

**Erosional Geometry's, Fault Control and Hydrocarbon
Distribution of the Basal Colorado Sandstone,
Cessford Area, Southern Alberta.**

G. Fong*, Dept of Earth and Atmospheric Sciences, University of Alberta,
C. McLaren, PanCanadian Petroleum Ltd.,
R.G. Walker, Roger Walker Consulting Ltd., Calgary Alberta,

and

B.A. Zaitlin, PanCanadian Petroleum Ltd.

ABSTRACT

The Basal Colorado Sandstone (BCS; cumulative gas production 770 BCF) is a 0 - 5 m thick transgressive unit on top of the non-marine Mannville (Dakota). It is overlain by marine shales of the Joli Fou (Skull Creek). The BCS is bounded below and above by sequence boundaries modified by flooding surfaces (FSSBs), and the BCS itself consists of shoreface sandstones that prograded during pauses in transgression. Incised channels hang from both FSSBs. Convergence of the upper FSSB toward the lower results in preservation of the BCS as a series of irregular pods, previously interpreted as depositional embayments. Embayment "depositional edges" are better interpreted as erosional, and the sandstone is a dissected sheet. In the Cessford area (cum. 540 BCF) a major channel system up to 6 km wide and 15 m deep cuts through shoreface deposits, and hosts a linear oil field 1.5 km wide trending transverse to the channel, and a gas field parallel to the channel. The transverse oil field is defined by faulting on one side and by the position of the gas cap on the other. Oil is restricted to this narrow strip across the channel because of much lower permeability in the adjacent shoreface sandstones. Reservoir compartmentalization by faulting has never previously been recognized in the BCS. The fault is parallel to the structural grain in the Precambrian basement, suggesting the possibility of basement control at Cessford. Other similar, unrecognized faults may influence oil and gas distribution in this part of the Western Canadian Sedimentary Basin.