

Depositional Facies of Mabrouk Formation Of Haima Supergroup: Implications for Petroleum Exploration in Farha South Field in Block 3 and 4, Oman

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ABSTRACT

Mabrouk Formation of late Cambrian to middle Ordovician in age acts as a regional seal rock for the late Cambrian Barik sandstone reservoir. Barik sandstone is currently producing oil from Farha South Field in blocks 3 and 4 which is located in the eastern part of Oman. This study attempts to constrain the distribution of Mabrouk Formation in terms of its thickness and facies change in relation to the depositional environment across the field. Two cores from Farha South-34 well that cover Mabrouk Formation have been studied. Cores were fully described and a sedimentary log was constructed. Petrography analysis has been carried out on five thin sections sampled from sandstone unit of the same selected well. Moreover, wireline logs were used to construct cross sections to examine the variation of Mabrouk thickness across Farha South Field. Different lithofacies of Mabrouk Formation were identified and characterized by means of the integration between core description and the provided wireline logs. Mabrouk Formation is dominated with shale. This shale was deposited from suspension in quiet energy, shallow marine environment with thin of fine to very fine sandstones that have deposited during periodic storm events. This study reveals that Mabrouk is best sealing in the northern part of Farah South Field. This gives more chances for hydrocarbon accumulation and preservation. However, Mabrouk is poorly sealing in south and south eastern part of Farha South Field. The findings of this study can help predicting the locations of high chances of hydrocarbon traps to drill the oil development wells.