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Occurrences of Gold and Base-metal Mineralizations at the Arinem Area, Western Java, Indonesia

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The Indonesia archipelago, 13,000 islands stretching for 5,200 km, contains an appreciable extent of Earth's Cenozoic volcano-plutonic arcs, and is the location of 15% of its historically active volcanoes. These arcs total approximately 9,000 km in length, with some 80% comprising segments containing known mineral deposits. Indonesia metallogeny is dominated by porphyry Cu and epithermal Au deposits (Carlile & Mitchell, 1994).

Arinem area is located at the south of Mt. Papandayan active volcano and is about 60 km southeast of Bandung City. The main mineralization in the area is represented by Arinem vein zone with total length about 5,900m, including unexposed vein zone at the south. Anomalies of Au, Ag, Cu, Pb and Zn elements were observed based on the evaluation of geochemical data of stream sediments. Distribution of Au anomaly has good correlation with Ag, Cu, Pb and Zn ones. Several drill holes data indicate that the occurrence of gold-silver is intimately associated with base metal mineral of copper, lead and zinc.

The host rocks of mineralization consist of volcanic rock such as lapilli tuff, tuff breccia, fine tuff, and andesitic lava as a part of the Jampang Formation of Miocene age. Quartz veins cross cut the Tertiary volcanic tuff breccias. These tuffs mainly suffered propylitic and argillic alteration and they are characterized by the occurrence of chlorite, clay minerals such as illite, kaolinite and in place by sericite and carbonate.

Based on the drilling data from level 265m, the mineralized quartz vein is characterized by colloform, crustiform, comb, vuggy, massive and brecciated in textures. Sulfide ore minerals mainly occur as thin band in brecciated texture zone. Some parts are associated with white clay and carbonate minerals cut by barren white crystal quartz with vuggy texture. Some massive quartz accompany sulfides ore minerals such as pyrite, chalcopyrite, sphalerite, galena and gangue minerals of white to brownish clay minerals, carbonate and sericite.

Results of chemical analyses for 70 core samples are in average of 0.66g/t Au, 9.89g/t Ag, 0.163% Cu, 0.221% Pb, 0.860% Zn, respectively. Ore minerals are mainly composed of sphalerite, galena, chalcopyrite and pyrite. The silver-telluride mineral (hessite) is found as inclusion in sphalerite, where some of hessite contain very fine grain electrum (?) inclusion.

Fluid inclusion study for sphalerite indicates that the temperature of mineralizing fluid was 152-218°C and salinity around 1.2-3.7 wt% NaCl eqv., while that for quartz temperature was 131-334°C and salinity around 0.2-4.8 wt% NaCl eqv.. Temperature for the inclusions of calcite is around 140-217°C with salinity 1.2-3.8 wt% NaCl eqv.. Although temperature and salinity obtained from sphalerite, quartz, and calcite suggest the epithermal type mineralization, further study is still in progress to understand the detailed mineralization process and to estimate the formation conditions of the gold-silver deposition in the Arinem vein system.