

Structural Development of Jebel Abd A1 Aziz, Northeast Syria

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ABSTRACT

Jebel Abd **A1** Aziz, one of the most prominent topographic features in northeastern Syria, is a large surface anticline. An integrated structural and stratigraphic study conducted by Unocal from 1988 to 1995 resulted in recognition that Jebel Abd A1 Aziz originated from inversion of a pre-existing graben. Understanding the complex structural and stratigraphic history of the Jebel AbdA1 Aziz is important to hydrocarbon exploration and development in the northern Arabian tectonic plate. This importance is demonstrated by the strong correlation between hydrocarbon productive areas and the areas of Plio-Pleistocene structural inversion.

Our study illustrates how the evolution of this structure is recorded in its local stratigraphy. Prior to the development of the Jebel Abd *A1* Aziz structure, Senonian shelf carbonates prograded southward from Turkey into the Palmyride-Sinjar Trough that extended from west central to northeastern Syria. The shelf edge of this carbonate system was south of and subparallel to the Syrian border. In the Jebel Abd A1 Aziz area, fine-grained basinal mudstones were deposited on a thin, transgressive, rudistid, bioclastic unit. In Early Maastrichtian, an east-west-trending graben developed at the present site of Jebel Abd A1 Aziz. Reactivated northwest- and northeast-striking faults bound structural blocks within the graben. Seismic data indicate that the edges of the rift basin were deeply eroded. Valleys, cut into the sides of the basin along the trend of the older cross-cutting regional faults, exposed Carboniferous and possibly older strata. Olistostromes formed along the basin-bounding fault scarps and small turbidite fans developed at the channel mouths. Paleocurrent direction data from the turbidite sand bodies corresponds well with the trends of the valleys mapped on seismic data.

Maastrichtian-age sediments are largely confined to the graben proper. Early Tertiary sediments filled a wider basin, but there is evidence that minor episodic inversion on some northeast and northwest trending faults occurred during the Eocene and early Miocene. The main inversion of the Jebel Abd A1 Aziz structure occurred in the Late Pliocene and Pleistocene. Inversion produced a large fault-propagation fold above east - west trending faults near the northern margin of the graben. Smaller folds developed above other graben-bounding faults and the northeast- and northwest-striking faults within the graben underwent oblique slip during the deformation.