THORN PROJECT - 1964

DECEMBER, 1964

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ABSTRACT

The Lajaune Creek copper-gold-silver mineral deposits are located in Northwestern British Columbia on a tributary of the Sutlahine River, 60 miles due East of Juneau, Alaska. The property, lying essentially adjacent to the Northeast flank of the Coast Range batholith, is underlain by broadly folded intermediate volcanics with lesser sedimentary rocks in unconformable contact with tightly folded, somewhat metamorphosed sedimentary and minor volcanic rocks. This geological setting has been intruded by Tertiary stocks, plugs and dykes, some of which are suspected to have contributed most of the metallic mineralization in the area.

The number of mineralized zones discovered in the Lajaune Creek watershed have been expanded from the initial three found in 1963 to seventeen. This necessitated expanding the 22 claim Thorn Group to 132 mineral claims. Of the seventeen known mineralized zones, twelve are worth further work during the 1965 season. The zones can be classified into three general groups as follows in what is considered their current order of importance:

(1) Two large areas of low grade, disseminated chalcopyrite,

(2) Structurally controlled chalcopyrite-pyrite-quartz replacement deposits,

(3) Low temperature quartz veins carrying important values in gold and silver.

The low temperature group lies almost exclusively within a quartz-feldspar porphyry plug that intrudes Upper Triassic-Lower Jurassic andesite flows and pyroclastics and siltstones. This intrusive contact is an important localizer of mineralized zones.

Igneous-etc-control on low T mineralization

In 1964, work done on the property consisted dominantly of prospecting supplemented by soil sampling with some hand trenching and limited IP geophysical work.

In 1965, a program of detailed geological mapping, sampling, IP geophysics, magnetic geophysics, prospecting and soil sampling, closely followed by light diamond drilling and trenching is recommended. On the cirque zone, a contract geophysical survey will be carried out with deep penetration IP geophysical gear. Should positive geophysical anomalies be detected during this survey, then a heavy diamond drill program will be initiated by a contract drilling company in the latter half of the 1965 season.

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INTRODUCTION

The Thorn property was initially discovered and subsequently covered by 22 mineral claims by company prospectors in August of 1963. The central claim group was supplemented by further staking in 1964 when additional mineral discoveries were made in the area during the 1964 field season. At present Julian Mining Company mineral property consists of 132 contiguous claims, including the initial 22 claim Thorn Group.

The property, approximately 60 miles due East of Juneau, Alaska, lies on Lajaune Creek which flows Northwest into the Sutlahine River. The Sutlahine River is a sizeable tributary of the Taku River which drains into the Pacific Ocean through the Alaska Panhandle.

Limited work was done on the three zones found in 1963, Zones A, B and C. It was considered that emphasis should be placed upon the finding of additional mineral showings in the general area in view of the nature of these initial discovery showings and the relative difficult accessibility of the property.

Consequently, in 1964 exploration in the Lajaune Creek watershed uncovered an additional 14 mineral showings, on 9 of which further work is justified in 1965.

GEOLOGY

The Thorn Group of mineral claims lie within the Tulsequah map sheet. This area was mapped by J. C. Souther of the Geological Survey of Canada in 1959 and 1960. However, other than a preliminary four miles to the inch geological map, most of the information collected from this program has not yet been published.

Kerr, of the G.S.C., in 1925 published his work that embraced the mining area along the mouth of the Taku River immediately East of the Alaska Panhandle-Canada boundary. This area is located 25 miles due West of the Thorn property.

This dual contribution by the G.S.C., coupled with general information gathered by company personnel serves as a basis for the following regional understanding of the underlying Lajaune Creek geology. As yet much of the contact relationships and age datings are little known and no doubt much of the tectonic history of the area will be considerably refined and corrected as further work in the Lajaune Creek watershed is done. Nonetheless, in spite of the relative sketchy regional geology acquired to date, some initial attempt at sorting out the geology is felt necessary in order to enhance the search for additional mineralized zones in the area.

General

During Permian times limestones with minor chert and argillite were deposited in an intrageosynclinal environment. This sequence was conformably overlain by more fine-grained clastic sediments and intercalated volcanic rocks as inversion took place within the geosyncline in the Late Permian and Early Triassic.

