Evaluasi Reservoir Interval "J", Lapangan "X" Formasi Pulubalang, Cekungan Kutai, Kalimantan Timur = Evaluation of Reservoir Interval "J", Field "X" Pulubalang Formation, Kutai Basin, East Kalimantan

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Abstrak

Daerah penelitian terletak di utara Delta Mahakam Kalimantan Timur dan termasuk ke dalam Cekungan Kutai. Penelitian dilakukan terhadap Interval “J” Lapangan “X” Formasi Pulaubalang Cekungan Kutai yang tersusun atas perselingan batupasir, batulempung, dan batubara. Formasi ini umumnya diendapkan pada lingkungan pengendapan delta dan merupakan salah satu interval penghasil hidrokarbon di Cekungan Kutai.

Studi ini dilakukan dengan pendekatan litofasies, elektrofasies, fasies pengendapan, dan petrofisika untuk mengetahui karakteristik reservoir untuk setiap fasies pengendapan. Data yang digunakan diperoleh dari 5 sumur yang meliputi data mudlog, batuan inti, dan log sumur.

Dari hasil penelitian, terdapat empat litofasies pada interval “J” yaitu litofasies batupasir blocky, litofasies batulempung, litofasies perselingan batulempung, batupasir dan batubara, serta litofasies batulempung sisipan batupasir dan batubara. Berdasarkan data wireline log, karakteristik elektrofasies terdiri atas cylindrical/blocky, funnel, bell, and serrated. Lingkungan pengendapan batuan Interval “X” berkisar dari daerah distributary channel hingga delta front pada lingkungan transisi delta. Litofasies batupasir blocky diendapkan pada lingkungan distributary channel, litofasies batulempung diendapkan pada lingkungan floodplain, litofasies perselingan batulempung, batupasir dan batubara diendapkan pada lingkungan floodplain-crevasse splay, dan litofasies batulempung sisipan batupasir dan batubara diendapkan pada lingkungan floodplain-crevasse splay.

Berdasarkan kombinasi litofasies dan elektrofasies, sebaran fasies pengendapan dapat dikelompokkan menjadi lima fasies pengendapan yaitu Fasies Channel, Crevasse Splay, Delta Front, Point Bar, dan Flood Plain. Dari analisis petrofisika, diketahui Fasies Channel adalah batuan yang paling baik berperan sebagai reservoir dengan volume serpih rata-rata 40.06%, porositas efektif 7,81% dan saturasi air 80,34%, sementara fasies floodplain memiliki rata-rata volume serpih 89,13%, porositas efektif 0,93% dan saturasi air 96,15%, fasies ini lebih cocok berperan sebagai seal rock melihat tingginya nilai volume serpih dan rendahnya nilai porositas efektifnya.
.....Study area located at northern Mahakam Delta East Kalimantan and belongs to Kutai Basin. The study conducted for Interval “J,” Field “X” Pulaubalang Formation, Kutai Basin which composed of sandstone, claystone, and coal intercalation. This formation is mostly deposited in deltaic environment and is one of the most prolific hydrocarbon intervals in Kutai Basin.

This study was conducted with lithofacies, electrofacies, depositional facies, and petrophysical approach to find out the reservoir properties for each depositional facies. The data used obtained from 5 wells i.e. mudlog data, core, and well log.

From the results of the study, there are four lithofacies in the “J” interval: blocky sandstone lithofacies, claystone lithofacies, claystone-sandstone-coal intercalation lithofacies, claystone with sandstone-coal stringer lithofacies. Based on wireline log data, electrofacies characteristics consist of cylindrical/blocky, funnel, bell, and serrated. The depositional environment ranges from distributary channel to delta front in deltaic environments. Blocky sandstone lithofacies deposited in distributary channel, claystone lithofacies deposited in floodplain, claystone-sandstone-coal intercalation lithofacies deposited in floodplain-crevasse splay, dan claystone with sandstone-coal stringer lithofacies deposited in floodplain-crevasse splay environment.

Based on combination of lithofacies and electrofacies, depositional facies can be grouped into five depositional facies: Fasies Channel, Crevasse Splay, Delta Front, Point Bar, dan Flood Plain. From petrophysical analysis, channel facies is the best reservoir rock with average volume of shale 40.06%, effective porosity 7,81% and water saturation 80,34%. Floodplain facies have average volume of shale 89,13%, effective porosity 0,93% dan water saturation 96,15%, this facies is more suitable as seal rock with the high shale content dan low effective porosity.