

## INTISARI

### **ANALISIS PETROFISIKA MENGGUNAKAN PERSAMAAN LUCIA UNTUK PERFORASI BARU PADA RESERVOIR KARBONAT, LAPANGAN RIMBA CEKUNGAN JAWA TIMUR UTARA**

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Lapangan RIMBA dipilih sebagai lokasi penelitian, berada pada Paparan Madura Utara, Cekungan Jawa Timur Utara. Studi geologi mengindikasikan lapangan RIMBA memiliki tipe reservoir dominan *unconventional* berupa batuan karbonat. Perbedaan karakteristik reservoir *unconventional* dan reservoir *conventional* (batupasir), menjadi pendorong digunakan analisis parameter petrofisika yang berbeda yaitu menggunakan persamaan Lucia. Persamaan Lucia dikembangkan untuk mengestimasi nilai parameter petrofisika berdasarkan hubungan empiris dari percobaan laboratorium terhadap beragam tipe batuan karbonat. Hasil akhir penelitian ini adalah titik perforasi sumur berdasarkan analisis petrofisika.

Target penelitian adalah Formasi Kujung I, Kujung II, Ngimbang bagian atas dan Ngimbang *Carbonate*. Data masukan dalam penelitian berupa data log sumur (AGE-1, AGE-2, AGE-3, AGE-4 dan AGE-5) dan data geologi yang meliputi data tektonik, stratigrafi, *mudlog*, petrografi, uji kandungan lapisan dan data *core*. Persamaan Lucia diaplikasikan untuk mengestimasi parameter porositas (dikombinasikan dengan persamaan Batemen dan Konen), saturasi air (dikombinasikan dengan persamaan Archie) dan permeabilitas. Hasil penelitian menunjukkan Kujung I merupakan reservoir terbaik karena memiliki rata-rata kandungan serpih 14%, porositas efektif 16%, porositas interpartikel 17%, saturasi air 64% dan permeabilitas 6,1 mD. Estimasi ketebalan reservoir Lapangan RIMBA menunjukkan peningkatan dari sumur yang relatif di utara menuju sumur yang relatif di selatan : AGE-5, AGE-2, AGE-3, AGE-1 dan AGE-4. Titik perforasi sumur AGE-1 berada pada kedalaman 4509 feet dan 6414 feet. Titik perforasi untuk sumur AGE-2 berada di interval 4737 feet. Untuk sumur AGE-3 titik perforasi berada di interval 4777 feet. Pada sumur AGE-4 titik perforasi berada di interval 6777 feet. Sedangkan sumur AGE-5 titik perforasi baru berada di interval 5010 feet.

*Kata kunci : empiris, karbonat, Lucia, lumping, petrofisika, perforasi , unconventional*

## **ABSTRACT**

### **PETROPHYSICAL ANALYSIS USING LUCIA'S EQUATION FOR NEW PERFORATION AT CARBONATE RESERVOIR IN RIMBA FIELD NORTH EAST JAVA BASIN**

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RIMBA field is located in North Madura Platform, North Java Basin. Geology review shown that area of study is dominated with carbonate unconventional reservoir. The differences between unconventional reservoir and conventional reservoir (sandstone) become encourages to use different method in petrophysical analysis, in this case using Lucia's Equations. Lucia's Equations known as empirical equation based on laboratory study of various type carbonate rocks to estimate value of petrophysical parameters. Aim of this study is to define perforation points based on petrophysical analysis.

Object of this study is potential reservoir formation as Kujung I, Kujung II, Upper Ngimbang dan Ngimbang Carbonate. Initial data used in this study are wireline data (AGE-1, AGE-2, AGE-3, AGE-4 and AGE-5) and geology data as tectonic, stratigraphy, mudlog, petrography, drill steam test and core. Lucia's equation in this study used to estimated parameters porosity (combine with Batemen and Konen's Equations), saturation water (combine with Archie's Equation) and permeability. Results shown Kujung I as optimum reservoir that has averages 14% shale volumes, 16% effective porosity, 17% interparticle porosity, 64% saturation water and 6,1 mD permeability. Reservoir thickness estimation of RIMBA field relatively increased from north to south: AGE-5, AGE-2, AGE-3, AGE-1, and AGE-4. Perforation points for well AGE-1 are 4509 feet and 6414 feet. Perforation points for well AGE-2 is 4737 feet. Perforation points for well AGE-3 are 4777 feet. Perforation points for well AGE-4 are 6777 feet. Perforation points for well AGE-5 is 5010 feet.

*Keyword: carbonate, empiric, Lucia, lumping, petrophysics, perforation, unconventional*