Conditions of Oil Reservoir Formation in Reefs Occurring in the Volgograd Region

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Nature reservoirs of the Devonian reef masses occurring in the Volgograd region (Russia) exist in the form of a complex three-member structure consisting of: reservoir - false cap rock - impermeable rock. A true reservoir is presented by high-capacity reefogenous porous-cavernous-fractured limestones and dolomites. A false cap rock (permeable to fluid) overlying the reef is usually conditioned by communicating fractures present in clayey limestones. With it's advent the roof of the reservoir is displaced to the true cap rock foot.

An oil reservoir is occurring above the roof of the false cap rock in the area of the structure curve. Thus, the roof structure of the false cap rock determines trap size and capacity i.e., oil and gas volumes accumulated in the reef. A false cap rock with a high level of structure curve is responsible for the low level of oil accumulation in the upper reef part or for the absence of a pool in it. Location of the oil-water contact coincides with the level of the true cap-rock foot in the area of the structure curve.

When delineating the pool it is necessary to take account of the levels of at least two structural surfaces: the roof of the false cap rock and the reef roof itself. It is also recommended to prepare a map of thicknesses for the false cap rock which is useful to trace reef trends with the account of the reef structural surface. It is necessary to determine a structure curve and a suspected outline of an oil pool for each reef trend on the structural surface of the true cap rock. This method allows to specify the location of the reef structure and to search for an oil pool of particular parameters by it's area and height.