P7-2 FRAKULLA GAS FIELD A TYPICAL MODEL OF MUD DIAPIR

REXHEP KOCI
Instituti I Naftes e Gazit, Fier, Albania

Frakulla area is located in the western part of Albania and is geologically represented by the uppermost part deposits of the Adriatic Basin. This basin is included in the central Mediterranean Basins group.

Some anticline and syncline structures are indicated in the western part of Albania. These structures are placed in a linear way forming some structural ranges with SSE-NNW axis direction. Frakulla is one of these structures as a part of Vlora-Panaja-Frakkull range (fig 1).

Frakulla region is stratigraphically represented by deposits of Neogene age (Serravalian stage to Pleistocene included) which are placed with stratigraphic and angular unconformity in the lateral parts of the basin. From the lithological point of view the section is represented by clay, siltstone, sandstone, and evaporates.

The structure is formed as a result of the mud diapir growth. It is a typical mud diapir with many gas sandstone beds surrounding it in all directions (fig 2). It is complicated with tectonic faults in both western and eastern flanks, which dip with angle 45-90° (fig 2&3). The southern and northern ends of the structure are clearly seen in the seismic sections and are reached from some wells.

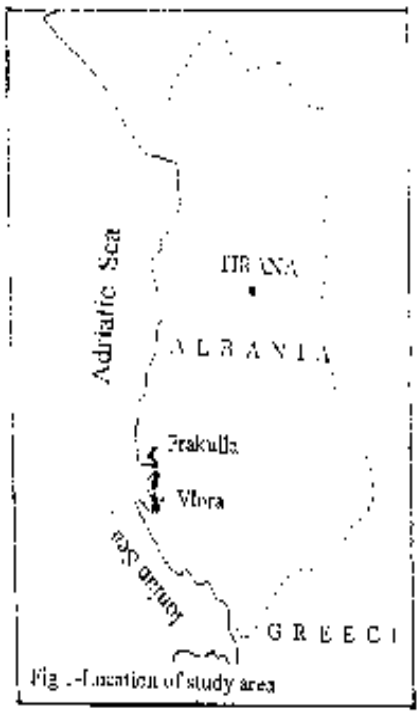

Fig. - Location of study area

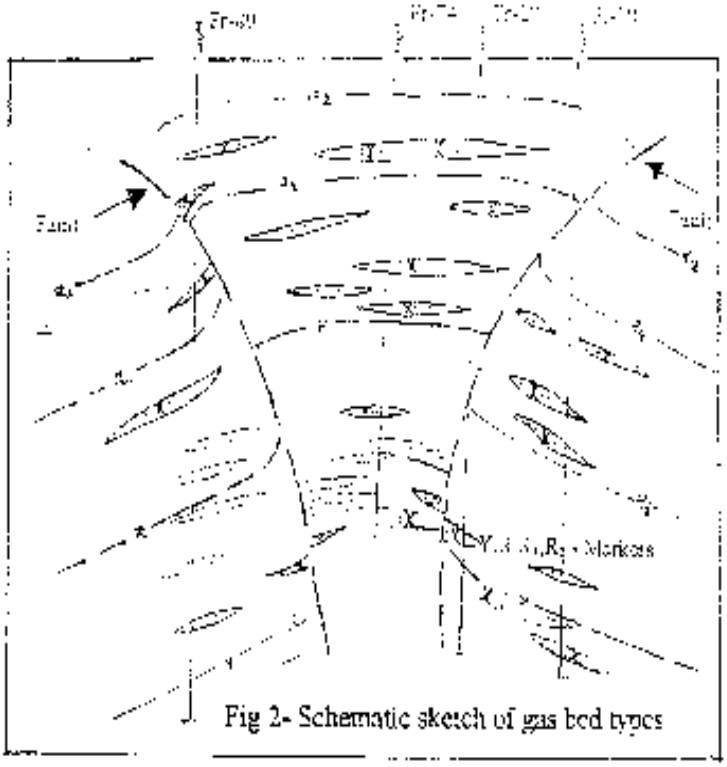
Fig 2- Schematic sketch of gas bed types

Clay package in the lower part of Messinian deposits belongs to a deep-sea depositional environment; while the overlaid clay-sandstone package is deposited in a shallow environment of lagoon type.

