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**Title: PORPHYRY AND EPITHERMAL DEPOSITS OF THE SW
PACIFIC REGION**

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Abstract: The SW Pacific region is well-endowed with porphyry Cu-Au and epithermal Au-Ag deposits. The Philippines, Indonesia and PNG contain world-class examples of both styles of mineralization. Japan, New Zealand and Fiji contain significant epithermal deposits, but lack major porphyry deposits.

Tertiary or Quaternary oceanic island arcs host many of the porphyry and epithermal systems. The youngest porphyries (e.g., Baguio and Mankayan districts, Philippines; Ok Tedi and Grasberg, New Guinea) have been exposed in arc segments that have undergone rapid uplift and exhumation. There is a correlation between regions where ridge subduction has occurred and locations of some of the largest deposits (e.g., porphyry and epithermal deposits in northern Luzon; Batu Hijau, Indonesia; the porphyry and epithermal deposits of mainland New Guinea; epithermal Au in Kyushu).

The ore deposits are most commonly associated with calc-alkalic magmatism. The intrusions can be low-K (Batu Hijau), medium-K (Baguio) or high-K (e.g., Grasberg) in composition. Major alkalic epithermal deposits occur in Papua New Guinea (Porgera, Lihir) and Fiji (Emperor). Alkalic porphyry Cu-Au mineralization occurs at Didipio (Philippines).

The Grasberg (Indonesia) and Boyongan (Philippines) porphyry Cu-Au deposits have formed in volcanic conduits, defined by large-scale matrix-rich breccia pipes that may have been the subsurface pipe facies of maar-diatreme complexes (e.g., Grasberg; Boyongan). Diatremes are common in SW Pacific porphyry deposits, but mostly form during late stage magmatic-hydrothermal activity (e.g., Dizon, Philippines; Batu Hijau). In contrast, diatremes associated with major epithermal deposits form early in the sequence of mineralization (e.g., Kelian and Martabe, Indonesia; Wau, Papua New Guinea; Acupan, Philippines).

Porphyry mineralization is characterized by quartz-magnetite-anhydrite-bornite-chalcopyrite veins, most commonly associated with K-feldspar and/or biotite alteration. In some deposits, the bulk of the mineralization was introduced during later illite alteration (e.g., Far South East, Philippines). Lithocaps (stratabound domains of advanced argillic alteration and silicification) are known to occur above or adjacent to several porphyries (e.g., Mankayan and Baguio districts).

Epithermal deposits that are known to be associated spatially and temporally with porphyry deposits include the Lepanto enargite-luzonite-gold deposit (Mankayan), and

the Wafi deposit (PNG), both of which occur in advanced argillic altered rocks. Porphyry-related epithermal Au-Ag veins associated with carbonate-illite-adularia alteration include the Teresa, Victoria and Acupan veins of the Mankayan and Baguio districts. These genetic associations between porphyry deposits and both the acidic and neutral-pH styles of epithermal mineralization have significant exploration implications. Districts known to contain at least one style of mineralization should be explored thoroughly for the others.