

Unlocking New Room of Production in Brown Field; Integration of Geological Data Conditioned 3D Reservoir Modelling of Lower Senonian Matulla Formation, RAS Budran Field, East Central Gulf of Suez, Egypt

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Abstract : The Late Cretaceous deposits are well developed through-out Egypt. This is due to a transgression phase associated with the subsidence caused by the neo-Tethyan rift event that took place across the northern margin of Africa, resulting in a period of dominantly marine deposits in the Gulf of Suez. The Late Cretaceous Nezzazat Group represents the Cenomanian, Turonian and clastic sediments of the Lower Senonian. The Nezzazat Group has been divided into four formations namely, from base to top, the Raha Formation, the Abu Qada Formation, the Wata Formation and the Matulla Formation. The Cenomanian Raha and the Lower Senonian Matulla formations are the most important clastic sequence in the Nezzazat Group because they provide the highest net reservoir thickness and the highest net/gross ratio. This study emphasis on Matulla formation located in the eastern part of the Gulf of Suez. The three stratigraphic surface sections (Wadi Sudr, Wadi Matulla and Gabal Nezzazat) which represent the exposed Coniacian-Santonian sediments in Sinai are used for correlating Matulla sediments of Ras Budran field. Cutting description, petrographic examination, log behaviors, biostratigraphy with outcrops are used to identify the reservoir characteristics, lithology, facies environment logs and subdivide the Matulla formation into three units. The lower unit is believed to be the main reservoir where it consists mainly of sands with shale and sandy carbonates, while the other units are mainly carbonate with some streaks of shale and sand. Reservoir modeling is an effective technique that assists in reservoir management as decisions concerning development and depletion of hydrocarbon reserves, So It was essential to model the Matulla reservoir as accurately as possible in order to better evaluate, calculate the reserves and to determine the most effective way of recovering as much of the petroleum economically as possible. All available data on Matulla formation are used to build the reservoir structure model, lithofacies, porosity, permeability and water saturation models which are the main parameters that describe the reservoirs and provide information on effective evaluation of the need to develop the oil potentiality of the reservoir. This study has shown the effectiveness of; 1) the integration of geological data to evaluate and subdivide Matulla formation into three units. 2) Lithology and facies environment interpretation which helped in defining the nature of deposition of Matulla formation. 3) The 3D reservoir modeling technology as a tool for adequate understanding of the spatial distribution of property and in addition evaluating the unlocked new reservoir areas of Matulla formation which have to be drilled to investigate and exploit the un-drained oil. 4) This study led to adding a new room of production and additional reserves to Ras Budran field.

Keywords : geology, oil and gas, geoscience, sequence stratigraphy

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