

ABSTRACT

ANALYSIS OF THE GROWTH STRATA OF THE UPPER CRETACEOUS TO LOWER PALEOGENE POTRERILLOS FORMATION ADJACENT TO EL GORDO SALT DIAPIR, LA POPA BASIN, NUEVO LEON, MEXICO

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Near-surface salt diapiric rise influenced depositional patterns within La Popa basin of northeastern Mexico. Outcrop exposures at El Gordo diapir, located approximately 70 km northwest of Monterrey in Nuevo Leon, Mexico, permit direct examination of sedimentation adjacent to a salt diapir. At El Gordo, three carbonate horizons (lentils), Lower, Middle, and Upper Gordo, are exposed within mudstone units of the Potrerillos Formation. Geologic mapping, measured sections, and thin section analysis were utilized to study growth strata at El Gordo diapir.

Carbonate lithofacies were organized into five lithofacies associations. Lower and Upper Gordo lentils trend from reef to fore reef to turbidite facies as they grade away from the diapir. Middle Gordo lentil comprises a subaqueous debris flow on the western side of the diapir that contains blocks of Lower Gordo

lenticular and extends as a thin carbonate horizon on the eastern side. Reef development is more prolific along the western and northern margins of the diapir than along the eastern margin. Carbonate lentils are thickest near the diapir and thin rapidly away from the diapir to where they merge with encasing mudstone.

Comparison of Potrerillos Formation stratigraphy between El Gordo diapir and the previously studied El Papalote diapir indicates that three, thicker halokinetic sequences were deposited at El Gordo diapir, whereas six are present at El Papalote diapir. El Gordo diapir is located in the hinge of an Hidalgoan fold, which partially resulted in it standing higher bathymetrically than El Papalote diapir. The location of the diapirs relative to the fold and the local differences in bathymetry are the primary reasons for differences in deposition between the two diapirs.

Eustasy was not a major influence on sedimentation adjacent to the diapir. Rather, sedimentation adjacent to the diapir was primarily controlled by diapiric rise and the resulting bathymetry. However, local sea level adjacent to the diapir would have influenced carbonate facies development. The interbedded nature of siliciclastic units and carbonate horizons at El Gordo diapir does not appear to be controlled by regional sedimentation patterns. Regional tectonic activity indirectly changed the local sedimentation patterns by affecting the geometries of the diapirs through shortening.

