Blackfly Gulch Property

Assessment Report 2010

Name:	Blackfly Gulch
Commodities:	Au-Ag-Bi-Sb-W-Pb-Mo
MINFILE:	N/A
Status:	Prospect
Deposit Type:	Reduced Intrusion Related Gold and Silver
Map:	082L/12
Latitude:	50° 41′ 10″ North
Longitude:	119° 35′ 00″ West
Elevation:	1650 metres
Mining Division:	Kamloops
Regional District:	Thompson Nicola

by

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Owner/Operator

Ptarmigan Range Exploration

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Terms of Reference

This work program was initiated to determine the character and metallogeny of a widespread mineral occurrence that was discovered in 2005 but has since seen no significant work. The program focused on four mineral showings to determine the context of each in relation to regional trends and determine if any of them contained any elements that may potentially be extracted economically.

This report comprises field observations and associated technical data, local Minfile abstract data, references to technical reports on similar deposits and other associated public documents. It refers to issues regarding geochemistry and uses chemical formulas, abbreviations and related terminology to address the context of the targeted elements in reduction-oxidation (redox) reactions, however redox nomenclature is outside the scope of the report and is included for reference only. Any discussion of deposit chemistry and process evolution is strictly speculation.

While reasonable care has been taken in preparing this report, the author cannot guarantee the accuracy or completeness of all supporting documentation. In addition, the interpretive views, images and figures expressed herein, unless otherwise credited, are those of the author and do not necessarily reflect the views of the British Columbia Geological Survey or the Geological Survey of Canada. For instance, the occurrence host rocks are officially designated as being part of the Chase antiform, comprised of the Cambrian-Carboniferous Eagle Bay assemblage of Kootenay terrane cratonic margin rocks. However when reconstructing the trend of similar geology and metallogenic occurrences along the Paleozoic margin, the author came to associate the rocks and mineralization with the Ordovician-Permian Harper Ranch and Slide Mountain overlapping terranes, so in this report Harper Ranch and Slide Mountain terrane references will be used locally while Eagle Bay references will be used regionally although the potential exists that Eagle Bay rocks could act as lithological equivalents for all intensive purposes. As well, the Chase antiform has been considered a continuous 150km Paleozoic recumbent fold along the Intermontane-Omineca margin(Okulitch), however overlapping terranes, late slip-strike compression and local upwelling has contorted the margin into a series of mal-aligned allochthonous structures overlying a circumferential-domal feature with outward dipping contacts and unconformities around Chase(Monger,1983 fig3A), which is corroborated by the southern plunge of the overlying Ptarmigan formation on the southern dip. So for the purposes of this report the Chase antiform will be a circumferential-domal feature with outward dipping unconformities at the Intermontane-Omineca margin at Chase.

1.0 Summary

The Blackfly Gulch project is a discovery stage exploration project targeting low grade, bulk tonnage, reduced-intrusion related gold and silver mineralization. The current exploration program includes geological mapping, whole rock geochemical analysis of significant showings and an interpretation of gravity, electromagnetic (EM), and seismic data.

Evidence indicates the Blackfly Gulch project hosts an epithermal style reduced-intrusion-related-gold-system (RIRGS) with silver mineralization, that is genetically associated with mesothermal style molybdenum mineralization and is distributed in relation to gravity and EM anomalies of the Charcoal Creek intrusion (new).

Only recognised since 1999, RIRGS are an under-recognized class of intrusion-related gold deposits. This deposit contains a metal suite that includes a combination of silver, bismuth, tungsten, antimony, lithium, tin, molybdenum, lead, tellurium, arsenic, cadmium, strontium and niobium and contrasts with the more widely recognised gold-rich porphyry copper and related deposits in the traditionally explored gold and copper provinces in subduction arc terranes. Well known RIRGS include Fort Knox, Dublin Gulch and Donlin Creek. Several of the deposits in this class contain >3 mil. oz of gold, illustrating the potential of reduced intrusion related deposits.

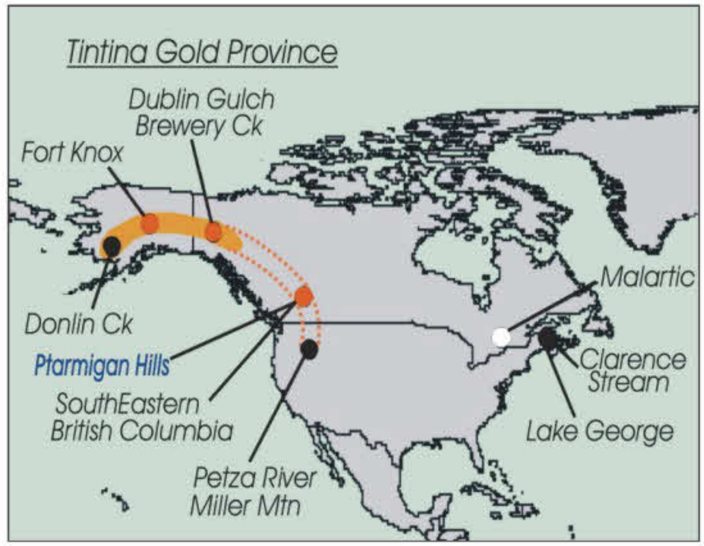


Fig.1 Gold deposits suggested to be RIRGS. The Phanerozoic examples for which there is a high degree of confidence, are shown in red. Ambiguous examples are black grey and white. Modified from Thompson, Lang, Baker, Hart 2005.

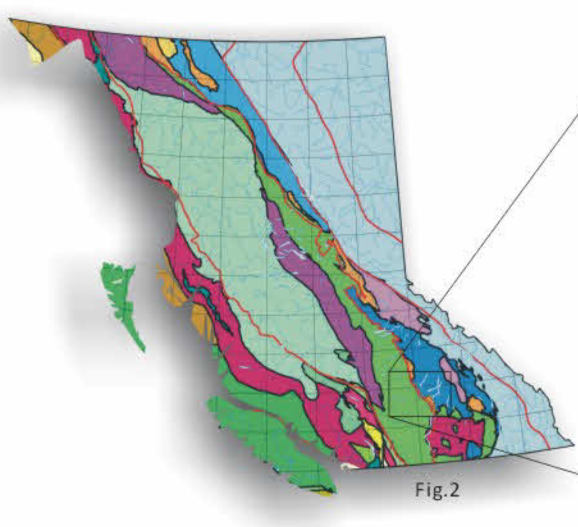


Fig.2

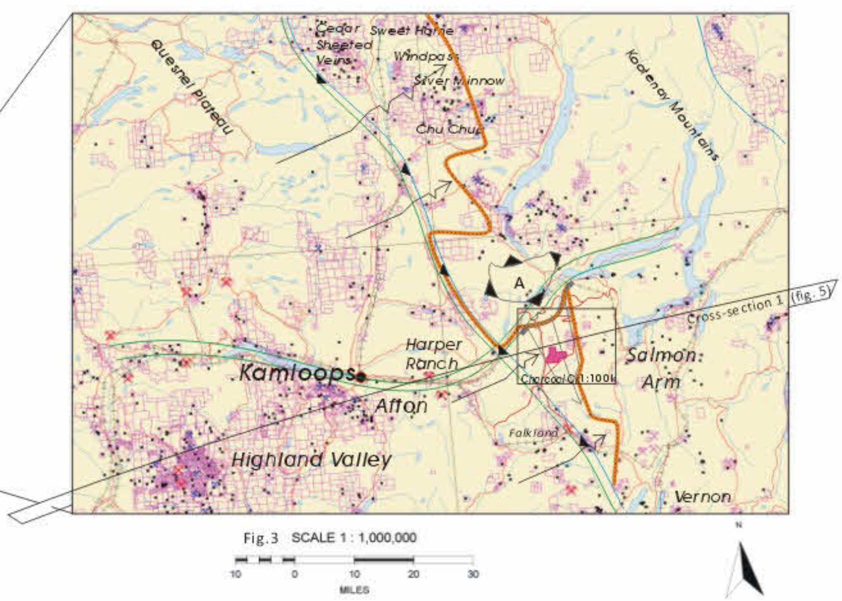


Fig.3 SCALE 1 : 1,000,000

1.1 Location and Access

The work area is located entirely on crown land in the Ptarmigan Hills of the Shuswap Highlands, 40 km east of Kamloops, British Columbia Canada, at an elevation of 1650 metres. The property is 20km south of the Trans-Canada highway and trans-continental railway and is serviced by 18km of logging roads. Power runs within 1km of the property line.

1.2 Topography, Physiography, Climate

The Shuswap Highlands is a plateau-like hilly area of 14,511 km^2 (5,603 mi^2) in southern British Columbia. It spans the upland area between the southeast corner of the Cariboo Plateau near Mahood Lake, southeast towards the lower Shuswap River east of Vernon in the Okanagan. 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(Boleen and Silver Creeks), Ptarmigan Hills(Charcoal and Chase Creeks) and other isolated pockets of hills and mini-plateaus. The Shuswap Highland is in essence a foothill (or transitional) area between the much broader interior plateaus southwest and west of it, and the mountainous terrain of the northern Monashee and Cariboo Mountains to the east/north-east.

The climate here is temperate, ranging from sub-alpine in the ~1800metre mountains in the northeast, to a semi-arid, continental climate found around the ~400metre Thompson River valleys in the southwest. Old growth fir and pine forests cover 50% of the property, the rest has been recently clear-cut and planted. There are a few small ponds on the property with no year-round creeks and no fish.

1.3 History

The Silver Creek formation east of the Ptarmigan hills has been prospected for uranium since the 1960s with no encouraging results. Placer scheelite was discovered by Ridley and Peatfield north of the work area in 1983-5(Assesment#14147). The mineralization in the Blackfly fractionated stock was discovered by Head during regional reconnaissance in 2005, an occurrence of fractionated felsic intrusives with quartz-sulfide stockworks was identified(Assesment#29031). No significant work was accomplished on these showings until the 2010 season when Head conducted a program that included mapping, gravity silt sampling, whole rock analyses of significant showings and an interpretation of gravity, electromagnetic and seismic data.

1.4 Tenures

In 2010, the Blackfly project includes 9 claims totalling 1064hectares, including Mineral Titles Online (MTO) tenures 788222, 831168, 831185, 837630, 843263, 843264, 843265, 843266, 843267.

1.5 Adjacent Properties

There are no contiguous properties or Minfile occurrences within 9km. The Dark Hill occurrence, 7km to the northeast, shows (samples 10-15) geochemically similar >Bi, Sb, Sr, Nb, Rb but more mesothermal style molybdenum and zinc mineralization(no assessment). The Mosquito occurrence (sample 9) 6km further northeast shows silver and arsenic bearing chalcedonic sulfide breccias and fluorite veins in granite (no assessment). The Tappen Creek occurrence 3km further east, hosts fluorite veins(minfile082LNW049). The 320-Harper footwall melange(sample 16-17) is 6km sw, and the Bolean-Harper mafic stocks(samples 4-6) are 9km south, which also indicates coincidental gold in stream sediments(bcgs) about Cretaceous intrusives (no assessment). The past producing Falkland gypsum mine(minfile 082LNW001) 15km south and the Tappen occurrence(minfile 082LNW080) 9km east, both host Kuroko mineralizaton. The Cedar Sheeted Veins occurrence(minfile 092P172) of the Fennel formation, north of the Chase antiform, and the Bunker Hill/Knox Fort occurrence(minfile 082FSW002) of the Bayonne suite, both host structural and geochemical similarities to Blackfly Gulch. All of these occurrences are located on the late Paleozoic cratonic margin, in juxtaposed Cambrian-Permian sediments with mafic volcanics and Jura-Cretaceous intrusive rocks, along a 1600km trend called the Tintina gold belt (Nokleberg 2005) extending through British Columbia, the Yukon and Alaska (Fig. 1).

