Oil and gas were discovered in Louisiana merely 8 months after the Spindletop discovery in nearby Beaumont, Texas, 90 miles to the west. The Jennings Field (originally called Evangeline Field) is located in Acadia Parish, Louisiana, 30 miles west of the city of Lafayette and 6 miles north of the town of Jennings (Fig. 1). Total production from this salt dome-derived structure is over 120 MMBO and 51 BCFG from Miocene through Oligocene Anahuac and Frio age sands associated with the supercap and flanks of a shallow salt dome. Remarkably, the field is still producing today, over 100 years later, with annual production rates of 200 MBO and 245 MMCFG.

Initial production from supercap hydrocarbon accumulations yielded spectacular gushers and prolific flow rates such as an estimated 7000 barrels per day for the discovery well. Supercap annual production peaked in 1906 at 9 MMBO. Production from the Jennings Field accounted for 67% of Louisiana's cumulative oil production for the years 1901 to 1920. The Yount-Lee Oil Company established production on the flank of Jennings dome in 1928 after discovering hydrocarbon accumulations on the salt flank of Spindletop dome in 1926. Development of the flank acreage revived field production to a peak of 8 MMBO in 1939.

The Jennings dome salt body has a slightly elliptical northwest-southeast orientation with the steepest salt face on the northwest flank. The salt exhibits an overhang on the east flank with associated hydrocarbon production. A shallow Miocene mineralized sand section is also associated with this eastern flank.
Jennings Oil Company Formation and Landowner Squabbles

The news of success at Spindletop and the surface signs of a possible oil accumulation that included a topographic high in an otherwise flat rice field and abundant associated gas seeps prompted five Jennings businessmen to form "S.A. Spencer and Company" and to lease nearly 2000 acres. The partnership then approached the Heywood Brothers, of Spindletop fame, to drill the initial well at Jennings. They contacted the right man. W. Scott Heywood was interested and lost no time in leaving for Jennings. After investigation of several seepages in the area, he signed a contract on April 29, 1901, to drill two wells to a depth of 1,000 feet. The contract provided that Heywood and S.A. Spencer and Company could organize a company to be called the Jennings Oil Company. Stock was sold to finance the drilling. This company then contracted with Heywood Brothers and Elmer Dobbins (Jennings machinist and Spindletop Lucas well driller) to drill the specified wells.

However, landowner Jules Clements had a change of heart and decided not to have any wells drilled on his property. He padlocked the gates and contacted a lawyer to cancel the oil lease. Clements was concerned that his cattle would break their legs falling into the holes. He was also confounded about what to do with the oil. Heywood reassured Clement of his cattle concerns and paid generous payments in advance for any damage to his rice crop. Clement soon granted approval to allow the drilling to commence.

Jennings oilfield circa 1905

Fig. 2 - Oil-soaked members of the Jennings Oil Co. Jules Clement No. 2 producing well with oil shown spewing in background. L-R: Unknown, Charlie Noble, Elmer Dobbins, Unknown, W. Scott Heywood.
Oil Production: landowner Jules Clement, who had observed the well was shut-in for the evening. Clement then offered to give Noble a 1-acre tract if he would resume drilling that evening (September 21, 1901), and Noble gladly accepted the offer. At 8:00 p.m. the drilling was stopped after penetrating 110 feet of oil sand at a total depth of 1882 feet. The well gushed a 4-inch stream of oil 100 feet into the air, a rate estimated to be over 7000 barrels of oil per day (Fig. 2). However, the well was spewing abundant fine sands within the oil and after several hours the well “sanded up.” Attempts to clean out the well continued for 30 days but finally after the pipe became stuck, the well was abandoned.

Drilling Deeper and Deeper ... a Gusher
The Jennings Oil Company Jules Clement No. 1 well reached the contracted depth of 1000 feet but without finding either oil or gas. The contract had called for the abandonment of the first well and the drilling of a second well to 1000 feet at another location. Originally they were confident that 1000 feet was a sufficient depth, as it was near the depth for the gushers at Spindletop. W. Scott Heywood convinced the investors to modify the contract to accept a single well drilled to a depth of 2000 feet. The contract was approved and drilling resumed. As drilling continued the results were discouraging, merely a small showing of oil had been encountered.

Charlie Noble, the night driller on the well, was approached by landowner Jules Clement, who had observed the well was shut-in for the evening. Clement then offered to give Noble a 1-acre tract if he would resume drilling that evening (September 21, 1901), and Noble gladly accepted the offer. At 8:00 p.m. the drilling was stopped after penetrating 110 feet of oil sand at a total depth of 1882 feet. The well gushed a 4-inch stream of oil 100 feet into the air, a rate estimated to be over 7000 barrels of oil per day (Fig. 2). However, the well was spewing abundant fine sands within the oil and after several hours the well “sanded up.” Attempts to clean out the well continued for 30 days but finally after the pipe became stuck, the well was abandoned.

