بسم الله الرحمن الرحيم

MONA MAGHRABY

شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكروفيلم

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جامعة عين شمس

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HYDROCARBON POTENTIALITY IN ABU SENNAN BLOCKS, WESTERN DESERT, EGYPT

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Abstract

The Abu Sennan block as a part of Abu Gharadig basin is producing hydrocarbon from Upper Cretaceous reservoirs in the three block partitions: SWS, GPT and GPY. Several attemps to explore the deep Masajid, Alam El-Buieb and Alamien reservoirs, but they are failed and considered as dry wells, except one. The main objective of the present work is to study the hydrocarbon potentiality of the deep Jurassic and Early Cretaceous reservoirs (Masajid, Alam El-Buieb, and Alamien), in addition to early Late Cretaceous reservoirs (Bahariya and Abu Roash “G”). The work permits the chance to evaluate the structural model postulating from the seismic and gravity interpretation. Lack of core data for the deep reservoirs only permits interpretation, the depositional facies, and reservoir characterization of the shallow targets (Bahariya and Abu Roash “G”). The structural configuration of the Abu Sennan area output from the structural contour maps and seismic structural attributes, it is represented by a group of en'echelon normal faults having the NE-SW orientation. These faults were intersected by NW-SE normal faults that were formed in the Early Cretaceous time. Five segments are identified along the Jurassic half graben. During Late Cretaceous-Middle Eocene time, the en'echelon normal faults suffered positive structural differential inversion along the Jurassic fault segments. The flattened seismic line perpendicular to the half graben at both Dabaa, Khoman and Abu Roash “C” horizons shows the inversion pulses associated with a clear onlap sediments on the top of both Khoman Formation and Abu Roash “C” Member. Some stratigraphic attributes were done for the Alamien/Bahariya levels, which are not conclusive owing to the carbonate facies and data deterioration.

The Bahariya and Abu Roash “G” units are the main oil/gas productive reservoirs. Petrophysically, the Middle Bahariya Formation is a heterogeneous reservoir in the NES-2 well in terms of four flow units with different capabilities are involved. Reservoir performance would be different among the contained

microport, mesoport, macroport, and megaport flow units. Mainly the reservoir production would be megaport flow unit that controlled among the other units as it is the prevailing unit. While the Abu Roash “G” Member is a heterogeneous reservoir in terms of three flow units with different capabilities are involved. Reservoir performance would be different among the contained microport, mesoport, and macroport flow units. The petrographical description of both units confirmed the presence of these flow units.

The analysis of the organic-rich shales of the Jurassic Khatatba Formation, as the most significant potential source rock, shows that there are many Jurassic sub-basins sources for hydrocarbon supply for the deep reservoirs, their capabilities different from so weak in the southwest (SWS field) to high capable in the northeast (GPY-GPT fields). Distance between the basin source and the amount and direction of migration control also the accumulation of hydrocarbons in closures. The fault seal/leak facilities and reservoir qualities are explained the failure occurred by the Jurassic drilled wells. Therefore, it is better to explore the deep reservoirs in the GPY field as a priority, the GPT field as a second priority, and then the SWS field.

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