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The impact of meteoric-water flux on diagenetic alterations in Palaeocene deep-water, marine sandstones, The Shetland-faroes basin, The British continental shelf

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Meteoric water flux and related formation of kaolinite due to the dissolution of detrital silicates are common features of continental and paralic sandstones. Conversely, meteoric-water flux is usually considered not be very likely to occur in dee-water, marine sandstones. However, the study of Palaeocene, deep-water, marine sandstones of the Shetland-Faroes basin, the British continental shelf revealed widespread and extensive dissolution and kaolinitization of mica and feldspar, which are attributed to meteoric-water flux during sea-level lowstand. The meteoric-water flux mechanism is enigmatic but could have occurred as a consequence of creation of hydraulic head along the basin margins or by hyperpycnal flow. Hyperpycnal flow occur when river water enters a stagnant seawater and the rivers/distributary channels make it to the shelf edge and the flows are delivered directly onto a slope. The kaolinite, which has blocked the pore throats, is characterized by considerable amounts of inter-crystalline microporosity. Alteration of mica resulted also in the formation of smectitic clays, which have together with threads-like remnants of mica completely filled adjacent pore space. Other diagenetic reactions that have influenced the reservoir-quality evolution include cementation by mainly carbonates (calcite and Fe-dolomite/ankerite), quartz, and clay minerals, mechanical compaction of ductile, argillaceous grain, inter-

granular pressure dissolution of quartz grains, and dissolution of calcite cement.