Additional wells were rapidly drilled in the area. A competitor, the Southern Oil Co., drilled the next well to 2500 feet and too far south of the field without finding oil. Southern Oil then drilled the next test just 250 feet northwest of the original Jules Clement No. 1. Upon reaching a depth of 1850 feet, the well blew out, making considerably more oil than the initial discovery, but this well also rapidly choked up due to the lack of a sand screen. The first successful productive well was the Jennings Oil No. 2, completed in June 1902 and located just 100 feet southwest of the original well. This well also has the distinction of being the first successful application of a screen for sand control, a device credited to Elmer Dobbins, driller and machinist. > continued on page 58
from Oligocene Camerina (A) sands equivalent to those in the Jennings Oil No. 1 discovery well. The main supercap productive area was centered near the intersection of sections 46, 47, and 48 of township 9 south, range 2 west (Fig. 4).

Salt Dome Flank Discovery Revives Field
In 1928, the Yount-Lee Oil Company discovered oil trapped on the southeast flank of the dome from Oligocene age sands. The No. 6 Houssiere-Latrielle was drilled to 7,294 feet and tested at a rate of 2500 BOPD. The recognition of salt flank oil reservoirs ignited a resurgence of drilling. Shell extended this deeper production to the south flank in 1936, Superior Oil on the west flank, and Gulf Oil on the east flank. Stanolind (later Amoco) purchased

The field produced 548,000 barrels of 20° to 25° API oil by the end of 1902. Rapid field development ensued. The field’s limits were quickly extended to the west by Superior Oil, and extended to the north and east by Crowley Oil in 1903. The following year Chicago Oil successfully drilled to the south and the Producers Oil Co., a subsidiary of the Texas Company (later Texaco), to the southeast. By early 1904 there were 35 producers in the field.

Early Production Peaks
By 1905, the reckless waste of gas and rapid production was resulting in declining reservoir pressures. Many of the earliest wells had to be put on pump and water encroachment was beginning to occur. The production peaked in 1906 at over 25,000 BOPD for a yearly total of over 9 million barrels of oil (Fig. 3).

These early years saw 45 “gushers” with rates of over 4000 BOPD. One early well, the Wilkens No. 2, produced 1 MMBO in 82 days for an average of 12,195 BOPD and for the life of the well produced over 2.5 MMBO. By 1909 there had been 445 wells drilled in the field at depths ranging from 100 to 2400 feet. The field’s production during this period was from supercap sands at depths of 110 to 2400 feet. The most prolific zone on the supercap was from 1700 to 1900 feet

Fig. 4 - Structure map of the top of the salt of the Jennings Field, note the overhang on the northeast portion of the salt dome

Fig. 3 - The Jennings Field from 1900 to 1910

Houston Geological Society Bulletin June 2003
Type Log: Jennings Field

Regional Geologic Setting
Jennings Dome is located within the Southeast Texas/South Louisiana Tertiary salt basin, along an east-west salt dome trend extending from Starks dome near the Texas-Louisiana state line to Bosco in central Louisiana (Fig. 6). This trend of domes along the nine south (9S) township is associated with the approximate updip limits of the Hackberry and Nodosaria embayments. The salt withdrawal associated with the formation of these salt domes most likely contributed to the formation of these embayments (Cossey and Jacobs, 1992). Jennings is located between the Hackberry embayment and the Nodosaria embayment (Fig. 6).

Salt Dome Configuration
The Jennings Salt Dome is an oval shape oriented northwest to southeast (Fig. 4). Salt overhangs are present on the northeast flank of the dome. The first salt penetration at Jennings occurred 25 years after the field's discovery. The shallowest salt encountered is at approximately 2400 feet and the shallowest cap rock at approximately 2000 feet. The caprock ranges in thickness from 400 to 1152 feet and is thickest on the southeast flank.

Pay Zones
Production was established from 12 Anahuac and Frio sands of Oligocene age at Jennings ranging from the Discorbis restricted to the Marginulina texana 3 sand (Fig. 5). These 12 sands in places may also include multiple productive lobes. Below the Marginulina texana 3 sand, sands have been encountered in the Hackberry and Nonion strurna section, but have yet to be found commercial at Jennings. The older Nodosaria blandpiedi and Vicksburg age section has also been penetrated in several wells.

Some of the oil sands were given names associated with lease names such as the "Arnaudet Sand"; "Clement Sand," "Leckelt," or, in the case of the Camerina (A), "Heywood Sand," the name of the initial drillers. The Heywood and Leckelt Sands (Fig. 5) are the most prolific Oligocene producing sands at Jennings. On the east flank of the dome, the Heywood Sand is the thickest and best-developed reservoir, with net pays in some wells exceeding 80 feet true vertical thickness.

