Exploration for Porphyry Deposits in SE Asia and the SW Pacific

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Biography: John Holliday has a geophysics/geology honours degree from Macquarie University and an economic/politics degree from Sydney University. Since 1982 he has worked for BHP and Newcrest, firstly as a geophysicist, but from 1986 mainly as an exploration geoscientist. John played a crucial role in the discovery and development of the Cadia Au-Cu porphyry deposits. From 1994-2004 he was Regional Exploration Manager for SE Australia, from 2005-2007 he was Chief Geoscientist and from 2008-2009 he was General Manager, Property Generation. He is now part-time consultant Chief Geoscientist.

Abstract

Miocene-Pleistocene magmatic arcs in the SE Asia-SW Pacific Region contain major Cu-Au porphyry deposits which are notable for their mostly high gold endowment -- Grasberg is a top ten copper mine and also the world's largest gold mine.

Modern exploration for porphyry deposits in the Region began with adventurous surface prospecting in the 60-70's, which located many deposits including giants such as Ertsburg/Grasberg, Ok Tedi and Panguna. A more recent phase of drill focused exploration has resulted in discoveries under or near outcropping gold deposits in "high sulphidation" lithocaps, for example Golpu, Far South East and Tujuh Bukit. Future exploration may move into areas with young cover, with one deposit – Boyongan-Bayugo – already discovered in a covered setting.

Exploration in the Region has to cope with varying combinations of operational factors such as jungle vegetation, mountainous topography, monsoonal rainfall, malaria, remoteness, poor personal security, and non-western living standards and land tenure systems. These factors all make application of best practice exploration techniques relatively more expensive in both time and dollars.

Nevertheless the latest techniques will be required for another phase of discovery. New surface geology mapping utilizing airborne geophysics data can lead to significant revision of past work, much of which dates from decades ago. Comprehensive alteration and geochemical data from drill holes can provide vectors for further drilling on old and new porphyry prospects. Recognition of geophysical signatures, particularly from magnetic and induced polarization surveys, and their interpretation in relation to the porphyry model can produce many new drill targets.