2-D Seismic Data Interpretation &Petrophysical Analysis of Meyal Block, Potwar Basin, Pakistan

By

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ABSTRACT

The study area (Meyal) is bounded by latitudes 33°22′N and longitudes 72°18′E and is a part of the Meyal block which lies in the northern part of Potwar sub-basin i.e. North Potwar Deformed Zone (NPDZ).

The seismic lines (a total of 8), seismic base map and well data (MEYAL-05), Vertical Seismic Profile (VSP) data of well (MEYAL-08) and Sonic, Gamma and resistivity log of Wells(10,17) are obtained from Landmark Resources (LMKR) with the prior approval from the Directorate General of Petroleum Concession (DGPC).

Identify key seismic reflections using well data and Vertical Seismic Profile(VSP).These reflectors are R1 (Kohat),R2 (Datta),R3 (Chorgali). Construction of Time, Velocity and Depth contour maps. Construction of Geoseismic / Depth section, restored section and calculation of crustal shortening of Seismic lines. The velocity graphs show that the velocity falls in the range between 2000m/sec to 5000m/sec along this structure. The maximum depth of basement is 7800m.

Calculaion of total and recoverable reserves and different parameters of reservoirs by utilizing well logs. In Meyal block Kohat, Chorgali, Sakesar and Datta Formations are major producing reservoirs.

The gray shales of the Mianwali (Triassic age), Datta (Jurassaic age) and Patala Formations (Paleocene age) are potential source rocks in study area (Meyal). Mianwali formation include 27% to 36% total organic content (TOC) in isolated pockets of shales.

The Kuldana Formation (Eocene age) and Murree formation both acts as cap for the reservoir.

The time, velocity, depth contour maps and of the respective surfaces of R1, R2 and R3 (probable top Eocene Kohat, Chorgali and Datta formation) shows that the subsurface structure is a faulted anticline. Thrust faults are NW-SE trending. The axis of the anticline is in the East-West direction and the faulted anticline plunges in both East and West directions. The depth section for the lines also shows that i.e. North dipping thrusts and South dipping back thrusts.

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