

INTISARI

PENGAPLIKASIAN ANALISIS JARINGAN SARAF PROBABILISTIK UNTUK MENENTUKAN DISTRIBUSI RESERVOIR BATUPASIR PADA FORMASI TALANG AKAR, LAPANGAN "CT", CEKUNGAN SUNDA

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Karakterisasi reservoir pada Formasi Talang Akar (TAF) di Lapangan "CT", Cekungan Sunda, memiliki tantangan tersendiri akibat heterogenitas litologi yang kompleks. Penelitian ini bertujuan untuk memetakan distribusi reservoir batupasir dengan mengintegrasikan metode Inversi Seismik Model-Based, multi-atribut seismik, dan pendekatan Machine Learning berbasis *Probabilistic Neural Network* (PNN). Pada tahap pelatihan, model PNN menunjukkan performa awal yang sangat baik dengan korelasi mencapai 0,64 untuk densitas dan 0,87 untuk porositas. Selanjutnya, evaluasi keandalan model melalui validasi *Blind Test* dan eliminasi sumur *outlier* berhasil meningkatkan akurasi prediksi, dimana korelasi validasi meningkat dari 0,42 menjadi 0,45 untuk densitas dan meningkat signifikan dari 0,37 menjadi 0,64 untuk porositas. Stabilitas parameter sigma pada nilai 0,6 yang teramati selama proses validasi mengindikasikan bahwa model memiliki kemampuan generalisasi yang baik dan konsisten terhadap variasi geologi lokal. Peta distribusi yang dihasilkan berhasil mengidentifikasi pola reservoir batupasir (channel system) dengan porositas tinggi di bagian utara lapangan yang terdeliniasi jelas dari zona non-reservoir di bagian selatan. Hasil akhir peta distribusi lateral tersebut selaras dengan kerangka geologi regional, membuktikan bahwa aplikasi PNN yang tervalidasi mampu meningkatkan resolusi karakterisasi reservoir batupasir secara efektif di Lapangan "CT".

Kata Kunci : Inversi Seismik, Formasi Talang Akar, *Probabilistic Neural Network* (PNN), Karakterisasi Reservoir

ABSTRACT

APPLICATION OF PROBABILISTIC NEURAL NETWORK ANALYSIS TO DETERMINE THE DISTRIBUTION OF SAND RESERVOIRS IN THE TALANG AKAR FORMATION, "CT" FIELD, SUNDA BASIN

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The characterization of reservoirs in the Talang Akar Formation (TAF) in the "CT" Field, Sunda Basin, presents unique challenges due to complex lithological heterogeneity. This study aims to map the distribution of sandstone reservoirs by integrating Model-Based Seismic Inversion, multi-seismic attributes, and a Machine Learning approach based on Probabilistic Neural Network (PNN). During the training phase, the PNN model showed excellent initial performance with a correlation of 0.64 for density and 0.87 for porosity. Furthermore, the evaluation of model reliability through Blind Test validation and outlier well elimination successfully improved prediction accuracy, where the validation correlation increased from 0.42 to 0.45 for density and significantly increased from 0.37 to 0.64 for porosity. The stability of the sigma parameter at a value of 0.6 observed during the validation process indicates that the model has good and consistent generalization capabilities against local geological variations. The resulting distribution map successfully identified a sandstone reservoir pattern (channel system) with high porosity in the northern part of the field, which was clearly delineated from the non-reservoir zone in the southern part. The final results of the lateral distribution map are consistent with the regional geological framework, proving that the validated PNN application can effectively improve the resolution of sandstone reservoir characterization in the "CT" Field.

Keywords: Talang Akar Formation, Seismic Inversion, Probabilistic Neural Network (PNN), Blind Test, Reservoir Characterization.