

INTISARI

SEBARAN POTENSI ZONA NIKEL LATERIT PADA DAERAH TAPUNOPAKA, SULAWESI TENGGARA BERDASARKAN DATA *GROUND PENETRATING RADAR (GPR)*

Oleh

Septine Sendy Azmy

21/473762/PA/20428

Nikel merupakan komoditas strategis dengan nilai tinggi dan Indonesia menjadi produsen nikel terbesar di dunia dengan produksi mencapai 1.579.000 metrik ton pada tahun 2022 (USGS, 2022), didominasi oleh endapan nikel laterit. Endapan ini umumnya tersusun atas empat zona, yaitu top soil, limonit, saprolit, dan bedrock, di mana kandungan nikel ekonomis terkonsentrasi pada zona limonit dan saprolit. Penelitian ini bertujuan untuk memetakan ketebalan dan distribusi zona laterit menggunakan metode Ground Penetrating Radar (GPR) dan data bor, serta memvisualisasikannya dalam model 3D.

Akuisisi data GPR dilakukan pada empat lintasan menggunakan antena frekuensi 30 MHz, dengan estimasi kedalaman penetrasi hingga ± 60 meter. Proses pengolahan melibatkan berbagai filter seperti *static correction*, *dewow*, *bandpass filter*, *background removal*, dan koreksi topografi. Data radargram dikorelasikan dengan data bor guna meningkatkan akurasi interpretasi. Hasilnya menunjukkan bahwa GPR efektif untuk eksplorasi zona laterit, dengan ketebalan zona limonit berkisar 0,35–2,32 meter dan zona saprolit 5,03–9,64 meter. Ketebalan lapisan dipengaruhi oleh topografi dan proses erosi. Visualisasi model 3D memberikan gambaran sebaran zona laterit yang representatif terhadap kondisi geologi bawah permukaan.

Kata kunci: nikel laterit, Ground Penetrating Radar, zona limonit, saprolit, model 3D, eksplorasi

ABSTRACT

DISTRIBUTION OF LATERITE NICKEL ZONE POTENTIAL IN TAPUNOPAKA AREA, SOUTHEAST SULAWESI BASED ON GROUND PENETRATING RADAR (GPR) DATA

by

Septine Sendy Azmy

21/473762/PA/20428

Nickel is a strategic commodity of high value, and Indonesia is the world's largest producer with a total production of 1,579,000 metric tons in 2022 (USGS, 2022), mostly derived from laterite nickel deposits. These deposits typically consist of four main zones: topsoil, limonite, saprolite, and bedrock, where the economically valuable nickel content is concentrated in the limonite and saprolite zones. This study aims to map the thickness and distribution of laterite zones using the Ground Penetrating Radar (GPR) method and borehole data, as well as visualize them in a 3D model.

GPR data acquisition was conducted along four survey lines using a 30 MHz antenna, with an estimated penetration depth of ± 60 meters. Data processing involved several filters including static correction, dewow, bandpass filter, background removal, and topographic correction. The radargram results were correlated with borehole data to enhance interpretation accuracy. The results indicate that GPR is effective for laterite zone exploration, with limonite thickness ranging from 0.35 to 2.32 meters and saprolite from 5.03 to 9.64 meters. Layer thickness is influenced by topography and erosion processes. The 3D visualization model provides a representative view of the laterite zone distribution in relation to the subsurface geological conditions.

Keywords: laterite nickel, Ground Penetrating Radar, limonite zone, saprolite, 3D model, exploration.