

Unleashing the Potential of Advanced Diversion Techniques: Integrating Simulation and Real Case Study to Enhance Productivity in Limited Entry Slotted Liner Horizontal Completions within Tight Carbonate Reservoirs

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Abstract

ARX is a common carbonate reservoir located in Egypt deserts. It is described as a Dolomite reservoir with tight formation, strong lateral continuity, and naturally fractures with low connectivity. The main challenges to maintaining economically viable well productivity are the heterogeneity and tightness.

The large interest in developing such low permeability reservoirs has been a direct result of the favorable economics achieved by the advancements in horizontal well drilling and stimulation technologies hold great promise to increase production by dramatically increasing the contact area with the producing interval, maximizing the drainage volume around a well and link those natural fractures network

Acid stimulation is a common technique used in oil and gas reservoirs to enhance the productivity of reservoirs. However, when horizontal wells completed with slotted liners are involved, unique challenges can arise. Horizontal wells have gained popularity due to their ability to access a larger reservoir area and increase production. Slotted liners, which consist of perforations along the wellbore, are commonly used in these wells to prevent sand intrusion. However, obstructions such as production logs, debris, or scale buildup can hinder the successful deployment of coiled tubing and acid stimulation tools.

This study investigates the challenges faced during acid stimulation of a horizontal well completed with a slotted liner, specifically focusing on a section where coiled tubing became stuck, spanning approximately 2000 ft horizontally. The study integrates software simulation of acid stimulation operations with actual well data and post operation production data to address the utilization of chemical diverter for delivering the acid stimulation to large areas that are inaccessible by coiled tubing due to obstructions in the horizontal section.