

STRUCTURAL EVOLUTION OF THE MANGYSHLAK, NORTH USTYURT, AND SOUTHEASTERN PRICASPIAN BASINS, WEST CENTRAL ASIA

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Located along the eastern coast of the Caspian Sea, the Mangyshlak, North Ustyurt and southeastern Pricaspian Basins are the westernmost hydrocarbon-bearing sedimentary basins of Central Asia. The Mangyshlak Basin, bounded by the Karaboguz Arch on the south and the Karatau (Mangyshlak) Uplift on the north, developed initially as a southward-deepening half-graben during the Triassic, with limited Cenozoic sagging creating the presently defined basin center. North of the Karatau Uplift, the North Ustyurt Basin developed as a southward-deepening half-graben as well, with the dominant “break-away” fault of West Kazakhstan located along the Karatau fault system. Late Triassic-Early Jurassic compressional deformation, driven by the collision of the Iranian Block with the southern margin of Central Asia at this time, resulted in the structural inversion of basement-rooted, Triassic normal faults, including the Karatau “break-away” fault, and the development of dominantly south-vergent fold-thrust systems within the North Ustyurt Basin. The South Emba Uplift, which defines the structural boundary between the southeastern margin of the Pricaspian Basin to the north and the North Ustyurt Basin to the south, is located above a north-vergent, Late Paleozoic (Hercynian) accretionary wedge along which the mixed oceanic-continental crust of the southeastern Pricaspian Basin was subducted beneath the Ustyurt microcontinent. However, the South Emba Uplift is presently defined by a broad structural high which developed during the Late Triassic- Early Jurassic. The dual collisions of the Indian subcontinent and the Arabian Plate with the southern margin of Eurasia during the Paleocene and Miocene, respectively, have resulted in the separation of the North Ustyurt and Mangyshlak Basins through the development of the Karatau Uplift as a Cenozoic transpressional structural system.