600149

HANNA GOLD MINES LIMITED

Cassiar B. C.

Jim Mackie

April 4, 1964

CONTENTS

HANNA GOLD MINES LIMITED - Cassiar B. C.

Location

Hanna Gold Mines Limited has a gold prospect, consisting of the Copco and Liz groups, totalling seventy-seven claims, Cassiar district, Liard Mining Division. The claims are four miles east of Cassiar on the eastern slope of Qartzrock Creek.

History

This property was originally staked as the Cornucopia group in 1935. In 1946, Benroy Gold Mines Ltd. bought the claims and initiated an extensive trenching and diamond drilling program. No commercial deposit was found and the claims were allowed to lapse. J. Copeland and J. Coutre restaked the property in 1960. During the summer of 1960, 25 tons of vein material of unstated grade was treated in a Gibson self-amalgamating mill. Cornucopia Explorations Ltd. which subsequently changed its name to Hanna Gold Mines Ltd. acquired the property in late 1960.

Up to July 1963, Hanna Gold Mines had completed 2,500 ft of drifting and crosscutting, 1,200 ft of underground diamond drilling, and some surface stripping.

Mineralogy

Representative rock samples from 21 (?) zones of the mine were studied. Most of the specimens were quartz containing small amounts of pyrite, arsenopyrite, sphalerite, tetrahedrite, chalcopyrite, calcite and tourmaline. A few samples contained small irregular masses of free gold. The remainder of the specimens were wall-rock, an altered andesine flow. Eleven polished sections and several thin sections were studied to determine textural relationships between the minerals. Without a drift and crosscut plan it has been impossible to correlate the mineralogy from one zone to another.

Most of the minerals occur in quartz veins, varying in width from 6 in. to $3\frac{1}{2}$ ft. Emplacement of the veins was controlled by joints striking N 60° E to S80°E and dipping steeply to the south.

Megascopic Descriptions

(a) Wall-rock: The wall-rock is an altered, medium grey andesine. It usually contains euhedral pyritohedrons of pyrite up to 2 mm in diameter. Arsenopyrite accompanies the pyrite in some zones. Some specimens have a schistocity caused by shearing.

(b) Quartz: Quartz comprises about 95% of the vein material It is massive with numerous cavities lined with euhedral crystal faces. The cavities are generally 1 to 2 mm. wide, but may be as wide as ½ inch. Generally, quartz has a sharp contact with the wall-rock. Some quartz has been highly fractured by shearing stresses. Quartz has altered to sericite in one spot.

(c) Pyrite: Pyrite occurs as: euhedral crystals up to 2 mm in diameter in the wall-rock, bands ⅛ to ½ in. wide in the quartz paralleling the vein wall, and as isolated euhedral crystals up to 4 mm in diameter in the quartz. Pyrite and the other minerals are usually found close to the vein wall. Bands of pyrite are composed of anhedral to euhedral crystals, varying from .2 to 2 mm in diameter. Arsenopyrite may be present.

(d) Arsenopyrite: Arsenopyrite has a similar habit as pyrite; euhedral crystals in the wall-rock, bands in the quartz, and filling small fractures in the quartz. There seems to be a deficiency of pyrite when arsenopyrite is present. Rhombic crystals of arsenopyrite are generally 0.2 to 0.8 mm long and are occasionally twinned.

(e) Tetrahedrite, Sphalerite, Chalcopyrite: These minerals are rare in the specimens. They occur either together or indivually as irregular masses up to ¼ in. long. They are usually associated with pyrite or arsenopyrite, appearing to fill cavities or fractures in the quartz.

(f) Gold: Gold either fills small fractures or cavities in the quartz. All gold observed was closely associated with pyrite.

(g) Tourmaline: Tourmaline is present in a few specimens as euhedral crystals up to 2 mm long in the quartz. One specimen contained a massive tourmaline vein $1\frac{1}{2}$ in. wide.

(h) Calcite: Calcite occurs as minute crystals lining some cavities in the quartz and as small irregular veins up to 1 in. wide; sometimes calcite forms veins with quartz.

(i) Jasper: One piece of jasper associated with pyrite was observed.

Microscopic Descriptions

(a) Wall-rock: The wall-rock is composed of laths of feldspar, and irregular masses of quartz and calcite. Some of the feldspars have altered to sericite. Small irregular masses of pyrite are peppered through the wall-rock. The rock has been silicified and carbonatized.

(b) Quartz: Massive in all sections except one , where a few crystal faces were in contact with tetrahedrite. Most of the quartz is highly fractured.

