YELLOW JACKET

FAME '87

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2.2 Structural Geology

The Yellowjacket Zone is interpreted as lying within a fault melange (Figures 7a and 7b). The rocks are strongly broken and have likely been subjected to several episodes of brittle fracturing and deformation. It is believed that most of this deformation was produced by movement along an east-northeast fault system following the Pine Creek valley and along associated cross faults.

Much of the fracturing has been healed by veins of various different mineralogies with calcite, iron and magnesium carbonates, talc and quartz being the most common. The veins often form complex stockworks with complex cross-cutting relationships. This makes vein pargenesis very difficult to unravel.

Following vein emplacement, reactivation of old fracture systems must have occurred. The latest and youngest fracturing did not heal, leaving the rocks shattered and broken.

Three known reactivated fault zones have been noted in the Yellowjacket Zone. Two fault zones, the North and South are evidenced by strong VLF conductors on surface and shattered gouge zones in drill core. Structural contouring of the gouge zones revealed the faults to be sub-vertical, striking 070°. Both faults are displaced between 15 and 35 meters between lines 14+00E and 15+00E. The displacement of the faults is apparently caused by a cross fault trending 110° and dipping approximately 50° to the southwest (see figure 7a and 7b). The dip of the cross-fault is interpreted from the best fit on vertical cross sections. The cross fault seems to displace the eastern extension of the mineralized zone some unknown distance.

2.3 Mineralization

In early 1987, the favoured interpretation of the Yellowjacket Zone was that mineralization existed in two east-northeast trending zones parallel to the main faults along Pine Creek. With further drilling, re-interpretation and surveying of drillhole collars, it is now apparent that one continuous zone of mineralization is present from 13+00E to 15+40E, where it may be truncated by the cross fault. The zone averages 5 to 10 meters in width, often bifurcating, pinching and swelling along strike and to depth. The strike is approximately 070° while the dip is subvertical. Several other small, discontinuous zones, up to 5 meters wide, occur throughout the Yellowjacket Zone. These trend obliquely to the main zone. The most prominent of these is a splay of the main zone extending through holes 87-24 and 86-6 at 050° (see figure 7a).

Within the mineralized zones, the mineralization is invariably coarse gold hosted in quartz veinlets. The veinlets are typically blue gray and generally less than 2 centimeters in thickness. Within the volcanic rocks, veining is accompanied by a thin one centimeter carbonate bleached envelope. This bleaching is not present adjacent to veins within altered serpentinite.

In many instances, the veining becomes frequent enough to form stockworks. These stockwork systems host the gold grades which approach sub-economic to economic widths of 3.0 grams Au/tonne or better. Some of the gold is visible and most is at least 150 microns in size.

Various sulfide minerals are found within the Yellowjacket Zone but they do not appear to be reliable mineralization guides. Pyrite is the predominant sulfide and may become more abundant adjacent to and within mineralized areas. In volcanic rocks where 1-2% euhedral pyrite is hosted within vein bleaching envelopes, economic gold grades are sometimes encountered. In some silicified andesites, however 1-2% euhedral pyrite is present with no gold. Hence, several different stages of pyritization are present. In general pyrite is present in only trace amounts.

Gersdorffite (NiAsS) and arsenopyrite have also been noted in Yellowjacket drill core. Both minerals account for the anomalous arsenic (As) values detected while gersdorffite is presumably host to most of the anomalous antimony (Sb). Occasionally arsenic and antimony enrichment do correlate with gold (see Figures 9a to 9o.s).

tetrahedrite?

Other sulfide minerals noted in the Yellowjacket Zone include millerite (NiS), chalcopyrite and pyrrhotite. None of these are related to gold mineralization.

Mineralization tends to be focused near lithological contacts, predominantly between volcanic rocks and serpentinite. The contact zones are generally broken and fractured, due to competency contrast, creating ideal porosity for vein emplacement.

Table 2 summarizes the best gold intersections from hole 87-20 through 87-34.

