

## LOWER PERMIAN FUSULINID BIOSTRATIGRAPHY AND GRAPHIC CORRELATION IN YUZHNO KHILCHUYU FIELD, TIMAN PECHORA BASIN, NORTHERN RUSSIA

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Yuzhno Khilchuyu (YK) Field is a giant oil accumulation located on the Kolva Ridge in the Timan Pechora Basin. Oil is structurally and stratigraphically trapped in a complex series of Lower Permian (Asselian-Sakmarian) shallow-marine (*Palaeoaplysina*) carbonate mounds. Correlations of Lower Permian cycles and carbonate mound distributions require detailed biostratigraphic data.

Fusulinid foraminifers recovered from two recently acquired continuous cores (each approximately 100m) and additional core intervals from 16 other wells provide the framework for correlation. Fusulinids are abundant in the section and have been recovered and identified in nearly all of the sampled intervals. Two biostratigraphic methods have been employed, classic assemblage zonation and graphic correlation.

Three fusulinid zones found regionally in the Asselian section in the Russian Platform and the Urals have been identified in the YK Field: the Lower Asselian *Sphaeroschwagerina vulgaris* - *Sphaeroschwagerina fusiformis* (P1a1) Zone, the Middle Asselian *Sphaeroschwagerina moelleri* - *Schwagerina fecunda* (P1a2) Zone, and the Upper Asselian *Sphaeroschwagerina sphaerica* - *Schwagerina firma* (P1a3) Zone. The Lower and Middle Asselian have both been further subdivided into local sub-zones. The Lower Asselian includes the *Daixina tschernovi* (P1a1a), and the *Triticites adjunctus* - *Daixina lilia* (P1a1b) subzones. Three subzones have been identified in the Middle Asselian: the *Sphaeroschwagerina moelleri* - *Schwagerina nux* (P1a2a), the *Schwagerina rhomboides* - *Schwagerina fecunda* (P1a2b), and the *Sphaeroschwagerina constans* - *Schwagerina paragregaria* (P1a2c).

Lower Sakmarian (Tastubian) strata have also been identified. Less robust fusulinid faunas do not permit more detailed zonation, but *Schubertella sphaerica sphaerica*, *Rugosofusulina shaktauensis*, *R. tajrjukensis*, *Schwagerina uralica uralica*, *S. uralica parva*, *S. decurta* and *S. declinata* are typical of this interval.

Graphic correlation within the YK Field increased biostratigraphic resolution and, together with core descriptions, improved understanding of the evolution of carbonate mound complexes. The above noted zonal marker taxa and all other species identified in the study were included in the graphic correlation. The standard reference section includes the most complete core interval and stratigraphic section encountered in the field. Additional core intervals from other wells were incorporated to build a composite standard reference section. This composite reference section provides a common chronostratigraphic scale for sequence stratigraphic correlations within the field.

It is important to note that this is a local composite standard section for the YK Field. As such, it has limited applicability for recognizing or highlighting field-wide unconformities, condensed intervals or depositional pulses. For this reason both classic zonal biostratigraphy and graphic correlation were critical. Regional biostratigraphic zones and sub-zones defined the overall stratigraphic framework, and graphic correlation aided in recognizing local discontinuities and sedimentation patterns, which lead to a better understanding of the development of mound complexes.