(c) Pyrite: Pyrite bands are bounded by crystal faces 200 to 300μ long. Within the bands the pyrite is massive and has been highly fractured. Some of the fractures have been filled with quartz. In two sections, euhedral crystals of arsenopyrite, 100 to 150μ long were observed in the massive pyrite. Some gold was associated with the fractured pyrite.

(d) Arsenopyrite: Arsenopyrite veinlets are composed of fractured subhedral to euhedral crystals, 150 to 200μ long, surrounding highly fractured massive cores. Some fractures have been filled with quartz.

(e) Sphalerite: Sphalerite contains small exsolution bodies of chalcopyrite (20 to 30μ in diameter)) and small irregular veinlets of chalcopyrite and tetrahedrite. Sphalerite has been highly fractured.

(f) Tetrhedrite: Some specimens of tetrahedrite have been cut by irregular veinlets of chalcopyrite(40 to 150μ wide) and quartz (100 to 300μ wide) .

(g) Chalcopyrite: Chalcopyrite occurs as massive material with no inclusions, ~~or~~ as veinlets in tetrahedrite, or sphalerite, and exsolution bodies in sphalerite.

(h) Gold: Gold fills fractures in quartz and pyrite. Grain size is generally 100 to 400μ in mean diameter, however finer grains may be as small as 10μ.

(i) Tourmaline: The tourmaline vein has a matrix of anhedral calcite crystals; whereas the remaining tourmaline has a quartz matrix.

Texture

Irregular blebs (20 to 30μ wide) and aligned rods (2μ by 10μ) of chalcopyrite are exsolved in sphalerite. Some boundary features are shown in figures 1 to 5 at the end of the report.

Mineral Abundance

Quartz constitutes about 95% of the vein material with the remainder metallic minerals. Pyrite (~80%) and arsenopyrite (~20%) are the dominant sulphides. Sphalerite, chalcopyrite, tetrahedrite, gold, tourmaline and calcite are present in trace amounts.

Paragenesis

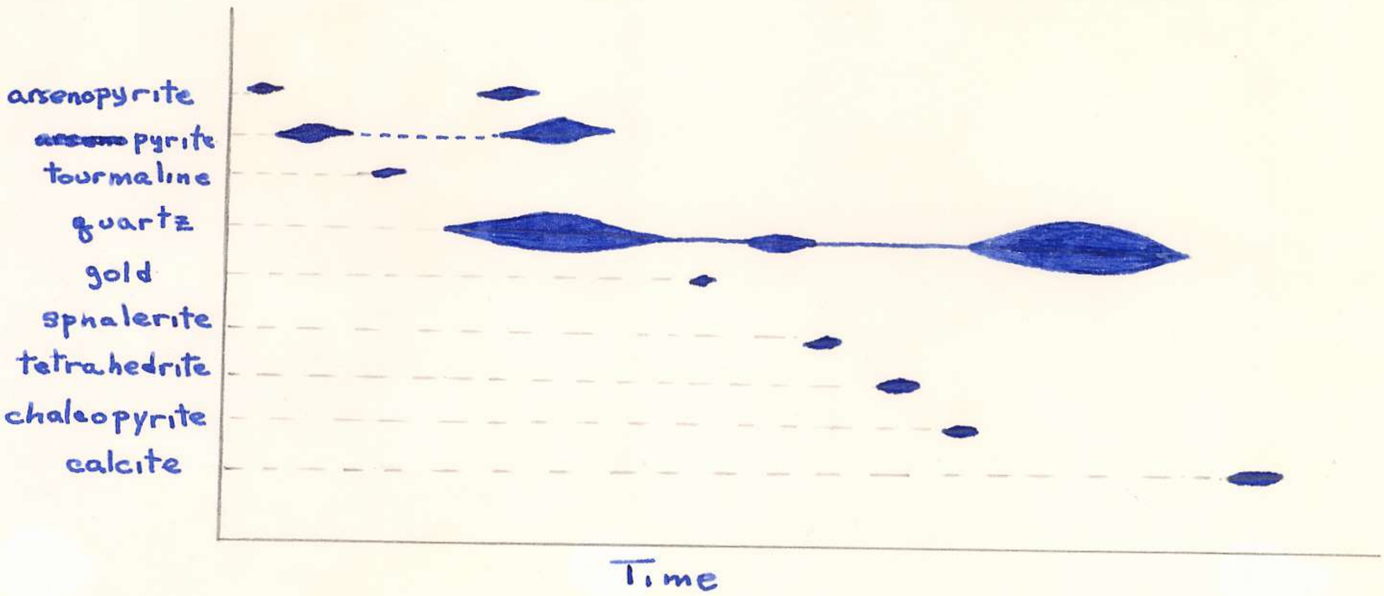
It is quite apparent from the hand specimens that the mineralogy and order of crystallization changes from vein to vein. However the paragenic sequence below seems to be applicable to most of the zones studied. In some zones some of the minerals are not observed.

