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Sedimentary Microfacies and Sand Body Architectural Analysis of Karamay Formation of Triassic in District I III, Karamay Oilfield

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Karamay Oilfield lies in the northwestern margin of Junngar basin, it is a foreland slop which is surrounded by the North Black Oil fault, Zhuluogou Fault and 3034 Well Fault, etc. Views on sedimentary facies and microfacies of northwestern margin of Junggar Basin are controversial for a long period, and the sand body architectural analysis of District I III, Karamay Oilfield hasn't been carried out yet. Firstly, by combining with the previous research achievements, and using abundant outcrop material, logging, drilling and seismic data of northwestern margin of Junggar Basin, the stratigraphic division and correlation framework of District I III (60 well-to-well sections) have been built up. Karamay Formation (T_2K) is divided into 5 sand groups (S_7、S_6、S_5、S_4、S_1) and 12 small strata from bottom to top in District I III. The Lower Karamay Formation can be further divided into 13 single sand stratum.

Secondly, the passage also researches on sedimentary microfacies in District I III, Karamay Oilfield. It is considered that alluvial fans, braided rivers, meandering rivers and lacustrine facies are developed in District I III. This view is different from other previous views which suggest alluvial fans and fan delta are developed in northwestern margin of Junggar Basin. This passage identifies root fan subfacies, middle fan subfacies and marginal fan subfacies in alluvial fan facies, braided channel subfacies, overflow bank subfacies and river flood subfacies in braided river facies, meandering channel subfacies, river flood subfacies in meandering river and shore-shallow lacustrine subfacies in lacustrine facies. Besides, braided stream channel microfacies and alluvial sand (conglomerate) flood plain microfacies in alluvial fan facies, water channel microfacies, channel bar microfacies, overflow bank microfacies and flood plain microfacies in braided river facies, water channel microfacies, marginal bar microfacies and flood plain microfacies in meandering river facies can be further identified as well. Every microfacies have been described in detail and their vertical connections and planar distributing laws have also been analyzed. It is suggested that the thickness of Karamay strata of Triassic is upward-thining from the bottom to the middle and then coarsening from the middle to the top, showing a process of lacustrine transgression to lacustrine regression during the period of Middle Triassic.

Furthermore, the author chooses the sand bodies of T_2k^1 in Area 1Z and Area 34 as key areas. Using the methods of mudstone interlayer identification, thickness center identification, geological model restriction, lithology and electrical property contrast, marker beds equidistance, 14 single sand bodies and 7 combination types have been identified, showing different single channels have different sand body combinations. Additionally, the statistics analysis of parameters of sand body architecture has been done, showing the thickness and the width of sand bodies are positively correlated.

The research of sedimentary microfacies and sand body architecture of T_2k in Karamay District I III has great impacts on distribution of remaining oil in Karamay. It is also significant to the project "The Secondary Exploration" of Karamay petroleum company.

Key words: Junggar Basin, Karamay, Triassic, Sedimentary microfacies, Sand body architecture

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