

**3D SEISMIC INVESTIGATION OF MARQUEZ DOME, EAST TEXAS.** D. B. Buthman,  
Unocal, 14141 Southwest Freeway, Sugar Land, Texas, 77478

Industry recently acquired 285 square kilometers of 3D reflection seismic data over the 13 kilometer diameter Marquez Dome impact crater, Leon County, Texas. The area is located within the gas prospective Cotton Valley trend in the East Texas Salt Basin between the Edgewood Graben System and the Woodbine Delta. Arbitrary reflection seismic profiles across the dome shows an approximately one square kilometer area where seismic reflectors are disrupted, incoherent, and flanked by coherent away-dipping reflectors. The base of the seismic incoherence occurs at approximately 1.3 seconds two-way time, this strong positive reflection indicating a soft to hard rock boundry characteristic of crater fill and relatively undisturbed dome-flanking country rock. Reflectors below the base of the disruption also exhibit doming. The "dome" maps seismically as a closed low, with west-northwest, northeast, and south-southeast synclinal spokes emanating from its perimeter. The presence of Pecan Gap Limestone material at the surface, exhumed from 1067 meters depth, together with the lack of coherent seismic reflectors within the dome, suggests that the dome formed by catastrophic pulverization and exhumation rather than plastic folding.