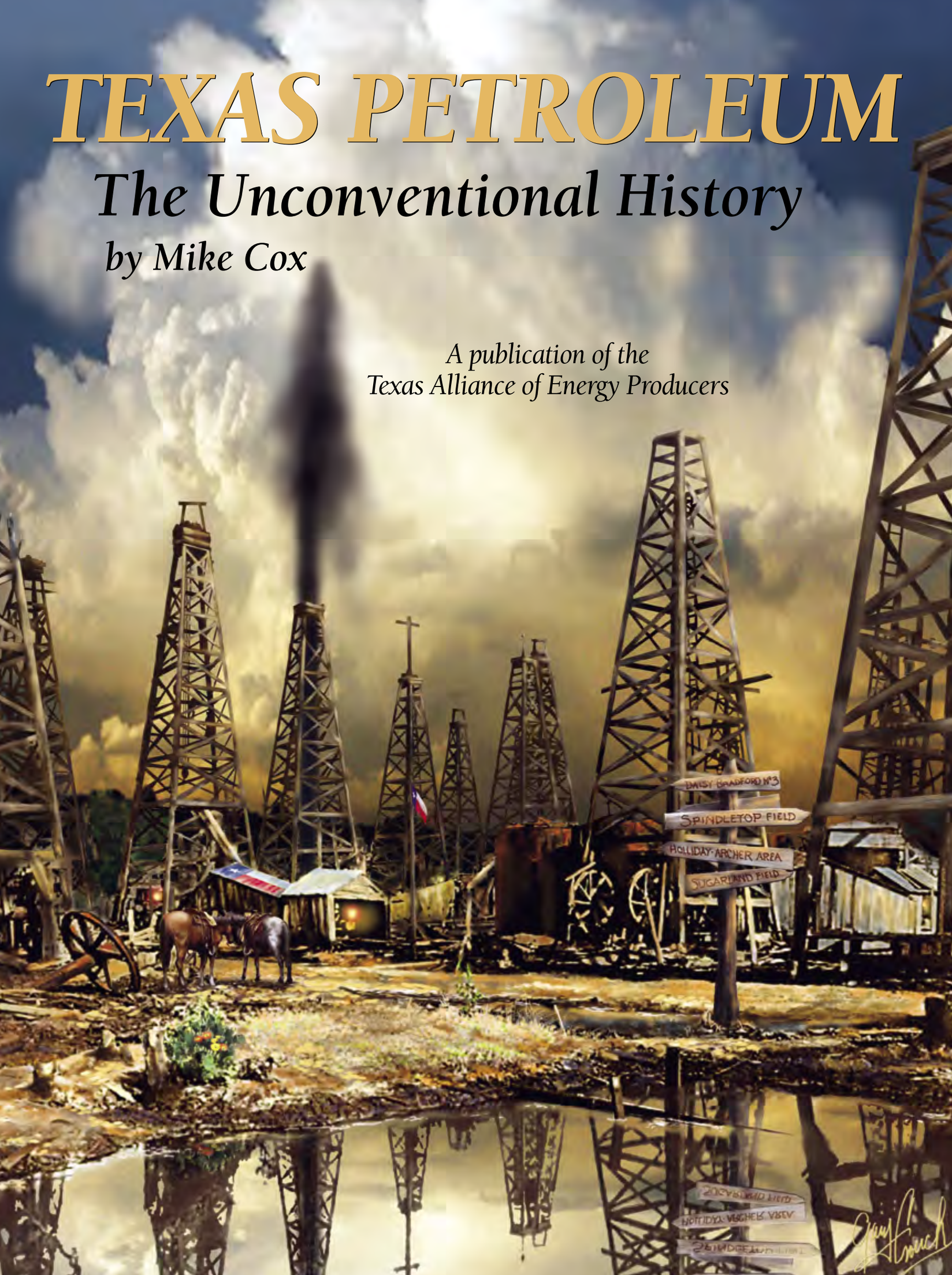
TEXAS PETROLEUM

The Unconventional History

by Mike Cox

A publication of the
Texas Alliance of Energy Producers



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Introduction

Born through dedication and stubbornness, the oil and gas industry in Texas has become an economic powerhouse that delivers jobs and prosperity to millions of people throughout the world.

The story of petroleum is written in the heartaches of failure as well as the excitement of success.

It is a story of drilling a hole deep beneath the Earth with the hope of producing hydrocarbons. The history of petroleum is controversial, but over time the value of crude oil and natural gas became important as a transportation fuel, electric power generation and so much more.

U.S. military forces used oil and gas to win World War I and II. Great Britain Prime Minister Winston Churchill proclaimed that the "Allies floated to victory on a sea of East Texas oil."

Nations used the "oil weapon" in the 1970s in an attempt to influence U.S. foreign policy.

This is a story of an unconventional industry that has used unconventional technology and delivered unconventional results. It is a story of risk takers that have achieved greatness.

Alex Mills
President and Chief of Staff
Texas Alliance of Energy Producers

Author's Note

I remember, when I was a teenager in the early 1960s, traveling with my granddad to Albany to do some camping and fishing. To get there from Austin, not that I paid much attention to maps in those days, we had to drive through Breckenridge. Even as a kid, I was struck by the fact that it boasted such a tall building for such a small town. That's because Breckenridge used to be a wild and woolly oil boom town, my granddad told me. And then, inveterate story teller that he was, he went on to regale me with his recollections of the oil boom days in West Texas. The reason he knew so much about it is because he was there. As a young reporter, he covered the Ranger oil boom in 1917. He worked for a long-defunct oil field newspaper based in Fort Worth, and also later was city editor of the also defunct *Fort Worth Press*.

Listening to Granddad's stories, it wasn't too hard for me to imagine what it had been like in those early days of oil exploration and production in West Texas. Thanks to that early introduction, I've been interested in Texas oil and gas ever since. Alas, the only money I've ever made off hydrocarbons in Texas is from writing about them, but at least it's been fun.

In researching and writing this book, my only frustration was in not being able to tell the story of Texas's rich petroleum industry history in as much depth as I would have liked. There are enough good stories, and fascinating characters, to fill a multi-volume set of books. So, in reading this book, please keep in mind that it is only what I hope you will find to be an interesting overview of the industry story in Texas.

Finally, I'd like to thank Beverly Waak, a long-time reader and lover of books who grew up in the refinery community of Baytown. She graciously read the manuscript for this book, gently pointing out typos, errors and areas needing clarification. She also took the author's photo. Truly, when I met Beverly, I struck it rich.

Here's hoping you enjoy this exploration of the industry that helped build Texas and is still at it today.

Mike Cox
Austin, Texas

PROLOGUE

When Virginia-born Enoch Horton brought his wife Martha and 10 of their 11 children to the Republic of Texas from Missouri in November 1844, all he sought was a piece of good land where he could raise his children and make a living.

The 640-acre tract he obtained through the St. Louis-based Texas Land and Emigration Company, whose Texas venture was known as the Peters Colony, lay adjacent to a shallow stretch of the West Fork of the Trinity River, about six miles west of a new settlement called Dallas. Other travelers found it convenient to splash across the river near where Horton had built his cabin, and as more newcomers moved into North Texas, the crossing became a well-used ford. When fall or spring rains raised the Trinity too high for horses and wagons, Horton took in a little money ferrying people and freight across the river.

One day when Horton saw an eagle's nest high in a nearby tree, he decided to call the spot Eagle Ford. A man that observant may have noticed a multi-layered outcropping of shiny, dark gray rock exposed along the bank of the river, but he could not have envisioned the future significance of those mud rocks and the vast underground formation—saturated with oil and gas—that stretched for hundreds of miles on a down-tilting plane all the way to the Mexican border. But long after Enoch Horton's time, long after his children's time and even their children's time, a huge chunk of subterranean Texas that came to be called the Eagle Ford Shale, a formation dating back to the Cenozoic era, would transform the state, the nation and the world.

In the first decade of the 21st century, an obscure, two-word place name in North Texas—Eagle Ford—became synonymous with a long, wide swath of oil production in South Texas that helped make the United States the world's top energy producer, eclipsing even the oil-sodden emirate of Saudi Arabia.

But that's getting ahead of the story. Before the Eagle Ford petroleum play changed everything, Texas had already seen one transformation caused by oil and gas—decades of boom and bust that gave the state the third component of an economic triad that, in addition to cotton and cattle, defined Texas until the development of the high tech industry became the fourth leg of the table.

Far more constant than the erratic value of a barrel of crude oil or the life and death cycle of oil and gas wells, oil and gas fields, and boom towns, has been the petroleum industry's constant quest for better ways to get the job done. Since the 1890s, Texas has often been on the cutting edge of petroleum-related technology. Less tangible than stacks of patents for drill bits, blowout preventers and pump jacks is a way of thinking that influenced many pioneer oilmen and still holds today—a willingness to take a chance on something most others see as foolhardy if not downright impossible. Many a Texan gambled and lost at the oil game, but many others risked everything and kept drilling or kept experimenting with new techniques until they struck oil, either literally or figuratively.

"Wildcatters," as the History Channel's *Empires of Industry* series put it, "made and lost fortunes searching Texas for black gold. Like the gold rush prospectors of an earlier generation, these adventurers dreamed of wresting fortunes from the earth. Their target was oil, and their destination

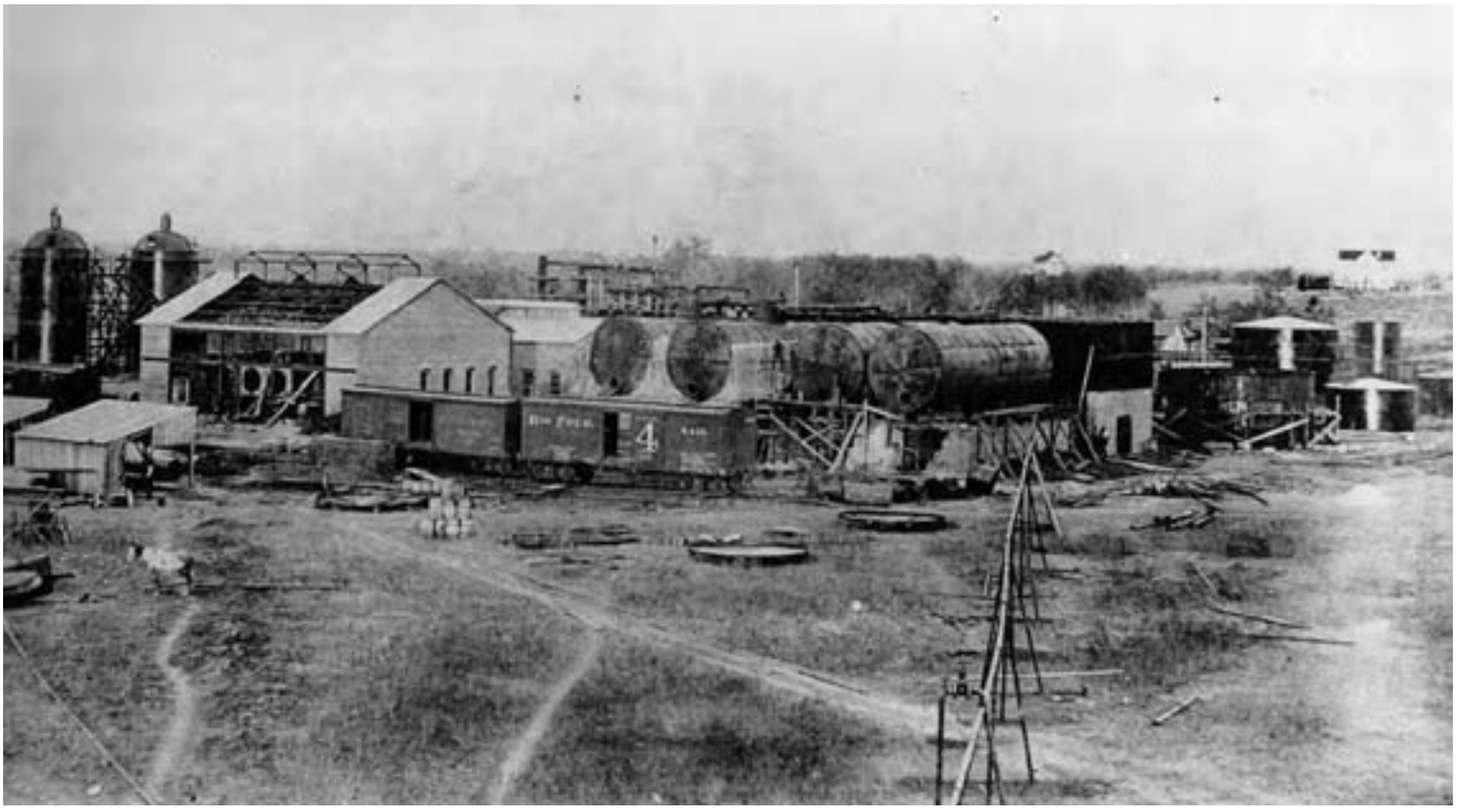
was Texas. Part gambler, part geologist, a wildcatter risked everything to drill a hole in the ground in the hopes of becoming an instant millionaire. Wildcatters turned sleepy hamlets into boomtowns, earned and lost fortunes, and enabled America's transformation into a nation of cars and drivers."

The oil industry not only helped build Texas, but the money that discoveries on 1.4 million acres of University of Texas-owned land in West Texas has brought in over the years has helped educate generations of young Texans. In 2013 the university made $1 billion from oil and gas. In addition, tax revenue coming from oil companies helped fund government services and build and maintain infrastructure. Beyond that, the philanthropic use of oil money has gone to support everything from health care to scientific research to libraries and the fine arts. Invested oil money even gave Texas professional football.

"The money received from oil has contributed more than any single source to the building up of Texas's modern roads, hotels, office buildings, and universities, and it has contributed more than any other factor to make it possible for the whole United States to have low-priced motor fuel and to produce and to drive more automobiles than any other nation," University of Texas petroleum engineering professor Frederick B. Plummer wrote in 1937.

Big oil is a Texas icon supported by hardworking men and women and a colorful cast of wheeler-dealer characters – past and present, real and fictional – whose story alone could fill volumes. Writers have produced a sizable field of oilfield literature, from works of history and biography to technical studies and a tank truck of fiction. Hollywood has added to the mix, with movies like the 1941 Clark Gable and Spencer Tracy classic "Boomtown" and an even bigger film, 1956's "Giant" with James Dean and Elizabeth Taylor.

This is the story of Texas oil and gas, an unconventional history of an industry that has benefited the state, the nation, and the world.



CHAPTER 1

EARLY OIL

Somewhere between present Sabine Pass and High Island, in July 1543, survivors of Hernando Desoto's ill-fated expedition to further explore the New World for Spain noted a thick, gooey substance floating in the brackish coastal water. Later referring to it as *cope*, the Spaniards—forced inland by a storm in the Gulf of Mexico—used the pitch-like material to caulk the bottom of their vessels before they resumed their journey. Merely one of history's myriad footnotes, it nevertheless represented the first known use of a petroleum product by non-natives in what would become the United States.

Two centuries later, as Texas began to be settled, new arrivals noted oil or gas seeps here and there, but since oil had no real economic value, no one cared.

NACOGDOCHES

The American oil industry got its start in Pennsylvania on August 27, 1859—19 months before the Civil War—when Edwin T. Drake successfully oversaw completion of the first-ever well sunk in search of petroleum for commercial purposes. While his name, usually prefaced by an honorific "Colonel," is generally the first to appear in any history of the oil industry, the jack-of-all-trades and former railroad conductor was not the man who came up with the idea of extracting oil from the earth and converting it into a highly sought product called kerosene.

New York lawyer George Bissell is the one who actually envisioned capitalizing on the growing demand for lamp oil by mining what was then known as "rock oil" (as opposed to vegetable or animal oils) and marketing it to light American homes and offices. Bissell's motivation had nothing to do with altruism. He pursued his vision hoping to make money, which, despite his lawyer's shingle, was something he did not have much of. To finance his scheme he teamed up with John Townsend, a banker from New Haven, Connecticut.

Corsicana's 1890s oil play led to the state's first refinery and generated a talent pool that helped shape the petroleum industry in Texas.

Townsend, in turn, happened to live in the same hotel with the then out of work Drake, whom he hired to oversee the drilling of an oil well near the timber town of Titusville, Pa. – a hilly area long known for its numerous oil seeps. The discovery well, drilled by a blacksmith named William A. "Uncle Billy" Smith, not "Colonel" Drake, came in at 69.5 feet and precipitated the first North American oil boom.

Down in Texas, Lynis Taliaferro Barret must have been an inveterate newspaper reader. Four months after Drake hit oil, Barret executed an agreement giving him mineral rights to 279 acres near a natural seepage called Oil Springs, 13 miles southeast of Nacogdoches in the piney woods of East Texas. The spot was well-known, at least locally. Spanish explorers had noted the seepage in 1790 and used oil from it to lubricate their cart and wagon wheels.

As a merchant and half-owner of a general store in the nearby community of Melrose, Barret appreciated the sales potential of the relatively new-fangled, kerosene-fueled lamp. A sudden national demand for what was then known as "illuminating oil" had pushed the price of a barrel of oil to $20, a giddying amount of money in the mid-19th century.

Before Barret could organize a drilling operation, sectional differences brought on war between the North and eleven seceding Southern states which reorganized themselves as the Confederate States of America. Born in Virginia and loyal to that venerable commonwealth, Barret interrupted his career in commerce to serve as a captain in the Confederate army. His business partner enlisted in the CSA infantry.

While Barret had followed the progress of the nascent oil industry in Philadelphia, he likely never heard of Juan Lopez Saenz, a Tejano rancher in South Texas. Saenz had moved from Rio Grande City to Duval County in 1854. The rancho he established stimulated a settlement briefly known as Noleda before it acquired a longer-lasting name, Piedras Pintas. That's Spanish for painted rocks, which is what a nearby geologic feature looked like.

Above: Early wooden oil tanks in Nacogdoches County, taken in 1880.

Below: Remnants of a nineteenth-century rig near Nacogdoches, where a grocer sunk a producing well in 1866.

Saenz needed water for his ranch, so he soon began digging a well on his land. Using a mule-powered drop tool tied to a rope, he found it irritating to hit oil at 30 feet. Badly needing water, he cut a piece of mesquite, wrapped burlap around it and used it as a plug to stop the oil flow. Then he continued drilling until he hit water.

The few writers who have mentioned Saenz's well over the years have always felt obliged to note that the Tejano's brush country "producer" amounted to the first "dual completion" in Texas. In a low-key way, the Piedras Pintas well also represented the state's first commercial oil operation. Saenz turned a *puerco*'s ear into a silk purse by making a small amount of money off travelers who both watered their animals and greased the wheels of their carts at his well.

Up in East Texas, after the Civil War, Barret and his partner reopened their store and Barret revisited his plan to seek oil in Nacogdoches County.

On October 9, 1865, he signed a document which granted him "the exclusive privilege of mining operations" on the same acreage he had leased in 1859. The instrument provided that the heirs to the Skillern estate be paid 1/12th "of all products of said lands in the way of minerals or oils." In time, that kind of arrangement would come to be called an oil lease, a simple, two-word description of a new area of Texas real estate law that in future years would end up conveying billions of dollars. Mineral leases also gave scam artists a new direction to apply their skills.

Soon, other Texans grew Texan interested in oil. That September, Beaumont attorney George W. O'Brien received an interesting letter from A.B. Trowell of Liberty. Trowell recommended that O'Brien "buy all the land in Jefferson County that has sour lake water or sour lake tar on it…The great excitement of this age is oil…This region of Texas will be wild upon the subject…"

Later that year, someone did drill a well in Saratoga, but the effort went nowhere, largely because of inadequate equipment.

While the advice offered by Trowell would prove spot on, the first producing oil well in Texas would come in among the whispering pines of East Texas, not the upper coast.

In December, with funding from four other investors, Barret organized the Melrose Petroleum Oil Co. Despite its redundant name, the firm would have the distinction of being Texas's first oil company. Next Melrose Petroleum went on to contract with Benjamin T. Kavanaugh to provide drilling equipment to sink a well on the Skillern property. Using a piece of machinery called "Butler's Improved Auger for Boring Wells," Barret and company began drilling on June 9, 1866.

Work continued for more than three months until September 12, when the Melrose crew struck oil at 106 feet. The shallow well produced only10 barrels a day, but an analysis of a sample the company sent to New York declared the oil "superior in all its properties."

With visions of his lease transforming his community into the Titusville of Texas, Barret traveled to New York and then Pennsylvania seeking financial backing for further exploitation of the Skillern tract. He secured a contract with Brown Brothers of Titusville, a company that agreed to ship $5,000 worth of drilling equipment to Texas and begin working the play Barret had found. But on the day that effort was to have begun, the company wrote, as Barret later put it, "that on account of the low price of oil and the unsettled condition of the country [Reconstruction], it would be inadvisable to prosecute the work further."

Despite his prescient thinking, it turned out Barret had the right idea at the wrong time. A drop in oil prices to less than $3 a barrel had tanked Eastern interest in the Texas play, and despite an upswing in prices in 1868, Barret's

dream of developing oil production in the Lone Star State went no further. Having found oil only to lose a fair amount of money in the process, Barret redirected his energies on the more dependable mercantile business.

Nineteen years later, other operators brought in oil wells in Nacogdoches County, but even though some 90 wells dotted the area by 1890, they netted a total of only 54 barrels, earning their royalty owners slightly more than $225. Even so, Nacogdoches County can be said to be the first in Texas to experience an oil boom, albeit minor compared to what lay ahead.

Hoping to further capitalize on the growing illuminating oil market, a group of investors had a 14-and-a-half-mile pipeline built from Oil Springs to the rail line at Nacogdoches. And a small-capacity refinery began operation at Bayou Vistador, about three miles from the discovery well sunk by Barret. Primitive as both projects were, each represented the first in Texas. Nacogdoches County also saw the first use of both rotary and cable tool rigs, the first oil storage tanks and the first use of metal drums to hold oil.

Despite fairly extensive drilling and the development of some infrastructure, it does not appear that anyone saw the Nacogdoches field as having anything but minimal economic value. Before long, Barret and the Nacogdoches oil field he tried to capitalize on had been all but forgotten.

Still, the visionary store owner had established a business model that would last into the modern era—that to produce oil a would-be mogul needed a lease to a likely prospect, a company to secure drilling equipment and someone to oversee the drilling process. After that, he needed a way to get the oil from its source to its potential market.

A century after Barret struck oil in East Texas, as an assemblage of dignitaries gathered at Melrose to unveil a state historical marker commemorating the Virginian's pioneer efforts, Railroad Commissioner Ben Ramsey, a native East Texan, put the matter into perspective: "Like so many inventors and explorers, [Barret's] timing was unfortunate for his personal welfare…. He was trying to develop a supply of oil when there was a glut in another part of the country [Pennsylvania] near the market [the more populated northeastern states]."

Barrett had been Texas's first wildcatter, long before the term entered the vernacular of the petroleum world. While he had been correct in his belief that money could be made from oil in Texas, a report prepared by the U.S. Bureau of Mines in 1871 did not share Barret's enthusiasm for the future of oil production in the 28th state of the union. In fact, Washington geologists flatly declared Texas had little if any oil to be found.

CORSICANA

Lynn Barret intentionally sought oil. The next significant petroleum discovery in Texas came purely by accident.

For decades, cotton growing had been the economic mainstay for the Navarro County town of Corsicana—and much of the rest of the state as well—but in the early 1890s, cotton prices withered. What the dry weather didn't kill boll weevils did. Several Corsicana businessmen decided that the future of their town lay in its industrial development, not agriculture. Since manufacturing plants needed a reliable supply of water, they organized a company to drill three artesian wells and hired a less-than-four-year-old firm to sink the shafts.

On June 9, 1894, drillers with the American Well and Prospecting Company hit oil-bearing stratum, not water, at 1,027 feet. The contractor lowered casing to seal off the oily sand and kept going deeper, finally hitting warm artesian water at 2,470 feet. Annoyed investors, needing a community water source much more than oil, punitively cut the contractor's fee by half, paying the company only $500.

Despite the effort to keep the water well chaste, traces of oil made it to the surface and at some point, someone thought to strike a match near it. That simple test demonstrated that the oil was in a heavy enough concentration to be flammable. Learning of that, two entrepreneurially minded businessmen collected a sample from the well and sent it to Pennsylvania for analysis. Receiving a positive report, they organized the Corsicana Oil Development Co. to spud

All that remained of Texas' first oil well, photographed in 1937.

Another view of the 1898-vintage Magnolia Refinery in Navarro County.

a test well. But they needed money to do that. John Davidson, a veteran of the Keystone State oil industry, agreed to invest in the test and may have been the one who convinced fellow Pennsylvanian John H. Galey to come to Corsicana. An experienced wildcatter, Galey contracted to drill five test wells for half interest in the company's leases. In turn, Galey conveyed half of his interest to partner James M. Guffey.

Drilled in the heart of the town in 1895, the oil well produced only 2.5 barrels a day when it came in. In May of the following year, a well at Fourth and Collins streets that made 22 barrels in its first 24 hours showed the mineral possibilities of the area and brought further drilling. The Corsicana discovery killed off any lingering interest in Nacogdoches' oil patch, where production had dwindled to a barrel a day per well.

The Corsicana wells flowed only modestly compared with fields in Pennsylvania, Ohio and Kansas, and the Pennsylvanians quickly lost interest in the Texas enterprise and sold out. The Corsicana Oil Development Co. was legally dissolved with a new company, Southern Oil, taking its place. At the close of 1897, Navarro County had 43 wells that had produced 66,000 barrels.

Without petroleum infrastructure—storage tanks, pipelines and refineries—oil is only so much dark goo lacking a way to market. Hoping to solve that problem, Corsicana's mayor invited another Pennsylvanian to visit Navarro County. His name was J. S. Cullinan.

In 1882, at 21, Cullinan had gone to work for the Standard Oil Company in the Pennsylvania oil patch, then the most productive and busiest in the United States. Standard, founded in Ohio in 1870 and owned by John D. Rockefeller, was the world's largest oil company. Cullinan worked for the company for 13 years, learning how to drill a well, erect a tank farm, put down a pipe line or operate a refinery. Two years after leaving Standard, Cullinan took the train to Texas to check out the new production in Corsicana.

With financial backing from two silent partners who just happened to be with Standard Oil, the Yankee oilman formed a company he called J. S. Cullinan and Co. Having both capital and know-how, Cullinan soon became the leading force in Corsicana's new oil play. He built a tank farm and started buying oil from local producers. In turn, he sold the oil, primarily to Standard Oil's regional marketing outlet in St. Louis, Waters-Pierce.

Cullinan shipped oil from Corsicana by rail, but knowing he could make more money for his company by refining the product in Texas, he spent $150,000 to build a refinery in Navarro County. As two-time Pulitzer Prize-winning writer Marquis James later put it in his history of Texaco, the East Texas refinery was "the first worthy of the name west of the Mississippi." Though the facility distilled kerosene for lamps, one inevitable by-product of that process was gasoline, most of which had to be disposed of. No market for it existed.

While apparently seeing no future in gasoline, Cullinan clearly thought unconventionally. He successfully tested using crude oil for locomotive fuel instead of coal and he came up with the idea of sprinkling oil on Corsicana's streets to allay dust, one of the first road "paving" projects in Texas. Waco and Fort Worth also gave Corsicana oil a shot on their streets.

Another innovation particular to Corsicana but not connected to Cullinan involved a Civil War-era cannon. Whenever lightning or some other cause ignited a tank fire, workers charged the old artillery piece and shot a hole near the bottom of the tank to drain as much oil as possible before it burned.

Within a year-and-a-half of the initial discovery, the Corsicana field consisted of 47

wells producing 65,975 barrels. That kind of action brought about a phenomenon that would reoccur many times more over the next century and beyond—a cycle of boom and bust. Soon, practically every town lot in Corsicana had been leased. By the time the United States declared war on Cuba in 1898 following the explosion of the battleship *Maine* in Havana harbor, the Corsicana oil field had 287 producing wells.

Not only did Corsicana see construction of the state's first major refinery, it became the first Texas community to benefit economically from the oil industry. As would happen again and again in later years, the play changed Corsicana from a county seat town mostly dependent on agriculture into an industrial city, exactly what local businessmen had hoped for even if it hadn't happened the way they'd planned. When federal census enumerators fanned out over the city in 1900 to assess its population, they found 9,313 residents, up substantially from 1890.

The boom, though modest compared with the explosive growth future discoveries would stimulate in Texas, dramatically increased tax revenue. Its treasury flush with funds, Navarro County could afford to build a new courthouse in 1905. By that time, however, the output of the field had already peaked, having reached top production in 1900 at 829,559 barrels. In that year, Corsicana accounted for two percent of the nation's oil.

What happened in Corsicana demonstrated to all business-minded Texans that beyond the income it could generate for everyone directly connected to the new industry, oil had a multiplier effect on the economy. The state's oil field supply business came into being in Corsicana.

Two early figures in the soon-to-blossom oil production equipment industry, brothers C. E. and M. C. Baker, came to Navarro County in 1895 from South Dakota, where they had been drilling water wells with a hydraulic rotary rig. To make the drilling easier, they pumped low-density mud into the hole. When they tried that technique in Corsicana, they found they could complete a well in half to three-quarters of the time it took to drill with a traditional cable tool rig. Teaming up with the owners of American Well Prospecting Co., which had relocated from Kansas after the oil play began on the basis of their water well, the Bakers began manufacturing rotary drilling rigs in the company's machine shop. Their invention revolutionized the oil industry.

"Corsicana's fame is not restricted to being the first commercial field developed in Texas," Lucile Silvey noted in her 1937 master's thesis, a study of the East Texas oil field. "It was here the rotary method of drilling was born, here the first southwestern pipeline was laid, here the first refinery was built, and here oil was first utilized for paving streets and roads, as well as for locomotive fuel consumption. It was at Corsicana that natural gas was first used for commercial heating and lighting purposes, out of which has grown a separate industry, vast in scope and regency."

This Civil War-vintage cannon was used at Corsicana to puncture burning oil tanks.

In addition, the Corsicana oil field brought about a far-sighted piece of legislation, a pioneer environmental measure that marked the state's first effort to regulate the oil business. House Bill 542, passed on March 29, 1899, and later signed into law by Governor Joseph D. Sayers, made it illegal to drill into a second oil-bearing strata before "incasing" the well. Among other things, it also required plugging abandoned wells. The measure did not provide for any agency with oversight over oil production, leaving enforcement up to civil lawsuits.

Oil would continue to be a significant factor in Navarro County's economy for years to come. As late as the 1950s, Corsicana touted the fact that its population included 21 millionaires. That's why the city boasted in 1953 of having the highest per capita income of any Texas town.

However it's gauged, the early play in Navarro County gave Texas a talent pool that proved quite handy seven years later, when the state—and the nation—entered the new age of petroleum big time. And J. S. Cullinan and others with a Corsicana connection would be key players.


BEAUMONT
OIL
EXCHANGE
AND BOARD
OF TRADE
BUILDING

CHAPTER 2

SPINDLETOP

"A GREAT OIL GEYSER"

Two years before the accidental petroleum discovery in Corsicana, a man who had only a few years before found God began a search for oil. His name was Patillo "Bud" Higgins.

His first discovery, his own spirituality, came in 1885 when he became converted at a Baptist revival. As devout a sinner as he would become a fervent Christian, Higgins had killed a Beaumont deputy city marshal in 1881. In the same gunfight which felled the lawman, a bullet fired by the officer mangled Higgins' left arm. When an infection set in, a doctor had to amputate most of the limb. Having lost an arm, he at least gained acquittal in court, his lawyer convincing a jury of his peers that Higgins had slain the officer in self-defense, not plain meanness.

As is the case with most important discoveries, Higgins's quest for oil was born of pragmatic need. Having transitioned from street fighter to businessman, in seeking the most efficient fuel to fire the kilns at a brick plant he operated, Higgins concluded oil would be the best bet. He had traveled to see out-of-state brick plants, finding they produced a better-fired brick after converting to oil.

For years, Higgins had believed oil could be found under a Jefferson County salt dome known as the Big Hill. ("Hill" is a relative term. The feature rose only about 15 feet above sea level, and looked like a hill only in comparison with the flat coastal plain around it.) His certitude was based on more than a hunch. He had taken his Sunday school class to the hill for a picnic, and while there he noticed several small springs with gas bubbling up. Poking a hole in the ground nearby, he lit a match and ignited the gas coming from below. The kids thought it was funny. Higgins thought it was very interesting.

The "Wall Street" of Beaumont during the boom.

Putting his Bible aside for a book on geology he had sent for, Higgins read by kerosene lantern light late into the night. In 1892, now fully convinced oil lay beneath the hill others called Spindletop (for a cone-shaped pine tree on top), he found three Beaumont businessmen willing to invest some money and organized the Gladys City Oil, Gas and Manufacturing Co. Gladys City, named for one of the girls in Higgins' Sunday school class, existed only in his imagination and the fanciful engraving on the letterhead of the company's stationery.

The street fighter turned businessman envisioned Gladys City as a future industrial metropolis, but just about everyone else in the area saw his proposed city and the oil play he predicted as nothing but a pipe dream. Higgins talked his partners into backing a test well on the hill, and in 1893 he hired a driller to spud in a well. Bad weather and slow going ate up available money and Higgins cancelled the test. He managed to raise money for a second test, but the driller did not have the right equipment for the job and the well ended up abandoned and plugged. Against his advice, other investors opted for a third try, which also flopped.

By this time, 1898, Higgins had sold his brick plant as well as his interest in the Gladys City company. What he did still have was leased acreage that included Spindletop, so if he could find someone willing to take a chance on another hole, he could still come out ahead if they found oil.

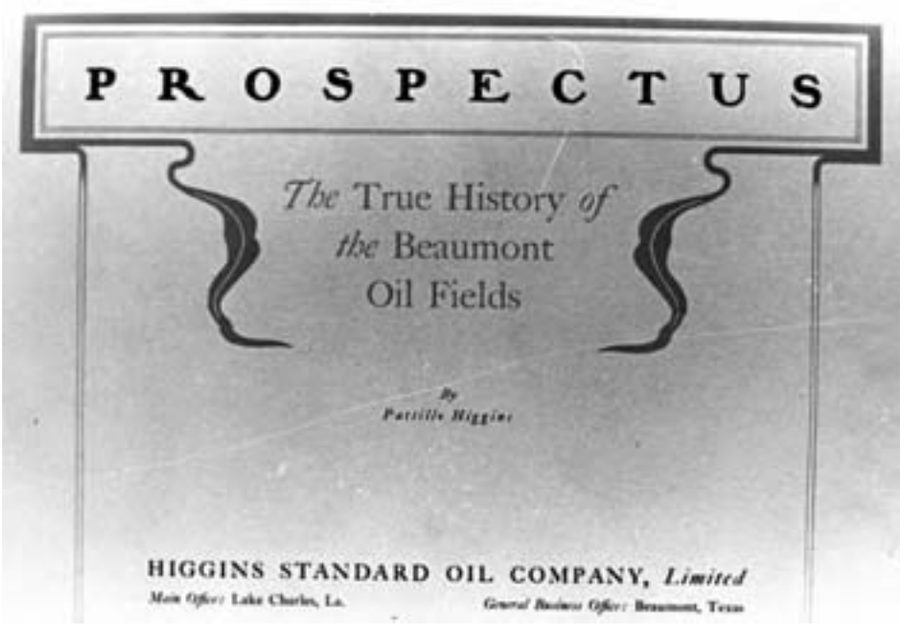
In 1899 he convinced mining engineer Anthony F. Lucas, then living in Washington, D.C., to bore ("boring" was the early term for drilling) another well on the hill. Lucas set about trying to raise money for a test, but given the history of failure at Spindletop, no one was willing to take a chance. Lucas ran the idea by the two gentlemen from Pennsylvania who had invested in Corsicana's play for a time, James M. Guffey and John M. Galey. With money they got from Pittsburg millionaire Andrew Mellon, the deal was on. But Higgins was not in on it. (By this time, so many different people had been contractually involved in one way or the other in the quest for oil at Spindletop that lawyers yet to be born would be assured a nice living from future litigation involving royalties.)

In August 1900, the Hamill Brothers of Corsicana, Jim G., Allen (Al) W. and Curt (Jim had been an artesian well driller in Waco before taking up the oil business in Navarro County; Curt a salesman and Al a cowboy), got a letter from Galey, who officed in Pittsburg. The Hamills and Galey had met when he was in Corsicana before writing off the Texas play as not worthy of any more of his money. Galey said, as A. W. later recalled, "that a Mr. Lucas" would be in touch with them to get a bid on drilling a well near Beaumont. J. G. Hamill took the train to Beaumont to look over the drilling site before proposing a price. After seeing the hill, he offered a contract to sink the test up to 1,200 feet for $2 a foot. Lucas considered that amount acceptable, and in October, the brothers shipped a rotary drilling rig from Corsicana to Southeast Texas. After the Hamills got a derrick built and all their equipment in place, drilling began on October 27, 1900.

The work proved to be brutally hard and the drilling crew consisted of only three men—Curt and A. W. Hamill and Peck Byrd. They ran the rig around the clock, not out of impatience to make hole, as oil workers call the drilling progress, but to lessen the possibility of a disastrous gas blow out. They had already hit one small pocket of gas, and felt that keeping the circulatory pumps going all night would prevent a dangerous pressure buildup.

Above: Patillo Higgins had one arm and one dream—oil.

Below: Naming it for one of the girls in his Sunday school class, Patillo Higgins organized the Gladys City Oil, Gas and Manufacturing Co. in Beaumont.



In the pre-dawn hours of December 9, Al Hamill, who was pulling a solo all-night shift began to smell gas. At first light, he noticed a showing of oil. When brother Curt and Byrd arrived with breakfast, they dispatched Byrd to get Lucas, who lived about a mile and a half away. Mildly excited, Lucas asked Hamill how much of a well he thought it would make.

"The only experience any of us had was at drilling small wells in the Corsicana field," Hamill remembered, "but I thought it would easily make 50 barrels a day."

By Christmas Eve, they were down 860 feet and had finally, though with considerable difficulty, broken through the sand and hit a hard formation. "Mr. Galey could see we three boys were worked down," Hamill said, so he suggested they shut down for the holiday. That was fine with the young drillers.

