Unrecognized Potential for Thick Triassic Reservoirs in Frontier Areas of NE British Columbia

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Accumulation of Middle Triassic strata in northeastern British Columbia has long been attributed to deposition in a passive margin basin with sediment sourced from the east & deposited on the western margin of Pangaea. The 'stable craton' model has been used to explain the thin & relatively even distribution of Middle Triassic marine sediments as a progradational clastic sheet on the passive western edge of ancestral North America. These strata have been a primary focus of hydrocarbon exploration interest in British Columbia for 4 decades. Conventional reservoirs that occur in fine-grained sandstone & coquina intervals in the Halfway Formation are interpreted as barrier island shoreface / inlet successions. Recently attention has shifted to less conventional play types such as the extensive, gas-prone, low permeability shales & siltstones of the Doig Formation.

Exploration to the west of known pools is mitigated by the prevailing knowledge: i.e. existing depositional models suggest that conventional sand & coquina dominated reservoir units become progressively thinner to the west. Recent work suggests that, rather than a passive margin setting, these strata accumulated during the early stages of foreland basin development. Our observations, based on fieldwork in the Rocky Mountain Front Ranges & Foothills & analysis of limited subsurface data from the sparse wells drilled in this area, support this hypothesis. Detailed correlations, facilitated by conodont & ammonoid biostratigraphy, show that Middle Triassic strata thicken westward into a large trough. Most significantly, the single thin (10-50 m) sandstone sheet that characterizes the Halfway Formation in its eastern reaches is represented by a thick (> 400 m) sandstone-dominated succession. Abrupt changes in unit thicknesses & thick, convolute-bedded intervals implicate the influences of local faulting in deposition. Correlation of the study interval to the western margin of Triassic outcrop preservation reveals abrupt stratal thinning west of the trough, & the presence of a western subaerial high. Furthermore sandstone / shale ratios suggest sediment sources from the west rather than solely from the east, as previous basin models demanded. These data indicate that the potential for thick new Triassic reservoirs is high in frontier areas west of the currently developed part of the WCSB.