

INTISARI

“ANALISIS KARAKTERISTIK RESERVOIR BATUAN KARBONAT MENGUNAKAN PENDEKATAN PETROFISIKA BERBASIS DATA LOG SUMUR UNTUK PENENTUAN ZONA POTENSIAL BARU LAPANGAN “GAMA” CEKUNGAN JAWA TIMUR UTARA”

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Lapangan “GAMA” dipilih sebagai lokasi penelitian, berada pada Paparan Zona Rembang, Cekungan Jawa Timur Utara. Lapangan “GAMA” merupakan salah satu lapangan kepemilikan yang dikelola oleh PT. Pertamina EP Cepu Zona 4 Area 1. Penelitian ini bertujuan menganalisis parameter petrofisika dengan hasil akhir penelitian menentukan zona potensial baru yang mengandung hidrokarbon berbasis data log sumur berdasarkan analisis parameter-parameter petrofisika.

Target penelitian berada pada Formasi Kujung Unit 2, Kujung Unit 3, dan Ngimbang Atas (CD). Zona target penelitian telah terbukti mengalirkan hidrokarbon berdasarkan data *Drill Stem Test* (DST). Data masukan dalam penelitian ini berupa data log sumur (.LAS) pada enam sumur penelitian yaitu, GAMA – 01, GAMA – 02, GAMA – 03, GAMA – 04, GAMA – 05, dan GAMA – 06. Analisis petrofisika menggunakan metode deterministik untuk menemukan lapisan-lapisan reservoir dan menghitung parameter-parameter petrofisika yang akan digunakan untuk menentukan zona potensial baru yang mengandung hidrokarbon. Dari perhitungan parameter petrofisika didapatkan nilai *cutoff* lapangan “GAMA”, diantaranya volume *shale* (V_{shale}) $\leq 0,25$ Dec, Porositas Efektif (ϕ_E) $\geq 0,03$ Dec, Saturasi Air (S_w) $\leq 0,7$ Dec, dan Permeabilitas (K) $\geq 0,14$ Dec. Berdasarkan parameter petrofisika yang dihasilkan kemudian digunakan untuk menentukan estimasi zona potensial baru. Zona potensial baru sumur GAMA – 01 berada pada interval 3039 m – 3058 m dan 3084 – 3093 m. Sumur GAMA – 02 berada pada interval 2032 m – 2089 m dan 2096 m – 2152 m. Sumur GAMA – 03 berada pada interval 2801 m – 2882 m. Sumur GAMA – 04 berada pada interval 2465 m – 2485 m. Sumur GAMA – 05 berada pada interval 2870 m – 2876 m. Sumur GAMA – 06 berada pada interval 2484 m – 2489 m dan 2540 m – 2542 m.

Kata Kunci : Cekungan Jawa Timur Utara, Analisis Petrofisika, Metode Deterministik, Parameter Petrofisika, Batuan Karbonat, Zona Potensial Baru

ABSTRACT

“ANALYSIS OF CARBONATE ROCK RESERVOIR CHARACTERISTICS USING A PETROPHYSICAL APPROACH BASED WELL LOG DATA FOR DETERMINING NEW POTENTIAL ZONES “GAMA” FIELD NORTH EAST JAVA BASIN”

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“GAMA” Field was selected as the research location, situated in the Rembang Zone Platform of the Northern East Java Basin. The “GAMA” Field is one of the assets managed by PT Pertamina EP Cepu, Zone 4 Area 1. This study aims to analyze petrophysical parameters with the final result of the study being to determine new potential zones containing hydrocarbons based on well log data and analysis of petrophysical parameters.

The research target is located in the Kujung Formation Unit 2, Kujung Unit 3, and Upper Ngimbang (CD). The target zone of the study has been proven to contain hydrocarbons based on Drill Stem Test (DST). The input data in this study consists of well log data (.LAS) from six research wells, namely GAMA – 01, GAMA – 02, GAMA – 03, GAMA – 04, GAMA – 05, and GAMA – 06. Petrophysical analysis uses deterministic methods to identify reservoir layers and calculate petrophysical parameters that will be used to determine new potential zones containing hydrocarbons. From the calculation of petrophysical parameters, the cutoff values for the “GAMA” field were obtained, including shale volume (V_{shale}) ≤ 0.25 Dec, effective porosity (ϕ_E) ≥ 0.03 Dec, water saturation (S_w) ≤ 0.7 Dec, and permeability (K) ≥ 0.14 Dec. Based on the petrophysical parameters produced, they were then used to determine estimates of new potential zones. The new potential zone of the GAMA-01 well is located at intervals of 3039 m – 3058 m and 3084 – 3093 m. The GAMA-02 well is located at intervals of 2032 m – 2089 m and 2096 m – 2152 m. The GAMA-03 well is located at intervals of 2801 m – 2882 m. The GAMA-04 well is located at intervals of 2465 m – 2485 m. The GAMA-05 well is located at an interval of 2870 m – 2876 m. The GAMA-06 well is located at an interval of 2484 m – 2489 m and 2540 m – 2542 m.

Keywords : *North East Java Basin, Petrophysical Analysis, Deterministic Method, Petrophysical Parameters, Carbonate Rocks, New Potential Zone*