Abstract:

Two main reservoirs are producing in Komombo Basin: the first one belongs to the C Member of the Six Hills Formation, and the second belongs to the Albian/Cenomanian cycle. The C Member reservoir lacks detailed studies. Therefore, a detailed study of this reservoir is needed. 3D geological reservoir modeling of the C Member reservoir can be a pertinent part of an overall strategy for the development of hydrocarbon fields in Komombo Basin. Five boreholes, three vertical seismic profiles and twenty 2D seismic reflection sections are integrated in Petrel™ modeling software for building 3D structural, facies and petrophysical models for the C Member reservoir. The constructed 3D structural model reveals the presence of two normal faults, in NW–SE and NE–SW directions. A detailed petrophysical evaluation was performed for the available wells. The resulted facies/petrophysical parameters are then used as input in the processes of facies and petrophysical modeling. The C Member reservoir exhibits thickness values ranging from about 91.5 to 426.5 m. The constructed 3D facies model of the studied reservoir depicts that the shale beds have the large probability distribution in the study area with the comparison of the sandstone and siltstone beds. The created 3D petrophysical models reveal that the C Member reservoir has a fair reservoir quality. This reservoir exhibits, generally, high water saturation values in most parts of the study area, while the hydrocarbon saturation is restricted to the depocenter of the basin.

Keywords:

Komombo Basin, C Member, Six Hills Formation, Reservoir characterization, 3D geological model, Upper Egypt

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