

Mid-continent Backfilled Valleys: Reservoirs and Outcrop Analogs

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Examples of backfilled valleys occur in parts of the Atoka in Northwest Arkansas, the Bartlesville Sandstone in eastern Oklahoma, and the Morrow Sandstone in the Oklahoma panhandle. Many valleyfill reservoirs in the midcontinent are backfilled, dominantly-tidal sandstones. This type of sand body differs from those formed entirely by fluvial (river) processes.

Valleys are commonly incised during sea level fall and filled during subsequent sea level rises. Valley filling tidal deposits commonly contain clay as drapes and thin beds, have variable grain size from bed to bed and form in cycles.

Differentiation of single stage (valley cut and filled in one stage) from multistage channels is important in both exploration and development. Individual channel fills commonly form separate compartments. Detailed gamma-ray logs of NW Arkansas outcropping tidal facies may allow recognition of similar facies in the nearby subsurface.

Tidal reservoir sand bodies to be examined include accretion point bars, tidal thalweg sandstones, and tidal-flat sandstones, all of which occur in Northwest Arkansas in outcrops to be visited during the Midcontinent SEPM/AAPG Field Trip to be held in October 10-11, 2003.

Development of criteria for recognition of tidal facies has lagged behind those for recognition of fluvial and shoreface deposits. Tidal point bars may be excellent reservoirs, but are commonly misidentified as "fluvial". Laterally-linked tidal point-bars often form discrete sand bodies as a result of both depositional and erosional processes.