



Jennings

Field

– the birthplace of

Louisiana's

Oil Industry –

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IT ALMOST DIDN'T HAPPEN

News of the spectacular oil gusher at Spindletop raced around the world and ignited the imagination of the entire nation. "Oil fever" spread throughout the region. After hearing that the Spindletop discovery was drilled in an area where gas had been observed seeping out of the ground, five Jennings businessmen created "The S.A. Spencer Company" and leased an area surrounding several gas seeps near Jennings that had been known to exist for many years.

The businessmen sent representatives to Beaumont, Texas, to hire an operator who had experience drilling for oil at Spindletop. There they met with W. Scott Heywood and described their Jennings prospect. Heywood was fascinated with their tale and immediately went to Jennings to personally inspect the prospect area, where he became convinced that there was oil underground. In a short time Heywood and the S.A. Spencer Company had organized the Jennings Oil Company and stock was sold to finance drilling the property.

The Jennings Oil Company contracted with Heywood Brothers and Dobbins to drill two exploratory wells, each to a depth of 1000 feet, in the hope of finding oil. Their first location was in a rice field near an area of high land in an otherwise flat prairie. The high ground and associated gas seeps were similar to the area surrounding the Spindletop Field discovery. However, the landowner, Jules Clement, had a change of heart and decided he didn't want any wells drilled on his property. He padlocked the fence gates and contacted a lawyer to cancel the oil lease. Clement complained that he didn't want his cattle breaking their legs by falling into the holes. He then explained

that he didn't know what to do with the oil if any was discovered. Heywood convinced Clement that his fears were unfounded and paid him generously in advance for any damage to his rice crop. Clement agreed to allow the drilling of a well.

After reaching a depth of 1000 feet in the first well with little sign of oil or gas, the contract called for the abandonment of the first well and the drilling of a second well to 1000 feet at another location. After all, 1000 feet had been deep enough to discover the tremendous oil gushers at Spindletop Field. But Heywood believed he needed to drill deeper.

Based on little more than a hunch, W. Scott Heywood convinced his investors, his drilling crew, and his own brothers to drill deeper. Instead of drilling two wells to a depth of 1000 feet each, Heywood persuaded the investors to change the contract to accept a single well drilled to a depth of 1500 feet, or deeper under his advisement. More drilling pipe was brought in and the well deepened.

After drilling to 1500 feet in depth, only a small showing of oil had been found for all their time, trouble, and expense. Many investors were bailing out, selling their \$1 shares in the venture for as little as 25¢. Heywood's associates, drilling crew, and even his own brothers were telling him to abandon the well.

Louisiana's oil industry began September 21, 1901, with the discovery of oil at Jennings Field. The Jules Clement No.1 Well was completed as a spectacular gusher on this day, spraying a fountain of oil into the air at a rate estimated to be 7000 barrels of oil per day. Just 9 months earlier, oil had been discovered near Beaumont, Texas, at Spindletop Field. Together, the Spindletop and Jennings discoveries ignited an "oil rush" of exploration and development activity throughout Texas and Louisiana.*

* One barrel = 42 gallons

Despite the urging of his family, friends and associates, Heywood's intuition told him to drill still deeper. At the age of 29, W. Scott Heywood was already a seasoned, experienced, and successful explorer. He had gone to Alaska in 1897 during the great Yukon gold rush, sinking a shaft and mining a profitable gold deposit. He was an oil finder, having successfully drilled for oil in California. When news broke of the Spindletop discovery, Heywood was one of the first "oil men" to reach Spindletop, and he drilled a number of the earliest successful oil wells. Heywood came to Jennings at the urging of investors and now he was convinced that the gas seeps were a sure sign of oil. Reluctantly, W. Scott Heywood's brothers once again agreed to support him in continuing. More drill pipe was delivered and the well was drilled deeper.

While drilling at 1700 feet, with only 4 feet left to go on his last piece of drilling pipe, Heywood drilled into the top of a sand showing good signs of oil. Heywood ordered additional drill pipe to continue drilling through the oil sand. The drill pipe arrived and drilling stopped after penetrating a total of 110 feet of the oil sand. Equipment was ordered to test and cap the well; Heywood had to wait several days for the equipment to arrive (Photo #1).

Finally, on September 21, 1901, the equipment had arrived and the well was ready for testing. The well was bailed to remove the drilling mud and draw oil into the well. Nothing happened. The well was bailed again. Finally, a 4 inch stream of oil came gushing out of the well, spewing oil over 100 feet into the air.



The Jules Clement No. 1 Well, the discovery well at Jennings Field. Photo taken before the well was completed as an oil gusher.

Louisiana's oil industry was born!

W. SCOTT HEYWOOD: MUSICIAN, GOLD PROSPECTOR, OIL MAN, STATESMAN

W. Scott Heywood was born May 21, 1872, in Cleveland, Ohio, the youngest of five children.

The son of a college professor and a school teacher, his father and sister died when he was 16 years old, leaving him and his brothers to care for their mother.

In his teens, Heywood was an accomplished musician, playing the cello and cornet at concerts, fairs, and resorts. In the fall of 1893, Heywood began a tour through the Midwest to California. While playing in Florence, Colorado, Heywood visited the Florence oil field and decided he wanted to get into the oil business.

When their concert company reached California, Heywood, who was recently married, decided to settle in California. Oil had recently been discovered there, so Heywood took a job teaching band and bought an insurance agency to make a living while trying to lease and promote oil deals.

After a concert in June 1897, Heywood heard of a man who had returned from Alaska with \$10,000 worth of gold after only a few months of panning. The man spoke of a large gold strike near the Yukon River in Alaska and said many claims were still open.

Heywood was fascinated by the man's story. Since he knew few people had heard the story and there had been no news in the press about the Klondike gold strike, Heywood thought he could reach Alaska and stake a claim before the news broke. After



The Heywood brothers. W. Scott Heywood is on the lower right.

Heywood gathered a year's supply of provisions and booked passage on a ship to Alaska. However, news of the gold strike hit the newspapers before they sailed, and Heywood found himself on a boat full of prospectors, horses, mules, and provisions headed for the Klondike gold fields.

After reaching Alaska, it took ten weeks by foot and a self-made boat for Heywood and his partners to reach the Klondike, only to find that all the gold claims had been staked for miles. However, they sub-leased a portion of a claim for a 50% royalty and were able to mine the claim for a small profit. Disappointed, Heywood took a job playing cornet with a band in a mining town; he left Alaska in September 1898.

Heywood returned to California and resumed his efforts in the oil business. He studied geology, leased acreage, drilled successful oil wells, and even started a profitable water company supplying water to drillers and the city of Coalinga.

When Heywood read in the newspaper of the Spindletop discovery, he immediately left for Beaumont, Texas, and arrived the same day the gusher had been capped and brought under control. He contracted Elmer Dobbins, the driller of the discovery well, secured a nearby lease, found an investor, and shortly thereafter drilled a gusher making 15,000 barrels of oil per day. Their second well was an even greater success. Heywood became recognized as one of the most successful contractors at Spindletop.

Based on his reputation and success at Spindletop, Heywood was approached to drill the Jennings prospect. At Jennings he recognized the gas seeps associated with a nearby hill as nearly identical to the conditions observed at Spindletop. Heywood drilled the Jennings discovery well and successfully developed the field, securing a large lease position, building pipelines and storage tanks, and contracting to sell the oil. He even invented a special screen to be used in an oil well to prevent loose sand from flowing into the wellbore and plugging the well.

In October 1908, Heywood returned to Alaska on a big-game hunting trip and retraced much of his travels to the Klondike gold fields. He visited Fairbanks and purchased a dogsled team so he could investigate a gold prospect eighty miles away. Gold fever struck again, and Heywood dug a mine shaft and began mining gold. He returned to California in the summer of 1910 after selling his gold operation for a profit.

After a brief retirement in California, he returned to Jennings in 1917 and drilled several wells at Jennings and elsewhere in Louisiana. At the urging of a friend, he ventured into Texas and was successful drilling at Borger Field and the Panhandle Field, both located near Amarillo, Texas.

Heywood returned to Jennings in 1927 and assisted Governor Huey P. Long in passing legislation to provide free schoolbooks for children. In 1932 Heywood was elected as state Senator for the Fourteenth Senatorial District of Louisiana. He was instrumental in establishing the Tax Reform Commission and in passing the homestead exemption.

***W. Scott Heywood
was a musician, pioneer,
prospector, oil man,
inventor, and legislator.
He had the wisdom and
strength to stand behind his
convictions and took
advantage of the rapid
changes and opportunities
of his time. He made a
tremendous contribution to
Louisiana and the nation.***

Early days at

Jennings Field

– a photo essay



FIRST OIL WELL

Jennings Oil Co. No. 1 Jules Clement, was completed at Evangeline, 5 miles northeast Sept. 21, 1901 by W. Scott Heywood and Associates. This was the start of the vital Louisiana oil and gas industry.

