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Program & Abstracts

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Mount Polley Alkalic Porphyry Copper-Gold Deposit.

Z. NIKIC and R. FESALJ, Imperial Metals Corporation,
Vancouver, British Columbia

The Mount Polley alkalic porphyry copper-gold deposit, located 56 km northeast of Williams Lake in central British Columbia, was discovered in 1964 by ground examination of a strong aeromagnetic anomaly.

The deposit occurs in a multiple alkalic intrusive complex within the Quesnel Belt, an allochthonous terrane of dominantly Upper Triassic to Lower Jurassic mafic to inter-

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mediate volcanics that lie along the eastern margin of the Intermontane Belt. A K/Ar age of 184 ± 7 million years is considered a median age for the Mount Polley complex.

Four main episodes of structural development are recognized at Mount Polley: (1) intrusion of a high-level igneous complex and development of intrusion breccia; (2) phreatic activity and formation of crackle breccia along with Cu-Au mineralization; (3) post-mineralization faulting and tilting of the complex; and (4) uplift and erosion during the Tertiary and Quaternary periods. The Mount Polley porphyry copper-gold deposit is hosted by an intrusion breccia and crackle breccia developed near the top of the complex or in crackle breccia in lapilli and crystal tuff. The host breccia is composed of monzonite, syenodiorite and minor volcaniclastics cemented by a late syenitic intrusive phase. Two principal zones of significant copper-gold mineralization, the Central Zone and West Zone, have been outlined by closely spaced drilling and trenching. The Central Zone is a tabular sill-like body of mineralized intrusive breccia with northerly strike and moderate easterly dip. The zone measures 1100 m along strike and is 200 m to 450 m wide. The West Zone forms the central portion of a westerly plunging pipe of mineralized intrusive breccia measuring 450 m in diameter and extending to at least the drilled depth of 275 m. Principal primary minerals, magnetite and auriferous chalcopyrite, occur as disseminations and veinlets in the breccia.

Although several parts of the deposit are strongly oxidized as a result of weathering, the very limited amount of supergene copper mineralization formed reflects the very low pyrite content of the deposit. Pervasive potash K-spar-biotite-diopside alteration coincident with the breccia, is surrounded successively by garnet-epidote and epidote alteration zone in the volcanic and hypabyssal wall rocks. A pyrite halo measuring 4500 m by 1000 m occurs outside and structurally above the two main mineralized breccia bodies. Calcite in veinlets throughout the orebody and wall rocks, the result of propylitic alteration, and absence of pyrite make the ore and waste acid-consuming.

Feasibility study and permitting for an 15 000 tpd open pit operation are in progress.