INTISARI

Studi Implementasi Metode *Ground Penetrating Radar* (GPR) untuk Identifikasi Batubara di Pit "X" Banko Tengah B, Sub-Cekungan Palembang Selatan

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Metode pengeboran atau *well logging* biasanya digunakan untuk menentukan ketebalan dan kedalaman lapisan batubara di lokasi Pit "X" Banko Tengah B. Korelasi antar data bor dilakukan untuk menggambarkan kemenerusan batubara. Namun, keterdapatan struktur geologi dapat menyulitkan interpretasi sehingga dapat menghabiskan waktu yang tidak sedikit karena diperlukan lebih dari 1 titik bor untuk mengetahui kemenerusan lapisan batubara. Dalam penelitian ini, metode *Ground Penetrating Radar* (GPR) diimplementasikan untuk membantu interpretasi kemenerusan batubara dari antar lubang bor tersebut.

Survei GPR dilakukan pada 5 lintasan memiliki panjang pengukuran 341-618 meter dengan orientasi yang bervariasi. Frekuensi sentral yang digunakan dalam pengukuran sebesar 25 MHz dengan estimasi kedalaman 40 meter. Pada penelitian ini, pengolahan data terdiri dari *move start time*, *dewow*, *gain function*, *butterworth*, *background removal*, *frequency-wavenumber* (f-k), dan *correct* 3D *topography*. Interpretasi didasarkan pada perbedaan permitivitas listrik, konduktivitas listrik, dan permeabilitas magnetik yang divisualisasikan dalam refleksi radargram. Untuk menghasilkan interpretasi yang lebih akurat dan menyeluruh, dilakukan korelasi data GPR terhadap data bor dan *outcrop*.

Hasil korelasi menunjukkan metode GPR dapat mengidentifikasi lapisan batubara cukup baik dengan kontras amplitudo yang stabil dan cukup kuat pada refleksi radargram. Struktur geologi yang berkembang pada area penelitian berupa patahan turun dan patahan naik serta lipatan lokal yaitu antiklin dan sinklin. Metode GPR juga dapat membantu dalam melakukan korelasi, dimana kemenerusan lapisan batubara sulit ditentukan secara presisi akibat lapisan batubara yang relatif datar.

Kata kunci: *Ground Penetrating Radar* (GPR), batubara, data bor, *outcrop*, struktur geologi, Pit "X" Banko Tengah B

ABSTRACT

Study on the Implementation of the Ground Penetrating Radar (GPR) Method for Coal Identification in Pit "X" Banko Tengah B, South Palembang Sub-Basin

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The drilling or well logging method is typically used to determine the thickness and depth of coal seams at the Pit "X" Banko Tengah B location. Correlation of drill data is conducted to describe the continuity of the coal. However, the presence of geological structures can complicate interpretation and can be time-consuming because more than one drill point is needed to determine the continuity of the coal seam. In this study, the Ground Penetrating Radar (GPR) method was implemented to assist in interpreting coal continuity between drill holes.

The GPR survey was conducted on five tracks with measurement lengths ranging from 341 to 618 meters and varying orientations. The central frequency used in the measurements was 25 MHz, with an estimated depth penetration of 40 meters. Data processing in this study included adjusting the start time, dewow filtering, optimizing gain function, applying Butterworth filtering, background removal, frequency-wavenumber (f-k) migration, and correcting for 3D topography. The interpretation was based on differences in electrical permittivity, electrical conductivity, and magnetic permeability observed in radargram reflections. To achieve a more accurate and comprehensive interpretation, correlation of GPR data with drill and outcrop data was performed.

The correlation results demonstrate that the GPR method can effectively identify coal seams with stable and strong amplitude contrast in the radargram reflection. Geological structures that developed in the research area include normal faults and thrust faults, ocal folds, namely anticlines and synclines. The GPR method also assists in performing robust correlation, particularly when determining the continuity of the coal seam proves challenging due to its relatively flat nature.

Keywords: Ground Penetrating Radar (GPR), coal, drill data, outcrop, geological structure, Pit "X" Banko Tengah B