Geology of the Hope 1 claim, Christina Lake area, southeastern British Columbia
(Tenure No. 502403)

NTS map sheet 082E/01
1:20,000 trim map sheets 082E010, 020
centered at 118º10'1"N, 49º5'37"E

Greenwood Mining Division

by
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February 12, 2006

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Introduction

The Hope 1 claim (tenure no. 502403) comprises 25 cells, covering an area of approximately 528.8 hectares (5.3 square kilometers) in the Christina Lake area of southeastern British Columbia (Figure 1). The claim is within the Greenwood Mining Division. It is 100% owned by Kootenay Gold Inc.

The claim is located 3 to 5 km due east of Christina Lake (trim maps 082E010, 020) and northwest of Sutherland Creek (Figure 2). Access is provided by a well-maintained gravel road that follows the north bank of Sutherland Creek east from the town of Christina Lake. Numerous subsidiary gravel roads provide access to most of the claim.

The area is mountainous, with relief ranging from 680 meters above seal level in the south to approximately 1300 meters in the north. The area is generally heavily wooded although some slopes have large open areas with exposed bedrock and grass cover. Considerable overburden covers much of the area and most rock exposures are generally restricted to road banks.

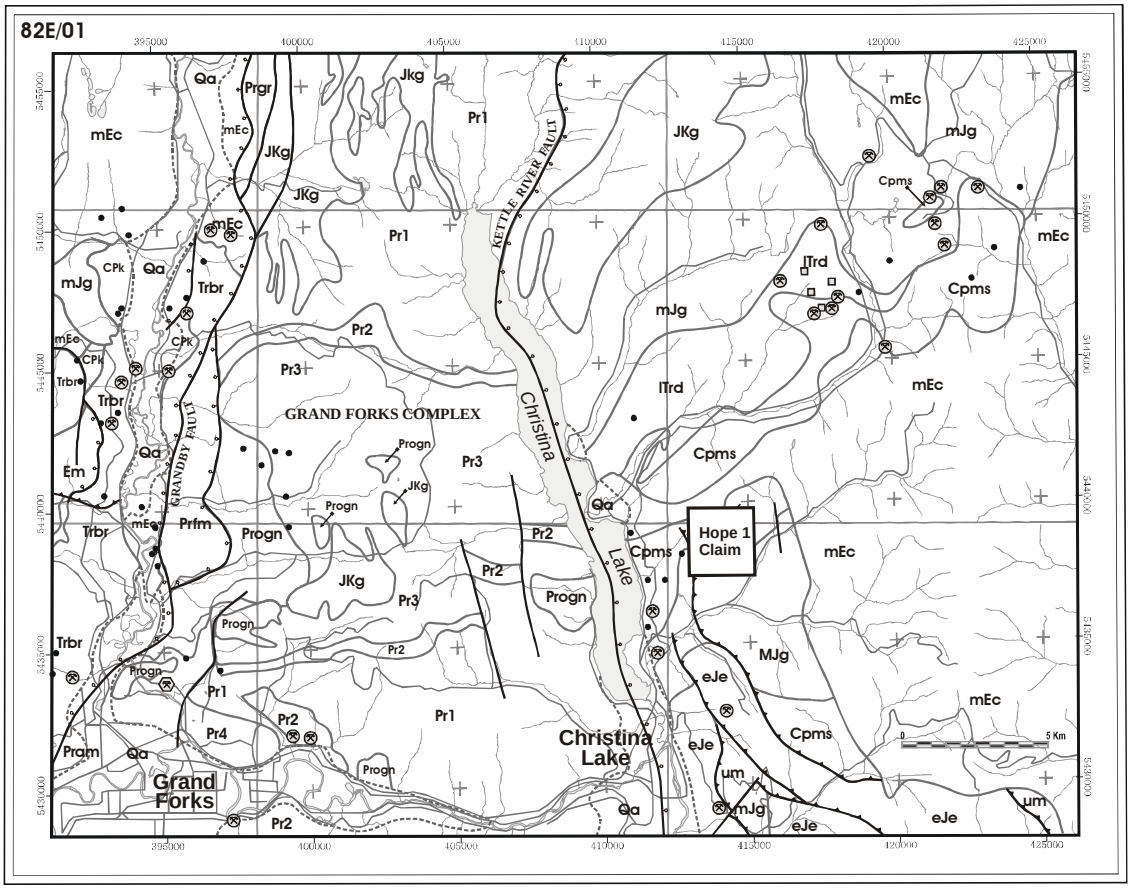
Two days were spent mapping the Hope 1 claim in September, 2005. This report describes the geology of the claim and the Elmore copper occurrence (082ESE095) located near the center of the claim

