

An Account of the Permitting and Drilling of the First Two Cavern Wells in the Golden Triangle Gas Storage Project, Jefferson County, Texas, USA

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ABSTRACT

This paper presents an overview of the Golden Triangle Storage (GTS) project, located on the Spindletop dome between the cities of Beaumont and Port Arthur, Jefferson County, Texas. A detailed account of the drilling of the first two cavern wells is presented, as well as some of the experiences in permitting within a National Historic Landmark. The GTS project is the first greenfield storage project in Texas that has been permitted as a Federal Energy Regulatory Committee (FERC) facility, and this created some unique challenges.

The Spindletop dome has a significant place in world and petroleum history. The Lucas gusher, drilled by Anthony Lucas in January, 1901, found oil at a depth of 1020 feet (311 meters). The well flowed at an estimated rate of 100,000 barrels (11,924 m³) per day until capped nine days later. This is considered the beginning of the modern petroleum industry.

Although the well was significant in its nature, and contributed to the overall growth of the oil and gas industry, the actual drilling operations overcame considerable challenges with innovative ideas and practices that are still in use presently. The two cavern wells that GTS drilled, though located only 1200 feet from each other, had their own unique personality and challenges. The GTS Cavern Well #1 was drilled less than 1000 feet from the location of the Lucas well, and only 600 feet from sulfur mining operations which were conducted from 1953-1976. The GTS Cavern Well #2 was located further to the north, near the top of the structure.

The Spindletop dome is not unlike other Gulf Coast salt domes. The diameter of the dome is approximately 6,000 feet (1,829 meters); radial faults extend from the dome, influencing the location of the brine disposal wells. The caprock is found at a depth of approximately 860 feet below ground level, and the salt is found at a depth of 1600 feet below ground level.

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