

Late Jurassic Carbonate Buildups – Promising New Gas Potential in Sarakhs Plain, Northeastern Iran

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ABSTRACT

Recognition of the corresponding depositional environments and the main parameters controlling the distribution of reservoir properties are essential for hydrocarbon exploration and production. The easternmost part of Kopet Dagh Basin, Sarakhs plain, is the main gas producing region in NE Iran. Khangiran, Gonbadly and Toos are 3 gas fields located in this area. The Late Jurassic buildups of Mozduran formation owing to their intrinsic internal porosities are prime hydrocarbon exploration targets. Seismic facies analysis as well as production rate through different wells in Sarakhs area show that the Probability of Success (POS) of all wells drilled into the Microbial buildups is 85.2%, while the corresponding percentage to the wells drilled into other facies was just 37.5, and associated with insignificant production rate, if any. The discovery of high gas productive buildups in the Mozduran reservoir is leading to a new concept in exploration procedures. Attention is now focused on the interplay of the inherited paleohighs and relative sea-level changes on abrupt facies/thickness changes and diagenesis in the carbonates, moreover the distribution of this hydrocarbon productive zone are not completely understood throughout the Sarakhs Plain. Overlying the carbonate buildups are Tithonian anhydrites, buff grey argillaceous limestone and brownish grey micritic and dolomitic limestone which fill in and smooth out the underlying relief and are regional cap rock. Core and facies analyses signify the Kimmeridgian reservoir facies of Mozduran Formation are mainly composed of Tubiphytes boundstone, Tubiphytes packstone/grainstone, Microbialite boundstone, dolomitized ooid grainstone/packstone and dolostone. A multidisciplinary study was carried out including thin sections, cores, facies/microfacies and wireline analysis along with 2D and 3D seismic data as well as production data to evaluate the distribution of carbonate buildups and reefs and to predict the probable stratigraphic traps.