The claim is centered on the Elmore copper prospect, a massive pyrrhotite – magnetite body that contains dispersed chalcopyrite. Past work on the property has included some open cuts and trenching. The claim area is underlain by a sequence of mixed mafic volcanics and metasediments of the Permo-Carboniferous Mount Roberts Formation, Middle Jurassic granites and granodiorites of the Nelson plutonic suite, and alkaline intrusive rocks of the Middle Eocene Coryell plutonic suite. Several north-trending (thrust?) faults occur along the western edge of the claim and at least one fault, marked by intense shearing and locally mylonite, trends northeast through the claim block.

Regional Geology

The Hope 1 claims are within the Kettle River (east-half) sheet, mapped at a scale of one inch to four miles (1:253,440) by Little (1957). It is included in the 1:250,000-scale compilation by Tempelman-Kluit (1989). This latter work stressed the importance of extensional tectonics throughout southern British Columbia and, within the Grand Forks area, supported a model proposed by Preto (1970) that recognized a Proterozoic core complex, the Grand Forks complex, between extensional normal faults.

The geology of the Grand Forks map sheet (1:50,000 scale) has been published recently by Höy and Jackaman (2005a, 2005b). The Hope 1 claim is in the hangingwall of the Kettle River fault, a north trending extensional fault that marks the eastern boundary of the Grand Forks complex (Figure 1). Acton *et al*. (2002) studied the area east of Christina Lake, focusing on the nature of late Paleozoic basement rocks and several previously unrecognized mafic intrusive complexes. Work by Höy and Jackaman (*op. cit*.) recognized the importance of west-verging thrust faults in this area, a similar



Legend

Cenozoic

Quaternary: Qa - Alluvium, silt, till

Tertiary

mEc Coryell plutonic rocks

Mesozoic

Kgd Cretaceous granodiorite

JKg Jur.-Cret. granodiorite, granite

mJg Mid Jurassic plutonic rocks

eJe Early Jurassic Elise Formation

Trd Late Triassic diorite

Trb Mid Triassic Brooklyn Fm

Paleozoic

CPk Knob Hill Group

Cpa Anarchist Group

um serpentinite

CPms schist, siltstone, calcsilicates, marble

Proterozoic to Paleozoic

Grand Forks Complex

Prfm leucogranodiorite, mylonitic, sheared

Prog granodiorite orthogneiss

Pr4 amphibolite, amphibolite gneiss

Pr3 schist, quartzite, marble, pegmatite

Pr2 quartzite

Pr1 Sillimanite paragneiss, schist, amphibolite

Figure 1: Regional geological map showing location of Hope 1 claim, Grand Forks Map sheet (082E/01); from Höy and Jackaman, 2005

