

# **Origin of the Cenozoic Conglomerate Deposits in Kuqa Depression, Tarim Basin, China\***

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## **Abstract**

During Cenozoic, the foreland deformation period of Kuqa Depression in Tarim Basin, western China, there was great alluvial fan deposition with thicknesses up to thousands of meters. However, this alluvial conglomerate became a block to gas exploration in underlying formations. Based on outcrop data, well logs, seismic and 3D electric survey, we analyzed the origin and distribution of the conglomerate in the Cenozoic foreland basin. From outcrop analysis, we confirmed the conglomerate's developmental phase and its size, gradation, sedimentary structure, and composition, by which we classified three deposition types or facies of the conglomerate, and the most dominant was alluvial fan. We measured the thickness and size of several Quaternary alluvial fans in Kuqa Depression by outcrop survey. To study the ancient alluvial fans, we correlated several wells that drilled the Pliocene and Pleistocene alluvial fans, using the well log data, and we analyzed their distributions by the seismic and electric survey. We found the electric data could be a good response to the conglomerate deposition of alluvial fans. The main conglomerate deposition was formed in Kuqa Formation, Xiyu Formation and Quaternary fans. There were three distribution models of the alluvial fan in Kuqa Depression, which were mainly controlled by the tectonic activity during the late Cenozoic and the provenance of different river systems at the northern boundary of the Kuqa Depression. Both of those two factors together controlled the scale and distribution of conglomerate deposition size and the gravel composition. Those alluvial fans were the direct evidence to the foreland deformation of Kuqa Depression, so it could be used to deduce the tectonic deformation history, which has not been confirmed. By analyzing the scale changing processes of alluvial fans, we believed that the foreland tectonic activity started at the Later Kuqa Formation, and the most intense tectonic activity started at the Xiyu Formation, which continued until now.

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## **Selected Reference**

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