
STRUCTURAL GEOMETRY AND TECTONIC EVOLUTION OF THE CAPE MONZE-SONARI AREA, WEST OF KARACHI

Mohammad Niamatullah¹, Anees Ahmed Khan², Muhammad Faizan³,
Syed Sohaib Zulfiqar⁴, Tariq Ahmed Qureshi⁵ and Waqar Majeed⁶

¹Department of Geology University of Karachi, ²SGS Pakistan (Pvt) Ltd, Karachi

³New Horizon Exploration & Production Ltd, Karachi, ⁴Schlumberger Islamabad

⁵Baker Hughes, Pakistan, ⁶New Horizon Exploration & Production Ltd

ABSTRACT

The Cape Monze Anticline is a southwest plunging anticline located at the southern end of the Kirthar Fold Belt. The Nari and the Gaj Formations of Oligocene and Miocene respectively are exposed in the area. The variation in thickness and sedimentary facies on two limbs of the anticline, presence of angular unconformities whose angle between upper and lower sequences opens away from the anticlinal hinge on the two limbs, higher dips in the fold core as compared to that on the limbs, indicate that the folding and deposition of sediments was intermittent, as well it is probably a growth fold. The folding was started at least in the early Oligocene just after the deposition of basal part of the Nari Formation.

The north-south trending strike slip faults on the northwestern limb of the anticline having sinistral displacement are in accordance with the stress field which has created the Cape Monze Anticline. However, a major strike-slip fault trending northeast having dextral displacement runs along the core of the fold, except at its southwestern end where by virtue of change in strike it has dominantly normal movement. Its parallelism with the Cape Monze Anticline indicates that this was incongruent with the fold and has been developed due to different stress field. The trend and dextral displacement along this longitudinal fault probably is due to interaction of the Arabian and Indian plates towards west.

The west-northwest trending listric normal faults were developed in the later stages of the tectonic activity. The movement of hanging wall along them has produced complex geometries on the two limbs of the Cape Monze Anticline. These faults are the result of gravity spreading towards south-southwest. The presence of normal faults at an angle to the south west plunging Cape Monze Anticline and roll over anticlines above these faults may provide suitable traps for the accumulation of hydrocarbons.