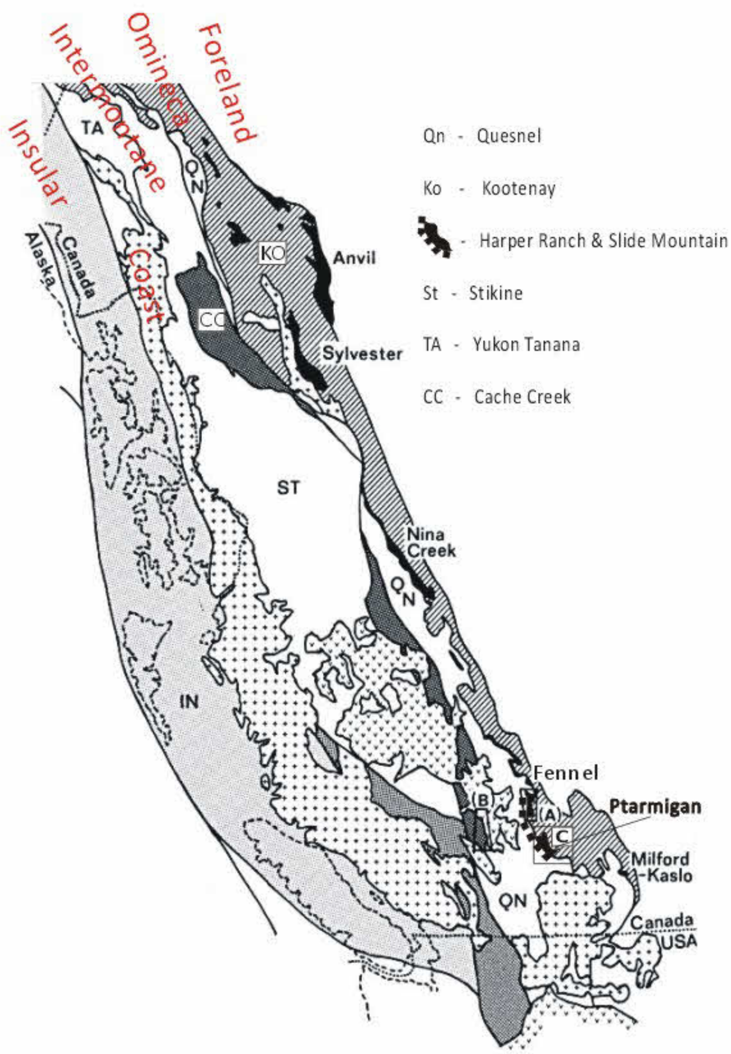
2.0 Cordillera Geology

2.1 Terranes

Terrane theory was first proposed by Jim Monger of the Geological Survey of Canada and Charlie Rouse in 1971 as an explanation for a set of fusilinid fossils found in central British Columbia. Rather than use facies changes or seaways (which were common explanations at the time), the two geologists proposed that the fossils in question had been part of an assemblage of rocks that had migrated across the Pacific Ocean to their present location. This theory was then developed by Porter Irwin and Davy Jones of the US Geological Survey to its common definition of "fault bounded regional geologic entities, each characterized by a different geologic history than its neighbours" (wikipedia).Terranes are most commonly associated with different tectonic elements such as island arcs, volcanic plateaus, subduction zones, continental margins, mid-oceanic ridges and continental fragments. These terranes are gradually joined together by elements such as overlap assemblages and stitching plutons and are accreted to the continent. In some cases, a terrane can contain multiple tectonic elements. For instance, the local Harper Ranch Terrane is composed of a massive carbonate component, a mixed limey-argillaceous-alkali oceanic floor component and a mélange component. There are five morpho-geological belts that define the geology of British Columbia from east to west: the Foreland, Omineca, Intermontane, Coast and Insular Belt. Each has a separate geology, including different metamorphic, physiographic, metallogenic and tectonic histories.

The subject of this report is the transitional zone between the Omineca and Intermontane belts. The respective Kootenay and Quesnellia terranes are in slip-strike faulted contact while the Harper Ranch-Slide Mountain terrane(s) comprise juxtaposed overlapping assemblages in and around the fault. The Louis creek, locally Raspberry creek fault is the present contact between the Omineca and Intermontane belts and locus to early obduction and late slip displacement (fig.4,5).

Furthermore, Eocene tectonics in southern British Columbia resulted in exhumation of high-grade metamorphic rocks in domal culminations, such as the Shuswap metamorphic complex and the Chase antiform (A, fig.2), which are bounded by low to moderate angle, outward dipping contacts, faults and unconformities (Monger 1982). Surface extension over the Chase antiform separated the allochthonous rocks into two formations (fig.3,4). One exposed north of Highway#1, called the *Fennel formation*, is Devonian through Permian age and consists of alkali volcaniclastic rocks, argillite, siltstone, and limestone. The other, exposed south of Highway#1, is the *Ptarmigan formation*(new), it is geologically and geochemically similar with the Fennel formation.



Modified from Smith & Lambert 1995

Fig.4
A) Fennel Formation
B) Cache Creek complex
C) Ptarmigan Formation

To the west, upper Triassic clastic strata that are continuous with the eastern, sedimentary facies of the Quesnel terrane can be traced continuously in a southeasterly direction to Vernon (Read and Okulitch, 1977). In a northwesterly direction, broadly coeval and compositionally similar volcano-sedimentary assemblages occur in the basement of the Quesnel arc through north-central British Columbia, and in the pericratonic Yukon–Tanana composite terrane, central Yukon, suggesting that they all represent pieces of a single, Paleozoic back-arc system that was dismembered during its accretion onto ancestral North America (Simard et al, 2003).

Evidence suggests that the targeted elements began as a *sub-crustal(electronegative),* gaseous unconformity filling that migrated under high pressure through constrained channels across the lithosphere footwall to the Quesnel-Kootenay terrane contact (fig.5). The acidic intrusive followed shears in existing potentially entirely siliceous and less reactive intrusive channels between the sediment platforms, before being trapped in the reducing (e- generative by chemical redox) alkali and alkaline rocksin the roof of the Ptarmigan anticline. In addition, there is evidence of pressure vacillations creating *Piezoelectric* (e-generative by electroposativity under compression) fields in and around the SiO2 structures, where free native metals crystalize in relation to electric current/fields during electrolytic deposition making foils and wires and bent crystals. Temperatures at Blackfly are estimated to have ranged from 650C in the central zone, to 50C in the west zone (fig.5,7).

2.2 Kootenay Terrane

The Kootenay terrane comprises mostly cratonic and derived oceanic rocks of Paleozoic and Precambrian age. Locally, the Kootenay terrane consists of regionally metamorphosed Cambrian-Devonian rocks of the Eagle Bay assemblage. Structures in rocksa round the Shuswap Lake area vary in style, changing upward and laterally in the tectonic pile through least four main phases of progressive deformation and accompanying metamorphism, followed by the emplacement of Mesozoic granitic plutons. Through the entire Eagle Bay assemblage, the Kootenay terrane comprises undivided quartzofeldspathic gneiss, biotite quartz schist commonly with sillimanite, kyanite, garnet or staurolite; amphibolite, quartzite, marble and skarn. In most country formations, there is abundant and locally dominant pegmatite, muscovite granite, granodiorite, and granodioritic to tonalitic gneiss that

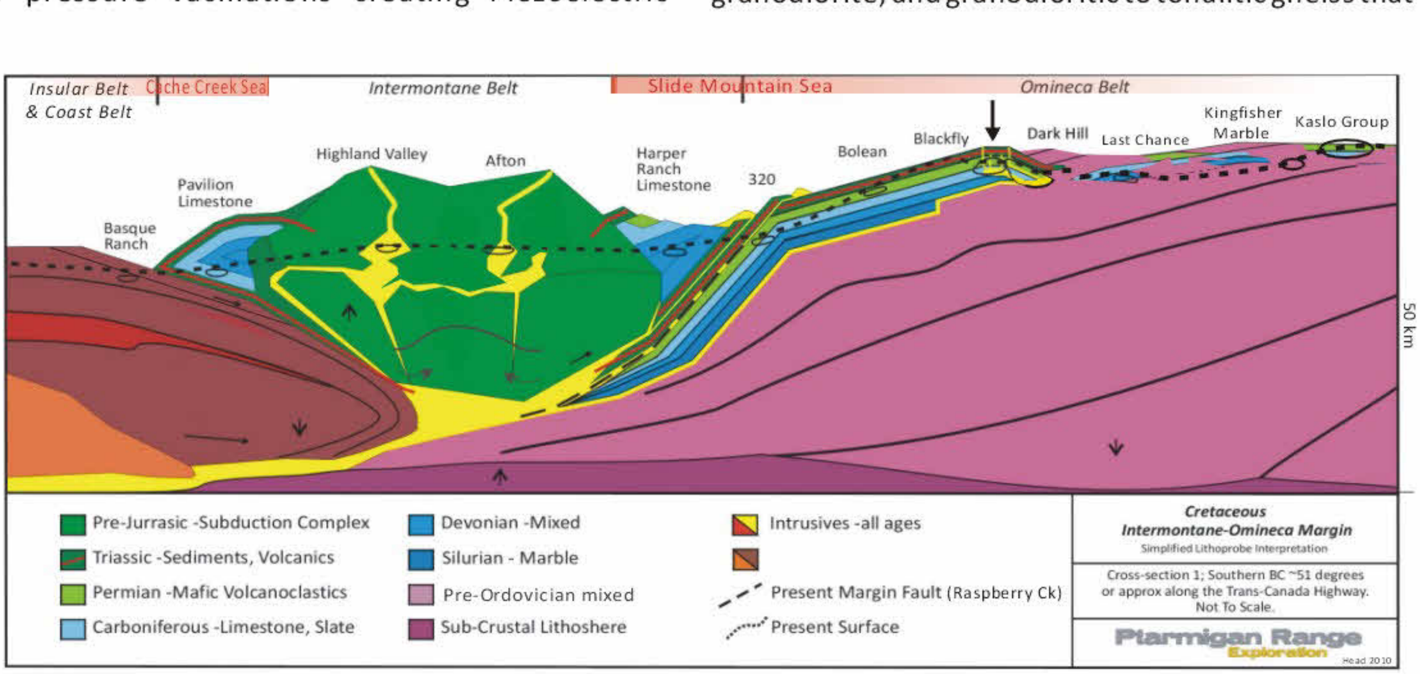


Fig.5 The Cretaceous setting of the Charcoal Creek intrusion, sourced by deep sub-crustal fluids during crustal shortening and low-grade metamorphism during and after the Jurassic orogeny. All Yukon, Alaskan, and British Columbia RIRGS examples are associated with plutons that intruded margin terranes that had already been regionally metamorphosed. (Hart, Mair 2005)

may range from Paleozoic to Tertiary in age. East and north of the work area, the Eagle Bay assemblage is comprised of low to medium grade meta-sedimentary and metavolcanic rocks of the Mount Ida group; Silver Creek, Tsalkom and Sicamous formations. The Precambrian-Paleozoic Silver Creek formation is pelitic and semipelitic schist, quartzite, micaceous and calcareous quartzite. The lower Paleozoic Tsalkom Formation predominantly consists of greenstone and chloritic phyllite and is overlain by calcareous black phyllite, graphitic phyllite, limestone and argillaceous and phyllitic limestone of the lower Paleozoic Sicamous Formation. The south dipping, Ordovician Little Shuswap orthogneiss of the Silver Creek formation forms the footwall to the south plunging Ptarmigan formation. The Silver Creek, Tsalkom and Sicamous formations have been considered lithological equivalents and part of the Mount Ida Group. The namesake of the Kootenay terrane is the Kootenay mountains, east of Sicamous.

Evidence supports emplacement of allochthonous terranes (Slide Mt.) onto pericratonic terranes (Kootenay) and imbrication of Upper Permian rocks beginning in pre-Late Triassic time. It is probable that tectonic stress buildup and release events associated with major plate reorganizations or interaction between the craton margin and pericratonic and allochthonous terranes influenced hydrothermal system pressures and controlled the northwestern Pangea sequence boundaries and migration patterns(Henderson,1998).

2.3 Slide Mountain & Harper Ranch Terranes

During the Paleozoic, the Slide Mountain sea was an active rift zone off the west coast of the North American craton. The sea had an eastern *cratonic-oceanic* derived component, and a western *arc-oceanic-cratonic* derived component. Accumulations of rifted mafic volcanism become predominant in both terranes. The eastern component is the Slide Mountain terrane, the western component is the Harper Ranch terrane. In southern British Columbia the Slide Mountain terrane consists dominantly of parautochthonous fine-grained quartzose clastic rocks, limestone and lesser amounts of conglomerate and volcanic rocks that are juxtaposed with allochthonous Harper Ranch rocks and autochthonous rocks of the North American continental margin. In southern British Columbia the Harper Ranch terrane is comprised of limestone, carbonaceous argillite, cherty argillite, calcareous siltstone and volcanic-chert-grain sandstone, as well as the mafic component. The alkali volcanic and alkaline sedimentary rocks of the Harper Ranch and Slide Mountain terranes are chemically reactive and in places structurally weak rocks within the pile. The namesake of the Harper Ranch terrane is near Kamloops. The namesake of the Slide Mountain terrane is north of Quesnel.

