A Delta in the Desert? A Study of the Cenomanian Bahariya Formation, Western Desert, Egypt

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ABSTRACT

The Western Desert is a prolific area of hydrocarbon production in Egypt with an estimated 2700 MMBOE reserves, most of which is contained in Cretaceous reservoirs. One of the chief producing reservoirs in this region is the Cenomanian Bahariya Formation, which covers most of the Western Desert from the Libyan border to the Nile River. In the area of the Khalda Ridge, the lower Bahariya Formation produces both oil and gas from marginal marine clastic reservoirs.

Core from the lower portion of the Bahariya Formation from 4 oil pools along the Khalda Ridge has been studied and subdivided into approximately 13 facies representing depositional environments including tidal flat, brackish bay, tidal channel, tidal shoal and delta front/marine shoreface. Many of these facies exhibit sedimentary structures associated with tidal deposition, such as tidal bundles, wave influenced current ripples showing current reversals and reactivation surfaces. Glaucony is also a major component of these facies.

A synthesis of sedimentology, ichnology and stratigraphy has been used to generate a paleoenvironmental interpretation for the lower Bahariya Formation. Sediments in this area exhibit widespread tidal influence and abundant soft-sediment deformation and these characteristics, coupled with an overall stressed ichnological assemblage, suggest deposition in a marginal marine system such as a tide influenced delta or estuary.