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BONNET PLUME RIVER MINES LTD.
Key Claims
Preliminary Report

ALRAE ENGINEERING LTD.

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ALRAE ENGINEERING LTD.
VANCOUVER, B.C.
ENGINEERS & GEOLOGISTS

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INTRODUCTION

At the request of the Principals of Bonnet Plume River Mines Ltd., a rapid reconnaissance of the Key claims was carried out between August 7th and 12th, 1969. A fly camp was established on the property using fixed wing and helicopter support. Geological mapping and prospecting over the area of interest was undertaken by a team of three geologists under the working supervision of Dr. J.G. Simpson. In the absence of suitable topographic maps, geological data was plotted on an air photograph enlargement on a scale of approximately 1" = 850'.

CLAIM LOCATION AND ACCESS

The Key group is indicated on the official government claim map (Claim Sheet 106E-1), as comprising 56 claims in a single block four claims wide by 14 long (grid reference 134°15'W, 65°5'N), extending from the Bonnet Plume River in a north-northwest direction toward Rapitan Creek valley. The claims are 20 miles east of the Wind River Trail and some 40 miles of road construction would be required to provide winter road access. The northeastern section of the claims covers the side hill of the main Bonnet Plume valley which rises to peaks of 5,500 feet; the river itself being a little under 2,000 feet.

The location posts for claims No's. 13, 14, 15 and 16 were apparently tagged with numbers 1, 2, 25 and 26 while ten claim posts were found hidden near the camp site, obviously not at their correct location. Hidden posts were not tagged and were numbered as follows:

#2 post - Key 9 and Key 10
#2 post - Key 13 and Key 14
#1 post - Key 11 and Key 12
#1 post - Key 15 and Key 16
#1 post - Key 17 and Key 18

GEOLOGY

From the base of the hills flanking the main valley, a sequence of banded acid volcanics, massive volcanics, volcanic breccia, shales and interbanded tuffs, thin limestones and a thick sequence of argillites and black slates roughly parallel the valley contours and dip generally to the northeast. On high peaks, at the crest of the valley ridge, elements of the volcanic sequence reappear, but have apparently overrode the shale-limestone sequence on flat thrusts derived from the northeast. The strata of interest within this sequence are the banded and massive acid volcanics and volcanic breccia which carry intermittant copper and iron mineralization along a visible strike of about one and one-half miles; the lower boundary of the volcanic breccia being perhaps slightly more mineralized than other sections of the volcanic sequence. The breccia dies out laterally to the southeast and is replaced by more massive tuffs and flow-banded lavas.

STRUCTURE

Although diagnostic way-up features were not readily available, the general structural picture evolved from the field work is that of a huge recumbent antiform plunging gently north-northeast with a vergance from the east. This is concluded from the apparent tendency to closure toward the north and the plunge of minor folds and bedding foliation intersections. This infers that the remnant volcanic rocks on the high peaks are a fold repetition of those seen on the lower slopes. The absence of a tuff-shale sequence with a distinctive limestone marker horizon in the repeated beds being due to overriding by the slate-argillite beds. This also implies that the lower slope sequence is reversed, i.e.: the oldest rocks being the argillite-slate group, the youngest being the acid volcanics. Cross sections of the volcanic sequence and the pattern of banding attitudes in these rocks indicate fold deformation and thrusting paralleling the major structure.

A close pattern of normal faults with north and northeast trends is readily apparent, with a major east-west fracture affecting all structural elements.

MINERALIZATION

Mineralization is restricted to the acid volcanics and volcanic breccia horizons outcropping along the base of the main valley ridge. All other lithologies are completely barren, except for minor dissemination of syngenetic pyrite in the argillites and slates. No significant mineralization was noted in either outcrops or talus slopes from the isolated exposures of volcanics on the high ridge which is, in fact, not covered by the claims as staked on the ground.

In the lower slope volcanics the mineralization includes both primary sulphides and secondary sulphides associated with faults and carbonate tension veins. There also appears to be two mineral environments, one in which hematite, in the form of specularite, is predominant and copper either subordinant or absent and one in which copper is dominant. In general terms, copper mineralization tends to be reduced from north to south along strike and vice-versa for iron.

PRIMARY SULPHIDES

Throughout the strike length of exposed volcanics, finely disseminated pyrite and chalcopyrite is found in flow-banded volcanics and occasionally in massive tuff and breccia zones. The overall percentage of sulphides in these rocks is very low and long stretches of volcanics are completely barren. While this type of mineralization would not be of economic significance in itself, it points to the volcanics as being the sulphide host rock for the richer secondary mineralization seen in fold axial zones and along fault lines.

SECONDARY MINERALIZATION

The so-called showings on the property are all restricted to the volcanic sequence and are of two main types, both of which are associated with carbonate veining. The most impressive of these is a fault environment where copper occurs in quartz and calcite filled fractures associated with the fault and in minor cross fractures and tension veins. The second type is a system of ramifying copper bearing carbonate veins filling fractures in the axial zones of tight folds. In both cases mineralization takes the form of blebs and streaks of chalcopyrite and pyrite and very rarely a little bornite in the calcite and quartz veins. In the brecciated volcanics fine stringers of sulphides occur with only minor amounts of secondary carbonate, although the breccia matrix is invariably quite rich in lime.

