

Back To Basic Approaches: A Preliminary Study on Layer B/600 for Tempino Waterflooding Project, Jambi - Indonesia

Grace S. Titaley¹, Bob W. Adibrata², and Tri Sasongko³

¹Enhanced Oil Recovery, PT Pertamina EP, Jakarta, Indonesia.

²Exploration, PT Pertamina EP, Jakarta, Indonesia.

³Region Jawa, PT Pertamina EP, Cirebon, Indonesia.

Majority of oil and gas field in Indonesia are mature fields, which have passed its primary production phase. EOR technology begins to apply here for increasing oil recovery. The common problem arose in applying EOR technology on mature fields is to define the reservoir continuity and build a model based on limited data. Characterization on detailed reservoir facies should be considered to minimize the uncertainty in applying waterflood pattern meant for optimizing the oil recovery. To achieve that objective, the analysis on log-core integration petrofacies was generated in Tempino field.

Tempino field, located in Jambi Province, Indonesia, discovered in 1928, lying on Jambi sub basin, South Sumatra Basin with current cumulative production is reaching 93.48 MMBO from sandstone of Air Benakat Formation. The sandstones were deposited in shallow marine and have a good quality of reservoir. Target for waterflooding optimization is Layer B/600. These particular layer has been injected by water since 2001 as pressure maintenance program.

Due to data availability in this field, with no seismic data, approaches are mainly on well data, where petrophysical analyses were done using 10 well logs (from 209 wells available) combined with cores data from 3 wells that analyzed in 2008. Sedimentology and petrography analysis from cores and biostratigraphic (forams, nanoplankton, and pollens) analysis from 5 wells distributed in 4 blocks from all of 7 blocks in Tempino, to define the depositional environmental and facies changes in Layer B/600. By knowing the play concept in Air Benakat Formation, the B/600 layer was put into a frame of shallow marine depositional setting. Stratigraphic sequences interpreted from log analysis can also be seen in cores and foraminifera analysis. Regression sequences identified from logs supported also by pollen and benthic forams, shows the changes of depositional environment from inner neritic to lower deltaic plain. Petrography observation on cores shows that Layer B/600 was deposited in shallow marine environment, near the land, which has occasional influence from open sea current. These analyses from 3 cores then applied to other wells using geostatistic approach, to build the 3D Geo-Reservoir model of Layer B/600.

A better understanding of facies distribution and well-to-well connectivity in Layer B/600 sand was achieved, to define any blocks would be the best area to put the injector-producer wells.