



Sedimentology, Ichnology, and Depositional History of the Falher D Member – Presence of a Wave-dominated Delta?

Trevor Hoffman*

University of Alberta, Edmonton, Alberta, Canada
trevor.hoffman@ualberta.ca

and

M. Gingras and S. Pemberton

University of Alberta, Edmonton, Alberta, Canada

Abstract

Differentiating strandplain shoreface deposits from wave-dominated deltaic deposits can be extremely difficult in storm-dominated and storm-influenced settings. In these settings most facies are strongly overprinted by storm events resulting in similar successions for both environments. However detailed comparisons can reveal a number of subtle differences including sedimentological and ichnological variations, geometry, facies distribution, and the presence of fluvial inputs.

The lower Cretaceous Falher Member within the Elmworth/Wapiti field area consists of five stacked successions of coarsening-upward storm-dominated sandstones and conglomerates. The Falher “D” member is one such succession and is subdivided into five facies associations: lower shoreface (FA1), upper shoreface and foreshore (FA2), channelized/convoluted deposits (FA3), brackish water deposits (FA4), and non-marine fluvial and coastal plain deposits (FA5). A detailed investigation of the Falher “D” sandbody reveals a number of interesting along-strike trends. Sedimentological, ichnological, and stratigraphic information indicates the presence of a wave-dominated delta located within the central portion of the study area. Specific evidence for the presence of a wave-dominated delta include the presence of stacked fluvial deposits within non-marine deposits directly perpendicular to the shoreline trend, ichnological intensity and diversity distribution, presence of specific sedimentary structures, and the distribution of conglomerate within the upper shoreface and foreshore. This conclusion is confirmed when comparisons are made to recognized wave-dominated deltas.