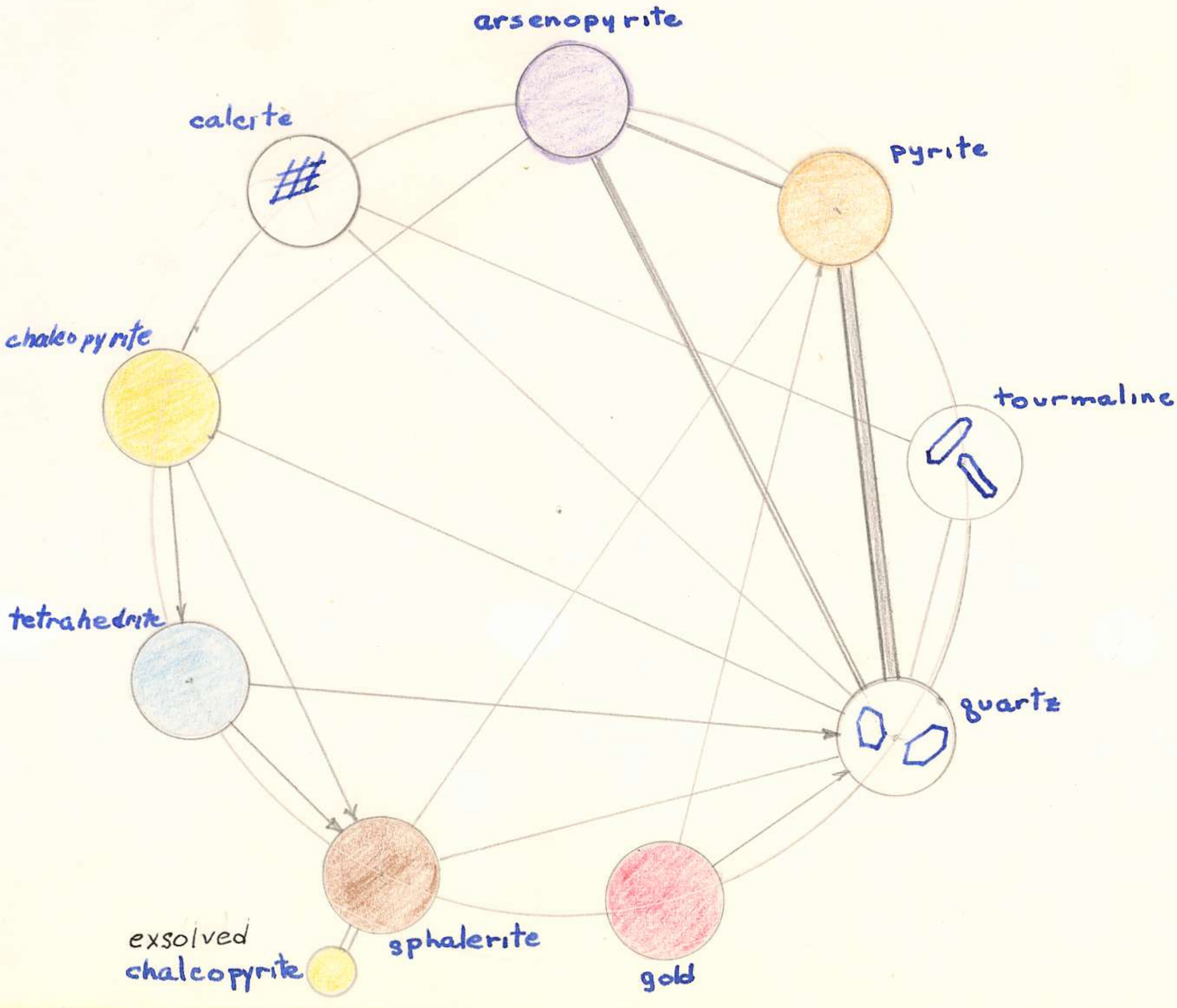
A minor amount of arsenopyrite followed by a larger quantity of pyrite were deposited in the wall-rock first. Some of the pyrite formed encrustations on the vein walls. Tourmaline was probably the next mineral to crystallize, followed by quartz which continued to crystallize until after the metallic minerals had been deposited. Some of the quartz seems to have permeated the wall-rock. Arsenopyrite followed by pyrite appear again in the form of bands and isolated crystals in quartz. Gold was the next mineral to crystallize, filling fractures in quartz and pyrite or forming encrustations on cavity walls. Next to crystallize was sphalerite closely followed by tetrahedrite and chalcopyrite. The final mineral to appear was calcite.

