

## SARI

Lapangan Velyn berada pada Cekungan Sumatera Selatan tepatnya pada Sub-Cekungan Palembang Tengah. Penelitian Potensial Reservoir *Low-Resistivity* di Lapangan Velyn ini difokuskan pada Formasi Gumai. Secara regional Formasi Gumai terbentuk pada lingkungan pengendapan *Fluvio-Deltaic to Open Marine*. Lapangan Velyn telah diproduksi lebih dari 42 tahun. Pada umumnya reservoir hidrokarbon memiliki log resistivitas ideal. Potensial reservoir hidrokarbon memiliki log resistivitas tidak ideal yang disebut *low-resistivity* dan sering diabaikan pada saat interpretasi karena dianggap terakumulasi air. Penelitian ini bertujuan untuk menentukan penyebab terjadinya reservoir *low-resistivity* dan menentukan zona potensial reservoir hidrokarbon yang memiliki nilai resistivitas rendah (*Low-Resistivity Reservoir*) di lapangan Velyn ini yang kurang diperhatikan pada awal eksplorasi. Metode yang digunakan yaitu dengan melakukan koreksi terhadap nilai resistivitas air ( $R_w$ ) yang mempengaruhi perhitungan penentuan saturasi air ( $S_w$ ) sehingga didapatkan hasil perhitungan  $S_w$  yang tepat dan optimis. Penelitian ini awalnya melakukan identifikasi log pada reservoir *low-resistivity* yang sudah terbukti dan berproduksi di Lapangan Velyn. Analisis dilakukan dengan mengintegrasikan data log sumur, *mud log*, deskripsi serbuk bor, analisis fluida, uji sumur, laporan sumur dan *dipmeter log*. Analisis tersebut menghasilkan beberapa penyebab yang mempengaruhi reservoir *low-resistivity* yaitu ukuran butir batupasir yang halus sehingga mampu mengikat air secara signifikan (*irreducible water*), kandungan serpih yang melimpah dan terdistribusi secara *laminated shale* dan *dispersed shale* sehingga menyebabkan terjadinya *clay bound water*. Penentuan  $R_w$  menggunakan data analisis fluida dan metode *pickett plot* untuk masing-masing zona dan perhitungan saturasi air dilakukan dengan menggunakan Persamaan Indonesia dan Persamaan Simandoux. Pada akhirnya, Lapangan Velyn memiliki tiga zona potensial reservoir *low-resistivity* dari seluruh sumur telitian. Selain itu terdapat tiga zona yang produktif yang sudah terbukti menghasilkan hidrokarbon. Secara stratigrafi vertikal, potensial reservoir didominasi oleh reservoir pada Zona NOV-1, NOV-2 dan NOV-3.

**Kata kunci :** *low resistivity*, reservoir, *laminated shale*, *dispersed shale*.

## ABSTRACT

Velyn Field is located in the South Sumatera Basin precisely in the Central Palembang Sub-Basin. The Low Resistivity Reservoir Potential Research in Velyn Field is focused in the Gumai Formation. Regionally Gumai Formation is formed in the Fluvio-Deltaic to Open Marine deposition environment. Velyn Field has been produced for over 42 years. Generally, the hydrocarbon reservoir has an ideal resistivity log. The hydrocarbon reservoir potential has a non-ideal resistivity log called low-resistivity and is often ignored at the time of interpretation due to accumulation of water. This study aims to determine the causes of low resistivity reservoirs and to determine the zone of potentially low resistivity reservoirs in this Velyn field that is poorly considered at the beginning of the exploration. The method used is to make a correction to the value of water resistivity ( $R_w$ ) which affects the calculation of the determination of water saturation ( $S_w$ ) so as to obtain the results of calculations  $S_w$  is precise and optimistic. This study initially identifies logs at proven and productive low-resistivity reservoirs in Velyn Field. Analyzes were performed by integrating well log data, mud logs, drill powder descriptions, fluid analysis, well tests, well reports and dipmeter logs. The analysis resulted in several causes affecting the low-resistivity reservoir which are fine grain size of the sandstone so as to bind water significantly (irreducible water), abundant flakes and distributed by laminated shale and dispersed shale causing clay bound water.  $R_w$  determination uses fluid analysis data and pickett plot method for each zone and water saturation calculation is done using Indonesian Equation and Simandoux Equation. Eventually, Velyn Field has three potential reservoir low-resistivity zones of all telitian wells. In addition there are three productive zones that have been proven to produce hydrocarbons. In vertical stratigraphy, reservoir potential is dominated by reservoir in NOV-1, NOV-2 and NOV-3 zones.

**Key word :** low resistivity, reservoir, laminated shale.