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Abstract

Objectives/Scope: The Obaiyed Field is in the Western Desert of Egypt, approximately 50 km. south of the Mediterranean coast. The reservoir is formed by the Jurassic Lower Safa sandstones. The trap is the combination of structure and stratigraphy. Varying reservoir quality characterizes the field and causes special challenges for the development.

Methods, Procedures, Process: The Lower Safa is sub-divided into the upper and lower accumulations, separated by the non-reservoir unit. Later deformation of the area created several un-connected fault blocks, the largest is the Obaiyed Northeast Block with forty-percent of the gas in place. The thickness of the Lower Safa is changing from 200 m. along the eastern boundary faults and thinning to zero to the south. Sandstone porosity of this competent rock is between seven to thirteen percent. Permeability range is between 0.1 to 600 md.

Results, Observations, Conclusions: Lower Safa contains condensate rich gas with fluctuating fluid properties due to the complex charge history. Hydrocarbon contacts are also changing across the field. Initially the field was at dew point. Currently, the reservoir pressures are below the dew point over the large part of the field due to the depletion recovery mechanism. In-place volume is 1.5-2-5 tcf., approximately 1.0 tcf. Is recoverable. Currently 19 wells are producing. Total production of the field is 240 MMscf/d gas and 16,000 bbls/day of condensate. Hydraulic fracturing technique is required for the production.

Novel/Additive Information: This paper describes four different wells completed by hydraulic fracturing. Conventional water based fracturing fluid was pumped for two wells while the other two offset wells were treated with the novel methanol-based flow channel fracturing. This new fracturing technique was chosen to address the possible suspected water block effect on production. By application of this new technique, the production increased three folds while reducing the amount of proppant by

half comparing to the offset wells treated conventionally. The development of the field is being continued with the new technique since 2016.