2.4 Quesnel Terrane

West of the Ptarmigan hills, the Mesozoic Quesnel Terrane strata comprise Nicola Group augite-phyric basalt to andesite flows, tuffs and breccias, shale, argillite, siltstone, phyllite and calcareous pelite. Rocks also include unconformably overlying Kamloops Group andesite, basalt, dacite, trachyte flows, breccias and tuffs, and conglomerate, sandstone and shale. The namesake of the Quesnel terrane is the town of Quesnel, 330km to the north. The namesake of the Nicola group is the Nicola Valley near Merritt, 150km to the south.

2.5 Intrusive Terranes

Regionally, several Jura-Cretaceous phases intrude unconformities proximal to the Paleozoic-Mesozoic margin. These phases include the Omineca-Selwin(102-97mya) and Tombstone(95-89 mya) suites which includes the Bayonne, Cassiar, Selwin and Whitehorse belts collectively forming the Tintina Gold Belt(Nokleberg, 2005). The belt is an alignment of suites with similar metallogeny but varying age and ore characteristics extending for more than 1600 km along the Cordillera from British Columbia to Alaska. The most prolific Au systems in the whole Tintina gold belt comprise metaluminous, moderately reduced, moderately fractionated, biotite>>hornblende> pyroxene quartz monzonites that have mixed with volatile-rich lamprophyric (*mafic/basic+electroposative*) melts. The magmas have a reduced primary oxidation state that form ilmenite-series plutons. This reduced state causes associated sulphide assemblages to be characterized by pyrrhotite, and quartz veins and methane(Hart).

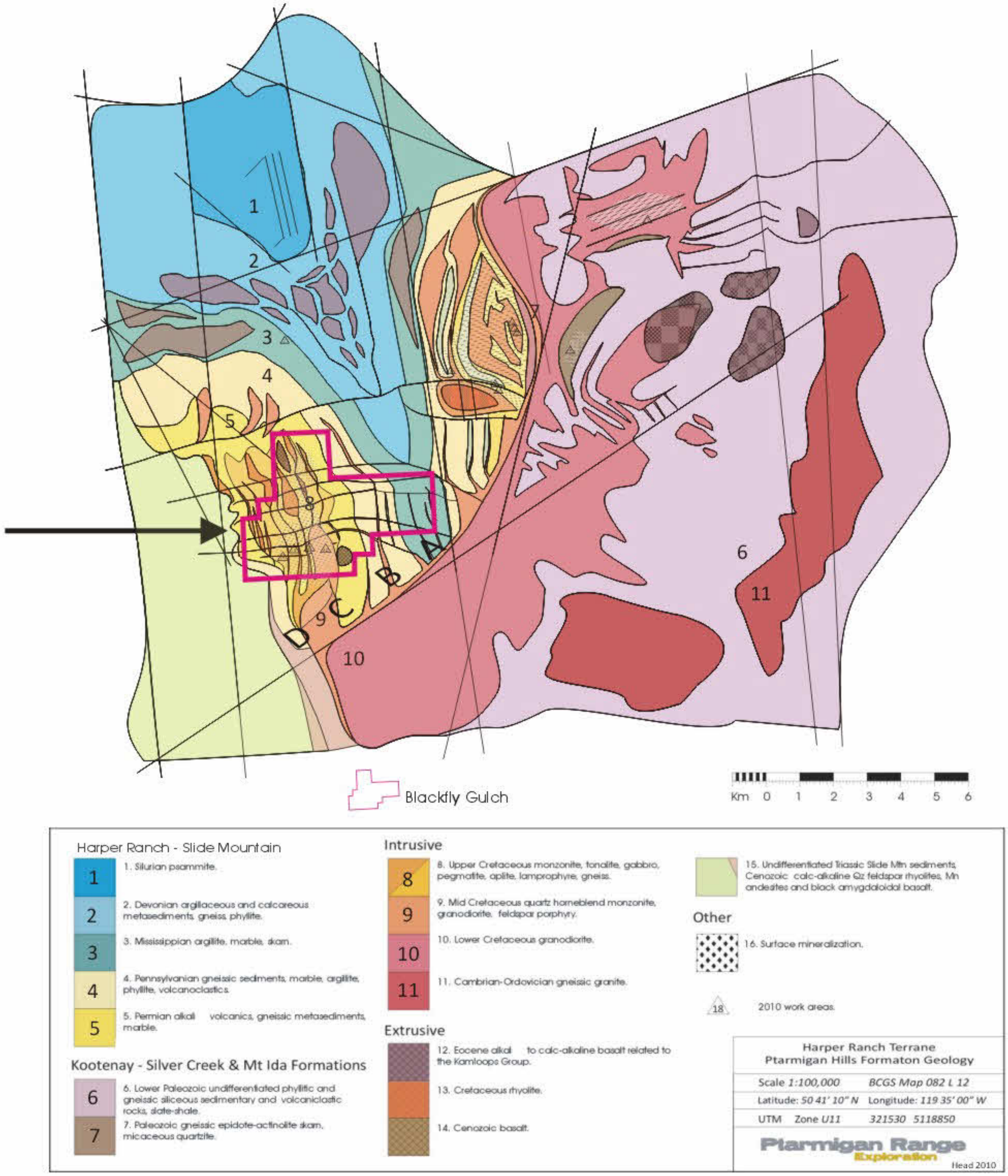


Fig.6 Regional Geology

Geology: Marble and skarn, pelitic meta-sediments, argillite, quartzite; alkali volcanics and volcanoclastics w/phyllite; monzonite, granodiorite, tonalite, felsic pegmatites, porphyries, aplite, lamprophyre, proximal and disseminated mafic stocks, calc-biotite gneiss, muscovite-feldspar-quartz schist, micaceous quartzites, meta-conglomerate, garnet-hornblende amphibolite, granite gneiss.

The Blackfly work area can be divided into four units. From east to west these are: A)calcareous and carbonaceous psamite B)alkali volcaniclastic rocks, argillite, marble C)Cretaceous intrusive rocks in metasomitized-replaced alkaline oceanic and alkali volcanic rocks; and D)altered metasediments with granite gneiss, gabbroic and felsic stocks.

3. Regional Geology

3.1 Limestone-Marble

Silurian Harper Ranch limestone-psamite 100 metres thick (exposed 10km north) is thrust into the west dipping, south plunging structural backbone of the Ptarmigan formation. Between the basement and the mafic carapace unconformity, thin bands of marbles up to 3 metres thick are interbed with carbonaceous argillite, quartzite and mafic volcanic rocks that pinch and swell along their horizons. In one exposure near the work area, limestone has ~100 mafic mineral bands of consistent thickness per 100 centimetres, indicating nearby coevolutionary, 'pulsating' alkali volcanism. Local intrusives contain the occasional marble clast or pennant. Calc-biotite gneiss and alkali phyllite are common at the margins.

3.2 Slate-Shale

Fine Carboniferous siliceous, calcareous and carbonaceous rocks occur towards the middle-top of the pile where thin bands alternate quartzite and alkalis. Country stratigraphy in the weak rocks is mostly destroyed by several phases of deformation and hydrothermal action.

3.3 Sandstone-Quartzite

Carbonifrerous-Permian horizons up to 100cm of sandstone/quartzite with interbed alkali phyllite, pinch and swell within the carbonaceous rocks towards the middle of the regional pile .

3.4 Mafic Volcanics

Permian intrusive stocks and volcanic rocks are regionally metamorphisized to greenschist facies. The rocks are interbed with siliceous carbonaceous and calcareous rocks near the top of the pile, helping create a reactive unconformity which is later rifted to host Cretaceous transitional mafic-felsic stocks. Locally the Permian rocks are fractured and altered to carbonate and phyllite.

3.5 Intrusives

The project focuses on a composite body of transitional ilmenite(>0.135% Ti) series, fine to coarse-grained biotite hornblende granodiorite-monzodiorite and fine grained aplite(0.100% Ti), with local tonalite. The monzodiorite-aplite host is a series of transitional bodies 900metres across dipping vertically and plunging north. An older? magnetite body exists adjacent to the system.

The plutons in this trend of suites are known to host large intrusive-related gold deposits, most notably in Alaska and the Yukon(e.g., Donlin Creek, Fort Knox, Ryan Lode, True North, Pogo, Brewery Creek, Dublin Gulch). In British Columbia the intrusive rocks of the Cretaceous Bayonne suite include the Sanca stock, which is biotite granodiorite, and the Mount Skelly pluton, which consists mainly of granodiorite and biotite monzogranite.

Mineral deposit types with potential in these areas include low-sulphide quartz veins with elevated arsenic and values in lead, silver, gold, and tungsten; greisen veins with molybdenum and tungsten values (some also carry copper minerals); quartz veins with values in copper, silver and gold; and polymetallic quartz veins with values in silver, lead, zinc and sometimes gold. Most of the occurrences are in and around Cretaceous intrusive rocks(Logan,Manns 2000). Also in southern British Columbia, the Nox Fort and Cedar Sheeted veins occurrences south and north of the Charcoal intrusion are at the western margin of the Selwin-Omineca trend. Another intrusive suite occurring in southern British Columbia, the Eocene (ca. 51Ma) Coryell Syenite Suite is also accompanied by gold mineralization. The presence of two Cretaceous and one Eocene gold bearing plutonic suites indicates the existence of at least three distinct episodes of gold mineralization in the region.

4. Geophysical Data

The geophysical data was acquired from the British Columbia Geological Survey through the MapPlace website and includes three 1:100k maps including Residual Total Magnetic, First Vertical Derivative and Gravity surveys that were overlain on grayscale DEM(Digital Elevation Model) and topographic annotation layers by the author for comparison. Recommended program maps are overlaid for reference.

4.1 Total Residual Magnetic

The Total Residual Magnetics shows the alteration halo of the Charcoal intrusion is synonymous with its gravity outline albeit slightly more irregular considering the stratigraphy and the liquidity of hydrothermal solutions. The lowest regional measurement is ~1km west of the height of gravity, potentially indicating the intrusive dips east at the surface, before probably dipping west (fig5,8).

4.2 First Vertical Derivative

The First Vertical Derivative shows that an intrusive-mesozonal character crosses 6km of stratigraphy east of zone 21, where epithermal character continues west for another 1000m through zones 19 and 18.

