

SARI

Cekungan Jawa Timur Utara merupakan cekungan yang sudah banyak dilakukan kegiatan eksplorasi minyak dan gas bumi salah satu Formasi yang menarik dan dijadikan target pada penelitian adalah Formasi Ngimbang karena Formasi Ngimbang dapat berperan sebagai batuan sumber dan reservoir. Maka penulis melakukan penelitian untuk membuktikan keberadaan reservoir lapangan SLS formasi Ngimbang yang terdiri 4 *well log* yaitu ST – 7, ST – 6, ST – 1, dan ST – 2.

Metode yang digunakan dalam penelitian ini berupa dua metode yakni metode analisis data kualitatif menggunakan log sumur dengan penentuan variasi litologi, fasies, dan lingkungan pengendapan, serta korelasi sumur. Metode kuantitatif meliputi analisis petrofisika yang berupa *volume shale*, porositas, dan permeabilitas, serta saturasi air. Analisis Kualitatif dan kuantitatif ini dilakukan menggunakan data wireline log yang divalidasi oleh data *routine core analysis*, *well report*, dan data *mud log*.

Berdasarkan hasil analisis kualitatif, didapatkan litologi batulempung, batupasir, dan batugamping. Pada sumur pengamatan pengendapan dengan sistem transgresi berupa TST dengan marker FS. Pada lokasi penelitian didapatkan fasies berupa *calcareous sandstone channel facies*, *interlaminated shale and sand facies*, *laminated shale and sand facies*, dan *detrital limestone facies* yang diendapkan pada lingkungan *tidal flats*, *estuarine channel*, *offshore bars*, dan *lagoon*. Hasil analisis petrofisika zona X1 sumur ST – 7, ST – 6, ST – 1, ST - 2 dari data *reservoir summary* menunjukkan akhir dari permeabilitas sebesar 88%. Sedangkan nilai porositas sebesar 20,3%, 28,2%, 16,5%, dan 14,4% . Nilai Vsh sebesar 0,7%, 24,5%, 10,9%, dan 11,8%. Nilai saturasi air sebesar 67%, 69%, 68%, dan 70% pada zona X1 Formasi Ngimbang. Hasil *cut – off* dari analisis petrofisika yang dapat divalidasi menggunakan RCAL (*routine core analysis*) yaitu sumur ST – 2 zona X1 memiliki nilai porosity sebesar 14,4%, *water saturation* sebesar 70%, dan *volume shale* sebesar 11,8% sehingga dapat disimpulkan bahwa sumur ST – 2 produktif terdapat hidrokarbon berupa *oil* yang telah disandingkan menggunakan *well report*. Sedangkan pada sumur ST – 7, ST – 6, ST – 1 terdapat hasil *pay – zone* yang artinya pada lapisan tersebut prospek sebagai lapisan hidrokarbon hal ini sudah disandingkan menggunakan data *well report*, namun pada sumur ST – 7, ST – 6, dan ST – 1 tidak dapat divalidasi menggunakan RCAL karena tidak terdapat data tersebut.

Kata Kunci : Cekungan Jawa Timur Utara, Formasi Ngimbang, Analisis kualitatif, Analisis kuantitatif.

ABSTRAC

The North East Java Basin is a basin where a lot of oil and gas exploration activities have been carried out. One of the formations that is interesting and targeted for research is the Ngimbang Formation because the Ngimbang Formation can act as a source rock and reservoir. So the author conducted research to prove the existence of the Ngimbang formation SLS field reservoir which consists of 4 well logs, namely ST – 7, ST – 6, ST – 1, and ST – 2.

The methods used in this research are two methods, namely the qualitative data analysis method using well logs to determine variations in lithology, facies and depositional environment, as well as well correlation. Quantitative methods include petrophysical analysis in the form of shale volume, porosity and permeability, as well as water saturation. This qualitative and quantitative analysis was carried out using wireline log data which was validated by routine core analysis data, well reports and mud log data.

Based on the results of qualitative analysis, the lithology of mudstone, sandstone and limestone was obtained. In the sediment observation well, the transgression system is in the form of TST with FS marker. At the research location, facies were found in the form of calcareous sandstone channel facies, interlaminated shale and sand facies, laminated shale and sand facies, and detrital limestone facies which were deposited in tidal flats, estuarine channels, offshore bars and lagoon environments. The results of the petrophysical analysis of zone XI wells ST – 7, ST – 6, ST – 1, ST - 2 from the reservoir summary data show a final permeability of 88%. Meanwhile, the porosity values are 20.3%, 28.2%, 16.5% and 14.4%. The Vsh values are 0.7%, 24.5%, 10.9%, and 11.8%. Water saturation values are 67%, 69%, 68%, and 70% in zone XI of the Ngimbang Formation. The cut-off results from petrophysical analysis that can be validated using RCAL (routine core analysis), namely the ST - 2 zone XI well has a porosity value of 14.4%, water saturation of 70%, and shale volume of 11.8% so it can be concluded that the ST – 2 well is productive, containing hydrocarbons in the form of oil which has been aligned using a well troubleshooter. Meanwhile, in the ST - 7, ST - 6, ST - 1 wells there are pay - zone results, which means that the prospect of this layer as a hydrocarbon layer has been compared using troublesome well data, but in the ST - 7, ST - 6, and ST wells – 1 cannot be validated using RCAL because there is no such data.

Keywords: *North East Java Basin, Ngimbang Formation, Qualitative analysis, Quantitative analysis.*