

ABSTRACT

DETERMINATION OF PROSPECT ZONES AND WELL BASIS ORIGINAL GAS IN PLACE THROUGH LOG DATA ANALYSIS ON "REN-10" WELL IN "ARMENIA" FIELD

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The Armenia field is an oil and gas field located in the Natuna Sea, precisely in the West Natuna Basin. The REN-10 well is one of the exploration wells located in the Armenia Field. The formation that is the reservoir is the Lama Formation which is located at a depth of 6681,5 ft to 9243,5 ft with sandstone and shale lithology. Based on the Drill Stem Test (DST) carried out on the REN-10 Well, data was obtained in the form of a reservoir pressure of 3261 psia, a gas flow rate (qg) of 0.53 MMSCFPD, and an oil flow rate (qo) of 1003 BOPD. The presence of oil and gas flows indicates that the reservoir in the Lama Formation is a gas condensate reservoir. In the REN-10 Well, analysis will be carried out to determine the depth location of the prospect zone. Analysis to determine prospect zones is carried out qualitatively and quantitatively. Apart from that, this well will also be identified regarding the amount of Original Gas In Place (OGIP).

Qualitative analysis is carried out using a quick look through log curves including gamma ray logs, deep lateral logs, and neutron & density logs to determine the location of the prospect zone. Quantitative analysis includes calculating shale volume, porosity and water saturation. The shale volume calculation uses the shale volume calculation equation for unconsolidated sand. Corresponding porosity calculations for the Lama Formation using neutron-density logs. Calculation of appropriate water saturation for the Lama Formation using the Dual Water method. Cut off is carried out on three parameters, namely porosity, shale volume and water saturation. Cut off porosity using a crossplot between permeability and porosity. Cut off shale volume using a crossplot between shale volume and porosity. Cut off water saturation using a crossplot between water saturation and porosity. The cut off results are the net thickness along with other petrophysical parameters such as shale volume, porosity and water saturation of the net thickness. The results obtained will be used to calculate OGIP volumetrically.

In the REN-10 Well, five prospect zones were obtained with details of zone A1 at a depth of 6682-6690.5 ft, zone B1 at a depth of 6882-6891 ft, zone B2 at a depth of 6907-6911 ft, zone C1 at a depth of 7053-7060 ft, and zone C2 at a depth of 7068-7073 ft. The total net thickness obtained from the Lama Formation is 13,5 ft. The volumetric OGIP calculation for the REN-10 Well was obtained at 6,343 BSCF.

Key words: shale volume, porosity, water saturation, net thickness, OGIP