

## **HYDROCARBON POTENTIAL OF TIGHT SAND RESERVOIR (PAB SANDSTONE) IN CENTRAL INDUS BASIN-PAKISTAN**

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Pab Sandstone of Late Cretaceous age has not been adequately evaluated in the Central Indus Basin of Pakistan. More than 90% of hydrocarbon accumulations in this basin are contained in the Eocene carbonates. Pab Sandstone forms the second major reservoir in the basin, and prior to discovery at Sui, four significant discoveries had been made in Pab Sandstone in the Central Indus Basin. Discoveries of Bhit (Lasmo) and Zamzama (BHP) in the Southern Indus Basin and at Sui in Central Indus Basin have provided new impetus for the exploration companies and their interest in Pab Sandstone as an exploration target in the region has been revived. Pab Sandstone in the Central Indus Basin is generally of shallow marine to fluvio-deltaic environments and is composed of multiple coarsening upward cycles separated by short lived transgressive events. Porosity is mostly of secondary origin created by dissolution of feldspar grains and locally of cement/ matrix. As seen in the outcrops and wells, upper part of Pab Sandstone is tight. Therefore, previously these sands were categorised as tight with limited potential. In Sui-1 well, these sands were overlooked by interpreting to be tight and/ or water bearing but subsequent testing has resulted in a reasonable size gas discovery. The reasons for masking the prospectivity of these sands could be deceptive results of wireline logs due to hole rugosity and stress break-outs which are observed to be a common and conspicuous phenomena in almost all the wells drilled through Pab. Local argillaceous nature of sand and presence of certain other iron rich minerals (glauconite, chlorite, pyrite, and siderite) also make the evaluation of hydrocarbons complex and deceptive. However, it is possible that these tight sands may contain considerable potential in the region after proper stimulation. It is also inferred from the regional data that sand fairway of Pab runs along the Sulaiman Fold Belt. In view of recent discoveries from the Pab Sandstone there is a need to drill more exploration wells for further evaluation of these sands and to re-evaluate the Pab Sandstone in the existing wells. Stratigraphic pinch outs of Pab Sandstone at the margins of the basins are also likely to be prospective and should also be explored for stratigraphic and combination traps.