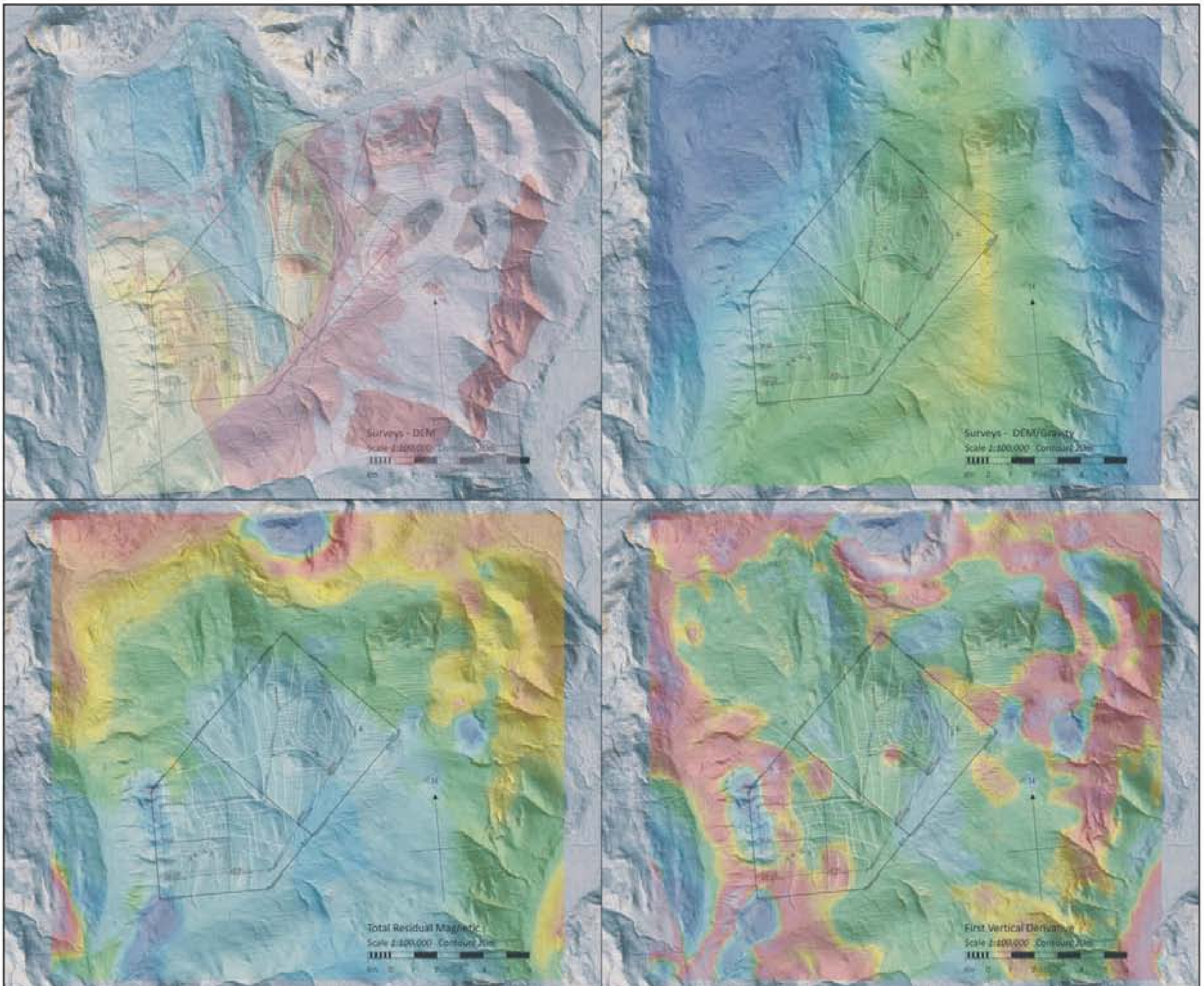


Fig. 7 Charcoal Creek - Ptarmigan Hills Geophysics

UTM Zone U11 321530 5618850
Scale 1:100,000 Contours 20m

A-1 *Helicopter Electromagnetic Survey 300m spacing*
G-1 *Ground Magnetic & Induced Polerization Survey 100m spacing*

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4.3 Gravity

The Blackfly showing is located on the western fringe of a 15km long gravity anomaly that represents an intrusive hosted in an unconformity at the east edge of the Ptarmigan formation and is thought to be an apophyses of a terrane suturing plutonic suite sourced in coincident trend with the Bayonne and Tintina provinces. The centre of the gravity high and centre of the regional magnetic low are both ~5km due east of the Blackfly showings, coincidently, at the centre of the topographic low of the Charcoal creek watershed.

5. Deposit Setting

5.1 Structures

The two dominant structures in the region are the Chase antiform to the north(A, fig.3) which dips south acting as late footwall to the Ptarmigan formation, and the Louis-Raspberry thrust, the west dipping footwall to the Quesnellia terrane, by which the cool and brittle allochthonous paricratonic oceanic terranes were thrust up onto the continent while channelling mafic-transitional-felsic sub-crustal gaseous melts through rifts in thrusts, normal faults and unconformities. The structures contained the melts enough to maintain an anhydrous component in addition to the usual hydrous component. The melts fractionated and cooled in rifted fracture sets in chemically reducing rocks, before reaching the surface. Normal faults and fracture sets run east to west through zones 18-21, perpendicular to the channelling stratigraphy. However the central intrusive zone (20-21) also takes on a sheeted character sub-parallel to the domal facies near mafic and calcareous contacts .

5.2 Metal Suites

This work indicates a Au-Ag-As-Bi-Sb-Pb-Sr-Nb +/- F metallogeny, so considering the affinity of fluorine for hydrogen, silicon, gold, silver, bismuth, antimony, arsenic and molybdenum, some presumptions are made about the evolution and alteration of the deposit.

Usually only found compounded with the most electropositive elements in its environment, fluorine (F_2) is a binary corrosive pale yellow gas. It is the most reactive electronegative element, participating in reactions with virtually all substances, even substituting for hydrogen in organic reactions (CH_4-CF_4) which, when considering the proceeding co-oxident/cation chain theory, could explain why RIRGS are rich in methane(CH_4) *inclusions*. Fluorine in hydrothermal systems forms hydrofluoric acid (HF), hydrofluorosilicate acid (H_2SiF_6) and *Lewis acids (As,Sb,BiF₃)* with the Pnictogen elements. These are all powerful oxidizers with a unique ionic character and would require constrained and saturated channels to reach the epizone where alkali mafic and alkaline calcareous electropositive rocks could reduce the acidic electronegative compound.

This work suggests that as the melt progressed towards the surface, the fluorine element was in excess and progressively striped increasingly electropositive elements from its environment as it moved through country rocks while using sulfur as a co-oxidant(?) in a series. The fluorine compound would absorb metals, for instance by oxidizing sulfides (MoS+F>MoF+S)at depth in country systems, becoming a metal fluoride pregnant solution rich in sulfur(late pyrrhotite), followed by migrating and oxidizing calcareous and mafic minerals at higher horizons where it releases *a free metal* back potentially to the free sulfur(that was not already converted to pyrrhotite, potential coorelation?), in exchange for the more electropositive calcium for instance, creating fluorite>> 6(MoS+F>MoF+S)+3Ca=6MoS+3CaF2. The most common fluorine end-member is fluorite (CaF_2) which is added to flux to lower melting temperatures while managing oxides(fig.9).

On a potentially related note, a study by A.Audetat(2010) finds at depth, Molybdenum increases 3x from the mafic melt to the felsic melt during mineralization. After breccia formation, Mo concentrations in the residual melt decreased gradually, suggesting that Mo was removed from the residual melts by the exsolving fluids.

The results of that study provide direct evidence for derivation of metals and sulfur from associated mafic-transitional magmas through fractional crystallization. Felsic tonalite is recognised as a mafic melt product. The tonalite in proximity to the Blackfly mineralization suggests a potential connection to local transitional fractionization.

5.3 Alteration

All country structures are regionally metamorphosed to schist grade. Chlorite, muscovite and biotite schists are regular through the complex. Pure and Impure marbles show localized skarns with schist or phyllite along contacts that commonly pinch and swell adjacent to the intrusive contacts. Cross-cutting faults induce more abrupt alkali and alkaline skarns and replacement mineralization. Across the central zone, alteration is pervasive and assemblages contain abundant clay gouge in and around the margins.

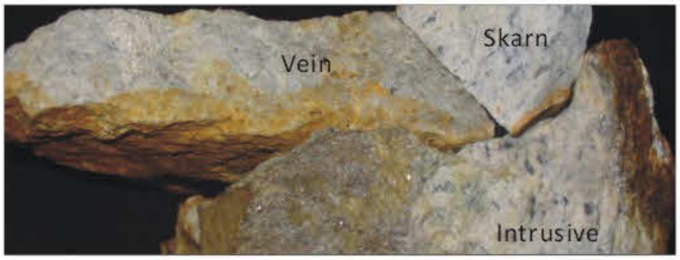
200 metres west of Zone 18

500 metres north of Zone 21

Alteration in the farthest western metasediments and gabbros is widespread but is restricted to narrow envelopes around veins, fissures and unconformities.

Zone 19

Across the entire project alteration also consists of fenitization and minor supergene hemitization. Fenitization is an alkali, metasomatic alteration characterized by secondary K-spar as well as sodic amphiboles and pyroxenes. The result is a rock resembling a syenite, and it often becomes difficult to distinguish the alkali intrusives from metasomatically altered gneiss and/or skarn.



The geochemical similarities between reduced gold deposits (e.g. Tintina Belt fig.1) and porphyry molybdenum deposits (such as high Bi, Te, W, Sr, Nb, Ga and low and peripheral Cu, Pb, Zn) suggest a genetic link (Stephens et al., 2004).

The Dark Hill molybdenum occurrence 6km north, contains elevated Bi, Te, W, Sr, Nb with associated F, so is interpreted to be related but to have been formed ~ 1km deeper in an entirely metasomited-plutonic state, opposed to the cooler more fractionated epithermal conditions at Blackfly. Four intrusive zones over 8km produced a Sr/Nb of ~20, samples 11,12,14,20

1	Feldspar rhyolite and andesite.
2	Schistose quartz metasediments, argillite, marble, volcaniclastics, phyllite
3	Gneissic metasediments, volcaniclastics, gabbro, phyllite
4	Gneissic metasediments, gabbro, granite gneiss, phyllite
5	Granite gneiss, schistose metasediments, gabbro, phyllite
6	Mid-Cretaceous quartz horneblende monzonite, granodiorite, K-spar porphyry
	Mid-Cretaceous tonalite-andesite in early Cretaceous tonalite
	Magnetite granodiorite dikes in schist
4.2a, 21	Layered monzonite and pegmatite w/stockworks, gabbro w/chlorite phyllite, alkali skarn
20	Aplite, pegmatite, monzonite
7	Late Cretaceous pegmatite and associated alteration
4.4	Leucocratic biotite monzonite gneiss, clay veins in metasediments
4.1, 18	Fractured metasediments, gabbro monzonite and gneiss
19	Fractured metasediments w/gabbro, monzonite
	Cenozoic volcanics

Fig.8 Blackfly Gulch *Central Zone Geology*

Scale *1:10,000* BCGS Map: *082 L 12* Lat: *50 41 10* Lon: *119 35 00*

Ptarmigan Range Exploration Head 2010

5.4 Work Area 20-21

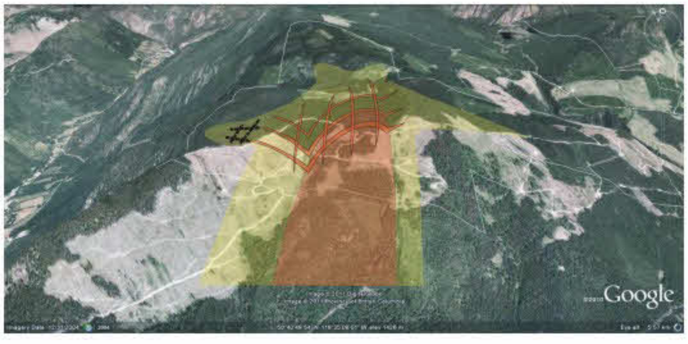
The Blackfly felsic reserve trend has a maximum width of approximately two kilometres. Bodies of brown-white quartz monzonite and aplite plunge near vetically west and carry the occasional mafic or carbonate pennant. The dominant structural control on gold mineralization in the central zone is the extension fracturing of the brittle alkali-felsic sequence that created arrays of fractures filled with thin (0.1–5 cm) quartz sulphide veins that are often cut by sub-parallel quartz or pegmatite veins.

Small veins of aplite and lamprophyre occur along and across the trends. They are thin and well differentiated, splay and coalesce. One of the latest and most volitile phases, the aplite contains the highest levels of Li and Rb with the lowest levels of Co and Ni. It is an ultra-fine-grained material with disseminated sulphides w/trace gold. Area19-21 assayed up to .72 gpt Au and 94,700gpt Ag.

Lamprophyre veins are usually a dark bronze colour, composed predominantly of fine grained material that alternates or cuts the aplite.

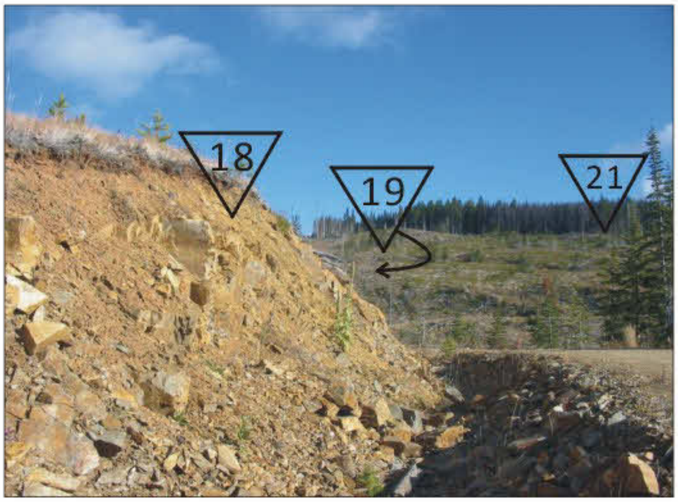
The aurifous aplite occupies the core/footwall of the more competent monzonite-alkali zone. The more competent monzonite rocks fractured less and progressively filtered the feldspar material from the solution? until the thinnest uppermost veins are filled with only quartz, native metals and sulphides.