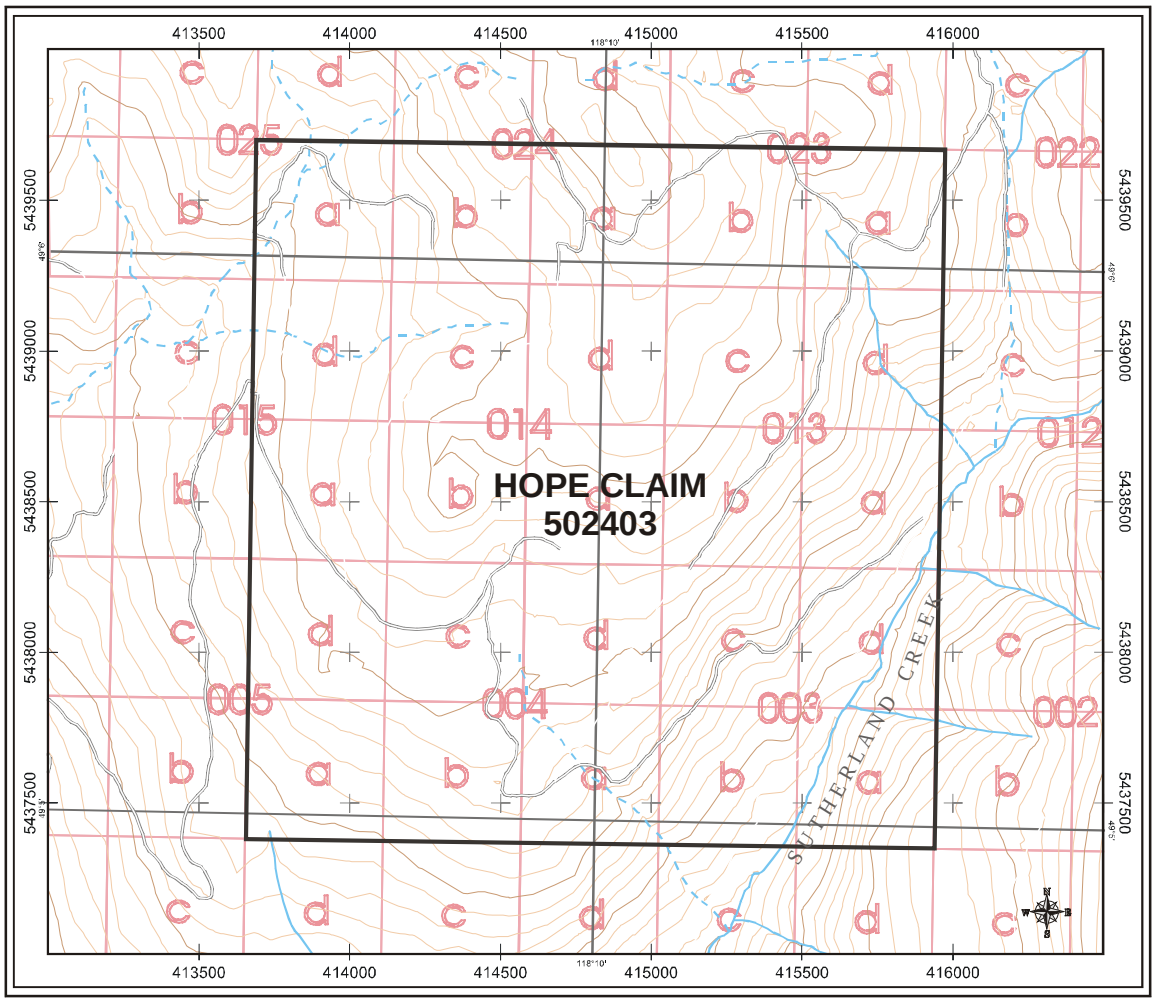


Figure 2: Map showing location of Hope 1 claim, Christina Lake area; see Figure 1 for regional location map and Figure 3 for geology.

structural setting to the Greenwood area where Fyles (1990) mapped a thrust- imbricated late Paleozoic to early Mesozoic assemblage.

Hangingwall rocks of the Kettle River fault (Figure 1) include mainly syenites and monzonites of the Eocene Coryell batholith and granites and granodiorites of the Middle Jurassic Nelson plutonic suite. A granodiorite of probable Cretaceous age intrudes the Nelson granodiorite near the northeast end of Christina Lake. Acton *et al*. (2002) also recognized and mapped a late Triassic diorite body, referred to as the Josh Creek diorite, which intruded Paleozoic metasedimentary rocks of the "Mollie Creek assemblage". It is located just north of Highway 3, north of the Hope 1 claim area. The Josh Creek diorite is intruded by Nelson and Coryell age plutons and has been deformed along with host metasedimentary rocks.

