PETROPHYSICAL AND GEOMECHANICAL PROPERTIES FOR MESOZOIC STRATA IN NORTHERN PART OF PUNJAB PLATFORM, CENTRAL INDUS BASIN, PAKISTAN

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ABSTRACT

Mesozoic age formations from northern part of Punjab Platform have been evaluated for their source and reservoir rock potential. Where, Chichali Formation is a considered source rock having the same lithology, age and environment of deposition as that of Sember Formation. Lumshiwal and Samana Suk Formations of Cretaceous and Jurassic age respectively, have been evaluated for their reservoir potential and lithological investigation.

To carry out the research work Well logs have been utilized. Petrophysical and geomechanical techniques have been utilized for identifying behaviour in shales of Chichali Formation while petrophysical analysis of reservoir rocks have been carried out. Using Passey's DLogR method, Fair to Good amount of TOC (Total Organic Carbon) has been identified in Chichali Formation which increases towards north while sand content is increasing towards south in Punjab Platform. Dispersed origin of grain content increases towards south and a higher shale play is observed in north of Punjab Platform with more allogeneic clays. Geomechanical properties also suggests a more ductile behaviour of Chichali Formation towards north as poison's ratio increases with increasing clay rich lithology which suggests a high amount of hydro fracking will be required to go directly for shale reservoir. Lumshiwal and Samana Suk Formations of Mesozoic age acts as reservoir rocks with a maximum of 20% and 30% effective porosities respectively. Chichali Formation further need to be studied based on core cuttings for a clear picture in the area with its potential to production as it already has a good amount of TOC shows.

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CONTENTS

CHAPTER 1

INTRODUCTION

CHAPTER 2

TECTONOSTRATIGRAPHY

CHAPTER NO 3

LITERAURE REVEW

CHAPTER 4

CONVENTIONAL WELL LOG INTERPRETATION

CHAPTER 5

ROCK PHYSICS AND GEOMECHANICAL INTERPRETATION OF SOURCE ROCK

FIGURES

TABLES