Gas bearing section of this gas field belongs to the upper part of Messinian deposits and its thickness is about 1500m. the most encountered gas beds are those of lithologo-structural and tectonic types.

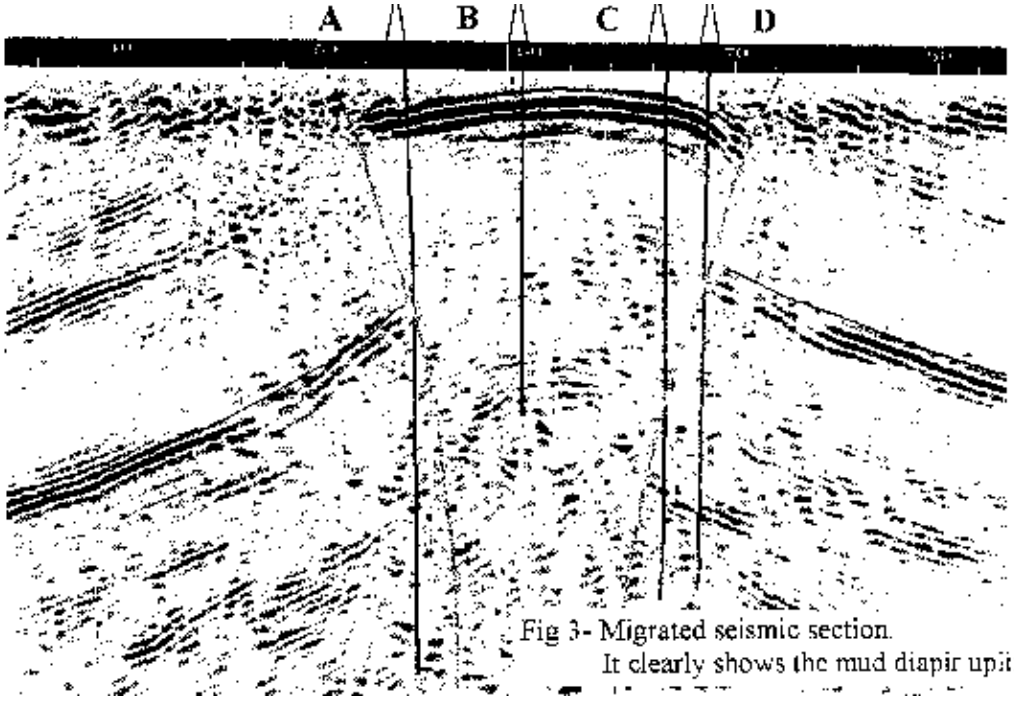

Fig 3- Migrated seismic section.
It clearly shows the mud diapir uplift.

Many drilled wells have proved the presence of abnormal pressure in every part of the structure. The data of their correlation were used for the construction of the pressure distribution map. This map looks very similar in comparison with the structural map. The abnormal pressures are shallower in the central zone or in the uppermost part of the structure than in their flanks. The pressure gradient in the western flank of the structure reaches up to 1.1-1.3 ATM.

We can draw some conclusions based on the detailed study of the available seismic and well data. Following are some of them:

-It is indicated that the abnormal pressures are encountered in different stratigraphic levels and that is conditioned by the presence of the sandstone bodies.

-It is observed that the presence of abnormal pressures is a director indicator, which can be used to predict the presence of sandstone bodies.

-It is also noted from the overlay of top abnormal pressure map and hydrochemical maps that exits a correlation between the hydrochemical inversion and the abnormal pressures. The top of the abnormal pressure represents also the bottom of the hydrochemical inversion. We think that this correlation exist as a consequence of the syngenetic origin both for abnormal pressure and hydrochemical inversion.

So, we can say that some factors affecting the quantity of hydrocarbon accumulation are discussed in this paper like these:

-Structural character of the area.

-Pattern and complexity of faulting around and over the mud diapir.

-Depositional environment.

-Rate of growth of the diapir.

-Time of uplift.

Finally, we can say that the presence of gas accumulation in Frakulla area is as a consequence of a favorable interrelation of these factors.