

THE DOMES OF EAST TEXAS¹

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ABSTRACT

Data collected during the last five years on the 15 salt diapirs that extend upward to shallow depths (<4,000 ft, <1,220 m) in the East Texas Basin are presented here in graphical and tabular form. These salt diapirs penetrate Jurassic and younger units and have controlled the deformation of these units in the central part of the basin. The regional geologic setting of the salt diapirs is summarized, and the meaning and significance of descriptive terms are discussed. This compendium contains both primary data and secondary data. Primary data are observations of dome shape, depth, structure, and resources. Examples of primary data are depths to caprock and salt, cross-sectional area and axial ratio, crestal area and percentage planar crest, axial plunge, tilt azimuth and tilt distance, structural symmetry, side convergence, overhand azimuth and overhang percentage, as well as a new quantitative classification of dome shape. The structural styles of strata around each dome are also described in terms of the size of the rim syncline and drag zone around the diapir, angular relations between the strata and the salt, and style of faulting. Hydrocarbon production histories, traps, and existing uses of each dome for storage or raw materials are described.

Secondary data include deductions and inferences based on the primary data. The growth evolution from the pillow stage, through the diapir stage, to the post-diapir stage is described, together with unconformities which resulted from erosional breaching of the dome in the past. The structural stability and hydrologic integrity of each dome is assessed in terms of the age of the most recent known deformation, and the geomorphic and hydrologic evidence for dome uplift, subsidence, or brine leakage is given, including a new classification of drainage patterns above domes.

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