Back at the rig on New Year's Day, 1901, they fired up the boiler again and resumed drilling, making 140 more feet by the end of the week. But then it seemed that the drill would go no farther. On January 9, A. W. wired his brother in Corsicana to send them a new fishtail drill as fast as possible. The following morning, A. W. met the train at the depot to pick up the bit. Returning to the well site, he helped the rest of the team to get the new drill attached and then they started putting drill pipe back down the hole.

They had 700 feet of pipe down when gas-propelled drilling mud and water shot up from the hole, followed by the drill pipe, which broke through the derrick's crown block and kept going. After the last of the mud, water and pipe was gone, gas whooshed from the hole. Then the well got quiet.

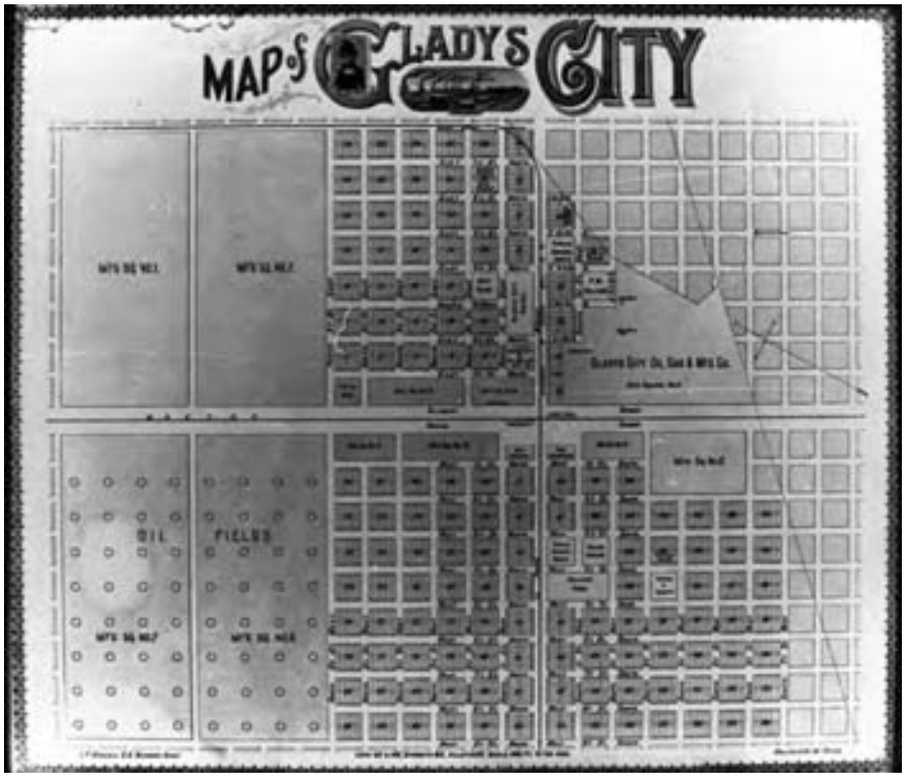
"We ventured back, after our wild scramble for safety, to find things in a terrible mess with at least six inches of mud on the derrick floor, and some damage done to our equipment," A. W. said. "Naturally, we were all disgusted."

About 10:30 a.m., as they began shoveling away the mud from the rig suddenly another blast of mud erupted from the hole "with the report of a cannon."

More gas followed, but it did not last long. "In a very short time the oil was going up through the top of [the] derrick and rocks were being shot hundreds of feet into the air." Soon, a six-inch fountain of dark green oil spewed twice as high as the derrick, more than 200 feet.

It took the Hamills and Byrd nearly 10 days to cap the well, which produced an incredible 70,000 to 100,000 barrels a day. To put that into perspective, at the time total oil production from the whole state of Texas amounted to slightly less than 2,400 barrels a day.

"A Great Oil Geyser," the *Galveston Daily News* proclaimed three days later. "All day long



Above: Gladys City looked better on paper than it ever did in actuality.

Bottom, left: Anthony Lucas drilled the Spindletop discovery well

Bottom, right: The well that changed Texas history, Spindletop, blew in on January 10, 1901.

THE BEAUMONT JOURNAL.

Roos Bros.

ROOS BROS.
SPECIAL HAT!
$2.50 AND $3.50
Roos Bros.

Special Sale of Ladies' Muslin Underwear.
E. DEUTSER.

AN OIL GEYSER.

Lubricating Fluid Spurts Over 100 Feet Into the Air.

BUTTERICK'S PATTERNS

House Furnishing Goods
NATHAN'S

NATHAN'S.
Now For Business.

Above: The Beaumont Journal *reported "An Oil Geyser"*

Below: Scores of derricks soon crowded the Spindletop well as drilling exploded in the field. Meanwhile, some entrepreneurs made their money selling souvenir photos like this one.

telegrams have been pouring into this city, asking one question: 'Is the published report of that well true [?]' It is true, every word of it, and to avoid exaggeration these reports are made especially conservative. The big oil geyser two and one half miles south of this city is truly the wonder of the country and this estimate is shared by thousands of people who have seen it."

The discovery brought a tsunami of money-hungry humanity to the upper Texas coast, the 1849 California gold rush all over again. But this time the gold was viscous and black. Gladys City finally materialized after the Spindletop well came in, but not the way Higgins had hoped for. Located three miles south of Beaumont, the hastily constructed wooden town did not outlast the boom. Beaumont exploded from 10,000 to 50,000 people in months.

Among the early arrivals was a young doctor, George Parker Stoker. "My introduction to the oil field was diverting, to say the least; just off the train, no room to sleep in, on all sides of me persons, to all appearances, lunatics, who could chatter about only one thing, and that one thing, oil," he recalled.

Then twenty-three and fresh out of medical school, the Mississippi-born Parker reached Beaumont by train, checked into a hotel, and then hired a hack driver to take him out to Spindletop. From Beaumont, the doctor bounced and swayed along a wagon road, which had been graded up and paved with crushed shell to accommodate all the mule-drawn vehicles carrying equipment to the oil field that had sprung up around the discovery well.

"By the time we entered the main part of Spindletop oil field," the doctor continued, "we were driving down a lane of derricks with just enough room between them for two vehicles to pass each other."

In drilling for oil where most experts believed it could not be found, Higgins became the first of many Texans in the energy business to try non-conventional techniques in their search for oil and gas. But he had to file a $4 million lawsuit against Lucas and one for $2 million naming his former partner, George Carroll of the Gladys City Co., before finally realizing some significant money in a settlement that spring. Soon, he formed the Higgins Oil Co.

By the spring of 1901, the salt dome that had come to be called "The Hill" supported five other gushers. Before the first serious norther

One enterprising oil field photographer even set up a store front to peddle his prints. Photos of tank fires sold particularly well

temporarily blew all the petroleum fumes offshore, the Spindletop field bristled with some 65 producing oil wells. The Lucas well, being the first, got most of the public's attention, but within the year it had been eclipsed by a 96,000-barrel-a-day gusher drilled by a company called Heywood Brothers.

That firm was only one of around 500 oil companies organized to capitalize on the Spindletop field. Most of those companies are long forgotten, but some of the businesses born of the Spindletop boom became giants, firms that owned some of the major brand names of the 20th century. The big three were the Texas Company, which eventually became Texaco, Gulf Oil (which evolved from the Guffey-Galey partnership) and the Magnolia Oil Company, which became Mobil. Humble (now Exxon-Mobil) and Sun Oil are also traced to the early coastal oil play.

With so much oil spewing out of the ground around Spindletop, operators needed a way to get the product to market. Located 17 miles down the Neches River from Beaumont, Port Arthur soon became a flourishing shipping point. The first vessel laden with Spindletop crude left for the refineries in the Northeast in March 1901.

But rather than shipping crude oil, which had a low flash point, it made more sense for producers to get their oil refined in the

Above: A new industry caused new problems, including blowouts like this one.

Below: Oil field fires destroyed infrastructure as well as product.

immediate area. Guffey and Galey, now very much back in the Texas oil game, built a refinery at Port Arthur, the first such facility on the Gulf Coast, and the second in Texas. By 1902, Guffey had a second refinery open and a third under construction.

The Texas oil industry had begun in earnest, and neither Texas nor the world would ever be the same.

As for Higgins, though Lucas got most of the credit for bringing in the well, he spent most of the rest of his life looking for oil and finding enough of it to make a fairly good living. Found among his papers at his home in San Antonio, where he died at 92 in 1953, was a document certified by the Jefferson County clerk on December 3, 1901. Bearing the signatures of 32 prominent Beaumont men, it can be summarized in one sentence: "Mr. Higgins deserves the whole honor of discovering and developing the Beaumont oil field. He located the exact spot where all the big gushers are now found."

EXPANDING PLAY

The old Texas expression that life is "chicken one day, feathers the next" proved true with Spindletop. By the fall of 1902, the shallow salt dome wells had practically stopped flowing. Producers switched to pumping, but that was a costly proposition given that oil brought only 21 cents a barrel. And still production dwindled, dropping from a high of 62,000 barrels a day to 5,000 and still falling. What for a time had been the greatest oil field in the world had virtually dried up.

Fortunately for Cullinan, who had founded the company that grew into Texaco, he had put $20,000 down to option 865 acres around Sour Lake, a natural seepage in Hardin County about 20 miles north of Spindletop. Since the seepage was well-known, and in fact had been drilled as early as 1896, other oil production men had the same idea and began leasing land in the area.

Two test wells found some oil near Sour Lake in 1902, and on January 8, 1903, nearly two years to the day after Spindletop blew in, the Texas Company brought in a gusher. Another significant oil field developed at Saratoga, also in Hardin County. The Sour Lake field developed in March that year. A Texas Company competitor, the Atlantic & Pacific Company brought in the first gusher at 656 feet with a 10,000 barrel a day flow. All the wells in the new play were shallow, none deeper than 1,500 feet, and within 15 months, Sour Lake had 450 wells.

At Saratoga, a modest producer had been brought in during the fall of 1901, but the Hooks No. 2 well proved the field in that area

on March 13, 1902, when oil blew over the top of the derrick. Post card images of similar gushers had become a new Texas icon, selling by the thousands and lining the pockets of both local and itinerant photographers. The *Galveston Semi-Weekly News* soon reported that the well near Saratoga "was performing in a way that would equal any of the freaks on Spindle Top [sic]" and made "a roaring sound like an approaching tornado." The well ended up producing only 500 barrels a day, but that was enough since more holes could be punched. As would be the case again and again with other towns and cities, the small community of Saratoga was in "a fever of excitement."

A year later production blossomed at Batson Prairie, also in Hardin County. On Halloween in 1903 a well drilled by the Paraffine Oil Company came in at 790 feet, producing 600 barrels a day. The company's third well was a gusher flowing 15,000 barrels a day.

Each of those fields had been developed by essentially the same men who had turned Spindletop into a veritable pincushion of oil derricks.

Roughnecks worked hard and played just as hard. Oil patch folklore has someone finding one roughneck's schedule penciled on the back of an envelope: "11 a.m./Get up; 11-11:30/ Sober up; 11:30-Noon/Eat; Noon to Midnight/Work like hell; Midnight-3 a.m./Get drunk; 3-3:30 a.m./Beat hell of out them that's got it coming; 3:30/Go to bed."

Farther west of the Sour Lake field, drilling began in 1905 near a small Harris County town called Humble, a community named for Pleasant Humble, a local justice of the peace. That modest-sounding name would become the brand for a company that would grow into one of the world's largest—the Humble Oil and Refining Co.

The history of the Texas oil industry is a succession of causes and effects interspersed with technological advances spurred by the need to solve a problem or get something done more efficiently.

Ross Sterling and his brother Frank had been making pretty good money selling mules at Sour Lake. Even though all the oil flowing from Southeast Texas would help bring in the automotive age, mules initially provided the motive power for the oil industry. They pulled wagons laden with drilling pipe and other equipment, road graders and earth-moving blades.

Above: Spilled oil covered the ground at Spindletop like water after a rain.

Below: A view of the real Gladys City, as opposed to Higgins' paper town, as seen from an oil derrick.

Above: Gushers didn't blow sideways, but promoters soon learned that gushers could be simulated for advertising purposes.

Below: Hack drivers from Beaumont did a land office business carrying spectators to and from the oil field.

Soon the brothers had made enough money in the mule business to buy a bank. And then another. And yet another. Well capitalized, they began drilling for oil in the Humble Field and started the company that prospered under that name for nearly 70 years.

HARD ON MULES AND MEN

On July 23, 1905, lightning ignited the oil in one of the large, open earthen tanks first used to hold all the crude spewing from the ground. Sending billows of thick, black smoke high in the sky, the fire spread quickly.

The inferno incinerated men and mules and equipment. Before the fire died out for lack of fuel, it had consumed some 900,000 gallons of crude.

The exact death count may never be known. Newspaper accounts had the number of casualties ranging from a hard-to-believe solitary death to 40 or 50 fatalities. The day after the fire, the *Houston Chronicle* reported 15 deaths, but the stories said that the heat of the fire had reduced man and animal to piles of ashes, preventing an accurate assessment of the toll.

Jim Crow-era racism also played a role in the inexact accounting. The *Chronicle* reported that only one of the victims, a watchman named "Slim" was white. The others were African-American.

Another reason for the lack of clarity on the effects of the disaster is that the fire

occurred before the oil industry had any regulation to speak of. The Texas Railroad Commission, created in 1892 to oversee railroad rates in the state, had no authority yet over the nascent petroleum industry. At the federal level, the creation of the Occupational Safety and Health Administration, better known as OSHA, did not come until 1969.

Since the Humble fire clearly had been the result of an act of nature, no authority investigated whether the storage facilities had been safely constructed and no entity held hearings or compiled an official report.

The Humble field soon played out, and the surviving men and mules moved to the next paying field, a process that would continue in the state well into the 1930s. By then, of course, heavy machinery had pretty much replaced the need for mules though some oil companies used them until the 1950s.

A couple of years after the fire, a man named Frank Rilling, probably an oilfield worker, sent a penny postcard showing the towering black smoke from the Humble fire to his girlfriend in Bridgeport, Connecticut.

"Received your pretty postal [post card] with many thanks," he wrote. "I am in a hurry answering, am I not[?]" Then Rilling scribbled beneath the image: "This was a grand thing to see as it burned at night."

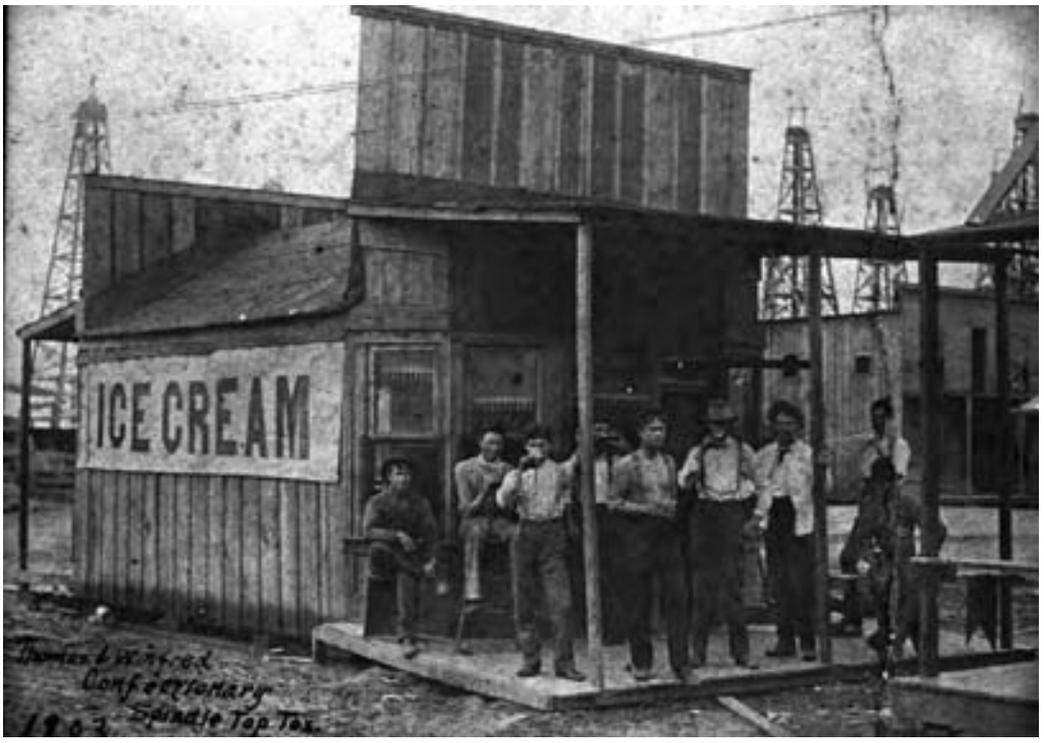
Of course, it hadn't been grand for the family and friends of the men lost, not to mention all the mules.

In 1907, C.H. Markham, general manager of the J.M Guffey Petroleum Co. said the yield from Texas's oil fields was rapidly dwindling and reliable production could no longer be taken for granted.

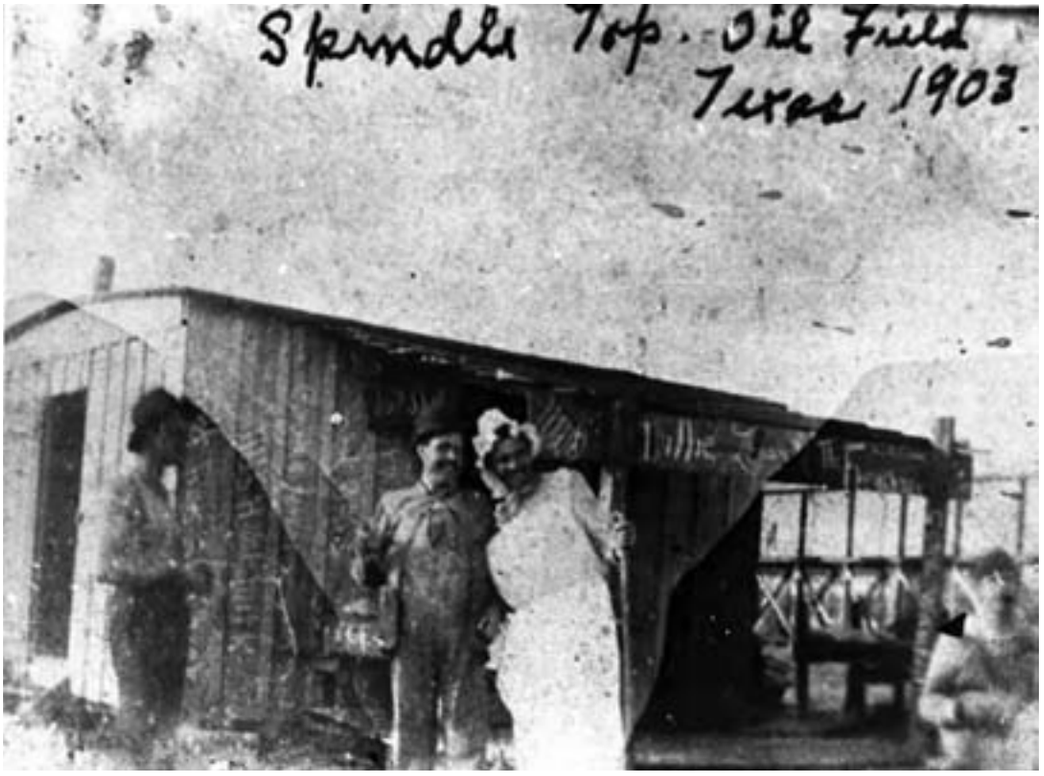
Patillo Higgins, who enjoyed considerably more credibility thanks to Spindletop, publicly countered Markham's view:

Above: The inside of Beaumont's oil exchange, where stocks—bogus and real—were bought and sold as money was made and lost.

Below: Beer flowed about as freely as oil during the Spindletop boom.



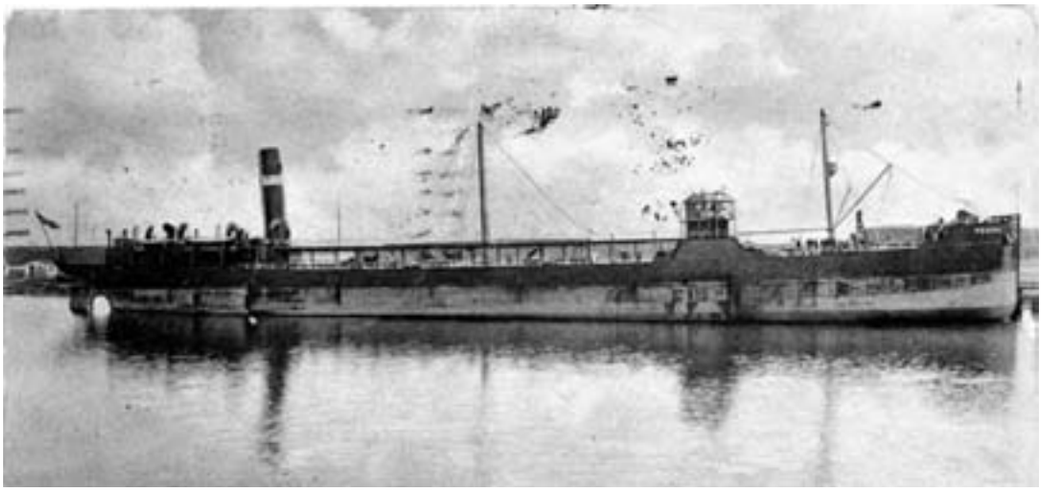
Above: After a hard day on the rig, a bowl of ice cream sometimes seemed more appealing that a beer.



Right: The Spindletop-area boom towns had few women, and the ones that were around weren't the types a man would want to take home to mama. Here oil field workers staged a "womanless" wedding.

"Texas is only in its infancy in the oil business," he declared in a written statement. "Many large gusher fields will be developed in the coast country of Texas…and some of the new fields will surpass any that have so far been developed, and will surprise the world."

Even more presciently, he predicted that major oil fields would be found in other parts of the state. "There is no need for consumers of crude oil to fear the fuel problem," he continued. "Nature has put great quantities of fuel right at our doors and the supply will not be exhausted."



Above: Within only a few months of the Spindletop discovery, oil tankers laden with Texas oil were making their way to the Northeast.

Left: Beyond its status as a port, Port Arthur soon became a center for refineries, including this early Gulf Oil facility.

GOOSE CREEK

The last big early-day field on the upper Texas coast, the Goose Creek play in eastern Harris County, was first drilled in 1903 but did not really come into its own for more than another decade. As had been the case in Sour Lake, natural seepage of gas from Tabb's Bay (an inlet in Galveston Bay) stimulated oil industry interest in the area. In 1916, area land owner John Galliard contracted with the Hoffman Deep Well Co. to drill a test on his property. The company hit a gusher on July 13. Two other gushers that summer satisfied producers that a sizable field had been found, and by the end of the year, it had yielded 42,000 barrels. More than a dozen oil companies were making wells in the new play by February 1917.

As production increased, citizens of the small community of Goose Creek, located on the edge of the bay, deemed their town inconveniently located. Residents and businesses abandoned the place to allow for more drilling and started a new town three-fourths of a mile inland. And since producing wells came in only a few feet from the bay, it seemed logical enough that more oil could be found by drilling in the water.

That thinking, which proved correct, led to the construction of drilling rigs at the end of piers built out into the bay. Beginning in June 1918, this was the first offshore drilling in Texas, though modest compared to what would come.

Above: Humble Oil and Refining Co. was born in Harris County and became one of the nation's major brands, but in the first two decades of the 20th century, brands proliferated. "Polarine" did not stand the test of time.

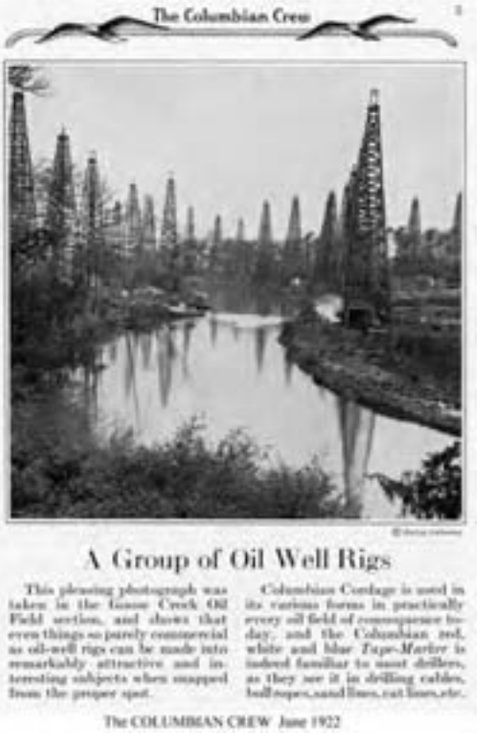
Top, right: In the early days of Texas production, oil was often stored inside earthen berms. While less expensive than building metal tanks, the crude lay exposed to lightning and often caught fire.

Middle, right: The Goose Creek oil field in Harris County saw the state's first drilling in water.

Bottom, right: Working on a rig was hard, dirty, dangerous work in the days before government regulation.

The field also is the setting for a piece of oil industry folklore that has the ring of truth. Supposedly, in 1908, Howard Robard Hughes, Sr., and his partner, Corsicana oil patch veteran Walter Sharp, donned roughneck attire and, in the dead of night, stealthily attached Hughes's newly invented cone drilling bit to a rig. The test demonstrated that the bit worked much better than the then-standard fishtail bit, and soon became the industry standard.

Goose Creek also was significant in that it led to the founding and fast growth of Baytown, which lies just north of the field. Since the creek connected to the Houston Ship Channel, which had opened the Bayou City to deep-water vessels in 1914, the general area was a logical site for refineries. The plant built in Baytown became the second largest refinery in the nation. Its capacity is more than a half-million barrels a day.


The Columbian Crew

A Group of Oil Well Rigs

This pleasing photograph was taken in the Goose Creek Oil Field section, and shows that even things so purely commercial as oil-well rigs can be made into remarkably attractive and interesting subjects when snapped from the proper spot.

Columbian Cordage is used in its various forms in practically every oil field of consequence today, and the Columbian red, white and blue *Tape-Marker* is indeed familiar to most drillers, as they see it in drilling cables, bull ropes, sand lines, cat lines, etc.

The COLUMBIAN CREW June 1922

The coastal field remains active, having produced more than 150 million barrels of oil.

COMMERCIAL GAS

Oil producers initially considered the natural gas that often whooshed from a well as either a good sign of oil or a nuisance that had to be dealt with by flaring it off.

What would grow into Texas' first large commercial gas field started with the accidental discovery of oil in 1901 when a Wichita County farmer hired a driller to sink a water well east of Wichita Falls in Clay County. At 263 feet, the driller hit oil instead of water. That discovery set off the first oil boom in Northwest Texas, leading to the founding of two towns – Oil City and Petrolia. (Neither place name represented any creativity. Petrolia, while catchy, was named for an oil town in Pennsylvania.)

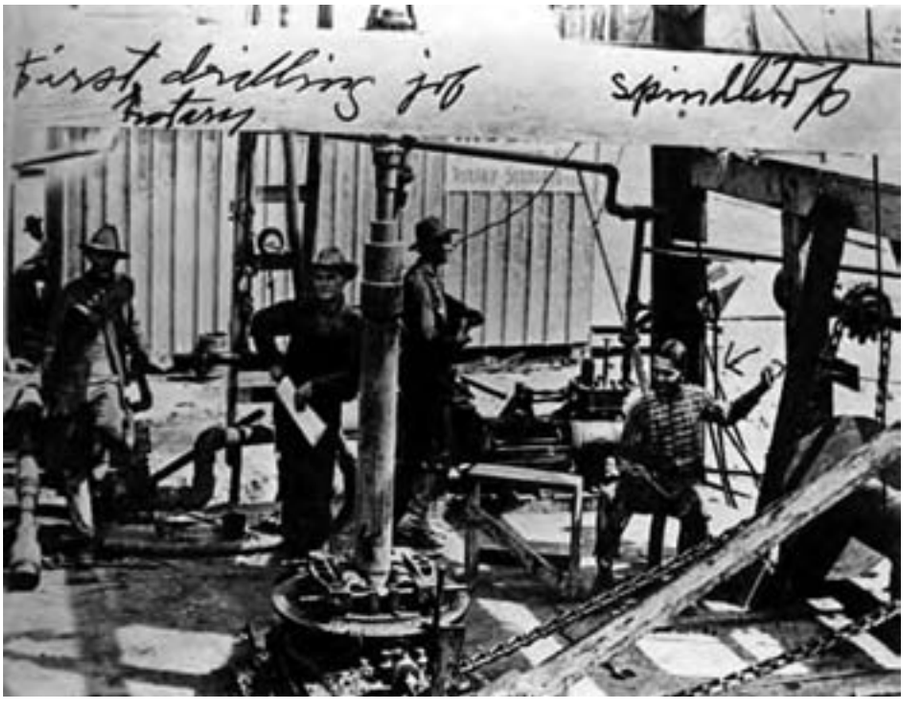
The town with the second-hand name lay nearer the Fort Worth and Denver Railroad, so it soon absorbed Oil City's population. An early-day postcard proclaimed, "Greeting from Petrolia…Where Fortunes Flow Forth."

But the Petrolia oil play proved minor compared with Spindletop field. However, fortunes did begin to flow forth starting in 1907 when shallow natural gas was discovered near Petrolia.

Within a couple of years, far-sighted producers had begun to realize that natural gas could have as much commercial value as crude oil. The Lone Star Gas Co. was organized in 1909 to market the gas found at Petrolia. The natural gas business began when Lone Star constructed a pipeline to Wichita Falls and the city became its first customer. A year later, Lone Star laid a 16-inch pipeline to Fort Worth and Dallas and went on to become a major utility company.

Above: Oil coming from the ground ended up in barrels and in tanks – except for all the oil that didn't. Overalls didn't last long in the oil patch.

Below: As the old saying goes, the Texas oil industry was developed by wooden rigs and iron men.




M Sloskey No.1 Oct. 17, 1917

CHAPTER 3

NORTH TEXAS

The shallow coastal salt dome wells had begun to play out, but the national demand for petroleum products had not. The railroads had begun refitting their locomotives to burn oil, and the Navy was rapidly doing the same with its ships. In addition to those large, new markets, as automobiles became more popular, the need for oil grew even more.

From 1902 to 1912, the number of automobiles in America went from 23,000 to 902,000. Truck production rose from zero to 41,000 during the same period. In response to that growth, the Texas Company opened a refinery in Dallas and in 1909 began producing what it called No. 4 Motor Gasoline from crude piped in from Oklahoma. Soon, the kerosene market had dwindled while the company sold every drop of gasoline it could refine.

In North Texas, geologists believed a formation known as the Red River Uplift had oil-bearing strata, but the shallow wells around Petrolia had produced only low yields. And when they did come in, discoveries tended to be either accidental or based more instinct than science.

"The most technically trained geologist could do little more than apply a good measure of horse sense in locating wildcat wells after attempting to decipher the significance of topographic features, paraffin dirt, mineralized water, and gas seeps," geologist John M. Vetter wrote for *Oil Weekly* more than a quarter century later.

Thirty miles west of Petrolia, rancher W. T. Waggoner hired a driller to dig a water well near Beaver Switch, a stock-shipping point on the Fort Worth and Denver Railroad in Wichita County. The hole produced only salt water and traces of oil.

The McCleskey No. 1 came in on October 17, 1917, igniting the Ranger boom.

"Damn the oil, I want water," Waggoner famously roared.

In 1902, the handful of residents at Beaver Switch petitioned for the community to be renamed Electra, in honor of Waggoner's daughter. Oil would soon electrify Electra, at least in the figurative sense.

On January 17, 1911, the Producers Oil Company hit oil on its fifth hole on the Waggoner Ranch. The company tried to keep its 50-barrel-a-day well secret, but that effort proved about as effective as stopping a rusty pipe from leaking. When a gusher drilled by Clayco Oil and Pipeline Co. blew in on April Fool's Day, sending crude shooting 100 feet into the air, yet another rush was on. The Electra field produced more than 21 million barrels of oil by 1914, its peak year. By then, the Waggoner Ranch had more than a hundred producing wells and the spread's owner wasn't quite as sour on oil as he started out.

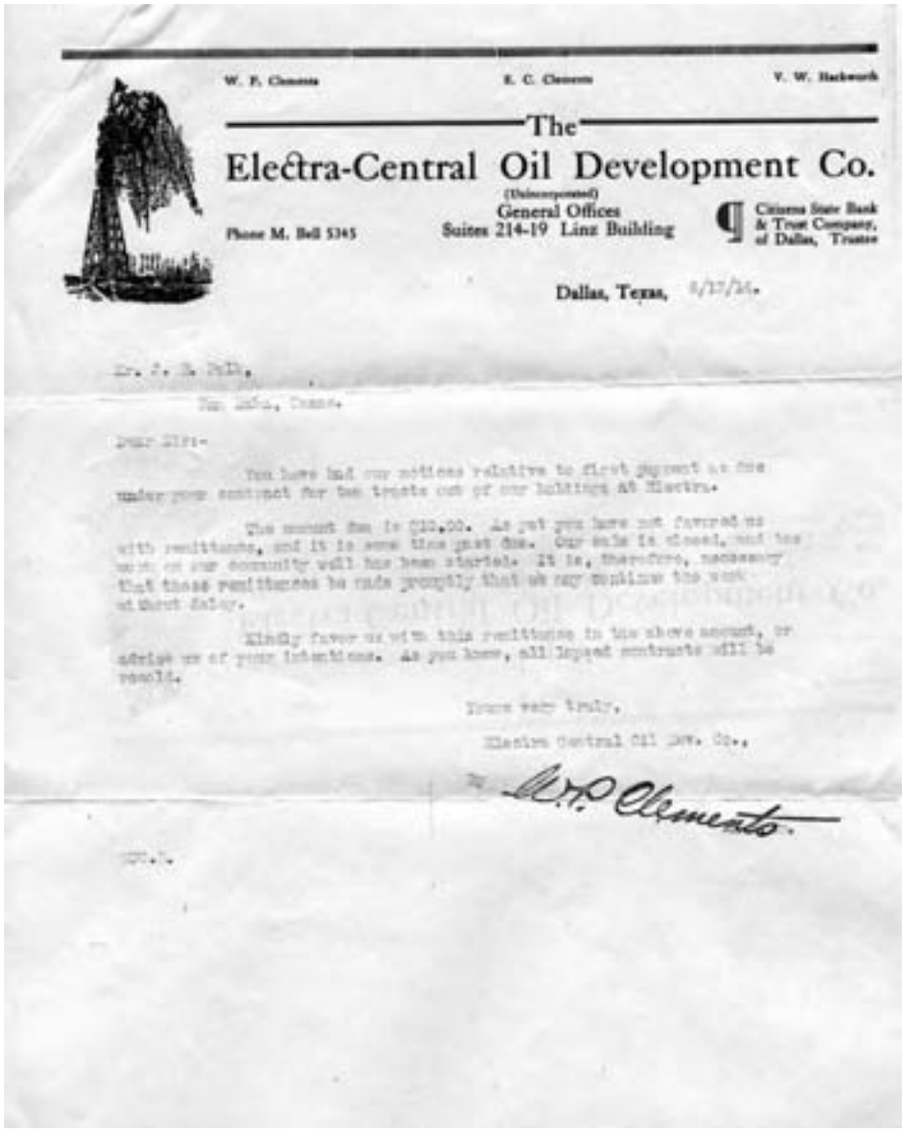
Oil continued to be easier to come by than water. "Everybody here have (sic) to buy every drop of water they use," someone wrote on a postcard they sent from Electra in 1913. "Get it from Vernon. Ship it in."

Even though no oil had been found in Wichita Falls, the railroad town became West Texas's first oil and gas city. In 1915 the Wichita Valley Refinery Co. began operation in Iowa Park, the first oil refinery in Wichita County and the first in West Texas. Later that year, the Panhandle Refinery Co. opened in Wichita Falls. Both plants handled the still-modest oil production from the Petrolia field. Having that infrastructure in place proved fortuitous for Wichita County, where a boom that would capture the attention of the nation stood in the offing.

ROARING RANGER

One hundred-twenty-five miles southwest of Wichita County lay a small town on the Texas and Pacific Railroad named after the legendary Texas Rangers.

Awareness that oil might be found beneath the arid acreage around Ranger had developed five years before, when the Texas Pacific Coal Co. based at the mining town of Thurber in nearby Palo



W. P. Clements E. C. Clements V. W. Hackworth

The
Electra-Central Oil Development Co.
(Unincorporated)
General Offices
Suites 214-19 Linz Building

Phone M. Bell 5345

Citizens State Bank & Trust Company, of Dallas, Trustee

Dallas, Texas, 8/17/26.

Mr. J. B. Pell,
Electra, Texas.

Dear Sir:-

You have had our notices relative to first payment on the note under your contract for the trade out of our holdings at Electra.

The amount due is $10,000. As yet you have not favored us with remittance, and it is now the past due. Our sale is closed, and the work on our community well has been started. It is, therefore, necessary that these remittances be made promptly that we may continue the work without delay.

Kindly favor us with this remittance in the above amount, or advise us of your intentions. As you know, all unpaid contracts will be recalled.

Yours very truly,

Electra Central Oil Dev. Co.,

By W. P. Clements.

W.P.C.

Pinto County had drilled some small test holes looking for coal seven miles south of Ranger. Samples showed traces of oil. In 1915, a test well 10 miles west of Ranger hit oil-bearing sand.

Other drilling followed, but operators began to lose interest, not to mention capital, when a succession of shallow holes proved dry. In the fall of 1916, Texas Pacific made a 200-barrel well between Breckenridge and Ranger.

A group of Ranger businessmen, painfully cognizant that a severe drought had practically dried up the town's economy (and that of much of the rest of the state), traveled to Thurber for a visit with W. K. Gordon, vice-president and general manager of Texas Pacific. The Ranger delegation told Gordon that some geologists believed oil did lie beneath that part of the state, but no one had drilled deep enough to find it. The Ranger men did not have to press their case particularly hard. Gordon had ridden over much of that part of the state looking for coal, and despite the lackluster results of previous drilling, he too believed oil could be found around Ranger. Clearly an astute businessman, Gordon agreed to drill four test wells down to 3,500 feet if the good people of Eastland County would lease at least 10,000 acres to Texas Pacific at the bargain price of 25 cents an acre.

