GEORGE, GENE R., Clark & George, Casper, WY

Cyclic Sedimentation and Depositional Environments of the Upper Minnelusa Formation, Central Campbell County, Wyoming

Three depositional cycles in the upper Minnelusa Formation of Wolfcamp and possibly Pennsylvanian age are examined in three oil fields in central Campbell County, Wyoming. The oldest cycle, the C cycle, is represented in Rourke Gap field, the B cycle in Big Hand field and the A cycle in the Maysdorf field. The shoaling upward cycles were terminated by rapid marine transgressions which deposited carbonates forming the trap for the sandstone of the underlying cycle. The Opeche Shale which overlies the Minnelusa partially forms the trap for the sandstones of the A cycle. The trapping mechanisms seen in the fields studied are depositional in character. At Maysdorf field, the A cycle surface has been erosionally modified but the trap is the result of early cementation rather than erosional truncation. Each Minnelusa cycle depositionally filled the topography left by the last cycle.

The lithologic character of each cycle changed as the eustatic sea level changed. As the sea level rose, carbonate and evaporite rocks covered the dune sand sequences sealing them and forming hydrocarbon traps. As the sea level dropped, the prevailing trade winds swept the sand dunes across these exposed carbonate plains. The oil bearing sandstone reservoirs within these cycles are highly economic. Understanding these cyclic sequences of the upper Minnelusa should aid in prospect generation.