

Reservoir Definition of Pematang Formation in the Upper-Redbed Section in Kelok and Tilan Fields, Central Sumatra Basin - a Recent Exploration Success

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Pematang Formation in the Upper Red Bed section in Kelok and Tilan area of Central Sumatra Basin has been a primer target for exploration in CPI since early '90s. Kelok and two Tilan fields were the most recent successful discoveries in Pematang Formation in the Upper Red Bed section. Lithostratigraphic correlation indicates there is no abrupt change in one field but insignificant changes may be observed across the adjacent field in the Kelok-Tilan cluster. In these fields, Pematang Formation is characterized by medium to good quality sands with interbedded shales. Porosity and permeability are ranging from 10 - 20 % and 10 1000 mD respectively.

Reservoir geometry of this formation where faults are dominating the reservoir characteristic is characterized from 3-D, medium quality seismic data. Major horizons correlating Pematang sands can be interpreted from the seismic. Seismic attributes indicate the major structures but a little information on the reservoir properties can be derived from the seismic attributes. Smaller faults and other minor structures are not prominent on the available seismic data. The fields are developed primarily based on the seismic definition of the reservoirs where normal faults are the dominant structures bounding the three-way closure anticlines.

Reservoir properties are characterized using formation evaluation of the well log data. However, the formation evaluation results are limited by the unavailability of core data as a true sample of the reservoir. This also does not permit reliable facies classification. To estimate the permeability and irreducible water saturation from the wire-line log data, available theoretical model and from core sample analogs to this field are compared.