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# The Cenomanian Sequence Stratigraphy of Central to West Texas

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## ABSTRACT

The Cenomanian sequence stratigraphy of Central to West Texas, as proposed by several authors, includes a single Transgressive-Regressive sequence composed of the Del Rio (Grayson equivalent) and overlying Buda formations. Field studies in Val Verde County reveal a more complex situation, with unconformities separating the Del Rio from the Albian limestones (Devils River/Salmon Peak, laterally equivalent to Georgetown and Santa Elena formations), a second unconformity between the Buda and the Del Rio, and a third between the Boquillas (Eagle Ford equivalent, Turonian in age) and the Buda. The nature of these unconformities is critical to the sequence stratigraphic interpretation, since unconformities may represent episodes of low sea level and subaerial exposure (sequence boundaries) but may also occur as a result of extreme sediment starvation on the sea floor (condensed sections/surfaces of apparent truncation, equivalent to maximum flooding surfaces separating Transgressive and Highstand Systems Tracts), or even as surfaces of scouring by strong submarine currents, with no particular sequence stratigraphic significance.

The basal unconformity on the Albian is marked by extensive borings (including *Gastrochaenolites*), and there is local red staining (particularly well seen at outcrops to the north, on Interstate 10). There is no good reason to challenge this unconformity as a sequence boundary.

The Del Rio is a highly fossiliferous formation, consisting of brown-weathering silty clays with thin limestones and sandstones. The oyster *Ilymatogyra* (was *Exogyra*) *arietina* is particularly abundant. While oysters suggest possible brackish water conditions, the presence of irregular echinoids and glauconite grains indicates normal salinities, at least for most of the formation. A variety of evidence indicates deposition on a storm-dominated shelf.

The basal Buda unconformity, recognized by several previous authors, is conspicuous for the clasts of Del Rio lithologies incorporated in the basal unit of the Buda. These clasts are more weathered than the body of the Del Rio Formation and intensively bored by *Gastrochaenolites*, indicating possible subaerial weathering and erosion prior to prolonged sea floor residence. The Del Rio thins to the west, and the Buda rests unconformably directly on Albian limestones. The thinning is attributable, at least in part, to erosion. The indications of shallow water conditions preceding the unconformity argue against a condensed section hiatus and a sequence boundary interpretation is most probable.

The Buda Formation consists of porcelaneous, bioturbated limestones, and middle to outer shelf environments are likely. The top surface of the Buda is a third unconformity, with microkarst solution pockets occupied by basal Boquillas sediments. This surface is also interpreted as a sequence boundary.

The Lower Cenomanian is interpreted as representing two depositional sequences, not one as described in the literature.