Carbonate alteration with fracture filling of significantly metasomatized monzonite.



5.5 Area 18-19

The hanging wall zone is more irregular, but is still characterized by fracture sets and veins that cut and splay along and across trends of metasediments, felsic-mafic dikes, greisens and larger lithological unconformities.



Hanging wall sample(18) is an altered felsic-gabbro sequence hosting massive parallel and irregular shears altered to carbonite that assayed 288gpt silver. Pictured with Central Zone (sample21) *800m* to the north.

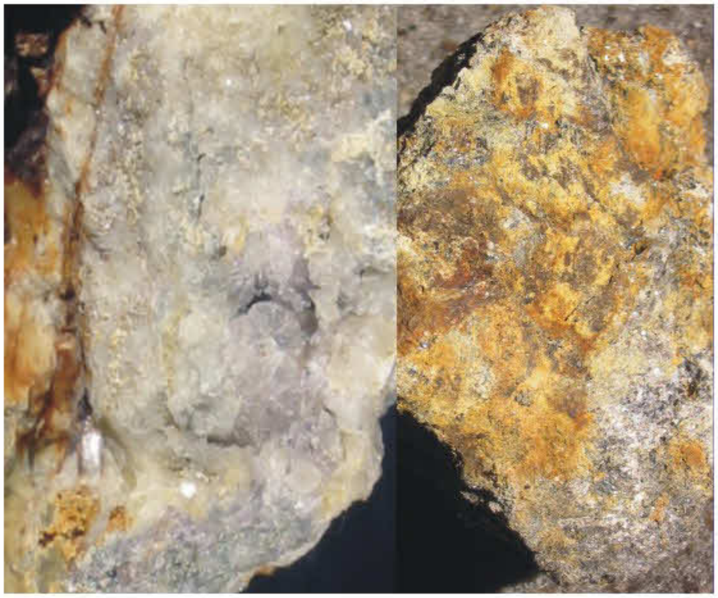
Sample 19 is a more competent intermediate dike hosting less veins in more distinct sets with less alteration.

5.6 East Zone

There is extensive metasomatism of intensely dolomitized limestone and mafic volcanics with polymetallic sulphides that are near a contact with the felsic intrusives. A zone of hornfelsic garnet-diopside skarn is developed containing sulfide mineralization. The sulphides are fine-grained and crudely banded. Limestone is completely metasomatized to skarn or marble.

5.7 North Zone

The North zone is dominated by granite gneiss and carbonate-biotite gneiss/schist occasionally with disseminated molybdenite. Fluorite is sporadic through the Charcoal Creek watershed.



A) Fluorite skarn (CaF_2)
B) Molybdenite gneiss + molybdite

6. Exploration

6.1 Sampling

Whole rock samples were collected from four significant mineralized showings on the property. The samples were part of a larger regional sampling program that tested 21 locations of Paleozoic -Mesozoic rocks along the Omineca-Intermontane margin including juxtaposed Slide Mountain and Harper Ranch terrane rocks and associated intrusives. The samples were delivered to Eco-Tech Laboratory Ltd in Kamloops to be analysed by 45 element aqua-regia ICP-MS and 30gram Au,Ag,Pt,Pd fire assays. The goal of the sampling was to qualify an element profile of each location and not necessarily to quantify a specific element at any location, therefore moe than one sample from each location were combined and the results for a each element will be the average of the samples. The variety of elements in a sample may appear broad, however when considering oxidation-reduction reactions, as broad a cross-section as possible from each location should be considered as cations and anions. Samples from the project include:

18) A mica/sulfide bearing quartz vein enveloping a mafic dike in argillaceous rocks, inducing carbonate alteration rich in silver, arsenic, bismuth and lead, with elevated calcium, chromium, iron, mercury, sulfur, antimony, selenium, tin, strontium, tellurium, tungsten and zirconium.

19) Fractured/oxidized transitional mafic-felsic dike of unknown thickness by unknown strike showing trace gold in the quality- control data, with elevated arsenic, cadmium and cerium.

20) Incompetent fine grained aplite body with grey sooty inclusions and "stockwork" labradorite 30++metres across, crumbles readily and in , contains the highest lithium probably in the form of Li-K-feldspar. Contains trace gold with elevated cerium, gallium, lithium, molybdenum, rubidium, tin, thorium and vanadium.

21) 80mya Felsic cross-cutting intrusives in 260mya mafic structures, rich in silver, bismuth, antimony, lead, and mercury with elevated gold, tellurium , arsenic, cadmium, selenium, tin and tungsten.

6.2 Interpretations and Conclusions

By combining the geophysical data acquired from the British Columbia Geological Survey with the assays and observations made on the ground while considering what is know of other reduced intrusion gold systems in the Tintina Belt, it is appears clear to the author that the Blackfly project is situated in a favourable location, hosts favourable geology, and hosts a structure containing a style of mineralization that can potentially contain economic quantities of gold and silver. However, while the Blackfly project hosts an important class of gold mineralization, this model has only been recognized since 1999 and is still not completely understood and even though the system is exposed on the surface intermittently for over 1000 metres on the property, and project is entirely road accessible, it will take substantially more work to define all of the geological, geophysical and metallogenic aspects of this system. For instance, while it is easy to speculate, what is the exact connection of mesothermal-molybdenum-pnictogens to epithermal-gold-pnictogens? How much mineralization comes from deep exsolving fractionization? and how much is from shallow dissolution fractionization? Either way, it is still believed that there is an important undefined connection between mesothermal +/-fluorine bearing molybdenum porphyry zones and epithermal reduced intrusion gold systems, such as seen at the Blackfly (18-21,BF1-4), and Dark Hill (11&14, DH-3A&DH1-B) showings.

6.3 Recommendations

Further hard rock assaying is recommended at all of the current work areas. A broad heiborne electromagnetic survey is recommended (fig x, A1), as well as a detailed 3-D induced polarization survey of the central zone(figx, G1). A tight geochemical soil sampling grid(fig.x G1) is also recommended to corroborate the IP survey in preparation for drilling. Age dating is recommended on all phases of all intrusions.

6.4 Geochemistry

Significant to this study are Blackfly samples 18-21 (and correlative Dark Hill samples 10-15). Phase temperatures of the targeted elements were plotted for reference (fig.9). Sulfidation and fluorination tends to lower the phase temperatures of the relevant elements. All coercive cations seem to be treated more or less equally by a $H_2SiF_6+HF+F_2$ compound?

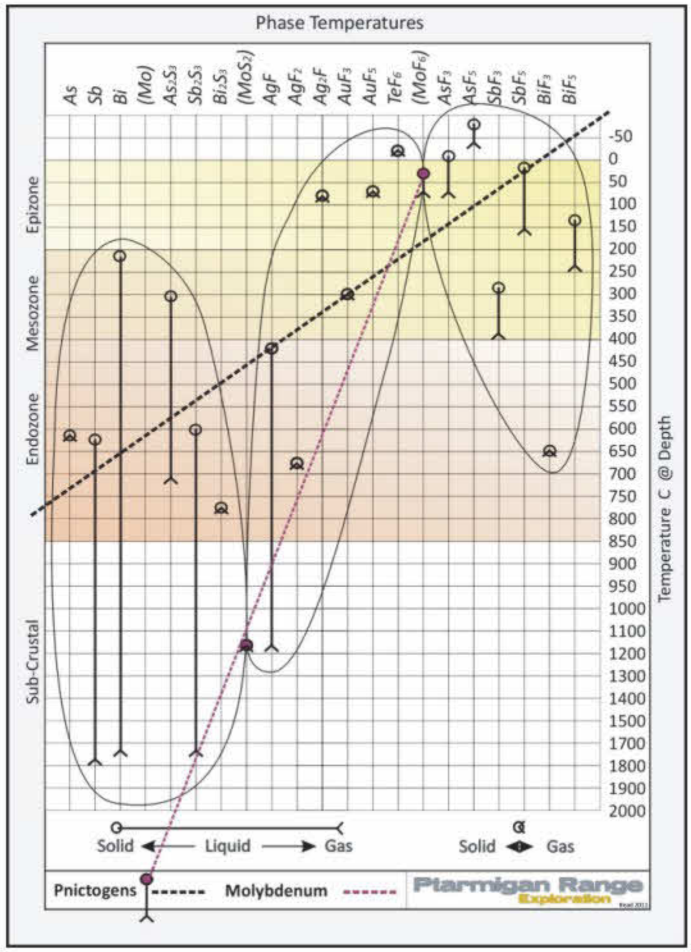


Fig. 9 Phase temperatures

ET #.	Tag #	Au (g/t)	Au (oz/t)	Ag (%)	Ag (g/t)	Ag (oz/t)	Cu (%)	Pb (%)	Pd (g/t)	Pd (oz/t)	Pt (g/t)	Pt (oz/t)
1	TAMIS-1	<0.03	<0.001						<0.03	<0.001	<0.03	<0.001
2	TAMIS-2	0.58	0.017						<0.03	<0.001	<0.03	<0.001
3	TAMIS-3	0.09	0.003						<0.03	<0.001	<0.03	<0.001
4	RB-1	<0.03	<0.001						<0.03	<0.001	<0.03	<0.001
5	RB-2	<0.03	<0.001						<0.03	<0.001	<0.03	<0.001
6	RB-3	<0.03	<0.001						<0.03	<0.001	<0.03	<0.001
7	PIT-1	<0.03	<0.001						<0.03	<0.001	<0.03	<0.001
8	T-1	<0.03	<0.001						<0.03	<0.001	<0.03	<0.001
9	M-1	<0.03	<0.001						<0.03	<0.001	<0.03	<0.001
10	DH-3C	<0.03	<0.001						<0.03	<0.001	<0.03	<0.001
11	DH-3A	<0.03	<0.001						<0.03	<0.001	<0.03	<0.001
12	DH-3B	<0.03	<0.001						<0.03	<0.001	<0.03	<0.001
13	DH-2	<0.03	<0.001						<0.03	<0.001	<0.03	<0.001
14	DH-1B	<0.03	<0.001						<0.03	<0.001	<0.03	<0.001
15	DH-1A	<0.03	<0.001						<0.03	<0.001	<0.03	<0.001
16	320-1	<0.03	<0.001				1.10		<0.03	<0.001	<0.03	<0.001
17	320-2	<0.03	<0.001						<0.03	<0.001	<0.03	<0.001
18	BF-1	<0.03	<0.001		288	8.40			<0.03	<0.001	<0.03	<0.001
19	BF-2	<0.03	<0.001						<0.03	<0.001	<0.03	<0.001
20	BF-3	0.03	0.001						<0.03	<0.001	<0.03	<0.001
21	BF-4	0.66	0.020	9.47				47.8	<0.03	<0.001	<0.03	<0.001
QC DATA:												
Repeat:												
2	TAMIS-2	0.58	0.017						<0.03	<0.001	<0.03	<0.001
10	DH-3C	<0.03	<0.001						<0.03	<0.001	<0.03	<0.001
19	BF-2	0.03	0.001						<0.03	<0.001	<0.03	<0.001
21	BF-4	0.72	0.021									

Fig. 10 Fire assays (appendix iv)

Stewart Group
ECO TECH LABORATORY LTD.
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V2C 6T4

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Fax : 250-573-4557

ICP CERTIFICATE OF ANALYSIS AK 2010- 1328

Ptarmigan Range Exploration
RR 1, Moser Rd, C-12
Falkland, BC
V0E 1W0

No. of samples received: 21
Sample Type: Rock
Project: Fall 2010
Submitted by: Geoff Head