SHOWINGS

No. 1

The most prominant showing is described as the main showing and is located near a minor northeasterly trending fault at the boundary between volcanic breccia and banded acid volcanics and tuff, now largely made over to flaggy micaceous quartzite. At this point carbonate veins near parallel to banding vary from 1/2 inch to two feet in width and together with associated quartz veins are strongely mineralized with chalcopyrite and pyrite in blebs and stringers over a zone some 15 feet wide. Uphill from the showings small cross-fractures are filled with calcite containing blebs of chalcopyrite and the zone, much diminished in width and mineral content, can be traced for about 200 feet. Some 200 feet downslope of the showing a possible outcrop, largely scree covered and perhaps itself a massive slide block, is similarly mineralized.

No. 2

A second area of notable mineralization occurs some 1,000 feet to the south-southeast, again near the contact of breccia and banded volcanics where a small fault trending at 110° azimuth has been mineralized with pyrite and chalcopyrite together with minor carbonate filled cross-fractures. The whole makes up a rusty malachite stained zone some 10 to 15 feet wide. The scree overburden in this locality prevents tracing of the showing uphill, but little mineralized scree was noted above the showing.

No. 3

Further to the west and forming a bald hillside at the junction of a gulley with the main valley floor, ramifying calcite veins in badly fractured volcanic breccia contains chalcopyrite and pyrite resulting in a large surface area of sparsely mineralized material. Northwards, the veining coalesces to a single calcite vein from six feet to 18 inches in width containing scattered blobs of chalcopyrite. From structural data and observations of the gulley wall, the zone is one of intense folding and thrusting; the copper bearing calcite veins in-filling fractures in the competent breccia horizons.

No. 4

The fourth notable showing occurs some 2,000 feet to the southeast of this again, with chalcopyrite concentrated in blebs in calcite and quartz veins near a gullied fault zone. The result is a broken mineralized zone up to 20 feet wide containing blebs of chalcopyrite up to two feet in diameter. Again, due to scree developments, it is impossible to trace this feature uphill from its location.

Elsewhere along the strike of the volcanic horizon, blebs and stringers of chalcopyrite are not uncommon, but in no sense can these be regarded as mineral showings and would, in fact, form part of the normal mineral assemblage of a deformed volcanic sequence, while areas to the south of No. 4 showing tend to show a redistribution of iron rather than copper.

SAMPLING AND ASSAY RESULTS

In all cases the shows are badly weathered and both pyrite and chalcopyrite have been extensively oxidized. Four chip samples were taken across three of the better showings while a fifth sample was made up of a random selection of volcanics containing disseminated sulphides. These samples were forwarded for assay and the location, width, etc. are given together with assay results in Table 1.

CONCLUSIONS AND RECOMMENDATIONS

There is no doubt that the rather complex horizon of acid volcanics, massive tuffs and volcanic breccia is the host rock for the observed copper mineralization, the more impressive showings resulting from the redistribution of sulphides on deformation and metamorphism.

The disseminated sulphides noted in some instances are low-grade and their distribution is too inconsistent for consideration as a potential large, low-grade deposit and it is suggested that the best chance for economic mineralization lies in the possibility of one or more relatively small, high-grade copper deposits being located on fault zones or in axial zones of tight folds. In general, it must be accepted that the possibility of such deposits is only slight considering the presently visible mineralization in relation to the exposed strike length of favourable ground. It is equally obvious that in an area so readily accessible any obvious economic mineralization would long since have been exploited.

The steep terrain and lack of soils preclude the use of normal geochemical and geophysical methods and further work could only be meaningful employing detailed geological mapping on a well prepared topographic base combined with exploratory diamond drilling. In normal circumstances it would be too expensive to recommend diamond drilling on the basis of available information. However, it is understood that the company is obliged to spend a minimum sum for assessment under the existing agreement before October 1969. Even should part of the cost of the survey described in this report be acceptable for assessment this would leave a cash payment outstanding. The presence of the company drill and equipment only 20 miles distant and the feasibility of rapid transport by means of available cat and sledge equipment suggests that a nominal footage should be drilled aimed primarily at testing the depth and extension of one or more of the above described showings. It is suggested that the caterpillar equipment be walked in to prepare a drill site as indicated at locations No. 1 to No. 4, drilling to commence on site No. 1 as soon as possible. As this will be exploratory drilling carried out at the tail end of the field season, a good deal of discretion will have to be given to the geologist on the spot with regard to direction and intensity of drilling at any given location and the order of drilling with regards to sites 2, 3 and 4. Further recommendations as to the retention of this property will rest largely on the results of this drilling.

COSTS

A cost estimate of this project is largely irrelevant, the actual extra cost to the company in carrying out this work being represented only by drillers wages, extra transport and diamond bits for a period of approximately two weeks.

Respectfully submitted:

Dr. J. G. Simpson, Ph. D.