

## **The development condition of longitudinal channels of a Lower Cretaceous formation and its perspective for sandstone type uranium deposits in the Erlian basin, northern China**

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The palaeochannel, which is classified as basal and interformational types on the basis of geological setting, is an important host for the sandstone type uranium deposit. Diversities exist in development conditions and uranium minerogenetic potential of the two types of palaeochannels. The Erlian basin, about 105 km<sup>2</sup> and adjacent to channel-type uranium deposit provinces in Russia and Mongolia, is one of main uranium basins in the north of China. It is significant to research into development conditions of palaeochannels for uranium mineral exploration in the Erlian basin.

### 1. Geological background

The Erlian basin consists of five depressions which divide the basin and form alternations with uplifts and depressions. Sedimentary capping strata of the basin mainly is the Lower Cretaceous Bayanhua group (K1b) which consists of the Aershan group (K1ba), Tenger group (K1bt) and Saihan group (K1bs) from bottom to top. The Saihan group, which is the product in the phase of depression, is the most important uranium strata in the Erlian basin.

### 2. Development characteristic and condition of the longitudinal palaeochannel of the Saihan formation

Large-scale longitudinal multi-palaeochannels are identified in the center and northeast of the basin, such as the QiHaRiGeTu-SaiHanGaoBi palaeochannel (CH01), BaYanWuLa palaeochannel (CH02) and GaoLiHan palaeochannel (CH03), et al., which character the length from several 10s of km to 100 km, width of several 10s of km and thickness of sand bodies from 20 m to 130 m, more or less. Palaeochannels of the Saihan formation are interformational type because the underlay is argillite at the top of the Tenger formation.

Restrictive geological environments and conditions are necessary to form longitudinal channels and mainly are as follows: (1) the basin in the sustained step of depression; (2) sharp gradient (>5°) in parts of sub-depressions and sufficient sedimentary supply from the upstream; (3) elongate erosional lowlands or normal faults along the macroaxis inside of the depression.

### 3. Minerogenetic perspective

Sandstone type uranium deposits detected, which are middle scale or larger, mainly locate in longitudinal palaeochannels in the Erlian basin. Longitudinal palaeochannels are rich sandstone bodies which character well continuation, rich organic clastic debris, well aquifer region and favorableness of adequate hydro-litho reciprocal action, and therefore are the most favourable sedimentary facie for mineralizing of sandstone type uranium deposits in the Erlian basin which possesses a high mineralization and exploration perspective.