Values in ppm unless otherwise reported

Et #.	Tag #	Ag ppm	Al %	As ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Ce ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Ga ppm	Ge ppm	Hg ppb	K %	La ppm	Li ppm	Mg %	Mn ppm
1	TAMIS-1	0.2	0.26	11.3	20.5	<0.1	0.32	0.10	0.07	13.22	1.1	249.5	5.8	0.81	1.2	1.0	15	0.13	7.5	0.6	0.02	29
2	TAMIS-2	12.3	0.26	404.9	3.5	<0.1	0.30	0.02	0.01	0.19	12.4	114.0	17.7	12.64	0.8	11.3	95	0.05	<0.5	3.4	<0.01	15
3	TAMIS-3	9.5	0.17	79.2	6.5	<0.1	0.16	<0.01	<0.01	0.52	1.1	155.5	5.6	3.26	0.5	3.0	25	0.02	<0.5	1.9	<0.01	15
4	RB-1	0.4	0.63	0.6	11.0	<0.1	0.30	1.57	0.25	0.59	40.4	59.5	167.0	23.34	2.3	20.6	15	0.03	<0.5	7.6	0.78	380
5	RB-2	0.4	0.41	1.5	4.5	<0.1	0.90	0.96	0.02	0.75	113.5	126.0	306.5	8.15	1.4	7.6	10	0.01	<0.5	0.2	0.10	80
6	RB-3	0.1	1.62	0.6	33.5	<0.1	0.58	0.72	0.10	2.24	38.5	158.5	59.4	4.88	5.5	4.6	<5	0.16	0.5	16.5	2.11	227
7	PIT-1	0.7	0.39	0.7	58.5	0.3	0.50	0.64	0.09	21.34	31.3	120.0	203.7	3.65	3.7	3.6	<5	0.17	12.0	7.7	0.23	129
8	T-1	0.9	1.26	1.1	33.5	0.6	0.92	2.36	0.44	44.76	188.0	115.0	230.9	8.38	6.6	8.2	15	0.48	23.5	67.2	1.06	507
9	M-1	4.9	0.07	29.5	55.5	<0.1	0.38	0.02	0.03	3.77	0.8	217.5	6.2	3.03	1.3	2.9	15	0.15	2.5	2.9	<0.01	25
10	DH-3C	1.0	1.50	1.2	58.5	4.8	5.78	1.55	170.90	51.86	17.3	124.0	522.7	5.12	17.8	5.7	75	1.08	23.5	91.6	0.93	748
11	DH-3A	1.3	0.84	13.0	39.5	2.6	19.72	0.77	10.50	17.70	2.7	190.0	185.3	9.35	7.0	8.5	20	0.80	9.0	55.3	0.40	300
12	DH-3B	0.5	1.92	0.6	114.5	5.6	2.26	3.04	6.84	17.73	10.7	196.0	254.8	1.63	10.4	2.1	<5	2.26	8.5	88.0	0.53	475
13	DH-2	0.1	0.53	1.6	132.5	8.1	0.50	0.20	0.28	15.36	68.2	91.5	8.5	10.59	2.8	10.5	<5	0.19	16.5	13.7	0.17	9290
14	DH-1B	1.1	1.28	0.7	53.0	1.1	82.18	0.15	0.26	24.48	17.4	129.5	198.3	3.94	6.5	4.2	<5	1.23	10.5	107.2	0.81	540
15	DH-1A	0.4	0.23	0.9	28.0	1.5	3.24	0.10	0.09	4.51	5.7	234.5	34.1	1.19	1.3	1.3	<5	0.19	2.0	13.0	0.11	70
16	320-1	3.3	1.34	4.9	299.0	<0.1	0.16	>10	116.20	8.83	18.0	151.5	>10000	3.26	5.0	3.3	190	0.74	4.5	29.3	1.24	858
17	320-2	0.2	0.33	4.6	46.5	0.4	0.18	>10	0.85	8.48	6.5	186.5	9.8	4.31	1.4	4.4	20	0.04	3.5	7.5	0.53	1695
18	BF-1	>30	0.34	321.3	22.0	<0.1	1288.00	4.84	0.60	3.22	12.1	229.5	11.9	7.78	2.2	6.5	120	0.04	2.0	16.5	0.06	58
19	BF-2	2.2	0.09	196.2	11.5	<0.1	5.76	0.06	3.53	6.35	6.4	173.0	27.3	2.50	0.7	2.4	220	0.09	3.0	2.8	0.02	101
20	BF-3	0.8	1.10	4.8	112.0	3.8	1.78	0.37	0.16	19.15	1.0	158.5	26.8	1.45	9.0	1.6	10	1.17	13.0	225.9	1.06	424
21	BF-4	>30	0.03	463.2	8.0	1.4	>10000	0.12	394.30	2.73	0.6	162.0	110.5	0.83	0.3	1.0	3580	0.03	2.0	0.8	<0.01	24
QC DATA:																						
Repeat:																						
1	TAMIS-1	0.2	0.29	12.0	22.0	<0.1	0.34	0.10	0.05	14.43	1.2	258.5	6.8	0.83	1.3	1.1	10	0.14	8.5	1.0	0.02	31
10	DH-3C	0.9	1.46	0.8	57.0	2.8	5.60	1.47	163.70	49.08	15.6	120.0	518.2	4.96	15.8	4.8	70	0.99	21.5	88.0	0.89	696
Resplit:																						
1	TAMIS-1	0.4	0.27	12.1	20.5	<0.1	0.42	0.10	0.07	15.07	1.2	250.5	7.1	0.83	1.2	0.8	15	0.12	8.0	0.6	0.02	28
Standard:																						
	Pb129A	11.9	0.84	5.9	66.5	<0.1	7.42	0.45	51.71	9.49	5.7	13.0	1438.0	1.68	2.6	1.7	65	0.13	4.5	2.0	0.79	373

Et #.	Tag #	Mo ppm	Na %	Nb ppm	Ni ppm	P ppm	Pb ppm	Rb ppm	S %	Sb ppm	Sc ppm	Se ppm	Sn ppm	Sr ppm	Ta ppm	Te ppm	Th ppm	Ti %	Tl ppm	U ppm	V ppm	W ppm	Y ppm	Zn ppm	Zr ppm
1	TAMIS-1	2.24	0.033	0.06	6.8	281	11.60	7.5	0.02	0.66	0.3	0.4	0.3	21.0	<0.05	0.06	2.6	0.001	0.04	1.0	2	0.2	3.53	14.6	1.02
2	TAMIS-2	0.50	0.030	0.04	43.0	14	16.24	2.7	>10	64.54	0.7	7.5	1.3	2.5	<0.05	<0.02	0.1	0.001	2.68	<0.1	12	0.3	0.48	4.2	0.54
3	TAMIS-3	0.38	0.028	0.04	5.8	4	6.89	0.9	2.74	31.82	<0.1	13.8	0.4	2.0	<0.05	<0.02	0.2	0.005	1.12	0.4	<2	<0.1	0.43	1.2	0.41
4	RB-1	3.71	0.039	0.10	276.6	81	2.89	1.1	>10	0.42	2.6	0.7	0.1	4.0	<0.05	0.02	<0.1	0.081	0.08	0.2	34	<0.1	4.09	20.5	0.84
5	RB-2	0.54	0.045	0.12	54.5	96	3.92	0.3	7.70	0.32	2.2	0.9	0.2	21.5	<0.05	0.42	<0.1	0.211	0.04	<0.1	22	0.1	3.90	3.6	2.63
6	RB-3	2.18	0.055	0.10	87.3	954	3.02	6.1	2.00	0.18	4.6	0.5	0.3	3.0	<0.05	0.04	<0.1	0.340	0.08	0.8	90	<0.1	12.50	32.8	3.30
7	PIT-1	0.67	0.113	1.36	96.9	360	8.95	5.9	1.06	0.02	2.8	2.0	1.5	116.5	<0.05	0.04	6.4	0.135	0.10	0.7	28	0.1	5.89	23.2	2.11
8	T-1	2.31	0.164	1.22	149.7	1496	4.87	44.7	5.56	0.06	7.9	2.7	2.6	111.5	<0.05	0.12	7.5	0.165	0.34	1.0	64	10.4	8.56	66.9	2.98
9	M-1	3.06	0.037	0.12	4.8	98	11.87	5.5	1.30	6.46	<0.1	7.4	0.6	11.5	<0.05	<0.02	1.1	0.001	0.54	0.4	<2	0.1	0.20	5.0	0.81
10	DH-3C	1.02	0.218	7.62	49.4	505	12.27	112.9	2.74	1.34	6.1	2.6	13.3	101.5	<0.05	0.24	10.8	0.101	0.60	1.7	46	0.2	6.13	4279.0	3.41
11	DH-3A	1948.00	0.173	4.48	9.4	192	21.80	87.0	3.96	5.20	3.0	3.5	7.4	103.0	<0.05	0.54	4.5	0.080	0.48	0.7	20	1.5	2.83	385.1	1.95
12	DH-3B	4.35	0.333	15.86	30.1	418	8.14	201.0	1.02	0.06	4.3	1.6	10.9	266.5	<0.05	0.16	6.8	0.135	1.08	1.2	26	0.3	6.57	125.9	2.65
13	DH-2	6.02	0.068	0.52	52.9	140	4.55	17.6	<0.02	0.08	1.4	0.4	0.5	57.0	<0.05	<0.02	2.9	0.035	0.16	9.2	12	1.1	9.92	300.1	2.46
14	DH-1B	1.04	0.064	0.52	34.7	310	9.83	181.5	1.78	0.04	3.3	2.4	6.6	12.5	<0.05	1.96	9.0	0.107	1.14	1.0	34	0.3	3.71	102.8	1.20
15	DH-1A	5.90	0.052	0.14	12.3	48	6.05	22.8	0.70	0.10	0.8	1.1	1.7	11.0	<0.05	0.16	1.6	0.012	0.16	0.2	6	0.2	1.16	14.0	0.61
16	320-1	12.97	0.065	0.22	61.3	1492	4.34	18.3	0.48	1.74	4.1	5.3	0.3	311.0	<0.05	0.08	0.9	0.227	0.10	0.5	98	0.3	5.49	51.8	3.11
17	320-2	0.61	0.037	0.04	47.3	218	4.19	1.3	0.02	0.38	17.9	0.4	0.4	1558.0	<0.05	0.18	0.1	0.011	<0.02	<0.1	224	12.2	9.94	14.3	0.72
18	BF-1	1.35	0.068	0.14	14.4	34	6718.00	21.1	6.80	10.90	0.7	26.3	10.9	225.5	<0.05	8.76	0.5	0.004	0.28	0.1	6	13.1	0.88	79.1	5.19
19	BF-2	0.84	0.052	0.24	13.4	25	74.80	4.6	1.34	1.82	0.6	1.2	0.4	31.0	<0.05	0.14	1.1	0.002	0.06	0.3	2	2.4	1.84	138.0	1.37
20	BF-3	8.14	0.140	3.14	3.8	863	11.99	252.3	0.44	0.16	6.0	1.7	9.6	65.0	<0.05	0.04	6.7	0.100	1.68	0.6	44	3.1	5.77	36.2	2.63
21	BF-4	1.40	0.053	0.16	4.6	19	>10000	0.9	9.46	>2000	0.3	>100	82.6	116.5	<0.05	852.20	0.3	0.001	32.42	0.4	<2	>100	0.65	198.0	0.56
QC DATA:																									
Repeat:																									
1	TAMIS-1	2.41	0.033	0.04	7.4	297	10.99	8.2	0.04	0.70	0.3	0.6	0.7	21.0	<0.05	0.04	2.9	0.001	0.06	1.0	2	0.2	3.80	13.6	0.97
10	DH-3C	0.91	0.210	7.04	48.7	488	10.57	109.5	2.59	1.10	5.3	2.4	12.1	99.0	<0.05	0.36	9.7	0.099	0.54	1.6	40	0.3	5.74	4295.0	3.20
Resplit:																									
1	TAMIS-1	2.39	0.040	0.04	7.7	312	11.61	6.2	<0.02	0.56	0.3	0.4	0.4	23.0	<0.05	0.04	2.9	0.001	0.06	1.1	2	0.4	4.13	14.7	0.94
Standard:																									
	Pb129A	1.90	0.061	0.26	6.0	459	5903.00	3.2	0.84	14.40	0.8	0.3	0.7	29.5	<0.05	0.40	0.4	0.038	0.06	<0.1	20	0.7	2.33	>10000	1.79

Aqua Regia Digest/ICPMS Finish

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Fig. 11 ICP-MS (appendix iii)

6.5 Common RIRGS Chemistry (Hart et al 2005)

The RIRGS are geochemically distinguished from oxidized intrusion-related mineralizing systems by their dominance in Au, associated W, and lack of anomalous Cu.

