretations

Surface mapping and sampling on the Blackfly property has been an effective practice in identifying mineralization and establishing the metallogenic zoning on the project. While overburden is thick in some places and margins and contacts are often interpreted, the bedrock outcrops that exist have provided significant data indicating the persistence of mineral assemblages characterized by gradational Mo-Au-W-Ag halos(fig.15).

Data indicates that a weak molybdenum zone is located in the interpreted footwall fraction of the central zone intrusives. The molybdenum zone evolves upwards in the tectonic pile and west into a broad tungsten zone(fig.16). Associated with the tungsten zone is a silver zone which continues northwest and upwards in the pile beyond the tungsten zone(fig.17). Gold is located at depth associated with tungsten and silver(fig.18). Other elements associated with the tungsten zone include lead, bismuth, antimony and arsenic.

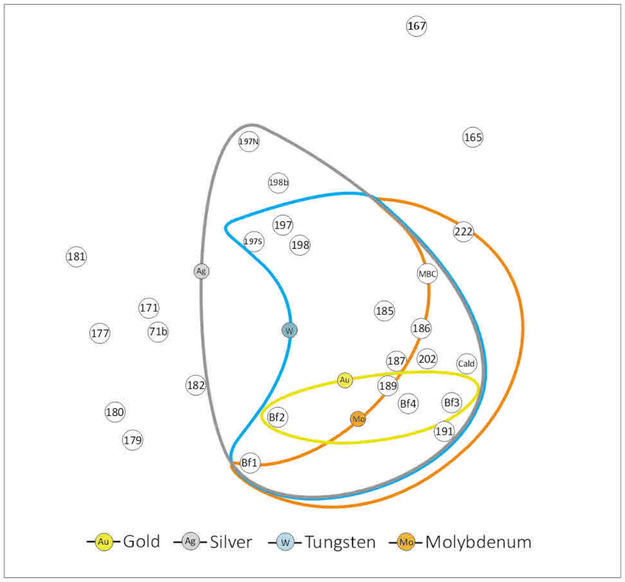


Fig.15 Overlapping Mo-Au-W-Ag metal halos.

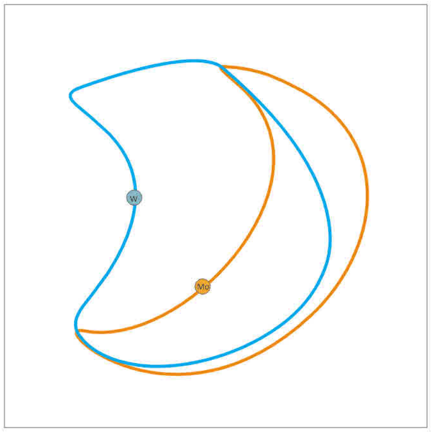


Fig.16 Tungsten and molybdenum

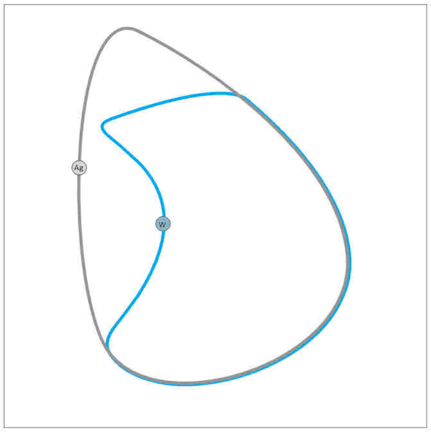


Fig.17 Tungsten and silver

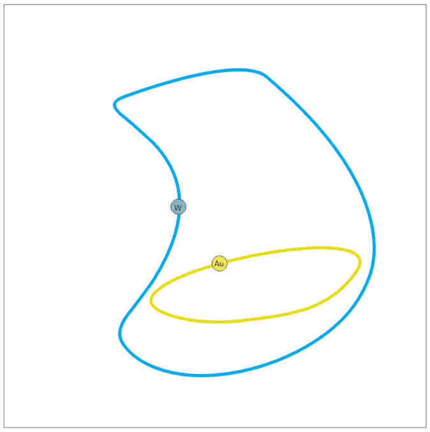


Fig.18 Tungsten and gold

5.2 Discussion and Recommendations

Further exploration on the Blackfly project is recommended. Additional work should be focussed on the central intrusive zone and associated hanging wall hornfels, which most closely fits the model with; favourable intrusive character combined with lithological structural elements, supported by characteristic metallogenic zoning.

Hard rock and soil sampling is recommended in the central gold zone to broaden the scope of data on the zone which has indicated additional surface exposures along regional trends in the zone. Trenching is feasible. Drilling short holes in and adjacent to the central zone may yield gold and silver intercepts near-surface.

