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Improved Depositional and Sequence Stratigraphic Models for the Basal Sandstone, Lower Sandy Member, Blair Formation, Rock Springs Uplift, Wyoming

The Lower Sandy Member of the Blair Formation in the Rock Springs Uplift of Wyoming merits reinterpretation based on recent observations and analysis of previously unstudied basal Blair Formation outcrops. The basal sandstone is important because of its potential to become a significant exploration play.

The Upper Cretaceous Blair Formation, including the basal sandstone, has previously been interpreted as a deep-water slope-to-basin floor, submarine fan deposit. However, new evidence from the basal sandstone supports a shallow water depositional environment, such as a lowstand tidally-influenced delta, rather than a deep-water submarine fan origin.

Within previously unstudied outcrops, the basal sandstone is typified by an upper and lower facies. The lower facies is characterized by a coarsening up succession of laterally accreting channel scours lined with clay rip-up clasts and overlain by planar laminated lower fine to upper fine-grained sands. The upper facies consists of thin, planar bedded to high-angle trough cross-bedded upper fine-grained sandstone.

Available evidence that suggests a shallow water depositional environment includes the following: possible tidal bundling within the high-angle cross-stratified facies (bundling has been recognized within the upper sandstone of the Lower Sandy Member), occasional bidirectional cross-bedding (herringbone cross-stratification), ichnofossil analysis indicating a salinity stressed environment, and the ubiquity of tractionally depositional processes.

Additional data acquisition in progress, intended to characterize channel geometries, delineate stratigraphic relationships, and define paleobathymetry include, a ground penetrating radar survey, 2-D seismic data analysis, test-well data analysis and palynology/micropaleo analysis.