

KORELASI FASIES DAN ANALISIS ZONA HIDROKARBON BERDASARKAN DATA *WELL LOG* PADA FORMASI TABUL LAPANGAN “HT” CEKUNGAN TARAKAN, KALIMANTAN UTARA

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SARI

Cekungan Tarakan merupakan cekungan Tersier utama di bagian timur *continental margin* pulau Kalimantan. Cekungan Tarakan merupakan cekungan potensial hidrokarbon dengan adanya kegiatan pengeboran yang dilakukan dalam rangka eksplorasi hidrokarbon yang masih aktif dalam dunia bisnis perminyakan. Keterdapatan daerah potensial menjadikan Cekungan Tarakan menarik untuk dilakukan penelitian. Penelitian dilakukan di lapangan “HT” yang masih termasuk ke dalam daerah produktif “S”, pada interval kedalaman Formasi Tabul yang diidentifikasi sebagai salah satu formasi *reservoir* yang potensial berdasarkan literatur yang ada. Penelitian dilakukan untuk mengetahui kondisi geologi lokal daerah penelitian, mengidentifikasi korelasi fasies pada daerah penelitian, dan menentukan zona hidrokarbon yang potensial untuk dilakukan *well testing*. Penelitian yang dilakukan meliputi analisis kualitatif dengan analisis data log menggunakan kaidah elektrofases dan sekuen stratigrafi serta analisis kuantitatif dengan analisis petrofisika. Penelitian ini dimulai dengan memberi batas atau *marker* sekuen stratigrafi dengan melihat pola log *gamma ray* secara elektrofases untuk mengetahui fasies dari zona *reservoir* yang diinterpretasikan melalui *marker* tersebut, lalu analisis petrofisika untuk mendapatkan nilai *vshale*, porositas, saturasi air, dan permeabilitas sebagai karakteristik *reservoir*. Hasil penelitian ini menyimpulkan bahwa lokasi penelitian berada di interval kedalaman Formasi Tabul yang terdiri dari litologi perselingan batulanau-batulempung, batupasir, sisipan babatubara, sisipan dolomit, dan serpih. Berdasarkan data biostratigrafi, Formasi Tabul terendapkan di lingkungan pengendapan *transitional, estuarine, coastal plain* pada kala Miosen Tengah. Kondisi fasies stratigrafi berdasarkan korelasi fasies secara sekuen stratigrafi di lokasi penelitian menunjukkan terdapatnya perulangan 3 fase TST dan 2 fase HST. Analisis petrofisika dilakukan pada 7 zona hidrokarbon yaitu H1, H2, H3, H4, H5, H6A, dan H6B dari keenam sumur pada fase TST 3. Dari ketujuh zona tersebut, diambil 3 zona potensial hidrokarbon relatif, yaitu H1, H6A, dan H6B. Berdasarkan nilai *cut off* parameter petrofisika dari data *Well Test* sumur produksi sebelumnya, didapatkan zona hidrokarbon produktif sebagai *reservoir*, yaitu H6A, dengan nilai *vshale* 14,9%; porositas 25,5%; saturasi air 47,8%; dan permeabilitas 4,03 mD, yang direkomendasikan sebagai zona hidrokarbon untuk dilakukan *well testing*.

Kata kunci: Formasi Tabul, cekungan tarakan, sekuen stratigrafi, *reservoir*, zona hidrokarbon.

FACIES CORRELATION AND HYDROCARBON ZONE ANALYSIS BASED ON WELL LOG DATA OF TABUL FORMATION IN “HT” FIELD TARAKAN BASIN, NORTH KALIMANTAN

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ABSTRACT

The Tarakan Basin is one of three major Tertiary basin located around the continental margin of Kalimantan in eastern Borneo. The Tarakan Basin is hydrocarbon potential basin which intensively undergoes drilling activities as a form of active hydrocarbon exploration in the petroleum business. Identification of potential area in the Tarakan Basin becomes an interesting topic to study. The study area located in “HT” field, which is still belong to “S” productive area. Tabul Formation becomes the focus of this study, as it has been identified as one of potential reservoir formations based on specific literature of Tarakan Basin. The study is meant to perceive geological condition locally in study area, identify facies correlation in study area, and determine a potentially hydrocarbon zone to propose for a well testing. The study includes both qualitative and quantitative analysis. Qualitative analysis includes analysis of log data using electrofacies defining, while quantitative analysis includes petrophysics analysis. The study begins by assigning a stratigraphic sequence or marker boundary by looking at gamma ray log patterns in electrofacies concept to determine facies of reservoir zone which is interpreted by the marker boundaries, then conducting petrophysics analysis to get values of vshale, porosity, waater saturation, and permeability as reservoir characterization. The results of this study conclude that the study area is focused at depth interval of Tabul Formation consisted of siltstone-claystone intercalations, sandstones, coal interbeddings, dolomite interreddings, and shales. Based on biostratigraphy data, Tabul Formation is deposited in transitional, estuarine, coastal plain depositional environment in Middle Miocene. Based on facies correlation by stratigraphic sequence, the study area indicates the cycle presence of 3 phases TST and 2 phases HST. Petrophysics analysis is conducted in 7 hydrocarbon zone, such as H1, H2, H3, H4, H5, H6A, and H6B preserved in TST 3 phase based on 6 wells. 3 potentially relative hydrocarbon zone, such as H1, H6A, and H6B, were taken of 7 hydrocarbon zone. Based on cut off value of petrophysics parameter from Well Test data of previous production well, productive hydrocarbon zone as reservoir was obtained in H6A, which shows value of 14.9% vshale; 25.5% porosity; 47.8 water saturation; and 4.03 mD permeability, which is recommended as a hydrocarbon zone proposed to well testing.

Keywords: Tabul Formation, tarakan basin, sequence stratigraphy, reservoir, hydrocarbon zone.