Easily grasping that even a little money is better than no money, county residents enthusiastically signed leases totaling 25,000 acres.

The first test well hit gas. Texas and Pacific spudded the second test on a farm belonging to J. H. McClesky a mile southwest of Ranger. On October 17, 1917, at 3,431 feet, the well hit oil.

Above: W. P. Clements, father of future Texas Governor William P. Clements, Jr., came to the Electra field in 1908

Top, right: Oil storage tanks near Electra break an otherwise flat horizon.

Right: A wooden derrick made windmills look small on the plains of North Texas.

Once they had the well capped, engineers calculated its flow at 1,600-1,700 barrels. The third and fourth test holes also hit oil.

McClesky celebrated his new wealth modestly, albeit somewhat strangely. Not long after the well came in, the farmer showed up at a local grocery store and bought a stalk of bananas.

"All my life, I've had a yearning to be able to feel like I was financially able to sit down and eat all the bananas I could eat at one sitting," he told others in the store, "and now I think I can afford it." After that, he wolfed down six bananas.

The Ranger field produced 93,053 barrels of oil in the next two-and-a-half months and Ranger exploded from 1,000 residents to 30,000. But as one writer put it, "It was never the same 30,000 people from one day to the next."

The Ranger boom captured the imagination of post-World War I America as well as millions of barrels of crude. "Ranger, Texas, is the hub of the most modern of the industrial romances of America," declared a fold-out postcard sent from Ranger in the summer of 1919. "A trip to Ranger where there is wealth for all," read the title of the card's four-paragraph printed text.

Above: The cover of a souvenir post card mailed from Ranger in 1917 during the peak of its boom.

Below: A dedicated cemetery didn't mean much when it came to drilling for oil.

Just like roustabouts, roughnecks, drillers, and others associated with the relatively new petroleum industry, crooks followed the oil play.

The unpaved, canyon-crossed road between Ranger and Strawn, with plenty of ranch gates to slow travelers and high ground

This shows the famous "Meriman Cemetery," where it is believed that the vast oil gushers are located, and for which a well-known oil company offered $1,000,000 for a lease in this cemetery, and which the Meriman Church congregation promptly refused for the reason that "the bodies in the graves would first have to be consulted for permission" to be removed before they would consent to lease the ground where their departed members rest in peace.

Showing the McClesky Hotel of Ranger, Texas, which, according to the daily transactions done in the lobby of this hotel, could rightfully be called the "Wall Street of Ranger." And if you want to see real pretty girls, visit the cafe, which is located on the main floor of this hotel.

Above: After the Ranger field discovery well came in on his property, J. H. McCleskey used some of his new money to build a hotel he named in his honor.

Below: The Ranger boom kept five Western Union telegram delivery boys jumping.

for lookout points, became particularly favored by hijackers.

A joke popular at the time told of a gunman holding up an oil worker who had $6 in his wallet. After counting the money, the hijacker returned $3 to his victim.

"Why'd you do that?" the surprised roughneck asked.

"'Because my brother's robbing people down the road, and he'll kill you if you don't have any money," the kind-hearted highwayman replied.

As had happened in other oil boom towns, and would happen elsewhere in the future, the state sent in Rangers to beef up local law enforcement and try to have an impact on prostitution, gambling and more serious offences. Rangers developed a near surefire way to determine if a man was honest or a crook—his hands. A fellow with dirty fingernails and calluses was a working man. A man with well-kept nails and smooth hands was a gambler or worse.

More single men than families came to the oil patch. But the oil business was hard on families as well as the men who worked in the field.

"When children were reared in a peaceful neighborhood of homeowners," historian Robert Cotner later recalled, "…it was difficult for them to comprehend the hardships faced by families adjusting to conditions of an oil boomtown. On a train, in the fall of 1918, returning from out-of-state in time for school, I met children who had not seen their fathers in months. Believing that housing might be available in Ranger, mothers and children looked forward to rejoining the family, hardly imagining the primitive conditions many would face."

Just look at them. These are telegraph boys of the Ranger Western Union Office. These "hurry-up kids" are of great importance at present to Ranger oil and lease brokers. Thousands, if not millions, of dollars' worth of business are done daily through these telegrams.

The Ranger field produced high-density oil which, due to heavy demand during World War I, fetched $4.25 a barrel. Beyond making a lot of people a lot of money, the Ranger field eliminated a critical national oil shortage. Historians later credited the oil field with being a deciding factor in the Allied victory in World War I.

After the war, with the number of motor vehicles increasing as fast as Henry Ford and other early automotive manufacturers could get them off the assembly line, not to mention continuing fuel demand from railroads and shipping companies, oil had become critical to the nation.

In another example of the near futility of making predictions, especially regarding oil, the U.S. Bureau of Mines raised a dark specter that must have at least delighted any surviving makers of horse-or-mule-drawn wagons: The nation would run out of oil in nine years and three months.

DESDEMONA

With no shortage of grifters and hijackers trying to make easy money off innocent victims or suckers in the oil patch, others sought wealth honestly, their only real capital being intelligence and no fear of hard work or taking a chance. Two of many men who fit that description, L.H. Cullum and W.E. Wrather, had started their oil industry careers with Gulf Production Co. With only $500 and two well-used automobiles between them, they decided to go into business for themselves. They would have sought leases in the known Ranger play if they could have afforded it. But not having enough money to drill in surer-bet country, they looked for less expensive leasing opportunities.

Wrather, a geologist, searched extensively in the southeastern corner of Eastland County near the small peanut-growing town of Desdemona, about 15 miles from Ranger. Three years earlier, a Desdemona barber had realized there could be more money in oil than sprinkling it on freshly

Above: Ranger didn't really have any alligators lying around, but it did get an unusual amount of rain during the early months of its boom. This is a tricked up photograph by someone with a sense of humor.

Below: A newspaper ad promoting Desdemona, yet another Texas oil boomtown.

Desdemona had a less romantic-sounding nickname: "Hog Town."

cut hair and raised enough funds to drill a test well. He ran out of money at roughly 1,500 feet and gave up. Someone else sank a hole not far from the barber's abandoned site, but quit when it became evident that if there was any oil in the area, it lay deeper. Just about to give up, Wrather finally discovered an outcropping indicating what he believed to be a promising oil bearing structure. He and Cullum found a financial backer and secured a 5,000-acre lease from Desdemona-area property owners eager to see wells come in on their land.

Cullum, Wrather and other interested parties organized the Hog Creek Oil Co., to drill a test well not far from a small creek on the Joe Duke farm. A Duke family story has the driller giving up on what became the Desdemona field discovery well and leaving the rig to report it as a dry hole. Duke went to the rig and told the men on the crew what he would give each man a new pair of boots if they kept drilling and hit oil. Thus inspired, they drilled a little deeper and the well blew in. The men got their boots and Duke became Texas' youngest millionaire, at least for a while. He died broke.

W.N. Koonce, one of the company's managers, had moved his bed to his porch hoping to sleep a little more comfortably in an unusually hot summer when a sudden increase in light on the night of September 2, 1918, woke him up. The derrick was on fire. Hoping to douse the flames before too much damage was done, he and his son jumped in his car and headed toward the rig, picking up neighbors on the way.

"We were helping the drillers drag out some tools and things when we heard a noise down in the well and the driller told us all to run," he later recalled, "but there wasn't any use of his saying that for we were already running. I'd been sick with the rheumatism and hadn't been able to run for eight or ten years but I think I passed everything on that hill that night. I didn't know but what the whole earth was on fire under there."

The well gushed in a burst of flames that shot 200 feet into the air, literally turning night into day. The Hog Creek No. 1 Joe Duke soon produced 3,000 barrels a day. In January 1919 the next producer came in at 8,000 barrels and not long after that a 15,000 barrel well was completed.

Magnolia Petroleum brought in the No. 1 Sam Davis three-and-a-half miles north of the Hog Creek well, and Desdemona soon boomed. Before long, it had exploded from 50 residents to a population approaching 20,000. (Most town booms did not coincide with U.S. Census years, so population figures varied and despite exponential growth likely were overblown.)

Even so, Desdemona was a dramatic example of what the prospect of sudden wealth could have on a community.

Production in and around Desdemona was good while it lasted, but peaked in 1919 at 7.3 million barrels. By the 1930 Census, Desdemona had declined to 609 people.

BRECKENRIDGE

Breckenridge only had about 800 residents when the No. 1 Chaney blew in on February 4, 1918. Before long, just as had been the case in Ranger, some 30,000 folks called Breckenridge home—at least for as long as the oil play would hold out. In the first year after the discovery well came in, the Breckenridge field had produced more than 10 million barrels.

In 1921, celebrating the claim that no dry hole had ever been drilled in the city limits of Breckenridge, six men put up an oil derrick in the middle of the town's main street in one hour and 45 minutes. According to The Oil Industry, a magazine published in New York City, the speedy rig completion broke a world's record. "It has been proposed to let the tower stand and the revenue would be expected to pay for civil improvements," the magazine said.

But that was the same year oil production in the area peaked at more than 31 million barrels. By then, 200 wells operated in town, with the field total about 2,000.

Top, left: Breckenridge had a wooden derrick smack in the middle of Main Street.

Top, right: Men and drilling rigs sought oil in Breckenridge and elsewhere in Texas.

Below: A postcard showing Walker Street in downtown Breckenridge.

Above: A stereo view card photo of Burkburnett's busy train station.

Below: The Burk Waggoner gusher made 4,200 barrels a day.

BURKBURNETT

Good money could be made in oil, but a farmer's cash flow depended on rain. And in Northwest Texas, that is a phenomenon of nature that can never be taken for granted.

With Texas suffering one of its worst droughts ever, Wichita County farmer S.L. Fowler, who lived just north of Burkburnett, decided to give up the agricultural ghost and sell his land. But his wife prevailed on him to stay around long enough to see if they had any oil on their property.

Oil play in the area had begun six years earlier, when the Corsicana Oil Company completed the No. 1 Schmoker well. Located three miles southwest of Burkburnett, the well flowed at a modest 80 or so barrels a day. Aware of that history, but not optimistic, Fowler nevertheless persuaded some of his equally stressed neighbors to pitch in what money they could and organized the Fowler Farm Oil Co. No one saw much of a chance of him hitting oil on his place, a general skepticism that earned the project the title of "Fowler's Folly."

With the $12,000 he had managed to raise, Fowler hired driller Walter Cline to spud in a test well. On July 24, 1918, the well began a moderate flow of oil onto what had once been Fowler's cotton field. Five days later, the well blew in at 1,734 feet, producing 2,200 barrels a day. In late August, another test well blew in as a gusher, and Fowler had a new crop to support his family.

Within 21 days, the Burkburnett town site included 56 drilling rigs with more arriving

daily. Some town lots had two or more derricks crowded on them. The *Wichita Falls Daily Times* compared the boom town to "a hive of bees at swarming time."

By June 1919, Burkburnett had more than 850 producing oil wells. Derricks stood everywhere, flares lit the night sky and the smell of oil filled the air.

Throughout 1919 the Burkburnett field continued to expand. When production reached the flood plain of the Red River, the boundary between Texas and Oklahoma, a legal controversy flared over which state owned a 480-acre tract known as the Burk Divide field. As lawsuits piled up, Gov. William P. Hobby dispatched 15 Texas Rangers to Wichita County to assert the state's sovereignty.

While the dispute over the Burk Divide field played out in the courts, Rangers set up camp and spent most of their time standing around looking tough. Across the river from their tents, a contingent of armed Oklahomans had their own camp. Newspapers hyped the boundary dispute as a potential "civil war" between the two states, but cooler heads prevailed and most of the lawmen left only a few days after arriving.

WICHITA FALLS

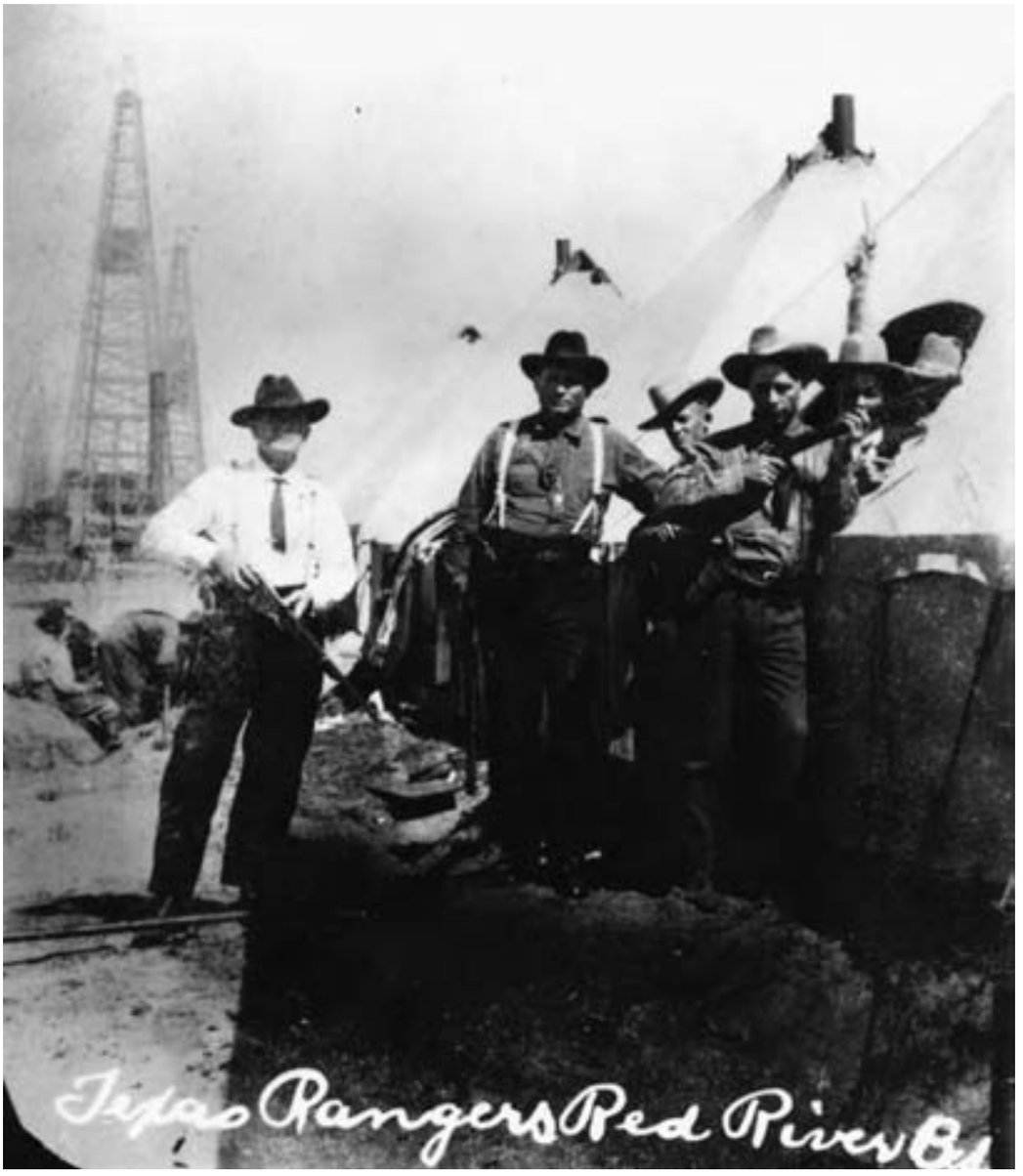
Fifteen miles southeast of Burkburnett, with its existing rail connections and municipal infrastructure, Wichita Falls also boomed as an oil industry headquarters and supply town. Soon after the big discovery near the Red River, available hotel rooms and office space became almost as valuable as crude. Oil stock deals were being made on the sidewalks.

In 1906, well before the boom, Oklahoma business man Augustus Newby built a one-story brick building near the railroad tracks. Keeping the building leased was no sure deal until the boom, when renters came easily. But by 1919, the modest structure bulged with seven tenants, including J.D. McMahon.

Originally from Philadelphia, McMahon ran a drilling rig construction company. With office space in great demand, McMahon made

Above: Wichita Falls became the oil capital of North Texas during the Burkburnett boom.

Below: A sidewalk in Wichita Falls sufficed as an oil stock exchange during the early days of the Burkburnett boom.



Right: Texas Rangers were called in to calm things down during a legal dispute between the Lone Star State and Oklahoma over oil-rich land along the Red River.

Below: Burkburnett's wild and wooly reputation inspired the 1941 movie Boom Town *starring Clark Gable.*

it known that he intended to build a handsome high-rise adjacent to the Newby Building. Circulating a set of blueprints depicting a skyscraper that would tower over the plains, McMahon collected some $200,000 (roughly $2.8 million in today's dollars) from investors.

In a classic case of failing to read the fine print, ingenuous investors did not notice something unusual about McMahon's blueprints: The scale had been calculated in inches, not feet. What investors took as plans for a 480-foot structure rising 48 stories, actually called for a building 480 inches tall.

Having raised ample capital, McMahon began construction. No one knew the new building would sit on land McMahon didn't even own, but investors did notice that for some reason the red brick structure stopped at four floors with only enough square footage for one small office per floor.

Naturally wanting their money back, investors sued. Unfortunately, the court found its hands tied. The engineer turned-scam-artist carefully never went on record that the building would rise 480 feet, and the blueprints his lawyer submitted as evidence clearly showed the structure going up only 480 inches.

Despite his courthouse victory, in an era when litigants sometimes resorted to appeal by six-shooter, McMahon found it expedient

to leave Wichita Falls. By 1922, he was vice president of the Rome Power, Gas and Electric Light Co. in New York. Researchers have not yet found what became of him after that, but assuming he might have been about 30 in 1919, he could have lived into the 1960s. Likely investing his ill-gotten gains from Wichita Falls, he well could have gotten a karmic payback when the stock market crashed in 1929.

At first, Wichita Falls civic leaders were embarrassed by the building and the scam behind it, but in 1920 New York cartoonist Robert Ripley featured the structure as the world's littlest skyscraper and all but those who got hornswoggled began to see the humor in it.

COWTOWN GETS OILY

Though its longtime nickname is "Cowtown," Fort Worth was the nearest major city to the North Texas oil patch other than Wichita Falls, which was smaller. A city that had developed, as the expression went, "from hide and horn," became an oil headquarters and refinery town.

In 1914 the Magnolia Petroleum Co. built a refinery with three plants in Fort Worth. A year later the refinery was producing more than 22,000 barrels of gasoline daily. The Pierce Fordyce Oil Association also had a refinery in Fort Worth. Its capacity was 6,000 barrels a day by 1916. A Gulf Oil refinery produced 7,500 barrels a day.

By 1920, thanks to the oil boom in Ranger, which is ninety miles from Fort Worth, Cowtown had five more refineries with four more in the planning stages.

Statewide, seventy refineries turned crude oil into saleable product. While that was only two more than Oklahoma, that still made Texas the nation's top producer of product from crude oil. Pennsylvania, where the oil industry began, had dropped to third place with 51 plants. The Lone Star State also had the largest aggregate capacity, 330,800 barrels a day.

Spindletop two decades before had proven that Texas had large quantities of oil, but the discoveries in the teens and '20s led to the emergence of the national perception of Texas as oil country.

"Oil millionaires are one of Texas's most noticeable crops," gushed the Chicago-based Clason Map Co. in its "Texas Green Guide." The anonymous writer continued, "The development of the oil industry has created a new crop of millionaires so extensive as to overshadow the fortunate ones of all the other great booms of history."

Above: Nothing could draw a crowd faster than a newly completed, high-pay well like this one near Cisco.

Below: A sign advertising Cisco's largest boomtown hotel, the six-story Victor.

Noting that geologists "consider that one of the world's greatest deposits of petroleum is now being opened up in Texas, and the guide predicted, "time alone can determine its extent and value." To that end, it continued, "Energetic drilling and development…is being carried on [at] a gigantic scale over an enormous area."

The Ranger field, which included Desdemona and Breckenridge, sputtered in 1921, but both trained geologists and optimistic wildcatters believed a state as big as Texas had to have more oil—somewhere.

CHAPTER 4

THE PERMIAN BASIN

In 1915, L. A. Wilke, a young man originally from Austin, started a newspaper in Big Lake, a water stop along the Orient Railway that ran from Kansas City to Alpine. At the time, if a man did not work for the railroad or operate a business in town, he ran a ranch or cowboyed on one.

As was a common journalistic practice at the time, Wilke met each train to see who had come to town, running their names in his next issue. One day, a man who said he was a geologist arrived at Big Lake. Smelling a good story, Wilke asked him if he thought oil would be found in West Texas. Nope, the rock scientist said in so many words. Not around here. Indeed, though there had been some modest exploration in that part of the state, it had the reputation of being a wildcatter's graveyard.

Dry as it has always been during recorded history, very few people at the time understood that much of West Texas had once been covered by a vast inland sea. The former seabed is called the Permian Basin, a scientific description that would eventually become a significant place name.

Throughout the first two decades of the 20th century, the belief continued to hold that West Texas did not have any oil beneath it. It was cattle country, and that was that. "The Permian rocks of Texas," geologist L.C. Snider opined in 1919, "have not yielded any oil or gas…and their nature is such that it seems improbable that any will be found in them."

However, other geologists, beginning with a study of the Marathon Mountains in Brewster County, advanced a theory that an underground structure they named the "Marathon Fold" might contain trapped oil. That feature, they said, possibly extended northeast all the way into Mitchell County and beyond.

A big wooden rig somewhere in West Texas.

By 1916 the state's "University of the first class," a term dating to the state Constitution of 1876, had been matriculating students on its 40-acre campus at Austin for 33 years. But whether the institution had achieved first class status was doubtful, mainly because funding for the University of Texas depended on tax dollars and tuition.

On June 21, 1916, Dr. Johan August Udden, the newly hired director of the school's Bureau of Economic Geology, submitted a report to the Board of Regents. Whether the men who set policy for the university paid much attention to the report is not known, but in carefully measured language, the geologist presaged the future.

"Looking at the ancient Marathon mountain structure as a whole," he wrote, "it does not appear unreasonable to regard it as suggesting the possibility of the existence of buried structures in which oil may have accumulated….The trend… would run through the southeast part of Pecos County into Upton or Reagan counties."

While ever so cautiously asserting that there were "natural chances for finding accumulations of gas as well as oil" on university land, the geologist suggested that drilling for oil not be undertaken "before a thorough geological examination has been made whereby the exceedingly small chance of making the right location for a test may be materially increased."

That theory naturally generated some buzz, so in 1918 a group of hopeful Mitchell County ranchers and professional men formed a company and spudded a test well on February 8, 1920. That July, the Underwriters' Producing and Refining Company's Texas and Pacific Abrams No. 1 1920 blew water, oil and gas over the wooden derrick. But despite a headline in the Colorado City newspaper proclaiming "Struck the Golden Flood!," the well was no gusher. Still, by 1922, Mitchell County had a modestly producing oil field. The slow-but-steady production never received anything but local media attention and routine mention in trade publications, but that Mitchell County well has the distinction of being the first producer in the Permian Basin. (In fact, the well still makes around 100 barrels a day.)

Rupert R. Ricker, a young Big Lake attorney fresh out of the Army, knew more about the letter of the law than he did geology, but no matter the nay-sayers, he believed the find in Mitchell

County proved there had to be oil elsewhere in West Texas. He applied for permits to drill on University of Texas-owned land for the dirt-cheap price of ten cents an acre. The land set aside by the Texas Legislature to benefit the state's university covered 431,360 acres across four counties, Upton, Reagan, Irion and Crockett. Not having the necessary $43,136 to obtain the permits and with time about to expire on his application, Rickert sold his interest in the deal for $2,500 to Frank Pickrell, an old Army pal, and Haymon Krupp, a businessman in El Paso. Pickrell and Krupp organized the Texon Oil and Land Company.

Originally, they had no intention of actually drilling for oil. They figured to make their money selling leases on the university land. But when investors proved reluctant to pay for untested acreage, Pickrell and Krupp knew they would have to sink a hole. The two men had 18 months in which to drill a well, or the giant lease would revert to Rickert.

Just about anyone approached to invest in the deal figured the two men for fools and declined to buy stock in the venture. But Texon obtained enough capital to acquire drilling equipment and transport it along with a driller and workmen on an Orient Railway flatcar to a forlorn site 14 miles west of Big Lake. The plan was to drill three miles out into the brush from the railroad track, but with the clock about to run out on their deal, Pickrell decided to spud the test well adjacent to the track, just beyond the railroad's right of way. The test had to be spudded in before midnight, and working through the evening, they just made it.

Maybe it was the next day, but soon after starting the well, Pickrell did something that most West Texans would have considered bizarre at best. Some of the money backing the venture had come from a nunnery in New York. When the sisters told their priest that they were investing in a Texas oil deal, he suggested that the well be named the Santa Rita for the saint of the impossible. The nuns mailed Pickrell a package of dried rose petals that had been blessed and sprinkled with holy water. Would he please climb to the top of the rig and scatter the petals while saying, "I christen thee Santa Rita?" Possessed either with a strong sense of obligation or a hardy sense of humor, Pickrell did as asked.

Drilling began on September 3, 1921. Nearly two years later, on May 28, 1923, driller Carl Cromwall hit oil at 3,028 feet, the discovery that finally stimulated extensive exploration and drilling in the 76,610-square mile Permian Basin.

"Scouts Declare Santa Rita Is a Paying Oil Well," the *San Angelo Daily Standard* proclaimed atop its front page on June 10, 1923.

"If a real oil field is developed the University of Texas probably will be the richest educational institution in the world," the newspaper correctly predicted.

Santa Rita indeed presaged "a real oil field" in the Permian Basin, but the full realization of its significance did not come instantly. For one thing, Pickrell needed more money to proceed with further drilling. He took the train to Pittsburg to meet with West Virginia-born Mike Benedum, a well-known wildcatter who had cut his teeth in the Pennsylvania oil fields.

This was not the first time someone had approached him about West Texas. His money had been behind the test wells that brought on the Desdemona boom in 1918. Benedum decided to take a chance on the potential play around Big Lake, but he had trouble

Above: A historical marker in Mitchell County to commemorates the first well drilled in the Permian Basin..

Below: The Santa Rita No. 1 near Big Lake triggered the West Texas oil boom.

interesting investors despite his growing reputation. Organizing a new company he called Plymouth Oil, he managed to sell 300,000 shares of stock at $1.50 each.

The first three wells Benedum drilled, Santa Rita Nos. 2, 3, and 4 resulted in two so-so wells and one dry hole. Santa Rita No. 5, located north of the original well, came in at 300 barrels and Benedum put up another $800,000 to fund further drilling. The next three wells resulted in one small producer and two more dry holes, but Santa Rita No. 9 blew in at 9,000 barrels a day and Benedum and others finally realized the Lone Star State had another big play around Big Lake.

Big Lake boomed, and, as the nearest city of any size, so did San Angelo. Mike Benedum also did pretty well. At year's end in 1925, Plymouth oil doubled its return to investors. The following year, the company's dividend amounted to $5.25 a share. Meanwhile, Pickrell sold out for $4.5 million and the University of Texas suddenly had a steady infusion of big money accruing in the state's Permanent Fund.

Santa Rita No. 1, though only a modest well in terms of production, is significant far beyond its numbers because the field it presaged stimulated additional exploration and drilling in the Permian Basin. Many other fields in the basin would follow.

Within two years, three small towns on the Texas and Pacific Railroad on the western end of the basin, Midland, Odessa and Big Spring, had been transformed from rail stops to boom towns. As production expanded in the Permian Basin, Midland emerged as the capital city of the West Texas oil patch. Soon, 36 oil companies maintained offices there. By 1928, a 12-story Gothic-style office building on Texas Avenue had been opened and quickly rented out. Within walking distance, the new Scharbauer Hotel became a popular meeting place for oilmen, with many a handshake deal originating in its lobby.

North of Midland, in Howard County, Big Spring—a railroad town that had developed where warriors riding the Great Comanche War Trail had once watered their horses—became a refining center. Soon four refineries were processing Permian Basin crude oil.

Another Permian Basin gusher blows in.

WINK

The state's western-most oil field, the Hendrick, came in on July 16, 1926, when Fort Worth promoter Roy Westbrook brought in a paying well at 3,006 feet on the 53-section ranch of Thomas G. and Ada Hendrick in Winkler County, only a few miles from the Texas-New Mexico line and one of the most remote parts of the state. By early the following year, the ranch bristled with wells.

In 1927, surveyors carved up one of the Hendricks' pastures for a town site that became Wink. A promotional ad for the Wink Town Site Company started with a short poem: "Every gink, who will stop and think, will buy lots in Wink." The town quickly grew and operated wide open until Texas Rangers came to tame it.

By 1928 some 15,000 people lived and worked where fewer than two years before there had been only sand and shinnery. One of those new arrivals was 19-year-old W.L. Robinson, who had been drawn to the oil patch by the most basic of motivations: money. As a student at North Texas State

Teacher's College in Denton, he had been $150 in debt and had couldn't see how working for $2 a day on his family farm would get him anywhere very fast. But in Wink, he easily found a $6-a-day-job as a roughneck. Of course, he worked 12 hours a day, seven days a week. The job was grueling and dangerous, but $168 a month amounted to big money back then.

"So the drillers and roughnecks drilled the wells; the pipe-liners laid the pipe lines; the tankers built the [oil] tanks; the roustabouts connected up the wells and kept them producing, and the muleskinners moved what needed moving," Robinson recalled years later. "The bootleggers, gamblers, prostitutes, dope-heads and hijackers preyed on the working men, and the Wink oil field was developed."

Those two sentences describe the production side of the oil industry anywhere in Texas—from Corsicana to Wink and from Beaumont to Borger—for most of the first half of the 20th century.

A MILLION-BARREL HOLE

In early 1928 the newly discovered Hendricks field in Winkler County spouted 500 barrels a day and places like Pyote, Monahans and Wink had become what one newspaper called "mushroom towns."

Unfortunately, the Roxana Petroleum Company (later Shell Oil) did not have a pipeline to get all its crude to a refinery. On top of that, hauling the oil to the nearest rail connection by truck over mostly unpaved roads would take a fleet of vehicles. To solve the problem, the company decided to build a Texas-size reservoir capable of holding a million barrels of oil.

After selecting a site in Ward County southeast of Monahans and not far from the Texas and Pacific Railroad's main line, Roxana brought in a large force of workmen to dig a giant hole. Using mule-drawn equipment, the workers completed an excavation that from an airplane must have looked like a giant meteor crater. Next, workers laid wire mesh over the packed earth. Then, working 24-hours-a-day, contractors poured tons of concrete.

When the concrete cured, the tank measured 522.6 feet from north to south and 426.6 feet east to west. With 45-degree walls, the tank dropped 36 feet from roof to floor at the center, 25 feet along the perimeter.

By late April 1928, workers hammered away at a wooden cover for the colossal tank, placing creosote-soaked support timbers at 14-foot intervals across the enormous reservoir floor. Those timbers supported a domed, tarpaper-covered redwood roof. Pressurized crude entered into the bottom of

Big Spring, Midland and Odessa all mushroomed following the Santa Rita discovery. This is an oil company building that went up in Big Spring.

The Permian Basin soon became Texas' largest and most productive oil field.

the tank, the intake located near a huge drain that would be used to empty the reservoir in case of fire. The tank also had six 150-foot lightning rods rising from it.

One thing Roxana's engineers apparently forgot to take into consideration was the weight of crude. One gallon of the thick stuff weighs about eight pounds. A barrel of oil contains 42 gallons, tipping the scales at some 336 pounds. When Roxana injected a million barrels of oil, under that much weight the tank leaked. Beyond that, despite the roof, evaporation also claimed oil. Too, the weight of the roof put a lot of stress on the concrete, causing cracks.

Even so, the product loss happened slowly enough to make the tank workable for a time. The oil it did manage to hold got shipped by rail to Oklahoma to be refined. But when production near Wink began to decline, the flow from the field could be more easily moved by traditional methods. By late 1929, the so-called "million barrel hole" had been abandoned, and no similar reservoirs were built.

OIL WEST OF THE PECOS

When Ira Yates traded a thriving general store for a sprawling ranch in Pecos County in 1915, most people thought he was crazy. That barren acreage was too poor to sustain many cattle or sheep. But Yates had a notion oil could be found under that acreage.

After the Big Lake field came in, Yates prevailed on geologist Levi Smith, who worked for Mike Benedum, to come take a look at his property. Yates told the affable rock hound that oil seepages could be found in numerous locations on the Pecos River and that he believed oil in producible quantities existed beneath his property. At the time, conventional wisdom held that oil would never be found west of the Pecos. And west of the Pecos is where Yate's ranch lay.

Yates succeeded in winning Smith over, and it worked out that the Mid-Kansas Oil Co. would sink four holes west of the Pecos. Neither, however, was drilled on Yates' ranch. Nor did any of them find oil. Yates argued for one more shot, this time on his place. With duly noted reluctance, Mid-Kansas agreed to spud a test well on Yates' ranch.

On October 28, 1926, more than a decade after Yates had acquired his property, the Ira G. Yates No. 1-A hit oil at 992 feet, producing 95 barrels an hour. Spudded in only 23 days earlier, the discovery well settled down at 4,000 barrels a day. "Well, I'll be damned!" Yates proclaimed when told of the gusher. The following day, in consideration of $185,000, Yates conveyed only a small percentage of his royalty in the well. When

Above: A postcard showing old ranch home of Ira Yates, a residence he no longer needed after oil was found beneath his acreage.

Below: A sign commemorating the Yates Field discovery well, a hole that continued to produce.

Mid-Kansas decided to take the well deeper, a much larger reservoir of oil was found only 500 feet farther down and the well began producing at a Spindletop-like rate of 71,000 barrels a day.

By the spring of 1927, the Yates Field had five wells producing an average of 9,099 barrels a day. Two years later, the Yates No. 30-A came in at an incredible 204,682 barrels a day. At the time, that stood as the most prolific oil well in the world.

Over the next two decades, the Yates discovery well was dug deeper three times. Each time its flow increased. More than 80 years later, the well continued to flow. The entire field has produced more than 2 billion barrels of oil.

Oil may have been plentiful in the Yates Field, but the availability of groceries for roughnecks and others in the oil patch could not be taken for granted. "Woman cooking," then a popular term for good food not prepared by calloused male hands with no shortage of black crude under their fingernails, ran particularly scarce.

Not long after the field came in, the *San Angelo Standard-Times* gave state-wide publicity to a woman whom reporter Sam Ashburn considered the best cook in the field, Mrs. R.L. Rice.

A driller's wife, Mrs. Rice ran one of nine boarding houses owned and operated by the Illinois Pipeline Co., then a major player in the Yates Field and elsewhere in West Texas and New Mexico. Given the remoteness of its areas of operation, the company furnished a structure, fuel, electricity and ice to vendors who in turn managed the boarding houses and made a living off the profits.

The accommodation Mrs. Rice operated fed employees and occasional visitors at the Mid-Kansas Oil Co.'s Camp No. 2 in Pecos County.

"The boarding house isn't a dirty establishment with chairs marked by the greasy hands of the working man," Ashburn wrote. "It is clean and attractive with chairs for the men to sit [on], pegs on which to hang

Above: A panoramic view of the Yates Field.

Below: This "Christmas Tree" of pipe, valves and gauges has nothing to do with the holidays and everything to do with the flow of West Texas crude.

their hats, large tables to hold the food and lace curtains on the windows."

For most oilfield men, however, the quality of the food that went on the table trumped ambiance. And when it came to cooking, Mrs. Rice did not disappoint.

"The food is home cooked and with the seasoning that gives it the best of taste," Ashburn wrote.

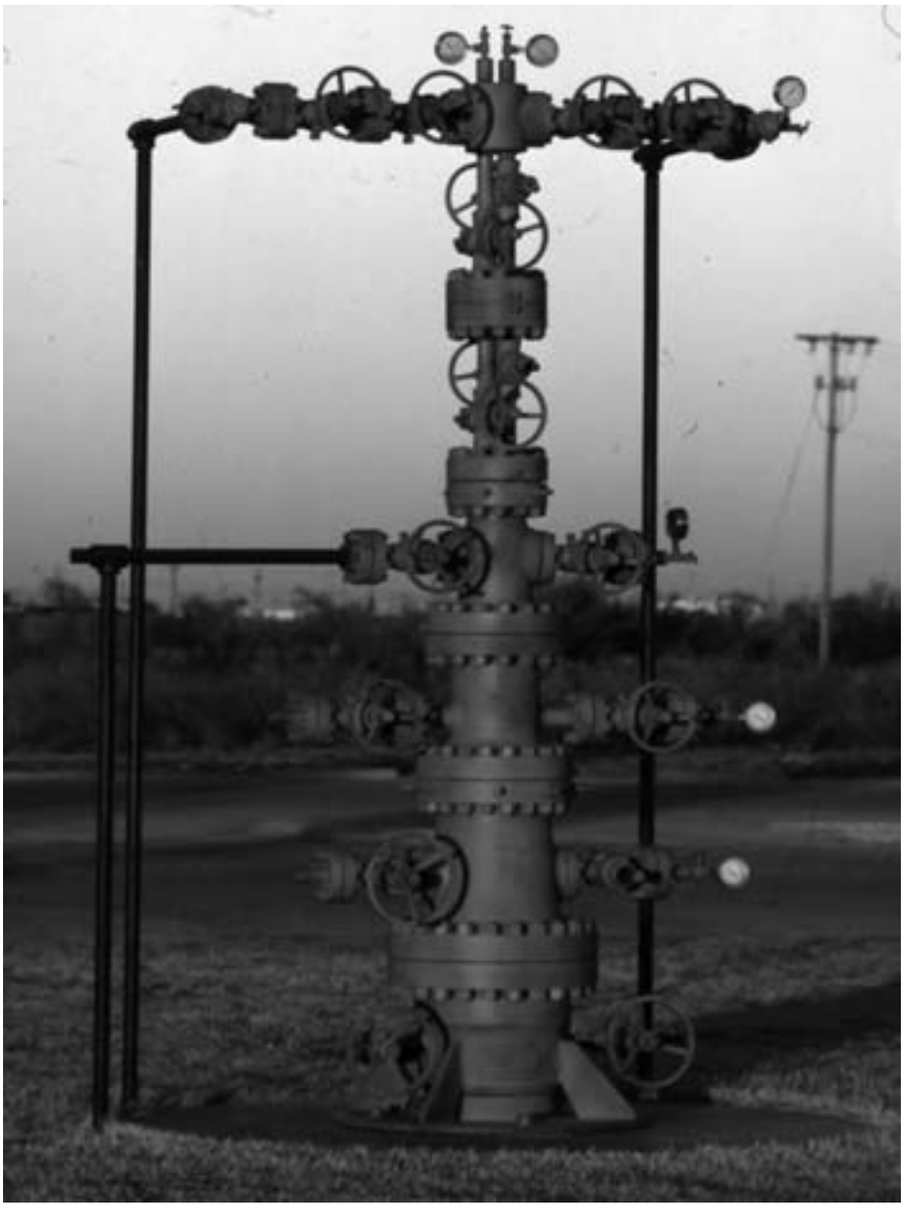
At least 120 men ate at the boarding house daily. Not only did Mrs. Rice cook breakfast, lunch and supper, she had food ready for men who worked at night and slept by day.

