

**2D SEISMIC INTERPRETATION AND PETROPHYSICAL ANALYSIS
OF LOWER GORU SANDS, AIDED BY SEISMIC ATTRIBUTES IN
KADANWARI FIELD.**



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

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2014

ABSTRACT

The Purpose of this study is to unveil the reservoir properties of Lower Goru sands of Kadanwari area in order to estimate the reservoir potential by carrying out Formation Evaluation technique, supported by computer generated attributes, and understand the general structural framework deciphered through integrated approach of seismic interpretation. The Kadanwari area belongs to the Middle Indus Basin where the stratigraphic sequence ranges from middle Jurassic to upper Pliocene ages. The area has been subject to complex deformation and declared to be evolved in three main tectonic events i) The Cretaceous uplift of Kadanwari area towards north and west. ii) The sets of basement-rooted wrench faults oriented in north-west to south-east fashion in late Paleocene to early Eocene age. iii) The large scale basin inversion associated with basement related structural elements. The study area is structurally derived by normal and transtensional nature of forces which exhibits deep rooted and vertical to sub-vertical faults that emerges in negative flower structure at shallow level. Although the quality of the seismic data is not effective enough to resolve discrete geological features at deeper level due to complex structuration, but the seismic signatures somehow reveal very critical discontinuities among the Goru reservoirs when aided by seismic attributes. The petroleum system in the area is proven and productive as there are several producing fields near by. A base map of scale 1:50000 have been produced using KINGDOM 8.4 seismic workstation in order to carry out the seismic interpretation and attribute analysis. Due to data quality constraints, only K-3 well data have been used to run the petrophysical analysis of the study area. The horizons marked are G Sands, E Sands, and D Sands (Based on ENI nomenclature of Lower Goru sand intervals). Time and depth maps have been prepared to acknowledge the extent and dynamics of the structure at reservoir level which shows that the horizons are deepening towards east and west of the study area and general trend of the faults lie in north-west to south-east direction over the study area making structural-cum-stratigraphic traps. The Isopach map of G sand suggests that the area is variable in thickness from north-west to south-east. The seismic attributes show that E sand has the satisfactory amplitude and frequency response that is required to meet the criteria of any gas bearing zone within the formation. The Petrophysical analysis have been conducted for these sand intervals to test their hydrocarbon potential and carry out their evaluation. The E sand interval have been

declared as the effective gas producing reservoir due to its high porosity-permeability and low water saturation as compared to other sand intervals.

ACKNOWLEDGMENTS

Thanks to Allah (Almighty), the source of all knowledge, wisdom within, and beyond my comprehension, who enabled me to complete this work.

My immense gratitude to Dr Muhammad Zafar (Head of Department, Earth & Environmental Sciences, Bahria University Islamabad) who provided me the opportunity to fulfill the partial requirement of the MS degree in Geophysics.

The venerable Prof. Dr. Tahseenullah Khan (Department of Earth & Environmental Sciences, Bahria University Islamabad) who played a pivotal role in skills development and student counselling during the coursework and remained a source of inspiration for me.

I wish to express sincere and deep sense of gratitude to my supervisors, Mr. Amir Malik (Geoscientist, LMKR) and Mr. Saqib Mehmood (Assistant Professor, Bahria University Islamabad), who not only suggested the study area but also provided invaluable guidance, continuous support, and supervision throughout this work.

I must not forget to associate my heartiest gratitude to Mian Shehryar Ali (Explorationist, ENI Pakistan), Mohammad Kamran (Reservoir Geologist, ENI Pakistan), and Yasir Zeb (Explorationist, ENI Pakistan) who guided me with their supreme experience and knowledge, and enabled me accomplish my thesis successfully.

At last but not the least, my family members who deserve regards and special thanks for their moral and financial support throughout my educational career, without whom I might not have achieved my goals. May Allah bless them and give me a chance to serve them better.

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