

CHARACTERIZATION OF SYN-DEPOSITIONAL FAULTING OF A  
COMPOSITE WEDGE HALOKINETIC SEQUENCE ALONG THE  
LA POPA SALT WELD, LA POPA BASIN,  
NUEVO LEON, MEXICO

ABSTRACT

BREANNA ELIZABETH HENNESSY, B.S.

Along the northeastern side of La Popa salt weld, the Maastrichtian age Muerto Formation forms the onlap wedge onto the thick beam of Campanian age drape-folded Parras Shale.

Approximately 0.19 km from the bend of the weld at this location is a syn-depositional fault (Cañon del Salto fault). Documented slickensides on the fault surface indicate a normal fault sense of movement. Detailed field mapping indicates faulting created a half-graben whose three-dimensional geometry is an elongate trough that parallels the trace of the weld and is overlapped by the Potrerillos Formation.

Petrographic analysis of the faulted strata and surrounding formations (Parras Shale, Muerto Formation and Potrerillos Formation) indicate that the hanging wall strata most closely resemble the Potrerillos Formation; however, field relationships provide the strongest evidence as to the origin of the hanging wall strata and suggest the hanging wall strata are correlative to the Parras Shale. Field relationships indicate that faulting juxtaposed the hanging wall upper Parras Shale against the footwall lower Parras Shale and that both units dip at roughly 70°. The hanging wall upper Parras Shale is overlain by a growth stratal wedge of the Muerto Formation at the easternmost extent of the fault trace. The hanging wall Muerto Formation beds thicken and curve toward the fault suggesting that faulting was syn-depositional to the Muerto Formation. The Muerto Formation pinches out along strike changing the stratigraphic relationship to one in which the Potrerillos Formation unconformably overlies the hanging wall Parras Shale. The Parras strata continue along the weld for approximately 1 km before it pinches out and the Potrerillos Formation in the upthrown block of the weld is juxtaposed against the Viento Formation in the downthrown block of the weld.

A comparison of the stratigraphic and spatial relationships documented in the Cañon del Salto fault to basic models of faulting above a diapir suggests that faulting occurred due to diapir-scale extension. Further, faulting occurred late in the formation of the Parras/Muerto composite wedge halokinetic sequence as a response to extension associated with drape-folding of the thick beam of Parras Shale as diapirism progressed.