

Lateral Variability Within the Cadotte Shoreline Complex (Elmworth Gas Field): Breaking Out Depositional Packages Within an Extensive Sandstone-Conglomerate Body

Curtis Lettley*

University of Alberta, Edmonton, Alberta, Canada
clettley@ualberta.ca

Abstract

The Cadotte Member (Albian Peace River Formation) forms an extensive shallow-marine complex in the subsurface and Rocky Mountain foothills of western Canada. It spans approximately 300 km along depositional strike, and 150 km along dip. Significant deep basin type gas accumulations are hosted within the Cadotte at depth. Permeability and gas deliverability in the Cadotte Member are strongly tied to primary textural and mineralogical character.

A sharp, but conformable facies contact is typically seen in the Cadotte Member between fine-grained quartz sandstone of the lower shoreface and coarser, chert-bearing sandstone and conglomerate of the upper shoreface. While this defines a consistent vertical relationship observed ubiquitously throughout the Cadotte Member, great lateral variation is encountered in the texture, mineralogy, sedimentary structures and ichnology of the upper shoreface sediment. This variation is thought to reflect trends in proximity to discrete points of (deltaic) sediment input, as well as spatial and temporal variation in basinal dynamics (e.g. wave base level, shoreface profile, sediment drift etc.). Additionally, the transition between shoreface sediments of the Cadotte Member and offshore deposits of the underlying Harmon Member is markedly different between northern and southern regions of the Elmworth area. This may reflect contrasting periods of shoreline stability and rapid progradation.

Several cores from the Elmworth field will be presented and discussed with an eye towards specific differences in the character of the Cadotte succession, and their palaeogeographic and stratigraphic implications.