ABSTRAK

ANALISIS PERBANDINGAN INVERSI *P-IMPEDANCE* DENGAN METODE DETERMINISTIK *MODEL BASED* DAN METODE STOKASTIK PADA FORMASI LAMA LAPANGAN "KSW" CEKUNGAN NATUNA BARAT

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Lapangan "KSW" adalah lapangan produksi minyak dan gas bumi yang berada di Cekungan Natuna Barat. Target penelitian adalah Formasi Lama. Formasi lama cukup unik karena berperan sebagai batuan sumber dan batuan reservoar. Litologi Formasi Lama terdiri dari perselingan batupasir, serpih dan batulanau. Penelitian dilakukan untuk membandingkan inversi seismik metode deterministik *model based* dan stokastik.

Inversi deterministik *model based* lebih mudah dilakukan, prinsipnya adalah meminimalisasi *error* antara *trace* model seismik dan *trace* seismik sebenarnya. Inversi deterministik cukup baik dalam mereprentasikan data yang sesuai dengan batas *bandwidth*. Inversi deterministik menghasilkan satu solusi optimal. Inversi stokastik menggabungkan *trace* seismik dan *initial guess model*. Inversi stokastik adalah teknik simulasi acak yang dapat menghasilkan beberapa realisasi impedansi yang cocok dengan data sumur dan seismik.

Berdasarkan hasil pengolahan dan analisis, inversi deterministik menghasilkan hasil inversi yang *blocky*, sesuai dengan data seismik namun jika divalidasi dengan data sumur log *gamma ray* kurang sesuai. Inversi stokastik menghasilkan hasil inversi yang membentuk *layer-layer* yang sesuai dengan data sumur *log gamma ray*. Untuk Lapangan "KSW" lebih cocok digunakan inversi stokastik karena hasil inversi stokastik dapat merepresentasikan lapisan pada Formasi Lama yang ketebalannya dibawah *tunning thickness* dengan baik.

Kata Kunci : Deterministik, *Gamma Ray*, Inversi, *Model Based*, *P-Impedance*, Seismik, Stokastik

ABSTRACT

COMPARATIVE ANALISYS OF P-IMPEDANCE INVERSION USING DETERMINISTIC MODEL BASED AND STOCHASTIC METHOD AT LAMA FORMATION "KSW" FIELD WEST NATUNA BASIN

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"KSW" Field is an production field of oil and natural gas located in West Natuna Basin. The research target is Lama Formation. Lama Formation is unique because it acts as a source rock and reservoir rock. Lama Formation lithology are intermittent sandstone, shale and siltstone. The purpose of this research is to comparing two seismic inversion method, deterministic model based and stochastic.

Deterministic model based inversions are the simple way to describe the subsurface, it's principle is minimize the error between a modelled seismic trace and the actual seismic trace. This inversions representing a best estimate within the limits imposed by the bandwidth of the data. Deterministic inversion provide a single 'optimal' solution. Stochastic inversion combines the seismic trace and initial guess model. Stochastic inversion is a random simulation technique that provide some realization which is matched with the available well and seismic data.

Based on the results of processing and analisys, deterministic inversion delivered blocky inversion results, in accordance with seismic data but if validated with well data of gamma ray log, it is less appropriate. Stochastic inversion delivered an inversion that formed layers which are appropriate with well data of gamma ray log. For "KSW" Field, better to use stochastic inversion method because the results of stochastic inversion can represent thin-bed on Lama Formation with thickness below the tunning thickness.

Keywords : *Deterministic, Gamma Ray, Inversion, Model Based, P-Impedance, Seismic, Stochastic*