

**STATIGRAPHIC AND STRUCTURAL  
MODELING OF TAJJAL BLOCK  
(KADANWARI FIELD),SINDH PAKISTAN**



**By**

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**(2012-2015)**

## ACKNOWLEDGEMENT

All praises for Almighty ALLAH, the most beneficial, the most merciful, compassionate The creator of the Universe who blessed me with the knowledge and enabled me to complete The research work. Without the kind blessing of whom, I could not be able to complete my Work and to be at such place.

All respect to Holy Prophet Hazrat Muhammad (P.B.U.H) who appeared and blossomed As model for whole of humanity.

I specially acknowledge the help the encouragement, endless love and prayers of my family Specially my loving and caring mother, which have always been a source of inspiration and Guidance for me all the way, whose invaluable prayers salutary advices and emboldening Attitude kept mu spirit alive to reach this milestone.

My sincere thanks go to Head of Department and my thesis supervisor **Dr. Mubarik Ali**. I am also very thankful to all the respected teachers of department of Earth Sciences Bahria University for giving me an initiative to this study. Their inspiring guidance, dynamic supe- Revision constructive criticism enabled to me to complete this thesis work.

## ABSTRACT

The Purpose of this study is to unveil the reservoir properties of Lowe 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 1) The Cretaceous uplift of Kadanwari area towards north and west. 2) The sets of basement-rooted wrench faults oriented in north-west to southeast fashion in late Paleocene to early Eocene age. 3) The large scale basin inversion associated with basement related structural elements. The study area is structurally derived normal and trans tensional 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 and dynamic forces, 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 several producing fields nearby. A base map of scale 1:50000 meters have been produced using Geoframe 2012/Petrel seismic workstation in order to carry out the seismic interpretation and attribute analysis. Due to data quality constraints, only K-3 well data well 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 reservoirs level which shows that the horizons are deepening towards east and west of the study area and general trends 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.

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## 1. INTRODUCTION

The science of geodesy applies the principles of physics to the study of the Earth. Geophysical investigations of the interior of the Earth involve making measurements at or near the Earth's surface that are influenced by the by the internal distribution of physical properties. Analysis of these measurements can reveal how the physical properties of the Earth's interior vary vertically and laterally.

There is a broad division of geophysical surveying methods into those that probe use of natural fields of the Earth and those that require the input into the ground of an externally generated energy.

Seismic method plays an important role in the study of hydrocarbon. It is the leading exploration technique. This study would highlight the role of seismic method in exploration geophysics. In order to carry out this study, seismic data of Tajjal Block located in Khatipur district was used. Study mainly focuses on the interpretation of reflection data of Layer 1205-507.

## 1.1 INTRODUCTION TO AREA

The Kadanwari gas field was discovered by LASMO Oil Pakistan Limited through Kadanwari-I well in 1988. It is located some 500km north east of Karachi in Khatipur district of Sindh province Pakistan (as shown in fig 1). LASMO Oil Pakistan Limited (18.42% interest) operates the Kadanwari field on behalf of its partner SORREL (50%), KUPPEC (12.79%), PSCOC (13.79%). It covers an area of 457.23km<sup>2</sup>.