



Identification of compartmentalization and Free Water Level using Borehole Images and high Resolution Formation Testing in the Panonian basin

Viktor Sőreg (1), Ahmed Amran (1), József Balogh (2), József Tóth (2), Ilona Vargáné Tóth (2), Emmanuel Bize (3), Nadege Bize-Forest (3), and Edmond Ngallema (3)

(1) MOL - Eurasian Exploration Projects, (2) MOL - Integrated Field Applications, (3) Schlumberger Data and Consulting Services

Of all the methods used for investigating petroleum reservoirs, Well Testing is of particular interest because it proves reservoir potential and confirms well performance. Well testing involves flowing the well at a control rate and measuring the reservoir response. Conventional well testing is performed in a completed well while high resolution well testing applies to uncompleted well, using wireline technology.

This paper describes the use of high technology wireline formation testers to improve reservoir characterization. The Schlumberger formation testing tools (PressureXpress and Modular Reservoir Dynamic Tester) are presented, with applications in geological modeling, drilling, completion and testing optimization as well as formation evaluation. One of the main goal of the study was to identify the gas (oil) saturated layers, to avoid testing unproductive zones. In well K4 utilization of formation tester allowed to point only the potential layers in a sand shale reservoir and a thorough study of these zones has allow the determination of potential reserves. Second successful objective was also to determine eventual compartments in the reservoir, i.e. which reservoir where in the same hydrodynamic system. Last but no least it has allowed an estimation of the free water level.

Combination of formation tester with FMI has also helped to visualize the Free Water Level (FWL) in the well, and to determine, in real time, the different points to be tested with XPT. FMI was also of huge benefits in these fractured reservoirs. The determination of free water level and the identification of hydrocarbon saturated layers reduce the cost of completion and conventional testing. Downhole fluid analysis provides a unique solution to the understanding of complex reservoirs. Based on the lessons learned, Improvements have been proposed for future operations.