

## INTISARI

### **Analisis Data Fisika Batuan dan Inversi Seismik untuk Karakterisasi Reservoir Resistivitas Rendah Anggota Formasi Arang Atas pada Lapangan “Dalmasca”**

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Penggunaan sifat-sifat fisis batuan pada industri migas dalam beberapa dekade terakhir berhasil menurunkan ketidakpastian yang ada pada tahap eksplorasi serta pengembangan suatu lapangan migas. Pada analisis data seismik, kontrol data fisika batuan sangatlah berperan dalam pemetaan distribusi reservoir dengan memanfaatkan properti fisika dari reservoir-reservoir tersebut. Ketidakpastian terbesar pada interval Arang-0 dan Arang-1 dari lapangan “Dalmasca” disebabkan oleh variasi tipe reservoir. Pada kedua interval tersebut, terdapat reservoir batupasir (*clean* – reservoir tipe A) serta batupasir serpihan (reservoir tipe B) yang memiliki properti fisika batuan dan petrofisika yang sangat beragam. Volume material serpih serta lempung merupakan faktor utama yang mengontrol kualitas reservoir. Dalam penelitian ini, penulis bermaksud untuk mengkarakterisasi reservoir-reservoir tersebut beserta distribusi mereka pada interval Arang-0 dan Arang-1 lapangan “Dalmasca” dengan mengombinasikan data fisika batuan serta seismik. Data yang digunakan pada penelitian ini mencakup data seismik *pre-stack* 3D dan beberapa sumur kunci yang memiliki data petrofisika serta geofisika yang lengkap. Langkah-langkah yang dilakukan pada penelitian ini mencakup analisis data petrofisika dan fisika batuan, pemodelan fisika batuan, analisis AVO, serta inversi simultan. Berdasarkan pada penelitian ini, disimpulkan bahwa pemanfaatan properti hasil inversi, seperti  $\lambda$ -rho ( $LR$ ) dan  $\mu$ -rho ( $MR$ ), yang dikontrol dengan data fisika batuan (dari data log sumur) ketika interpretasi telah berhasil untuk membedakan kedua tipe reservoir yang ada.

**Katakunci:** petrofisika, fisika batuan, inversi,  $\lambda$ -rho ( $LR$ ),  $\mu$ -rho ( $MR$ )

## ABSTRACT

### **Rock Physical and Seismic Inversion Analysis to Characterize Low Resistivity Reservoirs Member of Upper Arang Formation of “Dalmasca” Field**

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The use of rock physical properties in petroleum industry during the last few decades has proven to decrease the uncertainties faced in the exploration and also the development stages of the field. In seismic data analysis, rock physical control is useful in order to map the distribution of the reservoirs by using the physical properties of the reservoirs themselves. The biggest uncertainty faced in Arang-0 and Arang-1 intervals of “Dalmasca” field is the variation of reservoir types. There are clean (type A reservoir) and shaly sandstone (type B reservoir) reservoirs which have different rock physical and petrophysical properties. The shale and clay volume are also the main factors that control the reservoir’s quality. In this research, the author aims to characterize the reservoirs and also their distribution in Arang-0 and Arang-1 intervals of “Dalmasca” field by combining rock physical and seismic data analysis. The dataset used consists of 3D pre-stack seismic data and several key wells (contain velocity and checkshot data) as well as complete petrophysical and geophysical logs. The processes which were done in this research consisted of petrophysical and rock physical analysis, rock physical modeling, AVO analysis, and simultaneous inversion. Based on this research, it can be concluded that the use of seismic-inverted properties such as lambda-rho ( $LR$ ) and mu-rho ( $MR$ ), controlled by the rock physical data (derived from well logs) during the interpretation have resulted in a better way to distinguish both reservoir types.

**Keywords:** petrophysics, rock physics, inversion, lambda-rho ( $LR$ ), mu-rho ( $MR$ )