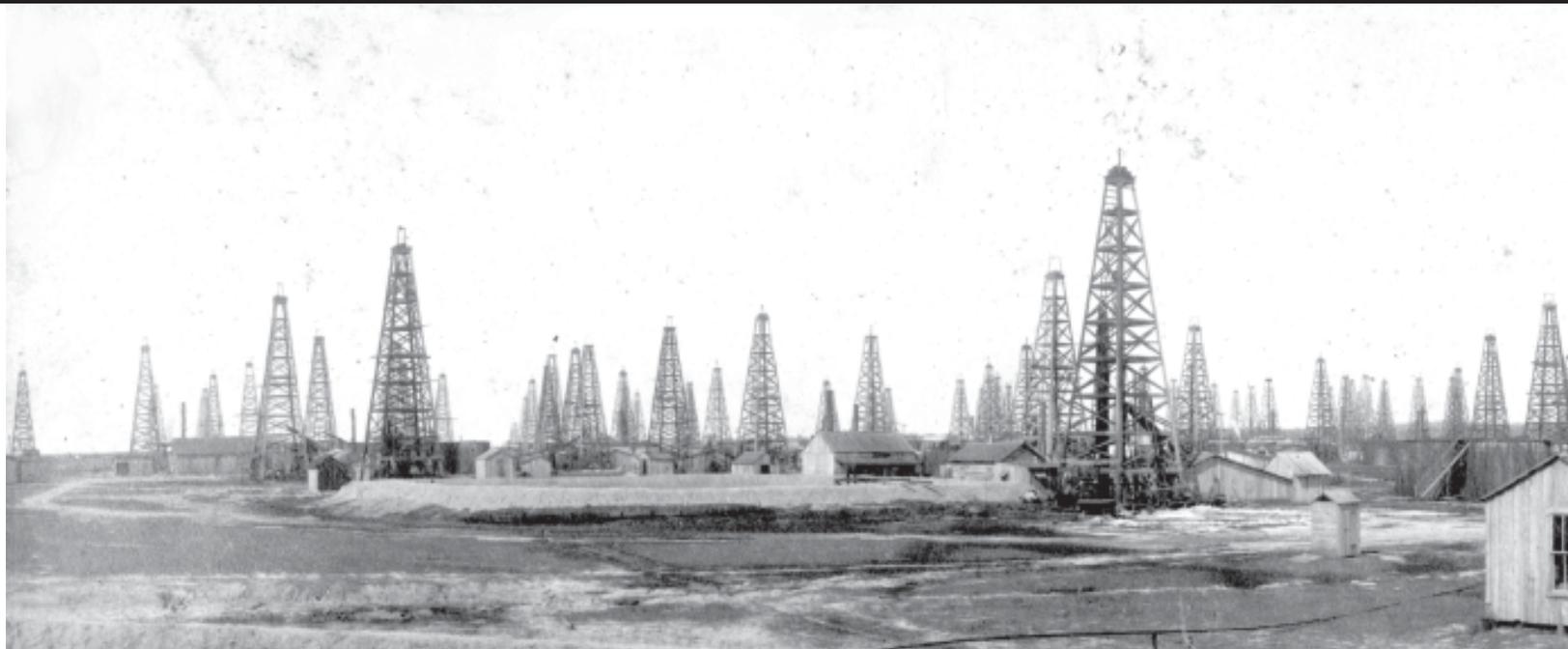
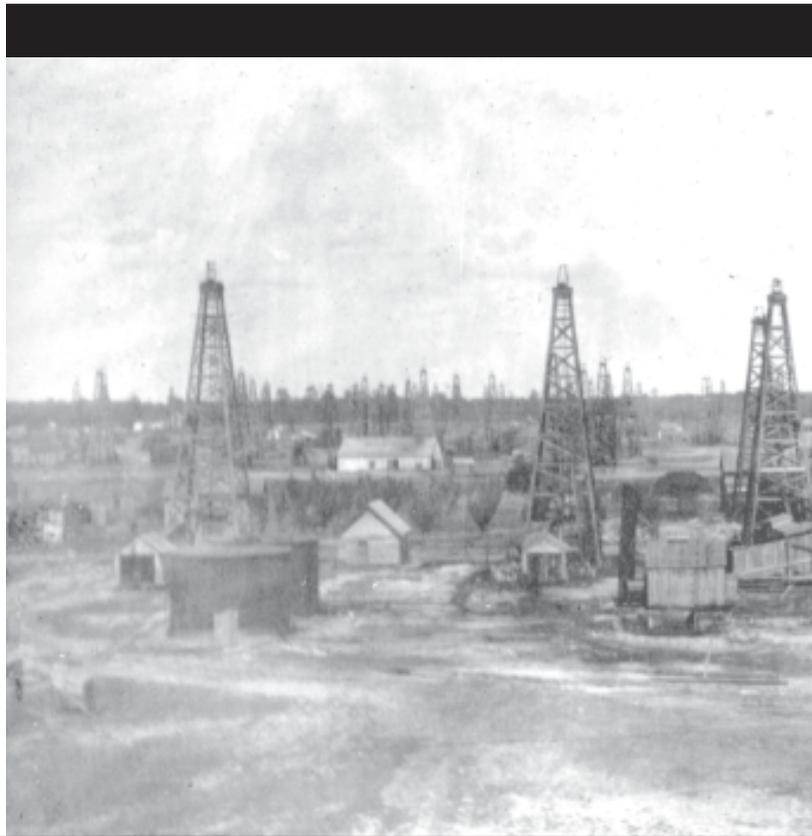


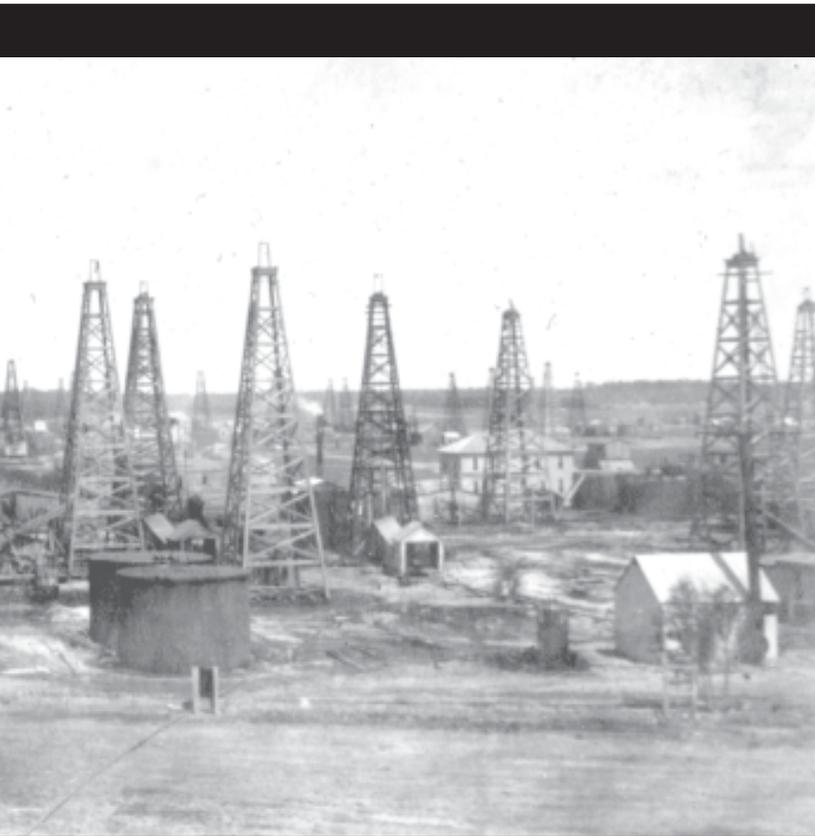
No. 2.

An oil-soaked drilling crew poses while a 4 inch stream of oil gushes in the background. The notation on the photograph indicates this is the Jennings Oil Company Number 2 Well, probably taken late 1901 or early 1902. Pictured is W. Scott Heywood (far right), oil pioneer, and Elmer Dobbins (center), one of the drillers of the original Spindletop discovery in Texas.

- 1. CHAS. NOBLE
- 2. E. E. DOBBINS
- 3. W. SCOTT HEYWOOD

Extensive early development at Jennings Field. Note several oil storage tanks in the foreground.

