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Rock fabric and pore geometry characteristics of the Mishrif Carbonates in South Iraq fields and application to the Majnoon field

A.M. Razoian Awadeesian* (South Oil Company)

SUMMARY

The Cenomanian Mishrif–Ahmadi carbonates rock fabric versus pore-geometry and its influence of production performance in the North-Rumaila & West-Qurna oil fields have specifically been studied to be used as analogues in the Majnoon oil Field, in the absence of similar data in the latter.

This carbonate succession commonly consists of multiple high-frequency lithofacies cycle sets. A single high-frequency lithofacies cycle is essentially distinguished by a shallowing-upward succession of mud to grain-dominated bioclastic wackestones, rudistid bafflestone of facies-buildup, grain-dominated bioclastic packstones; and coated-grain (bioclastic) peloidal grainstone of facies-buildups. A typical cycle is basically characterized by a composite system of multiple pore structure/pore throat grades.

High-resolution rock-fabric analysis and composite pore system determination is acquired through the use of the mercury injection technique, carried-out on tens of standard core-plugs, taken from the cored intervals in the studied fields.

Capillary pressure, mercury saturation and pore-size are measured and used to determine the effectiveness of the Pore-Throat-Sorting (PTS) parameter as a rock-fabric/pore-system indicator.

Using the above, three main reservoir facies performance groups which represent the Mishrif facies heterogeneity can be distinguished. This information is planned to be used as analogue data to assess water injection feasibility in the Majnoon field until new data are acquired.

It can be concluded that the Mishrif reservoir production characteristics will be controlled by its rock-fabric / pore-geometry heterogeneity. This creates a need for different production strategies during primary and secondary production of the field.