2-D Seismic Interpretation and Petrophysical Analysis of Miran-01 well, Gupchani Block, Nawabshah District, Sindh, Pakistan

By

MUHAMMAD AYUB KHAN

ASMA JAVED

MUBSIRA JABEEN

Department of Earth and Environmental Sciences
Bahria University, Islamabad

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ABSTRACT

In this thesis, 2-D Seismic Interpretation and Petrophysical Analysis of the well Miran-01 was done using seismic and well data. Miran-01 well is situated in the Gupchani Block of Nawabshah District Sindh, Pakistan. The well is an exploratory well. The study area lies in an extensional regime which exhibits normal faulting in the area. This study aims at exploring and interpreting the subsurface structures and finding the hydrocarbon prospects in the area using well data. For this purposes first of all the well data was correlated with seismic data and the depths of formation tops were converted from depth domain to time domain. Using this information, formation horizons were marked on the seismic sections and the faults were identified. After marking the faults the values of time and interval velocity from the velocity windows of seismic sections were used to generate the time, depth and 3-D surface maps. The faults marked on the seismic sections and the contour maps generated confirm the presence of Horst and Graben structure in the area. In the petrophysical analysis of the well Miran-01 seven potential hydrocarbon zones were marked by analysing the trends of the GR, LLD, Density and Neutron logs. All of these zones lie in the middle and lower basal sands of the Lower Goru Formation. These zones were marked on the basis of the criteria that there was a Neutron-Density crossover, there was a clear separation between the resistivity logs and there was a cleaning trend in the GR logs. After marking the zones the values of GR, LLD, Neutron and Density logs were picked up from the logs. These values were then used in the formulas of Volume of shale (Vsh), Volume of sand (Vsand), Density porosity (Dϕ), Effective porosity (Eϕ), Average porosity (Aϕ) and Saturation of water (Sw) to get the Saturation of Hydrocarbons (Sh). The results of all the marked zones show positive hydrocarbon potential in the area ranging from 45% to 80%.

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