Transactions of the 1995 AAPG Mid-Continent Section Meeting, 1996

Stratigraphic Architecture of the Tonganoxie Paleovalley Fill, of Northeastern Kansas: Abstract

Howard R. Feldman[1], Allen W. Archer[2], Martin R. Gibling[3], William P. Lanier[4]

ABSTRACT

The Tonganoxie paleovalley (Upper Pennsylvanian, northeastern Kansas) contains facies very similar to Lower Pennsylvanian (Morrowan) valley fill reservoirs, and can provide an outcrop and subsurface-based model of sandstone deposition. The Tonganoxie paleovalley was incised during lowered sea-level and filled during the subsequent transgression. The main paleovalley is approximately 41 m deep, 11 km wide, and 240 km long, and was fed by l-km-wide tributary valleys oriented roughly normal to the trunk valley. The basal sequence boundary is mostly marked by an abrupt shift in facies from marine deposits below the boundary to fluvial or estuarine deposits above. In two localities (one in the trunk valley, and one near the valley edge) the sequence boundary includes a poorly developed paleosol.

Sandstones within the valley occur in four distinct architectural elements that were deposited during different phases of transgression. Type I sandstone is a 3-18-m-thick belt of sandstone and conglomerate that is confined primarily to the trunk valley and was deposited by braided streams. The type I sandstone is overlain by estuarine deposits of sandstone (type II sandstones), rippled argillaceous sandstone to sandy mudstone, heterolithic facies, and coal. Most of the paleovalley was filled during this stage. The type II sandstones are narrow (1.5 km wide) arcuate bodies up to 8 km long and were likely deposited in tidal point bars near the fluvial to tidal transition, are either isolated sandstone bodies, or are incised into type I sandstone. Type III sandstone bodies occur at the upstream limits of narrow tributaries and are probably bay head deltas. Well logs indicate a range of mud content. Type IV sandstone is a thin (3 m) discontinuous sheet of marine sandstone deposited after most of the paleovalley had been filled.

Above the type IV sandstone is a laterally extensive marine limestone that extends beyond the limits of the paleovalley. The maximum flooding surface is within a phosphatic condensed zone within shale immediately above the limestone. The next sequence boundary is marked by renewed incision due to a lowering of relative sea level.

ACKNOWLEDGMENTS AND ASSOCIATED FOOTNOTES

1 Kansas Geological Survey, Lawrence, KS

2 Kansas State University, Manhattan, KS

3 Dalhousie University, Halifax, Nova Scotia

4 Emporia State University, Emporia, KS