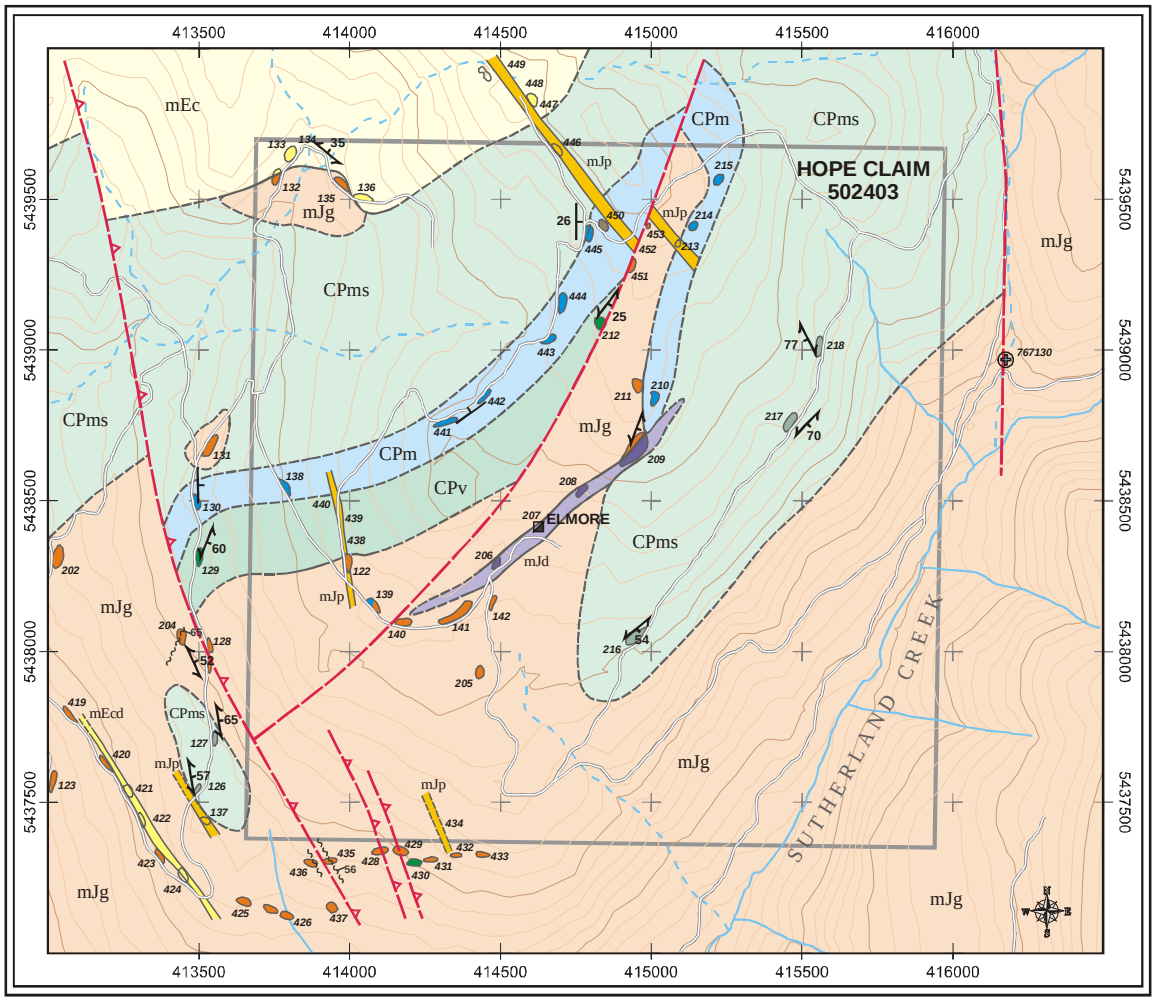
These intrusive rocks cut rocks correlated with the Early Jurassic Elise Formation and with an older Paleozoic metasedimentary succession of siltstone, calcsilicate schists and marbles exposed on the Hope 1 claim area. The age of these latter rocks is not known with certainty, but they are similar to parts of the Carboniferous-Permian Mount Roberts Formation exposed in the Rossland area to the east (Höy and Dunne, 1997) and are, therefore, tentatively correlated with these rocks. Alternatively, as indicated by Tempelman-Kluit (1989), they may be Ordovician to Devonian in age, and may possibly correlate with Lardeau Group rocks of the Kootenay Terrane.

Local Geology

The geology of the Hope 1 claim and immediately surrounding area is shown in Figure 3 (modified from Höy and Jackaman, 2005; Little, 1957). A large part of the area is underlain by medium to coarse-grained hornblende granodiorite and quartz diorite (mJg) of the Middle Jurassic Nelson plutonic suite. The intrusive is typically leucocratic, with some porphyritic phases defined by scattered white feldspar phenocrysts. Most exposures are relatively fresh, though propylitic and sericitic alteration occurs adjacent to the north and northeast-trending faults. Foliation is variable throughout the intrusion, but generally trends north to northwest, roughly parallel to the prominent fault set.

