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Petroleum Potential and Future Outlook of the Safi Offshore Area: A Segment of the Promising Atlantic Margin of Morocco

In the deep water areas of Safi Segment, a thick Mesozoic to Cenozoic sedimentary section was deposited contemporaneously with intense salt tectonics leading to development of relatively large and highly subsiding basins, between salt diapirs, on a graded slope. The fan apron and local mega fans, related to major rivers, depositional systems which prevailed in Lower Cretaceous and Tertiary were favourable for development of numerous and extensive reservoir units. The near onshore Lower Cretaceous outcrops show several episodes of quartz rich influxes shed from Palaeozoic reliefs and transported into the basin through fluvial systems.

The main play types identified using the newly acquired seismic comprise Lower Cretaceous to Tertiary clastics (ponded basins, channels, slope fans and deep water fans) involved in salt-induced roll-over and injected structures. There is strong evidence for salt injection along fault planes and for salt-induced bathymetric highs, under which sub-salt plays are likely to occur. The play types include rotated fault blocks (often associated with diapiric salt) and pinch-out plays, with break of slope deposits and large slumped masses providing additional objectives. Reefal build-ups, developed on the Jurassic shelf edge, have subsided into the relatively deep waters of the present day continental slope and provide a further structural - stratigraphic play. In the shallow-water areas, Triassic rotated blocs and large Paleozoic structural closures, located in the offshore extension of the Doukkala Basin, have been identified. Devonian reefal build-ups may provide an alternative play type in shallow water areas.

Prospective structures exist at several stratigraphic horizons, from Ordovician to Tertiary. Large stratigraphic and structural-stratigraphic traps have been identified in the deeper-water areas of the segment, often associated with the numerous salt diapirs. While many of these features are still classified as leads requiring additional seismic data and detailed mapping to confirm their potential, they demonstrate that this segment of the Moroccan Atlantic Margin has considerable potential.