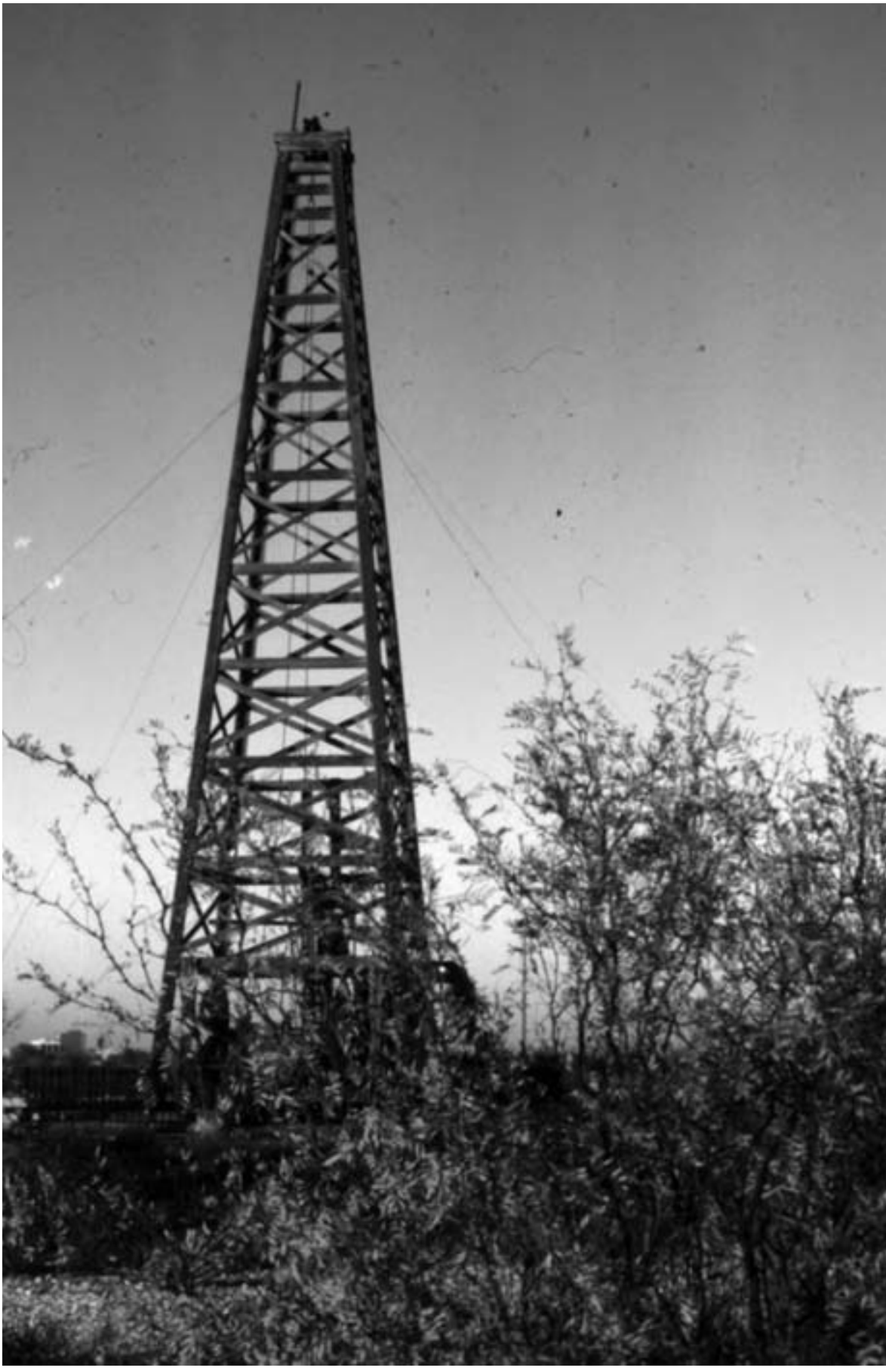
"Thirty minutes in this boarding house would enable a man to live without food for a week," Ashburn rhapsodized.

Since roughnecks and drillers made more money than roustabouts and other oilfield denizens, some boarding houses charged them 25 cents more per meal. Mrs. Rice, however, sold meals for a set price regardless of how much a man earned. Not only that, if a man found himself short of cash between paydays, Mrs. Rice let him eat for free until he could pay her back.

While Ashburn did not say how much Mrs. Rice charged per plate, he did describe a typical noon menu: "Meat and gravy, dressing, onions, squash, sweet potatoes and Irish potatoes, corn on the cob, beans and greens, fresh tomatoes, turnips…potato salad, light bread (white bread) and corn bread."

Dessert, either washed down with iced tea or a glass of sweet milk (as opposed to





By World War II, most of the wooden derricks in Texas had been replaced with metal rigs. This wooden rig is at the Petroleum Museum in Midland.

buttermilk) was a piece of pie "as big as the Russian army."

The Yates play revitalized the sleepy Upton County seat of Rankin. The town had been founded in 1912 when the Orient Railroad bypassed the original county seat of Upton, 12 miles to the north.

In the cold pre-dawn of January 11, 1928, the Upton County sheriff and two deputies shot two men to death behind a Rankin bank. The officers claimed the men had burglarized the financial institution and intended to use a cutting torch to break into the safe. A roadster holding a blanket-wrapped acetylene tank was found behind the building. At the time, the Texas Bankers Association had a standing $5,000 reward for dead bank robbers. The lawmen involved in the incident later got indicted for murder and conspiracy to murder in what Texas Rangers said was a scheme to frame a couple of innocent oil field characters so the officers could collect the reward money.

Above: This hotel did a flourishing business in McCamey as production soared in the Yates field.

Below: Oil booms attracted crooks, but in this case the Upton County sheriff was crooked – killing two oil field followers in the hope of collecting a bounty on dead bank robbers offered by the Texas Banker's Association.

CHAPTER 5

SOUTH TEXAS

DOWN MEXICO WAY

A successful businessman and state senator in Oklahoma, Oliver Winfield Killam saw trouble coming. The World War had ended in November 1918, but Killam believed the nation was headed toward a post-war economic downturn. And that's what happened in 1919.

Selling his business and personal property and foregoing his political career, he left Oklahoma for an unusually rain-soaked Laredo in the spring of 1920. At 45, married and with three children, he had decided to reinvent himself. He would become a millionaire Texas oil man, finding oil in a part of the state where no one thought it could be found—along the Mexican border. Of course, though he had a college degree, Killam knew nothing of the oil business other than good money could be made from it.

Easily obtaining an oil lease on the Hinnant Ranch in Zapata County, Killam and two partners, T.C. Mann and L.T. Harned, organized the Mirando Oil Co. The company name came from Nicolas Mirando, original owner of the Spanish land grant on which the Hinnant Ranch was later established. Coincidentally, in Spanish, "Mirando" means "look." Fittingly, when Killam formed the company, he was still just "looking" for oil. The only geologic data he considered in selecting a lease was that it had some hills on it that reminded him of the terrain in the proven oil play in Oklahoma around Bartlesville.

Central Texas has never produced much oil, but Edgar Davis brought in a major field around Luling.

What happened next is a familiar story in Texas oil history. Killam's first well, the Hinnant No. 1, proved a duster. Drillers found a trace of oil with Hinnant No. 2, but when they started bailing the well in, pipe slipped down the hole and blocked the oil sand. With existing technology, the well could not be salvaged so Killam had the Hinnant No. 3 spudded in. The well came in as a 30-barrel producer, small *papas* (potatoes) compared to boisterous plays elsewhere in the state, but it proved that oil could be found in South Texas.

With drilling continuing on the 10,000 acres Killam now had under lease, in September 1921, he purchased a section of land in Webb County and had a surveyor lay out a town site. He called it Mirando City, and when he and new partner Colon Schott of Cincinnati brought in a 4,000-barrel gusher just south of there on December 10, 1921, yet another Texas oil boom was on.

The only slight problem Killam had was owning a robust oil field with no way to get his product to market. With the nearest road 22 miles from the play, he had a pipeline built from the Schott Field to the railroad. In 1923, to further enhance the commercial potential of his field, Killam built a refinery at Mirando City.

In 1926, Killam sold much of his holdings to the Magnolia Petroleum Co. for $1.25 million. He retained his refinery, which he ran until the 1930s, along with his pipeline and two other oil companies he had created. On July 4, 1937, oilmen attending the Oil Jubilee in Laredo, named Killam "King Petro."

THE LULING FIELD

As the state's early oil plays went, the Luling Field did not break any records for size or production, but the man who brought it in deserves recognition as one of Texas's more eccentric oil men.

Unlike most rags-to-riches Texas wildcatters, Edgar B. Davis had already been a millionaire twice—the first time as a shoe manufacturer, the second as an investor in an East Indies rubber plantation—before coming to the Lone Star State to give the oil business a shot. He gave away most of his first fortune and lost his second earning a third.

In 1926, Oliver Killiam sold much of his holdings to Magnolia Petroleum Company.

Though Davis was a Massachusetts Yankee, a Fort Worth attorney he had met through the rubber business pitched him an investment opportunity in a Texas oil deal in Caldwell County. That was in 1919. Davis did not see the venture as particularly interesting, but his brother Oscar did, so they formed the Texas Southern Oil and Lease Syndicate.

The group hired a geologist newly discharged from the Army at Fort Sam Houston in San Antonio and he began surveying around Luling, a community known for its large, tasty watermelons. Checking geological features earlier noted by a mining engineer, E. Verne Woolsey concluded none had any merit. But in July 1919, he discovered a distinct fault line in an outcropping of rock on the San Marcos River near the small community of Stairtown. He believed oil would be found along that line. A test well proved to be a duster and Oscar Davis opted not to ante up another $25,000 for a second well, magnanimously letting his brother take over the syndicate.

Davis changed the name of the venture to the United North and South Oil Co. and kept drilling in the Luling area. He steadily lost money on a series of dry holes. Finally, on August 9, 1922, the Rafael Rios No. 1 came in at 2,161 feet. A 150-barrels-a-day well does not an oil boom make, but Davis kept locating additional wells. By then he was operating on credit, and that credit was evaporating faster than the juice spilling from a smashed Luling watermelon on a scorching summer afternoon.

With a note due that he couldn't pay, on the afternoon of April 15, 1923, Davis drove to a well he had under way, the Merriweather No. 2. "Despairing of any immediate action," he later wrote, he had just gotten in his car to drive off "when I chanced to look up and saw clouds of what looked like black smoke…shooting up the derrick in increasing force. We hastily got out of the automobile and beheld one of the sights of our lives…we were soon literally baptized in oil."

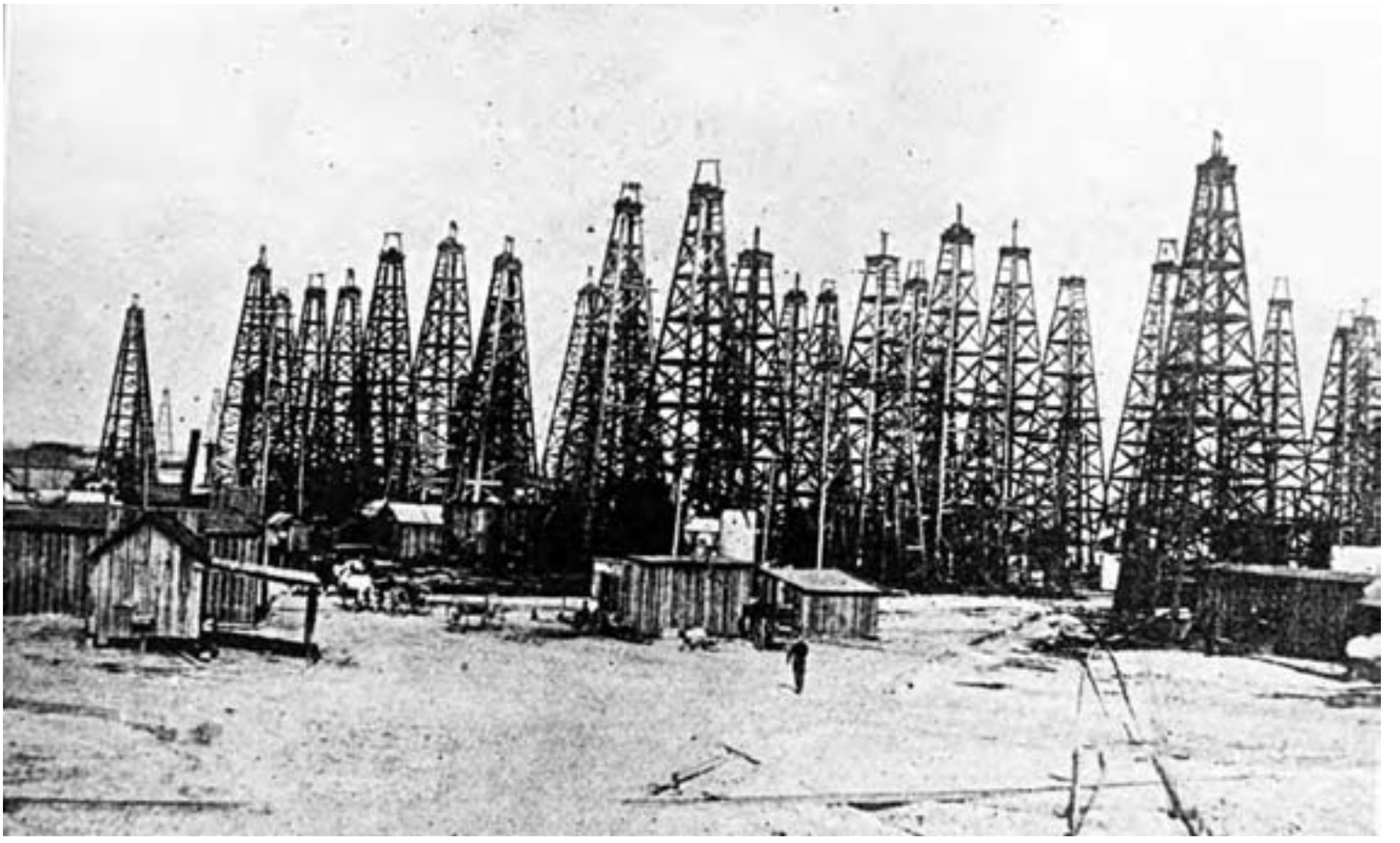
That well set off yet another oil boom, soon tripling Luling's population. The biggest well, a 10,000-plus barrel a day producer, came in on May 9, 1924. By the end of the year, Davis's company had 112 producing wells in Caldwell and Guadalupe counties.

Opting to cash out of the oil business, on June 11, 1926, Davis sold his holdings, which by then included 215 producers, for $12.1 million to the Magnolia Petroleum Co. He took about half that in cash and the rest in future production. For a time, the deal stood as the biggest transaction in oil industry history.

Davis did not pocket much of the money. To celebrate his success, he threw a Texas-style barbecue for some 15,000 residents of the two counties where he had made his latest—and final—fortune. Guests enjoyed 12,200 pounds of beef, 5,180 pounds of mutton, and 2,000 chickens with ample trimmings. For dessert, the crowd had 85 gallons of ice cream, 8,700 ice cream sandwiches and 7,000 cakes. They washed all that down with 28,000 bottles of soda and 6,500 bottles of near beer (prohibition being still in effect).

Not forgetting his employees, Davis paid $1.75 million in bonuses. He also donated two parks and two country clubs to the citizens of the area and with $1 million in seed money established the Luling Foundation to foster scientific agriculture.

"He was a good, decent but very odd man," longtime roughneck Gerald Lynch wrote in *Roughnecks, Drillers and Tool Pushers*. "We have seen all too few like him in the oil patch."




EFFECTS OF A THIRTEEN TON DYNAMITE EXPLOSION
CAUSING SEVERAL THOUSAND DOLLARS
DAMAGE IN BORGER AND TAKING TWO
LIPS OF TWO PERSONS.

CHAPTER 6

MORE BOOMTOWNS

THE PANHANDLE

M. C. Nobles, who had come to Amarillo in 1892 when the High Plains city was only about five years old, made a living for his family as a grocer. He later invested in the young city's trolley car system. But like many entrepreneurs, he was always looking for another deal.

Having read in the *Amarillo Globe* about successful oil drilling down state, Nobles took the train to Oklahoma City to talk with University of Oklahoma geologist Charles Newton Gould about oil prospects in the Sooner State. But before he boarded the west-bound train for his return trip to Amarillo, Nobles asked Gould, who from 1903 to 1907 had explored the Panhandle to document underground water sources for the Hydrographic Branch of the U.S. Geological Survey, if he thought the High Plains of Texas had any potential for petroleum. Gould recalled a series of domes along the Canadian River in northeastern Potter County and agreed to show Nobles where they were.

Back in Texas, Nobles organized a prospecting trip to the Canadian with Gould as the guide. Standing on high ground near Alibates Creek, Gould pointed toward the mound-like features he had noted in his earlier survey of the area. Oil and gas had been found in similar structures, he told Nobles and others in the party. Even though no proven production lay within 200 miles of Potter County, Gould believed that the area was worth drilling.

A crater caused by nitro explosion in Hutchinson County.

In April 1917, Nobles and other investors, including Gould, organized the Amarillo Oil Company and leased 70,000 acres along the Canadian. As the first World War neared an end in the fall of 1918, the company began drilling. That December, at 2,605 feet, the Masterson No. 1 hit gas.

The discovery of gas at first had no significant impact on Amarillo or the Panhandle even though it soon became available commercially as a cheap fuel for heating and cooking in homes and businesses and a few industries.

Another group of investors put together a group of leases in Carson County, east of Amarillo, and succeeding in getting the Gulf Production Co. interested in drilling a test well. That hole brought only gas, but on May 2, 1921, a second test, the Gulf Oil No. 2 Burnett, struck oil at 3,052 feet. The well produced 200 barrels a day, but it had been proven that the Panhandle might have more to offer than good grazing and farming land. Following the initial discoveries in Carson County, drilling spread across the Panhandle.

In Hutchinson County, the Dixon Creek Oil and Refining Co. No. 1 Smith came in at 400 barrels a day in March 1925. By the summer of 1926, a total of 174 High Plains wells averaged 48,985 gallons a day. The company's No. 2 Smith hit oil in December, the well making 3,000 barrels a day. Based on that, the No. 1 well was reentered and drilled a bit deeper. That proved to have been a pretty good idea because the well blew in as a gusher on January 11, 1926, producing 10,000 barrels a day. Nine months later 813 wells along or near Dixon Creek were producing 165,000 barrels a day.

The northern-most part of the state had been found to be what one writer termed "petroliferous."

Oklahoma land promoter A. P. "Ace" Borger and partner John R. Miller, an attorney, bought a 240-acre tract in the southern part of the county and developed a town site. Borger not-so-modestly thought the place should be named in his honor, and Borger, Texas, was born. In March 1926, Borger, Texas, shot up from Canadian river-break ranchland to boom-town status like a valve blowing off an over-pressured pipe. By the early fall, Borger approached a population of 45,000 and had a rail connection, a post office and a school, not to mention hotels, stores, bars and houses of ill repute. Soon it also had a power plant for electrical generation, telephone service, a hospital and a scrappy newspaper, the *Borger Herald*.

The play along Dixon Creek also benefited Amarillo, even though it was 65 miles away via a two-rut road. In less than a year, the town jumped from 25,000 to an estimated 40,000. By the end of 1927, more than 20 oil companies were drilling around Borger.

Brothers Frank and L.E. Phillips had founded Phillips Petroleum Co. in Bartlesville, Oklahoma, in 1917. Ten years later, they began selling gasoline at service stations and opened a refinery in Borger. Later, the company made Phillips 66 its brand. (One version of how the brand came to be is that the company borrowed the two sixes from U.S. Route 66, which traversed Oklahoma and the Texas Panhandle. Another story holds that the brand was born when a Phillips official was giving his company's gasoline a road test. Pleased at the performance of the vehicle, he remarked it was running "like 60." Supposedly, the driver checked the speedometer and said, "Sixty nothing…we're doing 66!")

The Panhandle activity soon expanded to Gray County, where the Prairie Oil and Gas Company's L.W. McConnell No. 1, a gasser that later produced oil, came in not far from Pampa.

Not every Panhandle resident viewed the discovery of oil in that part of the state as necessarily a good thing. Some wheat farmers and cattle ranchers, who had their own grass-versus-plow differences, at least agreed they didn't much care for lease hounds.

As oil company representatives spread out across the plains in search of likely drilling leases, they were not always welcomed by the landowner with a hospitable "light and hitch," the classic get-off-your-horse-and-stay-awhile greeting. Often they found signs warning them to proceed no farther. One sign read: "NOTICE OILMEN. NO TRESPASSING. IF CAUGHT WILL BE SHOT. IF SHOT WILL BE BURIED."

One tale that has the ring of truth involves a lease hustler named Olsen, a relatively new arrival from Norway. English was not his strong suit, but he finally prevailed on one reluctant old-time rancher to sign a lease with his oil company. Notifying his company of the new lease as soon as he could, Olsen received instructions to sell the lease to another company for a lot more money than he had paid the rancher.

Somehow, the rancher got word that he had been taken for a sucker by the lease man. When Olsen showed up at the courthouse to file the lease with the county clerk, the rancher approached him and quietly requested a private conversation. The rancher led Olsen to the cupola on top of the courthouse. The small room, which had an open transom above the door, held a couple of chairs.

Above: A night shot of oil well fire near Borger.

Below: Oil wells along Dixon Creek east of Borger, a town founded because of oil play in the Panhandle.

The rancher shut the door and wedged one of the chairs against it so that it could not be opened from the outside. Then he sat down on the other chair, took a knife and a piece of wood out of his pocket and started whittling.

Olsen did not know quite what to think until, in a low, slow voice, the rancher told the immigrant lease man that he didn't much appreciate the fact that he had made a big pile of money off his land. Before the rancher could outline what remedy he might have in mind, Olsen told him that he had paid the rancher's asking price fair and square and that it was none of his business what his company chose to do with the lease after that.

That was the wrong thing for Olsen to have said.

Suddenly animated, the rancher jumped up from his chair and pressed the tip of his knife into Olsen's nicely starched shirt.

"I'm going to cut your heart out," he said.

Above: Texas Governor Dan Moody twice invoked martial law in Borger, sending in Rangers and National Guard troops to restore order.

Below: A street scene in Borger at the height of its boom.

Above: Tank batteries at Mexia looked like so many giant checkers.

Right: For the first three decades of the 20th century, mules provided much of the motive power in the oil field. Here they are hauling a tank near Mexia.

Hearing that, Olsen sucked in a deep breath and said the first thing that occurred to him:

"If you start at me vit dat knife, all you vill see of me are my feet going trough dat transom."

The rancher thought about that for a few seconds and then burst into laughter. Thanks to that fast-talking Norseman he hadn't made as much off his land as he would have liked, but at least he wouldn't have to be hiring an attorney to defend him in a murder trial.

MEXIA

Locals pronounce the name of the Limestone County seat "Muh-hair." Those not familiar with the name, reacting to the town's first three letters, usually mistakenly call it "Mex..ia," the accent on Mex, as in Mexico. The correct pronunciation is "Ma-hay-ah," but no such confusion attached to the value of forcefully flowing crude.

Exploring only 31 miles from the old Corsicana field, in 1912, Blake Smith's Mexia Oil and Gas Co. began drilling in the vicinity

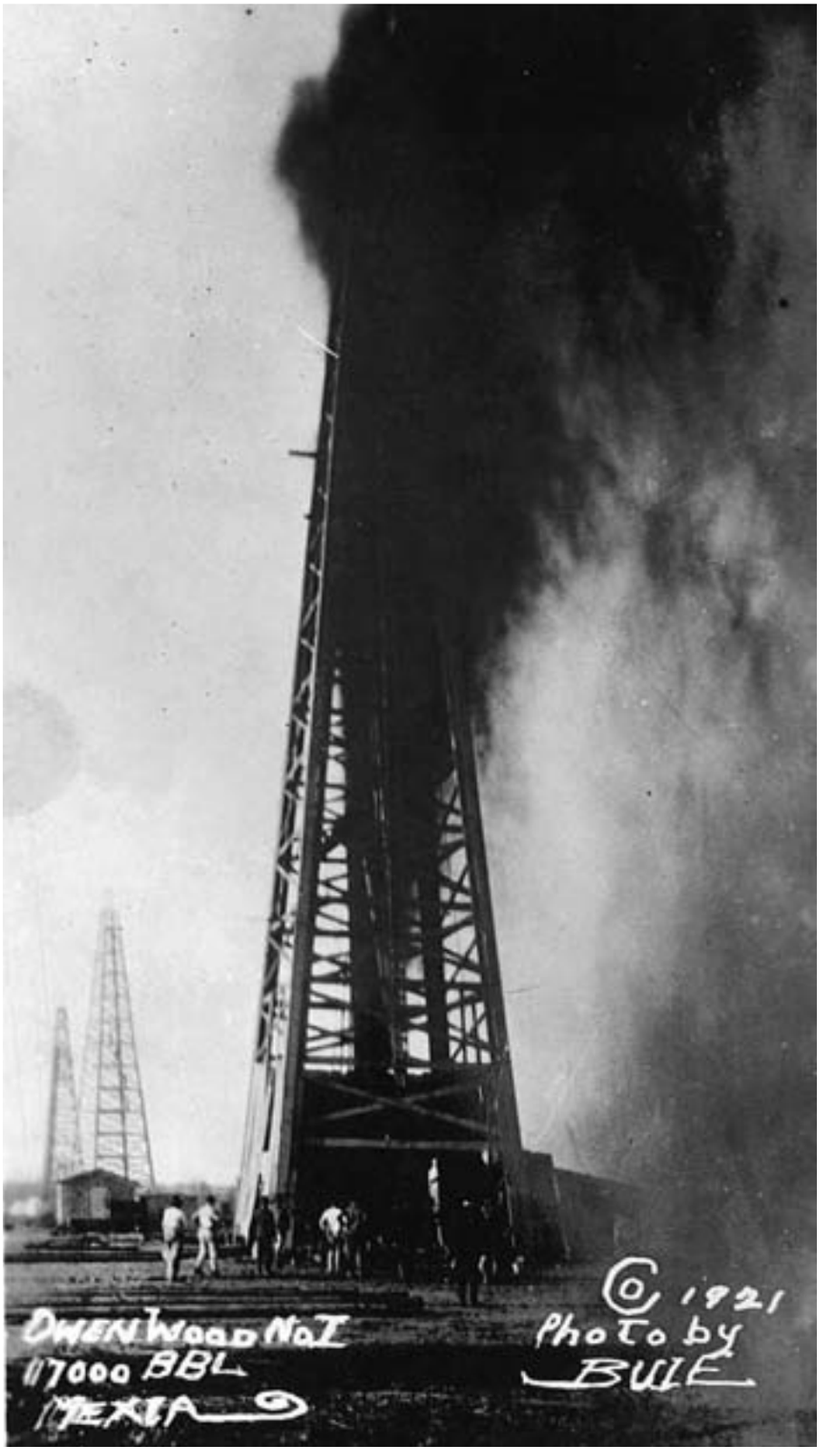
of Mexia. Smith had recruited 100 businessmen willing to invest in his company, a group of stockholders who must have come to question the soundness of the proposition, not to mention their judgment, when the first 10 wells Smith drilled all proved to be dry holes. Fortunately for all concerned, the 11th well brought gas.

Forty gas wells had been completed in the county by 1916 and the company negotiated contracts to sell its product to the cities of Mexia, Corsicana, Groesbeck and Waco. Within three years, however, the gas field had petered out. Believing oil could be found in the area as well, Smith offered a 50 percent stake to any producer willing to drill for oil on the 2,000 acres the company had leased.

Smith pitched that idea to Col. Albert E. Humphreys, owner of the Homaokla Oil Co. Humphreys wasn't interested, but his geologist was. With a seemingly ever-growing demand for oil, an increasing amount of brain power was being brought to bear in the search for new play. Oil companies had begun to rely more and more on geologists, many of them having left the more traditional mining and quarrying industries for the more lucrative career path tied to translating geological knowledge into producing fields.

Homaokla geologist F. Julius Fohs came to Limestone County with a two-man surveying crew. When, after studying the terrain, he reported a good possibility of finding oil in the area, the company began acquiring leases in addition to the land offered by Smith's company. Soon having 6,000 acres on which to drill, Homaokla sank two test wells, neither of which came in.

The company spudded another well on the L. W. Rogers farm, three miles west of Mexia. On November 19, 1920, the Rogers No. 1 was completed at 3,100 feet with a modest flow. The next well they drilled, the Berthelson No. 1, came in at 4,000 barrels a day. Each new well brought bigger pay. On August 21, 1921, the No. 1 Desenberg came in at 18,000 barrels a day. The same day, a 24,000-barrel-a-day well gushed forth, stimulating a boom that saw Mexia's population jump from 4,000 to ten times that in a matter of weeks.



That level of activity brought good and bad people to the new boom town. Conditions grew out of hand, eventually forcing Governor Pat Neff to declare martial law, a dire legal measure that had not been

A gusher near Mexia sparked yet another oil boom in the state.

invoked in Texas since the devastating 1900 Galveston hurricane that had claimed an estimated 8,000 lives. Neff ordered in state troops and Texas Rangers to control crime and vice in a town that had grown weed-like into one of the state's major cities virtually overnight.

The Mexia field produced almost five million barrels in 1921. Output the following year rose to more than 35 million barrels, but 1922 proved to be the field's peak production year.

THE POWELL FIELD

The boom in Mexia rekindled oil company interest in Navarro County, where Corsicana had seen the state's first significant production 25 years before. In early 1923, Humphreys brought in a 400-barrel well near the community of Powell, 11 miles southeast of Corsicana. The well had gone into the Woodbine sands, deeper than the shallow Corsicana field. Not long after, only a half-mile from that well, another operator made an 8,000-barrel completion. After only a month, the discovery well went to saltwater, but it had stimulated a drilling boom that soon revealed a substantial play. Like the Mexia play, the boom was short-lived, but for a time later that year, half of Texas's oil was coming from the Powell field.

HARD TIMES

The oil business had been blowing and going in Texas throughout most of the 1920s, as had the nation's economy in general. But by 1930, it had become painfully evident that the October 29, 1929, stock market crash in New York had triggered a world-wide economic depression.

Prices sank, businesses and banks failed and the nation saw nearly one of out of four working Americans out of jobs. Many people lost their homes, others lost everything.

"Over at Iowa Park, Texas," one newspaper reported, "an oil field worker found a jobless life with six hungry children and a wife too much for him. Last Sunday, while the children were in Sunday school, the father left a blood-stained note telling of his taking his wife's life and then of his plan to take his own—both were dead when discovered."

Oil boom towns didn't have niceties like paved streets. Mired cars and trucks became almost a cliché photo subject.

In the Panhandle, Fred Carl worked in the oil patch, first in Borger and then at Pampa. He arrived in Borger from Washington State in 1926 shortly after the boom began and worked in the fast-growing field for six months before his wife Ella joined him. Not long after she got to the Panhandle, she began sending long letters to her sister in Washington. Life back then in that part of Texas was either cold or dusty, but the money was good and she found plenty of things to write about.

By early 1931, with the nation's economy continuing to worsen, it looked like Carl was about to be laid off. The oil stock he had obtained through his company had become worthless as "this depression which now makes us feel absolutely helpless" deepened, Mrs. Carl wrote

Things were so bad, she went on, that oil workers and others had taken to hanging empty buckets from leaky pipelines to catch enough dripping gasoline to keep their cars running. "If you want some," she wrote, "you have to be there early though there are always men ahead of you. Gasoline here…is just as expensive as it is anywhere else."

Still, she reflected, "Oil will always have a market, I guess, because restless people will spend their last dime to buy gas to go somewhere."

Soon, a lot of people would be spending their dimes to get to East Texas—not out of restlessness but hoping to make a fortune.

Above: Most oil town housing was thrown up in a hurry, but oil money made this faux Santa Fe-style house in Borger possible.

Below: Somewhere near Borger, this Texas woman showed she both knew how to sit a horse and pose well for a photograph.

CHAPTER 7

THE BLACK GIANT

Tall pine forests shade much of the eastern third of Texas and, for generations, farming and the timber industry fueled the economy across much of the red-dirt part of the state. While most East Texas families managed to get by growing cotton and corn, some men accumulated vast wealth in the cutting and milling of timber.

One man who grew rich converting pine trees into lumber was Captain John Martin Thompson, a Georgian with Cherokee blood who came to Texas in 1844 from what is now Oklahoma. Settling in Rusk County, he prospered. Near the end of his long life, rather than trust the division of his sizable estate to a sheaf of legal papers constituting his last will and testament, Thompson decided to divide his assets among his 12 children. Gathering his brood, the old Southerner offered them a choice: Gold or land.

"The boys decided they would take the gold dollars," a grandson of Thompson recalled.

But hoping to be helpful and earn her father's approbation, Thompson's daughter, the youngest child by his first marriage, reacted differently than her brothers and half-brothers.

"Oh, Papa," she said, "just give me the land for my part."

Lou Della Thompson, who indeed got a portion of her father's Rusk County acreage, later married William R. Crim and they made a modest living farming her land. In addition to their crops, they raised four children—three boys and a girl. The oldest was J. Malcolm Crim. Everyone called him Malcolm.

Just about everyone in the county turned out to see the Daisy Bradford No. 3 come in. The well, and two other gushers a short time later, proved up the great East Texas oil field.

By the 1920s, having migrated to nearby Gregg County, Malcolm Crim owned and operated a general store in the small town of Kilgore. Soon after the Great Depression came on, Crim found himself struggling to stay in business. Most of his customers could only offer him IOUs for food and other necessities and Crim, a devoutly religious man like his long-widowed mother, took the unsecured notes even as he watched his own finances shrinking.

Maybe folklore, maybe true, the often-told story is that one day a Gypsy fortune teller came through town. For 50 cents, not an inconsequential sum back then, she offered to reveal a customer's future. Crim took her up on it. The woman did seem to know a lot about Crim's past and present, but it was his tomorrow that Crim had ponied up half a dollar to learn about and the traveling woman did not disappoint. She told him she saw his land covered in black oil.

Another sort of gypsy, a mostly self-educated, quasi con man named Columbus Marion "Dad' Joiner gets credit for being the first person to envision a rich oilfield in East Texas. He could quote the Bible or Shakespeare with equal authority and had learned that not all theater has to take place on the stage.

Alabama-born, Joiner had spent much of his life in Tennessee and Oklahoma. Having moved to Dallas, Joiner rented a low-cost office in the Gulf States Building and supported himself acquiring and peddling oil leases. He and his ilk were known as "lease hounds." By 1927 he didn't have much to show for his 67 years but he had no shortage of charm, particularly in dealing with the ladies—especially widows and spinsters. "Every woman has a special place on her neck," he supposedly bragged to someone, "and when I touch it, they start writing me a check. I may be the only man on earth who knows how to locate the spot."

While not a compulsively honest man, Joiner does seem to have honestly believed what he liked to call "an ocean of oil" lay undiscovered beneath the farm and timber land of East Texas. No matter the earlier oil plays in Nacogdoches, Corsicana or Mexia—all in East Texas—Joiner may have been just about the only wildcatter to believe a significant amount of oil could be found in that part of the state. Over the years, various tests in Northeast Texas had failed to produce any oil. The big oil companies now looked to West Texas as oil country, disdaining the other half of the state except for along the upper coast. With national prohibition in full sway, about the only useful liquid emanating from East Texas came in glass jars from moonshiners.

Marion "Dad" Joiner, a man who despite his nickname made an unlikely father for the East Texas field

Studying the newspapers his secretary bought for him at the Hotel Adolphus newsstand every day, Joiner kept up with the news, particularly concerning Texas's oil play. But what commanded his interest most were the obituaries, particularly those death notices listing the survivors of East Texas men of means, like bankers and doctors. Men in those professions generally owned land. Once he had a list bearing enough names, he'd take a train to East Texas and try to ingratiate himself with the widows of the dearly departed. His end game was the acquisition of cheap leases, particularly in Rusk County. If he could collect a little investment capital from the bereaved, all the better.

Dad's partner in the quest for East Texas oil was Joseph Idelbert Durham, a 73-year-old weighing around 325 pounds. The two had wildcatted together in Oklahoma, twice narrowly missing what would have been big strikes. One of their rigs would have hit oil if they only could have afforded to drill deeper, while the other hole had only been a half-mile off from good pay.

Durham introduced himself as Dr. A.D. Lloyd, an assumed identity that reportedly had to do with the six wives and assorted children he had acquired here and there in his younger days. He had no degrees, but he did have some pharmaceutical training. His knowledge of chemistry had facilitated an earlier career as a patent medicine purveyor. In trying to encourage folks to put up a little money toward his oil exploration aspirations, Dad passed "Doc" off as his geologist.