Several north to northwest-trending dykes (mJp) also occur throughout the area. They are typically a few meters to tens of meters wide and can be traced or extrapolated for several hundred meters strike length. They are commonly porphyritic with white subhedral feldspar crystals in a granular, leucocratic matrix. They cut both mJg and host metasediments but have not been observed within the younger Coryell plutonic rocks. Based on these relations, and the similarity with some phases of the middle Jurassic Nelson rocks, they are interpreted to be a late phase of this granitic suite.

Coryell intrusive rocks are exposed along the northern edge of the map area. These rocks are part of a relatively thin neck of Coryell that trends west from the main exposure of the Coryell batholith that dominates the east side of the Grand Forks map sheet. Exposures of the Coryell within the map sheet (Figure 3) are typically coarse grained, dominated by white feldspar and up to 20% quartz and mafics (biotite + hornblende). Superficially they resemble "granite", in contrast to pink syenite that forms a large part of the Coryell batholith. A coarse mafic phase, dominated by amphibole with



GEOLOGY of the HOPE CLAIM

CHRISTINA LAKE AREA,
SOUTHEAST B.C.

Geological mapping by T. Höy, 2005

0 500 1000 m

UTM ZONE 11
TRANSVERSE MERCATOR PROJECTION
NORTH AMERICAN DATUM 1983

Geological base map:
Höy, T. and Jackaman, W. (2005): Geology of the Grand Forks map sheet, NTS 82E/01; B.C. Ministry of Energy and Mines, Geoscience Map 2005-2.

LEGEND

Eocene

- mEc — Coryel pluton: med. to coarse-grained, light grey to white hornblende-biotite syenite; monzonite, monzodiorite.
- mEcd — Diorite.

Middle Jurassic

- mJd — Hornblende diorite, gabbro, amphibolite (age uncertain).
- mJp — Feldspar porphyry, porphyritic granite.
- mJg — Nelson pluton: hornblende granite, granodiorite; medium to coarse grained; massive to porphyritic.

Permian Carboniferous

- CPms — Siltstone, slate, phyllite, argillite, minor calcsilicates, mafic volcanics.
- CPm — Marble, calcsilicate schist; minor argillite, siltstone.
- CPv — Mafic volcanics, volcaniclastics; minor calcsilicates, metasediment.

- thrust fault
- fault (throw unknown)
- geological contact: known, approximate, assumed
- shaft, pit
- bedding attitude
- foliation attitude
- regional silt sample

Figure 3, Geology, Hope 1 claim

biotite, feldspar and minor calcite, may occur along the margin (stations 132, 133). It is possible that the northeast-trending "amphibolite" that occurs at the Elmore showing is a Coryell dyke, but it has been tentatively correlated with the older middle Jurassic Nelson suite.

These plutonic rocks intrude a succession of deformed metasediments and mafic volcanic rocks that are correlated with the late Paleozoic Mount Roberts Formation. The succession generally trends to the northeast, but as described below, may be folded into a relatively tight synform-antiform? pair. Stratigraphic tops are not known, but in general foliation and approximately parallel layering dip to the southeast, and hence more northern units are structurally, and possibly stratigraphically, lower.

A sequence of sericitic schist, siltstone, minor argillite and calcsilicate (CPms) is poorly exposed in the northern part of the area. It is probable that rare exposures of micaceous schist and rusty siltstone along a road northwest of Sutherland Creek (Figure 3) are part of the same stratigraphic package. The northern units are structurally overlain by calcsilicate that grades to massive marble of unit CPm. CPm includes impure diopside marble, banded grey marble, calcsilicate gneiss and minor quartzite. It correlates with thick marble exposures that have been quarried at Fife just north of the town of Christina Lake. A few exposures of mafic volcanic rocks (CPv), comprising mainly basaltic volcaniclastics, are exposed immediately south of the marble unit. These may correlate with mafic volcanic flows and volcaniclastics that are exposed within the Mount Roberts Formation in the Bonanza Pass area 12 to 15 km to the northeast.