From the middle Triassic, intrusion and uplift of the Coast Range granitic rocks was initiated and continued through the Mesozoic and Early Tertiary. This plutonic process in the Coast Range crystalline positive area to the West as well as that of the Cassiar to the East folded and fractured the belt of Permian and Early Triassic rocks between, and contributed to the metamorphism of the fine-grained clastic sediments and volcanics to phyllites and greenstones respectively.

Vulcanism, with loci essentially on the East flank of the Coast Range positive zone, in the Upper Triassic to Lower Jurassic Period provided extensive intermediate extrusives which were deposited with angular unconformity on these now well folded Late Permian and Early Triassic sedimentary rocks. This phase of vulcanism may have included basic dykes and sills and been terminated by acid extrusives.

Throughout the Jurassic and presumably the Cretaceous increasingly coarse clastic sediments were laid down conformably on the intermediate pyroclastics and flows. During this time continued uplift and intrusion in both the Coast Range and Cassiar positive areas folded and fractured this volcanic and sedimentary series and refolded for the most part the relatively incompetent Upper Permian-Early Triassic sedimentary and metamorphic rocks. It was during this period of stress developed in the basin between the Cassiar and Coast Range batholiths that the Atlin Horst developed.

Finally in Early Tertiary time, after the intervening sedimentary belt had been deformed, granitic intrusions, which until now had been confined to the two flanking crystalline Coast Range and Cassiar positive areas, were also emplaced, regionally controlled by favourable structures within the central sedimentary and volcanic belt.

Generally of a more acidic composition than the Coast Range batholithic complex, they tend to often align as stocks and plugs flanking the batholith proper. It is postulated that the large part of the metallic mineralization was deposited during the Early Tertiary and associated with these late stage intrusives.

Lajaune Creek

Lithology and Structure -

Many of the geological processes discussed under the General Geology and relevant to most of Northwestern British Columbia are manifested in the rocks underlying the Lajaune Creek watershed.

The area in question lies two to three miles from the contact of the Coast Range batholithic complex with Upper Triassic-Lower Jurassic intermediate volcanic extrusives. This volcanic sequence, which includes volcanic siltstones outcropping principally on the East slope of the Lajaune Creek valley between Camp and A Zone Creeks, represents the Southwest flank of a Northwest plunging syncline. The pink Rhyolite which provides the host for chalcopyrite mineralization in the Cirque Zone may have been extruded on these intermediate extrusives, also in the Late Triassic or Early Jurassic.

Overlying the volcanic formations, probably conformably, are clastic rocks, which in the Lajaune Creek area occur at the mouth of the creek near its junction with the Sutlahine River.

PRE UPPER TRIASSIC

Tightly folded and crenulated limestone with greenstone and possibly phyllite of Late Permian-Early Triassic age outcrops on the ridge that rises above Zones A, B and C to the East. An angular unconformity probably exists at the contact

↙ Also u/c. between pre-UT rks + overlying younger volcs.

of these rocks with the overlying younger volcanic rocks. In that these older rocks are situated topographically above the younger, either folding or faulting is prevalent in the area between Lajaune Creek and the limestone ridge.

Several bodies, probably of Tertiary age, have intruded both the broadly folded Upper Triassic-Lower Jurassic formations and the more intensely folded Upper Permian-Lower Triassic rocks. In the area to the immediate East of the claim block a rhyolite porphyry stock was emplaced along the axis of the Northwest plunging syncline. A quartz diorite plug outcrops in the rugged cirque area South of the Cirque Zone at about the 6000 foot elevation. Of paramount interest is the plug that outcrops at elevation 2500 feet at the junction of Lajaune and Camp Creeks. This body, mapped as a quartz-feldspar porphyry, has well-developed feldspar phenocrysts with very distinct euhedral crystals of quartz in a chloritic matrix. Smaller intrusives satellitic to this one outcrop at intervals for a mile down Lajaune Creek from the junction. The main body intrudes the Upper Triassic-Lower Jurassic formations at the contact of massive andesites and a well-bedded volcanic siltstone. Further, there is a suggestion that the plug was emplaced at the crest of an overturned fold, the axis of which plunges 43 degrees to the North. The smaller bodies downstream may have entered along strong East-West faults. Rhyolite dyking, typical of which occurs on the A Zone, is probably related to this stage of Tertiary intrusion and vulcanism.

