ENDAPAN EPITERMAL SULFIDASI RENDAH – MENENGAH DI DESA MONTERADO, KECAMATAN MONTERADO, KABUPATEN BENGKAYANG, PROVINSI KALIMANTAN BARAT

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ABSTRAK

Urat hidrotermal Monterado pembawa emas ditemukan pada tahapan awal eksplorasi di Desa Monterado, Kecamatan Monterado, Kabupaten Bengkayang, Provinsi Kalimantan Barat. Endapan primer ini terdapat di dalam kemenerusan sabuk magmatisme Kalimantan bagian tengah yang memanjang dari daerah Muyup, Kelian, serta Gunung Muro hingga daerah Monterado dimana terbukti memiliki sumber daya emas dengan sistem epitermal. Penelitian ini bertujuan untuk mengetahui tipe dan karkteristik dari endapan bijih di daerah penelitian. Metode penelitian yang digunakan untuk mencapai tujuan tersebut adalah pemetaan alterasi – mineralisasi detail, pemilihan sampel, dan pengamatan laboratorium seperti petrografi, XRD, mikroskopi bijih, kimia bijih (FA-AAS) dan mikrotermometri inklusi fluida. Urat pembawa emas terdapat pada satuan perselingan batulempung batupasir sisipan konglomerat (Formasi Volkanik Raya), satuan diorit kuarsa (Granodiorit Mensibau), satuan batupasir kuarsa (Formasi Hamisan), dan satuan Porfiri Diorit dan andesit (Formasi Sintang). Urat kuarsa yang termineralisasi secara umum dapat dibedakan menjadi dua tipe, tipe 1 yaitu urat berarah utara-selatan (Urat Nek Rimban dan Urat Muisan) dan tipe 2 yaitu urat berarah barat laut – tenggara (Urat Mertua, Urat Lipan, dan Urat Sekar). Secara genetik urat tipe 1 merupakan *tension vein* sedangkan urat tipe 2 merupakan *en echelon tension gash vein.* Berdasarkan kumpulan mineral sekunder, alterasi hidrotermal batuan dinding terdiri atas 6 zona, yaitu zona teralterasi lemah – tidak teralterasi, zona argilik (ilit – smektit $\pm$ kaolinit $\pm$ serisit $\pm$ kuarsa), zona argilik menengah (kuarsa – ilit –kaolinit $\pm$ serisit), zona propilitik (klorit – epidot $\pm$ kuarsa), zona silisifikasi (silika), zona filik (kuarsa – serisit $\pm$ pirit). Struktur urat yang dapat dijumpai adalah *masif, stockwork*, dan *breccia*. Tekstur urat yang dapat dijumpai adalah *comb* dan *drussy*. Analisis mikroskopi bijih mengindikasikan kehadiran *free gold* (*native/*electrum) yang berasosiasi dengan sulfida tembaga suhu tinggi (kalkopirit dan bornit), sulfida logam dasar (galena dan sfalerit), pirit, dan mineral tembaga supergen (malasit, kovelit, dan kalkosit). Analisis kimia bijih menunjukkan kadar Au tertinggi adalah 105 ppm dengan rata-rata 1.46 ppm (N=285) dan kadar Ag tertinggi 207 ppm dengan rata-rata 6.58 ppm (N=285). Analisis mikrotermometri inklusi fluida menunjukkan urat tipe 1 memiliki suhu homogenisasi 339.13^{o}C (rata-rata) dan salinitas 4.32 wt%NaCl eq (rata-rata), sedangkan urat tipe 2 memiliki suhu homogenisasi 329^{o}C (rata-rata) dan salinitas 4.62 wt% NaCl eq (rata-rata). Tahapan mineralisasi dibagi menjadi 2 tahapan, yaitu tahapan epitermal (pengendapan sulfida dan pembentukan urat kuarsa akhir) dan tahap supergen. Berdasarkan karakteristik tersebut, diinterpretasikan urat kuarsa pembawa emas secara genetic dikategorikan ke dalam endapan epitermal sulfidasi rendah – menengah.

Kata kunci: geologi, urat kuarsa, epitermal sulfidasi rendah-menengah, fluida, Monterado.

OF LOW – INTERMEDIATE SULFIDATION EPITHERMAL DEPOSIT AT MONTERADO AREA, MONTERADO SUB-DISTRICT, BENGKAYANG DISTRICT, WEST KALIMANTAN PROVINCE

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ABSTRACT

The Monterado gold-bearing quartz veins are recognized during first-stage exploration in Monterado Sub-district, Bengkayang District, West Kalimantan Province. The primary deposit is plotted within Tertiary Central Kalimantan magmatic arc, which is well known hosting some significant epithermal deposits along this belt including Muyup, Kelian, Mt. Muro, etc. This study is aimed to know the type and characteristics of ore deposit in study area. To achieve these objectives, research methods applied consist of detailed geological and alteration-mineralization mapping, sampling and selected samples analyses in various laboratories including altered rock petrography, XRD, ore microscopy, ore chemistry (FA-AAS) and microthermometric fluid inclusion analyses. The gold-bearing quartz veins are hosted by Interbedded mudrock-sandstone with conglomerate interlayered unit of Raya Volcanic Rocks Formation, quartz diorite unit of Mensibau Granodiorite, quartz arenite unit of Hamisan Formation and late diorite porphyry - andesite intrusions of Sintang Formation. Based on their orientation, the mineralized quartz veins are generally distinguished into 2 types including N-S trending massive quartz veins (Type 1), and NW-SE trending quartz veins (Type 2). The Type 1 veins consist of Muisan and Nek Rimban quartz vein and the type 2 veins consist of Mertua, Lipan, and Sekar veins. Genetically, type 1 vein are formed as tension vein, while type 2 vein are formed as en echelon tension gash vein. On the basis of mineral assemblages, wall-rock hydrothermal alteration is developed into 6 zones including non altered – weak altered zone, argillic zone (illite – smectite ±kaolinite ±sericite ± quartz), intermediate argillic (quartz – illite – kaolinite ± sericite), prophylitic (chlorite – epidote – quartz), phyllic zone (quartz – sericite + pyrite), silicification (silicified). Hydrothermal structure were identified as massive veins, stockworks vein, and breccia vein. Various textures are present, such as comb and drussy. Ore microscopic analysis indicates the presence of free gold (native/electrum) in association with high-temperature copper sulfides such as chalcopyrite and bornite, basemetal sulfides (galena and sphalerite), pyrite (abundant) and some supergene copper minerals such as covellite, chalcocite and malachite. Ore chemistry analysis shows an elevated grades of 105 g/t Au at an average of 1.46 g/t Au and 207 g/t Ag at an average of 6.58 g/t Ag (N =285 ore samples). Microthermometric analysis of fluid inclusions hosted by quartz in Type 1 quartz veins reveals a relative high temperature of homogenization (Th) of 339.13°C (mean) at the moderate fluid salinity of about 4.32 wt% NaCl eq. Similarly, Th of fluid inclusions within quartz of Type 2 quartz veins display a relative high Th of 329° C (mean) and moderate salinity of 4.62 wt% NaCl eq. (mean). Stages of mineralization in study area consists of epithermal stages (sulphide deposition and late quartz vein formation stages) and supergene stage. On the basis of those genetic characteristics, it is obviously interpreted that the gold-bearing quartz veins in the study area are genetically categorized into Low-Intermediate Sulfidation epithermal deposit type.

Keywords: ***geology, quartz vein, low-intermediate epithermal sulfidation, fluids, Monterado.***