Exploration Operations in the Southeast Part of the Peri-Caspian Depression

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Exploration by “Embanefit” in recent years has been directed toward study of the geology and oil-gas prospects of the sub-salt sediments on the Primor Paleozoic uplift, the Severo-Kultuk, and Tengiz structures; the supra-salt sediments in several areas; and the Permo-Triassic on the steep flanks of salt plugs.

The main thrust of geophysical surveys during the Ninth Five Year Plan (1971-75) has been the study of Permo-Triassic and sub-salt sediments. Detailed seismic surveys have outlined several new structures for deep exploration drilling.

On the south flank of the Vostochnaya Prorva field a flow of oil at 51 tons per day was recovered from the 3186-3179 interval of the Permo-Triassic sediments. The Permo-Triassic complex is productive on the north flank of the structure also.

In the Masabay area well 2 has yielded flows of oil from the 1885-2005 m interval of the Permo-Triassic, and after perforation of the 1923-1930 m interval the yield was 50 m per day.

In the Zapadnaya Prorva area well 51 yielded an open flow of oil after perforation of the Permo-Triassic in the 3183-3185 m interval. Perforation of a lower interval at 3319-3325 m yielded gas and condensate.

In the Aktyube area gas with water was obtained from Permo-Triassic sediments in the 3174-3165 m interval.

Two oil-bearing Permo-Triassic horizons have been found in the Yugo-Zapadnyy Kamyshtov field at depths of 770-895 and 804-962 m.

The new Pribrezhnyy field was discovered. The oil occurs in Cenomanian sediments on the northwest and southeast flanks of the dome. The pools are at a depth of 395-410 m. There are three sandy pays separated by clay dividers 1.5-5 m thick. Thickness of the productive horizon ranges from 13 to 47 m. Density of the oil is 0.9955, tar content is 72-75%, paraffin is 0.86-0.17%, and viscosity is 3393-9700 cst.

The new Yugo-Zapadnyy Tazhigali field is to the north of the Pribrezhnyy field and to the southwest of the Tazhigali field. The oil pool is in Albian-Cenomanian sediments at a depth of 396-452 m. Thickness of the horizon ranges from 4 to 22 m. The productive stratum consists of sands with clay beds, and the oil has the same composition as that of the Cenomanian horizon of the Pribrezhnyy field.

In the Pustynnyy area oil and gas shows were observed in the form of periodic outbreaks in the 3639-3658 m interval from sub-salt sediments. Some core was 70% oil saturated. Its density is 0.835, and viscosity is 4.56 cst.

In the Tengiz area well 1 at a depth of 4095 m yielded outbreaks of gas at 4095 m from Lower Carboniferous sediments.

Thus, during the Ninth and Tenth Five Year Plans geological exploration established commercial oil in the Permo-Triassic, disclosed new pools in the supra-salt sediments, and demonstrated oil-gas productivity of the sub-salt sediments.

The most favorable targets of the southeast of the Peri-Caspian depression are the sub-salt sediments. This is indicated by the recent recovery of flows of oil on the Kenkiyak, Karatube, Zapadno-Teplow, Gremyachin, and Tortay structures; intensive oil-gas shows in the Bikzhale, Pustyn, Bozobe, Tazhigali, and other areas; and also the discovery of the Astrakhan gas field in the southwest of the depression.