

## SARI

### KARAKTERISASI RESERVOIR DAN PENENTUAN TIPE BATUAN DENGAN MENGUNAKAN DATA BATUAN INTI DAN LOG SUMUR: STUDI KASUS PADA FORMASI MUDA, CEKUNGAN NATUNA BARAT

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Cekungan Natuna Barat merupakan daerah penghasil gas terbesar di Indonesia. Salah satu formasi di cekungan ini adalah Formasi Muda yang diidentifikasi sebagai reservoir gas biogenik di Blok B Natuna. Secara regional, formasi ini memiliki litologi penyusun berupa perselingan batulempung batupasir dengan sisipan batulanau. Ketika dilakukan penelitian, ditemukan hasil menarik. Deskripsi batuan inti menunjukkan banyaknya perselingan batuserpih batulanau (dominan batuserpih), namun pada log tidak menunjukkan kecenderungan pola perselingan yang jelas pada kurva gamma ray. Minimnya sensitivitas pada pengambilan data log terhadap sebuah perselingan yang tipis mengakibatkan perlunya penggabungan tiga metode analisis: deskripsi batuan inti, petrofisika, dan penentuan tipe batuan untuk mendapatkan hasil maksimal dalam menjelaskan karakter reservoir pada Formasi Muda. Dari analisis tersebut, dihasilkan tiga jenis asosiasi fasies. Asosiasi fasies -2, yaitu perselingan batulanau batuserpih, merupakan zona reservoir yang terverifikasi dengan nilai properti petrofisika, antara lain porositas efektif sebesar 31,9%, saturasi air 35,8%, dan volume shale 11,8%. Hasil tersebut juga berkorelasi positif dengan tipe batuan menurut struktur geometri pori, yang merupakan batulanau (RT-1), dengan interval nilai permeabilitas antara 15,1 hingga 111 mD. Integrasi ketiga data ini menunjukkan bahwa penilaian karakter reservoir memerlukan analisis yang menyeluruh, mencakup kondisi litologi, perhitungan kuantitatif, dan penentuan tipe batuan agar karakter reservoir dapat dipahami dengan lebih baik.

**Kata kunci :** Reservoir, *Pore Geometry Structure*, Petrofisika.

## ABSTRACT

### *RESERVOIR CHARACTERIZATION AND ROCK TYPING DETERMINATION USING CORE DATA AND WELL LOGS: A CASE STUDY ON MUDA FORMATION, WEST NATUNA BASIN*

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The West Natuna Basin is the largest gas-producing area in Indonesia. One of the formations in this basin is the Muda Formation which is identified as a biogenic gas reservoir in Block B of Natuna. Regionally, this formation has a constituent lithology in the form of interbedded claystone and sandstone beds with intercalated siltstone. When the research was carried out, interesting results were found. The description of the core rock shows a lot of interbedded between siltstone and shale (Shale dominant), but the logs do not show a clear tendency of the interbedded pattern on the gamma ray curve. The lack of sensitivity to log data collection for a thin interbedded results in the need to combine three analysis methods: description of core rocks, petrophysics, and determination of rock types to obtain maximum results in explaining the characteristics of reservoirs in the Muda Formation. From the analysis, three unit of facies associations were produced. The association of facies-2, namely interbedded siltstone and shale beds, is a verified reservoir zone with petrophysical property values, including effective porosity of 31.9%, water saturation of 35.8%, and shale volume of 11.8%. The results were also positively correlated with the rock type according to the pore geometry structure, which is a siltstone (RT-1), with a permeability value interval between 15.1 to 111 mD. The integration of these three data shows that the assessment of reservoir characteristics requires a thorough analysis, including lithological conditions, quantitative calculations, and determination of rock types so that reservoir characteristics can be better understood.

**Keywords:** Reservoir, Pore Geometry Structure, Petrophysics.