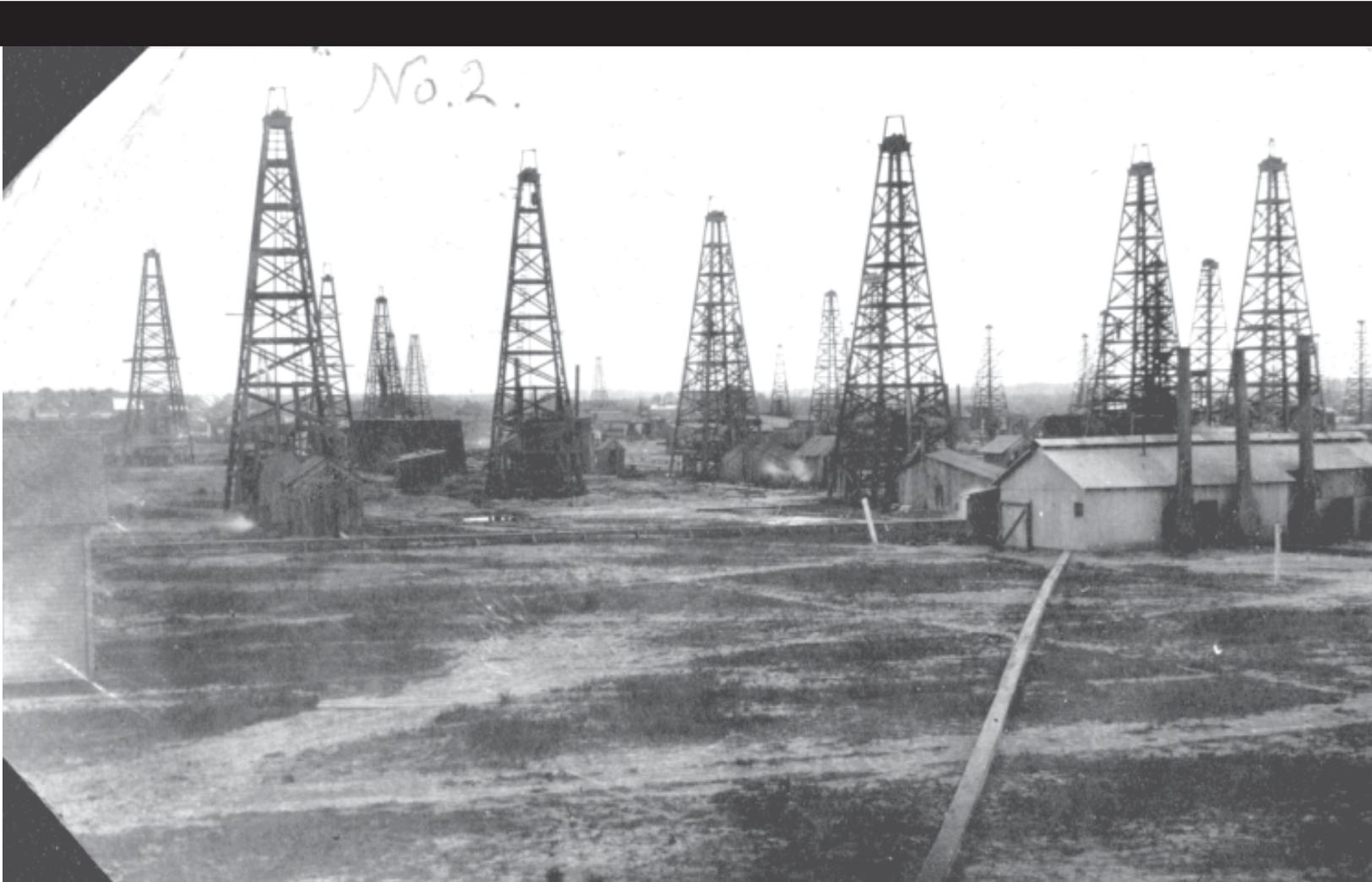


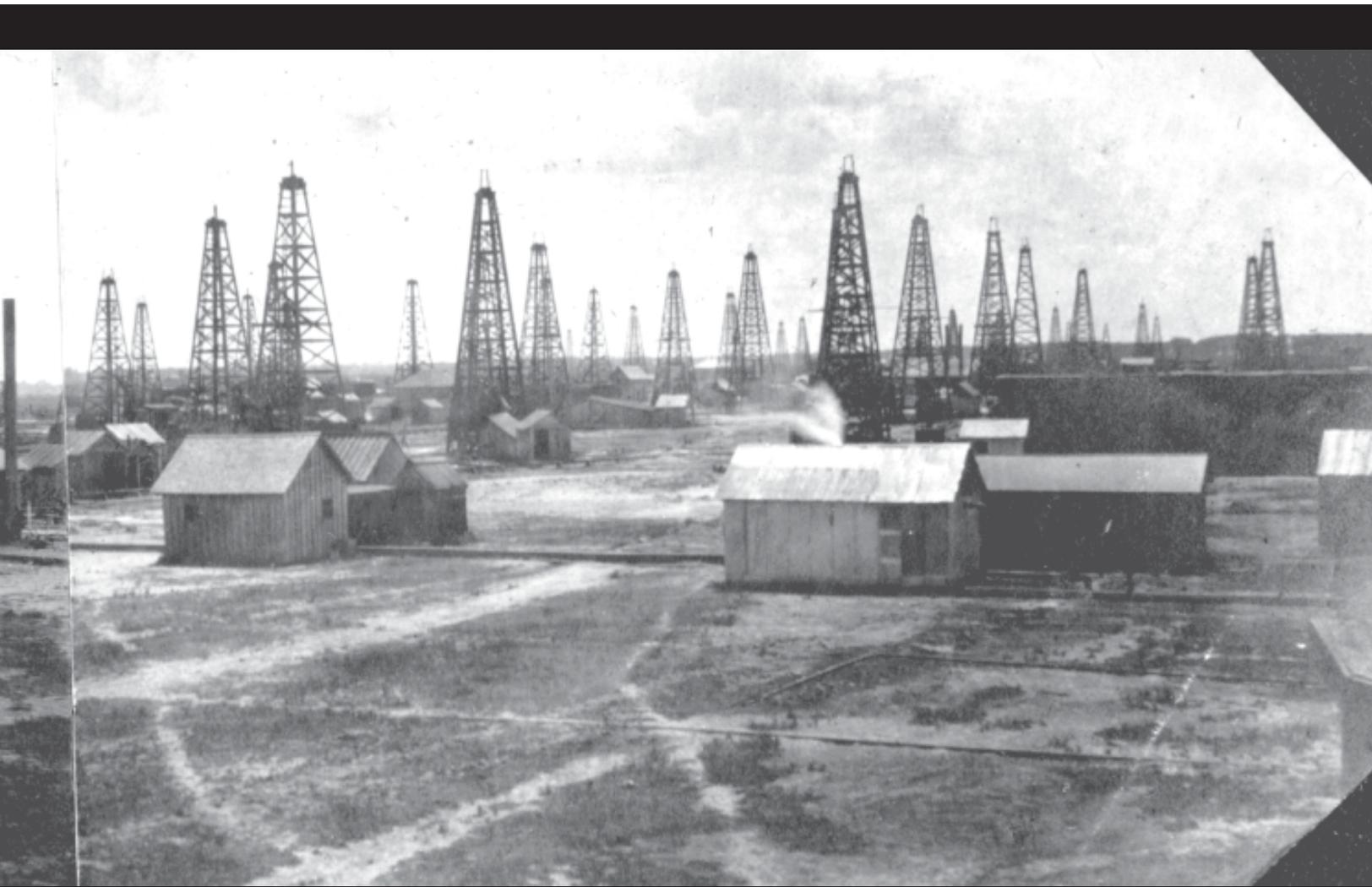


Early photograph of Jennings Field. A large earthen reservoir is visible to the left center, and an oil-filled reservoir is visible immediately to the right, partially obscured by the cabin in the center foreground.

