

Describing Depositional Model to Emerging Deepwater Exploration Province on Kawengan Group in Madura Strait, East Java Basin, as Pioneer Deepwater Exploration in Indonesia

Titis Wibowo¹, I W. Ardana Darma², Prihadi Soemintadiredja¹, and Dardji Noeradi¹

¹Geological Engineering, Bandung Institute of Technology, Jakarta Timur, Jakarta, Indonesia.

²PT Petronas Carigali Indonesia, Jakarta, Indonesia.

ABSTRACT

East Java basin is a tertiary basin located in East Java Region known as prolific hydrocarbon area. This research was held in the southeast part of basin known as Southern Basin bordered by Central Uplift in North and by Kendeng Zone in South. The area of this research was on an exploration phase. The hydrocarbon potential was contained almost in Oligocene until Pliocene rocks. This research is aimed to evaluate the play on Mio-Pliocene, Kawengan Group. Kawengan Group consists of 3 groups i.e. Mundu, Ledok, and Kalibeng. This interval is so interesting, we met young bed with a lot of resource, and different kind of reservoir with big possibility of gas in place. The data what used in this study are wire line log data, cutting, biostratigraphy, and 2D seismic lines. The method used in this research was a play fairway analysis by creating a segment for every geological feature in order to reveal drilling risks that result a map of drilling risks spread in the forms of CRS (Common Risk Segment) and CCRS (Composite Common Risk Segment). The methods used to analyzing the geological feature in this research were a subsurface map analysis, a seismic facies analysis, a log facies analysis of drilling, and an element petroleum analysis. The results of this research show there are three play types i.e. Mundu Globigerina Play, Ledok Sandstone Play, and Kalibeng Volcaniclastic Play. Based on the facies distribution on the paleogeography map, it shows that Mundu Globigerina Play is scattered well in the Northern area as coastal belt sand dominated by calcarenite limestone with a high amount of Globigerina. Ledok Sandstone Play grows in the central area as a submarine fan whose dominant lithology is sandstones. Kalibeng Volcaniclastic Play grows in the southern area as a submarine fan which has volcanic content. These three of play has a medium drilling risk in CCRS. There are 12 leads resulted by overlying reservoir segmen in CCRS map and trap distribution. These leads are: 2 Kalibeng Leads, 2 Ledok Leads, dan 8 Mundu Leads. This result proved that in the young bed we still have possibility to explore and also still have good outlook to drill with the barely fit data but use the right method. In this research also disenchant us that we still has hope, especially in Indonesia, we still has high gas resources with low risk and different kind of reservoir, which it is it has big possibility to drill out.