

## **Sequence Stratigraphy of the Milk River Formation in southern Alberta and Eagle Formation in northern Montana**

Tobias H.D. Payenberg\*, Andrew D. Miall  
Geology Department, University of Toronto,  
22 Russell Street, Toronto, ON, Canada  
[tobi@geology.utoronto.ca](mailto:tobi@geology.utoronto.ca)

and

Dennis R. Braman  
Royal Tyrrell Museum of Palaeontology, Drumheller, AB, Canada

The Milk River Formation of southern Alberta and its stratigraphic equivalent in northern Montana, the Eagle Formation is the first major regressive clastic wedge in a series of Upper Cretaceous regressions in this part of the Western Interior Basin. Despite ongoing gas production from this Formation at several locations, depositional environment and detailed stratigraphy of the Formation is poorly understood to date. Seven outcrop sections in southern Alberta and north-central Montana and approximately 2800 wells and over 20 cores were used to get a better understanding of the Milk River/Eagle depositional system.

The Milk River/Eagle Formation has traditionally been subdivided into the Telegraph Creek, Virgelle and the Deadhorse Coulee Member in southern Alberta. In northern Montana, the Formation includes the Virgelle Member, the unnamed Middle Eagle (Deadhorse Coulee equivalent) and an unnamed Upper Member, that does not exist in the outcrop area of southern Alberta. The Telegraph Creek Member of southern Alberta has formational status in Montana.

The Virgelle Member in outcrop represents a sharp-based, wave-dominated shoreline deposit overlying the coarsening- and shallowing-upwards shale, silt and sandstone of the Telegraph Creek Member/Formation. In the subsurface of central Montana, the Virgelle shoreline is represented by a series of offlapping shingles indicating very rapid deposition, probably under a forced regression. The Deadhorse Coulee Member and its Montana equivalent is the backshore to fluvial environment that is riding on the back of the Virgelle regression, and thins rapidly towards the basin. Following rapid transgression of this shoreline are a series of small deltas that originate in the southwestern part of the study area and prograde east and north into the basin. While up to five individual deltaic sequences have been identified in outcrop in central Montana, only one shoreline-parallel sequence can be traced into southern Alberta. Two sequence boundaries have been identified in the Eagle Formation based on palynology and outcrop analysis. One sequence boundary is situated below the deltaic sequences, while a second is marked by the transgressive surface of erosion topping the deltaic sequences, often termed the Milk River/Eagle shoulder.