

Low Energy Alluvial Deposits from the Upper Cretaceous Prince Creek Formation,
National Petroleum Reserve, North Slope, Alaska

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The Upper Cretaceous Prince Creek Formation crops out along the Colville River within the National Petroleum Reserve, North Slope, Alaska, and records a non-marine succession of predominantly low energy stream and associated flood-plain deposits. Overbank mudstones and siltstones contain root traces, drab colors, blocky structure, siderite nodules, and Fe-oxide mottling as well as rare dinosaur bones. Thin sheet sandstones up to 0.5 m thick also occur within floodplain deposits. These non-channelized floodplain facies are interpreted as lakes, lake margins, peat-bogs, levees, and crevasse splays. Poorly drained and weakly developed cumulative paleosols are ubiquitous within this low-lying alluvial plain.

Most channel sandbodies are 1 to 3 m thick, single story, very fine-to fine-grained, trough cross-laminated and/or rippled, and frequently contain carbonized root traces and siderite concretions. Finer-grained sandbodies occur either as small, thin, ribbon-like channels surrounded by overbank fines, or as more extensive sheet-like sands with lateral accretion surfaces. Ribbon sandbodies are interpreted as non-migrating anastomosed channel fills while sheet sandbodies display a more meandering character.

Rare, multi-story medium-to coarse-grained sheet sandstones up to 7 m thick are also present within the Prince Creek Formation. Coarser-grained sandbodies are dominated by lateral accretion and contain mud rip-up clasts, trough cross-laminations, silicified or carbonized logs, and localized pebble lags. Large dinosaur bones are also found rarely within channel lag deposits. Medium-to coarse-grained sandbodies are highly localized and restricted in area. Multi-story channel sandbodies record the highest energy flows within the Prince Creek, and probably represent meandering trunk channels within this multi-channeled alluvial system.