

## CORE CONFERENCE ABSTRACTS

THE SPIRIT RIVER FORMATION, DEEP BASIN  
GAS RESERVOIR

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The Lower Cretaceous Spirit River Formation contains important gas reservoirs in Alberta's Deep Basin. The productive Falher Member consists of non-marine clastics and coals south of the Elsworth field. Beyond the field itself, the unit is composed of five transgressive and regressive cycles in which marine and non-marine sediments are interbedded. Each cycle can be traced northward into a laterally extensive marine coarsening-upward cycle capped by a shoreline-attached sheet sandstone.

Conventional reservoirs are complexly interbedded granular conglomerates and sandstones within the transgressive-regressive cycles. Conglomerates interpreted as beach deposits are finer, better sorted, and may lack matrix entirely. Conglomerates interpreted as fluvial channels cutting through the shoreface have sharp bases, poorer sorting, some crossbedding, and variable amounts of sandy matrix. A complete gradation exists between the types. Shoreface and beach sandstones are fine grained, well sorted, burrowed, and have low angle to horizontal laminations mainly. The conglomerates form lenses surrounded by the sandstones.

Diagenesis of the sandstones (formation of quartz overgrowths, crushing of rock fragments, clay and carbonate cementation) has reduced the permeabilities of the sandstones to the range of .001 to .5 md. In situ permeabilities may be an order of magnitude lower. The tight sandstones act as seals to the gas trap because of their low permeabilities and great lateral extent undip from the conglomerate.