

PETROPHYSICAL ANALYSIS OF WELL-SAWAN 3B

USING WIRE-LINE LOGS.



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DEDICATED TO

My Sweet Mother Late, My Father,

Sister&Brother In Law ,

My Brothers,

Sweet Nephews, Hasan, Mariam, Urwa

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ABSTRACT

The main purpose of the study is to evaluate hydrocarbon potential of a well named Sawan-03B in Sawan Discovery Field, Southern/Lower Indus Basin, Pakistan. This has been achieved by using complete suite of wire line logs and available well data. This complete set of data is issued by **Land Mark Resources (LMKR)** Pakistan with the prior permission of **Directorate General of Petroleum Concessions (DGPC)**, Pakistan. To complete the above mentioned task the all logs were correlated to mark the horizon of interest i.e. reservoir zone. The reservoir rocks, Cretaceous volcani-clastic sandstones of the lower Goru Formation, show very high porosities at a reservoir temperature of 155°C and depths of 3390 to 3520 m.

Then the reservoir was evaluated for the hydrocarbon potential in detail using set of equations and different formation evaluation charts made by Schlumberger Log Interpretation Charts. The methodology adopted to accomplish this task include; the measurements for the Shale volume/Clay by using Gamma Ray Log, Porosities of the Reservoir zone by two different methods i.e. Sonic Log and Neutron Density Log, Resistivity of water by using Spontaneous potential log./Static Sp. Saturation of water in the zone of reservoir and Hydrocarbon saturation using Archie equation. The results for the dissertation were then displayed in the form of excel sheets and graphs/Cross-Plots for the better approach towards the task. These all displayed results show a good reservoir quality.

ABBREVIATIONS

d_h	Borehole diameter
d_i	Average diameter of invaded zone
d_j	Average outer diameter
h	Bed thickness in meters
R_m	Resistivity of the mud
R_{mf}	Resistivity of the mud filtrates
R_{mc}	Resistivity of the mud cake
R_w	Resistivity of the formation water
R_{wa}	Apparent resistivity of the formation water
R_t	Resistivity of the formation (uncontaminated zone)
R_o	Resistivity of the formation when 100% water filled
R_{xo}	Resistivity of the flushed zone
R_{sh}	Resistivity of the shale
S_{xo}	Water saturation in flushed zone or invaded zone
R_i	Resistivity of invaded zone
V_{sh}	Volume of shale
R_{mfeq}	Equivalent mud filtrate resistivity
R_{weq}	Equivalent formation water resistivity
E_{ssp}	Estatic spontaneous potential
S_w	Saturation of water
S_h	Saturation of hydrocarbon
\emptyset	Porosity
<i>BOEPD</i>	Barrels of oil equivalent per day

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