Long way to a pre-salt gas / condensate discovery on the northern part of Pre-Caspian Basin, Kazakhstan

G. Pákozdi[1], A. Kovács[2], Dr. Marat T. Zholumbayev[3]
[1]MOL Caspian RKZ
[2]MOL Budapest
[3]Ural Oil and Gas RKZ

The studied area situated in the northern escarpment zone of the Pre-Caspian Basin in Kazakhstan just in the neighborhood of the giant Karachaganak and smaller Chinarovsky fields. The modern intensive exploration has started in 2000 with a main goal to test some of the big sized prospects, well defined with 2D seismic, which could be considered as perfect Karachaganak analogues.

During the first period of exploration, the nice hunt for Devonian-Carboniferous Karachaganak type of carbonate reef buildups, resulted two dry holes on Zharsuat and Zhaik (deepest ever well in RKZ) structures.

The interpretation of new extended 3D and merging of all available data in the wider area caused to get a new understanding of the development of Paleozoic pre-salt sequence and opened the possibility to find new exploration targets.

The northern side of the Pre-Caspian Basin developed as a passive margin where several thousand meter Devonian strata of carbonate, shale, and sandstone were deposited. The extreme extension around Chinarovsky area caused a local asthenosphere rising forming the “core-complex” of Chinarovsky High. During Late Devonian time a transcurrent plate tectonic movement started between the Russian and Turanian plates along the weakest zone of the crust; forming the over trusted Rozhkovsky Anticline with inverted Riphean rift sediments in its core. Hole Devonian strata were eroded in the centre part of Rozhkovsky anticline and Chinarovsky High as well.

The flattened anticline and high was bordered by an active tectonic zone to the South. A stable platform was formed in the North, to the South the active extension basin zone, the Pre-Caspian Basin was formed. This paleotopography was overlain by three carbonate megasequences during Carboniferous and Lower Permian time.

Finally the implementation of the new geological model resulted in the discovery (two successful wells) of the Rozhkovsky gas-condensate field in Tournaisian carbonate reservoirs.

With the help of the new positive input data the work is going on with extended 3D reprocessing, sedimentology and migration model building to find new exploration targets and to lower appraisal risk.