Mineralization and Alteration -

Metallic mineralization is found in three distinct types of environments on the Lajaune Creek property:

(a) Structurally controlled chalcopyrite-pyrite-quartz replacement zones typified by Zones A, E and perhaps J. Wall rock alteration on these mineralized zones is not intense, usually marked by pyritization of the wall rocks adjacent to the mineralization.

(b) Low temperature quartz veins containing pyrite, tetrahedrite and enargite with stibnite, luzonite-famatinite, lesser arsenopyrite in minor amounts. Zones B, D, F, K and I, which are representative of this type of environment, often carry appreciable gold and silver values. Significantly, this low temperature mineralization, for the most part, is confined to the quartz-feldspar porphyry. Relatively intense wall rock alteration associated with these veins consists of clay minerals, sericite, and pyrite that envelopes mineralized quartz veins as well as narrow sulphide stringers and pods.

(c) Zones of relatively widespread mineralization of low grade disseminated chalcopyrite. Significantly, this type of mineralization lacks pyrite and has little or no readily apparent alteration associated with it. These features are characteristic of the Cirque and P Zones.

1963 MINERALIZED ZONES

Zone A

Work done on this, the initial discovery zone in the Lajaune Creek watershed, to date has been restricted to a limited program. In 1963, four pack sack holes were drilled totalling 232 feet on the main mineralized area. In 1964, some hand stripping was done on the mineralized quartz vein which outcrops in the A Zone Creek

200 feet North of the drilled portion of the zone. In addition, two IP geophysical lines were run; one over the main mineralized outcrop, the other approximately 800 feet to the South. Both lines detected anomalous phenomena.

The deposit as exposed by natural outcrop, limited stripping and the drilling presents a relatively complex geological setting. The dominant underlying rocks on the zone are both flow and pyroclastic andesite formations of Upper Triassic-Lower Jurassic age which probably strike N 75° W and dip 50° to the North. Rhyolite, strongly suspected to be of an intrusive origin, occupies that part of the zone that carries the most impressive copper values. The rhyolite, which for the most part has been severely brecciated, may be in fact a composite one. In the drill core, grey, pink and green rhyolite occur, often as part of the same rock type as fragments or matrix in a breccia. Usually, the core of a rhyolite intersection in the drill holes is unbrecciated. Often this core is characteristically porphyritic with tiny euhedral quartz crystals. It is not known as yet whether the breccia is of intrusive or structural origin. It may be both. Brecciation, however, would appear to be mandatory for localization of ore grade copper solutions. Chalcopyrite, pyrite and quartz with minor amounts of galena, barite, calcite and siderite form the major part of the matrix of the breccia.

A very strong fault, striking N ~~80°~~ 70° W, crosses the A Zone Creek 200 feet North of the mineralized rhyolite area. A large, somewhat vuggy, brecciated quartz vein lies within the fault zone. The vein carries appreciable but erratic chalcopyrite and pyrite. An offshoot of this brecciated quartz vein cuts across the A Zone Creek forming a small but impressive waterfall. This shoot is almost totally barite and calcite with a few remnant large angular fragments of quartz. Low grade

chalcopyrite in numerous seams and quartz stringers occurs in the andesites that lie between the quartz vein fault and the mineralized rhyolite area.

In 1965 it is proposed to trace the favourable mineralized rhyolite to the Southeast uphill and the Northwest beneath and across Lajaune Creek, initially by geophysical methods. An IP geophysical survey will be initiated to detect the sulphide bearing rock. Further, a magnetic survey on top of the IP grid will serve to divorce the favourable rhyolite from the andesite country rock, particularly since much pyrite occurs within the andesites enveloping the favourable mineralized zone. This geophysical work is to be followed by light diamond drilling or hand stripping, whichever should be applicable. In addition, a geochemical survey followed by geophysics will be carried out in order to detect further potential mineral zones to the Southeast along the strong fault structure.

Zone B

Considerable hand stripping was done on Zone B with a view to locating the source of the large boulders, well mineralized with disseminated pyrite and tetrahedrite, that were discovered during the previous season. This effort was unsuccessful.

