The Tujuh Bukit District: An Emerging Cluster of Cu-Au Porphyry Systems in East Java, Indonesia

Alexsei Robert Taube[1], Mochammad Hafid Rahadi[1], Arief Bastian[1], James William Sweeney[1]
[1]Merdeka Copper Gold, Banyuwangi, Indonesia

The Tujuh Bukit district in East Java, Indonesia, represents an emerging Cu-Au porphyry cluster formed in a subduction-related island arc setting with the mineralising event occurring around 5–4 Ma. The main Tujuh Bukit porphyry system, discovered in 2012, and is hosted by dioritic to tonalitic intrusions emplaced into volcanic-sedimentary sequences. It contains a current resource of approximately 1.7 billion tonnes at 0.5% Cu and 0.5 g/t Au. Recent drilling has confirmed five satellite porphyry systems: Candrian, Gua Macan, Katak, Tujuh Bukit North, and Tujuh Bukit South, redefining the area as a district-scale porphyry cluster. Several of these discoveries will have maiden Mineral Resource Estimates released in 2025.

Hydrothermal alteration is dominated by prograde potassic assemblages (biotite ± K-feldspar ± magnetite), overprinted by minor phyllic, argillic, and localised advanced argillic alteration. Mineralisation is primarily chalcopyrite with subordinate bornite, associated with quartz-magnetite stockwork veining that controls the distribution of Cu-Au grades. The satellite systems are slightly older and exhibit higher Au/Cu ratios than the main Tujuh Bukit porphyry, suggesting a more Au-rich character.

District-scale structural architecture is characterised by NW-SE trending corridors with N-S opening structures that facilitated magmatic and hydrothermal fluid ascent. Vertical mineralisation extends over 1,000 meters in the main system, with potential for similar profiles in the satellite centres. Ongoing exploration continues to test numerous targets, including Gunung Manis, Lompongan, and Salakan, while untested airborne magnetic geophysical bullseye and geochemical anomalies highlight additional potential across the district.

The Tujuh Bukit district displays the hallmark features of a fertile porphyry province, with multiple mineralised centres likely derived from a single magmatic-hydrothermal event. The evolving geological model underscores significant upside for further discoveries and resource expansion in this underexplored yet highly prospective region.

This paper describes the newly discovered deposits and the implications for expansion in the Tujuh Bukit District.