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REPORT

ON

HIGHLAND VALLEY
RECONNAISSANCE

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NICOLA AND KAMLOOPS

MINING DIVISION

S. H. PILCHER

HIGHLAND VALLEY RECONNAISSANCE

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PURPOSE

Ten days were spent in examining several properties in the Highland Valley area, the purpose being to become familiar with the general geology and rocks in the region and to gather data concerning the character and controls of the known mineralization and associated alteration.

HIGHMONT - GNAWED MTN. AREA

The Highmont camp is at present unoccupied, however permission was obtained from Vancouver to visit the property. The underground workings consist of a 1000-foot adit driven nearly due south. From its end a cross tunnel has been driven approximately 175 feet to the west. The entire workings are in the Skeena quartz diorite just to the north of a large northwest-trending dike of Bethsaida quartz diorite.

Copper mineralization is confined primarily to hairline fractures which trend both N.20°W. and N.60°-80°E. Molybdenite is present but does not seem to be directly associated with the copper. It occurs mostly in one-half to one inch quartz veins and as black smears along narrow slips.

A strong greenish alteration occurs around the larger faults and in areas of loose, blocky ground. The coloration is due to chlorite and green sericite. This alteration is similar to that at Lornex but is not nearly so extensive. Underground it does not appear to have any direct correlation with the mineralization. The large faults and blocky ground where this alteration is best developed are generally barren. The mineralization occurs in relatively fresh rock with the chlorite-sericite alteration extending only a few tenths of inches away from individual mineralized fractures. The best mineralization seems to occur in areas where the rock is pink in color, suggesting a possible correlation between mineralization and K-spar metasomatism.

Gnawed Mountain lies south and east of Highmont and has been explored by Anaconda. The ground is presently held by Trojan Consolidated. Rock exposure is fair and the area has been trenched extensively. The dike of Bethsaida and its associated breccias and porphyry trends N.W. - S.E. across Gnawed Mountain.

Weak mineralization is exposed over most of the western peak. At least part of the mineralization is in quartz veins and fractures trending N.20°W. Strong fracturing also follows N.40°E. and E.-W. directions. On top there is one drill hole labelled A-1, 705 feet, -45°, on bearing N.20°E. The breccia in this area is barren and consists of angular fragments of Bethsaida cemented by tourmaline and fine-grained quartz feldspar. The eastern peak is generally barren though quartz veins and fractures trending N.30°W. and N.50°E. are fairly well developed. Even though the fracturing persists, the mineralization appears to die out towards the east.

GAZA

The Gaza property lies northeast of Gnawed Mountain just east of the Sheba property. H. B. Hatch is the present owner.

The main purpose of examining this property was to see if the Skeena older Guichon contact was present here and if so whether any mineralization was indicated along the contact. It was found, however, that the property is entirely in older Guichon rocks, the Skeena contact, therefore, lying to the west on Sheba ground.

The one showing on the Gaza consists of a N.80°E. trending zone of quartz veins and fractures carrying bornite. The zone is about 50 feet wide and has been exposed in trenches over a strike length of about 800 feet. Sheba has two claims within the Gaza group which cover the eastern part of the zone.

Within the zone are one or more sections of high grade, confined to areas of concentrated quartz veining. The mineralization in the eastern-most trenches is much weaker. Four holes were drilled into the zone in 1964.

Rock alteration along the zone is prominent, consisting of K-feldspar metasomatism which can be recognized up to 15 feet from the mineralization. Another interesting alteration product is a pink zeolite (heulandite?) filling fractures within the area of K-spar metasomatism. Epidote veining is also evident.

JERICHO

This property, lying east and northeast of Gaza, is also owned by H. B. Hatch. It has been optioned by various companies including Phelps Dodge, Canadian Superior, and Bio Metals.

The property is underlain entirely by older Guichon rocks. The underground workings consist of a lower "production adit" driven southwest for about 1500 feet and an upper adit driven N.85°E. for about 900 feet and located near the vertical projection of the south end of the lower adit. The ground in the vicinity of the upper adit has been thoroughly drilled. The lower adit is unsafe and could not be examined.

