

## **Seismic data interpretation: A case study for delineating the structural trend in Karak Area, Pakistan**

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### **Abstract**

This research work presents the structural style and indication of hydrocarbons in the Karak block of Kohat Area, KPK with the help of seven seismic lines. First five lines are dip lines and last two lines are strike lines. Among them the lines 906-NSK-39 and 895-NSK-30 are EW directed, whereas the remaining lines are nearly NS directed. Two prominent reflectors namely R1 (Kohat) and R2 (Lockhart) are marked on the seismic sections. The marked horizons show the deformation in the area, caused by the compressional tectonics. Two thrust faults (F1 & F2) cut all seismic lines are marked on Kohat and Lokhart level which show fault propagating folds in the form of anticlines of Kohat and roll over on Lokhart Limestone in Karak. A time section is produced from the seismic section using the vibrating points and the two-way-times (TWT) of the reflectors and faults. The TWT are posted on the base map to make a time contour map of the Top Eocene (Kohat Formation) and Lockhart Limestone as it is continuing throughout the area. The seismic velocities (Vrms) have been used to find the average velocities of the Top Eocene (Kohat), Lockhart. These average velocities are then used to find the depths of the formations to get depth map. The seismic data shows the intense thrusting which in more depth reveals flower structure. Kohat Formation is exposed to the surface in the Karak region so there is no chance of hydrocarbon, whereas, Lokhart Formation is our primary target in term of hydrocarbons. Carbonates of Lokhart may be the major producing reservoirs in the area. A time and depth contour map for both Lokhart and Kohat formations are prepared and new well location is proposed in the Lokhart Limestone of Paleocene age inside the contour of 1000 m into the roll over structure. The prospective zones in the roll-over of Lockhart Limestone in Karak area is the primary targets for oil exploration.