
**Reservoir quality, diagenetic history and provenance
of the Late Triassic sandstones of Wolfville Formation,
Cambridge Cove, Bay of Fundy, Nova Scotia**

MUHAMMAD KETTANAH, YAWOOZ KETTANAH,
AND GRANT WACH

*Department of Earth Sciences, Dalhousie University,
Halifax, NS, B3H 4J1 Canada <mkettana@dal.ca>*

The sandstones of the Triassic Wolfville Formation at the Cambridge Cove at the Bay of Fundy were investigated petrographically. The study included grain size analysis, diagenesis, porosity, heavy mineral analysis and reservoir characteristics depending on these properties. These studies indicated that these fluvial sandstones are calcite cement-supported feldspathic litharenites to lithic felsarenites. They consist of quartz (33.6%), lithics (17.3%), feldspars (9.8%), minor amounts of mica and heavy minerals (2.6%) and cement (36.7%). The sandstones have a recycled orogenic provenance derived from metasedimentary and granitic rocks postdating the collision type setting and during the early stages of rifting. Their heavy minerals consist of iron oxides (76%), garnet (13.6%), apatite (3.3%), chlorite (3.3%), zircon (1.4%), tourmaline (1.3%), biotite (1%) and few others. The main sources of these deposits are the Early Paleozoic Meguma Supergroup, South Mountain Batholith and the carbonate rich Carboniferous formations exposed in Nova Scotia, with possible minor contribution from the Appalachian Mountain exposures in New Brunswick. The Wolfville Formation, which is overlain by the Blomidon Formation, has limited exposed area relative to its wide subsurface extension beneath the Bay of Fundy, where it is underlain by the Horton Bluff Formation in the Minas Basin area, and by Meguma and/or Avalon zones in the southwestern parts of the Bay of Fundy. The Wolfville sandstones have a porosity ranging from 2 to 17% which gives them the potential to be moderate to good reservoir rocks for hydrocarbons, especially where they overlie the potential source rocks such as the organic-rich shales of Horton Bluff Formation, or other younger shales within the Mesozoic rocks in the subsurface section beneath the Bay of Fundy.