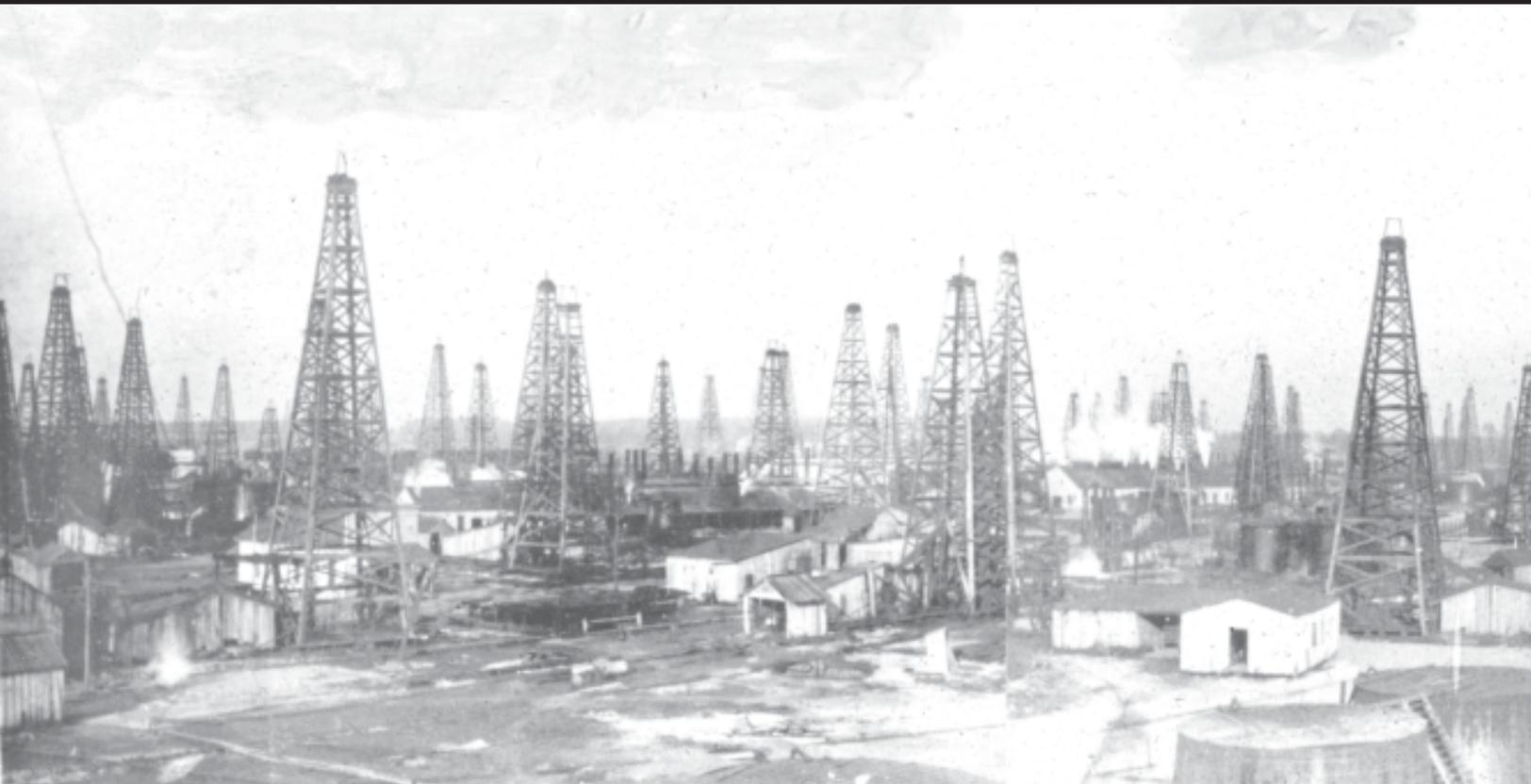


Early photograph of Jennings Field,





with above-ground pipelines and raised walkways.





No. 1.



Early development of Jennings Field





*Note the laundry hanging out to dry in the right center of the photograph.
Workers apparently set up living quarters next to the field.*

