Recent exploration have characterized reservoirs in early Cretaceous Xiagou Formation in Liugouzhuang Area, Qingxi Sag, Jiuquan Basin as typical condensed oil reservoirs, which further broadens the exploration area of hydrocarbons in Yumen Oil Field.

The paper presented here demonstrates reservoirs in Xiagou Formations in Liugouzhuang Area are in an advantageous condition for forming condensed oil reservoirs, based on studies of tectonic evolution, sedimentation and diagenesis of the basin, and findings from geochemistry analysis, core description, thin section identification, and physical property analysis.

The Qingxi Sag was in a closed-semi closed brackish lacustrine sedimentary environment, and exposed to the frequent climate change between moisture and arid in the early Cretaceous (Fan et al., 2003). A set of very thick deep-semi deep lacustrine pelitic dolomite consisting of intercalating laminar algal and pelitic dolomite lamina was formed under such condition (Fig. 1a,b). The laminar algal is considered to be good source rock, with Type-II Kerogen as its main type of organic matter and having high TOC and high potential hydrocarbon S1+S2 (Pan et al., 2012). The pelitic dolomite reservoir consists of muddy dolostone and dolomitic mudstone, and is mainly found at the central parts of the lacustrine basin. The main pore types are intracrystalline pore, secondary porosity and structural

Fig.1 (a) Organic lamina (Fluorescent thin-section, well Liu8, 4175.71-4175.76m), (b) Organic lamina (Fluorescent thin-section, well Liu4, 4304.25-4304.29m), (c) Secondary pore(Casting thin-section, well Liu4, 4270.3m), (d) Secondary pore (Casting thin-section, well Liu105, 4449.74-4449.81m), (e) Structural seam((Casting thin-section, well Liu4, 4443.55m), (f) Structural seam((Casting thin-section, well Liu105, 4466.49-4466.58m).
seams (Fig. 1c,d,e,f). It is highly compacted and the porosity and permeability is generally low. In the Cenozoic, Jiuquan basin evolved into the foreland basin stage, and the Liugouzhuang Area subsided continuously, causing the burial depth of the source rock to increase drastically, entering a mature-highly mature stage, during which large amounts of hydrocarbons were expelled. Along with the hydrocarbons, organic acid and CO₂ were also expelled from source rocks, making the pelitic dolomite easily erodible, and giving rise to secondary porosity. At the same time, the piedmont thrust nappe set the thin intercalating layers of dolostone and mudstone prone to structural seam, further enhancing the pelitic dolomite reservoir property. Drilling information indicates that the pelitic dolomite in Xiagou Formation in Liugouzhuang Area, with its high net pay vertically and its vast and continuous distribution horizontally, has high potential prospectivity.

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**References**
