

Karakterisasi Reservoir menggunakan Metode Inversi Seismik Impedansi Akustik dan Analisis Rock Physics Lapangan SR, Cekungan Sumatra Selatan = Reservoir Characterization using Acoustic Impedance Seismic Inversion Method and Rock Physics Analysis of SR Field, South Sumatra Basin

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Abstrak

Karakterisasi reservoir hidrokarbon merupakan serangkaian proses yang meliputi interpretasi, analisis, serta evaluasi sebuah reservoir berdasarkan data geologi dan geofisika. Suatu reservoir hidrokarbon dapat diklasifikasikan sebagai suatu reservoir yang berkarakter ekonomis untuk eksplorasi dan produksi jika proses karakterisasi reservoir dilakukan dengan tepat secara kualitatif dan kuantitatif. Integrasi data geologi dan geofisika dapat bermanfaat bagi karakterisasi reservoir melalui pemanfaatan metode inversi seismik. Keberadaan hidrokarbon di Formasi Talang Akar, Cekungan Sumatra Selatan dianalisis menggunakan inversi seismik yang menggunakan data full-stack seismic secara model-based. Implementasi metode inversi model-based menggunakan properti seismik, yaitu impedansi akustik. Dengan mengintegrasikan data sumur, dapat dihasilkan properti fisika batuan, seperti impedansi akustik gelombang-P (Z_p) dan kecepatan gelombang-P (V_p). Pemanfaatan impedansi akustik dengan memperhatikan hasil analisis wavelet yang tepat untuk melaksanakan proses inversi dapat bermanfaat untuk melakukan prediksi litologi bawah permukaan penyusun reservoir hidrokarbon. Hasil inversi impedansi akustik dapat dielaborasi untuk mendelineasi litologi sand dan shale secara umum pada lingkungan pengendapan berupa delta-fluvial. Prediksi litologi melalui ketersediaan data Sumur BUDAPEST, CANNES, dan DEBRECEN pada reservoir pada studi penelitian ini berhasil memprediksi litologi berupa sand (Class 1) sebesar 40.89%, sand (Class 2) sebesar 38.08%, shale sebesar 37.20%, serta karbonat sebesar 53.34%.

.....Hydrocarbon reservoir characterization is a series of processes that include interpretation, analysis, and evaluation of a reservoir based on geological and geophysical data. A hydrocarbon reservoir can be classified as a reservoir with economical characteristics for exploration and production if the reservoir characterization process is carried out qualitatively and quantitatively. The integration of geological and geophysical data can be useful for reservoir characterization through the use of the seismic inversion method. The presence of hydrocarbons in the Talang Akar Formation, South Sumatra Basin was analyzed using seismic inversion which uses model-based, from full-stack seismic data. The implementation of the model-based inversion method uses acoustic impedance as the property. By integrating well data, rock physics properties can be generated, such as P-wave acoustic impedance (Z_p) and P-wave velocity (V_p). Utilization of acoustic impedance by taking into account the results of the appropriate wavelet analysis to carry out the inversion process can be useful for predicting subsurface lithology making up hydrocarbon reservoirs. The results of acoustic impedance inversion can be elaborated to delineate sand and shale lithologies in general in delta-fluvial depositional environments. The lithology prediction through the availability of data on the BUDAPEST, CANNES, and DEBRECEN wells in the reservoir of research in this study succeeded in predicting lithology in the form of 40.89% sand (Class 1), 38.08% sand (Class 2), 37.20% shale, and 53.34% carbonate.