Bearpaw-Horseshoe Canyon Paleodelta Reconstruction, Drumheller Area

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Field and subsurface lithological and stratigraphic data are integrated into a sequence stratigraphic model of a part of the upper Cretaceous succession in south central Alberta Plains. The stratigraphy of the Bearpaw-Horseshoe Canyon transition zone has been reviewed and critically evaluated in an attempt to develop a comprehensive, although preliminary, depositional model. Field observations near the town of Castor, town of Dorothy, and along the Willow Creek Valley (Drumheller) were compared and integrated with the subsurface data from an adjacent area encompassing townships 27-38, ranges 16-23 W4, for a high-resolution sequence stratigraphic approach.

Two major transgressive systems tracts were recognized in the subsurface to the west of the outcrop. These transgressive systems correlate lithologically and sedimentologically with the marine shales and associated shoreface sandstones of the Bearpaw formation that outcrop east of Willow Creek, near the town of Dorothy. The third transgressive event in the study area, marking the base of Horseshoe Canyon formation, has a more restricted subsurface area of distribution and can be observed along the Willow Creek Valley, above the Dorothy shoreface sandstone.

The Bearpaw-Horseshoe Canyon paleodelta records a three-cycle evolution within the study area. The litho-facies assemblage depicts a general distribution of the progradational processes in a southeasterly direction, with slightly different directions from one cycle to another. Consequently, the peat accumulation gradually advanced along the direction of the deltaic progradation.