Structure

Many exposures of the Mount Roberts Formation are folded into open to relatively tight, outcrop-scale folds. These appear to be syn-metamorphic, with the prominent regional northeast-trending foliation approximately parallel to their axial planes. They appear to correlate with a dominant northeast trending Phase 2 deformation that is described by Acton *et al*. (2002) in rocks farther west. The distribution of stratigraphic units of the Mount Roberts Formation (Figure 3) suggests that they have been folded into a northeast-plunging antiformal structure cored by the mafic volcanic unit (CPmv). A fault-bounded tongue of middle Jurassic "granite" is intruded into the axial zone of the fold. Post-kinematic middle Jurassic dikes (mJp) and the middle Jurassic pluton (mJg) cut this structure and the foliation, indicating deformation is older than middle Jurassic. Farther west, Acton (2000) has shown that these Phase 2 structures cut the Late Triassic Josh Creek diorite, hence constraining deformation between late Triassic and middle Jurassic.

A northeast trending fault, with unknown displacement trends through the central part of the area. It appears to parallel and displace the axial zone of the Phase 2 fold and cut the Middle Jurassic Nelson intrusion. It is marked by prominent gouge near station 140.

A north-northwest trending fault occurs along the western edge of the map area. It is marked by a wide zone of shearing, gouge and locally mylonite that dips moderately to steeply east. Based on structural overlaps and correlations with faults to the east (Höy

and Dunne, 2001) and west (Fyles, 1990), this fault is interpreted to be a thrust. It is younger than Phase 2 deformation and the middle Jurassic plutonic rocks. It is interpreted to cut middle Eocene Coryell rocks in the north part of the map area (Figure 3) and if this is correct, thrusting must by syn to post Eocene in age. Many of the dikes in the area parallel the general trend of this fault, raising the possibility that these are Coryell dikes rather than Middle Jurassic Nelson dikes.

Mineralization

The Elmore showing (Minfile no. 082ESE095) is the only important mineral occurrence within the Hope 1 claim. It is exposed in several pits on both sides of a gravel road on the slopes northwest of Sutherland Creek.

Past work on the property has included several open cuts and pits, probably dating back to the early 1900s (B.C. Ministry of Energy and Mines, Annual Report 1921, page 181). Regional soil geochemical programs and ground magnetometer surveys were done on these and surrounding claims in 1969 and 1971 (Kermeen, 1969; Scott and Somerville, R.D., 1971). There is no recorded work since 1971.

The showings are poorly exposed and determination of trends and extent of mineralization is difficult. They comprise massive pyrrhotite and magnetite with variable chalcopyrite and appear to trend approximately east-west to possibly northwest. At the western showing (Figure 3), two pits approximately 20 meters apart indicate a strike length of at least 20 meters and a width of at least 10 meters.

Mineralization comprises massive, coarse grained pyrrhotite, magnetite, variable chalcopyrite and patchy pyrite in a massive amphibolite (mJd) host. The amphibolite is locally brecciated and typically rusty-weathering, but does not appear to be altered to skarn mineral assemblages. The massive oxide-sulphide unit is locally veined with quartz and intensely brecciated.

Analyses of two grab samples of the massive oxide-sulphide unit are given in Table 1 below. Both samples contain relatively high copper (0.65% and 0.41%) but low silver, gold, lead and zinc content.

sample	utm E	utm N	Mo	Cu	Pb	Zn	Ag	Ni	Co	Mn	Fe %
207a	414646	5438437	1.1	6503.1	18.7	54	2.7	10.5	156.1	238	20.5
207b	414646	5438437	1.1	4076.8	3	41	1.6	10.7	122.6	310	26.01

Table 1: Analyses of two hand samples from a pit at the Elmore (082ESE095) mineral occurrence. All values except Fe are in ppm. Analyses by Acme Analytical Laboratories Ltd., 852 W. Hastings Street, Vancouver, file A500208. Analysis: GROUP 1DX - 15.0g.

It is probable that the massive magnetite-pyrrhotite-chalcopyrite unit is an iron-copper endoskarn developed in the amphibolite unit. Marble and calcsilicate gneiss exposed to the northeast suggest that marble may also underlie the showing. Small

occurrences of marble are preserved within unit mJg to the southwest at approximately the same distance (150 meters) south of the intrusive-metasediment contact.

Several skarn occurrences were noted elsewhere on the Hope 1 claim, most notably north of the Elmore occurrence where unit CPm unit is intruded by the middle Jurassic intrusion (mJg). These were typically garnet-diopside skarns with variable pyrite or pyrrhotite content.