Having used his wiles to acquire drilling rights to 5,000 acres in East Texas, Joiner still needed to close a deal with Daisy Bradford, a 50-something doctor's widow with 975 acres right in the middle of Joiner's paper patchwork quilt of leases. Finally sweet-talking her into leasing her land—providing he drilled on her place first—Joiner put together enough money to spud a well in 1927. When a drill bit got stuck and could not be freed, he abandoned the hole, had the 112-foot derrick moved 100 feet and started drilling again. Poor-boy quality equipment failed on the second try, so Joiner ordered the derrick moved a third time, 500 feet from the second test. The bad luck continuing, a beam broke after the rig had been skidded only about 300 feet. Frustrated, Joiner decided to drill right there.

Overseen by driller Ed Laster, an oilfield pro from Shreveport, the Daisy Bradford No. 3 was spudded in May 1929. While Laster knew what he was doing, he still had a jerry-rigged setup liable to break down at any time. But at 3,536 feet on September 5, 1930, the drill hit oil-rich Woodbine sand. The following day, a telegram reached Mrs. John A. Alfred in Winston Salem, NC. Twelve words told a history-changing story:

"Wild excitement prevails struck oil Joiner well eight miles west last night." Alfred must have figured he could afford two more words, "Love John."

The excitement would get even wilder. After hitting the oily sand, Laster kept drilling. By early October, he believed he was getting close to actual oil. On October 3, as word spread that the well might be about to come in, believers and nay-sayers alike began showing up at the drilling site. A line of Model T's and other vehicles headed to the Bradford farm stretched more than seven miles. When the would-be sightseers got there, they had to pay 25 cents for parking. Vendors did a flourishing business selling hamburgers, bootleggers moved plenty of

product and a barnstormer pilot showed up to take folks up for an aerial view for $2 a head. By the end of the day, an estimated 8,000 people jammed Mrs. Bradford's farm, but nothing happened other than continued drilling. Either disappointed or muttering a version of "I told you so," most of the spectators cleared out by nightfall.

Finally, approaching 9 p.m., a rumbling could be heard coming from the well. As the wooden derrick began to shudder, a column of oil blew up from the hole. By that time, many had left, but those who stuck it out could later claim they had witnessed the beginning of a new era in East Texas.

Malcolm Crim was one of the many excited folks in that part of East Texas. He had read in the September 14, 1930, edition of the *Dallas Morning News* about the wildcat well brought in by Joiner eight days earlier. "A beautiful situation exists," the article said, "which points to the early development of the field…." That was because the major oil companies, believing no significant oil could be found in East Texas, had not bothered to lease any land in the area.

The only land Crim had an interest in was the acreage belonging to his mother. Not having enough money to drill a well himself, the hopeful grocer began looking around for someone willing to take a chance on sinking a hole on the property. That turned out to be Ed Bateman, a thin-walleted operator out of Fort Worth who had started out as a newspaperman in Dallas.

Not having any money but knowing that money could be made in oil if you were either smart or lucky, Bateman had teamed up with Elmer Hays, a driller. Hays said he could help Bateman find some inexpensive leases and introduced Bateman to Crim. The two made a deal and the Bateman Oil Co. spudded a well on Mrs. Crim's farm. The hole went down 13 miles from the Joiner well.

Mrs. Crim sat listening to the sermon in Kilgore's First Presbyterian Church on December 27, 1930 when a young man wearing oil-soaked denim overalls came running into the sanctuary.

"The well's in, Mrs. Crim. It's a gusher," he shouted.

A pious woman, she nodded that she understood, smiled and then turned to hear the rest of what the preacher had to say. Knowing how hard her son worked at his store just to get by, and how the Depression had hit East Texas so hard, maybe she said a

Dad Joiner and his phony-geologist Doc Lloyd after the discovery well of the giant East Texas field came in.

silent prayer of thanks. When her son unlocked his store the next morning, Crim made it known that none of his customers owed him anything. To drive home the point, he opened his mostly empty cash register and tore all the IOUs into pieces.

Indeed a gusher, the Lou Della Crim No. 1 produced an estimated 22,000 barrels a day compared with 300-400 barrels coming from Joiner's well.

The two East Texas wells ignited a speculative frenzy as lease scouts and land men swarmed the area. "Lease every inch of ground you can…," Dallas oilman Clint Murchison told his agents. "Give 'em a dollar or two or five, whatever it takes. But get that land." In the darkest days of the Depression, a wave of money was rolling into that part of East Texas like so much crude spreading from a ruptured tank.

"A farmer could go to bed on 50-cent-an-acre land and wake up with the ground beneath worth $400 an acre," the East Texas Oil Museum later explained in a booklet published to commemorate the field's 75th anniversary. "[O]thers were doing even better. Seventy-five acres on the edge of the field brought $12,000. A driller sold 40 acres for $16,000. And a farmer near…Joiner's discovery well talked an oil scout into giving him $75,000 for a mere 14 acres."

Con men also struck it rich, peddling bogus leases and investment deals. "Buy royalty in Dad Joiner's block," one advertising postcard read. "Follow the man that is known to have made millions for himself and others, send your order today."

One more oil well proved absolutely that the new field had world-wide significance.

Wanting a share of the oil pie for its community, the Longview Chamber of Commerce offered a $10,000 reward to the owners of the first producing well brought in within 12 miles of the Gregg County courthouse. Barney A. Skipper made his livelihood as a cotton buyer, but he believed he could earn more money on a different form of commodity. Skipper had written to more than 700 oil companies trying to raise interest in drilling on leases he had acquired, but no one had been interested. Now that two big wells had come in, Fort Worth oilman W. A. "Monty" Moncrief and J. E. Farrell were looking for land on which to drill. Skipper talked them into drilling on a 400-acre tract he had leased from F.K. Lathrop. Only five miles from downtown Longview, the F. K. Lathrop No. 1 came in on January 26, 1932. The Longview Chamber of Commerce got its oil well, but with embarrassment its manager had to admit the chamber didn't even have $10,000. However, they would happily pay 80 percent of the award. Since the owners of the venture had already found a buyer for $3.27 million, they let the drilling crew keep the $8,000 from the Longview chamber.

The small community of Kilgore turned into a big oil town, virtually overnight. Derricks stood everywhere.

The Longview Chamber of Commerce offered a reward for the first person to bring in a well within 12 miles of the Gregg County courthouse. A well soon came in, and so did a lot of people.

Before the dogwoods bloomed that spring, it was evident to the major oil companies and independent producers alike that a giant oil field had been discovered. Someone dubbed it the "Black Giant" and the name stuck.

"The oil world as a whole calmly admits without question or comparison that the East Texas oil field is the largest ever known both in area and production," the *Longview Daily News* crowed.

As Kilgore's East Texas Oil Museum later noted, "Dad" Joiner's vision of an ocean of oil was more an enormous river of oil. The field stretched 45 miles north to south, 6 to 14 miles across. At 140,000 acres it was six times larger than the Yates field (for a time it ranked as the largest field in the world) and turned the sleepy Gregg County community of Kilgore into another wild boom town. Towns like Gladewater, Henderson, Overton and Longview also were energized.

At the peak of the East Texas boom, some 32,000 oil wells sucked crude from the earth. The rush to make money had made many producers forget about the law of supply and demand. When Joiner struck oil in the Woodbine in the late summer of 1930, oil sold for $1.10 a barrel. The price had dropped to 60 cents a barrel by Christmas and by the end of 1931, the price was in free fall, at times hitting two cents a barrel. "What good is oil when it's cheaper than water?" one East Texas oilman asked rhetorically.

Worried about runaway drilling in the new field, Gov. Ross Sterling called the Legislature into special session on July 14, 1931, charging lawmakers with coming up with a measure to give teeth to a provision of the state constitution declaring the "conservation and development of all the natural resources" of Texas to be "public rights and duties."

Sterling's notion of conserving the East Texas field did not seem like a good idea to many of those benefiting from the boom. "The proration," opined the editor of the newly established *Gladewater Journal*, "the 300-barrels to 20 acres—all the efforts to master

All roads seemed to lead to East Texas during the boom.

this pool will fail, and East Texas is going to write its own destiny with its own oil without the consent of governor, legislature, congress or the president."

Later that summer, stretching his Constitutional authority as thin as the paper it was printed on, Sterling declared martial law in Gregg, Rusk, Smith, and Upshur counties on August 16. Certain oil producers, he proclaimed, were "in a state of insurrection against conservation laws [and] . . . in open rebellion against the efforts of the constituted civil authorities."

In reality, the problem had more to do with economics than potential violence. While crude oil prices had continued to sink as the Depression worsened, the flow from more than 1,400 wells in the East Texas field approached a million barrels a day—one third of the nation's total production. Independent producers ignored the Railroad Commission's efforts to cap production. But the big oil companies saw the situation building toward financial disaster and Sterling, the former president of Humble Oil, agreed. Meanwhile, independent operators continued to pump crude.

Top, left: A well blowing in somewhere in the "wild East Texas" field.

Above: Governor Ross Sterling ordered National Guard troops to East Texas to enforce production limits

Bottom: Newspaper editorial cartoon supporting the state's efforts to prevent waste in the prolific East Texas field.

The day after Sterling's martial law order, 1,200 National Guard troops under Gen. Jacob F. Wolters (in civilian life general counsel for the Texas Oil Co.) and 14 Texas Rangers set about shutting down the oil field. Inside 24 hours, the state held control. With mounted troops and rangers patrolling well sites, the state allowed production to resume on September 2.

The National Guard set up one of its camps on a rise just outside Kilgore. Before long people were calling the assemblage of olive drab tents "Proration Hill." Jack Nolan, an itinerant post card photographer noted for snappy captions, wrote under a picture he took of the camp: "The Army of Occupation where the National Guard eat, sleep and shoot craps." On another post card depicting a troop of mounted, campaign-hated guardsmen, Nolan called them "petroleum petrolmen."

The Railroad Commission, which had steadily been gaining regulatory authority over the oil industry in Texas since 1917, set a per-well limit, but despite the soldiers and rangers, enforcement of the conservation measures proved nearly impossible. Producers simply drilled more wells or openly ignored the order, pumping what came to be called "hot oil." A month after the commission action, production substantially exceeded the maximum allowed.

After several independent operators won a federal injunction against the state proration orders, Sterling ordered the state troops, with

Above: Postcard showing Gladewater at the peak of the East Texas boom.

Below: Gas, like eggs or milk, was available "Fresh Daily" from the Gladetex Refinery at Gladewater in 1932.

Bottom, right: Oilfield Willie, no one ever reported his last name, was one of many characters who flocked to Kilgore during the boom. He ran for governor in 1932 and not long after that died in a car crash.

the rangers as peacekeepers, to begin regulating the flow of the wells. However, on February 18, 1932, a three-judge federal panel held that Sterling could not assume the functions delegated legislatively to the Railroad Commission, in effect negating the governor's use of martial law in the oil field to enforce proration. The state troops went home to their families.

While the governor's action eventually was ruled unconstitutional, within a few years most operators had come to accept the importance of proration, a practice which continues today.

The wasteful extraction of oil despite its low value clearly had an impact on the field. By 1937, Brad Mills, associate editor of the Houston-based *Oil Weekly*, noted that the six-year-old play was "showing unmistakable signs of middle age. It is graying around the temples, and much of the spring has gone from its step." Water encroachment and a

Above: Catastrophic oil field fires were a constant threat and occasional reality.

Left: The Big Inch pipeline from East Texas provided the crude oil that helped the Allies win World War II.

decline in pressure were big problems. Still, he wrote, "The field is large enough, and strong enough to withstand a great deal of abuse…"

And it did. By the first decade of the 21st century, the "Black Giant" had produced more than six billion barrels of oil and still had more than 7,000 wells.

CHAPTER 8

WAR AND POSTWAR

WORLD WAR II

In the latter years of the 1930s, one of the better customers for Texas oil was the island nation of Japan, which had been engaged in a vicious if one-sided war with China since the summer of 1937. The U.S. eventually stopped selling to the empire-minded country, but when Nazi Germany invaded Poland on September 1, 1939, Texas oilmen at first envisioned an increased flow of their product to England and other European countries suddenly at war with Germany. Soon, however, the U.S. would have a critical need of its own for oil.

When radio stations broadcast the first bulletin that the U.S. Naval base at Pearl Harbor had been attacked by the Japanese on December 7, 1941, many Texans not only had never heard of the Hawaiian facility, home of the nation's Pacific Fleet, most had no idea where Pearl Harbor even was.

The Texas oil industry quickly became a key component of the war effort. For the most part, competitiveness and even the quest for increased profit went on hold for the greater good. As quickly as possible, oil companies with refineries in Port Arthur, the Houston area and West Texas refitted and expanded their plants to produce high-octane fuel needed for aircraft and butadiene needed for the synthetic production of rubber tires. The big companies pooled their patents and once closely guarded proprietary information to hasten the development of improved refining techniques. By 1942 the government had begun rationing gasoline and instituted a war-time 35 mile an hour speed limit. (Rationing did not happen because gasoline was in short supply; the problem was rubber. The measure was intended to conserve that critical product by decreasing wear on tires.) Assuming a motorist had rationing stamps to use, the cost per gallon remained affordable with the price of a barrel of West Texas Intermediate crude frozen at 92 cents for the duration of the war by the Petroleum Administration for War. Oil companies chafed at so much federal regulation, but most understood the expanded bureaucracy as a temporary necessary evil.

Once Texas gained full title to its coastal waters in the 1950s, offshore drilling increased dramatically.

At the beginning of the worldwide conflict, 90 percent of Texas oil reached the East Coast by sea from the Houston-Beaumont area. But in January 1942, wolf packs of German U-boats began attacking oil tankers in U.S. waters, sinking 62 ships in the Gulf of Mexico and sending another 171 vessels to the bottom along the East Coast between Florida and New York.

With tankers being torpedoed within sight of the Texas coast, the German war machine succeeded for a time in impeding the flow of oil to the Allies. Spiraling maritime insurance costs did the rest as shipping companies looked to their bottom line and found it more prudent to keep vessels in port until the U.S. Navy and Coast Guard could clear American waters.

A partial, but significant solution would be an enormous inland pipeline, an engineering feat considered one of the most successful cooperative efforts between industry and the federal government ever achieved.

On August 3, 1942, the big oil companies—working under federal authority—began construction of a 24-inch underground pipeline that would extend from Longview in the heart of the East Texas field to southern Illinois and from there to Phoenixville, Pennsylvania. Some 15,000 men worked day and night on the project. Completed a year later at a pace that averaged nine miles a day, the 1,254-mile pipeline carried more than 300,000 gallons of oil a day from Texas to the Northeast. A second pipeline, this one 20 inches in diameter, paralleled its bigger brother.

Dubbed the Big Inch and Little Big Inch, by war's end the two petroleum lines had pushed more than 350 billion barrels of crude and refined products to the East Coast. Texas oil surging through the world's longest pipelines played a significant role in the Allied victory that came in 1945.

"One wonders why so little is said about this monumental accomplishment," an editorial writer for the *Longview Journal* pondered in 2014. "It is a shame that we Texans, who are known for our

braggadocio, have let this happen. Others certainly acknowledged [the pipeline's] importance. Winston Churchill, prime minister of England during World War II, said the Allies floated to victory on a sea of East Texas oil."

West Texas did its share for the war effort, as well. In 1944, drillers discovered in the sandstone along the northern side of the Edwards Plateau the Sprayberry-Dean and Horseshoe Atoll oil fields. Geologists estimated those plays would produce more than 10 billion barrels.

While the war created a strong market for Texas oil, it had an adverse impact on drilling rig companies since the metal necessary for putting together rigs was needed for artillery, tanks and other military purposes. Many Texas rig-building companies either went out of business or switched to war-related production.

On top of that, hundreds of thousands of Texans enlisted in the military or got drafted, depleting the oil industry's manpower pool. Even so, refineries operated around the clock. Almost anyone could find a job, but rooming houses, apartments and low-cost hotel rooms were hard to come by. Fire gutted the packed Gulf Hotel in downtown Houston on September 7, 1943, killing 53 guests, many of them refinery workers. The blaze still stands as the deadliest fire in Texas history.

Above: Production in the East Texas field had slowed by the 1950s, but exploration and drilling continued in the Piney Woods. Here a crew takes a break for some "woman-cooking."

Below: By the 1950s, no one worked in the oil patch without a hard hat.

When the war ended, the oil industry experienced a brief slump as demand for product suddenly decreased and the nation's economy adjusted. In addition, the government did not let the price of a barrel of oil float to what the market would really allow until 1946, when it raised the still-regulated price to $1.37. Federal control ended a year later, and the price shot to $2.32.

By the end of the 1940s, however, America and the oil industry enjoyed a postwar boom that stimulated growth while maintaining low fuel prices throughout the 1950s. Gas was cheap, but it had more punch. During the war, oil companies had found that the processes used to manufacture high-octane aviation fuel could be used to make high-octane gasoline. As the war decade ended, cars picked up acceleration along with the economy.

THE 1950S

The last of Texas's old-style, muddy-street, standing-room-only oil booms came in 1949 to the South Plains town of Snyder, seat of Scurry County. The rapid infusion of people and outside money (deposits at the First National Bank increased from $6 million to $14 million in six months) quickly followed completion in 1948 of several significant wells in the Canyon Reef limestone, a long-buried giant ocean reef that stretched for 175 miles in the complex Permian Basin stratigraphy. With an average drilling time of 30 days, wells came in around 6,500-7,000 feet, an easy and economical depth for mid-20th century drilling technology.

"West Texas Taps a Big New Oil Pool," *Life Magazine* told its large national readership in its December 5, 1949 issue. "…Snyder and all of Scurry County are shaking with the excitement of the state's biggest oil boom since the 1930 East Texas strike." While the Snyder boom played out like most Texas booms before it, the county stayed dry. That legal nicety did not stop roughnecks and other newly arrived denizens of the oil patch from getting as drunk as they wanted, but it did make it harder. Unlike the oil they were extracting from the earth, their alcohol had to be purchased elsewhere and smuggled in by modern-day bootleggers. "Where Cotton Grows and Oil Flows," a big sign welcoming visitors proclaimed. But not everyone found the community charming. At the bottom of the sign, someone who hadn't spent too much time learning to spell used black paint to add, "And the rent is to dam high."

By the late fall of 1949, Scurry County had more than 200 working wells. Two years later, at what proved its point of peak production, it would have 10 times that many.

Texas now had some 500 producing fields holding 56 percent of the nation's proven reserves, or 13.5 billion barrels. Forty percent of the world's oil came from the Lone Star State.

If oil seemed abundant in Texas, water was not. Starting in the early 1950s, it virtually stopped raining over much of the state as Texas entered one of its worst-ever droughts. The prolonged dry spell hit West Texas particularly hard, but the economic impact associated with the shortage of one type of fluid was somewhat mitigated by ample production of another.

Above: A high-wheeled oil field truck offered a shady place to take a break on a hot, humid day.

Below: These ladies didn't work in the oil patch, but their husbands did.

As Texas and the nation enjoyed the postwar boom of the 1950s, intersections often had a competing service station at each corner.

The Sprayberry play in the Permian Basin continued to see frenetic drilling. By then home to more than 200 oil companies, Midland weathered the drought far better than other communities. Oil companies needing more office space gave the city an impressive skyline, and soon the chamber of commerce took to calling it the Tall City. Odessa flourished as a blue collar town with fewer office buildings but decidedly more beer joints.

Despite the Texas drought, once the Korean conflict ended and the nation got over the shock of learning that Soviet Russia had developed its own atomic bomb, the state and the rest of America settled into a peaceful, prosperous decade with seemingly endless possibilities thanks to a robust economy driven by cheap fuel and ever-improving technology.

With gasoline costing less than 30 cents a gallon, oil companies worked to develop a loyal customer base by offering free car care—sharply uniformed attendants cheerfully checked your oil and spark plugs, cleaned windshields, aired tires and pumped gas—at

what were truly service stations. In fact, the term "filling station" fell out of common usage. To promote travel, all the oil companies produced detailed city and state maps, available free to customers, along with travel guides.

"Better Living with Abundant Fuels," Houston-based Humble Oil and Refining Company's employee magazine *The Humble Way* proclaimed in its May-June 1950 issue. "We have become a mobile nation," an unnamed corporate writer noted in the article, "a nation on wheels, a nation with wings. In a few hours we travel distances that would have taken days or weeks only 50 years ago….[Inexpensive gasoline] enables us to bring up our children in suburban areas even if we work in big cities. It widens our choices of recreation and our circle of acquaintances….Indeed, fuels have become an Aladdin's Lamp to turn our wishes into realities."

Even so, it took a lot of energy to keep that Aladdin's Lamp burning—2 billion barrels of liquid fuels and 6 trillion cubic feet of natural gas a year. "It takes a great deal of exploration and drilling to continue discovering and developing new resources equal to those being consumed," the Humble article continued.

If it occurred to the oil company public relations flak who wrote that glowing piece that the nation could ever face a shortage of oil and gas, he opted not to mention it.

But someone else did.

At a meeting of the American Petroleum Institute in San Antonio in 1956, Shell Oil geologist Dr. M. King Hubbert uttered a pronouncement that made him about as popular as the proverbial illegitimate child at a family reunion: Texas oil production, in fact all production in the nation (which at the time included only 48 states, Alaska and Hawaii still being territories) would peak somewhere between 1965 and 1971. He also predicted that world production would peak in about 50 years.

The Texas scientist had developed a complicated mathematical formula that led him to his grim conclusion, but it boiled down to this: Oil fields tend to peak and go into irreversible declines when they have produced roughly half of their proven reserves. Larger reserves get discovered first because they are easier to find, meaning the average size of discoveries continues to get smaller, requiring more effort. That pattern, he predicted, would hold for Texas, the U.S. and the world.

Above: Oil companies pioneered the use of credit cards, though back in the early 1960s they were called "charge cards."

Left: In the 1960s, when peak oil was just a little-known theory, oil companies like Humble promoted travel with free maps and brochures like this one.

Above: To attract customers when gas sold for 30 cents a gallon or less, oil companies gave away or sold at low cost promotional products like Sinclair's Dino the Dinosaur. PHOTO BY MIKE COX.

Below: Kerr-McGee drilled the first offshore rig in the Gulf of Mexico in 1947.

Opposite: A rig operating off the Texas coast in the 1960s.

While Hubbert's notion seemed logical, his concern did not break into the mainstream. Essentially, most Texans, be they producer or consumer, didn't think the party could ever end. For one thing, no telling how much oil was going to be found under the sea.

OFFSHORE

Though drilling rigs had been built in the shallow waters of Caddo Lake in East Texas as early as 1911 and at the end of piers in the Goose Creek field seven years later, decades passed before sufficient technology existed to construct free-standing drilling platforms in ocean water, a hostile, corrosive environment subject to wind, tides and wave action.

But following World War II, a Texas company looked beyond the horizon into the open waters of the Gulf of Mexico. The management of Kerr-McGee saw unexplored territory and a potential for development of vast pools of oil that surely lay beneath the sandy bottom of the relatively shallow Gulf. Larger oil companies would have more resources to throw into such an undertaking, but as had happened before and would happen later, the big boys opted for the sure deal and kept their figurative feet dry, at least for the time being.

Using a small fleet of war-surplus vessels and barges, engineers with the Houston-based company oversaw construction by Brown and Root of a tennis court-sized drilling platform in 18 feet of water on metal piers sunk into the Gulf bottom. Located 43 miles southwest of Morgan City, Louisiana, but only 10.5 miles from the coastline, on November 14, 1947, the Kermac No. 16 well struck oil. The *Oil and Gas Journal* hailed the discovery as "spectacular" (the well made 960 gallons a day, a bit short of spectacular) and the new

technique that brought it about as "revolutionary." The well had cost $450,000 to build and drill.

Interest in oil exploration beyond the coastline triggered the most serious philosophical rift between some states and the federal government since the Civil War. Known today as the tidelands dispute, the issue in Texas went back to its days as an independent republic. During that period, Texas set its coastal boundary as three leagues from its shoreline, or 10.35 miles into the Gulf of Mexico. Other states, however, claimed only three miles.

The matter stood merely as an obscure legal point until momentum began to build for offshore production. Given the enormous potential for tax revenues and money for leasing rights, the federal government claimed that Texas's extended tideland ownership had

Modern offshore rigs lie farther out in the Gulf of Mexico and go down deeper than their earlier predecessors

Oil companies maintain large fleets to move personnel and equipment to and from offshore rigs

ceased with its admission to the Union in 1845. In fact, with oil companies also exploring offshore Louisiana and California, the administration of President Harry Truman moved to assert federal jurisdiction over the entire continental shelf.

Texas and the other two coastal states resisted legally and politically, but twice, in 1947 and 1950, the U.S. Supreme Court upheld the federal position. Accordingly, off shore exploration and production literally lay dead in the water. During the 1952 presidential race, Republican Gen. Dwight D. Eisenhower had as one of the planks of his campaign platform that Texas was entitled to its tidelands. Not surprisingly, a GOP presidential candidate carried Texas for the first time in the state's history. The dispute marked the beginning of the state's decades-long transition from Democratic stronghold to a Republican bastion.

Following Eisenhower's election, Congress passed the Outer Continental Shelf Lands Act in 1953. The new law gave the Department of the Interior authority to sell leasing rights in federal waters outside the jurisdiction of the states.

The U.S. Justice Department challenged the 1953 act, but the U.S. Supreme Court upheld it in 1960. That had the effect of finally granting Texas permanent title to 2.4 million submerged acres and resulted in a lot of money for the school children of Texas. In 1987, the Texas General Land Office estimated that the state's school fund had benefited by some $2 billion because of the favorable-to-Texas tidelands decision.

Offshore drilling began in earnest in 1954, with nationwide production of a modest 133,000 barrels a day, two percent of the U.S. total. Capitalizing at first on underwater salt domes just offshore, production companies moved farther and farther into the gulf, drilling ever deeper.

"Today," writes Daniel Yergin in his 2011 book *The Quest: Energy, Security and the Remaking of the Modern World*, "about 30 percent of total world oil production—26 million barrels per day—is produced offshore, in both shallow and deep waters. The total global deep water output in 2010 was almost 6 million barrels per day—larger than any country except for Saudi Arabia, Russia, and the United States. Altogether, deep water production could reach 10 million barrels [daily] by 2020."

The downside of offshore oil production has been its environmental impact. Despite state and federal regulations, minor and major well blowouts have occurred, the most serious being the April 2010 Deepwater Horizon well incident, which claimed the lives of 11 oil workers and resulted in the release of five million barrels of oil (205.8 million gallons) into the Gulf of Mexico. The oil slick extended for more than 130 miles and 70 miles wide and impacted the shorelines of Texas, Louisiana, Mississippi, Alabama, and Florida.

CHAPTER 9

END OF AN ERA

In 1970, American produced 9.6 million barrels of oil a day. That was as good as it would get. The next year, production across the nation dropped slightly and the trend continued. Oil production in Texas peaked in 1972 at 3.4 million barrels a day.

Dr. Hubbert's prediction, made 15 years before, had come to pass.

Even at the highest level of production, Texas and the other states with significant proven oil reserves had not been producing enough crude to keep up with consumption. In fact, not since the administration of President Truman had U.S. domestic production met U.S. demand. Every year since 1948, reliance on foreign oil had been growing—a far cry from World War II, when the U.S. produced 63 percent of the world's oil.

In 1973, the term "energy crisis" entered the American vernacular. What since Spindletop had seemed like an always-available, always-inexpensive supply of oil and gas suddenly could no longer be taken for granted. Neither could brand names in a highly competitive market. On January 1, Humble Oil and Refining Co. became Exxon USA. Two months to the day later, 100-year-old Curt Hammil died in Houston. He had been the last living key figure in the drilling of the Spindletop well.

Natural gas availability arose as the first energy-related problem of the decade. In the winter of 1972-73, shortages of natural gas became critical. At one point, Dallas found itself on the brink of having no available natural gas. San Antonio and Austin, among other cities, saw shortages that led to energy rationing. The University of Texas had to cancel some classes because it did not have sufficient natural gas to heat some of its buildings. Gov. Dolph Briscoe ordered energy use reductions for state office buildings and even cut lighting on state highways.

The oil and gas industry was hit hard by energy crises of the 1960s and '70s.

Oil or coal-fired power plants began to look like the future of electrical generation in Texas, at least until an even more reliable, if controversial, means became available. Austin and San Antonio voted to participate in the South Texas Nuclear Project, an effort that would eventually bring on-line the state's second nuclear power plant. (The first would be Comanche Peak in Somervell County, which went online in 1990.)

And then, in the early fall, things got worse.

On a cool October morning in 1973, staffers of the two afternoon newspapers serving the two largest cities in the Permian Basin, the *Odessa American* and its next-door competitor, the *Midland Reporter-Telegram*, had barely had time to get their first cup of coffee down before the alarm bells on the 66-words-a-minute Associated Press printers in their respective news rooms began an incessant ringing. The A-wire from AP headquarters in New York was moving a bulletin conveying sketchy, but stunning news – war had broken out in the oil-rich Middle East.

At 2 p.m. on October 6, 1973—6 a.m. in Midland-Odessa—Egyptian artillery had begun shelling Israeli positions along the Suez Canal while that Arab nation's Soviet-supplied aircraft rained down rockets and bombs on Israeli Defense Force personnel and tanks. By the end of the day, following a massive, Blitzkrieg-like operation, five Egyptian infantry divisions occupied the Israeli side.

The attack caught the U.S. intelligence community by surprise, not to mention the average American, already more preoccupied with college football and the seemingly ever-deepening Watergate scandal than foreign affairs. While satellite imagery had revealed a massive buildup of Arab military forces in the days leading up to the attack, the Central Intelligence Agency misinterpreted the data. The nation's best and brightest cloak-and-dagger types wrongly concluded that Egypt and Syria had only been engaging in routine military maneuvers. Not until shortly before the balloon went up did the U.S. realize war was imminent. By then, despite urgent telephone calls from Secretary of State Henry Kissinger to his counterparts with Egypt and Syria, it was too late.

Observing Yom Kippur, the holiest day of the year in Judaism, Israel had also been caught unaware. Hoping to regain territory lost in the 1967 Arab-Israeli War, Egyptian forces crossed the canal and established a foothold on the Sinai Peninsula. On the other side of Israel, Syrian forces had taken part of the Golan Heights. Soon Iraqi forces joined what was at first a one-sided conflict.

A nasty war unfolding some 7,165 miles from the heart of the Lone Star state's oil production would soon change the energy picture not only in Texas, but across the United States.

Since Syria was a Russian ally, U.S. military forces went on high alert. President Richard Nixon soon ordered a massive infusion of military equipment and supplies to support the Israelis, an action the Arab world retaliated against with another surprise—the weaponization of oil.

Eleven days after Egypt and Syria invaded Israel-controlled territory, the Organization of Petroleum Exporting Countries (OPEC), an entity created in 1960 but little-known to the American consumer, declared an oil embargo on the U.S. and other countries supporting Israel. By November, Arab OPEC member states had reduced oil production to 4.4 million barrels a day from the pre-war level. That shortfall equaled 7.5 percent of total world output.

The impact to the U.S.—and Texas—quickly became evident. The price of oil quadrupled in only three months. For the first time since World War II, Americans could not count on a full tank of gas. Gas stations began seeing long lines, often selling out while motorists waited for their turn at the pump. It got so bad that service stations began closing at 9 p.m. on Saturdays and staying closed all day Sundays. Motorists who couldn't afford gasoline, or couldn't get it when they needed it, could not even gain solace in viewing NASCAR races. The association reduced race length by 10 percent and cancelled the Sebring race for 1974.

"All of this…was taking place in a state where driving 100 miles or more for a steak dinner was considered an inalienable right," Waco economist Ray Perryman later observed. "It also wasn't supposed to take much more than an hour to get there."

The oil embargo, which since it had not been enforced militarily amounted more to production cuts on the part of OPEC members than an actual blockade of petroleum supply, triggered a national recession.

Aside from reminding Texas and the rest of the nation of the importance of cheap, plentiful energy, the embargo and resulting increase in the price of a barrel of oil stimulated an exploration and drilling boom in Texas. On November 7, President Nixon announced Project Independence, a package of tax incentives and other measures intended to promote domestic production.

Nationally, Congress mandated a 55-mile-an-hour speed limit, the lowest since World War II. Nixon signed the Emergency Highway Energy Conservation Act into law on January 2, 1974.

Despite renewed drilling, and even after OPEC ended the embargo effective March 18, 1974, it still looked as if the nation were running out of oil. President Jimmy Carter warned in a 1977 speech that oil and natural gas were "simply running out." As many had done before, he predicted the crude oil production across the world would peak during the following decade.

Near the end of Carter's administration, the energy situation only got darker with the revolution of 1978 that toppled the Shah of Iran, an American ally. The world's supply of oil tightened in the fall of 1978 when Iran's 37,000 Iranian oil workers went on strike, the output of that oil-rich nation's refineries dropping from 6 million barrels a day to 1.5 million. The Shah fled his country in January 1979 and, with the world's oil supply down by only four percent, a second energy crisis struck the U.S.

In July 1979, Carter declared the nation's energy situation the "moral equivalent of war" and announced a plan to reduce the nation's reliance on foreign oil. He also began dismantling the price regulation system set in place during the Nixon administration. The 1980 Iran-Iraq war made the oil supply picture even darker, but the dicey

international situation sparked boom times in Texas.

The Permian Basin experienced yet another boom as rig counts rose with the price of oil, which would increase a staggering 250 percent. Big and large companies brought in new wells and revitalized old fields. The upsurge in activity did not make a major impact on the nation's continual dependency on oil from other nations, but it sure helped the economy in Texas, particularly in Midland-Odessa and Houston.

At the height of the boom, the Lone Star State, particularly Houston, looked like the place to go if you wanted a good job. From the Texas standpoint, things were so flush that the worker pool had about played out. People from the so-called Rust Belt of the industrialized North descended on the Sunbelt by the tens of thousands seeking work in the oil patch or positions created by the general economic upturn the drilling boom created.

Noticing that national sales of its Sunday issues were soaring, the *Houston Chronicle*'s advertising management realized that out-of-state residents were buying the newspaper because of the large number of help wanted classified ads it carried, particularly in its fat, first-day-of-the-week issue. To capitalize on that, the *Chronicle* began shipping its product to cities like hard hit Detroit, where unemployment had reached nearly 17 percent by December 1981. One Motor City newsstand owner later said that for half a year, 80 percent of his sales were of the *Chronicle*. In fact, in selling 900 or so copies a day, the news vendor made more off the Texas newspaper than he did from the city's struggling hometown dailies.

The good times also rolled in Midland and Odessa.

"It seems we had the most Rolls-Royces, the most Lear jets and, of course, the most divorces per capita," reflected Bud Brigham, CEO of Midland-based Brigham Exploration two decades later.

The price of a barrel of West Texas Intermediate Crude, the benchmark, reached $40, up from $6 only a few years before, and the catchy phrase (at least to those in the oil industry) of "$85 in '85" gained currency. Meanwhile, few vehicle owners could be cheered by learning that in the North Texas town of Bonham, a company that manufactured gasoline pumps, made an ominous engineering adjustment—its pumps for the first time had three digits in the price-per-gallon display to handle what many thought would never happen, gasoline costing more than $1 a gallon.

When gas shortages starting causing motorists to pay more at the pump, fuel economy suddenly became important. Texaco distributed this gas-mileage calculator.

CHAPTER 10

BOOM AND BUST

As chaotic as the 1970s had been in Texas, with winter natural gas shortages and gasoline lines, most of the next decade proved even tougher.

The 1980s did at least get off to a good start. The state's economy rose faster than a drugstore cowboy thrown from the mechanical bull at Gilley's Club, a country western dance hall in Houston owned by singer Mickey Gilley. Sales of 10-gallon hats with fancy feather bands and custom-made ostrich skin boots soared as Baby Boomers, even those who had descended on Texas from the North, decided they were urban cowboys and cowgirls. Private jets from Midland took oil men and their wives or girlfriends to Las Vegas for an evening of gambling and booze, or to Dallas to pick up another fur coat at Neiman Marcus. Willie Nelson sang, cocaine disappeared into nostrils up rolled $100 bills and with the hugely popular TV series *Dallas* extending the Texas myth worldwide, one of the weightier questions of the day became "Who Shot J. R.?," a reference to the March 21, 1980, season finale in which lead character J. R. Ewing—quintessential mythical Dallas oilman—took a bullet from a mysterious assailant.

By the summer of 1981, however, a new buzzword emerged in the news media, "glut." As in "oil glut." *Time Magazine* said "the world temporarily floats in a glut of oil." The *New York Times* also used the g-word, announcing in June that an "oil glut…is here." Whistling past the proverbial graveyard, the head of Exxon said the industry faced only a temporary surplus of product, the use of "glut" merely being illustrative of "our American penchant for exaggerated language." The reality is that two factors led to a downward spiral in the price of crude, a reduction in U.S. energy consumption and over-production by an industry wanting to capitalize on the good times.

A forest of oil derricks still stands in Kilgore, but these days they are ornamental, reminders of the wild boom of the 1930s.

PHOTO BY MIKE COX

The drop in usage tied to the consumer's desire to save money when possible, coupled with a growing environmental movement. Having endured two rounds of gasoline lines and price hikes inside six years, U.S. consumers started being more judicious in their use of gasoline. Suddenly, foreign-made, higher-mileage vehicles began to be increasingly popular. Americans also had begun paying more attention to their monthly electric bill, turning off light switches and setting air conditioner thermostats higher than they used to.

Even with crude prices dropping while supply rose, Texas's economic adrenaline ran so strong that it took another four years before it became evident once again that Newton's Law applied to oil prices as well as anything else: What goes up, must come down.

Oil prices started a slow slip in early 1982, holding at around $27 a barrel in 1985. Then prices collapsed like an old wooden derrick in a well fire, bottoming out at $10 in 1986. By the end of the year, it had become painfully evident to those associated with the Texas oil industry that rather than the much-repeated "$85 in '85" slogan, the reality was $10 in '86.

