ABSTRACT

INTERPRETATION OF LOG DATA FOR DETERMINING PROSPECT ZONES IN THE "AR-11" WELL OF THE "ARA" FIELD

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The well "AR-11" in the "ARA" Field is located in Jambi Province, within the Jambi Sub-Basin of the South Sumatra Basin. This basin contains a petroleum system with the Lahat Formation as the source rock. The Lahat Formation, Talang Akar Formation, Air Benakat Formation, and Baturaja Formation serve as potential reservoirs. The Gumai Formation acts as the cap rock, with structural traps in the form of anticlines. In the "ARA" Field, this well penetrates the productive Air Benakat Formation. Promising prospects are indicated by oil flow test results, necessitating further research to estimate potential hydrocarbon zones in Well "AR-11".

This research begins with data grouping and evaluation of data availability to identify prospective hydrocarbon zones. Subsequently, the data is input into a simulator. The next step involves qualitative analysis to determine the top and bottom depths of porous layers containing hydrocarbons. Quantitative analysis involves calculations of shale volume, porosity, and water saturation. A cut-off determination is also performed to separate productive layers from non-productive ones, followed by reservoir lumping and identification of prospective hydrocarbon zones.

Based on qualitative and quantitative analysis, 14 zones with potential prospects were identified, with a shale volume (V_{sh}) cut-off of 0.53, a porosity cut-off of 0.1, and a water saturation (S_w) cut-off of 0.66. From these cut-off values, the net pay zone for Well "AR-11" was determined to be 137 meters. The most promising hydrocarbon layers in Well "AR-11" are found in Zone 8 (1411.5 m–1423.5 m) and Zone 10 (1449.25 m–1456.25 m), as the parameter values in these depth intervals are better compared to other zones, and none of the parameter values exceed the cut-off limits.

Keywords: petrophysical analysis, cut off, hydrocarbons, prospect zone.