

## **PREDICTION OF POROSITY AND WATER SATURATION USING SEISMIC INVERSION FOR HABIB RAHI LIMESTONE, MARI GAS FIELD, CENTRAL INDUS BASIN, PAKISTAN**

**Mirza Naseer Ahmad<sup>1</sup>, Hamid Mushtaq<sup>2</sup>, Mohammad Saqib<sup>1</sup>, Tufail Khoso<sup>2</sup>, Farhana Ali<sup>1</sup>, and Farukh<sup>2</sup>**

<sup>1</sup>*LMK Resources, Islamabad, E-mail: [nmirza@lmkr.com](mailto:nmirza@lmkr.com), [msaqib@lmkr.com](mailto:msaqib@lmkr.com), [fali@lmkr.com](mailto:fali@lmkr.com)*

<sup>2</sup>*Mari Gas Company Ltd, E-mail: [hamidm@marigas.com.pk](mailto:hamidm@marigas.com.pk), [t\\_khoso@marigas.com.pk](mailto:t_khoso@marigas.com.pk), [farrukhgeo@marigas.com.pk](mailto:farrukhgeo@marigas.com.pk)*

The main advantage of using seismic acoustic impedance for studying reservoir properties is that it can be used wherever seismic data exist, provided that well logs are available for calibration. In this article reservoir properties such as porosity and Sw of Habib Rahi limestone of Mari Gas field has been predicted using seismic inversion technique. Empirical relation was developed between acoustic impedance and porosity/Sw using well data. These relations was applied on average inverted impedance horizon of Habib Rahi unit to calculate distribution map of porosity and Sw over the extent of whole available seismic data. The porosity prediction is in good match with actual average log data of Habib Rahi limestone. The estimated Sw also highlights zones of high and low Sw. These results suggest that locally derived empirical functions between impedance and porosity/Sw can provide cost effective estimates of porosity and Sw distribution for carbonates of Indus Basin.