

Karakterisasi Reservoir Karbonat Menggunakan Seismik Inversi Impedansi Akustik Studi Kasus Cekungan Sunda Formasi Batu Raja = Carbonate Reservoir Characterization Using Acoustic Impedance Seismic Inversion Case Study of the Sunda Basin Batu Raja Formation

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Abstrak

Lapangan “R” merupakan lapangan pengembangan yang berada di Cekungan Sunda. Formasi Baturaja merupakan salah satu reservoir utama di Cekungan Sunda yang memiliki fasies karbonat tebal dan mampu menyimpan hidrokarbon. Oleh karena itu, penelitian untuk mengkarakterisasi reservoir pada Formasi Baturaja dilakukan. Salah satu metode terbaik yang digunakan adalah seismik inversi impedansi akustik. Metode seismik inversi impedansi akustik lebih efektif digunakan daripada metode seismik konvensional karena dapat menunjukkan interpretasi struktur, stratigrafi, litologi dan distribusi fluida dengan resolusi yang lebih baik dan akurat. Berdasarkan analisis kualitatif data sumur dan crossplot, litologi yang mengisi Formasi Baturaja adalah karbonat (limestone dan limestone-dolomit), shale, dan shale karbonat. Pada penelitian ini, pemodelan inversi impedansi akustik menggunakan tiga metode, yaitu model based, bandlimited, dan linear programming sparse spike. Berdasarkan hasil penelitian pada Lapangan “R”, didapatkan estimasi nilai impedansi akustik karbonat yaitu berkisar 8500- 13.000 (m/s)(g/cc), shale <6000(m/s)(g/cc) dan overlap antara shale dan karbonat dengan rentang nilai 6000-8500(m/s)(g/cc). reservoir karbonat yang diperkirakan memiliki porositas yang cukup dan berasosiasi dengan hidrokarbon diidentifikasi dengan nilai log NPHI antara 0.2 – 0.38 v/v.

.....The “R” field is a development field located in the Sunda Basin. The Baturaja Formation is one of the reservoir prospect in the Sunda Basin which has thick carbonate facies and is capable of storing hydrocarbons. Therefore, research to characterize of the reservoir in the Baturaja Formation was carried out. One of the best methods used is acoustic impedance seismic inversion. Acoustic impedance seismic inversion method is more effective than conventional seismic methods because it can show better resolution and more accurate interpretation of structure, stratigraphy, lithology and fluid distribution. Based on qualitative analysis of well data and crossplot, the lithology of Baturaja Formation is carbonate (limestone and limestone-dolomit), shale, and shale carbonate. In this study, acoustic impedance inversion modeling uses three methods which are model based, bandlimited, and linear programming sparse spike. Based on the research results in Field R, the estimated carbonate acoustic impedance values are around 8500-13,000 (m/s)(g/cc), shale <6000(m/s)(g/cc) and overlap between shale and carbonate with a range value 6000-8500(m/s)(g/cc). Reservoir carbonates which are estimated to have sufficient porosity and associated with hydrocarbons were identified with log NPHI values between 0.2 – 0.38 v/v.