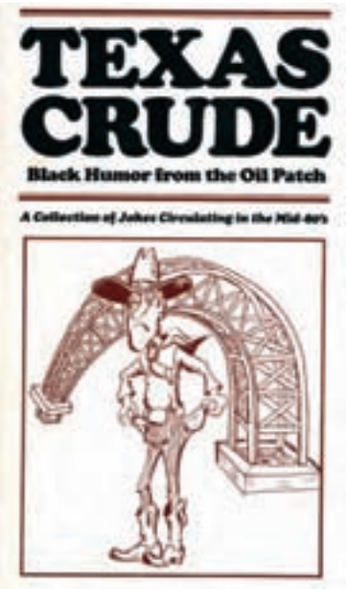
The initial impact of the oil bust came in the Permian Basin, which produced most of Texas' oil. Drilling slowed and exploration ceased. Oil field workers had to get by working reduced hours, though soon even that looked like a good deal as hundreds and then thousands lost their jobs while scores of independent operators lost their companies. On most days, Midland's posh Petroleum Club sat emptier than a rusted-out oil drum, though its bar had no shortage of men drowning their worries in a stiff drink or two or six. In October 1983, the Midland National Bank failed and had to be bailed out by the federal government, a particularly onerous development in that highly conservative city. Soon, owners of office buildings saw vacancy rates of 25 percent or more, housing construction starts stopped and the effect continued to spread like so much spilled oil.

"You're going to see the vast number of independents pretty well dried up," predicted William Fisher, then director of the Bureau of Economic Geology at the University of Texas. "They [independent oil companies] might have enough production to hang on, but they're not going to be plowing the money back in and drilling new wells."

Above: By the mid-1980s, it looked to many like the sun was setting on the oil industry as prices tanked.

PHOTO BY MIKE COX.

Below: This oil-bust joke book came out in 1986.



Not only that, producers started shutting down so-called "stripper wells," marginal holes pumping 10 barrels a day or less. At the time, Texas had 126,202 stripper wells. More than 25 percent of them ended up being shut in.

As drilling literally ground to a halt and companies rolled belly up, expensive oil field equipment appeared on the market at garage sale prices. In Wichita Falls a company that had been going and blowing in selling and financing high-dollar drilling equipment found itself needing to dispose of nine large repossessed drilling rigs. One rig, which sold for $7 million in 1981, went on the market for $900,000 and the struggling company left holding the bag hoped to get at least two-thirds of that.

Loan defaults killed off more banks in West Texas, and the insolvency contagion spread to the state's giant banks, which had over-loaned and under-collateralized. The bust hit Houston, the energy capital of the nation, particularly hard. At one point, 3,000 home and business loans went into foreclosure per month. Real estate prices dropped nearly a third in some areas.

Chamber of Commerce types in Detroit must have taken perverse pleasure in reading in the *Chronicle* that in a city where 70 percent of its workers relied directly or indirectly on the oil business, Houston had a problem. Construction virtually ceased and financial institutions failed along with many businesses. Banks that survived tightened their credit to an extent that few could qualify for a loan.

For Houston the situation amounted to the economic equivalent of a Category 5 hurricane roaring through the heart of the city. Thousands of people lost their jobs, with unemployment in the six-county Houston metropolitan area rising to 9.1 percent by January 1983. The refinery cities of Beaumont and Port Arthur saw a 14.9 percent jobless rate compared with a statewide average of a still-not-good 8.5 percent.

"Texans Make Light of their Plight," read a headline in the *Washington Post* that July. The story talked about how oil industry workers and executives alike in the Lone Star State had managed to find some small comfort in gallows humor, a growing oeuvre of jokes about the oil boom gone bust. By the fall of 1986, a small booklet called "Texas Crude: Black Humor from the Oil Patch" had gone on sale at book stores and truck stops across the state. It contained more than 40 jokes like "What's the difference between a Texas oil man and a pigeon? A pigeon can still make a deposit on a new Mercedes."

Texans had little else to laugh about that year. It was as if the projector had been reversed on a movie showing an oil gusher blowing in—all the money in the oil business began to disappear as if being sucked back into the ground. By January 1987, the state had lost 230,000 jobs, including more than half of all oil jobs. For all practical purposes, Texas and other energy producing states had sunk into a depression, mentally and financially.

Tax revenue tanked, forcing local and county governments, as well as the state, to slash budgets. The state comptroller's office estimated that Texas lost $1 billion in tax revenue. At the beginning of the decade, 28 percent of the state's tax revenue had come from the energy business. By the end of the decade, the petroleum industry's tax contribution had dropped to only 8 percent.

The 1980s had marked the Texas oil industry's bleakest days, the future looking as black as the thickest crude.

"The debacle of the 1980s was an economic disaster of epic proportions," wrote Dick Ghiselin in *Petroleum Engineer International*. "Few industries, or even countries, could have survived such a downturn. Yet in retrospect, we can see the crisis served as a reality check for resourceful oil men and women. Companies reorganized and launched what has been characterized as a major paradigm shift. The new vision became technology, and it was applied across the board to reduce risk, optimize production and save time. Everyone got into the act."

Looking up at the inside of an old oil derrick.

PHOTO BY MIKE COX

CHAPTER 11

UNCONVENTIONAL THINKING: SHALE PRODUCTION

When word began to spread about the amount of gas blowing out of one of Mitchell Energy's new wells in Wise County, executives and geologists with other companies in the competitive, but mostly cordial, Texas oil industry didn't believe what they were hearing. Old George Mitchell apparently had decided to play a practical joke on some of his fellow Texas oil men.

But the numbers were real. The news from North Texas, coming when just about everyone believed the once oil- and gas-rich Lone Star State's figurative fuel tank was slowly but steadily headed toward "empty," presaged a one-two punch of booms that would be equal to or greater than the 1901 Spindletop gusher that began the age of oil in Texas. Even the discovery of the storied East Texas oil field, the so-called Black Giant that came to life in 1930, was not as significant as what had transpired in Wise County.

Of course, as with many momentous changes, it took a while for the oil industry, not to mention Texas and the nation in general, to grasp the significance of what had happened that summer day in 1998. The innovation in unconventional production techniques, overseen by Mitchell, proved to be a Super Bowl-level game changer for Texas, the U.S. and the world. But it all started long before that prolific gas well came in near the close of the 20th century.

A picture of Texas at night. The light generated by the development of the Eagle Ford Shale can be seen as an arc south of San Antonio (area framed in red).

COURTESY OF NASA.

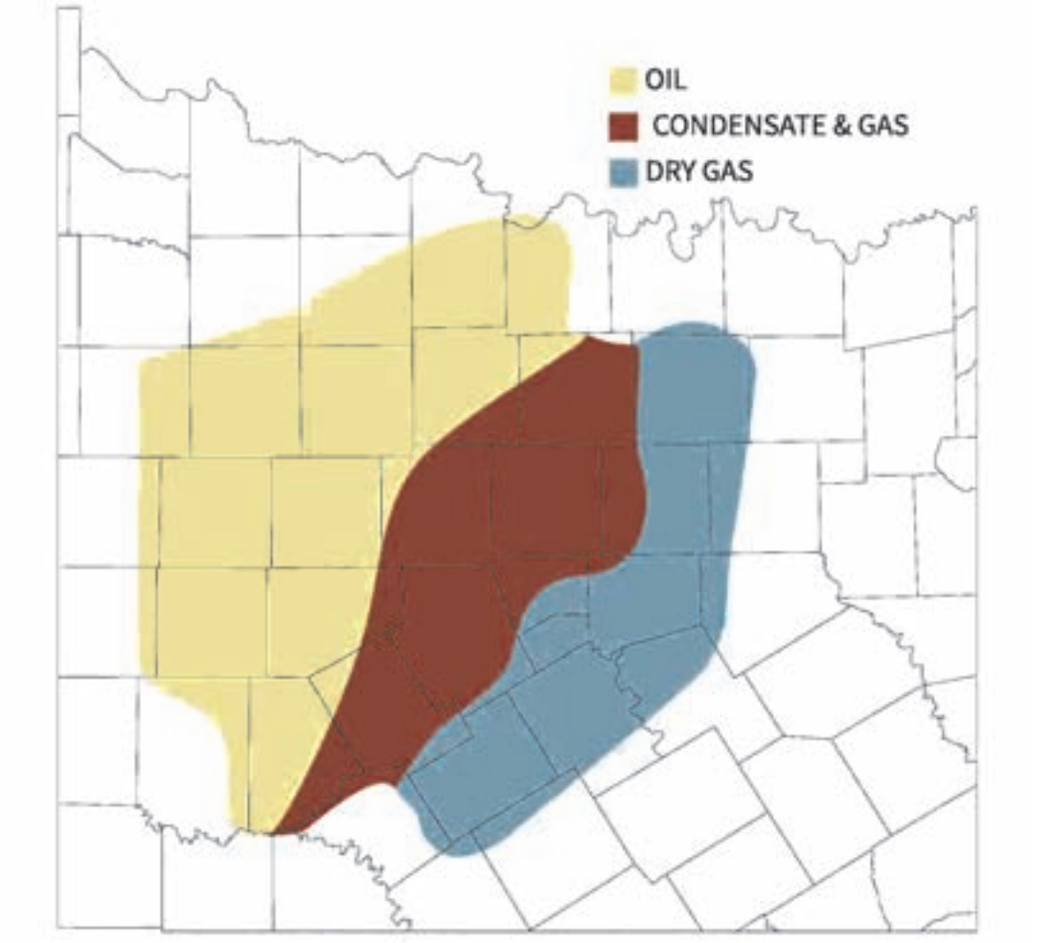
Later nominated for a Presidential Medal of Freedom, the Galveston-born son of a Greek immigrant revolutionized the industry. Mitchell majored in petroleum engineering at Texas A&M University, graduating as class valedictorian in 1940, a year before the U.S. entered World War II. Following his military service in the Army Corps of Engineers, Mitchell got hired by Amoco, spending most of his time working on rigs in the swamps of Louisiana, learning the oil business the greasy, hands-on way. But he never forgot what one of his professors at A&M had told him: "If you want to drive a Chevrolet, work for a big oil company, but if you want to drive a Cadillac be an independent."

It did not take Mitchell long to decide he'd prefer a Cadillac over a Chevy, so in 1946 he and his older brother Johnny formed their own company in Houston. Having worked on rigs, Mitchell had both an engineering and scientific understanding of the energy business. And he would continue learning and studying, often staying up most of the night pouring over photostatic copies of drillings logs, hoping to find a geologic pattern others had missed.

The thirty-something oilman's level of success changed from okay to a lot better on the basis of a tip he got from a Chicago bookie in 1952. But the Windy City gambler wasn't touting a hot thoroughbred. Over coffee at a downtown Houston drug store in the building where Mitchell had an office, the bookie told Mitchell about a ranch in North Texas that might have good potential for gas. It turned out that someone Mitchell had known at A&M had been shopping the deal around for at least two years, but Mitchell didn't know that at first.

Mitchell reviewed the property's known geology and decided the bookmaker, who of course wanted some of the action, just might have spotted a sure bet. He leased 6,000 acres on the David J. Hughes Ranch in Wise County and soon brought in a substantial gas well. Quickly and quietly, he leased an additional 300,000 acres—an area about a third of the size of the sprawling King Ranch in South Texas—at $3 an acre.

His company went on to develop what at first seemed to be a robust gas field, but by the late 1970s Mitchell and his colleagues began to notice an ominous if slow decline in production. That was a big problem, because since the mid-1950s Mitchell had held a very lucrative contract to supply 100 million cubic feet of natural gas daily for Chicago, the nation's second-largest city. To stay in business, his company would have to meet that demand every year of the contract. On top of that, since an



Above: Production in the Barnett Shale covers a large area of North Texas.

Opposite, top: As production began in the Eagle Ford Shale in 2008, oil and gas rigs changed the landscape in South Texas.

Opposite, bottom: Framed by the arm of an excavator, another rig penetrates the Eagle Ford Shale.

energy company's worth is calculated in how much oil or gas it has available to sell, Mitchell had to keep replacing reserves.

Since gaining his North Texas leases, Mitchell had been extracting enough gas to meet his contractual obligations and stay solvent, but it took a lot of financial wheeling and dealing to make that possible. As production numbers for his Wise County field continued to decline, Mitchell realized, as the old Texas expression goes, that he had "just about licked all the sweet off" that play.

In 1981, Mitchell previewed a research paper about to be submitted to a professional journal by one of his geologists, Jim Henry. The paper had to do with a geologic formation known as the Barnett Shale.

The Barnett, first observed in an outcropping near Barnett Spring in San Saba County in west Central Texas, was nothing new to geologists. The dense, black organic rock lay under much of North Texas, about a mile to a mile-and-a-half down. In some places, even deeper. In analyzing well logs, Henry had noticed a fair number of gas shows (traces) recorded when drill bits ground through the shale. Even so, while concluding that the Barnett Shale might hold commercial quantities of gas, Henry did not advocate drilling it due to the cost involved.

Mitchell, on the other hand, thought the Barnett might have possibilities for his company. He told his engineers to give the shale a try. Gas, he began to think, could be coaxed from the shale by fracturing, a technique that had been around for years. Industry awareness that natural fractures in shale held oil and gas was nothing new, but that usually occurred only at shallow depth. Mitchell thought product also could be extracted from deeper shale, assuming an economically acceptable method could be developed to shatter the rock so gas could escape into a hole. His company had fractured wells in Limestone County as early as 1979, so he told his team to try that technique in the Barnett.

Given that fracturing was expensive, Mitchell's staff was not universally excited about the Barnett. The conventional thinking in the industry was that shale was only an oil and gas "kitchen" and sealing formation. Still, Mitchell was the boss, and he told them to try it anyway.

The company drilled its first well into the Barnett in Wise County in 1981. The C.W. Slay No. 1 made a modest amount of gas. Over the next several years, other wells in the Barnett produced gas through fracturing with chemicals, but the technique was expensive and the return far from prolific. And at times, it just plain didn't work, ruining a well.

Seeing more dollars going out than the amount of gas coming in, the company's investors and board members pushed for abandonment of the fracturing effort. But Mitchell remained adamant, insisting that his team keep at it.

"My engineers kept telling me, 'You are wasting your money, Mitchell,'" he told a writer for *Forbes Magazine* in 2009. "And I said, 'Well damn it, let's figure this thing out, because there is no question there is a tremendous source shale bed that's about 250 feet thick.' "

Pouring a lot of money into what most of his people thought was figuratively a very deep, very dry hole, Mitchell continued to insist that a way could be found to make the Barnett Shale economically feasible.

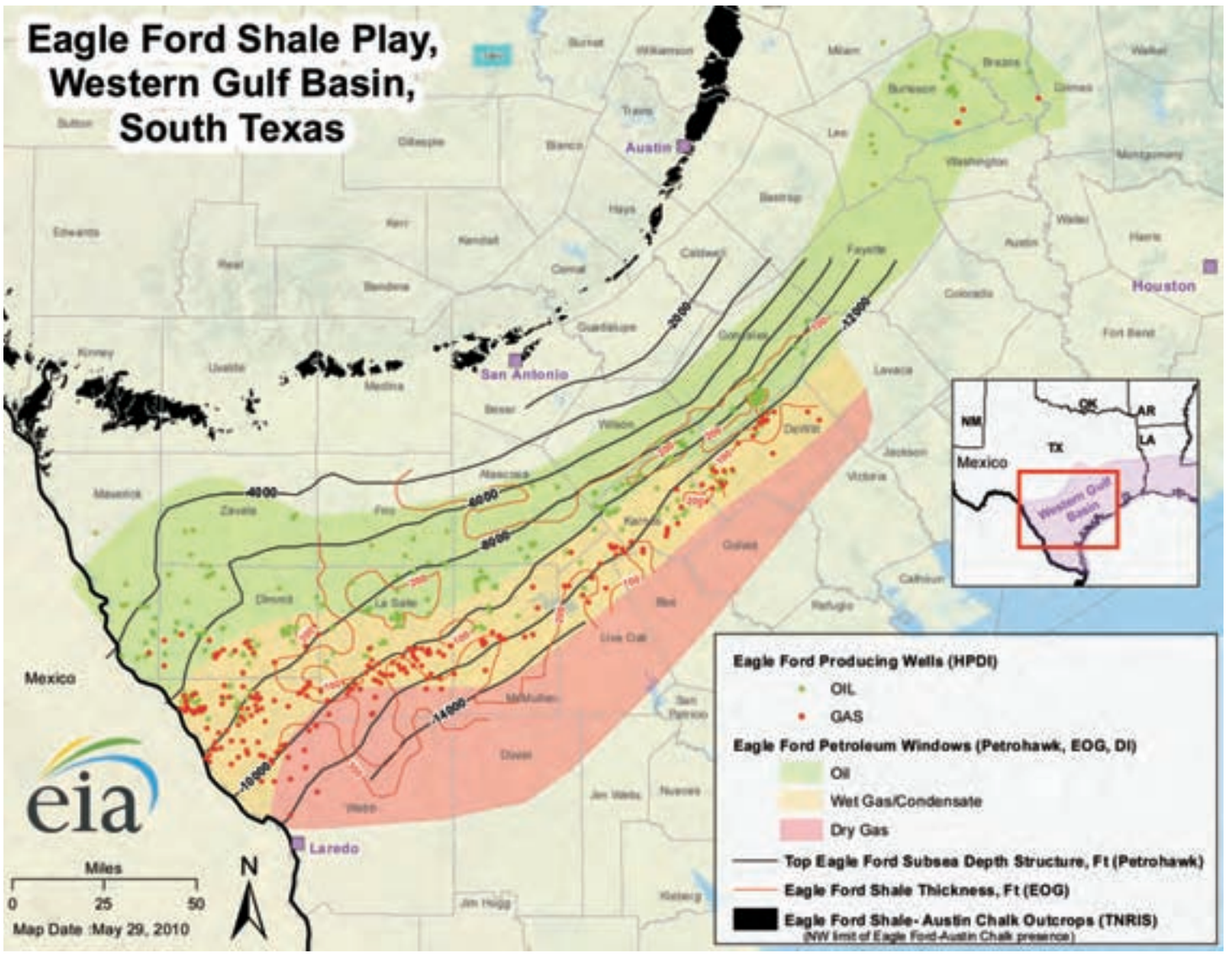
Major discoveries and significant inventions don't always have an "ah ha" moment, but for Mitchell Energy, it came on a summer day in North Texas. The breakthrough involved a mixture of water, sand and a determination to keep trying. *Wall Street Journal* energy reporter Russell Gold told the story in his book, *The Boom: How Fracking Ignited the American Energy Revolution and Changed the World*.

Nick Steinsberger, a 34-year-old University of Texas petroleum engineering graduate originally from Nebraska, drove from his residence in Fort Worth to a rig near the small Wise County community of Ponder early in the morning on June 11, 1998. Drilling on the S.H. Griffin No. 4 well had been finished.

The crew had cut a deep hole down into the Barnett Shale. Now it was Steinsberger's job to complete the well.

That would involve the use of a fracturing technique he believed would force gas from the cement-like Barnett Shale, but his experimental process had not worked the previous four times he had tried it. Despite Mitchell's ongoing insistence that his employees come up with a way to get gas out of the rock in a cost-efficient manner, back in Houston, Steinsberger's managers were losing patience. In fact, the young engineer—married and with two children—worried that he stood in danger of getting laid off and he probably did.

In the more than half-century that oil companies had fractured wells to force more hydrocarbon out of wells, techniques had ranged from injecting hydrochloric acid into a hole to using the thick gels that had been the state of the art before Steinsberger's innovation. Basically, what he had been trying was injecting a high volume of water, at extreme pressure, into the shale. Rather than employing gel to fracture the rock, he had gone counter to conventional wisdom and proposed water as the way to crack the structure. An agent to reduce friction would be added to the water to make it slippery. Then sand would be used to keep the fissures propped open. Once all that sandy fluid had been pumped back out of the well, the theory was that gas would start bubbling from the cracks and make its way into the well casing.



A map of the Eagle Ford Shale play.

COURTESY OF THE ENERGY INFORMATION ADMINISTRATION.

Gravel, water, whatever…the South Texas boom has created a market for just about anything.

After giving all the pumps, pipes and other equipment a final check, Steinsberger ordered the pumping to begin. For five hours, more than a million gallons of "slick" water was injected into the well. Monitoring the well's pressure as it went up and down, the engineer could tell that fracturing was occurring. Following the introduction of sand, the next step was pumping out the well.

That process took almost a week, but after the first few days, gas began to bubble up. When most of the water was gone, gas began to blow out. Steinsberger's unconventional technique had worked.

Back then, an excellent gas well made 70-80 million cubic feet in its first three months. The S.H. Griffin No. 4 produced nearly twice that amount of gas per day in its first 90 days. It was the best gas well Mitchell had ever completed, though thanks to the technique Steinsberger had developed, bigger wells would come. That first well quickly got management's attention at Mitchell Energy.

To Mitchell and others, some of whom having to admit it with reluctance, it looked as if the formula for getting hydrocarbons from shale had finally been found. Within a half-year, every well that the company drilled in the Barnett relied on Steinsberger's methodology, a technique that came to be called slick-water hydraulic fracturing.

Getting up in years, and with other interesting non-energy ventures in mind, Mitchell had been trying to sell his company. While he had dealt with some tire-kickers, no one followed through. Now, with his production numbers getting better and better due to the hydraulic fracturing breakthrough his company had made, someone was finally interested.

In 2002, Mitchell closed on the sale of his company to Oklahoma-based Devon Energy Corp. for $3.5 billion. The rags-to-riches Texas wildcatter no longer had his own energy company, but the deal left him as one of the larger shareholders. Devon went on to combine advances in horizontal drilling it had developed with the fracturing techniques pioneered by Mitchell's company and played a big part in the explosion in hydrocarbon production that would follow.

Elsewhere in the Barnett Shale, which covers 24 North Texas counties, other production companies began using the techniques developed by Mitchell Energy and by 2013, U.S. gas production had increased by 25 percent compared with 2004 numbers. Given the law of supply and demand, prices dropped to a 10-year low in the spring of 2009. Since the play in the Barnett began, it

Above: Rental property is scarce and costly in the Eagle Ford play.

Below: A new term, "Man Camp," entered the vernacular as rural landowners got into the housing business as the Eagle Ford boom picked up momentum.

has produced more than nine trillion cubic feet of gas.

When Mitchell died at 94 on July 26, 2013, Pulitzer Prize-winning energy author Daniel Yergin said, "George Mitchell, more than anyone else, is responsible for the most important energy innovation of the 21st century."

Lying beneath 6,400-plus square miles of some of the most populated real estate in Texas, the Fort Worth-Dallas Metroplex, the Barnett Shale is believed to contain more than 43 trillion cubic feet of natural gas. That would be sufficient to keep the stoves and hot water heaters running in every Texas household for two centuries, assuming natural gas remains a mainstay fuel for that long.

In 2007, with the Barnett Shale producing gas faster than a bowl of chuck wagon pinto beans, former Mitchell Energy geologist Dan B. Steward wrote a little-known book chronicling the story of the play. Published by the Fort Worth Geological Society and the North Texas Geological Society, *The Barnett*

The Eagle Ford boom caused a surge in demand for temporary housing and spurred a frenzy of new hotel construction all across South Texas.

Shale Play: Phoenix of the Fort Worth Basin, a History, focuses primarily on the Mitchell Energy story, but it is a basic reference for anyone interested in the Barnett.

"Little did we know that, at that very moment, we were using or evaluating the three technology components that would be the most responsible for the [Barnett] play's future expansion and boom," Steward wrote. "I believe we are already seeing Barnett technology and understanding filter into other areas."

Listing geologic formations in and out of Texas as "evolving plays…born from the success and technology of the Barnett," Steward said he believed the technology also would lead to rejuvenation of the Devonian Shales in the Appalachian Basin "and development of additional plays in numerous other basins and shales." He continued, "Hopefully the result will be a tremendous volume of gas available to provide for future energy needs."

As events would soon show, the only thing lacking in Steward's 17-word prophecy were the words "and oil."

Two hugely significant developments in oil industry technology proved to be momentous turning points. Motivated by the most basic of all business forces, the desire for more profits while keeping costs as low as possible, Mitchell's company had injected new vitality into an aging oil industry. Not only had the breakthrough in the Barnett Shale made natural gas more plentiful and more affordable for both the private and commercial consumer, the perfection of the slick-water fracturing and horizontal drilling dyad would enable a boom that far exceeded what happened in North Texas.

CHAPTER 12

THE BIG ONE

From the vast, silent darkness of space 512 miles above Earth, the NASA Suomi NPP weather satellite made another pass over South Texas on an April night in 2012. By that November, as part of a scientific study of the extent and environmental impact of man-made lighting, the satellite had completed night shots documenting every square mile of the planet.

One of the composite images based on the data the satellite beamed back to Earth would have puzzled scientists only a few years before: Spreading to the northeast from north of Laredo on the Mexican border stretched a long band of light equal in luminescence to the city lights of Austin, San Antonio and Corpus Christi. The light came from thousands of oil and gas wells and hundreds of drilling rigs in the Eagle Ford Shale, a huge area of petroleum production that covers 30 of Texas's 254 counties.

Essentially only empty ranch country as recently as 2008, by 2014 the area had more than 8,000 producing oil or gas wells. The growth has been explosive, the oil well count jumping from 40 in 2009 to 1,262 just three years later. The superlatives ascribed to the area amount to a list of Texas brags on steroids. More oil and gas had come from this play by 2013 than all of the production of Iran, Iraq and the Arab Emirates combined. Oil reserves in the Eagle Ford have been estimated at 3 billion barrels. In addition, the U.S. Energy Information Administration calculates that the formation holds 50.2 trillion cubic feet of recoverable gas with the average well likely to produce 2.36 billion cubic feet of gas.

New pipeline going down in South Texas.

While the numbers change faster than the digits on a gas pump, the Eagle Ford produced 599,000 barrels of oil and 2.69 billion cubic feet of gas a day during the first half of 2013. In 2013, Eagle Ford oil production hit 700,000 barrels a day. As 2014 began, the Eagle Ford was producing more than 1 million barrels a day.

The Eagle Ford boom has revitalized a part of the state that previously depended mostly on the vagaries of agriculture and ranching to sustain its economy. Though South Texas has had some oil play for many years, for decades many South Texas landowners relied on income from hunting leases just to be able to pay their property tax bill. Now, for a lot of ranchers one month's oil or gas royalty check far exceeds what he could expect from making his place accessible to dove, quail, deer, or turkey hunters for the rest of his life.

It may be apocryphal, but an oft-told story has to do with an elderly woman who went to her small-town bank to cash the first royalty check she received from a company that leased her South Texas land.

"I'm sorry, ma'am," the teller says after examining the woman's check. "I can't cash that."

"Well, let me see the manager then," the woman insists.

"I'm sorry, ma'am, we can't cash that," the bank president says after taking a look at the check.

"But surely you have the $15,000 on hand," the woman persists.

"I'm sorry, ma'am, but that check's for $1.5 million."

If that story's not true, it could be. The latest Texas boom, partially overlapping one of the worst droughts in Texas history, has had a huge economic impact on the Lone Star State. In a way, the Eagle Ford boom is a descendant of one of the more robust, if short-lived booms of the last half of the twentieth century.

The hot play in Texas—and the nation—during the 1970s was along the Austin Chalk, a 10-20 mile wide formation that begins on the border with Mexico, cuts across the central part of the state and continues all the way to Mississippi. In 1975, thanks to improved drilling and completion techniques, penetrating the chalk began to pay around Giddings, in Lee County east of the city that gave the formation its name, Austin. One of the brighter points of a grim decade, at the time the Giddings field was hailed as second only to Alaska's North Slope in importance.

New pipeline construction to accommodate the million barrels of oil that are produced by the Eagle Ford Shale each day.

A key player in exploiting the Austin Chalk was Corpus Christi geologist Roland "Rock" Robertson. More than three decades later, his son Gregg, who had moved beyond his original desire to be an investigative reporter, decided to follow in his father's footsteps as a geologist. Still, in pioneering the Eagle Ford play, he employed information-gathering and deductive skills that would have made his journalistic idols Woodward and Bernstein proud.

In 2007, going over drilling logs submitted to the Railroad Commission by a production company operating in Live Oak County, Robertson noted that a well, which was producing both gas and oil, had gone below the Austin Chalk into the Eagle Ford Shale. Studying data on the company's other wells, he saw that about half of them were in the chalk and half in the shale. Learning of that one substantial South Texas well, other companies started drilling in Live Oak County, but their wells were not coming in. At some point, Robertson realized that the pay from that one good well likely came from the shale, not the chalk. Well aware of the gas bonanza under way in North Texas shale, Robertson thought hydraulic fracturing and horizontal drilling could probably be used to extract oil as well as gas from the Eagle Ford Shale.

Like the Barnett, the Eagle Ford Shale was not a new geologic discovery. A 1917 geological report had noted that this formation, which consisted of "gray to dark-colored fine-grained shale," overlay the oil-rich Woodbine sand. But the authors of this early 20th century document saw nothing about the Eagle Ford rock to be excited about. "[I]t is not believed to be of any economic value except that it serves as an impervious cover which retains the water in the underlying sand," the report concluded.

But for years before the Austin Chalk boom, that Cretaceous formation, despite efforts to drill it, had been considered too much trouble. Oilmen referred to the Austin formation as "the devil's chalk" before finally figuring out it actually had a shiny—well, oily—halo. Like a good journalist, Robertson looked at the facts objectively. And he thought those facts pointed to the potential for a previously unknown play —the Eagle Ford shale.

Robertson had a friend who worked for Petrohawk Energy Corp. in Houston and drove there to share his thinking. Serendipitously, the company had enjoyed good success drilling shale in Louisiana and was then actively looking for new shale play elsewhere. Company officials were interested, but they wanted more data. Seismic returns looked promising, but the company did not decide to start drilling until Robertson located a core sample from a 1952 dry hole that had penetrated the Eagle Ford. Finding it on a shelf at the University of Texas's Bureau of Economic Geology in Austin, Robertson sent some of the rock off for analysis.

When the lab report came back, it showed the rock was rich in hydrocarbon. In a handshake deal straight out of the 1920s, Petrohawk CEO Floyd C. Wilson agreed to give Robertson 10 percent of the action in his company's Eagle Ford drilling.

As had Mitchell and other successful wildcatters in earlier years, with money fronted by Petrohawk, Robertson worked with a land man and quietly began acquiring $150-$175-an-acre leases in the name of his company, First Rock, Inc., so as not to arouse competitive interest. Within two months they had rights to 100,000 acres and had acquired another 50,000 acres before drilling began in August 2008 on a test well in LaSalle County that proved a producer in early October that

year. That well, which flowed at 7.6 million cubic feet of gas a day, reached 11,141 feet into the earth with 10 fracturing stages.

Soon, the boom was on. Lease prices jumped to $400 an acre and as more wells came in, shot up to $10,000 or more per acre. Three years to the month after Petrohawk spudded in what would be the Eagle Ford discovery well, Australia-based BHP Billiton acquired the company for $15.1 billion. The drill bit from that already historic well has been bronzed and sits on display in the lobby of BHP's building in Houston.

In 2012, the *Corpus Christi Caller-Times* named Robertson "Newsmaker of the Year" for his role in discovering the value of the Eagle Ford Shale. Considered the father of the Eagle Ford play, he continues his work as an independent geologist, though he may not have to put in quite as many hours as he used to.

As drilling expanded in the new South Texas play, production flourished in some 30 operating fields. Since then, though, the number of wells has continued to increase but with consolidation the number of fields had dropped to 22 by the spring of 2014.

Roughly the size of Massachusetts, the Eagle Ford play extends 400 miles northeast from Webb and Maverick counties on the U.S.-Mexico border to Brazos County. It is about 50 miles wide and about 250 feet thick, though its depth ranges from 4,000 to 14,000 feet. Thanks to the high amount of carbonate it contains, the shale is more brittle than the Barnett Shale in North Texas. That makes hydraulic fracturing even more effective. In the deeper part of the play, Eagle Ford wells produce dry gas, but to the northeast, the wells deliver more liquids. Of course, there's oil, much of it around Eagleville.

Since Eagle Ford production began, at least nine other companies started working the rich new play. To list them alphabetically, the major operators in the Eagle Ford are Andarko, Apache, Atlas, BHP, EOG, Geo Southern, Lewis Petro, Pioneer, SM Energy and XTO.

Earlier oil booms in Texas fostered newspaper startups dedicated solely to the industry, including sheets like the pre-World War I era Fort Worth-based *Oil World*. The same thing has happened with the hydraulic fracturing boom, only the new medium is the internet. Several websites focus on the Eagle Ford. One of those sites, www.eaglefordshale.com put the early 21st century boom into perspective:

"The Eagle Ford Shale (EFS) is quite possibly the largest single economic development in the history of the state of

Drilling activity continued at a frenetic pace in South Texas in 2014, six years after the play began.

Texas and ranks as the largest oil and gas development in the world based on capital invested….The play had more than a $60 billion impact on the local South Texas economy in 2012 and over 116,000 Eagle Ford jobs were supported in the 20 county area impacted by the play."

The number of dollars to the good connected to the play has only grown since then.

More than 275 drilling rigs operated in the area by the spring of 2014, making it the most active shale play in the world. And like an old-fashioned gusher, amazing numbers associated with the Eagle Ford continued to spew forth.

While some numbers are hypothetical, real numbers are equally compelling. In fiscal 2012, the state took in more than $44 billion in taxes, some $3.7 billion more than the State Comptroller had projected. In addition to property taxes coming from energy companies or related businesses, oil and gas production taxes brought in roughly $1 billion. That was 39 percent higher than projected. Finally, sales taxes—from what goes to the state every time an oilfield worker buys a six pack to a new pickup truck—rose by 12.6 percent in 2012.

The Eagle Ford boom also was pumping money into city and county governments and local economies. Once-sleepy Carrizo Springs has been the epicenter of the growth, shooting from 5,600 in population to 40,000. Karnes City, Gonzales, Goliad, Three Rivers, George West, Alice, Beeville and other South Texas towns also have been revitalized by the play.

To capitalize on the boom, towns that only hunters, kinfolks, or stranded motorists would have considered spending the night in now boast national hotel chains. Rooms go for $200 to $300 a night, assuming a vacancy can be found. With more people needing a place to stay than some towns could accommodate, so-called Man Camps have sprung up to offer oil workers housing. Owning rental property in the Eagle Ford country is almost as good as having a stake in a well.

In addition to the oil company workers moving to the area, local residents have no trouble finding jobs, whether it's for $15 an hour at a Dairy Queen or $75,000-$100,000 a year driving a truck. Land that before the boom almost couldn't be given away now sells at a premium, assuming any property can be found on the market.

Not only has the boom created new wealth and recharged the state's tax coffers, it has positively affected the national economy. While the Eagle Ford and other Texas oil play cannot be solely credited for turning the U.S. economy around following the Great Recession that began in 2008, it definitely had a role in it. A study by three Purdue University economists released in the fall of 2013 estimated that the new shale play (nationwide) was pumping $473 billion a year into the U.S. economy. That's about 3 percent of gross domestic production. In addition, cheap energy is attracting big time foreign investment to the U.S.

ENVIRONMENTAL CONCERNS

The increase in drilling and production has also led to additional regulation of the industry: new air-monitoring regulations; a total re-work of the drilling, completion and cementing rule; a federal study of hydraulic fracturing; and a need for more and better roads to handle the increased traffic of large trucks.

The Texas Department of Transportation reported in April 2014 that it takes some 1,180 loaded trucks to bring just one well into production. That number of trucks equaled 8 million cars a year on rural roads

Hydraulic fracturing stimulated both production and environmental concerns, as indicated by this decidedly un-Chamber of Commerce-like bumper sticker.

Producers play it safe with plenty of rules.

designed to accommodate only 200 to 2,000 cars a day. The department estimated it could cost up to $1 billion a year to shore up and expand highway infrastructure in the Eagle Ford counties. The Texas Legislature approved an additional appropriation of $225 million to TXDOT in 2013 and another $225 million in 2013 to a county road grant program. TXDOT continues to seek additional funding for transportation projects through other avenues, including vehicle sales tax revenue.

The cost of the 21st century boom has not been confined to roadway damage. In 2012, the area saw 252 traffic deaths, an increase of 42 percent from the year before. In the other big area of play, the Permian Basin, traffic fatalities jumped by 27 percent to 318.

Since the increase in oil and gas activity began in North Texas, the area has experienced dozens of minor earthquakes ranging from 2.0 to 3.0 on the Richter scale. Thirty quakes were reported from November 2013 to early spring of 2014. Some minor damage has occurred. The industry, state regulators, universities, and seismologists continue to search for the cause of the earthquakes and solutions. Getting most of the preliminary blame were disposal wells, which are permitted by the Railroad Commission to inject water produced during the drilling, completion and production cycles. The Railroad Commission has held public meetings on the issue, but as of the summer of 2014 it had not determined possible causes of the seismic activity. A Texas House committee also heard testimony on the matter earlier in the year.

Another area of environmental concern is the amount of water being used by the oil and gas industry. The Texas Water Development Board says the industry uses only one percent of the state's water. With more than 6 trillion gallons a year being drawn from Texas impoundments and aquifers, one percent—60 billion gallons—is still a lot of water, but agriculture uses 61 percent and municipalities 34 percent. The oil and gas industry also has invested heavily in the technologies to clean up the produced water and use it again, which will reduce its water usage even more.

The Texas Commission on Environmental Quality has increased its monitoring of air emissions in the Barnett Shale and Eagle Ford Shale producing areas. The Barnett Shale is the most monitored air in the U.S. with the

installation of 15 automated gas chromatograph stations that take air samples every hour. Since 2000, air sampling data from these monitors "demonstrates that, for the extensive number of VOCs [volatile organic compounds] measured, shale gas production activities have not resulted in community-wide exposures to those VOCs at levels that would pose a health concern," according to a study published in the peer-reviewed journal, *Science of The Total Environment*.

Additionally, TCEQ had begun in 2012 to collect air emission data from the Eagle Ford that runs some 50 miles south of San Antonio.

PERMIAN REDUX

The same technology that turned much of South Texas into one of the most extensive oil and gas plays in history also has revitalized the Permian Basin.

As Devon Energy's web site pointed out in 2014, during the first few years of the new century, words like "aging" and "dying" were being used to describe the venerable Permian, which extends 300 miles long and 250 miles wide and includes 50 counties in Texas and New Mexico. The basin and sub-basins have produced in excess of 40 billion barrels of oil since the early 1920s, but output had been in decline for four decades.

