RESERVOIR CHARACTERIZATION OF SAWAN GAS FIELD, MIDDLE INDUS BASIN, PAKISTAN

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ABSTRACT

Sawan Field is located in the Thar Desert, District Khairpur in Sindh province of Pakistan. The study area lies in the extensional tectonic regime exhibiting horst and graben structure. Lower Goru Formation is acting as a potential reservoir which is being charged by shale of Sembar Formation.In the present study hydrocarbon potential of Sawan Field has been interpreted by evaluating the well logs of one exploratory well (Sawan-03B) and two development wells (Sawan-07 and Sawan-08) in terms of reservoir characterization. The petrophysical properties which have been determined include clay volume, effective porosity, permeability, saturation of water and hydrocarbon. Lithology and clay mineral identification have been done with the help of cross plots and charts. Low Resistivity Pay (LRP) phenomenon has been observed in reservoir zone and suitable reasoning is proposed to deal with it. Finally, depositional environments of reservoir facies have been determined by identifying a number of sequences on GR log curve and these facies are then correlated.It has been determined that main lithology of the reservoir is sandstone with intercalations shale containing illite abundantly. The values of Resisitivity logs are relatively low ranging 3-15 ohm-m in the hydrocarbon zone because of the Low Resistivity Pay Phenomenon. With the help of facies analysis it has been interpreted that the depositional environment of reservoir facies is shallow marine to deep marine and there is a considerable change in the depth of these facies from north to south in the study area. On the basis of all these delineated petrophysical parameters it has been determined that Sawan Field has great potential to produce commercially viable natural gas.

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