Throughout the length of the upper adit are numerous quartz veins (up to six-inch width) and fractures carrying bornite. Almost all of these trend N.30°-60° west and dip 60-70° northeast. Many of these curve into a more westerly strike on the south wall of the adit, suggesting horsetails or tension fractures related to an E.-W. structure. Again K-spar and pink zeolite is present. Green chlorite-sericite is also present immediately adjacent to some of the larger veins.

A second showing, known as the Bornite Ridge showing, is located on the Jericho property about one and one-half miles southwest of the main showing. It consists of a 10-foot zone of fracturing and quartz veining striking about N.60°E. and dipping 15° northwest. The quartz veins, some up to six inches in width, carry bornite. The zone is exposed down-dip for about 100 feet. Bedrock has not been exposed in any of the trenches along strike. Pink K-spar and epidote are present within the zone. Some quartz veins have outer rims of K-spar. Also present are narrow seams of green chlorite-sericite.

ALWIN

Alwin Mines is presently exploring in the vicinity of the old O.K. Mine. Mr. Albert Wells is the manager of the program, and Mr. Webb Cummings is geologist. Over 20,000 feet of diamond drilling have been done so far. At present they are driving a tunnel parallel and south of the main east-west structure. This tunnel is being used for drilling north into the main zone. A crosscut will also be driven north into the zone at about 900 feet from the portal. The present developed length is about 800 feet.

The workings are entirely in Bethsaida granodiorite. Two major structural directions are evident underground, N.25°E. and N.80-90°E. Both seem to be equally well developed though the northeast direction is later than the east-west set. Both sets carry: (1) quartz-chalcopyrite veins, (2) quartz-calcite-pyrite veins, (3) quartz-chalcopyrite-molybdenite veins,

(4) quartz-molybdenite veins, and (5) gougy black slips with molybdenite smears. Most of the molybdenite seems to occur as these smears and shows no direct relation to the copper.

Again an outer zone of K-spar and pink zeolite is developed. Green chlorite-sericite alteration is present immediately adjacent to the veins.

Core from the main zone shows a compact mass of intergrown sericite, chalcopyrite, and bornite. All other original constituents of the rock have been destroyed. The transition from this rock to relatively fresh Bethsaida is amazingly abrupt (providing no core is missing). The adjacent Bethsaida shows only a slight development of K-spar.

The main zone is open on both ends. To the east are the old stopes of the O.K. mine. Part of this section has been drilled. Deep overburden is present in the area west of the portal. This ground is of interest because the Skeena contact passes through this area in a north-south direction and would intersect the westward projection of the mineralization.

STELLAKO

The Stellako property joins Jericho to the southwest and includes the area around and southwest of Roscoe Lake. Noranda in 1965 put up money for mapping, geochemical and I.P. surveys over most of the property. Some twenty-one holes were drilled in the area of the main showing.

The showing consists of a north-northeast trending zone of fracturing, quartz veining, and strong alteration. Most of the mineralization is confined to the quartz veins, some of which form lenses up to three feet thick with massive bornite and chalcopyrite. The zone is about 60 feet wide and has been traced by trenching and drilling about 1000 feet along strike. The drilling has shown the mineralized sections within the zone to be narrow and erratic. Some three-foot sections assayed up to 4% copper. One 40-foot section assayed 1.4% copper.

The mineralization occurs both in Bethsaida and in aplite and appears to be related to the contact between these two rock types. The aplite forms an irregular dike-like mass which is exposed to the east of the Bethsaida in most trenches. East of the dike a coarse-grained rock termed "Stellako Granite" is exposed. This appears to be an altered Bethsaida.

Intense green chlorite-sericite alteration extends along the length of the zone, attaining widths of up to 200 feet. This alteration has affected the aplite as well as the Bethsaida. K-spar rich rubble in some eastern trenches may indicate an outer alteration zone.

Soil samples were collected at 50-foot intervals along east-west lines spaced 200 feet apart. Copper values range from 25 to 600 ppm. with threshold being at about 75 ppm. The higher values (>75 ppm.) have a sporadic distribution and indicate no particular trends or well defined anomalous zones. A few very high values (>200 ppm.) occur in the general vicinity of the showing but surprisingly the samples taken immediately adjacent to the showing are generally low.

