Geology of Magpayang Gold Prospect, Surigao del Norte, Philippines

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The interest of Magpayang Gold Prospect (MGP) is due to its location within the Gold District of Surigao. About 6kms north of MGP is the porphyry-hosted Boyongan-Bayugo Porphyry Copper-Gold Deposits (BBPCG) and approximately 2kms east of the prospect is the Siana Mine which is hosted by a carlin-type of deposit. It is bounded to the north by Mt. Maniayao, to the west by Philippine Fault Zone and Malimono Range, to the east by Timamana Limestone and Bacuag Formation and to the south by Mainit Lake.

Magpayang area is dominantly underlain by Tugunan Formation (TGF), Maniayao Andesite (ANP) volcanic rocks and Quaternary Alluvium (Qal) deposits. TGF is the oldest in the area with relative age of Pleistocene based on stratigraphy. It is composed of fine to coarse sedimentary rocks from mudstone-siltstone to sandstone-conglomerate. Mudstone is laminated with thickness of <0.5cm to bedded, occasionally oxidized, and rare lenses containing weak pyrite disseminations. Some beds contain 10-50% mollusks and organic fragments with siltstone interbeds. Siltstone, on the other hand, occasionally exhibits vertical bedding and strongly disturbed layers in some areas. Conglomerate is bedded with clasts of pebble to cobble-sized ANP interbedded with friable sandy matrix and sandstone lenses. Qal (Terrace Gravel) is widespread and is concentrated in the south. It is composed of polymictic, clast-supported, non-graded to unsorted, sub-rounded to sub-angular of mainly ANP, dioritic and silicified rocks and rare ultramafic rocks. A patch exposure of ANP observed in MGP is relatively fresh which exhibits porphyritic texture with plagioclase-hornblende phenocryst and occasional hematite appears as flow.

The “boulder field” floats identified by Anglo American Exploration Phils., Inc. along the main creeks of MGP was revisited by Philex Mining Corporation team. Observed floats show porphyry-related features similar to BBPCG host deposit rocks, which are cut by strong quartz veins and quartz stockworks. However, only a few of these floats retained their original texture due to leaching and intense silicification and only a few of these floats show centerlines which may have contained sulfides such as pyrite and chalcopyrite but may have been already leached out. These samples assayed from 0.5g/t Au to 86.9g/t Au. Float that are not found in BBPCG which shows epithermal-related features are also found in MGP. These floats are pervasively silicified, brecciated with coarse (0.5-1cm) vugs that are both lath- and irregularly-shaped. Other floats found are BBPCG pre-mineralization rocks showing
propylitic alteration and medium-grained quartz-sericite assemblages that are similar to Medium-grained Diorite (MGD) of the BBPCG.

Six holes were drilled in MGP but 3 holes (MSD1-3) within the vicinity of Lake Mahucdam failed to go beyond the thick Tugunan rocks. Anomalous copper in groundwater and patchy polymetallic soil anomalies were delineated near MSD4 drillhole. MSD4 also intersected the paleosurface and shows massive hyaloclastite basalt with weak-moderate clay-chlorite-calcite alteration, strong limonite oxidation, common calcite vein/fracture fills and limonite, and trace of native Cu at the end of the hole. Also, two drillholes, JSD17 and JSD19, shows possible distal propylitic alteration.

Results of the current surface exploration in Magpayang reveal that the area is dominantly composed of clastic sedimentary rocks known as TGF. The presence of ‘boulder fields’ floats indicate that a concealed porphyry system is possible. With this assumption, the historical small scale mining and the existence of gold in the area could be alluvial or paleo-placer in nature. Drilling beyond the Quaternary volcanics and thick Tugunan would help discover the precove rocks and possibly locate the porphyry source. Moreover, a detailed look in the Tugunan Formation and the paleotopography and geomorphology of the area could help identify possible layers or areas which may contain gold.