

## DEPOSITIONAL SETTING

The Permian Shihezi 8 (He 8) and Shanxi 1 (Shan 1) units were interpreted to have been deposited in braided river systems, surrounded by swamps.

- The presence of carbonaceous shales and well preserved plant fossils indicates a swamp depositional environment (Fig. 10&11).
- The channel deposits show fining-upward in general (Fig. 10&11), and cut into carbonaceous shales.
- The coarse- and fine-grained sands are frequently interbedded, indicating migrating braided rivers.
- Due to braided river migration, the fluvial sands incise each other forming extensive sandbody complexes.

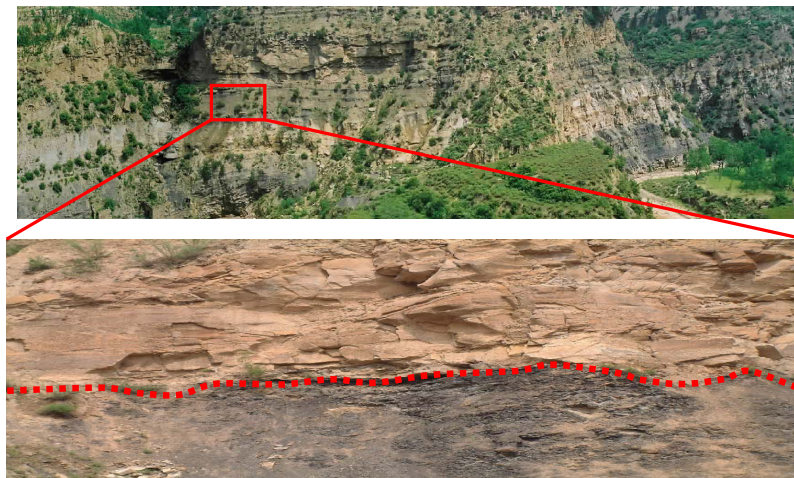


Figure 10. The outcrop in Lunlin county, Shanxi province, showing facies and sharp contact.

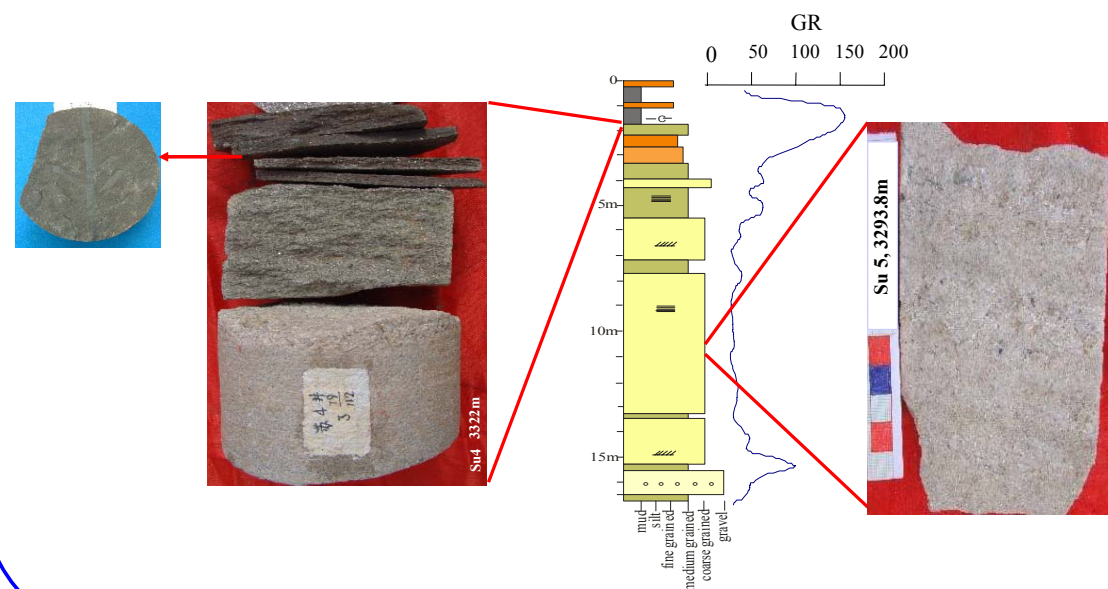


Figure 11. The channel deposits in the Sulige Gas Field.

## COARSE-GRAINED SAND FACIES

The coarse-grained sands were deposited in channel bars and the base of channels (Fig. 12). The medium- and fine-grained sands are interpreted as channel fills. High energy and low energy channels are both identified in the braided multi-channel systems in the He 8 zone (Fig. 13). High energy regime led to the development of major channel bars, where the major net gas pays exist.

- 1. Channel bar—coarse sands**
  - Channel bar coarse sands typically measure more than 5m thick, characterized by massive structures with sharp contacts at top and base.
- 2. Basal channel—coarse sands**
  - Basal channel coarse sands typically measure less than 2m thick, and account for 8-10% of the total channel fills.