More intrusive-hosted and proximal mineralization may be discovered at depth in the tungsten zone immediately north and west of the gold zone mineralization. It may be recommended to conduct an induced-polarization and magnetometer survey over the area in preparation for drilling deeper targets.

Surface exploration for additional distal target-zones is also possible. It is suggested that more sampling be conducted within and beyond the tungsten-silver halos, west and northwest of the intrusives, which would be the most favourable locations for additional proximal and distal mineralization.

Additional reconnaissance in the east and northern portions of the property is recommended. The two zones are structurally beneath or beyond the identified targets, but the zones are still in proximity of known mineralization and may host dikes, sills or veins with associated skarn and replacement.

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prexploration@ymail.com

Blackfly Gulch Exploration
Assesment Report 2013
PRE-2013-BF001
June 06, 2013

Re: Geoffrey W. Head

Statement of Qualifications

2000-Present: President of Ptarmigan Range Exploration

Familiar with the common aspects of mineral exploration including aerial and ground surveys, geochemical analysis, drill sampling, data corroboration and claim maintenance.

1996-2000: Seismic Survey Crew Coordinator with Veritas DGC Land

Familiar with all aspects of managing geophysical exploration crews, including working with senior project observers establishing daily production objectives and coordinating crews and equipment to meet production goals.

1994-1996: Blaster and Line Troubleshooter with Veritas Geophysical

Familiar with all aspects of seismic geophysical exploration, including but not limited to maintaining an operational seismic receiver spread and detonating seismic source charges with encoded FM radio signals to meet data production objectives.

Box#12 RR#1 Moser Road
Falkland, British Columbia
V0E 1W0
Canada
prexploration@ymail.com

Statement of Costs

Blackfly Gulch exploration:	
Experienced Field Technician, all inclusive;	
2012 7/7-8	
7/21-22	
8/25-26	
9/1-8	
9/15-16	
9/22-23	
2013 5/21-31	
(28 days) @$500/day	$14,000.00
Field Helper, all inclusive;	
2012 7/7-8	
7/21-22	
8/25-26	
9/1-4	
(10 days) @$350/day	$3,500.00
Assaying, all inclusive;	
Full service contracted to ALS Canada Ltd.	
21Aufire, 12ME ICP-AES, 2Ag ICP-AAS, 1Agfire	$881.32
Mobilization-Demobilization	$0.00
Administration and processing	$39.68
Total	$18,421.00

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: 604 984 0221 Fax: 604 984 0218 www.alsglobal.com

ALS Minerals

To: PTARMIGAN RANGE EXPLORATION
BOX 12 RR#1 MOSER ROAD
FALKLAND BC V0E 1W0

Finalized Date: 21-JUN-2013
Account: PTARAN

CERTIFICATE OF ANALYSIS KL13103232

Sample Description / Method / Analyte / Units / LOR	WEI-21 Recvd Wt. kg 0.02	ME-ICP61 Ag ppm 0.5	ME-ICP61 Al % 0.01	ME-ICP61 As ppm 5	ME-ICP61 Ba ppm 10	ME-ICP61 Be ppm 0.5	ME-ICP61 Bi ppm 2	ME-ICP61 Ca % 0.01	ME-ICP61 Cd ppm 0.5	ME-ICP61 Co ppm 1	ME-ICP61 Cr ppm 1	ME-ICP61 Cu ppm 1	ME-ICP61 Fe % 0.01	ME-ICP61 Ga ppm 10	ME-ICP61 K % 0.01
182	0.29	<0.5	0.14	<5	10	<0.5	<2	0.01	<0.5	7	14	21	0.56	<10	0.03
198	0.31	<0.5	6.98	<5	560	62.3	<2	8.45	1.1	14	32	138	5.37	30	0.68
165	0.63														
171	0.33														
171B	0.36														
179	0.41														
180	0.28														
181	0.26														
185	0.27														
186	0.36														
187	0.41														
191	0.41														
198B	0.31														
167	0.34	<0.5	7.52	<5	1490	2.3	<2	1.51	<0.5	2	7	2	0.98	20	2.90
177	0.41	<0.5	6.50	<5	1430	3.3	<2	3.12	<0.5	14	91	6	3.06	20	3.20
189	0.34	>100	4.13	158	690	2.9	7180	0.07	9.1	6	27	82	4.04	10	2.24
197	0.44	6.3	7.54	<5	1240	3.9	16	0.81	<0.5	5	29	26	1.50	20	4.06
197.100S	0.25	4.7	7.22	<5	1490	3.6	15	0.11	<0.5	4	34	21	1.48	30	4.40
197N	0.27	0.6	7.89	<5	1200	3.3	<2	0.55	0.8	5	25	20	1.59	20	3.36
202	0.20	1.4	4.85	54	780	2.1	4	0.49	<0.5	7	26	5	2.71	10	1.83
222	0.25	<0.5	6.58	<5	230	4.3	<2	3.38	<0.5	13	117	38	4.83	20	1.65
MBC	0.26	>100	4.18	53	910	1.8	1375	0.50	0.7	16	23	15	2.86	10	2.80
CALDS	0.25	<0.5	6.09	<5	2550	2.0	4	1.99	0.7	82	55	5	6.09	20	3.56

