

## SEQUENCE STRATIGRAPHY AND TECTONICS IN THE KIRTHAR FOLDBELT, PAKISTAN

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The Kirthar Foldbelt formed during Pliocene to Recent times in the Himalayan collision zone between the Indo-Pakistan and Eurasian Plates. The foldbelt is characterized by broad buckle folds separated by narrow synclines previously interpreted as the result of thin-skinned tectonics terminating abruptly eastwards in a major passive backthrust [2]. The current interpretation is of thick-skinned inversion possibly involving pre-existing extensional faults developed on the Indo-Pakistan Plate passive margin [24].

The Kirthar Foldbelt was established as a major petroleum province in 1997 when commercial gas reserves were discovered in Upper Cretaceous sandstones within the Bhit Anticline. The plate tectonic setting of depositional environments for source, reservoir and seal play elements have been evaluated and a revised sequence stratigraphic framework developed using regional data extending from the western Kirthar Foldbelt to the Middle Indus Basin in the east.

After Bhit, gas discoveries were made in 1998- 99 at Zamzama and Badhra and many Companies are now actively exploring in the Kirthar Foldbelt for additional gas reserves. Approximately 4-5 TCF of gas reserves have been found in the Kirthar Foldbelt to date and it is estimated that an additional 5 to 10 TCF remain still to be discovered.

We continue to improve our understanding of the relationships between structural geology and depositional environments in the Kirthar Foldbelt as new exploration wells, outcrop and seismic data are evaluated. Delivering new gas reserves will require rigorous multi-disciplined understanding of the subtle stratigraphic variations caused by extensional faults that existed prior to compressional deformation. Further, breakthroughs in subsurface seismic imaging, 3D modelling and visualization of compressional foldbelt traps are required to improve our capacity to identify, constrain and explore ever more complex and hidden exploration targets.