

# **Architecture and Characterization of Shoreface Conglomerates in the Deep Basin of Western Canada**

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Conglomerate shoreface reservoir trends in the Alberta and British Columbia Deep Basin have produced 3.0 TCF of liquids-rich natural gas since initial exploration in the late 1970's. These trends form some of the most prolific hydrocarbon pools and fields (i.e. Elmworth, Wapiti, Noel, Hiding and Narraway) in the Western Canada Sedimentary Basin. However, their lack of seismic expression, and geophysical contrast from thickly interbedded coals, has made exploration of these high permeability (10's to 1,000's of md), low porosity (8-10%) reservoirs a geological play with heavy reliance on core-based observations. Successful exploration relies on recognition of sedimentologic "reservoir edge" indicators and ability to predict lateral facies variability on the intra-parasequence level. Thus, laterally continuous exposures of these reservoirs in outcrop provide powerful predictive capabilities for pool delineation, architecture and recognition of "proximity indicators".

Along the British Columbia Front Ranges, detailed sedimentologic descriptions and synthetic gamma-ray logs of closely spaced measured sections from laterally continuous outcrop provide the observational base for documenting the distribution, compartmentalisation and architecture of analogous shoreface conglomerate reservoirs. A pattern of offlapping cyclicity of shoreface facies observed in outcrop occurs within all Falher parasequences, but on widely varying orders of magnitude and frequency. This variability is predictable and predominantly a function of conglomerate-sandstone ratio at the time of deposition.

Outcrop observations and development drilling of subsurface pools have demonstrated a much greater degree of reservoir heterogeneity and discontinuity than was first inferred from the originally published depositional models of the Falher trends in the mid 1980's.