

STUDI ALTERASI DAN MINERALISASI PADA ENDAPAN EPITERMAL SULFIDASI TINGGI DAERAH BOLAANG MONGONDOW SELATAN, PROVINSI SULAWESI UTARA

ABSTRAK

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Secara administratif, lokasi penelitian terletak di area pertambangan PT. J Resources Bolaang Mongondow, Kabupaten Bolaang Mongondow Selatan, Provinsi Sulawesi Utara, Indonesia. Penelitian ini bertujuan untuk mengetahui kondisi geologi, tipe alterasi dan persebaran mineralisasi, serta kaitannya dengan kadar logam khususnya Au pada daerah penelitian. Analisis yang dilakukan dalam keberlangsungan penelitian mencakupi analisis stereografis, analisis petrografi, analisis mineragrafi, analisis ASD, dan analisis *Fire Assay* dengan AAS. Stratigrafi pada daerah penelitian dari tua ke muda tersusun atas Satuan tuf-vulkanik-andesitik Bakan (Pliosen – Pleistosen), Satuan tuf-vulkanik-dasitik Bakan (Pliosen – Pleistosen), Satuan breksi-tuf-dasitik Bakan (Pliosen – Pleistosen), Satuan breksi-vulkanik-polimiktik (Pliosen – Pleistosen) dan Satuan intrusi-andesit Bakan (Pasca-Pleistosen). Struktur geologi yang berkembang berupa sesar mendatar kanan dengan arah NW-SE dan sesar mendatar kiri dengan arah ENE-WSW, serta tegasan utama berarah NE-SW. Zona alterasi pada daerah penelitian terbagi menjadi 6, berupa zona *silica vuggy* (kuarsa berongga ± alunit), zona silika masif (kuarsa masif ± alunit), zona argilik lanjut silika (kuarsa ± alunit ± kaolinit), zona argilik lanjut lempung (kaolinit ± dikit ± alunit ± kuarsa), zona argilik (ilit ± montmorilonit ± kuarsa), dan zona kloritik (klorit ± ilit ± montmorilonit ± kuarsa). Mineralisasi yang hadir pada daerah penelitian ditemukan pada tekstur mineralisasi diseminasi pada tubuh breksi dan *infilling vuggy* dengan mineral bijih berupa pirit, kalkopirit, enargit, kovelit, dan hematit. Satuan breksi-vulkanik-polimiktik Bakan menjadi satuan dengan kadar Au tertinggi karena permeabilitas batuan yang baik. Pada zona alterasi, *silica vuggy* dan silika masif adalah zona yang memiliki kadar Au yang tergolong ekonomis, sedangkan pada zona alterasi argilik memiliki kadar Au terendah berupa *waste*.

Kata Kunci : Alterasi Hidrotermal, Breksi Vulkanik Polimiktik, Epitermal Sulfidasi Tinggi, *Fire Assay* (AAS), Mineralisasi Emas (Au)

STUDY OF ALTERATION AND MINERALIZATION IN HIGH SULFIDATION EPIIPHERAL DEPOSITS IN SOUTH BOLAANG MONGONDOW AREA, NORTH SULAWESI PROVINCE

ABSTRACT

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Administratively, Administratively, the research location is located in the mining area of PT. J Resources Bolaang Mongondow, South Bolaang Mongondow Regency, North Sulawesi Province, Indonesia. This study aims to determine the geological conditions, types of alteration and distribution of mineralization, and their relationship to metal content, especially Au in the research area. The analysis carried out in the continuation of the research includes stereographic analysis, petrographic analysis, mineragraphic analysis, ASD analysis, and Fire Assay analysis with AAS. The stratigraphy in the research area from old to young is composed of the Bakan tuff-volcanic-andesitic Unit (Pliocene - Pleistocene), the Bakan tuff-volcanic-dacitic Unit (Pliocene - Pleistocene), the Bakan breccia-tuff-dacitic Unit (Pliocene - Pleistocene), the breccia-volcanic-polymictic Unit (Pliocene - Pleistocene) and the Bakan intrusive-andesitic Unit (Post-Pleistocene). The geological structure that developed was a right-normal strike-slip fault with a NW-SE direction and a left-normal strike-slip fault with an ENE-WSW direction, and the main stress was NE-SW direction. The alteration zone in the research area was divided into 6, namely the silica vuggy zone (hollow quartz $\pm$ alunite), the massive silica zone (massive quartz $\pm$ alunite), the advanced silica argillic zone (quartz $\pm$ alunite $\pm$ kaolinite), the advanced clay argillic zone (kaolinite $\pm$ little $\pm$ alunite $\pm$ quartz), the argillic zone (illite $\pm$ montmorillonite $\pm$ quartz), and the chloritic zone (chlorite $\pm$ illite $\pm$ montmorillonite $\pm$ quartz). Mineralization present in the research area was found in the disseminated mineralization texture in the breccia body and vuggy infilling with ore minerals in the form of pyrite, chalcopyrite, enargite, covellite, and hematite. The Bakan volcanic-polymictic breccia unit has the highest Au content due to its good rock permeability. In the alteration zone, vuggy silica and massive silica are the zones with economical Au content, while the argillic alteration zone has the lowest Au content in the form of waste.

Keywords : *Hydrothermal Alteration, Polymictic Volcanic Breccia, High Sulfidation Epithermal, Fire Assay (AAS), Gold (Au) Mineralization.*