Type of Deposit

The deposit seems to be a high level, high temperature emplacement. Exsolution of chalcopyrite in sphalerite suggests a deposition temperature of 450° C. However the presence of arsenopyrite and tourmaline indicate a depositional temperature around 550° C. Because the veins attitude is apparently controlled by jointing, the veins were emplaced at a relatively high level.

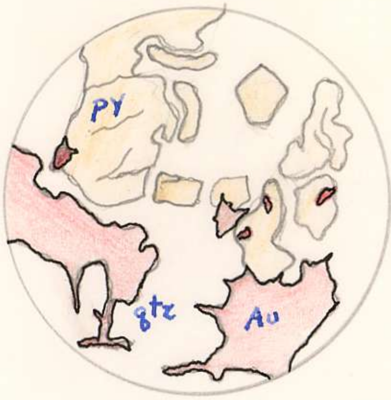
PARAGENIC SEQUENCE





POLISHED SECTIONS

med power.

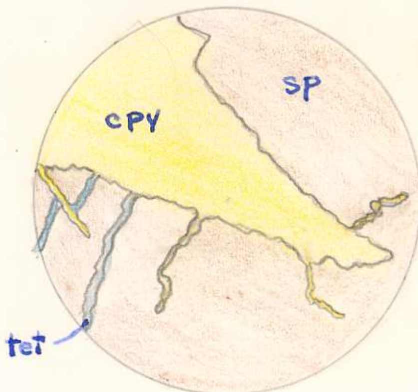


Gold (red) filling fractures in quartz (white) and pyrite (orange).

0 500µ 1000µ
SCALE

Fig. 1

low power

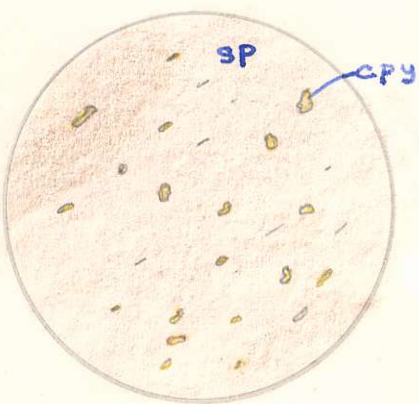


Sphalerite (brown) veined by tetrahedrite (blue) and chalcopyrite (yellow).

0 1000µ 2000µ
SCALE

Fig. 2

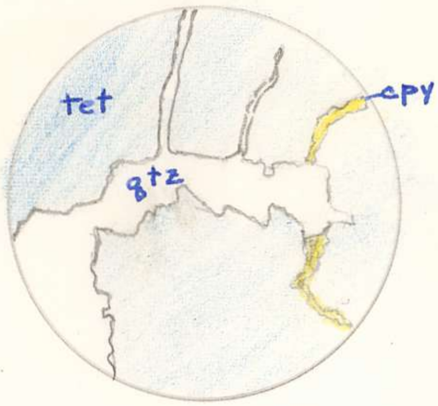
hi pow cpy in sp
12µ x 2µ
30
20-30µ masses



Exsolution bodies of chalcopyrite (yellow) in sphalerite (brown).

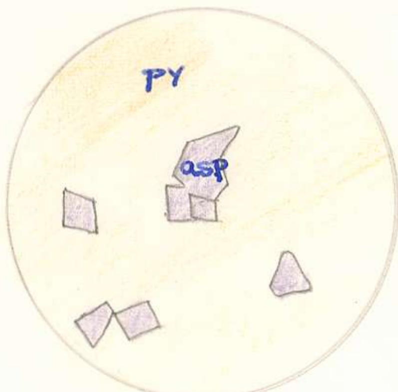
0 125µ 250µ
SCALE

Fig. 3



Tetrahedrite(blue) veined by quartz(white) and chalcopyrite(yellow).

Fig. 4



Arsenopyrite crystals(purple) in massive pyrite(orange).

Fig 5

SCALE

Bibliography

(1) Gabrielse, Hubert, McDame Map-Area, Cassiar District, British Columbia, GSC Memoir 319, 1963.

(2) Annual Report, Minister of Mines and Petroleum Resources, British Columbia, '46, '47, '60, '61, '62.

(3) Survey of Mines, The Financial Post, 1964, p84.