Delineation of Structural Trends in Caldwell County, Texas

Vsevolod Egorov[1], Robert Neese[2], and Jonathan Neese[2]

[1]GeoExpera, 7490 Brompton St., Ste. 466, Houston, Texas 77025

[2]Gravity Map Services, 307 Wollschlaeger Dr., Boerne, Texas 78006

GCAGS Explore & Discover Article #00251*
http://www.gcags.org/exploreanddiscover/2017/00251_egorov_et_al.pdf
Posted October 30, 2017.

*Article based on an abstract published in the *GCAGS Transactions* (see footnote reference below), which is available as part of the entire 2017 *GCAGS Transactions* volume via the GCAGS Bookstore at the Bureau of Economic Geology (www.beg.utexas.edu) or as an individual document via AAPG Datapages, Inc. (www.datapages.com), and delivered as a poster presentation at the 67th Annual GCAGS Convention and 64th Annual GCSSEPM Meeting in San Antonio, Texas, November 1–3, 2017.

ABSTRACT

The first successful exploration well in Caldwell County, Texas, was completed by a team lead by Edgar B. Davis in 1922. This well followed a few dry holes and marked the discovery of the Luling Field. Since then, few oil fields such as Lytton Springs (1925), Salt Flat (1928), and others were discovered. Today, hundreds of independent operators are still producing oil from them. Initially, oil-bearing reservoirs were encountered within the Edwards carbonates deposited in a shallow marine environment of Early Cretaceous (Albian) time. Oil is also produced from younger reservoirs, including the Buda limestone and the Upper Cretaceous Austin Chalk. Some of the known reservoirs of this age are associated with volcanics (e.g., Lytton Springs Field). Currently, production is mostly limited to the zone where the top of Edwards carbonates is encountered at 1000–2500 ft below the surface. Although depositional environment and diagenetic changes define reservoir quality within the formation, the structural component has proven to be an important factor in finding oil. The very first field in the county was discovered by drilling along a surface-mapped fault. Following discoveries were made along similar northeast-southwest structural trends controlling oil traps.

Over the years, land gravity surveys were collected in the area and comprise a quickly-retrievable and low-cost dataset. In our work, modern day transformations and visualization techniques were applied to a legacy gravity data. The resulting maps clearly demonstrate that most of the production trends correspond to the structures revealed by the enhancement of these data. Some potentially bypassed zones could also be suggested for future exploration or development wells.

Although this study was conducted in a mature area, it contains additional information which can be used. It also provides a compelling example of how gravity methods can be applied for exploration in less mature areas.

Originally published as: Egorov, V., R. Neese, and J. Neese, 2017, Delineation of structural trends in Caldwell County, Texas: Gulf Coast Association of Geological Societies Transactions, v. 67, p. 581.