Six character samples taken from these large boulders in 1963 averaged 0.202 oz. gold, 0.01 oz. silver, and 1.20% copper.

An extremely vuggy quartz vein, averaging 15 feet wide and outcropping for a strike length of 250 feet, lies 500 feet down the hill from the mineralized float. The nature of this vein, which lies within well altered quartz-feldspar porphyry, is strongly suggestive of intensely leached sulphides. An IP geophysical

anomaly located uphill from the quartz vein and downhill from the rich float material likely has detected this mineralized vein.

Mapping of the quartz vein, the single IP geophysical line surveyed, and the location of the float indicate a minimum 750 feet strike length on the vein structure.

In 1965, it is planned to pursue the defining of the vein by further IP geophysical work followed by light diamond drilling and/or hand stripping to test the vein for grade and width.

Zone C

Some low grade tetrahedrite-pyrite in quartz rock was found between Zones A and B in 1963 and designated Zone C. In 1964, work on this zone consisted of a reconnaissance geochemical survey followed by a single line IP geophysical survey and some hand stripping of one of the geophysical anomalies detected.

Reconnaissance geochemistry in the vicinity of Zone C revealed a relatively high concentration of lead ions in the soil with very little copper present. This could be quite significant when considering the underlying geological setting. Generally, at the elevation of the IP geophysical anomalies, the quartz-feldspar porphyry intrudes and is in contact with Mesozoic siltstones. Higher up the siltstones are in contact with older Paleozoic well contorted limestones and greenstones. In that older sedimentary rocks lie topographically above younger volcanic rocks, there must be either a fault of appreciable size or else the older rocks have been folded above the younger. In either event, structures probably exist on this hillside which could lend themselves to replacement lead-zinc

possibilities. As yet no important lead-zinc deposits have been found on the company ground although an independent prospector has found one small showing up Lajaune Creek. However, considerable float has been noted and reported by company prospectors. One very large greenstone boulder in particular, found in the Cirque Zone area, consisted principally of massive sphalerite with appreciable galena and chalcopyrite.

As a follow-up to the favourable lead anomalous soil condition, an IP geophysical survey was run along the claim line nearby. Four anomalies were located, only one of which was stripped and further investigated. This anomaly was found to be a heavily pyritic zone which no doubt was responsible for this particular geophysical anomaly.

On Zone C during the coming season, it is planned initially to conduct a grid geochemical survey. Further, IP geophysical work will be carried out to further delineate IP anomalies noted in 1964 and to aid in defining the geochemical anomalies located. A magnetic survey over the established geochemical and IP geophysical grid may localize both the hidden porphyry-siltstone and the siltstone-limestone contacts which exist on this hillside.

1964 MINERALIZED ZONES

During the 1964 field season, fourteen more distinct areas of mineralization were found within the Lajaune Creek watershed. Nine of these zones are considered worth pursuing further to investigate their economic potential. Of the following fourteen zones, only Zones H, K, L, M and Q will not be worked on in the coming season.

Zone D

Massive sulphide boulders were found immediately across Lajaune Creek from the B Zone. These boulders lie in what is probably slide debris and their source likely lies hidden beneath overburden on the hillside above. Some hand stripping was done but the source of the sulphide float was not found.

Mineralization consists primarily of pyrite with appreciable tetrahedrite, enargite and minor luzonite-famatinite. A grab sample assayed 8.45% copper, 0.64 oz. gold, and 9.06 oz. silver.

This zone may be the strike extension of the B Zone structure. If so, the indicated mineralized length of Zone B could be extended from 750 feet to approximately 1000 feet.

It is planned to do some limited IP geophysical surveying above the slide area to locate the source of this float material.

Zone E

The E Zone is located approximately 500 feet above the floor of the valley directly across the creek from the base camp site at the confluence of Camp Creek with the main Lajaune Creek.

A twenty-foot wide shear zone mineralized with chalcopyrite, pyrite, and quartz has been exposed by a hand trench which crosses a gully. An "eyeball" estimate of the grade is something in the order of 2% copper. Another trench in the gully 100 feet lower down the hillside also exposed the mineralized shear zone, but the mineralization is of lower grade. The gully probably reflects the sheared contact of relatively unaltered andesite flow rock with a fine-grained rock which

may be a bleached portion of the andesite or else the fine-grained edge of the altered quartz-feldspar porphyry. This depressed contact area can be traced across Lajaune Creek and up the opposite valley wall, for perhaps 2000 feet horizontally. This contact area is covered with overburden, slide debris, and thick vegetation.

