GEOLOGY, FACIES ANALYSIS, AND HYDROCARBON PROSPECTION IN NGRAYONG FORMATION, DAF FIELD, NORTH EAST JAVA BASIN

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ABSTRACT

North East Java Basin is one of sedimentary basin that proven contain hydrocarbon and already production until now. The hydrocarbon prospection study aims to know potential hydrocarbon in Ngrayong Formation from facies and sequence approach based on wireline log, mudlog, and biostratigraphy data of five wells. This study area is one of PT. Pertamina EP operational area and located in north side of East and Central Java Province. Ngrayong Formation deposited in Early Miocene-Middle Miocene (N8-N12) with marine environment. This formation divided into Ngrayong sandstone unit, Ngayong shale unit, and Ngrayong carbonate unit. These units consist of quartz sandstone, calcareous sandstone, carbonaceous shale, calcareous shale, calcareous claystone, and siltstone. There are several facies that found in shallow marine such as middle shoreface, lower shoreface, sandbar, offshore, carbonate shoal,tidal flat, and midouter ramp.

The presence of trace oil/ gas and crossover between neutron and density value in log data are several ways to know potential hidrocarbon. Several facies that found have potential hydrocarbon are middle shoreface facies, carbonate shoal facies, mid-outer ramp facies, sandbar, and lower shoreface facies. While sandbar facies, carbonate shoal, mid-outer ramp, and middle shoreface are proven contain hydrocarbon based on bed contain test. Most of them was deposited in transgressive system track in third sequence and transgressive system track in fourth sequence. Based on biomarker analysis from oil sample in sandbar sandstone, the oil maturity is mature and it comes from source rock that deposited in lagoon or estuarine facies.

Keyword : North East Java Basin, Ngrayong Formation.