

## **Provenance and diagenesis of the Lower Cretaceous sandstones in the deep well Newburn H-23, Scotian Slope, Canada**

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Newburn H-23 is one of seven deep wells drilled on the Scotian Slope. These wells are new and thus in the early stages of research. As such it is important to determine the history of the detrital and diagenetic minerals found in this well and to draw comparisons between them and their shallower age-equivalents on the shelf. Sandy intervals from the Early Cretaceous have been analyzed dominantly using various methods to observe chemical and textural relationships between diagenetic and detrital minerals.

The detrital mineralogy of these sandstone intervals is similar to other wells in the Sable subbasin, suggesting that they are sourced by the Sable River with minor input from Meguma Group metasedimentary rocks and an increased supply of sodic volcanic clasts, probably from Scatarie Bank. The diagenetic history of this well, however, contains several mineralogical occurrences which have not yet been identified elsewhere in the Scotian Basin, including probable diagenetic zircon and fluorine rich ferroan-calcite. These minerals, along with diagenetic titania minerals suggest: (1) low pH, a high organic content, and a high fluoride content in circulating basinal fluids during mesodiagenesis; and (2) a supply of zirconium, increased salinity in basinal fluids, and higher than expected temperatures during mesodiagenesis. These findings are consistent with evidence from other wells for high salinities and temperatures late in the history of the Scotian Basin.