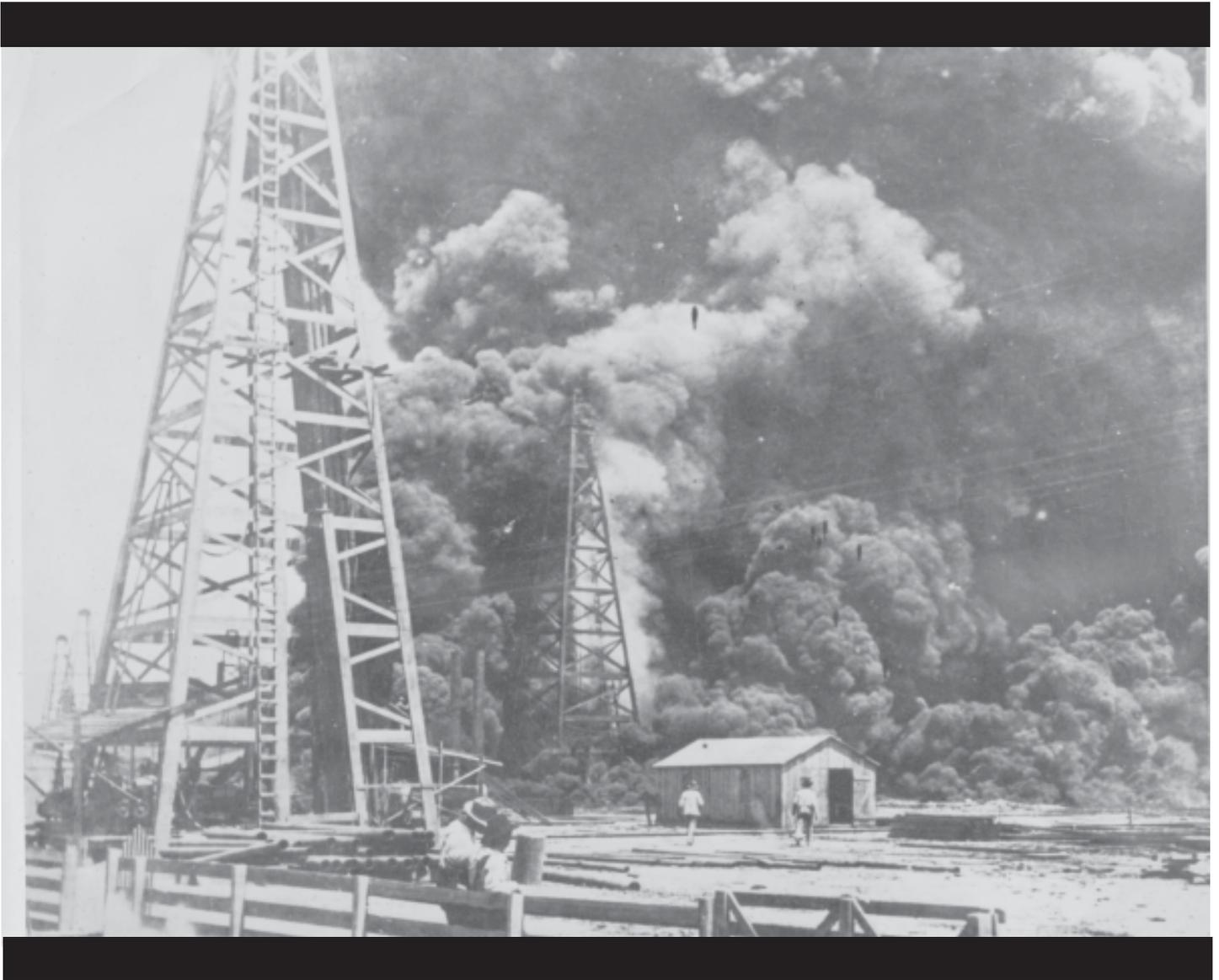


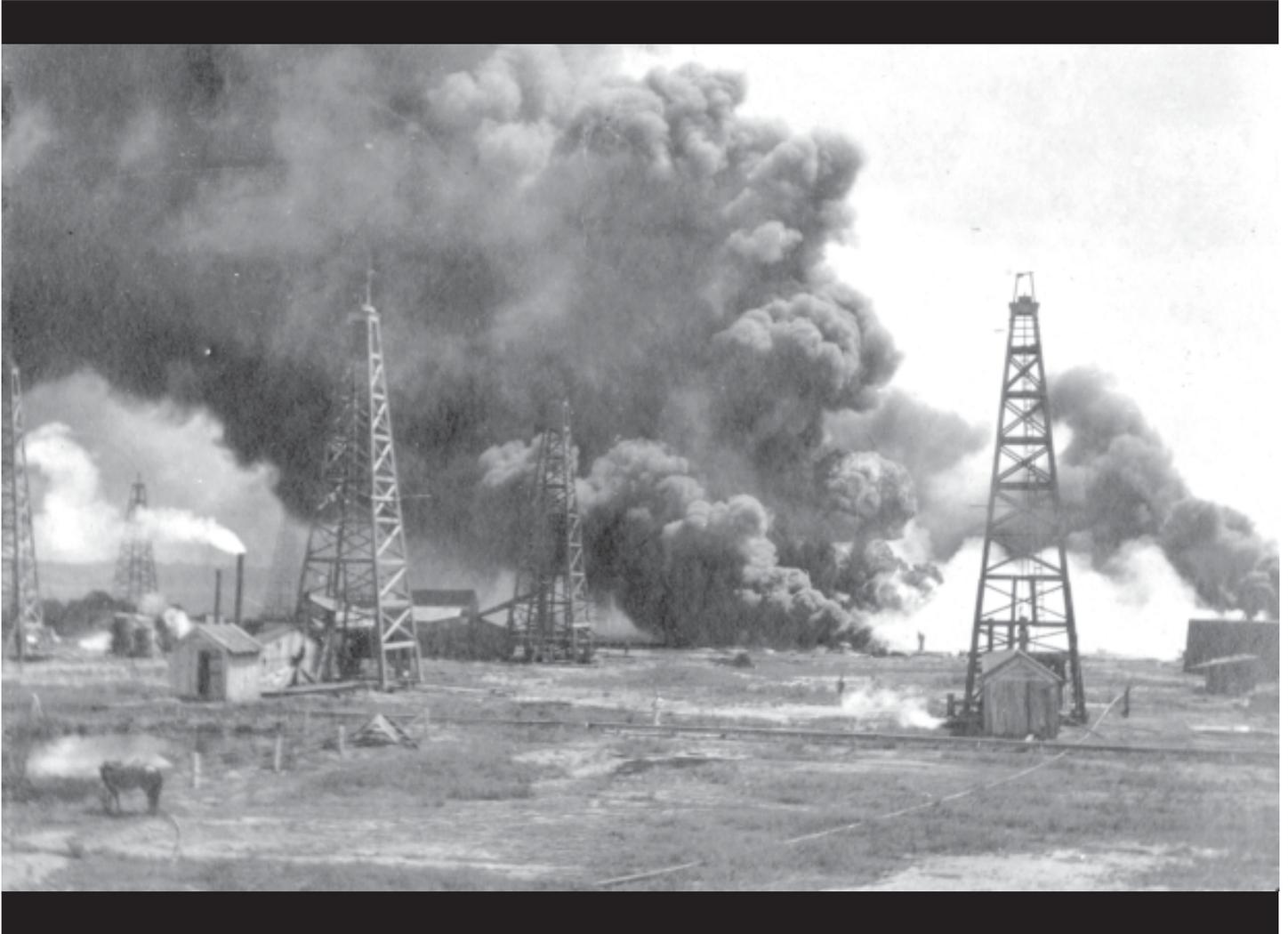
*Rapid development at Jennings field, early 1900's.
Note the horses and buggy in the foreground. The large
number of derricks show the necessity for each leaseholder to
drill their own well to prevent the draining of oil from the
lease by an adjacent well. Today conservation laws provide
for the orderly development of oil and gas fields and prevent
the drilling of unnecessary wells.*

On fire, probably the Jennings Oil Company No. 2 Well, which caught fire by lightning after producing for a short time. Fire was a constant threat to the early industry due to frequent lightning and the open flow and storage of oil. A successful method to extinguish oil fires was to choke out the fire with steam. After burning for 9 days, this fire was extinguished by dousing with large volumes of water which quickly turned to steam in the extreme heat.



Oil fire,



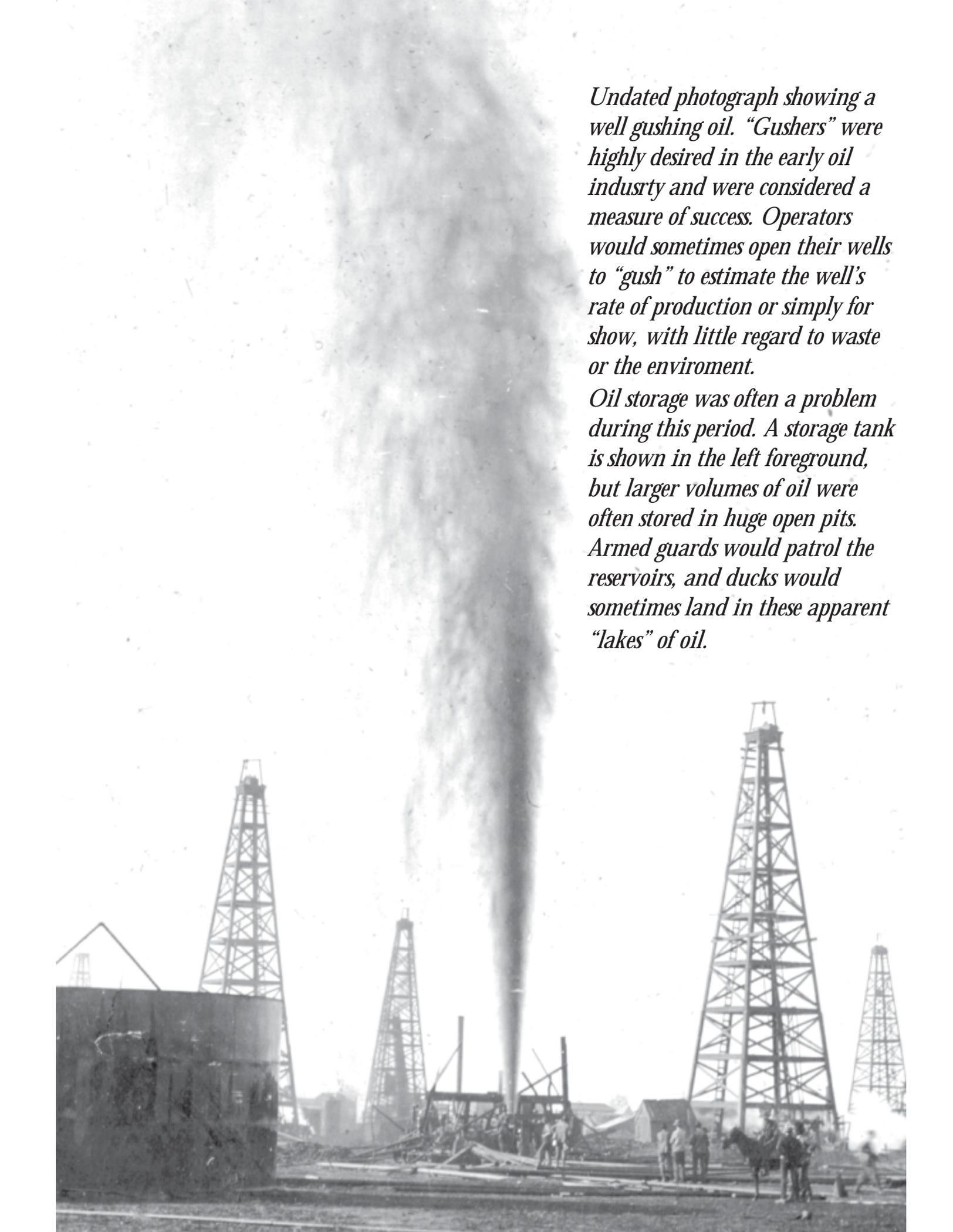


probably the Jennings No. 2 Well.



Oil fire, probably Jennings No. 2 Well.





Undated photograph showing a well gushing oil. "Gushers" were highly desired in the early oil industry and were considered a measure of success. Operators would sometimes open their wells to "gush" to estimate the well's rate of production or simply for show, with little regard to waste or the environment.

Oil storage was often a problem during this period. A storage tank is shown in the left foreground, but larger volumes of oil were often stored in huge open pits. Armed guards would patrol the reservoirs, and ducks would sometimes land in these apparent "lakes" of oil.



GEOLOGY

Originally called Evangeline Field, Jennings Field is located 6 miles northeast of the town of Jennings, Louisiana (Figure 1). The field was formed by a salt dome that created an anticline or arch in the sediments above the salt which served as a trap for oil and gas. Additional traps for oil and gas were created as deeper sediment layers were bent upwards next to the salt as the salt pierced through the layers. In addition to the uplifting and piercing of sediments by the salt, the uplift also created faults or breaks in the sediment layers.

A map of the top of the salt shows that the Jennings salt dome is a general oval shape in a northwest to southeast orientation (Figure 2). The crest of the salt is located toward the northwest end of the dome at an approximate depth of 3000 feet. Three possible salt overhangs, created when shallow salt extends out over the deeper salt face, are present on the northeast flank of the dome (Figures 2, 3, & 4). Salt overhangs often provide traps for oil and gas.

The initial discovery at Jennings Field was oil trapped in a sandstone layer lying above the salt dome. The main producing oil sands lying above the salt occur at depths of 1800 to 2100 feet, however, oil has been found from 100 to 2400 feet in depth. For the first 27 years of production at Jennings Field, all the oil produced came from these shallow sands above the salt dome (Figure 5).

