

## ABSTRAK

### PEMODELAN STATIK RESERVOAR UNTUK PERHITUNGAN CADANGAN HIDROKARBON PADA LAPISAN A, LAPANGAN “WJW”, FORMASI TABUL, CEKUNGAN TARAKAN, KALIMANTAN UTARA

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Lapangan “WJW” yang berada pada Formasi Tabul berkembang dalam lingkungan delta yang kompleks, sehingga menarik untuk diteliti. Studi ini bertujuan membangun model statik 3D untuk menggambarkan distribusi fasies, properti petrofisika, dan potensi cadangan hidrokarbon berdasarkan data geologi, sumur, dan seismik. Metode yang digunakan meliputi integrasi data sumur dan seismik untuk kerangka stratigrafi, pemodelan fasies dengan SIS, pemodelan properti petrofisika dengan SGS, analisis gas kromatograf untuk identifikasi fluida, serta teknik geostatistik. Hasilnya, Formasi Tabul terdiri dari litologi batupasir dan batuserpih yang diendapkan pada lingkungan *delta front* dengan asosiasi fasies *distributary channel*, *distributary mouth bar*, dan *shale delta front*, serta marker stratigrafi berupa *sequence boundary*, *maximum flooding surface*, dan *flooding surface*. Pemodelan dilakukan pada lapisan A dengan fasies *distributary channel* berarah barat laut-tenggara. Model yang dihasilkan mampu merepresentasikan distribusi nilai properti petrofisik  $V_{shale}$  sebesar 0.1844-0.8578 dengan *cutoff* 0.45, porositas efektif sebesar 0.0004-0.1125 dengan *cutoff* 0.13, permeabilitas sebesar 0.5- 14.97, dan nilai saturasi air 0.7344 – 1 dari reservoir gas dan menghasilkan perhitungan cadangan *volume bulk* sebesar  $2775 \times 10^6 \text{ m}^3$ , *hydrocarbon porevolume* gas (HCPV) sebesar  $0.1 \times 10^6 \text{ m}^3$ , dan GIIP sebesar  $2708 \times 10^6 \text{ m}^3$ .

Kata kunci: Fasies, Formasi Tabul, Pemodelan statik, Perhitungan cadangan, Reservoir gas.

## **ABSTRACT**

### **RESERVOIR STATIC MODELING FOR HYDROCARBON RESERVE CALCULATION IN LAYER A, "WJW" FIELD, TABUL FORMATION, TARA KAN BASIN, NORTH KALIMANTAN**

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*The "WJW" field, located in the Tabul Formation, is interesting to study because it develops in a complex deltaic environment. The goal of this study is to create a 3D static model that describes the distribution of facies, petrophysical properties, and potential hydrocarbon reserves, based on geological, well, and seismic data. Methods include integrating well and seismic data to create a stratigraphic framework, modeling facies with SIS, modeling petrophysical properties with SGS, analyzing fluids with gas chromatography, and applying geostatistical techniques. The Tabul Formation consists of sandstone and mudstone lithologies that were deposited in a delta front environment. These lithologies have facies associations of distributary channels, distributary mouth bars, and delta front shales. There are also stratigraphic markers, such as sequence boundaries, maximum flooding surfaces, and flooding surfaces. Modeling was conducted on layer A with distributary channel facies in a northwest-southeast direction. The resulting model represents the distribution of Vshale petrophysical property values ranging from 0.1844 to 0.8578, with a cutoff of 0.45; effective porosity ranging from 0.0004 to 0.1125, with a cutoff of 0.13; and permeability ranging from 0.5 to 14.97 and a water saturation value of 0.7344 to 1.0000 for the gas reservoir. It also produces a bulk volume reserve calculation of  $2,775 \times 10^6 \text{ m}^3$ , a hydrocarbon pore volume gas (HCPV) of  $0.1 \times 10^6 \text{ m}^3$ , and a GIIP of  $2,708 \times 10^6 \text{ m}^3$ .*

*Keywords: Facies, Tabul Formation, Static modeling, Reserve calculation, Gas reservoir*