Fluvial-Tidal Sandbody Relationships in the "Nonmarine" Iles Formation near Rangely, Colorado

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Tidal influence has been rarely reported in the geologic literature in the non-marine portions of the Upper Mesaverde Group in the Piceance and Uinta basins. However, a detailed field study of the non-marine Iles Formation north of Rangely, CO finds a number of tidal indicators including paleocurrents in the landward direction, mud-drapes and double mud-drapes, and sigmodial cross-stratification. Tidal influence is strong within the field area despite its location 60 to 70 km to the closest transgression of the Iles shoreline. Tidal units in the field area occur in six sandbody types: tidal bars, tidally influenced channel fills, fill and spill channels, tidally influenced splays, tidal constructional bars, and tidally influenced braided complexes. Fluvially dominated sandbody units are also present within the field area including point bars, fluvial channel fills, fluvial constructional bars, and minor crevasse splays and channels.

A cyclical pattern of tidal influence is observed in the field area. The lower portion of the field area is strongly tidally dominated. Tidal influence decreases upwards with the middle portion of the field area exhibiting fluvial dominance. The upper portion of the field area shows evidence of increasing tidal influence. This cycle is linked to the migration of relative sea-level. Multiple cycles of mudstone to sandstone dominance are also observed within the field area. These cycles occurred on a shorter time scale and represent the migration of the main channelbelt in and out of the area. The field area is correlated into the Cozzette and Rollins members based on the cycles of tidal influence, amalgamation of sandstone units, and evidence of lengthy subaerial exposure.