A single IP geophysical line run along the Lajaune Creek valley and crossing the contact located a significant anomaly over the depression. The anomalous interval occurs over an area of overburden between fresh andesites and a well altered quartz-feldspar porphyry. From the anomaly in the valley to the mineralized outcrop in the gully high up on the valley wall it is approximately 1000 feet of horizontal length and 500 feet in elevation.

At the same elevation, another trench located about 50 feet from the mineralized outcrop and within the well altered porphyry has exposed 12 feet of massive tetrahedrite-pyrite-enargite. Neither the ultimate extent of this mineralization nor its relation if any to the chalcopyrite zone nearby are known yet.

In 1965 the chalcopyrite-pyrite zone will be further defined by IP geophysical lines run at intervals over the entire length of the contact gully on both sides of Lajaune Creek valley. The geophysical survey will be followed by a program of light diamond drilling to investigate the nature of the anomalies outlined as well as further hand stripping of the mineralized zones where applicable.

Zone F

A zone of wide spread hydrothermally altered quartz-feldspar porphyry

containing pods, stringers, disseminations and quartz veins of pyrite-tetrahedrite-enargite mineralization exposed in the canyon of Camp Creek has been designated Zone F. From an ore point of view that mineralization which does not occur in quartz veins can be disregarded.

Two parallel linear zones of alteration containing erratic mineralization are on the strike (N 60° E) of the B Zone approximately 1500 feet away. They may possibly represent the extension of that structure. Although of no particular economic interest, a remote possibility exists that the alteration reflects B Zone quartz veins at depth.

Beyond this dual linear alteration and further up the Camp Creek canyon, a strong well-mineralized quartz vein outcrops on the canyon wall, essentially at the contact of quartz-feldspar porphyry and the intruded andesites. The quartz vein, which can be traced for 850 feet, strikes east-west and varies in width from five to thirty-five feet with a number of bulbous sections and off-shoots. The vein is closed on the East but remains open to the West where it disappears beneath overburden. The vein was sampled at intervals but the samples were lost in a plane crash. However, using grab samples and comparable mineralization elsewhere, notably the I Zone, the vein can be said to contain ore grade values in gold and silver and perhaps copper.

During the coming field season it is planned to resample the vein at regular intervals along its entire length. Hand stripping of its possible extension beneath the overburden to the West will perhaps expose further mineralization. A limited magnetic survey in this area could prove helpful in view of the apparent

contact control of the quartz vein. Should the surface sampling be favourable, then a light diamond drilling program to test the vein at depth is proposed.

Zone G

The G Zone is located in the first creek that drains Northeast into Lajeune Creek downstream from the E Zone.

Massive sulphides (pyrite with arsenopyrite) lie in the brecciated and sheared footwall of a strong East-West striking fault that outcrops on one side of the creek. The creek itself is the surface trace of another fault, which either displaces the mineralized structure downstream or cuts it off. A chip sample taken across the four-foot wide mineralized zone assayed 0.61 oz. gold and 4.81 oz. silver.

As yet no strike length is developed on this zone. In 1965 some hand stripping with associated geological mapping will be undertaken to further investigate this mineralization.

Zone H

In the second creek downstream from the E Zone that also drains Northeast into Lajeune Creek, a narrow outcrop of chalcopyrite mineralization immediately above the creek mouth has been reported. This zone has not been examined geologically but apparently like the G Zone is in andesitic country rock.

This zone will be examined during the coming season and should it be warranted, mapping and stripping will be initiated.

Zone I

An area of mineralized quartz lies in a Southerly flowing tributary of camp creek. Known as Zone I, it outcrops at about 500 feet in elevation above the canyon floor of camp creek.

Stringers and seams of tetrahedrite-enargite-pyrite mineralization fill fractures which strike both perpendicularly and obliquely to the general strike of the quartz veining that contains the mineralization. The quartz lies within altered porphyry close to, yet not at, the porphyry-andesite contact. About 25 feet of fresh unaltered porphyry occupy the intervening area.

