SEQUENCE STRATIGRAPHY AND PETROPHYSICAL ANALYSIS OF SAWAN GAS FIELD, CENTRAL INDUS BASIN, PAKISTAN

By

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CERTIFICATE OF ORIGINALITY

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Sequence Stratigraphy and Petrophysical analysis of Sawan Gas Field, Central Indus Basin, Pakistan.

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ABSTRACT

The objectives of the study are to reconstruct sequence stratigraphic framework and petrophysical analysis of the reservoir marked by using sequence stratigraphy of Sawan gas Field. The study area lies in Central Indus Basin, District Khairpur, Sindh province, Pakistan. The study area lies tectonically in extensional regime. Lower Goru Formation and Sembar Formation act as a reservoir and source respectively. To achieve objectives, data set of seismic lines, consisting of seismic lines PSM96-114, PSM96-115, PSM96-133, PSM98-201, PSM98-202 and well logs of Sawan-01, Sawan-02 and Gajwaro-01 has been used. First of all interpretation of seismic lines has been carried out. Interpretation of seismic lines shows extensional regime in the area and cut entire Cretaceous section. Total of seven reflectors have been marked on each seismic line. Lower Goru Formation is thinning towards west. Seismic lines also show eastward tilt of stratigraphy due to uplift at western side. Sequence stratigraphic reconstruction has been done by integrating seismic and wireline log data. Total of seven sequence boundaries have been interpreted between top of Chiltan Limestone to Top of Lower Goru Formation. It has been observed on seismic lines that Sembar Formation initially generated shelf margin profile and then ramp margin on which Lower Goru deposition took place. Shelf edge deltas and slope fans have been observed on seismic lines and signatures of slope fans are also observed on wireline logs as well. Total of six sequences has been interpreted. Stratigraphic and sequence stratigraphic correlation has been carried out by using Sawan 01, Sawan 02 and Gajwaro 01 and a Low Stand Systems tract (LST) within Lower Goru C sands has been marked as a zone of interest. The petrophysical interpretation includes shale volume, effective porosity, permeability, saturation of water and hydrocarbon. On the basis of good effective porosity and hydrocarbon saturation petrophysical analysis confirms that the LST in Sawan-01 and Sawan-02 has good hydrocarbon potential.

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