Tungsten enrichments and deposits occur within the RIRGS, such as the Ray Gulch W skarn at Dublin Gulch, but Au and W enrichments may be spatially distinct (Brown et al., 2002), or later Au may overprint early W veins or skarns (Mair et al, 2006).

Bi and Te are common elements but are also characteristic features of many other deposit models.

Sulphide-rich (10%) sheeted veins at Clear Creek contain up to 30 g/t Au, as much as 1 wt.% As, and 100 to 1000 ppm Bi and W (Marsh et al., 1999).

At Fort Knox, Au strongly correlates with Bi and Te, and but weak enrichments of W, Mo, Sb, and As do not correlate with elevated Au (Bakke, 1995; Flanigan et al., 2000).

High Au grade intersections at Dublin Gulch have elevated Bi, As, Sb, Cu, and Zn concentrations, although again Au grades solely correlate with Bi and Te (Maloof et al., 2001).

Factor analysis on the Clear Creek veins indicated a dominant Au-rich As-Bi±Sb, Te element association, and a base metal suite of Ag-Bi-Pb±As, Au that represents a cooler/later assemblage (Marsh et al., 1999). Tungsten displays little correlation with either element suite, but had values of >300 ppm in many Au-rich samples.

Similarly, mineralization at Scheelite Dome was characterized by both a Au-Te-Bi±W±As and a Ag-Pb-Zn-Cd-Sb±Cu±Au elemental association, with the latter characteristic of ores in the nearby Keno Hill Ag district (Mair et al., 2000).

Epizonal Au at Brewery Creek lacks the typical W, Bi and Te association. Instead, Au ores occur with arsenopyrite and are dominated by As.

Late fractures host stibnite enrichments but Au-Sb correlations are erratic. Additionally, Hg was recovered during mining, thus giving Brewery Creek an As-Sb-Hg association.

Geochemical zoning occurs at the pluton scale, with elemental zonation reflecting the cooling trend of the hydrothermal fluids, with a component of country-rock buffering.

Unexposed plutons may be up to several kilometres below the surface and fail to show apparent zoning trends.

The Brewery Creek deposit and nearby occurrences (Ida, Oro) emphasize that the fluid systems associated with these more shallowly emplaced systems (~3 km) take on epizonal characteristics and metal signatures in response to the lower temperatures. The pluton's geochemical influence is typically on the order of 1 to 3 km, but can be larger in larger plutons, for example >10 km at Scheelite Dome. Intrusion-hosted ores are dominated by a Au-W-Bi-Te signature with Au correlating well with Bi and Te, but not at all with W.

Geochemical signatures of high-temperature skarns adjacent to the pluton may be similar, but in some systems, As and W enrichments may be more significant than Bi-Te signatures.

Percent-level Cu and Bi, with 8.6 g/t Au at the Marn deposit (Brown and Nesbitt, 1987), occur only in skarns formed from alkalic or more oxidized plutons.

Hornfels-hosted ores, which may be veins, disseminations, or replacements, are more sulphide rich than intrusion-hosted ores, and are characterized by elevated As that correlates with Au (Flannigan et al., 2000).

Distal mineralization, which forms at or beyond the limits of hornfels, is dominated by a Pb-Ag-Zn or Sb-rich geochemical association, and typically occurs as fault-filled veins. Vertical zonation patterns within a system may mimic the lateral zonation, but may be less evident due to the much broader thermal gradients that occur above the pluton.

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Statement of Qualifications

1974-Present: Partner with RJR Mining

Familiar with the common aspects of operating a small mining property including exploration, operations development and financing.

2000-Present: President of Ptarmigan Range Exploration

Familiar with the common aspects of mineral exploration including project planning and coordination, public relations, data acquisition and corroboration, claim maintenance and sampling.

1996-2000: Geophysical 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 the production goals.

!994-1996: Blaster and Line Trouble shooter 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.

Statement of Expenses

26 days	- Labour - Lodging - Food - Fuel - Equipment - Merchandise - Administration - Contingencies - Depreciation - Inflation - Taxes	
	@ $480	$12,480.00
4 Assays	- ICP-MS 45 element - 35gr. Fire Au-Ag-Pt-Pd	
	@ $55.36	$221.44
		$12,701.44

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ICP CERTIFICATE OF ANALYSIS AK 2010- 1328

Ptarmigan Range Exploration

Falkland, BC
V0E 1W0

No. of samples received: 21
Sample Type: Rock
Project: Fall 2010
Submitted by: Geoff Head

Values in ppm unless otherwise reported

Et #.	Tag #	Ag ppm	Al %	As ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Ce ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Ga ppm	Ge ppm	Hg ppb	K %	La ppm	Li ppm	Mg %	Mn ppm
1	TAMIS-1	0.2	0.26	11.3	20.5	<0.1	0.32	0.10	0.07	13.22	1.1	249.5	5.8	0.81	1.2	1.0	15	0.13	7.5	0.6	0.02	29
2	TAMIS-2	12.3	0.26	404.9	3.5	<0.1	0.30	0.02	0.01	0.19	12.4	114.0	17.7	12.64	0.8	11.3	95	0.05	<0.5	3.4	<0.01	15
3	TAMIS-3	9.5	0.17	79.2	6.5	<0.1	0.16	<0.01	<0.01	0.52	1.1	155.5	5.6	3.26	0.5	3.0	25	0.02	<0.5	1.9	<0.01	15
4	RB-1	0.4	0.63	0.6	11.0	<0.1	0.30	1.57	0.25	0.59	40.4	59.5	167.0	23.34	2.3	20.6	15	0.03	<0.5	7.6	0.78	380
5	RB-2	0.4	0.41	1.5	4.5	<0.1	0.90	0.96	0.02	0.75	113.5	126.0	306.5	8.15	1.4	7.6	10	0.01	<0.5	0.2	0.10	80
6	RB-3	0.1	1.62	0.6	33.5	<0.1	0.58	0.72	0.10	2.24	38.5	158.5	59.4	4.88	5.5	4.6	<5	0.16	0.5	16.5	2.11	227
7	PIT-1	0.7	0.39	0.7	58.5	0.3	0.50	0.64	0.09	21.34	31.3	120.0	203.7	3.65	3.7	3.6	<5	0.17	12.0	7.7	0.23	129
8	T-1	0.9	1.26	1.1	33.5	0.6	0.92	2.35	0.44	44.76	188.0	115.0	230.9	8.38	6.6	8.2	15	0.48	23.5	67.2	1.06	507
9	M-1	4.9	0.07	29.5	55.5	<0.1	0.38	0.02	0.03	3.77	0.8	217.5	6.2	3.03	1.3	2.9	15	0.15	2.5	2.9	<0.01	25
10	DH-3C	1.0	1.50	1.2	58.5	4.8	5.78	1.55	170.90	51.86	17.3	124.0	522.7	5.12	17.8	5.7	75	1.08	23.5	91.6	0.93	748
11	DH-3A	1.3	0.84	13.0	39.5	2.6	19.72	0.77	10.50	17.70	2.7	190.0	185.3	9.35	7.0	8.5	20	0.80	9.0	55.3	0.40	300
12	DH-3B	0.5	1.92	0.6	114.5	5.6	2.26	3.04	6.84	17.73	10.7	196.0	254.8	1.63	10.4	2.1	<5	2.26	8.5	88.0	0.53	475
13	DH-2	0.1	0.53	1.6	132.5	8.1	0.50	0.20	0.28	15.36	68.2	91.5	8.5	10.59	2.8	10.5	<5	0.19	16.5	13.7	0.17	9290
14	DH-1B	1.1	1.28	0.7	53.0	1.1	82.18	0.15	0.26	24.48	17.4	129.5	198.3	3.94	6.5	4.2	<5	1.23	10.5	107.2	0.81	540
15	DH-1A	0.4	0.23	0.9	28.0	1.5	3.24	0.10	0.09	4.51	5.7	234.5	34.1	1.19	1.3	1.3	<5	0.19	2.0	13.0	0.11	70
16	320-1	3.3	1.34	4.9	299.0	<0.1	0.16	>10	116.20	8.83	18.0	151.5	>10000	3.26	5.0	3.3	190	0.74	4.5	29.3	1.24	858
17	320-2	0.2	0.33	4.6	46.5	0.4	0.18	>10	0.85	8.48	6.5	186.5	9.8	4.31	1.4	4.4	20	0.04	3.5	7.5	0.53	1695
18	BF-1	>30	0.34	321.3	22.0	<0.1	1288.00	4.84	0.60	3.22	12.1	229.5	11.9	7.78	2.2	6.5	120	0.44	2.0	16.5	0.06	58
19	BF-2	2.2	0.09	196.2	11.5	<0.1	5.76	0.06	3.53	6.35	6.4	173.0	27.3	2.50	0.7	2.4	220	0.09	3.0	2.8	0.02	101
20	BF-3	0.8	1.10	4.8	112.0	3.8	1.78	0.37	0.16	19.15	1.0	158.5	26.8	1.45	9.0	1.6	10	1.17	13.0	225.9	1.06	424
21	BF-4	>30	0.03	463.2	8.0	1.4	>10000	0.12	394.30	2.73	0.6	162.0	110.5	0.83	0.3	1.0	3580	0.03	2.0	0.8	<0.01	24
QC DATA:																						
Repeat:																						
1	TAMIS-1	0.2	0.29	12.0	22.0	<0.1	0.34	0.10	0.05	14.43	1.2	258.5	6.8	0.83	1.3	1.1	10	0.14	8.5	1.0	0.02	31
10	DH-3C	0.9	1.46	0.8	57.0	2.8	5.60	1.47	163.70	49.08	15.6	120.0	518.2	4.96	15.8	4.8	70	0.99	21.5	88.0	0.89	696
Resplit:																						
1	TAMIS-1	0.4	0.27	12.1	20.5	<0.1	0.42	0.10	0.07	15.07	1.2	250.5	7.1	0.83	1.2	0.8	15	0.12	8.0	0.6	0.02	28
Standard:																						
	Pb129A	11.9	0.84	5.9	66.5	<0.1	7.42	0.45	51.71	9.49	5.7	13.0	1438.0	1.68	2.6	1.7	65	0.13	4.5	2.0	0.79	373

