

Timing and geological controls on copper-gold porphyry and skarn mineralisation in Tifalmin and Nong Districts, Star Mountains, Papua New Guinea

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ABSTRACT

Recent work on the copper-gold porphyry and skarn deposits of the Tifalmin and Nong River districts in the Star Mountains including U-Pb zircon dating of intrusions, whole rock geochemistry, petrology, Terraspec alteration and a regional ZTEM survey have allowed refinement of the controls on and the geological development of the Cu–Au mineralisation. The most significant identified deposits in the districts are the Olgal deposit (210 Mt @ 0.4% Cu and 0.4g/t Au) in the Tifalmin district and the Fune skarn (best result 33m @ 0.62% Cu and 0.20g/t Au, from 114m) in the Nong River district

Regional LiDAR and ZTEM surveys have proven very useful in mapping the thrust faults in the area. ZTEM allows many of the regional thrusts to be traced across areas where the thrusts were previously obscured by lack of surface exposure.

Intrusives in both the both the Tifalmin and Nong River districts show a progressive southward decrease in age, a trend seen in other intrusive and volcanic centres in the central New Guinea highlands. The youngest intrusives for both the Tifalmin and Nong River districts (1.9 Ma for Nong and 2.4 Ma for Tifalmin) are known or suspected to be cut by regional thrust faults.

Logging and mapping at several of the Tifalmin porphyry deposits has shown a trend of an early copper-gold rich intrusive phase marked by A-type veinlets that are intruded and diluted by later porphyry phases.

Mapping and drill core logging at the Fune prospect show skarns have developed at the contact between the siltstones and sandstones of the Feing Group and overlying the Daria Limestone. Mapping and drilling around the Olgal and Futik deposits suggests the Feing-Darai contact may also be an important control on skarn development in those areas