

## **Application of Laboratory Measurements and Single Well Predictive Model (SWPM) to Understand the Reservoir behavior of a Carbonate Field, India: A Case Study**

**Ajay Kumar<sup>1</sup>, Mohit Khanna<sup>1</sup>, P. Tellapaneni<sup>2</sup>, Rajesh Kumar Singh<sup>2</sup>, and Arpana Sarkar<sup>2</sup>**

<sup>1</sup>*BG Exploration and Production India Limited, [ajay\\_ku6@rediffmail.com](mailto:ajay_ku6@rediffmail.com)*

<sup>2</sup>*Schlumberger*

The Mukta field is located in the north-western part of Heera-Bassein block in Bombay Offshore Basin, India. The field is situated in the western vicinity of Panna field with syncline in between and is around 25 km east of giant Bombay High field. The Mukta field was discovered in 1981 by drilling first well in the eastern culmination of the structure and produced oil and gas from Bassein limestones of Eocene to early Oligocene in age. The field has subsequently been delineated by drilling more E & A wells. Currently, the field is producing from a single wellhead platform.

The present paper focuses on the understanding of reservoir characteristics using well log data in conjunction with lab measurements. The study has been carried out in one small part of the field that is currently under development phase. The Thin section petrography, Core NMR and Mercury Intrusion Capillary Pressure (MICP) data shows that the limestone has all three type of porosity (Micro, Meso, and Macro) with dominance of Meso porosity system. The petrophysical evaluation shows that the water saturation in the reservoir zones is governed by height from FWL and porosity development. The study also depicts that the reservoir zones are under transition due to insufficient height from FWL.

A Single Well Predictive Model (SWPM) study has been carried out and results were compared with those of the Drill Stem Tests (DSTs) carried out in the well. A good match between both SWPM and DST results (Kh, Radius of Investigation, and PI) was seen. The study is helpful in decision making for future development of the area.