Et #.	Tag #	Mo ppm	Na %	Nb ppm	Ni ppm	P ppm	Pb ppm	Rb ppm	S %	Sb ppm	Sc ppm	Se ppm	Sn ppm	Sr ppm	Ta ppm	Te ppm	Th ppm	Ti %	Tl ppm	U ppm	V ppm	W ppm	Y ppm	Zn ppm	Zr ppm
1	TAMIS-1	2.24	0.033	0.08	6.8	281	11.60	7.5	0.02	0.66	0.3	0.4	0.3	21.0	<0.05	0.06	2.6	0.001	0.04	1.0	2	0.2	3.53	14.6	1.02
2	TAMIS-2	0.50	0.030	0.04	43.0	14	16.24	2.7	>10	64.54	0.7	7.5	1.3	2.5	<0.05	<0.02	0.1	0.001	2.68	<0.1	12	0.3	0.48	4.2	0.54
3	TAMIS-3	0.38	0.028	0.04	5.8	4	6.89	0.9	2.74	31.82	<0.1	13.8	0.4	2.0	<0.05	<0.02	0.2	0.005	1.12	0.4	<2	<0.1	0.43	1.2	0.41
4	RB-1	3.71	0.039	0.10	276.6	81	2.89	1.1	>10	0.42	2.6	0.7	0.1	4.0	<0.05	0.02	<0.1	0.081	0.08	0.2	34	<0.1	4.09	20.5	0.84
5	RB-2	0.54	0.045	0.12	54.5	96	3.92	0.3	7.70	0.32	2.2	0.9	0.2	21.5	<0.05	0.42	<0.1	0.211	0.04	<0.1	22	0.1	3.90	3.6	2.63
6	RB-3	2.18	0.055	0.10	87.3	954	3.02	6.1	2.00	0.18	4.6	0.5	0.3	3.0	<0.05	0.04	<0.1	0.340	0.08	0.8	90	<0.1	12.50	32.8	3.30
7	PIT-1	0.67	0.113	1.36	96.9	360	8.95	5.9	1.06	0.02	2.8	2.0	1.5	116.5	<0.05	0.04	6.4	0.135	0.10	0.7	28	0.1	5.89	23.2	2.11
8	T-1	2.31	0.164	1.22	149.7	1496	4.87	44.7	5.56	0.06	7.9	2.7	2.6	111.5	<0.05	0.12	7.5	0.165	0.34	1.0	64	10.4	8.56	66.9	2.98
9	M-1	3.06	0.037	0.12	4.8	98	11.87	5.5	1.30	6.46	<0.1	7.4	0.6	11.5	<0.05	<0.02	1.1	0.001	0.54	0.4	<2	0.1	0.20	5.0	0.81
10	DH-3C	1.02	0.218	7.62	49.4	505	12.27	112.9	2.74	1.34	6.1	2.6	13.3	101.5	<0.05	0.24	10.8	0.101	0.60	1.7	46	0.2	6.13	4279.0	3.41
11	DH-3A	1948.00	0.173	4.48	9.4	192	21.80	87.0	3.96	5.20	3.0	3.5	7.4	103.0	<0.05	0.54	4.5	0.080	0.48	0.7	20	1.5	2.83	385.1	1.95
12	DH-3B	4.35	0.333	15.86	30.1	418	8.14	201.0	1.02	0.06	4.3	1.6	10.9	266.5	<0.05	0.16	6.8	0.135	1.08	1.2	26	0.3	6.57	125.9	2.65
13	DH-2	6.02	0.058	0.52	52.9	140	4.55	17.6	<0.02	0.08	1.4	0.4	0.5	57.0	<0.05	<0.02	2.9	0.035	0.16	9.2	12	1.1	9.92	300.1	2.46
14	DH-1B	1.04	0.064	0.52	34.7	310	9.83	181.5	1.78	0.04	3.3	2.4	6.6	12.5	<0.05	1.96	9.0	0.107	1.14	1.0	34	0.3	3.71	102.8	1.20
15	DH-1A	5.90	0.052	0.14	12.3	48	6.05	22.8	0.70	0.10	0.8	1.1	1.7	11.0	<0.05	0.16	1.6	0.012	0.16	0.2	6	0.2	1.16	14.0	0.61
16	320-1	12.97	0.065	0.22	61.3	1492	4.34	18.3	0.48	1.74	4.1	5.3	0.3	311.0	<0.05	0.08	0.9	0.227	0.10	0.5	98	0.3	5.49	51.8	3.11
17	320-2	0.61	0.037	0.04	47.3	218	4.19	1.3	0.02	0.38	17.9	0.4	0.4	1558.0	<0.05	0.18	0.1	0.011	<0.02	<0.1	224	12.2	9.94	14.3	0.72
18	BF-1	1.35	0.068	0.14	14.4	34	6718.00	21.1	6.80	10.90	0.7	26.3	10.9	225.5	<0.05	8.76	0.5	0.004	0.28	0.1	6	13.1	0.88	79.1	5.19
19	BF-2	0.84	0.052	0.24	13.4	25	74.80	4.6	1.34	1.82	0.6	1.2	0.4	31.0	<0.05	0.14	1.1	0.002	0.06	0.3	2	2.4	1.84	138.0	1.37
20	BF-3	8.14	0.140	3.14	3.8	863	11.99	252.3	0.44	0.16	6.0	1.7	9.6	65.0	<0.05	0.04	6.7	0.100	1.68	0.6	44	3.1	5.77	36.2	2.63
21	BF-4	1.40	0.053	0.16	4.6	19	>10000	0.9	9.46	>2000	0.3	>100	82.6	116.5	<0.05	852.20	0.3	0.001	32.42	0.4	<2	>100	0.65	198.0	0.56
QC DATA:																									
Repeat:																									
1	TAMIS-1	2.41	0.033	0.04	7.4	297	10.99	8.2	0.04	0.70	0.3	0.6	0.7	21.0	<0.05	0.04	2.9	0.001	0.06	1.0	2	0.2	3.80	13.6	0.97
10	DH-3C	0.91	0.210	7.04	48.7	488	10.57	109.5	2.59	1.10	5.3	2.4	12.1	99.0	<0.05	0.36	9.7	0.099	0.54	1.6	40	0.3	5.74	4295.0	3.20
Resplit:																									
1	TAMIS-1	2.39	0.040	0.04	7.7	312	11.61	6.2	<0.02	0.56	0.3	0.4	0.4	23.0	<0.05	0.04	2.9	0.001	0.06	1.1	2	0.4	4.13	14.7	0.94
Standard:																									
	Pb129A	1.90	0.061	0.26	6.0	459	5903.00	3.2	0.84	14.40	0.8	0.3	0.7	29.5	<0.05	0.40	0.4	0.038	0.06	<0.1	20	0.7	2.33	>10000	1.79

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StewartGroup
Geochemical & Assay

CERTIFICATE OF ASSAY AK 2010-1328

Ptarmigan Range Exploration 19-Jan-11

Falkland, BC
V0E 1W0

No. of samples received: 21
Sample Type: Rock
Project: Fall 2010
Submitted by: Geoff Head

ET #.	Tag #	Au (g/t)	Au (oz/t)	Ag (%)	Ag (g/t)	Ag (oz/t)	Cu (%)	Pb (%)	Pd (g/t)	Pd (oz/t)	Pt (g/t)	Pt (oz/t)
1	TAMIS-1	<0.03	<0.001						<0.03	<0.001	<0.03	<0.001
2	TAMIS-2	0.58	0.017						<0.03	<0.001	<0.03	<0.001
3	TAMIS-3	0.09	0.003						<0.03	<0.001	<0.03	<0.001
4	RB-1	<0.03	<0.001						<0.03	<0.001	<0.03	<0.001
5	RB-2	<0.03	<0.001						<0.03	<0.001	<0.03	<0.001
6	RB-3	<0.03	<0.001						<0.03	<0.001	<0.03	<0.001
7	PIT-1	<0.03	<0.001						<0.03	<0.001	<0.03	<0.001
8	T-1	<0.03	<0.001						<0.03	<0.001	<0.03	<0.001
9	M-1	<0.03	<0.001						<0.03	<0.001	<0.03	<0.001
10	DH-3C	<0.03	<0.001						<0.03	<0.001	<0.03	<0.001
11	DH-3A	<0.03	<0.001						<0.03	<0.001	<0.03	<0.001
12	DH-3B	<0.03	<0.001						<0.03	<0.001	<0.03	<0.001
13	DH-2	<0.03	<0.001						<0.03	<0.001	<0.03	<0.001
14	DH-1B	<0.03	<0.001						<0.03	<0.001	<0.03	<0.001
15	DH-1A	<0.03	<0.001						<0.03	<0.001	<0.03	<0.001
16	320-1	<0.03	<0.001				1.10		<0.03	<0.001	<0.03	<0.001
17	320-2	<0.03	<0.001						<0.03	<0.001	<0.03	<0.001
18	BF-1	<0.03	<0.001		288	8.40			<0.03	<0.001	<0.03	<0.001
19	BF-2	<0.03	<0.001						<0.03	<0.001	<0.03	<0.001
20	BF-3	0.03	0.001						<0.03	<0.001	<0.03	<0.001
21	BF-4	0.68	0.020	9.47				47.8	<0.03	<0.001	<0.03	<0.001

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Geochemical & Assay

Ptarmigan Range Exploration AK10-1328 19-Jan-11

ET #.	Tag #	Au (g/t)	Au (oz/t)	Ag (%)	Ag (g/t)	Ag (oz/t)	Cu (%)	Pb (%)	Pd (g/t)	Pd (oz/t)	Pt (g/t)	Pt (oz/t)
QC DATA:												
Repeat:												
2	TAMIS-2	0.58	0.017						<0.03	<0.001	<0.03	<0.001
10	DH-3C	<0.03	<0.001						<0.03	<0.001	<0.03	<0.001
19	BF-2	0.03	0.001						<0.03	<0.001	<0.03	<0.001
21	BF-4	0.72	0.021									
Resplit:												
1	TAMIS-1	<0.03	<0.001						<0.03	<0.001	<0.03	<0.001
Standard:												
PGMS-15		0.40	0.012						0.42	0.012	0.09	0.003
GBM908-14					306	8.92	2.37	3.26				

FA/AA Finish

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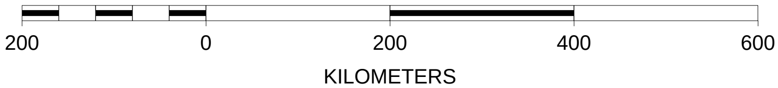
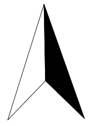
NM/PS
XLS/10

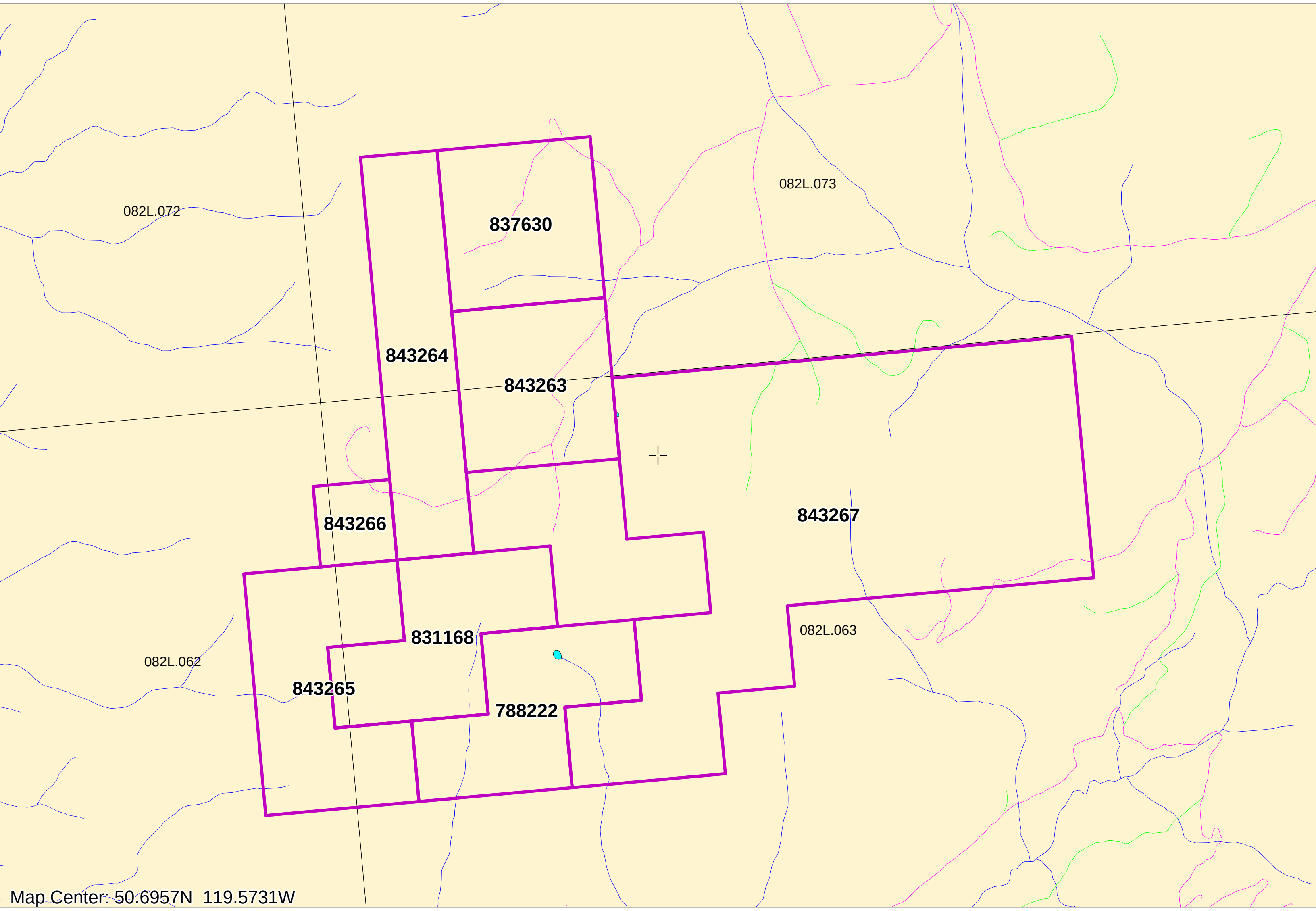
Location

SCALE 1 : 8,206,272





Blackfly Gulch Claim Map



SCALE 1 : 34,980