

ANASTOMOSED RIVER DEPOSITS: POTENTIAL HYDROCARBON TRAPS AND FLUID DISTRIBUTIONS

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Recent research on large sized modern anastomosing river systems (upper Columbia River, British Columbia and Magdalena River Colombia, South America) has led to the recognition of six major deposition environments: channel, levee, crevasse-splay, lacustrine, marsh and peat bog or swamp. Potential reservoirs consist of thick, narrow stringers of channel sand and laterally extensive, sheet-like crevasse-splay sand.

Geometrical analysis of the potential reservoirs and associated lithofacies has led to an assessment of several potential hydrocarbon trap types and fluid distributions, which may be seen in analogous Mesozoic fluvial rock sequences. There are five major stratigraphic trapping mechanisms, listed in decreasing order of occurrence: (1) up-dip pinchouts of channel fills and/or crevasse splays, (2) limited point bar sand contained laterally and above by mud, (3) differential compaction of over-thick sand at channel confluences, (4) up-dip reservoir terminations against the margins of shale-filled channels, and (5) overlap of two stratigraphically different channels resulting in a domal high due to differential compaction.

Potential fluid distributions in the five different traps include the following: (1) flushed channel sand connected

to hydrocarbon-bearing crevasse-splay sand, (2) hydrocarbon-bearing crevasse-splay sand, connected to water-bearing channel and crevasse-splay sand as a function of changing channel orientation, (3) in some cases uppermost crevasse-splay sands hydraulically disconnected from the feeder channel (similar to Mississippi Delta), and (4) stratigraphically overlapping crevasse-splay sands in hydraulic connection to either the same or separate channel sand reservoirs.