ABSTRAK

ANALISIS KETEBALAN DAN ESTIMASI VOLUME ZONA LATERIT BERDASARKAN PEMODELAN 2D DAN 3D GEOLISTRIK RESISTIVITAS DENGAN KORELASI DATA BOR DI AREA LALINDU KABUPATEN KONAWE UTARA

Oleh

Fariz Al Hamdi

Nikel adalah jenis logam yang sering dipakai dalam industri dan sebagian besar dimanfaatkan untuk produksi *stainless steel*. Kebutuhan akan nikel diperkirakan akan semakin tinggi sebagai akibat dari semakin bertumbuhnya industri kendaraan listrik yang membutuhkan nikel sebagai bahan baku pembuatan baterai. Indonesia adalah negara yang memiliki cadangan nikel terbesar di dunia. Kebanyakan dari cadangan nikel ini terdapat di wilayah Indonesia timur, salah satunya di Provinsi Sulawesi Tenggara. Penelitian ini dilakukan untuk mengetahui area dengan prospek nikel laterit melalui analisis ketebalan dan estimasi volume zona laterit. Data yang digunakan adalah data hasil akuisisi geolistrik resistivitas konfigurasi *Dipole-Dipole* sebanyak delapan lintasan yang tersebar di empat area berbeda. Data ini kemudian diolah dengan melakukan pemodelan inversi 2D dan rekonstruksi 3D. Selain data geolistrik, dalam penelitian ini juga digunakan data lubang bor sebanyak lima data lubang bor. Berdasarkan hasil analisis dan interpretasi, diketahui bahwa zona laterit di daerah penelitian terdiri dari zona saprolit dengan nilai resistivitas 1 – 50 Ωm dan zona *bedrock* memiliki nilai resistivitas 51 - 16.140 Ωm. Ketebalan zona saprolit pada lintasan kalibrasi rata-rata 7 - 13 meter. Lintasan 1 memiliki ketebalan rata-rata 5 - 10 meter. Lintasan 2 memiliki ketebalan rata-rata 3 - 15 meter. Lintasan 3 memiliki ketebalan rata-rata 5 - 10 meter. Lintasan 4 memiliki ketebalan rata-rata 10 - 15 meter. Lintasan 5 memiliki ketebalan rata-rata 3 - 10 meter. Lintasan 6 memiliki ketebalan rata-rata sekitar 5 - 9 meter. Lintasan 7 memiliki ketebalan rata-rata 7 - 30 meter. Total estimasi volume zona laterit yang terukur dalam penelitian ini adalah 272.704 m^3, dimana volume area 1 sebesar 45.064 m^3, volume area 2 sebesar 171.728 m^3, dan volume area 3 sebesar 55.912 m^3.

Kata kunci : Nikel Laterit, Geolistrik, Resistivitas, Sulawesi Tenggara, *Dipole-Dipole*

ABSTRACT

THICKNESS ANALYSIS AND VOLUME ESTIMATION OF LATERITE ZONE BASED ON 2D AND 3D GEOELECTRIC RESISTIVITY MODELING WITH DRILL DATA CORRELATION IN LALINDU AREA, NORTH KONAWE REGENCY

By

Fariz Al Hamdi

Nickel is a type of metal commonly used in the industry, primarily utilized in the production of stainless steel. The demand for nickel is expected to rise significantly due to the growing electric vehicle industry, where nickel is a crucial raw material for battery manufacturing. Indonesia is a country with the largest nickel reserves in the world. Most of these nickel reserves are located in the eastern regions of Indonesia, including the Southeast Sulawesi Province. This research aims to identify areas with lateritic nickel prospects through the analysis of thickness and volume estimation of the lateritic zone. The data used in this study include the results of geoelectric resistivity measurement with Dipole-Dipole configuration along eight lines spread across four different areas. This data is then processed by conducting 2D inversion modeling and 3D reconstruction. In addition to the geoelectric data, the study also incorporates data from five drillholes. Based on the analysis and interpretation, it is revealed that the lateritic zone in the research area consists of saprolite zones with resistivity values ranging from 1 to 50 Ωm, while the bedrock zone has resistivity values ranging from 51 to 16,141 Ωm. The saprolite zone thickness on calibration line averages 7 - 13 meters. Line 1 has an average thickness of 5 - 10 meters. Line 2 has an average thickness of 3 - 15 meters. Line 3 has an average thickness of 5 - 10 meters. Line 4 has an average thickness of 10 - 15 meters. Line 5 has an average thickness of 3 - 10 meters. Line 6 has an average thickness of 5 - 9 meters. Line 7 has an average thickness of 7 - 30 meters. The total estimated volume of the measured lateritic zone in this study is 272,704 m^3, with the volume of area 1 being 45,064 m^3, the volume of area 2 being 171,728 m^3, and the volume of area 3 being 55,912 m^3.

Keywords: Nickel Laterite, Geoelectric, Resistivity, Southeast Sulawesi, Dipole-Dipole