

ABSTRAK

IDENTIFIKASI PERSEBARAN BATUPASIR BERDASARKAN DATA GEOLISTRIK RESISTIVITAS KONFIGURASI WENNER-SCHLUMBERGER DI DAERAH TENGGARONG SEBERANG, KALIMANTAN TIMUR

Oleh
Widya Alysia Maharani
NIM: 115210031
(Program Studi Sarjana Teknik Geofisika)

Daerah Tenggarong Seberang yang termasuk dalam Cekungan Kutai, dengan cekungan sedimen terbesar di Indonesia, yang menunjukkan potensi sumber daya batupasir yang signifikan dan memiliki nilai ekonomi tinggi. Penelitian ini bermanfaat sebagai data awal eksplorasi sumberdaya batupasir, mendukung perencanaan pengelolaan sumberdaya alam, dan mendorong pembangunan infrastruktur di wilayah Kalimantan Timur.

Penelitian ini bertujuan mengidentifikasi persebaran batupasir menggunakan metode geolistrik resistivitas dengan konfigurasi Wenner-Schlumberger di Tenggarong Seberang, Kalimantan Timur. Batupasir menjadi sumberdaya alam penting untuk mendukung infrastruktur dan industri. Data diperoleh dari 11 lintasan survei lapangan dengan elektroda berjarak 7–10 meter dan panjang lintasan 329–470 meter. Data resistivitas diolah dengan perangkat lunak Res2Dinv untuk penampang 2D dan Rockwork untuk pemodelan 3D serta peta *slicing* elevasi tiap 10 meter, memberikan gambaran persebaran batupasir secara horizontal dan vertikal.

Hasil menunjukkan bahwa di daerah penelitian batupasir dengan nilai resistivitas $> 22 \Omega \cdot \text{meter}$ tersebar hingga kedalaman sekitar 50 meter pada beberapa lintasan. Kemudian, litologi lainnya yang tersebar di daerah penelitian berupa batu lempung dengan nilai resistivitas $< 22 \Omega \cdot \text{meter}$. Pemodelan 3D mengungkap pola persebaran batupasir yang memanjang ke arah utara-selatan dan barat-timur, sementara batu lempung dan batupasir tersebar lebih luas dan merata. Estimasi sumberdaya batupasir sekitar $9.753.200 \text{ m}^3$ dan batu lempung sekitar $2.178.800 \text{ m}^3$, sehingga total sumberdaya di daerah penelitian sebesar $11.932.000 \text{ m}^3$.

Kata kunci: Estimasi Sumberdaya, Geolistrik, Pemodelan 3D, Wenner-Schlumberger

ABSTRACT

IDENTIFICATION OF SANDSTONE DISTRIBUTION BASED ON GEOLISTRIK RESISTIVITAS DATA USING THE WENNER-SCHLUMBERGER CONFIGURATION IN TENGGARONG SEBERANG AREA, EAST KALIMANTAN

By
Widya Alysia Maharani
NIM: 115210031
(*Geophysical Engineering Undergraduated Program*)

The Tenggarong Seberang area, part of the Cekungan Kutai, the largest sedimentary basin in Indonesia, shows a significant and economically valuable sandstone resource potential. This study provides basic data for further exploration of compact sandstone resources, supports natural resource management planning, and promotes infrastructure development in East Kalimantan.

This study aims to identify the distribution of compact sandstone using the geolistrik resistivity method with the konfigurasi Wenner-Schlumberger in Tenggarong Seberang, East Kalimantan. Sandstone is an important natural resource to support infrastructure and industry. Data were obtained from 11 field survey lines using electrodes spaced 7–10 meters apart and line lengths of 329–470 meters. Resistivity data were processed using Res2Dinv software for 2D sections and Rockwork software for 3D modeling and slicing maps every 10 meters, providing a horizontal and vertical distribution overview of sandstone.

The results show that in the research area, sandstone with a resistivity value of $> 22 \Omega \cdot \text{meter}$ is spread to a depth of about 50 meters in several paths. Then, other lithologies spread in the research area are claystone with a resistivity value of $< 22 \Omega \cdot \text{meter}$. 3D modeling reveals a distribution pattern of compact sandstone that extends in a north-south and west-east direction, while claystone and sandstone are spread more widely and evenly. The estimated sandstone resources are around $9.753.200 \text{ m}^3$ and claystone around $2.178.800 \text{ m}^3$, so that the total resources in the research area are $11.932.000 \text{ m}^3$.

Keywords: Geolistrik, Resource Estimation, 3D Modeling, Wenner-Schlumberger