Reservoir Pressure and Mobility Monitoring in Brown Fields in the Middle Magdalena Valley Using Modern Wireline Formation Tester Technology

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Pore pressure regimes along the sand bodies forming the formations in the Middle Magdalena Valley have been found to have a wide range of variation in brown fields being attributed to the production history and recovery methods, particularly water injection. The heterogeneous nature of the reservoirs as well as completion techniques traditionally used has induced differential depletion between zones. Vertical and lateral communication in this environment is paramount to know for drilling fluids density planning and completion design as well as injection monitoring hence pressure data acquisition has evolved over the years until it has become a common acquisition practice for every new drilled well. Not only pressure presents drastic variations with depth but also mobility profiles obtained from the pressure drawdown during the pretests done with the formation tester. Mobility, an indication of permeability, can be found varying from values as low as 0.1 to moderate to high values in the range of 50 – 200 md/cp. Improvements to the acquisition technologies have been implemented in order successfully accomplish the pore pressure and mobility measurements in the field.

This paper presents the acquisition technology as well as particular applications of the pressure and mobility measurements in brown fields in the Middle Magdalena Valley in Colombia.