ABSTRACT

IDENTIFICATION NICKEL LATERITE PROFILE BASED ON THE RESPONSE ELECTRICAL RESISTIVITY TOMOGRAPHY (ERT) METHOD AND ITS CORRELATION WITH DRILLING HOLE DATA IN THE "FAI" AREA IN THE CONCESSION OF PT. VALE INDONESIA TBK. SOROWAKO, EAST LUWU DISTRICT, SOUTH SULAWESI

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In the process of nickel exploration, difference often occur between the estimated reserves and the results obtained during mining so that the ERT or Electrical Resistivity Tomography method is needed to be able to support in mapping the subsurface of nickel laterite deposits using a gradient configuration. One of the nickel laterite explorations carried out at PT Vale Indonesia Tbk is in the "FAI" area of the East Block type which is the focus area of this research.

This study aims to determine the nickel laterite layers based on resistivity data and drill data as well as the influence of Fe, SiO2 and MgO on the resistivity value in each layer of the nickel laterite profile. Data processing uses RES2DINV software to obtain 2D resistivity cross sections. The 2D cross section is then correlated with drill data in Datamine software. Furthermore, the results of correlating drill data and resistivity data are used to obtain elemental content data and resistivity data to obtain graphs of the effect of Fe, SiO2 and MgO on resistivity values.

Based on the correlation between the resistivity cross section and the drill data, there is an indication of the nickel laterite layer system, namely limonite, saprolite, bedrock which has different resistivity values, namely the resistivity value of 100-300 **Ω***m is interpreted as red limonite and the resistivity value of 300-1000* **Ω***m is interpreted as yellow limonite The resistivity value of 20-300* **Ω***m is interpreted as saprolite The bedrock layer has two characteristics, resistivity values <200* **Ω***m are interpreted as bedrock layers that have been affected by structures and resistivity values >200* **Ω***m are interpreted as bedrock layers that have not been affected by structures. Variations in resistivity values are influenced by porosity, permeability, water content, and fracture structures in the bedrock. In the limonite layer Fe has the highest content compared to* SiO_2 *and MgO with a high resistivity value response. In the saprolite layer* SiO_2 *has the highest content compared to Fe and MgO with a low resistivity value response due to the influence of high water content. In the bedrock layer MgO has the highest level compared to Fe and* SiO_2 *with a low resistivity value response due to the influence of fractures in the bedrock.*

Keywords: *Electrical Resistivity Tomography, Gradient Array, Nickel Laterite, East Block, Fe,* SiO_2*, MgO.*