

ABSTRAK

KARAKTERISASI DAN PEMODELAN ZONA PROSPEK MINERALISASI MELALUI INTEGRASI DATA *TIME DOMAIN INDUCED POLARIZATION* DAN DATA BOR PADA DAERAH “Z”, BANYUWANGI, JAWA TIMUR

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Mineral logam terbentuk dalam sistem hidrotermal yang berasosiasi dengan aktivitas magmatisme, dan umumnya ditemukan dalam endapan epitermal tipe *high sulfidation* (HS) dan *low sulfidation* (LS). Pemahaman yang mendalam mengenai tipe endapan dan zonasi alterasi sangat penting untuk meningkatkan efisiensi eksplorasi, terutama dalam menargetkan tubuh mineralisasi yang tersembunyi, seperti yang terdapat di Tambang Emas Tujuh Bukit, Banyuwangi, Jawa Timur. Penelitian ini menggunakan metode geolistrik *Time Domain Induced Polarization* (TDIP) untuk memetakan kondisi geologi bawah permukaan pada wilayah penelitian yang terletak di bagian utara zona utama Tambang Emas Tujuh Bukit. Pengukuran dilakukan pada 9 lintasan yang terbagi dalam 2 blok dengan menggunakan konfigurasi *Pole-Dipole* dan *Gradient Array*. Hasil pengukuran menghasilkan penampang 2D resistivitas dan *chargeability* bawah permukaan, model 3D resistivitas dan *chargeability*, korelasi penampang interpretasi seluruh lintasan, serta peta *slicing chargeability* per elevasi, yang mana seluruh hasil tersebut sudah diintegrasikan dengan data geologi bawah permukaan untuk menghasilkan interpretasi yang lebih akurat mengenai potensi mineralisasi di wilayah tersebut. Hasil penelitian menunjukkan bahwa zona mineralisasi umumnya memiliki nilai *chargeability* lebih dari 50.7 msec dan tersebar pada batuan dengan resistivitas rendah hingga sedang pada rentang nilai resistansi 1,05 hingga 1260 ohm.m yang telah mengalami alterasi hidrotermal bertipe *advanced argillic* dan *propylitic*, serta sebagian berada pada zona silisifikasi. Mineralisasi dominan terletak di bagian barat wilayah penelitian, meskipun ada beberapa *spot* yang juga ditemukan di bagian tengah dengan pola distribusi acak. Pola distribusi ini menunjukkan pengaruh aktivitas vulkanik dan pergeseran sesar. Struktur utama berupa sesar geser berarah barat-laut-tenggara dan barat-daya-timurlaut berfungsi sebagai jalur utama bagi fluida hidrotermal dalam memfasilitasi pembentukan mineralisasi pada daerah penelitian.

Kata Kunci: Alterasi, *Chargeability*, Geolistrik, Mineralisasi, Resistivitas.

ABSTRACT

CHARACTERIZATION AND MODELING OF A MINERALIZATION PROSPECT ZONE THROUGH INTEGRATION OF TIME DOMAIN INDUCED POLARIZATION, AND DRILLING DATA IN THE 'Z' AREA, BANYUWANGI, EAST JAVA

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Metallic minerals are formed in hydrothermal systems associated with magmatic activity and are commonly found in epithermal deposits of the high-sulfidation (HS) and low-sulfidation (LS) types. A thorough understanding of deposit types and alteration zoning is essential for improving exploration efficiency, particularly in targeting concealed mineralized bodies, such as those found at the Tujuh Bukit Gold Mine in Banyuwangi, East Java. This study uses the geoelectrical method of Time Domain Induced Polarization (TDIP) to map the subsurface geological conditions in the study area located in the northern part of the main zone of the Tujuh Bukit Gold Mine. Measurements were taken along 9 lines, divided into 2 blocks, using the Pole-Dipole and Gradient Array configurations. The measurements resulted in 2D resistivity and chargeability cross-sections, 3D resistivity and chargeability models, correlation of the cross-section interpretation for all lines, as well as chargeability slicing maps per elevation. All of these results were integrated with subsurface geological data to provide a more accurate interpretation of the mineralization potential in the area. The research results show that the mineralization zones generally have chargeability values greater than 50.7 msec and are spread across rocks with low to moderate resistivity, ranging from 1.05 to 1260 ohm.m, which have undergone hydrothermal alteration of the advanced argillic and propylitic types, with some parts located in a silicification zone. The mineralization is predominantly located in the western part of the study area, although several spots are also found in the central part, with a random distribution pattern. This distribution pattern reflects the influence of volcanic activity and fault displacement. The main structural feature, a northwest-southeast and southwest-northeast trending strike-slip fault, acts as the primary pathway for hydrothermal fluids, facilitating the formation of mineralization in the study area.

Keywords: Alteration, Chargeability, Geoelectrical, Mineralization, Resistivity.