

Analysis and Interpretation of the petrophysical properties of Mamuniyat reservoir in El-Feel Oil Field, western part of Murzuk Basin, NC-174, Libya

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Abstract

The sandstone of Upper Ordovician Mamuminyat Formation represents part of stratigraphic column in Murzuq Basin, south west Libya. It is the primary reservoir target in the basin, sourced and capped by Lower Silurian Tanezzuft Shale (Sola, 2000). The Mammuniyat reservoir in Murzuq Basin is characterized by lateral and vertical variation of petrophysical properties due to lateral change of depositional environment and the diagenetic effect on the formation load various facies deposition quality. The Concession NC174 is discovered in 1997 by Lasmo Grand Maghreb Limited then On the 26th October 2003 the development drilling campaign started by MOG till the present time. The El feel field is the major discovery in NC174. Porosity range is 16-18% and permeability some hundreds millidarcys. The Net thickness/Gross thickness ratio varies from 20% to 95% with an average value of 70%. The sedimentary fill in the Murzuq basin is mainly Paleozoic to Mesozoic in age and reaches a thickness of about 4000 meters in the depocenter. The sedimentary sequence is punctuated by several regional unconformities corresponding to successive tectonic activity phases. In the area of NC174, the tectonic phases developed anticlines and fault bounded anticlines generally super-imposed and re-activated through time. The resulting structural style is characterized mainly by poli-history sub-vertical reverse faults with different directions (N-S, NNW-SSE and NNE-SSW), these faults bound most of the prospects apparently superimposed on subtle anticlines oriented SSWNNE along which the culminations are aligne.