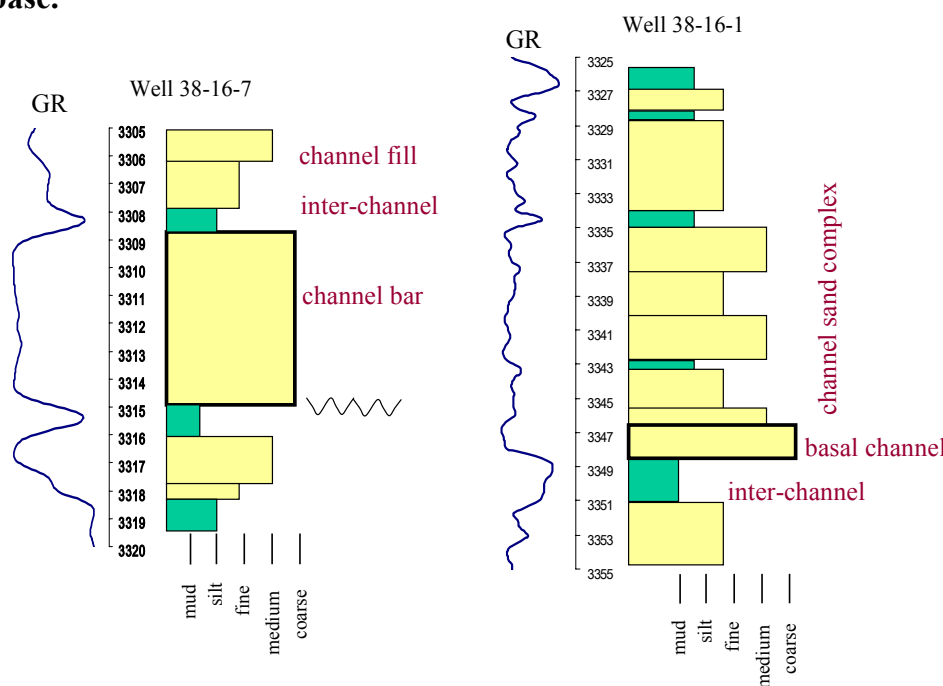


Figure 12. Facies as interpreted from representative cores.

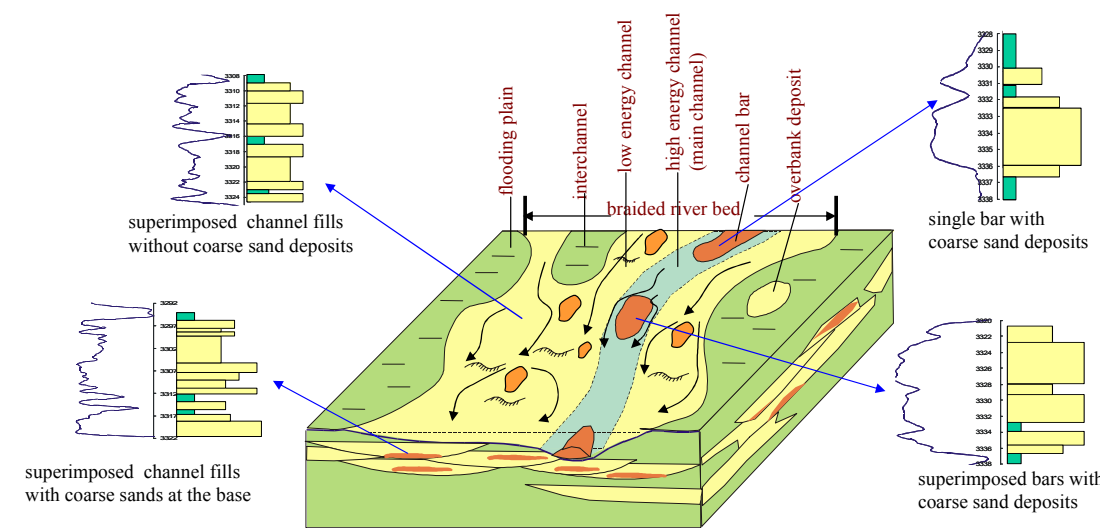


Figure 13. The sedimentary model of braided river with high and low energy channels in the Sulige Gas Field.

## STACKING PATTERNS OF COARSE SANDS

There are three types of coarse-grained sandstone stacking patterns: isolated, superimposed channel bars, and stacked channel bars and channels (Fig. 14). The isolated pattern is dominated in the gas field.

- 1. Isolated channel bar:** gas sandbody lateral continuity is often less than 300-500m.
- 2. Superimposed channel bars:** gas sandbody lateral continuity can be more than 1000m.
- 3. Stacked channel bars and channels:** the main gas sandbody is 300-500m in length, but the basal channel coarse sand may connect other gas sandbodies.

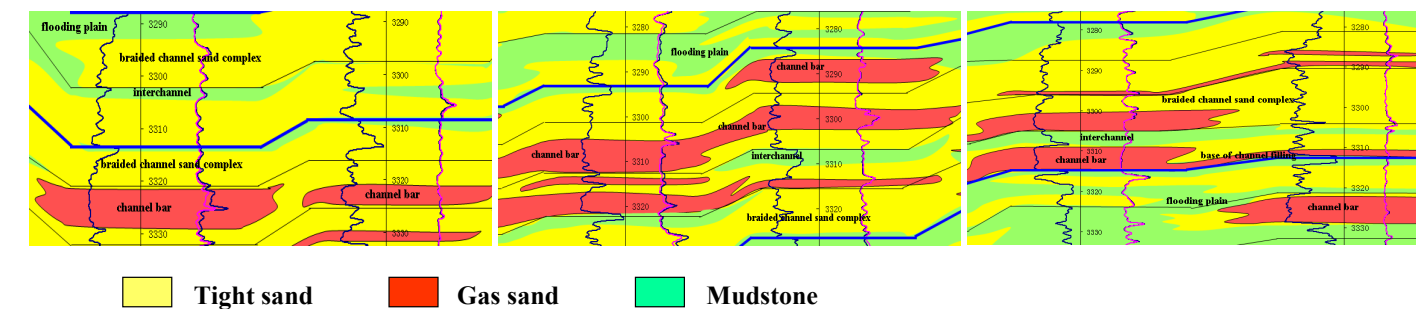


Figure 14. Three types of coarse-grained sandstone stacking patterns in the Sulige Gas Field.