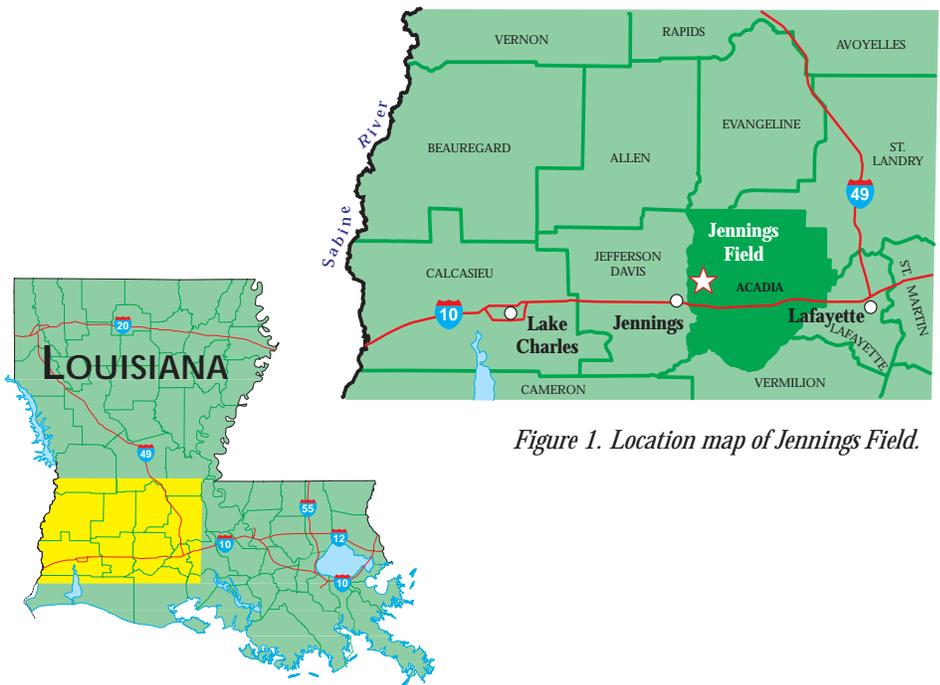
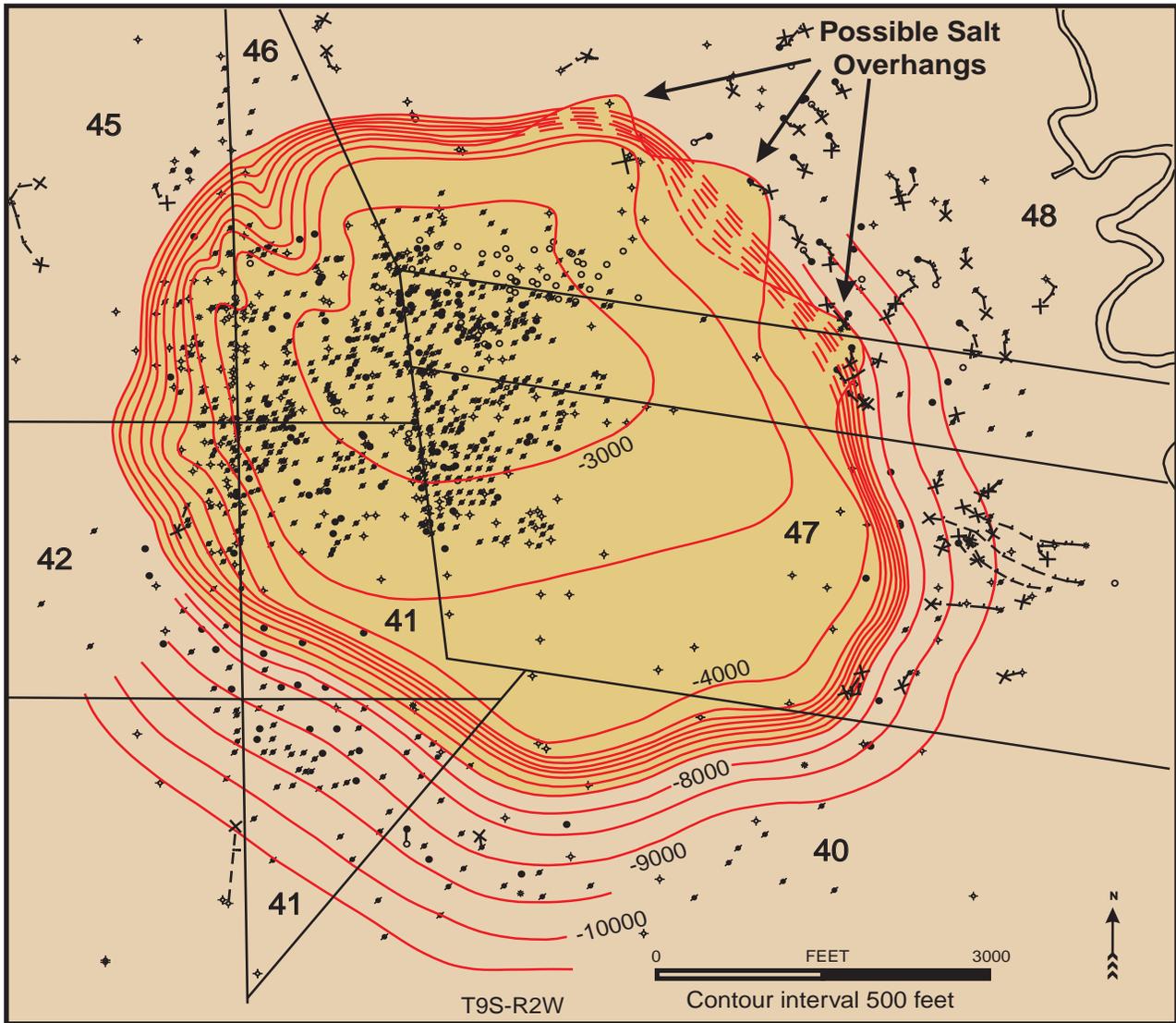


Figure 1. Location map of Jennings Field.

Top of Salt Dome, Jennings Field



(Spencer and Miller, 2001b)

Figure 2. Contour map of Jennings Field. The small black symbols show the location of oil wells. The orange lines show the depth to the top of the salt dome.

The earliest wells were located near the shallow crest of the dome and produced oil from sands lying above the salt. Later wells produced from sands on the flank of the salt dome. On the northeast flank of the dome are 3 possible salt overhangs where the shallow salt extends beyond or "hangs over" the deeper salt body. Overhangs often provide additional traps for oil and gas.

AMOCO-Crowley Oil & Mineral No. 152

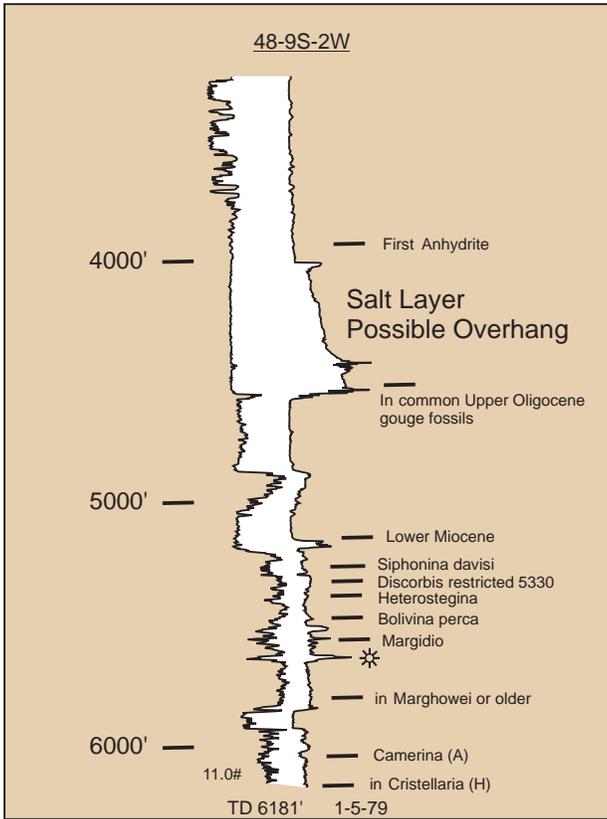


Figure 3. A portion of the electric log for a well drilled on the northeast flank of the Jennings salt dome showing a possible salt overhang. This well drilled through a sand and shale section, penetrated a layer of salt at a depth of approximately 4000-4500 feet and re-entered a sand and shale section below.

(Spencer and Miller, 2001b)

In 1928, the Yount-Lee Oil Company discovered oil trapped in deeper sands on the flank of the dome. A type electric log of the deeper sand section adjacent to the salt dome is shown in Figure 6. Some of the oil sands were given names to help identify them within the field, such as the “Heywood Sand”, “Leckelt Sand”, and “Arnaudet Sand” (Figure 6). This occurrence of oil and gas on the flank of the salt dome started a new period of exploration activity at Jennings Field. Activity boomed and oil production surged once again as these new oil reservoirs trapped next to the salt face were discovered and produced (Figure 5).