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: 604 984 0221 Fax: 604 984 0218 www.alsglobal.com

To: PTARMIGAN RANGE EXPLORATION
BOX 12 RR#1 MOSER ROAD
FALKLAND BC V0E 1W0

Finalized Date: 21-JUN-2013
Account: PTARAN

CERTIFICATE OF ANALYSIS KL13103232

Sample Description	Method / Analyte / Units / LOR	ME-ICP61 La ppm 10	ME-ICP61 Mg % 0.01	ME-ICP61 Mn ppm 5	ME-ICP61 Mo ppm 1	ME-ICP61 Na % 0.01	ME-ICP61 Ni ppm 1	ME-ICP61 P ppm 10	ME-ICP61 Pb ppm 2	ME-ICP61 S % 0.01	ME-ICP61 Sb ppm 5	ME-ICP61 Sc ppm 1	ME-ICP61 Sr ppm 1	ME-ICP61 Th ppm 20	ME-ICP61 Ti % 0.01	ME-ICP61 Tl ppm 10
182		<10	0.01	40	<1	0.06	6	<10	4	0.35	<5	<1	7	<20	0.01	<10
198		80	0.91	1335	<1	2.62	21	1440	7	1.25	<5	11	2240	50	0.43	<10
165																
171																
171B																
179																
180																
181																
185																
186																
187																
191																
198B																
167		10	0.21	566	<1	3.33	<1	170	18	<0.01	<5	2	1300	<20	0.09	<10
177		80	1.38	999	<1	3.09	71	340	9	<0.01	<5	9	2280	<20	0.31	<10
189		10	0.07	583	7	1.64	11	350	5280	0.36	106	3	890	<20	0.06	<10
197		10	0.41	708	<1	4.27	7	310	25	0.20	<5	5	1740	<20	0.13	<10
197.100S		<10	0.47	281	<1	4.09	3	300	20	0.10	<5	4	1215	<20	0.08	<10
197N		20	0.21	827	<1	3.60	11	220	11	0.03	<5	4	1195	<20	0.14	<10
202		10	0.24	368	<1	2.62	7	260	13	1.36	<5	3	1140	<20	0.09	<10
222		30	2.47	999	13	0.92	41	300	25	0.60	<5	13	320	<20	0.26	<10
MBC		10	0.14	91	2	1.38	4	210	902	0.28	19	2	895	<20	0.05	<10
CALDS		10	0.82	42400	3	2.31	31	530	25	0.01	5	8	2090	<20	0.27	<10

***** See Appendix Page for comments regarding this certificate *****

ALS Minerals

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: 604 984 0221 Fax: 604 984 0218 www.alsglobal.com

To: PTARMIGAN RANGE EXPLORATION
BOX 12 RR#1 MOSER ROAD
FALKLAND BC V0E 1W0

Finalized Date: 21-JUN-2013
Account: PTARAN

CERTIFICATE OF ANALYSIS KL13103232

Sample Description	Method Analyte Units LOR	ME-ICP61 U ppm 10	ME-ICP61 V ppm 1	ME-ICP61 W ppm 10	ME-ICP61 Zn ppm 2	Ag-OG62 Ag ppm 1	Ag-GRA21 Ag ppm 5	Au-AA24 Au ppm 0.005
182		<10	1	<10	8			
198		<10	173	<10	137			
165								<0.005
171								<0.005
171B								<0.005
179								<0.005
180								<0.005
181								<0.005
185								<0.005
186								<0.005
187								<0.005
191								<0.005
198B								<0.005
167		<10	19	<10	37			<0.005
177		<10	79	<10	76			<0.005
189		<10	26	640	22	>1500	2670	0.033
197		<10	52	10	26			<0.005
197.100S		<10	58	10	19			<0.005
197N		<10	33	<10	40			<0.005
202		<10	24	<10	20			<0.005
222		<10	108	<10	149			<0.005
MBC		<10	17	>10000	47	210		<0.005
CALDS		10	65	40	115			<0.005

***** See Appendix Page for comments regarding this certificate *****