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## Justification of oil and gas potential the basement formations of Western Siberia

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In Western Siberia, on numerous oil fields and newly drilled ultradeep wells (SG-6 and SG-7) as well as by core, logging materials, cavernous-fractured, fractured cavernous-porous space is established, not only in the upper part of the basement (the weathering crust), but in decompressed rocks located at greater depth, below the basement surface. New seismic technology (using the scattered waves) allows today to map the zones and areas of reservoir rocks distribution in the interior of the basement. Evaluation of hydrocarbon potential from the geochemical position is based on the isolation in the section of oil and gas source strata, which in a first approximation are fixed by the generating capabilities of oil and gas source deposits is determined by the results of the analysis Rock-Eval, reflecting the content and composition of organic matter and the nature of catagenetic transformations. Study of catagenetic staging of organic matter is a necessary tool for geochemical evaluation of hydrocarbon potential, and in the first place, it refers to the deep, heterogeneous, sometimes dislocated Paleozoic deposits of the West Siberian oil and gas basin. Using the new features of the basement heterogeneity mapping and isolation of reservoir rocks distribution zones and areas, as well as the evaluation of hydrocarbon generating potential of sedimentary source strata, that clothe ledges of the basement, specifically choose and depth of project wells.

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## Low salinity flooding magic number is 5000 ppm

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The debate among the researchers in the petroleum industry on the mechanism of low salinity water flooding and the optimum salinity of the injection water in sandstone and carbonate oil formations still did not reach a final conclusion. In this paper, a summary of our experience that covers the possible application of low or smart water flooding in two UAE carbonate oil reservoirs will be presented. Low salinity means dilution of reservoir formation brine, injection brine, or sea water to an optimum salinity that has to be determined in the laboratory, while smart water injection signifies ionic composition modification process. The objective of this paper is to share our laboratory work and results conducted on two carbonate reservoirs that include a systematic approach to determine the mechanism of low salinity flooding and complete assessment of the two approaches of smart water and low salinity water processes. Results revealed that in both reservoirs, low salinity produced significant improvement in the displacement efficiency and dilution of the injection water (URD water, sea water) to a level approaching 5000 ppm is the optimum system. Modification of the ionic composition of different waters did not result in an improvement of the process efficiencies. The magic number of low salinity concentration of 5000 ppm has been reported by a number of researchers. Results also indicated different mechanisms of low salinity flooding for the carbonate reservoirs. The low salinity injection water has to have a salinity below some limit (TDS <~0.5% or 5000 ppm).

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