

Maximizing the Asset Value through Implementing MRC Targeting Higher Recovery and Better Reservoir Management Practice

Alaa Shbair¹, Yasser Abo Alhag¹, and Noor Nasriq¹

¹ADNOC

Abstract

Optimization of reservoir development to build and extend plateau, calls for drilling large number of wells to deliver and support planned plateau production and improve sweep efficiency. MRC drilling breakthrough was introduced as an attractive solution to optimize development cost. Nonetheless, an increase wells productivity in long horizontal drains was anticipated to mitigate tight reservoir unit developments challenges of water breakthrough mechanism as well controlled BHP and enhancement of ultimate recovery . The objective of this paper is to demonstrate the application of MRC drilling. A case study is presented herein for a layered carbonate reservoir, undergoing redevelopment plan with Water Injection scheme. Average porosity 20-23% and permeability 2-30 md. Evaluation of MRC wells was carried out in phases. The **planning phase** included the reservoir modelling, selection criteria and wells planning. Simulation modelling evaluated prospective performance in terms of oil sweep and cumulative production and Leff range. The completion reassessment called for sign limited entry liner (LEL) completions to assure effective acid stimulation. In the **execution phase**, ultra- deep resistivity tool was beneficial in detecting water slump front and was integrated with the Image log results and Isolation of risky interval was proposed to avoid early WBT in well life. **Post commissioning**, the technical evaluation for the MRC cases included base line of PLTs and PTA analysis pre and post stimulation. Finally, comparison with analogue legacy wells was done with proof of added value. The evaluation results of MRC cases with conventional wells proved the value of MRC to accelerate production reserves and pressure support with higher well injectivity/productivity. The analysis resulted in proposed actions to improve and define the best production/injection scenario for efficient MRC deployment. First application of MRC led to: Well count optimization during the redevelopment phase (reduction of 20% total wells). Reactivating Inactive, enhancing wells potential and elongating well life by reducing drawdown, minimizing inverse coning; modified strategy to LHZ in bottom zone instead of slanted/short HZ. Increasing and Accelerating production/Injection, Qo 2*X rates, PI/II >> 2 times. Uniform profile across horizontal drain with Effective well length >> 70%. Estimated CAPEX saving of +24 MM drilling/surface tie in cost.

The case study presented will help in evaluating workflow for MRC implementation in green/brown fields. The promising results can be a guidance to extend the implementation of the MRC for field development/re-development plans early in the development phase.