

## **Siliciclastic Sedimentation in Paleocaves of the Pekisko Formation, Twining Field**

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### **Abstract**

Karst landforms developed on the post-Mississippian surface in the Twining area are expressed as topographic irregularities interpreted as buried hills, dolines and collapsed valleys. The surface is composite and developed over a period of time spanning about 140my culminating in burial of the karst terrain in the Early Cretaceous. Speleogenesis of underlying carbonates is manifest as paleocaves outlined by unconformities that separate the host Pekisko Formation (Tournaisian) from younger siliciclastic sediment fills.

Sediment that fills the paleocaves belongs to three different facies. *Diamictite* facies is characterized by poorly sorted sediment ranging from boulders through pebbles and sand supported in fine-grained clayey matrix. *Sandstone* facies is comprised of sands and pebbly sands with current-induced structures and crudely developed soft-sediment deformation. *Shale* facies includes maroon, grey-green, and gleyed mudstones with well-developed slickensides. Paleocave fills are interpreted to have been emplaced by allogenic groundwater recharge from sinking streams.

Each of the paleocave facies is interpreted in terms of depositional environments known from modern caves. Diamicton develops under conditions of extreme sedimentation when landslides or debris flows enter a cave system. Sand is deposited in fluvial channels with stratification the consequence of the local flow regime; soft- sediment deformation of the sands probably occurs during floods when the sediment mass is sheared through confined passages. Mud represents slack-water deposition in ephemerally submerged reaches of caves. Wetting and drying of mud leads to maroon and green colouration along with the development of slickensides, and is analogous to sedimentation and pedogenesis on floodplains.