

A Story of Two Haushi Wells at Abu Butubul High, Western Oman

Hussain I. Najwani¹, Yaqoob Al Rashdi¹, Majid Al Abdali¹, and Ibrahim Al Saleh¹

¹Exploration, Oman Oil Company Exploration & Production, Muscat, Muscat, Oman.

ABSTRACT

Oman Oil Company Exploration and Production (OOCEP) was awarded Block 60 exploration & production rights in 2010 to develop gas from Cambrian Barik reservoir of Abu Butubul field. Although deep Barik wells evaluated hydrocarbon pay in shallow Permian Haushi formations, a trapping mechanism for Haushi reservoirs was not certain. To appraise fluid type and recovery of this pay, a well test was performed in a Barik development well (ABB-C) that produced formation water. However this was considered as an inconclusive result due to operational limitations. Following this, drilling and testing results of a Haushi appraisal well (ABB-APP) were surprising due to a heavier oil recovery. Unfortunately, this surprise did not last long on production testing. Learnings from the Haushi appraisal activities were implemented in trap and charge risking of an exploration prospect (Abu Butubul South). Trap integrity was assured by restoring the trap at critical times of charge and tectonic events. Drilling & testing results of an exploration well (ABB-EXP) recovered light oil from Upper Gharif sustainably at higher production rates. Additionally, hydrocarbon pay was also evaluated in Middle and Lower Gharif Limestone. However it was concluded that recovery of these hydrocarbons dictate well stimulation requirement. Unlike the (ABB-APP) well, the Haushi exploration well (ABB-EXP) found the Basal Sand of Lower Gharif and Al Khlata reservoirs to be dry. Based on these well results, core & fluid sample studies that were performed, the following points can be concluded: - Trap integrity & geochemistry are critical factors in exploration of shallow hydrocarbons within Block 60. - Integration of petrophysical, geological and geophysical analysis allows distinguishing residual hydrocarbons “breached trap” from mobile hydrocarbons “intact trap”. - Observations made to characterize breached traps are: - Hydrocarbon saturation is correlating inversely with porosity. - Hydrocarbon saturation is correlating inversely with depth. - Inconsistent & unsustainable well testing results.