

Chemostratigraphic Correlation of Horn River Group, Central Mackenzie Corridor, Northwest Territories

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Abstract

Refinement of the Horn River Group stratigraphic framework (Hare Indian, Ramparts and Canol formations) in the Mackenzie Plain area of the Central Mackenzie Corridor, Northwest Territories (NWT) is fundamental to shale reservoir exploration. Trends in whole rock lithochemical data throughout the succession have revised correlation in outcrop and within the subsurface, particularly where the carbonate-dominated Ramparts Formation is absent and organic-rich, fine-grained siliciclastics of both the Canol and Hare Indian formations are visually similar. The main trends used in a chemostratigraphic zonation of the succession include enrichments in uranium, changes in the silica to zirconium ratio, fluctuations in both the terrigenous input profile (a summation of aluminum oxide, iron oxide, potassium oxide, and titanium oxide) and thorium to uranium ratio, enrichment in calcium oxide, and elevation in trace elements such as molybdenum, vanadium, and nickel. These trends also characterize subunits of each formation: the Hare Indian Formation consists of a basal Bluefish Member and upper Bell Creek member (proposed, not yet formalized), the Ramparts Formation often contains an organic rich Carcajou member, and the Canol Formation is differentiated into a basal recessive member, middle resistant member, and upper recessive member.

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