3-D Gravity Model: Jennings Dome

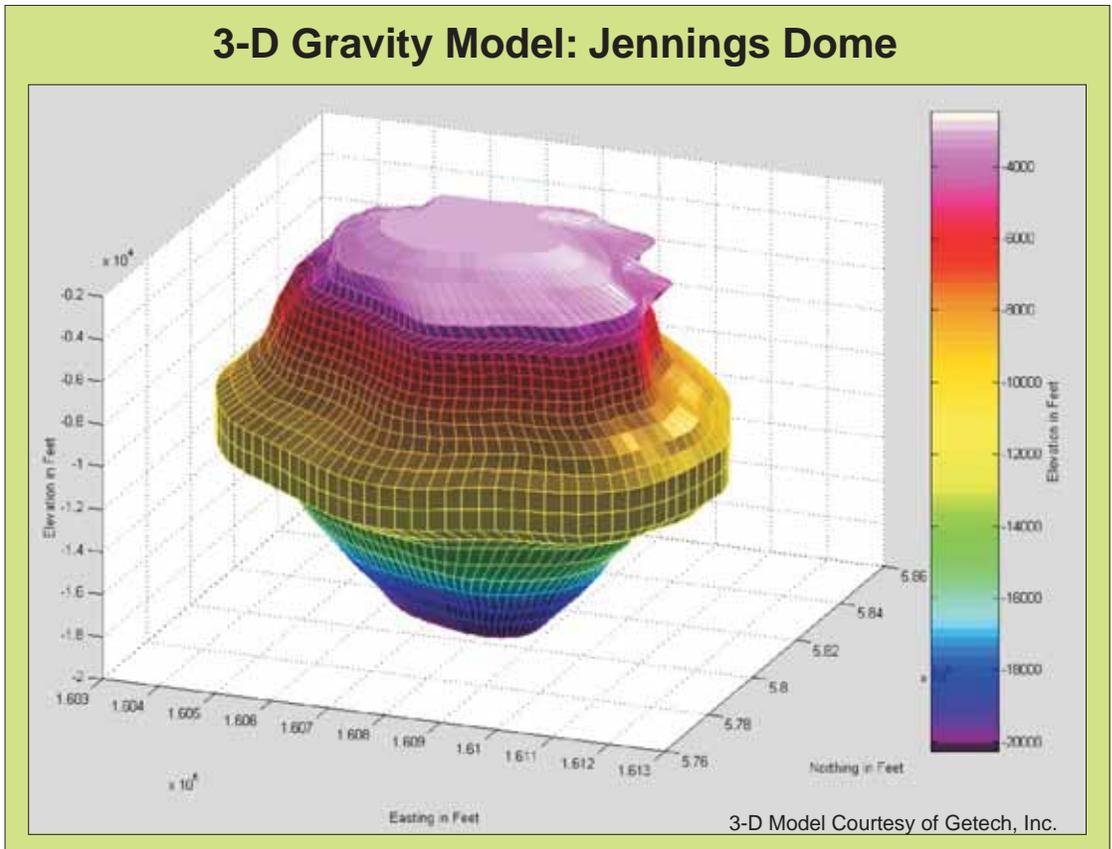
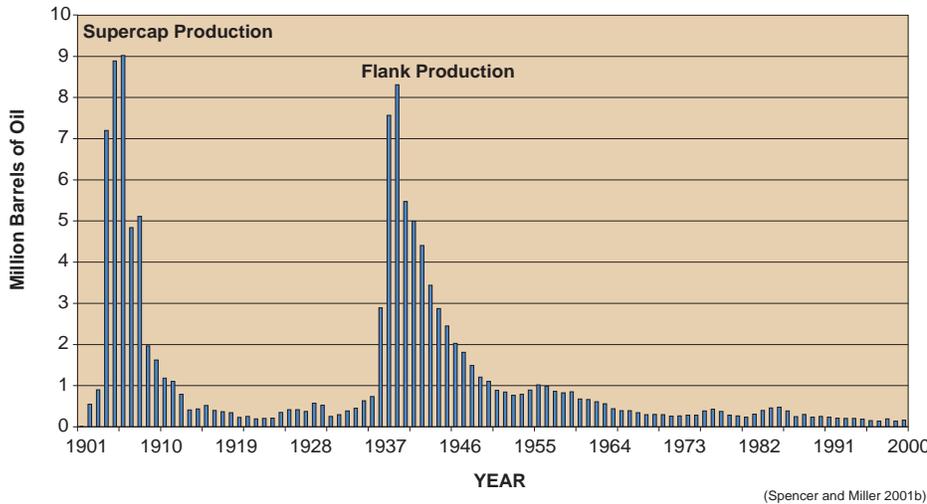


Figure 4. Computer generated 3-D image of the Jennings salt dome. Surface measurements of the earth's gravity were used to create this image. Note the shallow salt overhangs on the northeast flank.

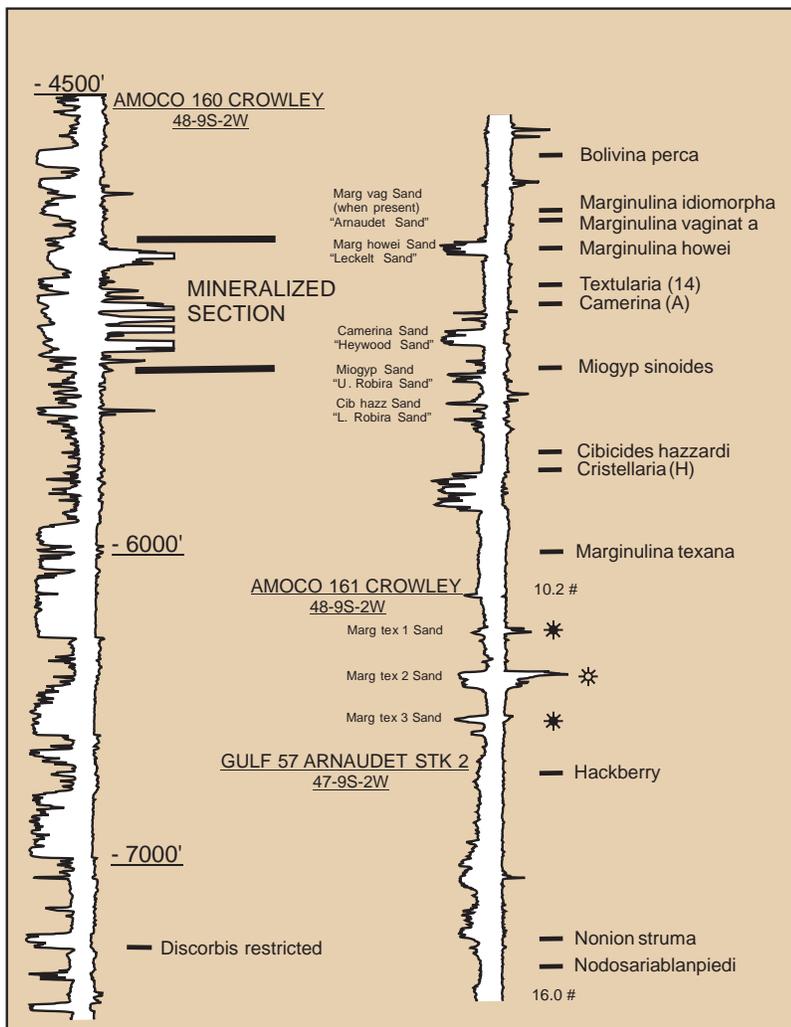
Oil Production: Jennings Field



(Spencer and Miller 2001b)

Figure 5. Production at Jennings Field increased rapidly in the early 1900's as operators rushed to drill "gushers". This early "Supercap Production" was from shallow sands lying above the crest of the salt dome. Production increased again in the late 1930's when deeper oil sands were found on the flank of the salt dome. ("Flank Production"). The field continues to produce oil and gas today.

