Intergrated geophysical techniques for structural interpretation and characterization of Eocene Reservoir, Indus offshore, Pakistan

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Abstract

Two-dimensional seismic interpretation has been carried out in (G and H blocks) Indus offshore to confirm the structure and reservoir characteristics of Kirther Formation. The study area lies East of Murree ridge and is dominated by extensional tectonics. Time, Depth contour and 3D surface maps of Kirther Formation have been generated which are further correlated with petrophysical results of Well PakG2-1. Lithological interpretation of Kirther Formation was carried out by using a relationship of MN Cross plot (Schlumberger 1972). The seismic lines confirm the presence of faults and sea mounts in the study area . Time depth contour maps along with 3D surfaces revealed closures towards the North Western and Southern part. A prominent closure towards the North Western side represents an anticlinal feature with decrease in values towards center. Rock physical interpretation revealed that Poisson Ratio is inversely proportional to the Bulk, Shear and Youngs modulai attributing to wetness of the rock by means of formation fluids. The reservoir zone was identified ranging from depth of 4434m to 4600m. The average porosity ranging from 17% to 21% with high water saturation of 80%. From water saturation it has been clear that the fluid present in Kirthar Formation is mostly water. The lithology identified by using MN Crossplot was limestone with less quantity of shale.