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GEOLOGY OF WESTERN MINES, BUTTLE LAKE, B. C.

REGIONAL SETTING

The Western Mines Buttle Lake ore deposit is situated near the /north limit of a northwest trending belt of Permian volcanics. In the Buttle Lake area these volcanics are truncated to the southwest by the Bedwell batholith, a mid Jurassic grandiorite; and dip below the overlying Triassic (Karmutsen group) volcanics to the north and east.

The Permian volcanics in the mine area have a thickness in excess of 6,000 feet and have been locally subdivided into 3 units. The oldest unit is the Vent Formation, which is composed of bedded tuffs and breccias of dacitic to rhyolitic composition. Volcanic flows are rare but pyroclastic rocks with a flow matrix are not uncommon and flow fragments in the pyroclastics are quite common. Most of the rock types show evidence of subaqueous deposition and it appears that this unit forms submarine volcanic piles; which are overlain and infilled by the Sharp Banded Tuff Formation.

The Sharp Banded Tuff Formation is composed mainly of fine lithic tuff, containing numerous cherty banded tuff members. This unit appears to represent the close of a volcanic cycle.

The overlying Dacite Lapilli Tuff Formation is a fairly uniform assemblage of green lithic to lapilli tuffs some 4,000 feet thick. A major sub-aerial vent system is suspected for this unit.

Early Permian crinoidal limestones overlie the Dacite Lapilli Tuff Formation, and are in turn overlain by andesites and basalts of the Triassic age Karmutsen group.

The overall structure is characterized as a broad arch or anti-form with a gentle north plunge and northwest strike, broken by faulting into tilted blocks. The oldest fault system trends northwest, probably influenced the location of the vents, and was certainly active before the deposition of the Dacitic Lapilli Tuff Formation. Younger fault systems trend north-south and east-west and off-set the ore zones up to 400 feet laterally. This faulting subdivides the 3 mile long explored section of the volcanic pile into the Lynx, Myra Falls and Price Mines.

MINE GEOLOGY

The ore deposits at the Lynx and Myra Falls mines occur in the lower part of the Vent Formation. Where undisturbed by faulting they are stratabound between a rhyolite tuff and an overlying andesite flow, along the 40 degree northeast dipping flank of the volcanic pile. Two mineralized rhyolites are noted higher up in the Vent Formation, but economic mineralization has not been proved in them to date. Limited exploration on the Price claims has yet to prove any economic mineralization there.

Several close spaced, steeply dipping (70 degrees southwest) faults form a prominent shear zone which extends the length of the known area of mineralization, with widths of 400 to 800 feet. Within this shear zone the original volcanic rocks are highly foliated and altered (to Quartz Sericite Schist and Quartz Chlorite Schist mainly). Numerous discrete, contorted ore lenses are present within this shear zone, apparently faulted and remobilized from the stratabound ore zone.

Three distinct types of ore are present at Western Mines. The most abundant type of ore within the shear zone is a fina grained, massive, often banded mixture of sphalerite, pyrite and chalcopyrite. A second type of ore is massive pyrite with varying amounts of chalcopyrite and the final type of ore found is sparsely to heavily disseminated sphalerite, pyrite and chalcopyrite in altered rhyolite. Other sulphides present in minor amounts are galena, bornite, tetrahedrite and argentite. Native gold and native silver have also been noted. Gangue minerals are pyrite, quartz, sericite, chlorite, barite and calcite.

The ore bodies have relatively small cross-sectional areas, with average widths in the order of 8 to 10 feet; but are remarkably persistent along strike. Production to date plus ore reserves total some 4.5 million tons grading 0.08 oz./T Gold, 3.5 oz./T Silver, 1.6% Copper, 1.0% Lead and 7.5% Zinc.

To summarize briefly, the main features of the ore deposits at Western Mines are as follows. The volcanic pile is symmetrical about a northwest trending fault system and a breccia to tuff facies change occurs downdip of this fault system. All of the mineralization found to date occurs in rhyolite, adjacent to and downdip of the fault system; with most of the mineralization being concentrated at the top of the rhyolite members. No significant mineralization is found in the hanging-wall andesite or footwall rhyo-dacite members, although fragments of ore and altered rhyolite occur in the hanging-wall tuffs and breccias. These features indicate that centres of submarine volcanic activity were localized along a pre-existing northwest fault system. Hydrothermal mineralization is closely associated with the rhyolite phases of volcanic activity, and it is suggested that massive sulphides were deposited primarily at the rhyolite-marine interface, and concentrated downdip of vents and fumaroles controlled and inter-connected by the northwest fault system. At the close of the Vent Formation - Banded Tuff Formation volcanic cycle, movement along this northwest fault dragged a considerable portion of the ore deposit to its present position in the shear; while the rest remains in its original stratabound position.