Hydraulic fracturing and horizontal drilling have recharged production in the basin, where now about 25 percent of the nation's drilling rigs are in operation. Production began gathering momentum in 2007, and once again, people and equipment began rolling into the Midland-Odessa area. By 2012, production in the basin had increased by 25 percent and Midland had become the nation's fastest-growing metropolitan area, with nearly a five percent population growth that year.

Once again, an old Permian Basin expression resurfaced: "God never gave us trees. God never gave us water. But thank God, he gave us oil."

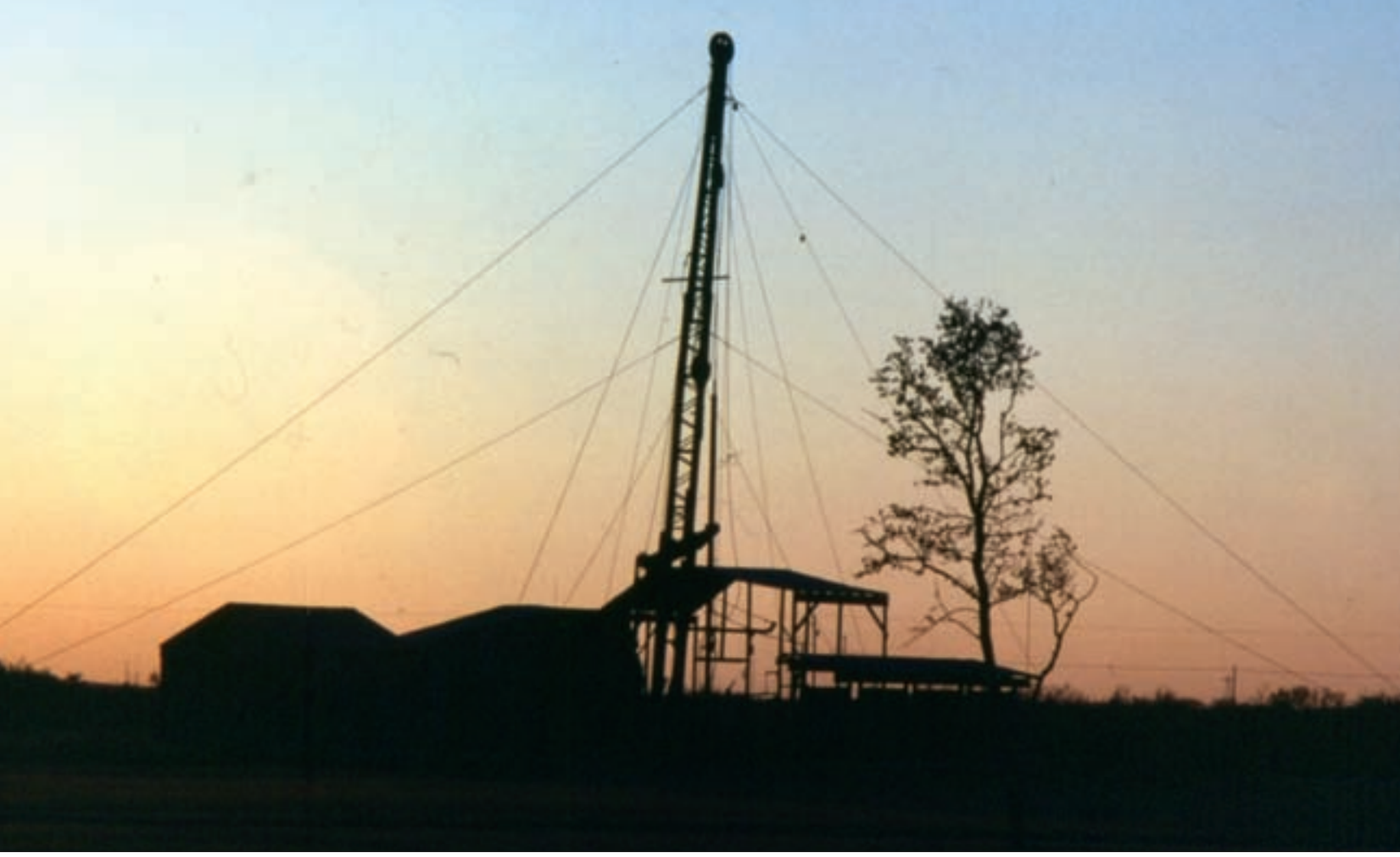
The Bakken Play in North Dakota and the Eagle Ford Shale have gotten most of the ink, but some geologists believe the Permian Basin is still the big gun when it comes to energy. "It's the reliable Permian—which has already produced 29 billion barrels of oil—that has the most room to grow," *Time Magazine* declared.

Thanks largely to the Eagle Ford, but with ample production from the Permian Basin, oil and gas production in the state tripled from 2011 to 2014. In the spring of 2011, Texas was producing 1.35 million barrels a day. Three years later, the level approached 3 million barrels daily, the highest production since 1977, and only a half-million barrels short of Texas's peak year of 1972.

That amount of oil and gas coming from the Lone Star State put Texas ahead of Kuwait and Qatar, and monthly production volume was approaching that of Iran in the late spring of 2014. The U.S. Energy Information Administration predicted that Texas's production could surpass China by the end of the year, and by 2015 possibly exceed Russia and Saudi Arabia. If Texas were an independent nation, it would be the world's eighth-largest oil producer.

Using new technologies, oil companies are going back into older fields, including East Texas and Spindletop.

PHOTO BY MIKE COX.



By April 2014, Texas had 885 drilling rigs in operation.

Looking at the boom in terms of rig count, in April 2014, Texas had 885 drilling rigs in operation. That amounted to nearly half of the nation's total rig count of 1,825.

THE BLACK GIANT WAKES UP

In the spring of 2014, the Black Giant appeared to be waking up from a long nap.

"I never thought I'd go back to East Texas," oilman Mark A. Plummer told a reporter for *Bloomberg News*.

The third-generation oilman, owner of Dallas-based Chestnut Exploration and Production, said his company had completed a robust gas well in Rusk County and had plans to spud 36 more wells on leases that had been worked by the legendary oil tycoon H. L. Hunt when he became a key player in the East Texas field shortly after its discovery during the Depression. Chestnut had more than 10,000 acres leased. Anadarko Petroleum and EOG Resources also were working the 84-year-old field discovered by "Dad" Joiner in the wooden derrick days.

One of the reasons behind the renewed interest in old fields is an industry concern that incredible as it is, the shale play might be slowing. Indeed, for the first time since the latest Texas boom began, the rate of production increase in 2013 was as low as it has been. Even so, it grew by 40 percent. The year before, production had nearly doubled in the Eagle Ford.

Chestnut's secretly acquired, extensive acreage included the red-dirt Salmon Field where 45 wells had been drilled in the 1960s when that part of the state was still producing a lot of oil. Though plugged and abandoned for 40 years, the wells on that portion of the company's lease had accounted for some 5 percent of the East Texas field's total production. Plummer told the *Bloomberg* writer he believed $1 billion worth of oil still lay trapped in the fissures of the rock beneath those pastures.

Meanwhile, Apache announced it intended to drill on land roughly ninety miles northwest of Houston. Anadarko also was looking at prospects in the once awesome East Texas field.

"I think it's [the East Texas field] going to be just as hot as West Texas within a couple of years," Plummer said in the *Bloomberg* report.

CHAPTER 13

GOING FORWARD

In the spring of 2014, what's old was what's new over much of the state. In South Texas, EOG was reworking the legendary King Ranch field, where Humble Oil first began production in 1939. The Houston-based company took over operation of the lease from Exxon Mobil, Humble's successor corporation. The sprawling ranch has 4,000 wells, with EOG planning 24 new wells for 2014.

Even the historic 1901 Spindletop field appeared on the verge of renewal. E&B Natural Resources of Bakersfield, California, and several other companies were drilling in the spring of 2014 near the old salt dome field that launched the modern oil era in Texas.

While both the ecological and geological impact of the 21st century Texas oil boom and how long it will last continues to be debated, no ambiguity can be found in the statistics.

"By leaps and bounds," declared Kathleen Hartnett-White and Vance Ginn in an assessment written for the Texas Public Policy Foundation, "Texas oil increasingly dominates the phenomenal rise in domestic oil production. After 28 years of continuing decline, Texas has increased its oil production by a remarkable 141 percent since January 2009, a rate of growth coincident with an astonishing 155 percent increase in the inflation-adjusted West Texas Intermediate oil price.

"For this unparalleled success in the energy sector," she continued, "we should thank risk-taking men and women in the Texas oil business for setting the U.S. well on its way to becoming the world's energy superpower and for renewing faith in the prodigious vigor of free enterprise."

Unconventional production techniques have made peak oil seem further away, but wind energy and other sources will be part of the future.

INNOVATION

Booms have come and gone, but the Texas oil industry has seen one constant: Innovation. If necessity is the mother of invention, in Texas, a willingness to be unconventional is the proud papa.

From the rotary drill bit to blowout preventers, from mud to pump jacks, from magnetometers to seismic technology and from computer programs to slick-water fracturing and horizontal drilling, Texas has long been at the forefront of oil field technology.

Patillo Higgins, the determined character who kept trying for oil until he got it at Spindletop, is a good example of this mindset, which, with ample help from newspapers, magazines and Hollywood, became the stereotypical view of the Texas oilman—a gutsy gambler willing to bet all his chips on a hunch. Other wildcatters, just as daring, sought to make their own luck through technology.

Another early innovator was Curt Hamill, Antony Lucas' driller. Hamill and his two brothers, who had cut their teeth in the Corsicana oil field, developed the use of mud in drilling. The problem for which Hamill would develop a unique solution was sand. The coastal plain lay over several hundred feet of sand. That material not being the most stable of geologic features, holes drilled into sand often collapsed. To deal with that issue, Hamill pumped mud down the hole instead of the water normally used to flush the drill cuttings. Mud proved not only more effective at getting the cuttings out, it stuck to the sand and tended to keep the holes from caving in. Mud has been a mainstay in the oil patch ever since.

Man's ability to coerce oil and gas from beneath the surface of the Lone Star State has steadily improved with each decade.

On January 3, 1926, for example, a wildcat came in on the Nash Ranch in Fort Bend County. The well had been drilled on the flank of a salt dome located through the geophysical work of Everett DeGolyer. The pool gained the distinction of being the first anywhere in the world discovered solely through geophysical methodology.

In 1936, at the depth of the Great Depression, the Kadane-Griffith No. A-1 Mangold came in near Kamay, the first deep well in Wichita County. While that well is not among Texas' more famous, it had the distinction of being the first drilled with a piece of machinery invented in Wichita Falls —an internal combustion engine-powered rotary drilling rig, soon popularly known as the "Spark Plug Rig."

The list of Texas-born innovations could go on and on.

The transition from intuition and guts to science and guts was in full sway by 1939, when Frank Phillips of Phillips Petroleum (later Phillips 66), wrote in *Oil Weekly*: "The necessity for the oil man to depart from his traditional and deep-seated respect for rule-of-thumb method, hunches, and gamble was a bitter pill for some to swallow….[But it] is now generally recognized, both by those within the industry and outside of it, that technical effort has rendered meritorious service."

When Buckminster Fuller (with whom George Mitchell had become friends before the noted architect's death in 1983) posited his so-called knowledge, doubling curve in 1982, he concluded that up to 1900, human knowledge had doubled roughly every 100 years. In the less than half-century from the discovery of oil at Spindletop to the end of World War II, which saw the first and only use of nuclear weaponry, the doubling of knowledge rate reached 25 years. Since then, perhaps an example of knowledge's growth, futurists have been pronouncing knowledge growth rates by category. Nanotechnology is said to be doubling every two years, with medical knowledge doubling every 18 months. Human knowledge in general is believed to be doubling every year to 13 months, and IBM sees the doubling rate eventually reaching 12 hours.

An exponential increase in knowledge has certainly been at play in the energy field, as 3D seismic imaging, the breakthroughs in hydraulic fracturing and horizontal drilling, and faster, more accurate, computer-controlled drilling equipment have shown. Indeed, a report by accounting giant Ernst & Young argues that technological innovations coming from the Texas oil industry are exceeding Silicon Valley's technological advances.

Clearly, innovation has continued to postpone peak oil.

"The limitations of resources are relative to the position of our knowledge and of our technique," economic historian Abbott P. Usher wrote in 1929. The perception of a limit for a particular resource like oil recedes "as we advance, at rates that are proportionate to the advance in our knowledge."

With knowledge growing as fast as it is, it's reasonable to conclude that mankind will either continue to come up with new ways to extract hydrocarbons from the Earth until they are truly gone to the last molecule or it will discover a new way to energize the world that will no longer require the mining of oil and gas in their various forms.

As long as the first assumption continues to be true, Texas is likely to continue as a major world player in the energy business.

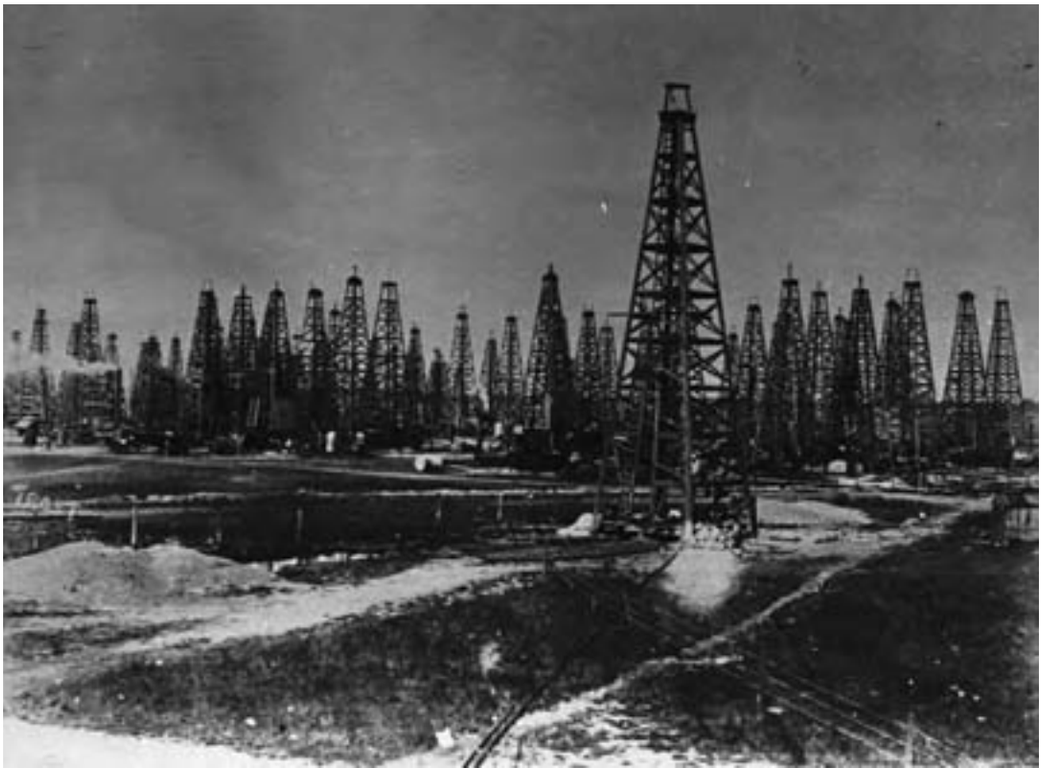
After decades of decline, Texas has increased its oil production by over 100 percent since January 2009.

Technological innovations drive new discoveries.

APPENDIX

TEXAS OIL & GAS IN PHOTOGRAPHS

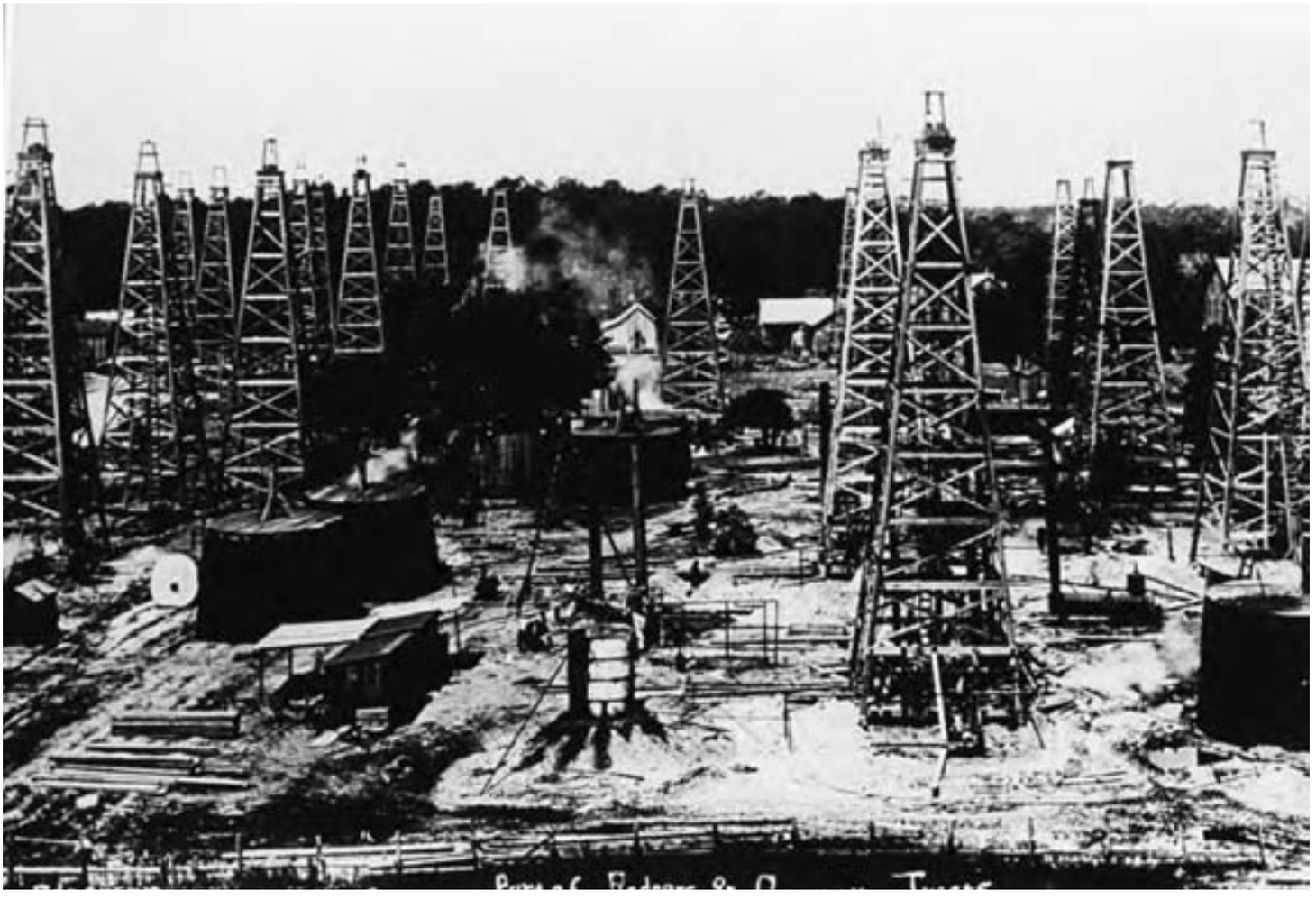
A selection of historical images that capture the history and growth of the Texas petroleum industry and the communities it has touched.



Opposite, top: Spindletop Field.

Opposite, bottom: Gladys City.

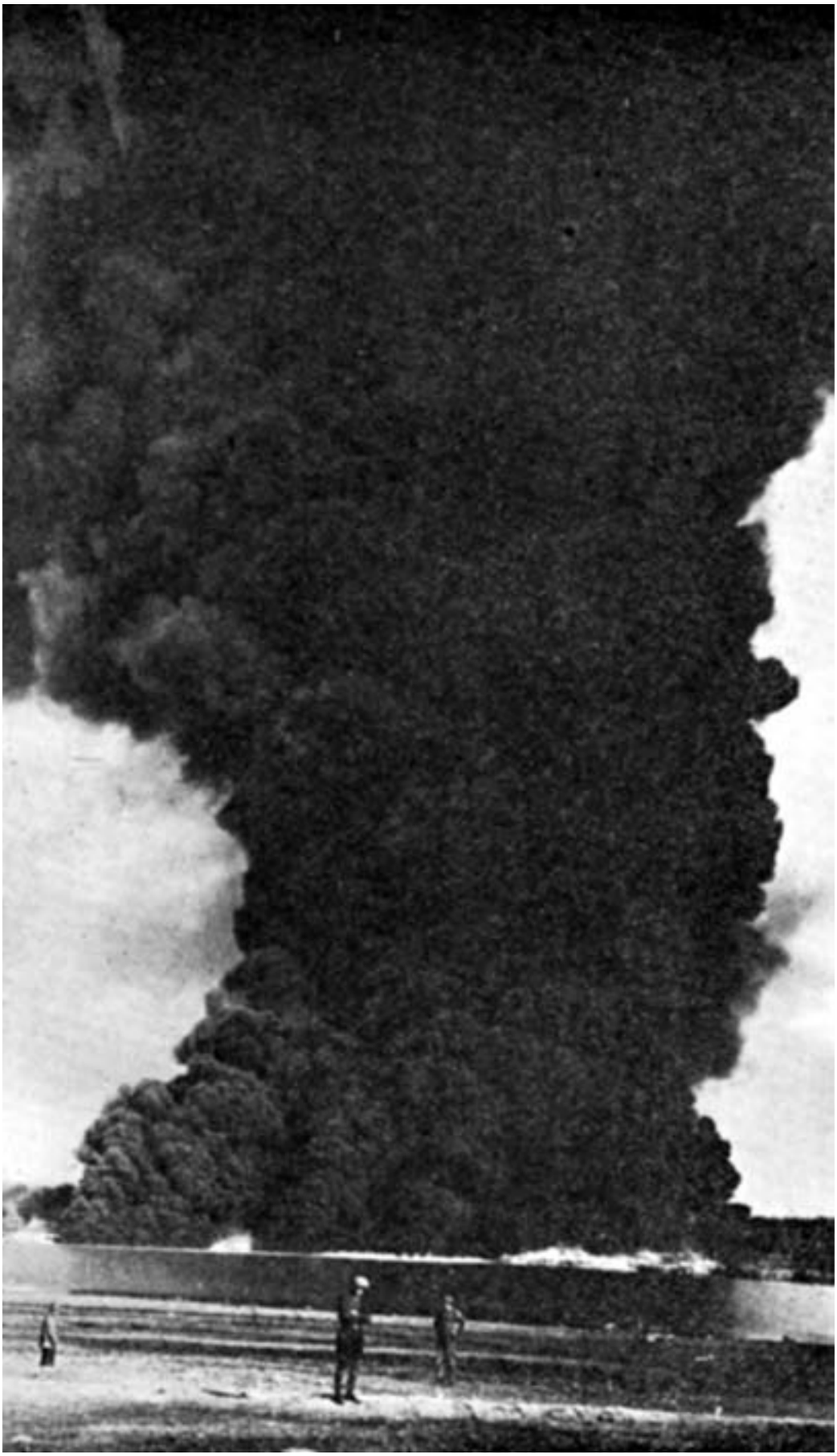
Left and below: The distance between wells was a non-issue back when.



Oil profits often went up in smoke in the early days.

Above: Mules and horses provided motive power in the oil patch for decades.

Left: This was a staged "blowout" to appeal to potential investors.



Right: Oil producers' bad luck was a photographer's opportunity to peddle postcards.

Opposite: Ranger, Texas, boomed big.


NEWS

Opposite, top: Wagons in the early 1900s.

Opposite, bottom: Parking was a problem in booming Borger.

Left and below: Oil production needed a great deal of infrastructure.

Above and right: Valves, pipes, and tanks handled crude.

Opposite: Bustling Borger kept Texas Rangers busy in the mid-to-late 1920s.


Airoplane View of
Borger, Tex.


TEXAS RANGERS

Right: Texas Rangers helped to keep order in the early oil fields.

Opposite: Scenes from the East Texas oil boom.


A SCENE AT THE
JOE D. HUGHS TEAMING CAMP
KILGORE TEX
JACK NOLAN
PHOTO
121


HUMBLE CAMP
FROM THE HILL TOP
137
KILGORE TEX
JACK NOLAN
PHOTO


A SCENE IN THE HUMBLE CAMP
KILGORE TEX
125
JACK NOLAN
PHOTO

Top, middle, and bottom: The "Black Giant" eliminated the Depression for a time in East Texas..

Opposite: Early wooden rigs in Wichita County.

Right: A driller hits pay dirt.

Opposite, top: Borger moves from boards to bricks.

Opposite, bottom: A night shot of an early Magnolia filling station.


MAGNOLIA PETROLEUM COMPANY
MAGNOLIA PETROL


802·960

Opposite, top: Ladies whose man worked the oil patch.

Opposite, bottom: Dirt roads connected the early fields.

Left: Oil often was more plentiful.than water—and sometimes still is.

Below: No one wore protective gear in the early 1900s.

Opposite, top: Derricks grew thicker than pine trees in East Texas.

Opposite, bottom: Rangers tried to bring law and order to the East Texas field.

Left: By the early 1950s, hardhats were the norm in the field.

Above: Gladys City after Spindletop blew in.

Opposite, top: Operating a rig is not an easy job.

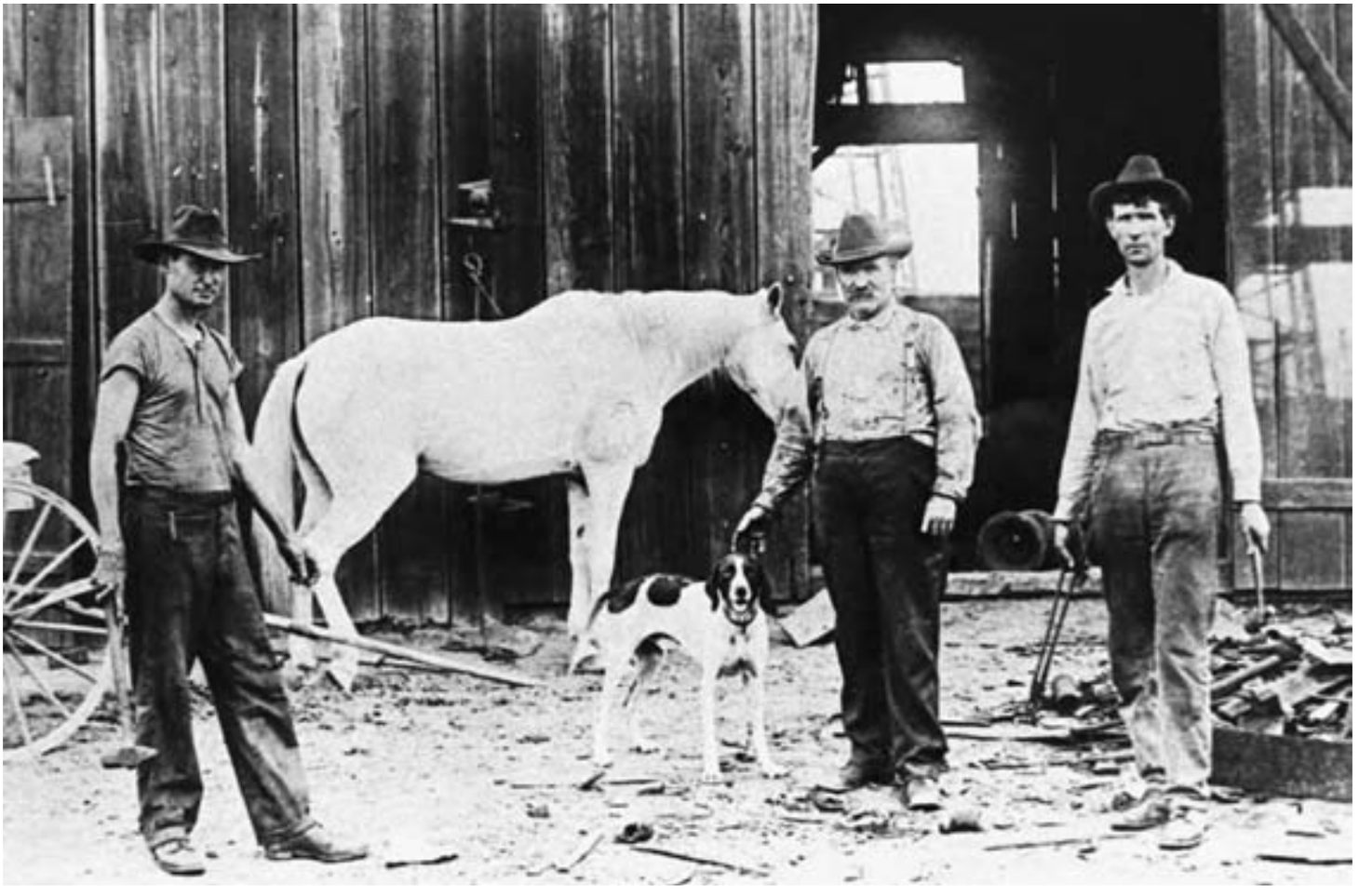
Opposite, bottom: Rigs sprouted like rain lilies at Spindletop.

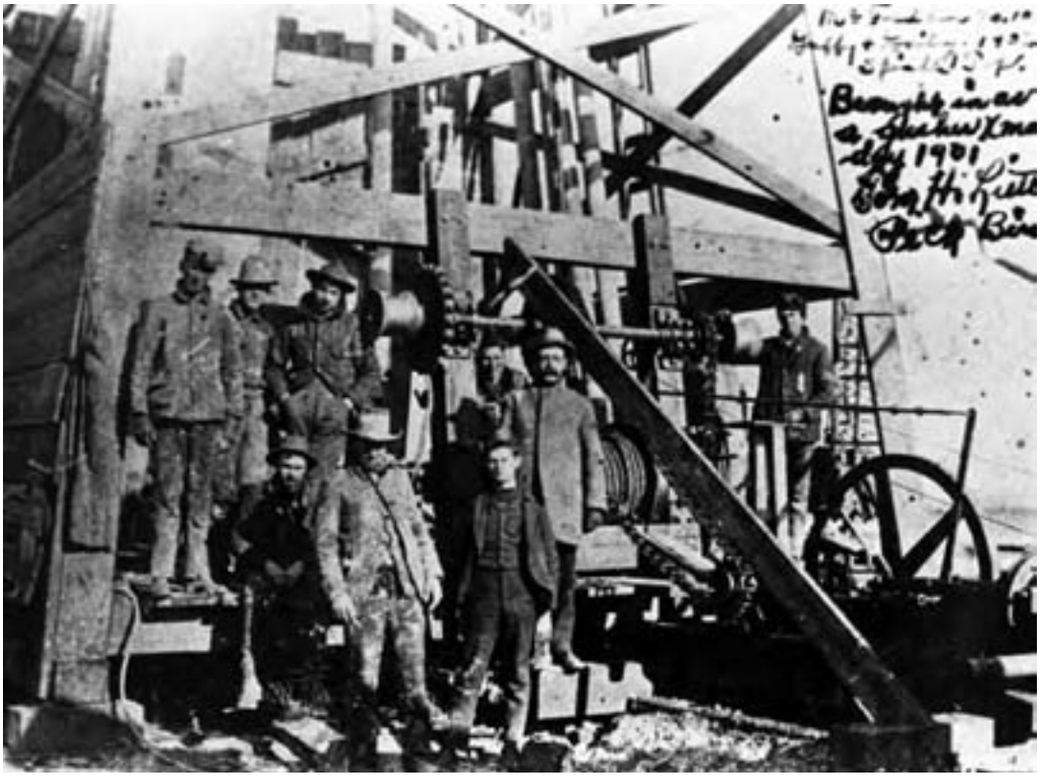

Spindle Top

Above: By the 1960s, rigs towered higher and drilled deeper.

Opposite, top: Wooden derricks dwarf a lady in white.

Opposite, bottom: Texas more comfortable with horses and hounds learned to live with oil.



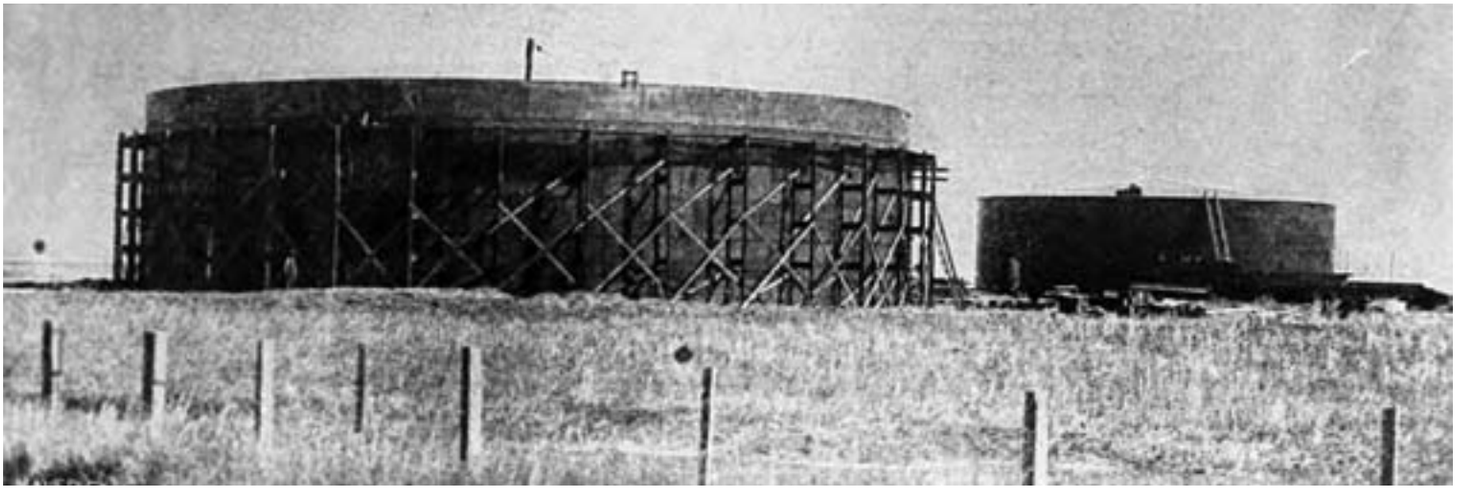


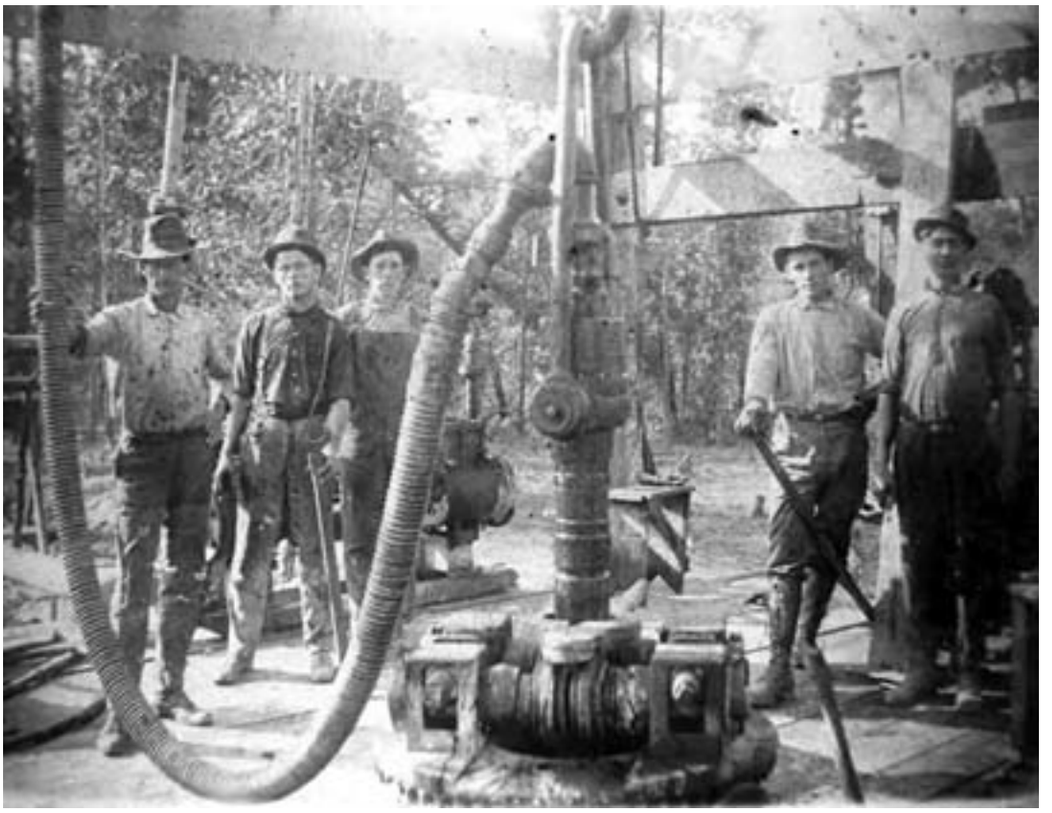
Above and right: Oil workers at Spindletop worked hard and played hard.

Opposite, top: A mule train at Borger.

