

Sona Pass and Lal Bakhar, Listric Normal Growth Faults at the Southern Tip of the Kirthar Fold Belt, Northwest of Karachi

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Abstract

The studied area is located at the southeastern dipping limb of the Cape-Monze Anticline which in turn lies at the southern end of the Kirthar Fold Belt. The Nari and Gaj formations of Oligocene and Miocene respectively, are exposed in the area. Geological mapping was carried out on a scale of 1:25,000 and stratigraphic sections were measured. The structural trend is northeast-southwest and folds in the region are plunging towards southwest. Two major faults: the Sona Pass Fault and the LalBakhar Fault, transect the regional structure. The former is dipping towards southwest while latter is dipping towards northeast and apparently forming a horst like structure. The folded hanging walls above both faults while the undeformed footwalls indicate that both of them have listric geometry. The hanging walls in both of them have not been folded into rollover anticlines only, but have also been folded into synclines and anticlines. This suggests probable stair step pattern geometry of the listric normal faults in the subsurface.

There is abrupt and significant difference in the thickness of strata in the hanging wall and the footwall of the Sona Pass Fault. Strata are much thicker in the hanging wall as compare to the foot wall indicates that it is a growth fault.

The presences of a horst like feature across an anticline may form an excellent structural trap. Moreover, the presence of rollover anticlines may also form good structural traps in the area. In both cases it is important that the northwest dipping limb should also be preserved.