The width of the mineralized quartz varies from 20 to 50 feet. Quartz veining has been exposed by the creek for 140 feet. It vanishes beneath overburden on either side of the creek. A sample taken across 32 feet of mineralization by a prospector assayed 0.18 oz. gold, 6 oz. silver, 0.5% copper. However, in view of the perpendicular lay of the mineralization with respect to the quartz vein trend, the prospector's sampling technique is somewhat obscure. Later sampling done in oblique fashion across both the vein and mineralization was lost in the aforementioned air crash.

Sampling and geological mapping of this zone will be undertaken in the 1965 season. Stripping of what appears to be relatively light overburden, aided by IP geophysical and magnetic surveys will serve to extend the length of the mineralized zone. This initial work is to be followed by light diamond drilling should the preparatory work prove favourable.

Zone J

The J Zone outcrops at the contact of quartz-feldspar porphyry and intruded andesites in a strong tributary stream that flows Northeasterly into Lajoune Creek. The mineralization consists of low grade disseminated chalcopyrite with much pyrite in a well altered intensely sheared porphyry. The trend of this shearing is on strike with the strong fault structure that cuts across the A Zone and possibly may be its extension.

Interest in this zone has been a negative one due to the relatively low grade copper. However, in view of the possible relation to the A Zone structure as well as some high copper geochemical values on strike but higher up the hillside in the West Zone area, some work is now justified. Hand stripping of the zone, some geochemical work on its possible extension up the hill, and detailed geological mapping will be pursued.

Zone K

A quartz vein six feet wide outcrops for 120 feet in a Southerly flowing branch of Camp Creek. Designated the K Zone, it strikes North 30° West, dips at South 55° West and contains numerous stringers and seams of massive stibnite. The country rock in this area is rhyolitic flows and pyroclastics. Samples taken from the vein revealed no values in gold or silver. On this basis, no further work is felt necessary on this zone.

Zone L

Pods of massive mineralization with erratic seams, stringers, and disseminations of tetrahedrite-enargite-pyrite occur in a faulted, well altered

quartz-feldspar porphyry a few hundred feet up Camp Creek from its mouth. Samples of the massive material assayed well in gold and silver. In that no quartz hosts the mineralization and hand stripping revealed no continuity to the controlling fault structures, the L Zone is not considered to be of any economic importance.

Zone M

Some limited trenching was done on the hillside on which Zone M lies. This was prompted by the presence as float of a quartz fragment assaying 0.53 oz. gold, 8.64 oz. silver and 0.27% copper. Other fragments of float material thought to be of similar grade were found in the immediate area. The source of this float which contained finely disseminated tetrahedrite-enargite and pyrite was not uncovered.

It may be that float mineralization in the M Zone area has been derived from the strike extension of the I Zone which lies approximately 1200 feet to the Northwest at a somewhat higher elevation. The favourable volcanic-porphyry contact located uphill and North of the float mineralization and temporarily hidden by overburden would be the best area to search for a potential gold-silver orebody. A magnetometer survey to define the contact followed by an IP geophysical survey across the contact at intervals to locate the mineralization would be the most rewarding approach to this search.

Zone P

A widespread area of low grade chalcopyrite-pyrite mineralization has been reported by one of the prospectors from the West side of Lajaune Creek valley, across the creek from the A Zone and higher in elevation. As yet, this zone hasn't been geologically examined. However, a single airborne magnetometer flight line,

paralleling and flanking the creek, revealed what is probably a contact between two rock types that may have some bearing on the localization of this mineralization.

In 1965 it is planned to geologically map this P Zone; the mapping to be followed by IP and magnetic geophysical surveys. Should it be felt justified then hand stripping and/or light diamond drilling on selected parts of the area may be in order.

Zone Q

The Q Zone is situated about 50 feet downstream from the confluence of Camp Creek and the Southerly flowing tributary in which the K Zone lies.

It has been reported that a rhyolite dyke 25 feet wide contains minor uneconomic disseminated chalcopyrite and pyrite. In addition, lightly disseminated erratic chalcopyrite apparently occurs in the rock for some distance downstream. The zone may be controlled to some extent by a strong structure whose existance is suggested by a distinctive East-West trending airphoto linear over the area containing this mineralization.

