

Lower Triassic Montney Sequences, Facies and the Montney-Doig Boundary

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Summary

The Lower Triassic Montney Formation in the WCSB has produced large volumes of oil and gas from dolomitized coquinas and from siltstones to very fine-grained sandstones, variably in progradational shoreface, forced-regressive shoreface, “estuarine”/tidal, storm-dominated (HCS) offshore transition and turbidite channel and lobe/fan settings, mainly in western Alberta. Current exploration focus is on finer-textured, gas-saturated, distal downslope extensions of turbidite and coarsening-up distal regressive facies extending well into NE BC. All of these Montney facies occur within two major third-order, unconformity-bounded sequences with multiple internal fourth-order or higher-order sequences, mainly in progradational stacking patterns. Dolomitized bivalve-lingulid coquinas occur at six or more of these third-order or higher order sequence boundaries. The widely-accepted (industry) pick for the top of the Montney (differing from the ‘type’ designation as the base of the Doig ‘phosphate zone’) is marked by spectacular conglomerates, interpreted to record another third-order sequence boundary.

Pre-Triassic structure (best expressed by third-order residual structure mapping of the top Paleozoic unconformity), intra-Triassic and post-Triassic tectonism and structure play a major role in facies distribution, trap formation and burial-thermal history of the Montney. Proof of intra-Montney fault movement is provided by up to 9 m of intensely sheared Montney sections (“seismites”) between undisturbed facies in core along the Hay River Fault Zone; seismic shock probably was a major triggering mechanism for Montney proximal and distal turbidite sedimentation.

Workshop cores will illustrate selected Montney facies, including productive distal facies from NE BC, and the Montney-Doig boundary.