Results of the I.P. work (done by McPhar) were negative. Weak responses in the vicinity of the showing were interpreted as indicating a shallow high grade zone. These results discourage further work in the central part of the property.

Only the extreme northeast and southwest sections remain untested. A determination of the location of the Bethsaida-Skeena contact and an air photo lineament study would be helpful in determining the potential of these two areas. It should be noted here that there is some question as to whether the rocks at the showing are Skeena or Bethsaida. To the writer and to the Noranda people the rock appears to be Bethsaida but Dr. Carr has called it Skeena. In some areas these two rock types are difficult to distinguish, expecially where the Bethsaida exhibits chilled and finer grained margins adjacent to the Skeena contact.

T.C.

The T.C. property lies near the western edge of the Guichon batholith, surrounding Pimainus Lake, with one section extending two miles north and another one and one-half miles south of the lake. The entire claim group has been covered by I.P. (Seigel), mag., and geochem. (silt samples only). Trenching and percussion drilling has been done on the northern group.

The I.P. results were negative and Dr. Seigel concluded that the property does not warrant further expenditure. Dr. Skerl, however, interprets the data to indicate two minor I.P. anomalies trending north-northeast. These do not appear to be significant.

The copper values in silts range from 25 to over 9,000 ppm. Because of the variability of the drainages sampled (swamps, dry streams, flowing streams), the results can be said to do nothing more than indicate the presence of mineralization in the area.

The mag. results indicate two north-northwest trending lows which generally correspond to topographic depressions. These magnetic lows extend along strike for several miles.

Four east-west trending trenches spaced about 200 feet apart in a north-south direction have been cut in the eastern-most anomaly in the vicinity of line 50 N. These expose Bethsaida which is cut by a few narrow quartz stringers carrying minor bornite and chalcopyrite. At least part of these stringers trend N.10°W., parallel to the anomaly. The rock exhibits very slight chlorite-sericite alteration. Northward for 2,000 feet scattered trenches in the general vicinity of the mag. low also expose Bethsaida weakly altered along a few narrow zones of north trending fractures and quartz stringers. These contain only traces of copper.

Seven holes drilled across this mag. low on line 60 N. confirm the presence of only weak mineralization. Assays averaged less than 0.1% copper. To the south on line 15 N., of nine holes drilled across the same anomaly, only one reached bedrock, indicating that the anomaly may be at least partly due to overburden. The one hole which reached bedrock contained only traces of copper.

On line 70 N. about 1,200 feet west of the eastern mag. anomaly, two outcrops, one of Skeena and one of Bethsaida, locate the contact. A 10-foot zone of Skeena at the contact exhibits weak chlorite-sericite alteration. No mineralization is evident. On the same line another 800 feet to the west the western-most mag. anomaly is expressed by a broad valley. Moderately chloritized Skeena crops out on the east side of the valley and relatively fresh older Guichon crops out on the west. The mag. low, therefore, may be in part due to alteration in the Skeena along the contact zone. Overburden along the stream valley and/or high mag. values in the older Guichon rocks on the west may also be the cause of this anomaly.

All lines have been cut with a cat and a fair amount of bedrock has been exposed along them. The overall impression is one of narrow scattered zones of weak alteration and mineralization. Most Bethsaida exposed is relatively fresh. The very weak mineralization exposed and the negative I.P. results discourage any further work on this property.

DEB CLAIMS

This group of claims, owned by R.B. Stokes, lies about four and a half miles south of Lornex and includes most of the ground formerly held by Rio Tinto. The group covers an area on either side of Skuhost Creek.

The slopes extending back from either side of the creek are almost entirely covered by overburden which appears to be quite deep. Most outcrop occurs in the bluffs immediately adjacent to the creek, consisting of medium to coarse grained Bethsaida.

No exploration work has been done on the property. The main attractions are several north - northwest-trending lineaments, along and west of Skuhost Creek, which project northward into the Lornex area, strong northeast-trending lineaments which offset Skuhost Creek, and the possible presence of a north trending Bethsaida-Skeena contact near the west edge of the property. During road building on the south end of the property one of the north - northwest lineaments was cut and found to be a weakly mineralized fault zone. Stokes also reports mineralized float in Skuhost Creek near the north end of the property and weak disseminated mineralization from an outcrop of finer grained material (Skeena?) on the northwest part of the claim group.