Although reported to be of uneconomic interest the zone will be examined by a geologist in the 1965 season. It may have some relation to the Cirque Zone mineralization which outcrops 3000 feet Southerly.

Cirque Zone

The Cirque Zone outcrops in the bed of a Northwesterly flowing tributary of Camp Creek at elevation 5000 feet.

Low grade, uneconomic chalcopyrite, signifacantly with no pyrite, is disseminated in a pink rhyolite host rock for 1100 feet along the creek. Some

random and erratic quartz stringers contain some of the chalcopyrite. Splashes of chalcopyrite occur on the fracture planes of a well fractured Upper Triassic andesite flow rock for an additional 200 feet downstream. The fractures in both the rhyolite and andesite trend predominantly across the creek. Beyond this, rock outcrop vanishes beneath overburden for another 1500 feet downstream to the claim line where outcrop mineralized with considerable pyrite and very minor chalcopyrite once again occurs. Molybdenite was the only other metallic mineral observed and this was erratic and rare.

Samples of this copper bearing rhyolitic rock taken at intervals over 350 feet averaged 0.25% copper and 0.75 oz. silver. Oddly enough, samples taken from the P Zone with the same general grade of copper had the same copper-silver ratio.

It may be that the source of this mineralization on the Cirque Zone is an underlying intrusive containing higher grade copper in or around it. With the exception of what can be observed in the creek bed, the surrounding area is essentially covered by a mantle of overburden. To search for higher grade mineralization a relatively deep (800 feet) penetration IP geophysical program will be undertaken to search beneath the overburden and even to probe beneath what may be a mantle of mineralized country rock. Should anomalous conditions be encountered during this survey, the anomalies will be investigated by a contract diamond drilling program.

West Zone

An area of high geochemically anomalous copper values across the Lajaune Creek valley from P Zone yet higher in elevation than P Zone has been named the West Zone.

Significantly, this side of the valley has considerably more geochemically anomalous copper on it in direct contrast to the East side which has high lead geochemical values. In addition, this general area may be underlain by the strike extension of the strong fault that cuts the A Zone and is suggested on the J Zone, both of which are chalcopyrite-pyrite bearing zones.

A grid geochemical survey will be undertaken on this zone during the coming season to be followed by IP geophysical work to detect hidden sulphide zones. Detailed geological mapping will be done in conjunction with particular phases of work. Should it be justified hand stripping and/or light diamond drilling of the indicated mineralization will be carried out.

PROSPECTING - 1964

A two-man prospecting team was assigned to search favourable country in the general Sutlahine watershed. From June 24th to July 16th the team was occupied prospecting the East side of Lajaune Creek from the base camp downstream as far as the Sutlahine River. They met with no success.

From July 20th to the middle of August, from a fly camp established eleven miles due Northwest of the Lajaune Creek camp and across the Sutlahine River reconnaissance prospecting was carried out. Nothing of significance was reported.

The next and final phase of this program took place from mid August to early September. The camp was located in the valley adjoining the Lajaune Creek valley to the immediate West, that also trended Northwest into the Sutlahine River.

Some erratic copper showings were reported in this valley but nothing that could be interpreted as having any economic significance. In view of its proximity to Lajaune Creek, a reconnaissance geological examination of this particular valley is in order for 1965.

SEARCH FOR ADDITIONAL ZONES

The number of mineralized zones of potential economic interest in the Lajaune Creek watershed was expanded in the 1964 field season from three to twelve. Because of the generally very thick vegetation, widespread overburden of variable thicknesses, and to a lesser extent overlying Tertiary volcanics, much of the favourable rock remains hidden. In view of the impressive number of mineral deposits discovered to date in this relatively restricted area, it is not at all unreasonable to expect to find a number of other zones on the property.

To pursue this objective, in conjunction with the recommended work on the various zones already known, a program of prospecting supplemented by reconnaissance geochemistry and regional geological mapping is in order. Reconnaissance geochemistry such as that undertaken in the creeks on the C Zone and West Zone areas should aid in localizing favourable detailed prospecting areas and areas worthy of a grid geochemical attack. All tributaries flowing into Lajaune Creek from Camp Creek to the Sutlahine River, particularly those flowing Northeasterly, need to be worked in this fashion. In addition, prospecting and reconnaissance geochemistry should be initiated in the general area of the P Zone. Little work has been done on this hillside yet.

