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Geology and Hydrocarbon Potential of Paleozoic Units in Diyarbakır Basin, SE Turkey

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Turkey includes structurally complex part of the Arabian plate with Paleozoic and Mesozoic units. Paleozoic units targeted exploration and production activities have been increased during last two decades in southeastern Turkey. These activities have been resulted with several oil field discoveries in the region. Diyarbakır Basin in this region contains Paleozoic units ranging from Cambrian to Permian in age show a good example for petroleum system. In the basin, the upper Silurian shales considered as hydrocarbon source rocks and seals and upper Ordovician sandstones suggested as good local reservoirs. That is why individual members of early-late Silurian (Wenlock- Pridoli) to early Devonian (Lochkovian) age Dadaş Formation of the Diyarbakır Basin were evaluated in respect to their potential of petroleum formation based on some organic-geochemical, petrographic and biostratigraphical analyses. Upper Ordovician (Hirnantian) Bedinan Formation represent the oldest reservoir rocks exposed in the Diyarbakır Basin, which were recorded from several deep wells in southeastern Turkey.

Several outcrop studies and exploration wells have been performed, which can be tied to the type sections of the formations from north to south between the Hazro and Derik sections. For surface study both outcrop has been studied and surfaced sections measured and units were identified. The findings have been correlated with subsurface units. Subsurface study consists of geophysical and well drilling studies. 2D and 3D seismic data have been processed and interpreted. Drilling cuttings, core and log data has been received as a well data.

Following results have been achieved;

- Surface (outcrop) and subsurface units were correlated.
- Hydrocarbon system; source rock, reservoir rock and sealing have been identified.
- Reservoir lithology is arcozic sandstone consisting of 70% of quartz and 20% of feldspar Cementing agent is dolomite.
- Reservoir quality and petrophysical parameters have been described. Porosity and permeability quality is a function of clay content. High clay content is lowering permeability and porosity.

The Diyarbakır Basin may be the least explored Paleozoic basins of the Arabian plate with proven petroleum systems. Lack of information continues to contribute to the perception of low prospectively in the basin. As a result, this study will provide a new understanding for exploration and production of the hydrocarbon resources in the region.

Biography:

Bayram Kara has BS degree from Istanbul Technical University, Turkey and MSc degree from University of Tulsa, USA both are in Petroleum Engineering. He is studying to fulfill Phd degree in Geological Department of Ankara University, Turkey. He started to work for Turkish Petroleum Corporation (TPAO) in 1993 as a production engineer and he took different responsibilities and positions until 2001. He worked as a senior electrical submersible pumps (ESP) applications engineer on Reda/Exxon Chad project for Schlumberger Oilfield Services in 2001 and as a consultant for ESP's for PDO-Shell in 2002. He was appointed as Batman Regional Manager of Turkish Petroleum Corporation in April, 2003 and he kept this position until August 2007. He joined to Çalık Enerji A.Ş. as the Director of Oil and Gas Exploration and production activities in August 2007. He is holding General Manager and Board Member positions in Çalık Petrol Arama Üretim A.Ş. since February, 2018.