

### **Diagenesis of the Albert Formation, Moncton Subbasin, New Brunswick**

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The Late Devonian to Early Carboniferous Albert Formation of the Moncton Subbasin in southern New Brunswick is an ancient lacustrine and associated fluvial deltaic deposit. It forms the reservoir of the only oil and gas field in onshore Atlantic Canada.

A detailed diagenetic study has revealed as a primary depth, control on the occurrence of authigenic phases of ankerite, albitization of feldspars and mixed layer illite-smectite. Dominant authigenic minerals occur as porefill and porelining and include calcite, ankerite, quartz overgrowth, chlorite and illite. Carbon and oxygen isotope analyses of carbonate cements and veins suggest inorganic derivation, with minor contribution from

bacterial oxidation at shallow depth and skeletal material in deeper burial. Two sets of fractures were observed. Hydrocarbon migration postdates the fracturing events.

Reservoir sandstones are fine to medium grained, subarkosic to sublitharenite in composition, and moderate to tightly packed. Porosity in these sandstones is mainly secondary, ranging from 10-20% and due largely to dissolution of detrital feldspars and carbonate cements. Microporosity in authigenic chlorite may constitute about half of the total porosity. Most of the sandstones are tight and permeability is highly variable reaching a maximum of 10 mD.