

Overcoming the Challenges and Difficulties while Planning the Massive New Wells Placement in the Greater Burgan Field

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ABSTRACT

Burgan Reservoirs have been the mainstay of Greater Burgan Field for over nearly seven decades. These sandstone reservoirs have strong aquifer support in the lower units such as BGSM. Water encroachment in these reservoirs drive the development plan to target the un-swept areas in various Burgan Reservoirs. The variable rock quality from shaly/interbedded to massive/prolific over a large area with varying connectivity and continuity presents a formidable challenge to the exploitation of these Reservoirs. The development strategy of Burgan reservoirs has been that of a bottoms-up strategy to capitalize on the strong natural water drive. However, the vertical heterogeneity and the stratigraphy resulted into fluid movements that did not synchronize with bottoms-up development strategy. Therefore, each Burgan reservoir tracked for its fluid movement to guide the development plan and locate in-fill wells. There exists a significant opportunity for in-fill drilling to target the un-swept oil in good reservoirs and effectively drain the poor quality reservoirs. For the year 2018-19, the total number of wells planned are 77 wells which to be drilled across the various Burgan sands. Out of the total number of wells, there are 69 producers targeting both the Burgan Upper sands and the Burgan Lower, two Burgan PAD sets to be drilled with 18 burgan producers. In Burgan Upper reservoir due to the lack of pressure support, a six water injection wells proposed in these areas. Two observation wells are proposed to be drilled provisionally to be placed near the injection wells to monitor sweep efficiency. There are three categories of risk in the risk register: 1. Subsurface related a. Drilling wet zones b. Drilling zones with insufficient sand development to support planned rates The primary mitigation for the subsurface risk is to complete in another zone (e.g. a well targeting the 3SL is re-directed to the 3SU). For the facilities, wells can be directed to different facilities or the existing facilities can be optimized to manage water and minimize the impact on gross production rate. 2. Well construction risks 3. Facilities constraints 4. safe well spacing and placement In this paper, we will discuss the complete process of targets selection criteria, well planning, anti-collision and risk mitigation for the mature Burgan reservoir