Type Log: Jennings Field



(Spencer and Miller, 2001b)

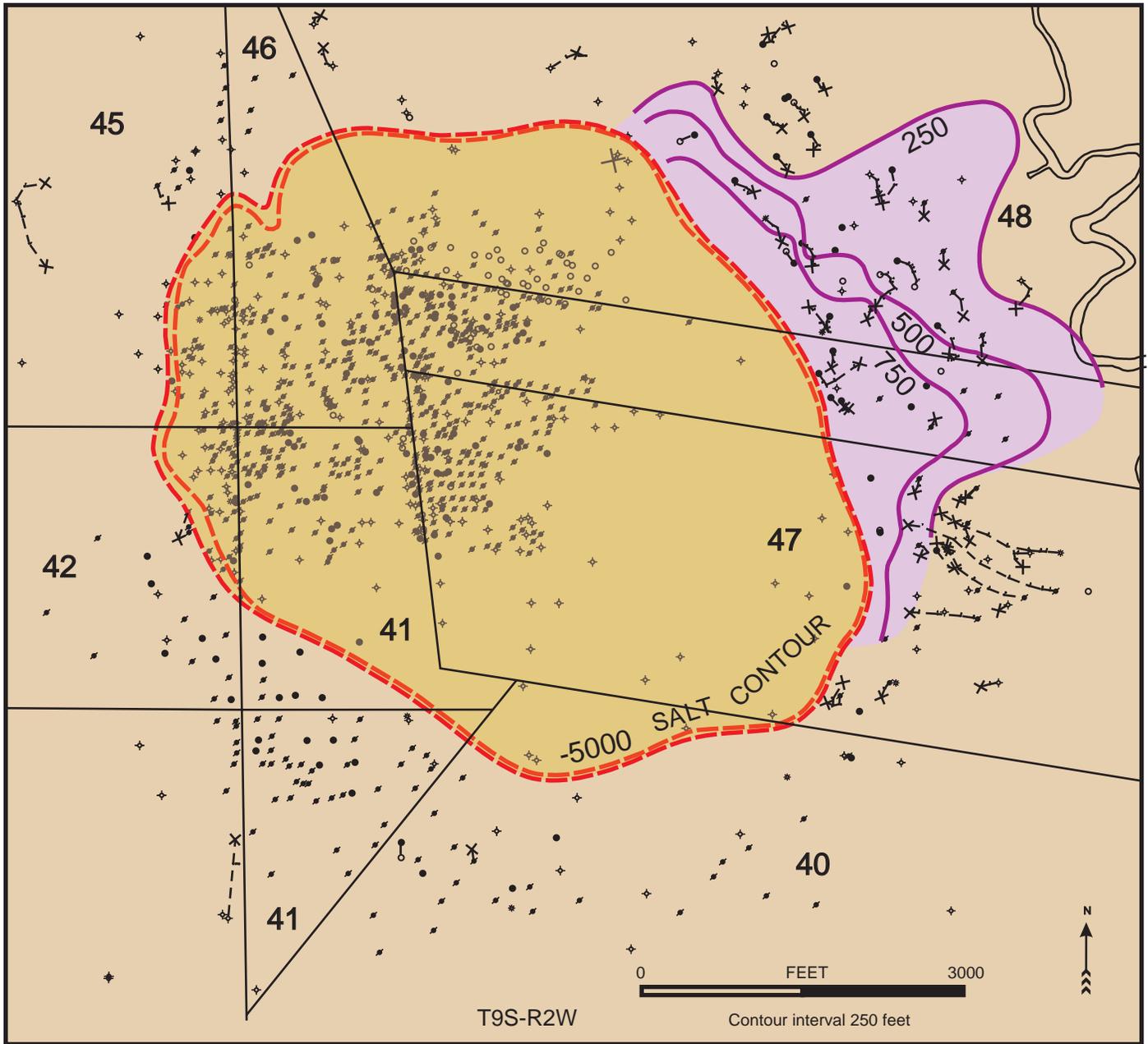
A mineralized sand section is present on the northeast flank of the Jennings dome and is noted on the type log at a depth of approximately 5000 feet (Figure 6). The mineralized section is a series of sands that have been cemented by the formation of minerals, mainly calcite and pyrite. The minerals probably precipitated from groundwater solutions that rose along the flank of the salt dome and flowed into the sands. Mineralized sands or zones can be very hard to drill through and often pose problems for drillers. A map of the thickness and distribution of the mineralized section shows it thickening toward the salt face (Figure 7).

Jennings Field has been a prolific producer, with total production of 120 million barrels of oil and 45 billion cubic feet of gas since 1901. Through 1920, the production from Jennings Field alone accounted for 67% of the total oil and gas production for the entire state of Louisiana. Jennings Field continues to produce oil and gas today and is still an area of drilling and development activity. Total production in year 2000 amounted to 200 thousand barrels of oil and 245 thousand cubic feet of gas.

Figure 6. This is a type log of the Jennings Field showing the deeper sand section present adjacent to the salt dome.

Note the mineralized sand section at approximately 5000 feet. These are sands which have been cemented by the formation of minerals, chiefly calcite and pyrite. The minerals probably precipitated from groundwater solutions that rose along the flank of the salt dome and flowed into sands. These mineralized sands or zones can be very hard and pose problems for drillers.

Net Mineralized Sand Map



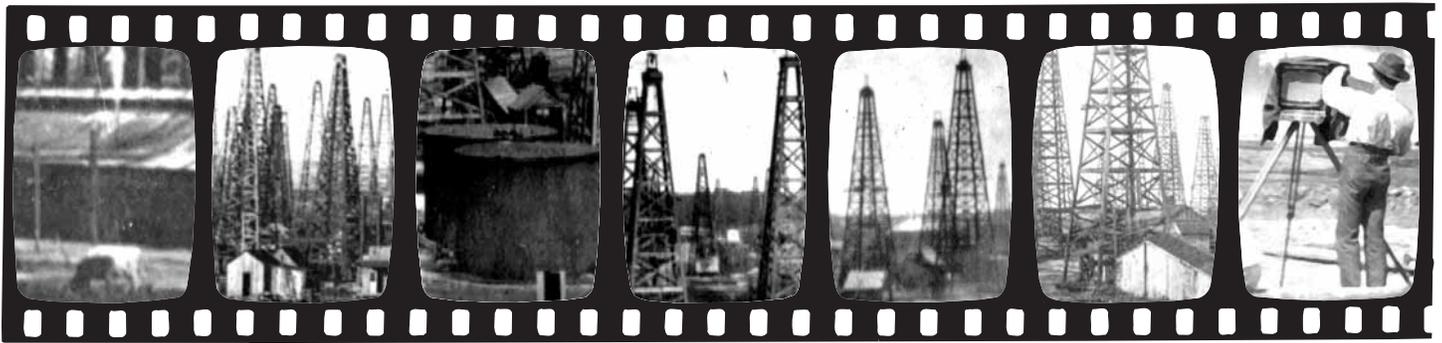
(Spencer and Miller, 2001b)

Figure 7. Contour map showing location and thickness of the mineralized section (in purple). The orange lines show the location of the salt face at depths of 5000 feet and 5500 feet. The mineralized section is observed only on the east and northeast flank of the salt dome, and thickens near the salt face.

REFERENCES

- Barton, Donald C., and R.H. Goodrich, 1926, The Jennings Oil Field, Acadia Parish: American Association of Petroleum Geologists Bulletin, v. 10, p. 72-92
- Cossey, Stephen P.J., and Richard E. Jacobs, 1992, Oligocene Hackberry Formation of southwest Louisiana: sequence stratigraphy, sedimentology, and hydrocarbon potential: American Association of Petroleum Geologists Bulletin, v. 76, p. 589-606.
- Franks, Kenny A., and Paul F. Lambert, 1982, Early Louisiana and Arkansas Oil, a Photographic History 1901-1946: College Station, Texas A&M University Press, 243 pp.
- Halbouty, M.T., 1935, Geology and geophysics of the south-east flank of Jennings Dome, Acadia Parish, Louisiana, with special reference to overhangs: American Association of Petroleum Geologists Bulletin, v. 19, p. 1308-29.
- Halbouty, M.T., 1967, Salt Domes, Gulf Region, United States and Mexico: Houston, Gulf Publishing Co., 425 pp.
- Heywood, W. Scott, 1941, The Autobiography of an Oil Man: Oil, Pictorial Trade Journal of the Petroleum Industry, v.1, no.3-9, June 1941.
- Roach, C.B., 1943, Subsurface study of Jennings Field, Acadia Parish, Louisiana: American Association of Petroleum Geologists Bulletin, v. 27, p. 1102-1122.
- Spencer, J.A., and C.L. Sharpe, 1993, Deep-seated salt sheet in eastern Calcasieu Parish, Louisiana: Gulf Coast Association of Geological Societies Transactions, v. 43, p. 363-371.
- Spencer, Jeff, and Byron Miller, 2001a, Jennings Field: 100 Years of Exploration in Louisiana: American Association of Petroleum Geologists 2001 Annual Convention Program Book, p. A190.
- Spencer, Jeff A., and Byron Miller, 2001b, 100 Years of Exploration and Production at Jennings Field: Gulf Coast Association of Geological Societies Transactions, v. 51.

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