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Alteration Mineralogy of the Mapula Porphyry Copper Prospect in the Masara Gold District, Eastern Mindanao, Philippines

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Southeastern Mindanao in the Philippines hosts several porphyry deposits, such as the Boyongan-Bayugo, Pantukan and Tampakan. Within this region is the Masara Gold District which has been a major source of gold with decades of exploration activities and numerous academic works. However, porphyry copper prospects were also identified in the area, but with very little detailed information available. The prospects are part of an emerging belt of intrusion-centered hydrothermal deposits in Southeastern Mindanao. This study aims to characterize the mineralization and alteration of the Mapula porphyry copper prospect which is the largest porphyry copper prospect in the Masara Gold District, which formed in association with the Masara Intrusive Complex. Diorite and diorite porphyry host the Mapula porphyry copper prospect.

At the Mapula creek, surface manifestations of the Mapula porphyry copper prospect include oxidized cross-cutting A, B, and D veins with supergene minerals malachite, azurite, and chalcocite. Based on the reconnaissance mapping and core logging of two available drill holes, five alteration types were classified: (1) propylitic alteration typified by epidote-chlorite-calcite which replaces mafic minerals. It is weakly developed distal from the deposit center; (2) argillic alteration consisting of kaolinite and illite serving as pervasive surface cover and present in the first 100m of the drillholes; (3) chlorite-sericite alteration exhibited by chlorite-pyrite with dense stockwork B veins. Bornite and chalcopyrite occur as inclusions within the porphyry veins and as disseminations in the diorite and diorite porphyry; (4) sericitic alteration typified by sericite-pyrite with dense sub-parallel B veins. Sulfide centerline of B veins consists of chalcopyrite-bornite-pyrite; and (5) potassic alteration in the diorite porphyry typified by magnetite-secondary biotite-K-feldspar with minor occurrences of M-veins. Associated ore minerals are bornite-chalcopyrite-pyrite.

With the promising alteration footprints of the Mapula porphyry copper prospect, further drilling activities would be able to delineate the porphyry copper ore body.