New Exploration Targets for Oil and Gas in the Cis-Ural Downwarp

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During the 45 years of exploration in the Bashkir part of the Cis-Ural downwarp commercial oil and gas have been found in Lower Permian sediments on reefs and folds of the Kinzebulatov type; in Upper and Middle Carboniferous on the Araslanov, Volostnov, Saratov and other uplifts in the south of the downwarp and also in the Yuryuzano- Aysk depression; and in Lower Carboniferous and Upper and Middle Devonian on the Tabyn anticline. See Fig. 1.

In the south part of the Bel’sk depression the favorability of the Berkutov gas region is based on the discovery in 1976 of a gas condensate field and the presence of several favorable areas. The gas pool was discovered by well 36 on the Ziriklin structure, which had been found by seismic surveys on a Middle Carboniferous reflector. This structure is bounded on the west, east, and north by faults and is a horst. See Fig. 2.

Ishimbay wells 101, 300, and 301 were drilled for information on the sub-reef horizons. It was supposed that the Lower Permian reefs occurred at the crests of Carboniferous and Devonian uplifts or on their west flanks. According to the drilling data they are on the west flank of a large fold. See Fig. 3.

In Beloglin wells 3 and 6 oil is recovered from limestone of the Starooskol horizon. The overlying limestones of the Mullin horizon are also possibly oil-bearing. This appears to occur on the east flank of a gentle anticline. See Fig. 3-IV.

Oil is present in sandstone of the Takatin. formation in Beloglin well 3 and absent in this same stratum in well 6 where it is 106 m higher. The same situation is found in the Voskresen area where well 19 yielded oil and wells 76 and 77, which penetrated the sand higher, yielded water. Attempts to increase flow of oil by HCl treatment resulted in appearance of water.

The graben-like downwarp in the Ishimbay area deserves attention. In wells 300 and 301, which are located 2 km from one another, the thickness of the Kynov-Pashiy formations increases eleven fold. See Fig. 3-I. Such sharp variations in thickness are found also in grabens on the southeast flank of the Russian platform. Such structures are favorable where Takatin and Starooskol sediments are present.

In the north of the Bel’sk depression the Tabyn and Bakrak oil fields are already in production, and in the Arkhangel area the section from the lower Tournaian through the Frasnian, inclusively, is productive. A pool 244 m high occurs on a long, narrow fold, which has an area of 9 by 1.2 sq km.

Four gas-oil fields and one gas condensate field have been discovered in the Yuryuzano-Aysk depression in Middle and Upper Carboniferous sediments. Wells in various areas here have disclosed oil-gas shows along the entire Paleozoic section. Carbonate sediments of the Bashkir stage are regionally productive in this depression. Porous limestones of the Varey horizon are gas-oil-bearing along the entire western border; toward the east, however, these sediments become more dense as clay content increases, limestones of the Tournaian stage and Upper Devonian are also favorable for oil and gas.

A thick unit of clastic-carbonate sediments of the Lower Devonian and Silurian is present in the Yuryuzano-Aysk depression and in the south of the Bel’sk depression. The area of the Silurian rocks is not less than 5000 sq km in first of these depressions.

The Wendian and upper Riphean along the east border of the Cis-Ural downwarp and along the extreme west belt of the folded Urals should be studied for oil and gas. Structures, seals, reservoirs, and source rocks are present here.

In the area of the Ishimbay group of reef structures, porous lenses of considerable thickness are expected below the presently producing pools.

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