Summary

Massive magnetite-pyrrhotite-chalcopyrite is locally developed within amphibolite and "granite" that intrudes a marble – calcsilicate gneiss succession of the Permo-Carboniferous Mount Roberts Formation. Exposures of the mineralization are largely restricted to several pits; their extent and orientation are not known. It is probable that these are endoskarns; alternatively, it is possible that they are massive sulphide-oxide veins although the low gold content distinguishes them from the massive sulphide veins that host mineralization in the Rossland gold camp to the east.

Based on mapping of the Hope 1 claim, the geological history is summarized below.

1. Pre middle Jurassic: folding of Permo-Carboniferous Mount Roberts Formation
2. Middle Jurassic: intrusion of Nelson-age granites to quartz diorites and younger related dikes.
3. Probable related skarn alteration and mineralization.
4. Post Middle Jurassic plutonism: northeast-trending brittle faulting.
5. Intrusion of Middle Eocene alkalic rocks of the Coryell suite
6. West to southwest-verging thrust faulting.

References

Acton, S.L. (2000): Quesnel terrane near Christina Lake, southeastern British Columbia; MSc. thesis, *University of Calgary*.

Acton, S.L., Simony, P.S. and Heaman, L.M. (2002): Nature of the basement to Quesnel Terrane near Christina Lake, Southeastern British Columbia; *Canadian Journal of Earth Sciences*, volume 39, pages 65-78.

B.C. Ministry of Energy and Mines (1921): Shamrock Group, Christina Lake; Annual Report 1921, page G181.

Fyles, J.T. (1990): Geology of the Greenwood-Grand Forks area, British Columbia; NTS 82E/1,2; *B.C. Ministry of Energy, Mines and Petroleum Resources*, Open File 19.

Höy, T. and Dunne, K.P.E. (2001): Metallogeny and mineral deposits of the Nelson-Rossland map area; *B.C. Ministry of Energy and Mines*, Bulletin 109.

Höy, T. and Jackaman, W. (2005a): Geology of the Grand Forks map sheet, NTS 82E/01; *B.C. Ministry of Energy and Mines*, Geoscience map 2005-1, scale 1:50,000.

Höy, T. and Jackaman W. (2005b): Geology and mineral potential of the Grand Forks map sheet (082F/01), southeastern British Columbia; *B.C. Ministry of Energy and Mines*, Geological Fieldwork 2004, Paper 2005-1, pages 225-230.

Kermeen, J. (1969): Cannonball, FFC, Messenger, Prize claims, Greenwood Mining Division; *B.C. Ministry of Energy, Mines and Petroleum Resources*, Assessment Report 2371.

Little (1957): Kettle River, British Columbia; *Geological Survey of Canada*, Map 6-1957.

Preto, V.A. (1970): Structure and petrology of the Grand Forks Group, British Columbia; *Geological Survey of Canada*, Paper 69-22, 80 pages.

Scott, J.S. and Somerville, R.D. (1971): FFC claims, Greenwood Mining Division; *B.C. Ministry of Energy, Mines and Petroleum Resources*, Assessment Report 3054.

Tempelman-Kluit, D.J. (1989): Geology, Penticton, British Columbia; *Geological Survey of Canada*, Map 1736A, scale 1:250,000.

STATEMENT OF COSTS

Field mapping (T. Höy)	$1000.00
Field assistant	300.00
Field expenses:	
Meals and accommodation:	158.00
Vehicle rental / expenses	255.00
Transportation to field	74.00
Report preparation / filing	1200.00
Drafting / reproduction	428.00
Management (15%)	584.00
Total:	$4477.00

STATEMENT OF QUALIFICATIONS

I, Trygve Höy, PhD., P. Eng. do hereby certify that:

1. I attained the degree of Doctor of Philosophy (PhD) in geology from Queens University, Kingston, Ontario in 1974.
2. I have an MSc. in Geology from Carleton University, Ottawa, Ontario (1970), and a BSc. in Geology from the University of British Columbia (1968).
3. I am a member of the Association of Professional Engineers and Geoscientists of BC. and a member of the Society of Economic Geologists.
4. I have worked as a geologist for a total of 31 years since my graduation from university, 27 years as a project geologist with the B.C. Geological Survey Branch and 4 years as an independent consulting geologist.
5. I spent two days geologic mapping the Hope 1 claim area.
6. I am responsible for the preparation of this report entitled: **Geology of the Hope 1 claim, Christina Lake area, southeastern British Columbia**, dated February 12, 2006.

Dated this 12th Day of February, 2006.

Trygve Hoy