Mineralized Miocene Sands
A mineralized Miocene sand section occurs on the northeast flank of Jennings dome (Fig. 8). This interval ranges in net thickness from 0 to 930 feet with the highest net thickness of mineralized section corresponding to the salt overhang on the east flank (Fig. 8). Without full log suites and paleontological sample descriptions, it can be difficult to distinguish caprock from mineralized sand. This has been a problematic zone of lost circulation for drillers. The mineralized Miocene sand is noted on the type log at an approximate depth of 5000 ft (Fig. 5). The juxtaposition of the thick caprock and Miocene sands contributed to the mineralization by allowing heavy brines from the salt-caprock contact to migrate into the porous Miocene sands and precipitate as calcite cement and pyrite.

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Fig. 6 - Regional geologic map showing the location of the Jennings Field between the Hackberry embayment and the Nodosaria embayment.

Fig. 7 - Gravity model of the salt stock and overhang.

3-D Model Courtesy of Getech, Inc.
Jennings Field is still producing today, with an annual production rate of approximately 200 thousand barrels of oil and 245 million cubic feet of gas (2000 statistics). The field has produced over 120 million barrels of oil and 51 billion cubic feet of gas. Over 900 wells have been drilled in the Jennings Field with over 180 companies and individuals as operators.

Jennings Field has seen limited drilling in the past five years, with fewer than 10 new wells. The dome has not been adequately evaluated seismically. Limited seismic control includes a 1996 3D seismic survey over the southern half of the dome and a few older 2D seismic lines.

The most comprehensive published studies of Jennings Field contain a wealth of information on the history and geology of the field. Four excellent studies are by Barton and Goodrich (1926), Halbouty (1935), Roach (1943), and Spencer and Miller (2001, 2001b).
From Spindletop to Jennings—Overcoming Drilling Challenges

W. Scott Heywood recruited the best available help in Elmer E. Dobbins to drill on a 15-acre lease near the Lucas gusher at Spindletop. The Heywood No. 2 was a rousing success and is historically recognized as the highest flowing well in Spindletop field at an estimated 96,000 bopd. Dobbins used the knowledge gained from Spindletop and applied it to Jennings in 1901, enabling the well to reach the greater depths (1882 feet) to penetrate productive oil sands.

A native of Minnesota, Dobbins had moved to Corsicana, Texas, in 1900 to practice artesian well drilling with the rotary bit, a newly introduced tool to the southwest. One of only a few artesian drillers, Dobbins, a mechanical engineer and machinist, had been recruited by Jim and Al Hamill to be the day driller for the first Lucas well at Spindletop in January 1901. An ever-present problem was with sand in these young, unconsolidated sediments. Percussion tools had failed to extend beyond depths of 420 feet at Spindletop. Sands would bind the fishtail bit and the drillpipe would stick. Mud and cuttings flowing back into the drillpipe during pump shut down to make pipe connections had also become a nuisance. The drillers on the Lucas well solved the problem by drilling a hole in the side of the casing and putting a sole from a boot to act as a flap or back-flow valve (now called a float valve). Enough water was put in to run the sand out of the side of the casing to get the drill pipe turning again. This spectacularly simple solution is credited with advancing the oil industry and the widespread use of the rotary method.

Dobbins and the Hamill brothers experienced numerous drilling complications requiring resourceful solutions. They had first used drilling mud at Spindletop and observed that the walls of the borehole seemed to hold up better with mud. A pit of muddied water was fenced in and cattle forced to walk through it. Another problem occurred when the well took a kick and 700 feet of drill pipe shot out, knocking the crown block off. Capping the well, which was not accomplished until the ninth day following a release of 800,000 barrels, was an enormous challenge as the 6-inch stream of oil shot 200 feet into the air. Each of the problems encountered on the Lucas well and the manner in which it was resolved was to be the basis for the “technology” that, in turn, made the Lucas well crew including Dobbins greatly in demand.

The advances at Spindletop were applied to the Jennings Oil Co. No. 1. The equipment was primitive: a 64 foot-high derrick, small drawworks, rotary, two pumps, fishtail bits, and a 40-hp boiler. Somehow the crew managed to drill to a depth of 1882 feet, far deeper than the Lucas well’s total depth of 1020 feet.

Evidence also points to Dobbins’ involvement in the development of a stainless steel sand screen at Jennings. The sand screen was critical to productive oil flow to prevent wells from “choking off” and was first introduced on the Jennings Oil Co. Jules Clement No. 2 well.

Dobbins had the distinction of being the day driller on Spindletop (the highest flow rate in the world ~100,000 bopd) and Jennings (Louisiana’s first oil well) at the ripe age of 25. Although well established and successful, Dobbins and his family left the Jennings area in 1906 because of a family illness. He sold his business to Oil City Iron Works, the equipment and technology with it.