Establishing Prospectivity of Tayarat Formation over West Kuwait Sub-Region by Revisiting Old Data: A Case Study from Kuwait

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ABSTRACT

Southwestern region of Kuwait covers an area of about 3600 Sq.Km, with Saudi Arabia bordering the south and Iraq to the west and northwest. The study area went through some exploration activity for deeper targets based on gravity anomalies and low fold seismic records. About 10 exploratory wells were drilled between 1960 to 1980's targeting the Lower Cretaceous and Jurassic objectives. All of these wells penetrated through the shallow Upper Cretaceous section and only few basic logs were recorded within Tayarat Formation due to the well design constrains. The study area is also covered by a regional grid of 2-D seismic data acquired in 1996 and has been recently reprocessed. Tayarat Formation is already an established hydrocarbon bearing reservoir towards the east and southeast of the study area. Initial reassessment of the old logs indicated presence of good reservoir facies with better resistivity development within Tayarat Formation. Furthermore, few feet of core available within Tayarat Formation was restudied and indicated presence of hydrocarbon. This encouraged exploration team to revisit the existing vintage data and perform an integrated analysis. Subsequently, a comprehensive G&G analysis was carried out judiciously integrating the petrophysical analysis, sequence stratigraphy, structural interpretation and seismic attributes. The regional to local approach adopted in this study, by calibrating the log signatures and seismic attribute responses of the study area with the adjacent fields, helped to minimize the uncertainty due to data unavailability. Additionally, conversion of 2D data into Pseudo-3D helped to identify the strike slip fault trends which otherwise remains difficult in 2D seismic data. Mapping of these fault trends helped to understand the entrapment mechanism. This study revealed Tayarat Formation to be highly prospective over the study area which was considered as marginally prospective in the past. The integrated study resulted in identification of several exploratory locations which are expected to be drilled shortly.