

**2D SEISMIC INTERPRETATION AND PETROPHYSICAL ANALYSIS OF
ZAMZAMA GAS FIELD, LOWER INDUS BASIN, PAKISTAN**



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**A thesis submitted to Bahria university, Islamabad in partial fulfillment of the
requirement for the degree of BS in Geophysics**

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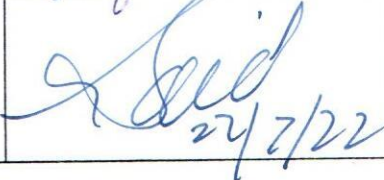
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This thesis is submitted by **Mr. Aafaq Ahmad Toor and Mr. Awais Khan** is accepted in the present form by Department of Earth & Environmental Sciences, Bahria University, Islamabad as the partial fulfillment of the requirement for the degree of **Bachelor of Sciences in Geophysics**, 4 years program (Session 2018– 2022).

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ABSTRACT

This research is about using Seismic interpretation and petro physical analysis to identify the subsurface structural analysis and hydrocarbon potential of the Zamzama region. Zamzama is a gas field in Sindh Province of Pakistan and tectonically it lies in the Lower Indus basin specifically southern Indus basin of Pakistan. The Zamzama Field is a large, thrust-related anticline on the eastern edge of the Kirthar Fold belt northeast of the Bhit and Badhra fields, and south of the Mehar, Sofiya and Mazarani fields. Two potential reservoirs were present in the study area which are Pab and Khadro formation. Pab acts as a primary reservoir and Khadro as a secondary reservoir. There were four dip lines and two strike lines in the area. Seismic Interpretation has been done using Kingdom Suite 8.6, horizons were marked, and fault is identified. Major Fault in the area was F1 which is dipping in the NE to SW direction. This interpretation concludes to an Anticline thrusting in the NE direction. Time and Depth maps of horizons has been evaluated. Shallowest contour encountered was 1.7 seconds. The horizon on the formation were noted on the seismic data interpretation, and faults were discovered. The research area's subsurface structures were delineated using time, velocity, and depth contour maps. For the petro physical investigation, the well log data was also retrieved. The study area's hydrocarbon potential was assessed based on the results of a Petro physical examination of the Zamzama North-03 Well the hydrocarbon bearing zone, volume of shale, average hydrocarbon, and water saturation in the Zamzama North-03 well. Reservoir zones has been identified in the Pab Sandstone on the basis of reservoir evaluation criteria. The reflector was identified using seismic interpretation; this was then cross-checked with petro physical investigation, and the same conclusion was reached. The Pab Formation of Zamzama block, lying in the Lower Indus Basin of Pakistan, is a prominent gas-producing sand reservoir. Most production is from the fluvial and shallow marine sandstones of late Cretaceous Pab Formation, but the Zamzama Field also produces from estuarine Palaeocene Khadro Formation sandstones, which are in stratigraphic pressure isolation from the Pab Formation.

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