2.4 Geological Synthesis

The Yellowjacket Zone lies roughly on the contact of the serpentinized ultramafics of the Atlin Intrusions (Aiken 1959) to the north and the andesite of the Cache Creek Group to the South. The ultramafics most likely occur as sheets emplaced within the Cache Creek Group rocks by low angle thrust faulting. Folding and later faulting have steepened the angle of dip of most faults to sub-vertical.

Within the Yellowjacket Zone, the contact is a fault melange consisting of pods and slivers of andesite, basalt and mafic dykes hosted by serpentinite in various stages of alteration. The predominant structural trend in the area, as determined from geophysics, is 070°, with the Yellowjacket Zone lying on the strongest of these trends. A second, less common structural trend is evident cross cutting the zone at approximately 110°-140°. Movement along these fault systems likely caused more brittle rocks such as basalts and andesites to fragment while the serpentinite, due to the soft, sheet-like characteristics of serpentine, "flowed" around the fragments. As a result, the mafic rocks appear as a series of three-dimentionally discontinuous pods and blocks completely surrounded by serpentinite.

Hydrothermal activity along the fault systems resulted in alteration of most lithologies. CO_2 and Ca were introduced to the system and combined with Fe and Mg liberated from the ultramafics to form the carbonates present in the area. Si was either derived from outside sources with the CO_2 and Ca or was liberated from the ultramafics through progressive alteration. The silica and carbonates filled open fractures in the mafic rocks and upon further fracturing of the brittle carbonatized serpentinites created a complex history of veining throughout the zone.

Reactivation of fault zones has occurred up until recent geological history. The North and South fault zones seem to bound the altered package hosting the Yellowjacket Zone while the cross fault apparently truncates the silicification and the basalts to the east.

3. SUMMARY

The Yellowjacket Zone is underlain by a major fault zone trending 070°. The fault zone, which dips sub-vertically, has been activated numerous times. The resultant fracturing has formed a plumbing system for hydrothermal fluids which have produced quartz carbonate alteration of varying intensity.

Diamond drilling during the current calendar year intersected a number of significant mineralized zones with values as high as 15.01 g Au/tonne over a true width of 2.0 meters. Some of the mineralized zones carry visible gold as in the case of holes 23 and 24.

Although results of the diamond drilling have been encouraging, tracing the quartz veining and mineralization to depth has been a problem. Drill hole density below the 100 meter level, however, is inadequate and a raking ore shoot could conceivably remain untested.

The mineralized quartz-vein zones within the Yellowjacket Zone are irregular shaped bodies generally 4-8 meters wide. They often bifurcate, pinch and swell along strike and to depth (see Figures 7a,b and 8a-d). The main zone is approximately 250 meters in length; several other discontinuous zones trend obliquely to it. The unpredictable nature of such systems complicates the understanding of the geometery of the mineralized zone.

Further complicating the geometery of the mineralized zones is the presence of one or more cross-cutting structures. One such structure has been identified to date but others may be present. Movement along such features is unknown, but they undoubtedly trucate and displace the mineralized zone.

Along Pine Creek, the Yellowjacket structure has been delineated by geophysical interpretation for approximately 5 km. Only 10% of it has been testing by drilling. A reconnaissance drill program along the strike length of the Yellowjacket structure is recommended. Drill holes along associated parallel structures and cross structures are also advisable to determine their potential as hosts for similar gold systems. These programs should be conducted bearing in mind the following:

1. The Atlin Intrusions (Aitken, 1959) are in fault contact with the volcanics of the Cache Creek Group. The contact has been re-faulted several times. The resultant fault melange locally contains gold mineralization.

2. The presence of cross-cutting structures is only now beginning to be appreciated. Such features could be responsible for localizing mineralization and should be tested.

3. Veining and mineralization within the Yellowjacket Zone appear to be spatially related to lithological boundaries. The presence of both volcanics/dykes and serpentinite within an altered zone may be of significance.