

UNDERSTANDING GAS COMPOSITION VARIATION OVER MARI GAS FIELD-IMPLICATIONS FOR GAS QUALITY PREDICTIONS

Syed Asif Ahsan, Tufail Ahmad Khoso, and Muhammad Maroof

Mari Gas Company Limited, 21 Mauve Area, 3rd Road, G-10/4, Islamabad,

email: ahsansa@marigas.com.pk; t_khoso@marigas.com.pk

Mari Gas Field lies in the Middle Indus Basin and was discovered by Esso Inc. in 1957. Habib Rahi Limestone (HRL) of Eocene age had initial recoverable reserves of 6.800 TCF of which 2.649 TCF had been produced by 30th July, 2003. The current production rate is approximately 450 mmcf/d which is expected to be increased up to 550 mmcf/d at the completion of current development well drilling programme. Gas had also been discovered in Lower Goru sand (LG sand) in 1997. The LG sand has recoverable reserves of 0.743 TCF (P-50). This gas is compositionally distinct from the one in HRL. The HRL gas is being utilized for fertilizer production and power generation. Gas has, so far, not been extracted from the LG sand.

Chemical composition variations in gas fields can be due to several geological factors. These factors need to be understood to mitigate the risk associated with field economics. A reasonable size gas field can turn in to an economic fiasco if gas composition is not favourable.

The HRL gas is compositionally distinct from LG sand gas. The HRL gas is drier and leaner in CO₂ and N₂ content. Different modes of generation of CO₂ and its accumulation in Mari Field's reservoirs have been investigated. Wells in closer proximity of deep-seated faults have higher CO₂ content than those that are located away from such faults. The LG sand and HRL CO₂ content complement each other proportionately, i.e. higher CO₂ content in LG sand is also accompanied by higher content in HRL.