WELL LOGS BASED PETROPHYSICAL ANALYSIS AND NET PAY ESTIMATION, FIMKASSAR AREA, POTWAR SUB BASIN, PAKISTAN

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A thesis submitted to Bahria University, Islamabad in partial fulfillment of the requirement for the degree of M.S in Geology

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CERTIFICATE OF ORIGINALITY

This is to certify that the intellectual contents of the thesis

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ABSTRACT

The Eocene reservoirs including Chorgali and Sakesar formations are considered the main source of hydrocarbons in the Fimkassar Oil Field, Potwar Sub basin, Pakistan. This study is intended towards estimating Petrophysical properties including Volume of Shale, Porosity (Average and Effective), Water Saturation and finally Hydrocarbon Saturation using well logs. These petrophysical properties were then used to estimate the Net pay thickness in the respective horizons in order to analyze and ascertain the best zones for performing Perforation and producing Hydrocarbons. This study has utilized well logs of Fimkassar-01 and Fimkassar-02 wells for estimating the petrophysical properties. Gamma ray log is used for estimating Volume of Shale, Neutron log, Sonic log and Density logs are used for estimating the porosities in both wells, Latero Log Deep and Average porosities are used to estimate resistivity of Water and finally Water Saturation. After estimating these properties, three cut offs were applied to these properties. A 30% cut off was applied to Volume of Shale, 4% cut off was applied to Effective porosity and 50% cut off was applied to Water saturation to finally estimate the Net pay thicknesses for Chorgali and Sakesar formations in both wells and the best zones were identified in both wells for perforation and the production of hydrocarbons.

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