

ABSTRAK

ANALISIS POTENSI MATERIAL *QUARRY* UNTUK KEBUTUHAN INFRASTRUKTUR JALAN MENGGUNAKAN METODE GEOLISTRIK RESISTIVITAS TOMOGRAFI (ERT)

Oleh

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Penelitian ini bertujuan mengevaluasi potensi material *quarry* untuk pengerasan jalan operasional di Sungai Ayawan Estate (SAYE). Eksplorasi menggunakan metode *Electrical Resistivity Tomography* (ERT) 2D pada empat lintasan (SA-01–SA-04) di Blok E20-F20 dan Q24 dengan kedalaman investigasi 20 meter, dikalibrasi data singkapan (*ground truth*). Hasil inversi 2D menunjukkan kontras profil stratigrafi yang signifikan. Pada Blok E20-F20, intrusi Lava Andesit Segar baru ditemukan pada kedalaman ± 16 meter tertutup *overburden* tebal, menyisakan ketebalan batuan keras tipis (± 3 meter) dengan kemenerusan lateral terbatas. Kondisi ini menghasilkan estimasi rasio pengupasan (*stripping ratio*) yang sangat tinggi sehingga tidak ekonomis. Sebaliknya, pada Blok Q24, intrusi Breksi Andesit Segar ($> 800 \Omega m$) terpetakan dangkal (0–16 meter dari permukaan) dengan ketebalan rata-rata 7 meter dan kemenerusan lateral yang sangat baik. Kesimpulannya, area Blok Q24 sangat direkomendasikan sebagai prioritas lokasi *quarry* karena efisiensi rasio pengupasannya, sedangkan Blok E20-F20 tidak direkomendasikan untuk dieksploitasi.

Kata Kunci: Breksi Andesit, *Electrical Resistivity Tomography*, Kemenerusan Lateral, *Quarry*, Rasio Pengupasan.

ABSTRACT

ANALYSIS OF QUARRY MATERIAL POTENTIAL FOR ROAD INFRASTRUCTURE NEEDS USING GEOPHYSICAL RESISTIVITY TOMOGRAPHY (ERT) METHOD

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This This study aims to evaluate quarry material potential for operational road pavement in the Sungai Ayawan Estate (SAYE). Exploration utilized the 2D Electrical Resistivity Tomography (ERT) method along four lines (SA-01–SA-04) in Blocks E20-F20 and Q24 with a 20-meter investigation depth, calibrated by ground truth data. The 2D inversion results reveal a significant stratigraphic contrast. In Block E20-F20, Fresh Andesite Lava intrusion was only found at a depth of ± 16 meters under a thick overburden, leaving a thin hard rock layer (± 3 meters) with limited lateral continuity. This yields a severely high estimated stripping ratio, rendering it uneconomical. Conversely, in Block Q24, Fresh Andesite Breccia intrusion ($> 800 \Omega m$) was mapped shallowly (0–16 meters from the surface) with an average thickness of 7 meters and excellent lateral continuity. In conclusion, Block Q24 is highly recommended as the main quarry priority due to its stripping ratio efficiency, while Block E20-F20 is not recommended for exploitation.

Keywords: *Andesite Breccia, Electrical Resistivity Tomography, Lateral Continuity, Quarry, Stripping Ratio.*