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Reservoir Characterization using Comparative Petrophysical Testing Approach Acquired with Facies Architecture Properties Analysis

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Abstract : Studies conducted to map the reservoir properties based on facies architecture in which to determine the distribution of the petrophysical properties and calculate hydrocarbon reserves in study interval. Facies Architecture analysis begins with stratigraphic correlation that indicates the area is divided into different system tracts. The analysis of distribution patterns and compiling core analysis with facies architecture model show that there are three estuarine facies appear. Formation evaluation begins with shale volume calculation using Asquith-Krygowski and Volan Triangle Method. Proceed to the calculation of the total and effective porosity using the Bateman-Konen and Volan Triangle Method. After getting the value of the porosity calculation was continued to determine the effective water saturation and non-effective by including parameters of water resistivity and resistivity clay. The results of the research show that the Facies Architecture on the field in divided into three main facies which are Estuarine Channel, Estuarine Sand Bar, and Tidal Flat. The petrophysics analysis are done by comparing different methods also shows that the Volan Triangle Method does not give a better result of the Volume Shale than the Gamma Ray Method, but on the other hand, the Volan Triangle Methode is better on calculating porosity compared to the Bateman-Konen Method. The effective porosity distributions are affected by the distribution of the facies. Estuarine Sand Bar has a low porosity number and Estuarine Channel has a higher number of the porosity. The effective water saturation is controlled by structure where on the closure zone the water saturation is lower than the area beneath it. It caused by the hydrocarbon accumulation on the closure zone.

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