A sharp magnetic high (800 gammas) was detected by two airborne magnetometer flight lines immediately to the East of K Zone at elevation 6000 feet on unstaked ground. Significantly, no rock types have been reported or seen in this general area which would account for this distinctive magnetic anomaly. This area has been reported to be covered by a mantle of Tertiary rhyolitic flows and pyroclastics so that favourable Upper Permian-Lower Triassic and/or Upper Triassic-Lower Jurassic rocks are effectively hidden. In particular, reactive Permian limestones may be expected to underly the Tertiary volcanics. Furthermore, the magnetic anomaly lies immediately adjacent to the axis of the Northwesterly plunging syncline which controls the emplacement of a Tertiary rhyolite porphyry stock outcropping along the axis to the Southeast. The possibility exists that a mineralizing intrusive in contact with reactive limestones has localized a copper-magnetite ore body here. In view of number and variety of the mineralized zones in the Lajaune Creek watershed, this possibility should not be overlooked.

CONCLUSIONS

The number and variety of mineralized zones in the Lajaune Creek watershed, a relatively restricted area, is singularly impressive.

Three characteristic mineralized deposits outcrop on the claim group and two other types are as yet only suspected to exist in the area. These are as follows, in order of comparative importance:

(1) Zones of widely dispersed, disseminated chalcopyrite mineralization with no pyrite and little or no alteration features.

(2) Structurally controlled chalcopyrite-pyrite-quartz replacement deposits with moderate pyrite alteration.

(3) Low temperature pyrite-tetrahedrite-enargite with luzonite-famatinite, stibnite, in quartz veins with intense hydrothermal alteration.

(4) Lead-zinc-copper replacement bodies in reactive rocks.

(5) Chalcopyrite-magnetite contact metasomatic bodies in reactive rocks adjacent to an intrusive.

The contact of the quartz-feldspar porphyry is an important localizer of mineralized zones. All of the low temperature type deposits lie within the porphyry. Of this type, Zones F, I and M may be a series of potential gold-silver ore shoots lying within an altered portion of the porphyry at or close to its contact with andesite. The structurally controlled chalcopyrite-pyrite-quartz replacement zones found to date also to some degree are controlled by the porphyry-andesite contact, lying immediately outside it essentially in the andesite. The widely disseminated chalcopyrite zones, Cirque and P, apparently bear no relation to the quartz-feldspar porphyry intrusive.

RECOMMENDATIONS

A program of detailed geological mapping, IP geophysics, magnetic geophysics, soil sampling, diamond drilling and trenching is recommended on the various zones in the manner outlined in the text.

Additional staking is recommended, particularly if a heavy diamond drilling program takes place on the Cirque Zone. This staking would involve two blocks tied onto the company's 132 claim group. The magnetic anomaly should be staked as well as a string of claims along Lajaune Creek downstream as far as the Sutlahine River for access purposes.

With regard to further prospecting on and around the Lajaune Creek claim block, this would be considerably enhanced by some regional geological mapping. Key areas to be prospected, supplemented by reconnaissance soil sampling, are the area to the immediate East of the Cirque Zone and the Northwest slope of Lajaune Creek from Camp Creek to the Sutlahine River.

Prospecting on a regional basis outside the Lajaune Creek mineralized area and to the Northwest should be concentrated on two geologically favourable areas:

(1) A belt of folded volcanic and sedimentary rocks lying <u>within</u> the Coast Range batholitic complex in general bounded by Mt. Ogden, Stuhini Creek and the Sutlahine River. Once again, Late Permian-Lower Triassic rocks in unconformable contact with Upper Triassic-Lower Jurassic formations are intruded by Tertiary plugs and dyke swarms.

(2) The area lying immediately Northeast of and <u>outside</u> the Coast Range batholith proper between the Sutlahine and Taku Rivers. Similar geological circumstances that contribute to the Lajaune Creek mineralization can be expected to occur in this area.

Respectfully submitted by:

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