The writer traversed the property on the east side of Skuhost Creek northward from the fault-road intersection mentioned above to the north end of the group. The only outcrops seen were those of fresh Bethsaida in the vicinity of the creek. Elsewhere the rock is either deeply weathered or covered. At the north end of the property a strong northeast lineament crosses Skuhost Creek and offsets it. The Bethsaida here is fairly well exposed, showing a weak alteration and bornite mineralization along small north - northwest-trending fractures and quartz stringers. The alteration is characterized by a weak development of K-spar, pink zeoloite, and epidote. Within the area of weak alteration is a 50-foot fault with fairly intense chlorite-sericite alteration and containing traces of bornite. This appears to be on the same lineament cut by the road several miles south.

A second traverse was run for about one mile west of Skuhost Creek, however, no contact zone nor any outcrop was apparent. According to Dr. Carr a map filed by Rio for assessment purposes in 1966(?) shows the contact to be slightly west of the Deb group. Rio did I.P. work along the contact.

The northwest trending lineaments east of Skuhost Creek are weakly mineralized, where exposed, including the area around an intersection with a major northeast trending lineament. In view of our present knowledge concerning possible controls of mineralization there is no reason to suspect that they might be better mineralized in areas not exposed. The only possible way of determining this would be a fairly costly I.P. survey.

The location of the contact in the western section needs to be determined before the possibility of a mineralized contact zone is evaluated. If Rio has actually examined the contact zone by I.P., no further work would be warranted there, no matter whose ground it is on.

The property is worth two to three days more of examination in this supposed contact area and perhaps along some of the other lineaments east of the creek. Before this, however, an effort should be made to obtain a copy of the Rio Tinto map.

BENSON

This group lies due north of and adjoining the Deb group. It is immediately south of Lornex. Some trenching and drilling are reported to have been done though the results are not available.

This property was only very briefly examined. Weak alteration was found where the Cris-Lornex road crosses Skuhost Creek and two miles to the south where the creek is offset by a northeast lineament. Because of its proximity to Lornex and its location along the same north trending structure, the property warrants several more days of examination.

SOUTH ORO

The south Oro ground lies southwest of the northern part of Chataway. In the west central part of the claims six trenches, spaced about 100 feet apart in a northerly direction, expose Bethsaida in contact with aplite which lies to the east of the Bethsaida. Both rocks are weakly altered along a few quartz stringers and fractures. This zone as well as some of the fractures and stringers trends north - northeast. Only traces of malachite were seen coating some of the fractures. The situation here is quite similar to Stellako in that the mineralization occurs in a contact zone between Bethsaida and aplite, and, in fact, this zone projects north - northeast

into the Stellako showing. The mineralization on the Oro ground is, however, much weaker. The western part of the claim group has been covered by I.P. with negative results. Further work in this area is not warranted. Several days' work could be spent in trying to find the Bethsaida-Skeena contact which is presumably along the east part of the group.

BETHLEHEM

The pit at Bethlehem was visited; however since no geologists were available to show the writer around, very little was seen of the pit geology.

FINDINGS AND THOUGHTS ON FUTURE WORK

On most of the available properties examined, the rather complete I.P. work with negative results, the lack of any widespread chlorite-sericite alteration as is present at Bethlehem and Lornex either in place or as float, and the restriction of the known mineralization to relatively narrow zones of fracturing and quartz veining discourages any further work on these claims. The intensity of mineralization seems to decrease to the south and east from the central part of the batholith. However, because of the obvious major structures present on the Deb claims and Benson ground, several more days should be spent in examining these areas.

The impressions gathered on this trip are based on only very brief examinations of each property and I believe we should continue compiling data on the area. This study should include the following.

1. Further field examinations of the northern and southeastern parts of the batholith.
2. Examination of outcrops in the vicinity of Bethlehem, Lornex, and Highmont to see if there has developed an outer alteration zone of K-spar, zeolite, and epidote. Indications are that they may be present and, if so, this alteration would be extremely useful in determining the potential of other areas.
3. An air photo lineament study of the entire batholith combined with locations, trends and controls of known mineralization, and locations and trends of contacts.

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