SEISMIC DATA INTERPRETATION AND PETROPHYSICAL ANALYSIS OF DARBULA-01 WELL, CENTRAL INDUS BASIN, PAKISTAN

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A thesis submitted to Bahria University, Islamabad in partial fulfillment of the requirement for the degree of B.S in Geophysics

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ABSTRACT

This thesis attempts to use seismic interpretation techniques to analyze the subsurface geology of our research region, as well as petrophysical studies to identify possible hydrocarbon bearing horizons. The LMKR seismic dataset included five migrating 2D seismic lines from the Darya Khan, Punjab Platform. Darbula-01's whole suite of wireline logs was also gathered for petrophysical investigation. We identified four horizons using our time-depth chart: The Salt Range Formation, Khewra Sandstone, Kussak Formation and Jutana Formation. To transform the time sections into depth sections, the required information from the time sections was employed. The strata had a NE-SW dip, which indicated stratal changes. Because the region is tectonically stable with minimal deformation, no faults were indicated on the seismic sections, revealing a monocline structure. The time-depth chart was used to create the time contour maps, which were then translated into depth sections using average velocities. These contour maps aid in understanding the area's geological setting and correlating well tie corresponding parameters. Petrophysical analysis was used to highlight the reservoir region of the Darbula-01 well, which entailed defining the zone of interest and then interpreting the logs. Our zone of interests, the Khewra Sandstone and Jutana Dolomite, have high porosity, which implies the existence of heavy oil, according to the petrophysical investigation. Our results revealed that extracting the current heavy oil was not economically viable, and that a source rock distribution problem had arisen, resulting in the Darbula-01 well being tagged dry and abandoned.

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