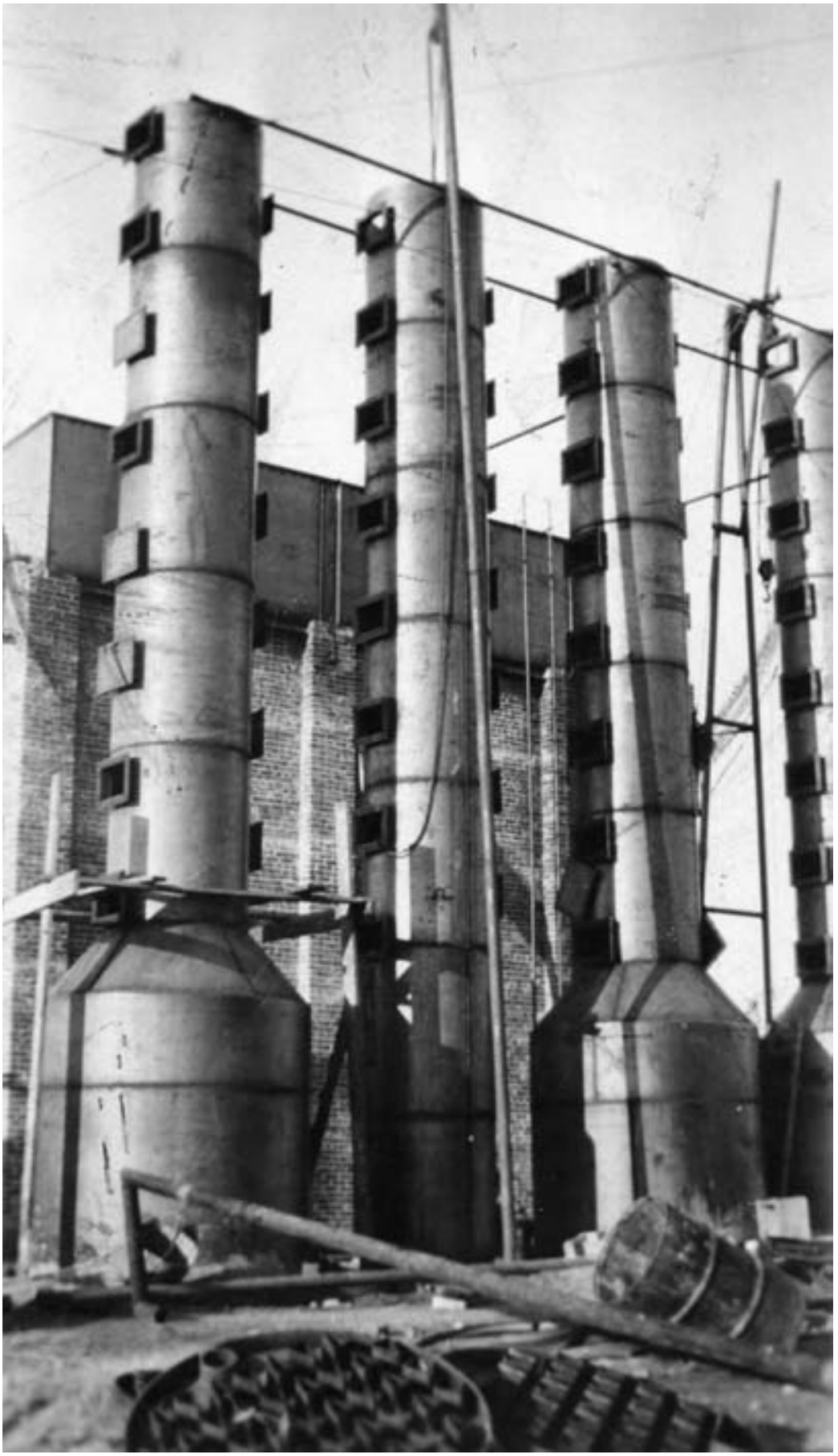
Opposite, middle: Oil deals went down in tents and shacks.

Opposite, bottom: Oil tanks rise above the plain in North Texas.



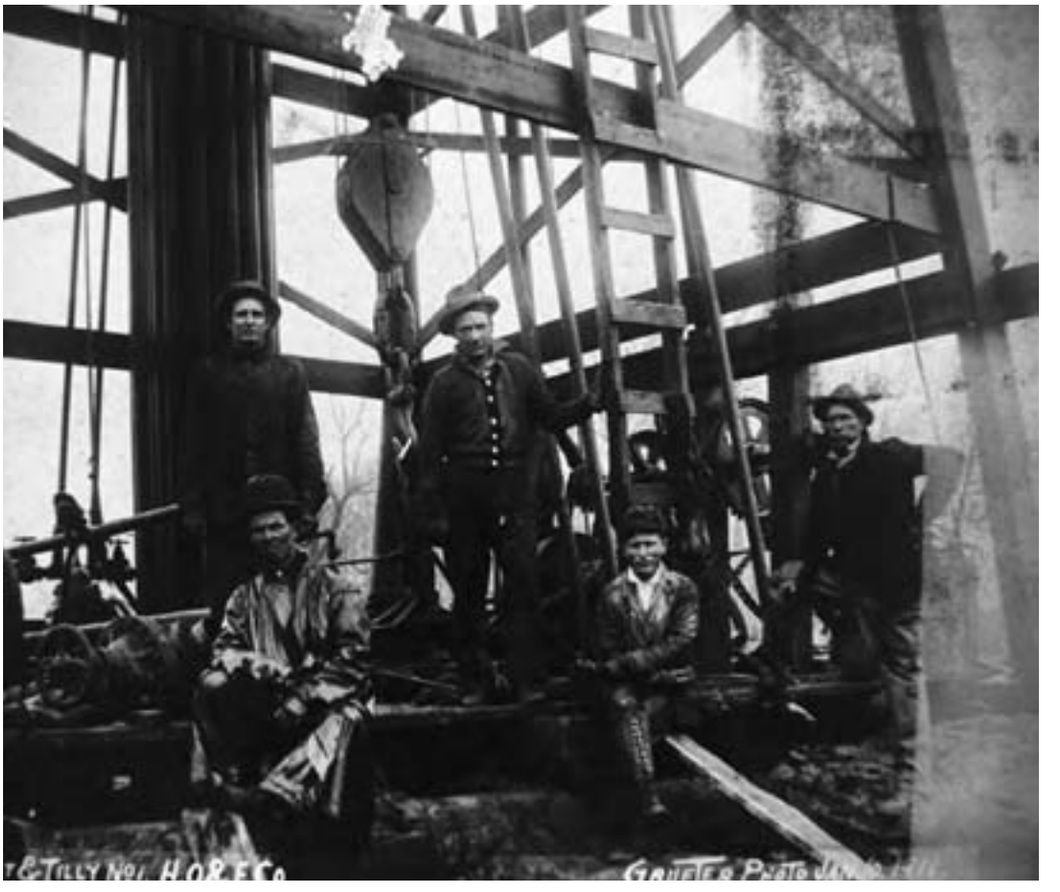


No one ever said oil is an easy way to earn a living.



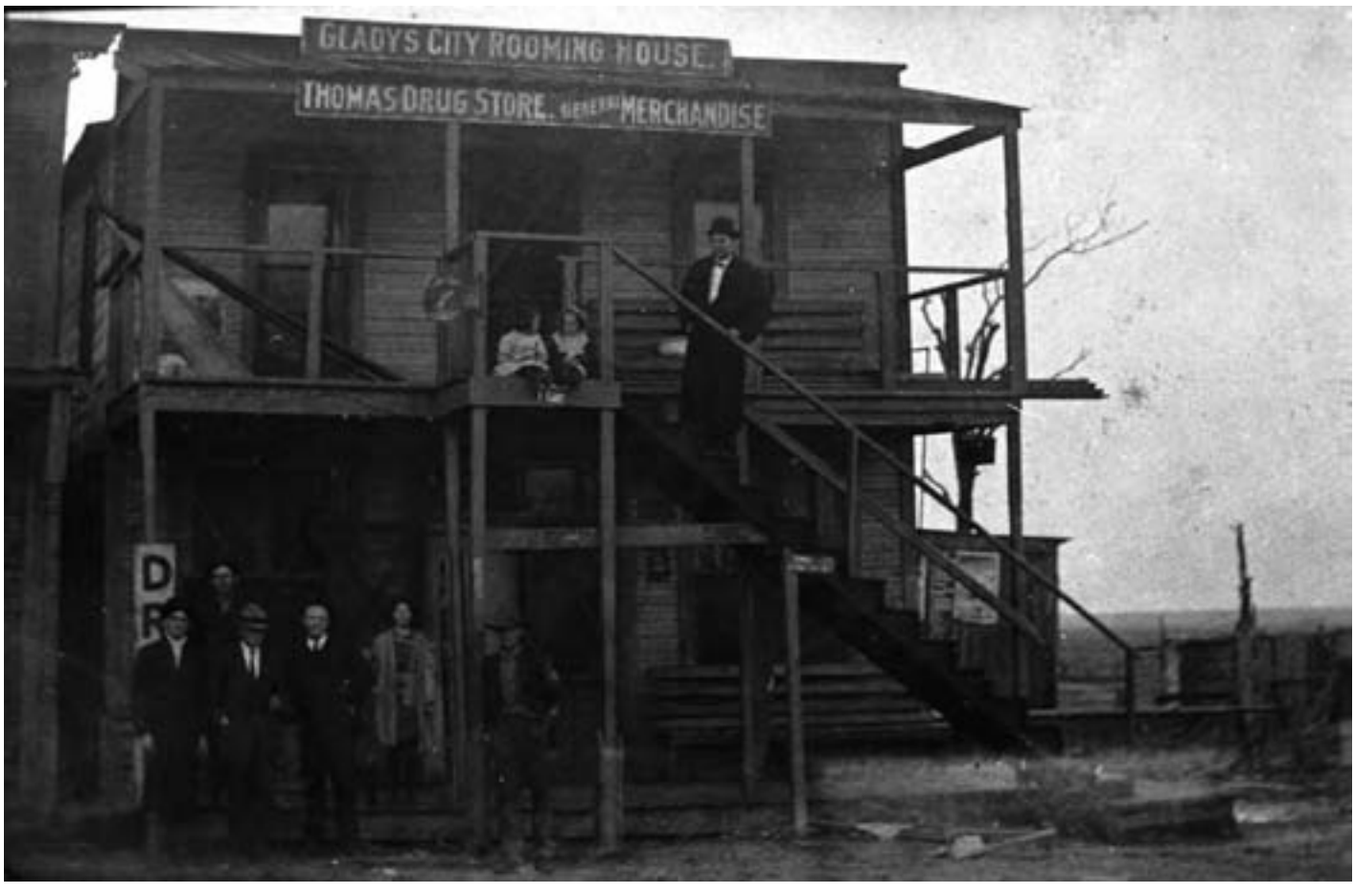
An early refinery in the Panhandle.

A couple of early drilling rigs in Southeast Texas.

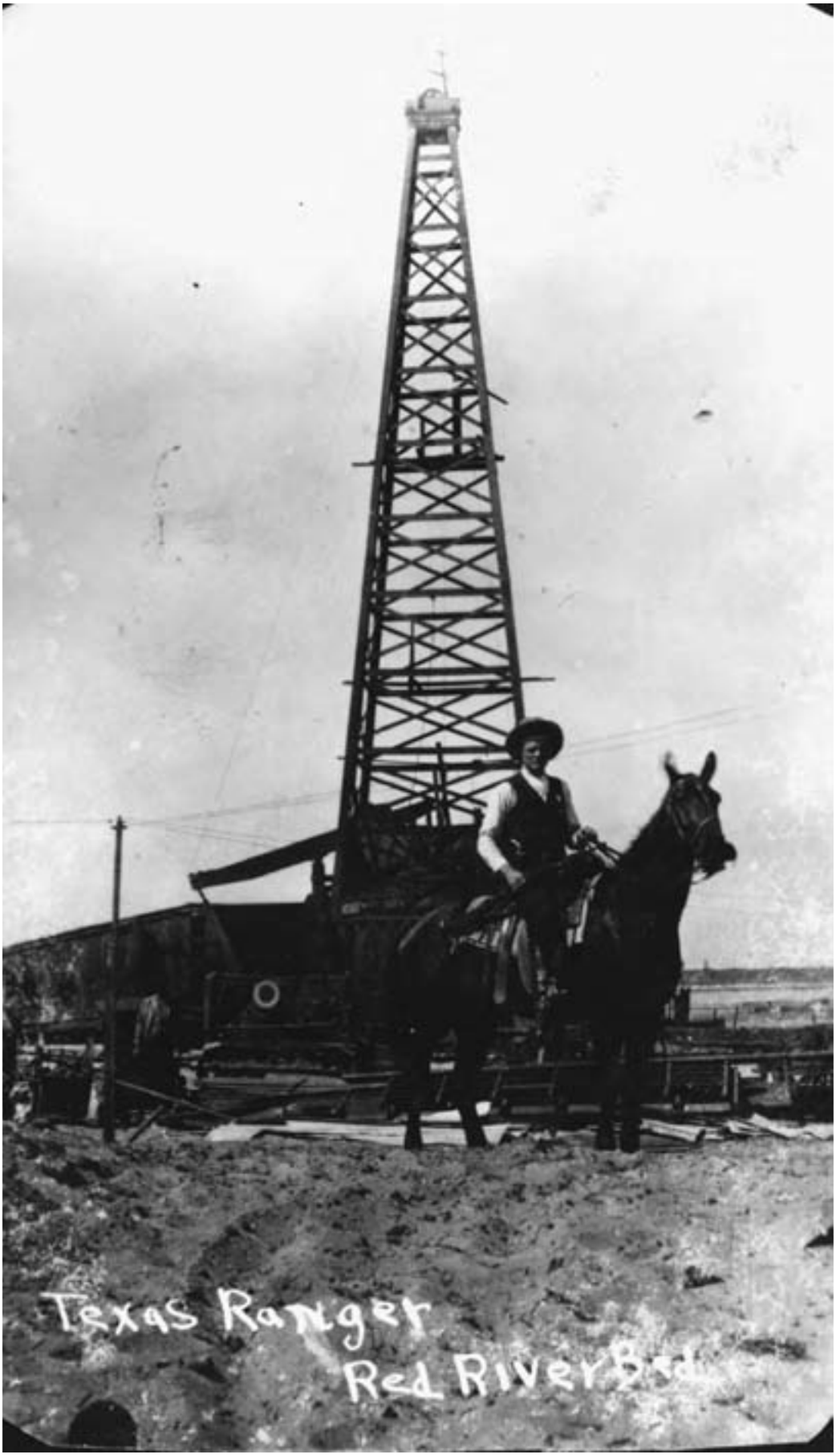


Boom days in Kilgore.

The business landscape looked a lot different after Spindletop.



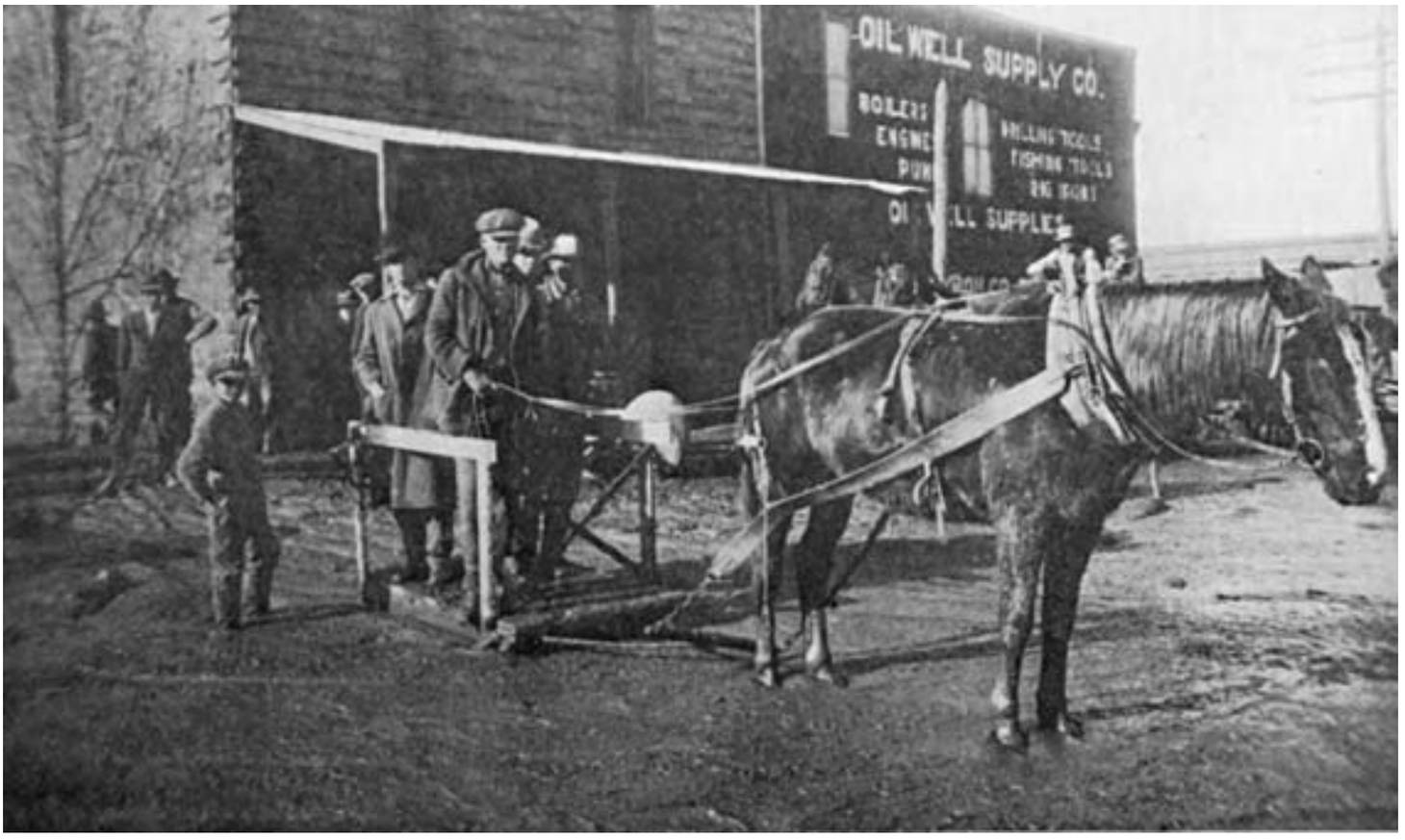
Unfortunately, crude and wooden rigs made good fuel for fires.

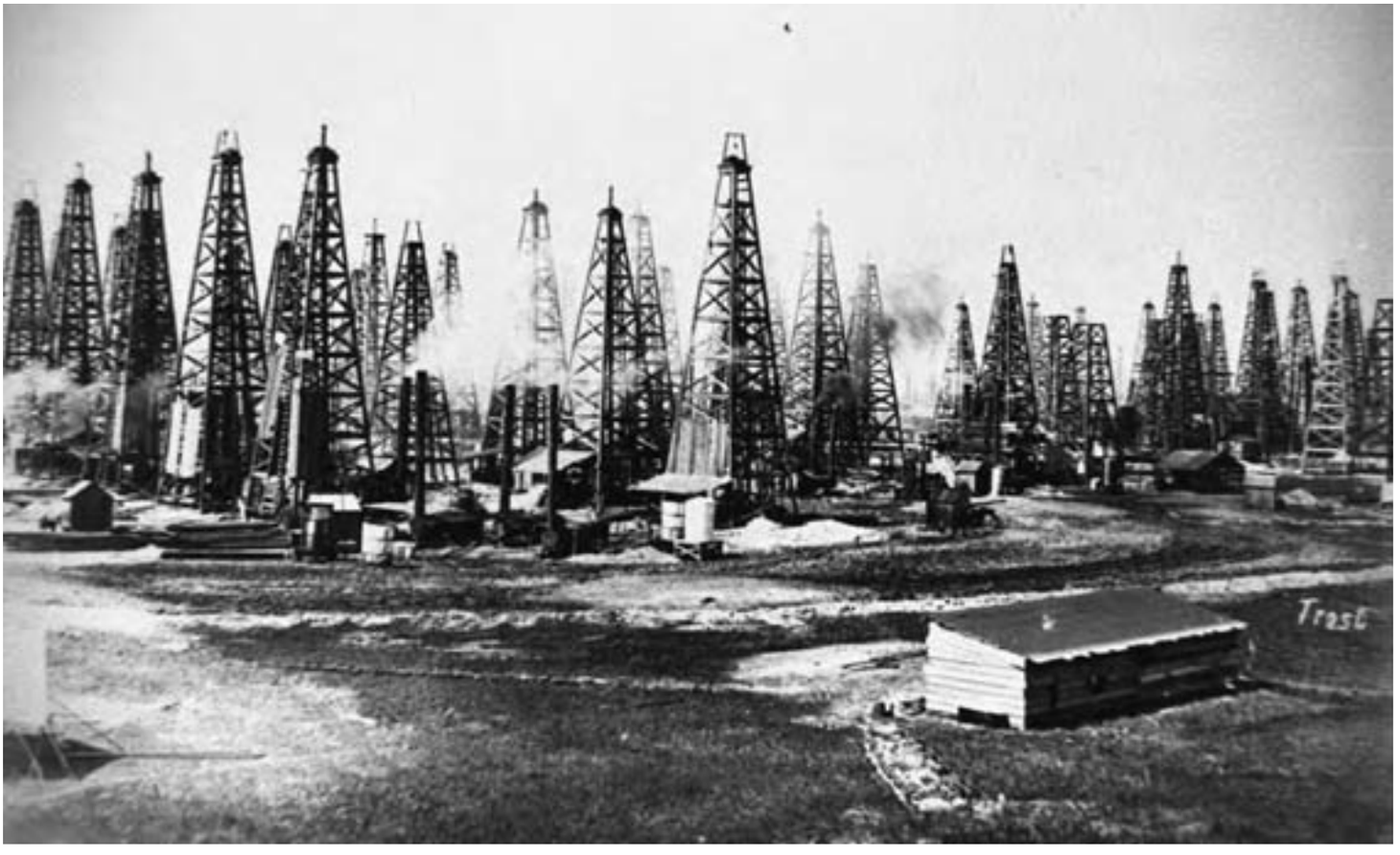


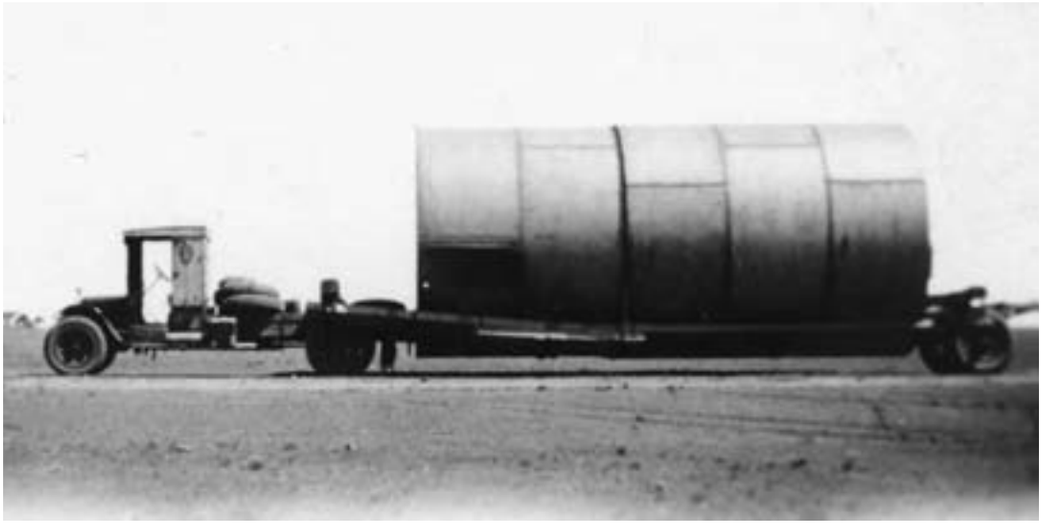
Right: Oil rigs attract cameras.

Opposite, top: A hand sleigh at Ranger.

Opposite, bottom: A forest of derricks.


OIL WELL SUPPLY CO.


Trust

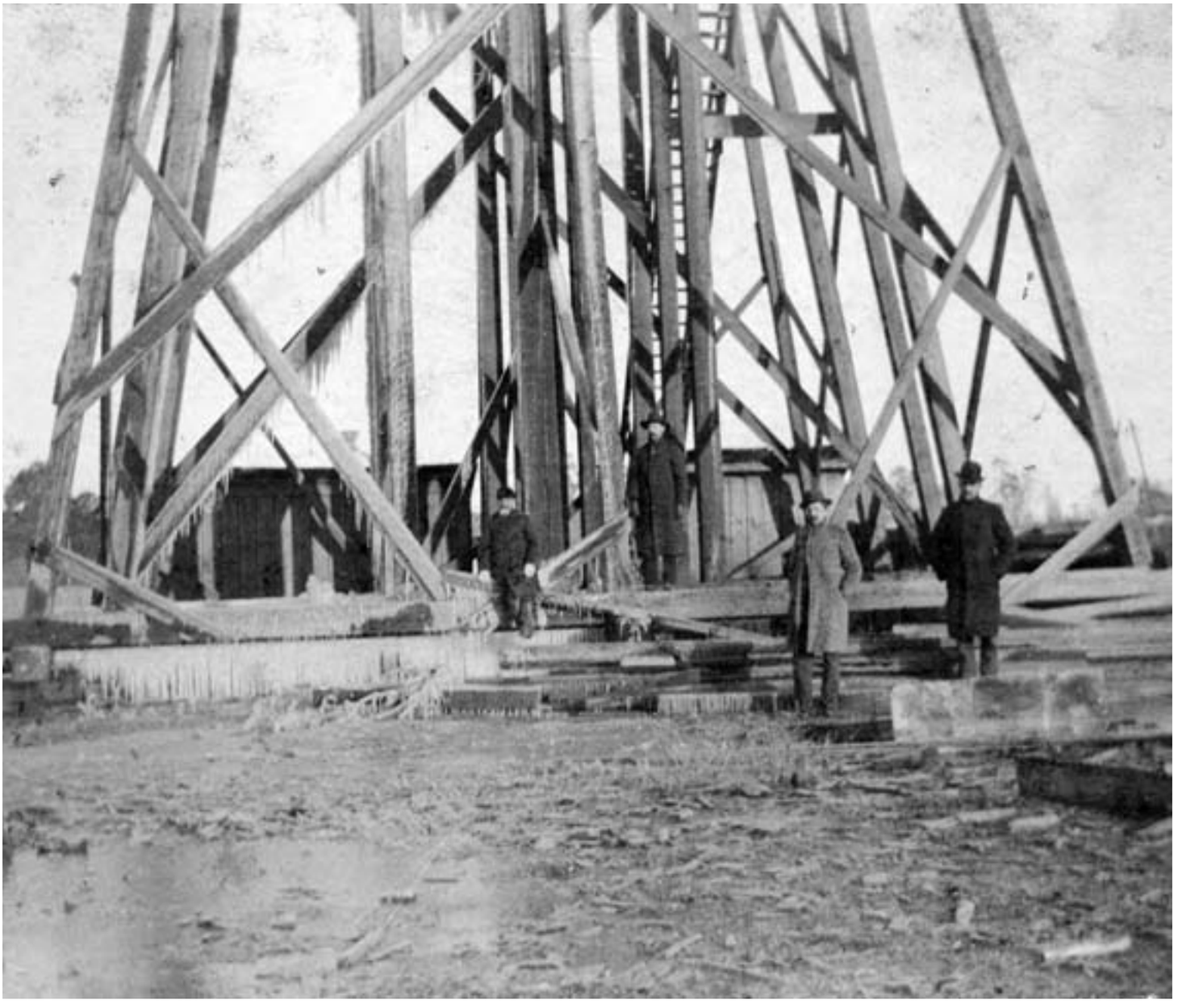


Opposite, top: For reasons unknown today, "X" marks the spot in this 1920s image.

Opposite, bottom: A "tornado" or black smoke rises over a West Texas tank fire.

Left: A small truck handles a big load.

Bottom: An icicle draped rig in bowler hat days.



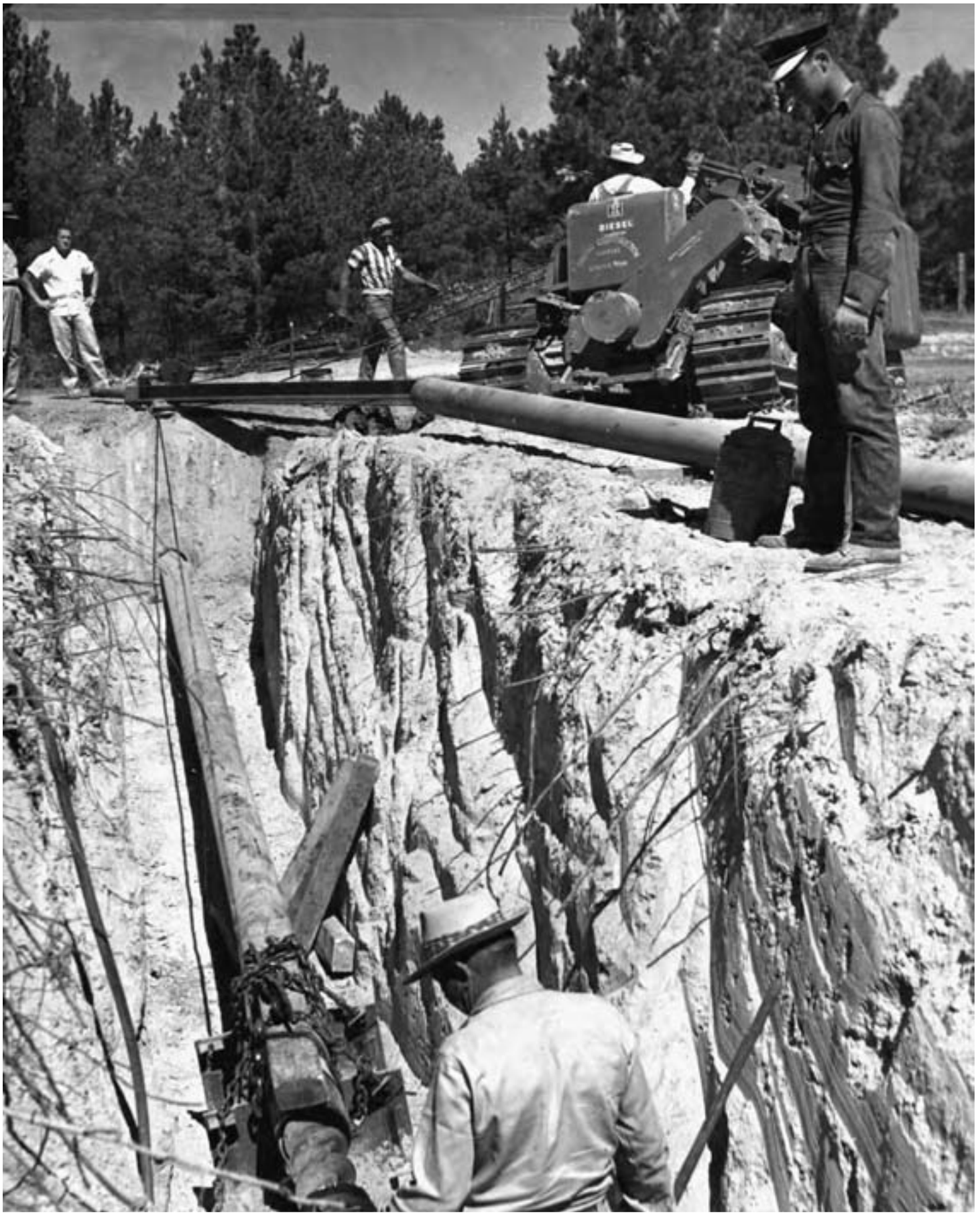
Right: Housing and office space weren't fancy in oil boom towns.

Below: Kilgore bustled with derricks.

Opposite, top: Rigs in Gladewater, Texas.

Opposite, bottom: "American Gothic" in the oil patch.


Photo By Ward Studio
Gladewater Tex
Phone 307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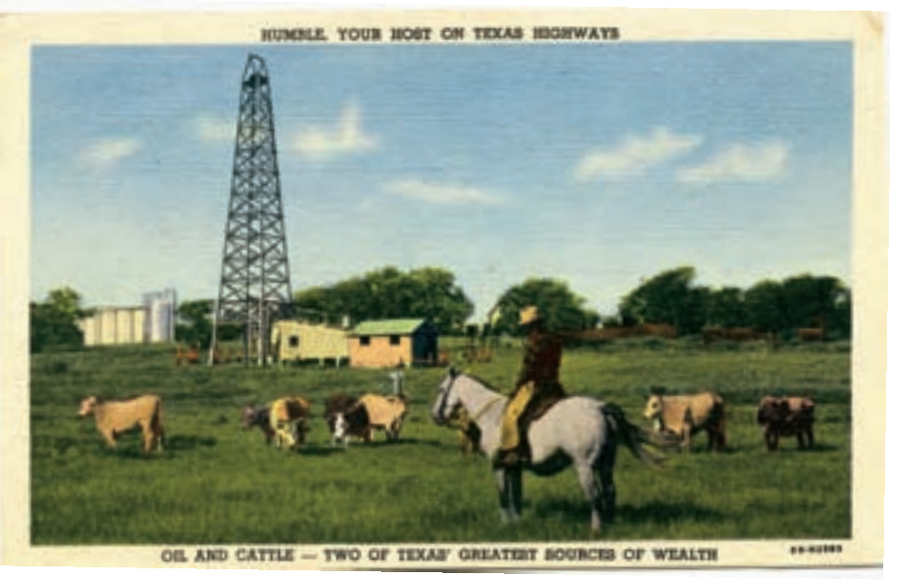


Opposite: Oil pipelines criss-cross Texas.

Top, middle, and bottom: It is hard to find a Texas town that was left untouched by the rise of the Texas oil industry.

APPENDIX

TEXAS ALLIANCE OF ENERGY PRODUCERS

The Texas Alliance of Energy Producers became a statewide organization in 2000 with the merger of two of the oldest oil and gas associations in the nation: the North Texas Oil & Gas Association and the West Central Texas Oil & Gas Association. It has 3,300 members.

The Alliance has three offices to serve the needs of its members: Austin, Houston, and Wichita Falls. Wichita Falls serves as the headquarters, and is where the administrative, membership, communications and meetings functions are carried out. The Alliance's government relations program is operated out of the Austin office. The Houston office serves the Alliance in membership recruitment.

Alliance members are the decision-makers in the oil and gas industry.

In a recent membership survey:

- 47% said they are the sole owner of their company
- 13% said they are co-owners
- 15% said they are the CEO

Most (81%) said they were over 50 years of age and 52% said they had been in business over 30 years. Another 29% said they had been in business 21-30 years.

Alliance members are well educated:

- 65% said they have a bachelors degree
- 21% said they have a masters degree
- 5% said they have another advanced degree.

Alliance members represent all segments of the energy industry:

- 75% of Alliance members work in exploration and production
- 25% of Alliance members are drilling and well servicing contractors, service and supply companies, crude oil and natural gas purchasers, accountants, lawyers, and bankers.

Two-thirds of the members said they have 10 or fewer employees, while 5% said they had more than 100 employees.

Alliance members are active in the oil & gas industry throughout the State of Texas and beyond:

- 83% have operations in South Texas (Railroad Commission Districts 1-4)
- 35% operate in East Texas (RRC Districts 5 and 6)
- 73% operate in North Texas (RRC Districts 9 and 10)
- 92% operate in West Texas (RRC Districts 7B, 7C, 8, and 8A)
- 44% operate in Oklahoma
- 32% operate in New Mexico
- 27% operate in Louisiana
- 53% operate in various other states

Top: Outgoing Alliance Chairman Townes Pressler (center) moderated a question-and-answer session between the two Republican Railroad Commission candidates, Wayne Christian (left) and Ryan Sitton (right), at the Membership Breakfast of the Alliance Expo & Annual Meeting on April 23, 2014, in Wichita Falls, Texas.

APPENDIX

NOTABLE INDUSTRY FIGURES

"RED" ADAIR

His full name was Paul Neal Adair, but the world knew him simply as "Red" Adair.

Born to a decidedly not-well-to-do family in Houston on June 18, 1915, Adair worked in a drugstore and later as a railroad man before World War II, when near the end of the conflict he learned ordnance disposal. After the war, he went to work for Myron Kinley, who specialized in dousing oil well fires. In 1959 he started his own company, and until he sold it in 1993, was involved in putting out more than 2,000 oil and gas well fires, on land and offshore.

Adair gained an international reputation in 1962 when his company contained a giant gas well fire in Algeria nicknamed the Devil's Cigarette Lighter. Flames shot into the air as high as a 45-story building until Adair and his men extinguished it with an explosion that depleted the oxygen around the fire.

In 1968, John Wayne played Adair in *Hellfighters*, a movie inspired by the Houstonian's success in defeating the spectacular Algerian fire.

Adair continued to battle big blazes throughout the 1970s, '80s, and early '90s. In 1984 his company put out a huge offshore fire on a rig off Rio de Janeiro. Four years later Adair oversaw the squelching of a giant fire on the Occidental Petroleum Company's Piper Alpha oil rig in the North Sea. The famed firefighter's last big job came in 1991, when his company took on some of the oil well fires set in Kuwait by the Iraqi military near the end of Operation Desert Storm.

Two years later, Adair sold his company and retired. The 89-year-old oil field legend died in 2004.

HUGH ROY CULLEN

Hugh Roy Cullen never made it past the fifth grade in school, but he did a pretty good job of teaching himself.

Born in Denton County in 1881, but reared by his mother in San Antonio, by the time he was 12, he had a candy sacking job paying $3 a week. At night, he studied.

Five years later, he began working as a cotton buyer in Schulenberg. On a cotton-buying trip to Oklahoma, he met Lillie Cranz, a rancher's daughter. They married when she turned 21, and the first of their five children was born in 1905.

When Cullen began his career, from an economic standpoint, cotton reigned king in Texas. But that changed after the Spindletop well came in early in 1901. Moving to Houston in 1911, Cullen continued in the cotton business while also venturing into real estate. However, he could not escape hearing and reading about how men were making fortunes in the oil business.

Turning from bales to barrels of crude, in 1921 Cullen made his first big oil strike. Seven years later, he partnered with another wildcatter, "Silver Dollar" Jim West. They worked together until 1932, when Cullen formed Quintana Petroleum.

Cullen's good fortune in the oil business revolved around his propensity to keep working fields that his competitors believed had played out. In seeking oil where others thought there to be none, and in developing new ways to do it, he repeatedly proved that a modest public school education did not seem to hinder his ability to understand the geology books he read. All his self-study paid off manifestly. In 1936, as many struggled simply to get by during the world's worst economic depression, Cullen was well on his way to being one of the wealthiest men in the nation.

Then, that same year, his son died in an oil field accident. From that, he learned one more thing: There's more to life than simply making money. By 1938, Cullen and his wife Lillie began focusing on philanthropy. They poured millions into the causes they believed in, including higher education, hospitals and cultural amenities.

"Giving away money is no particular credit to me," Cullen would later say. "Most of it came out of the ground…and while I found the oil in the ground, I didn't put it there. I've got a lot more [money] than Lillie and I and our children and grandchildren can use. I don't think I deserve any great credit for using it to help people."

Cullen died in Houston on July 4, 1957.

GLENN H. MCCARTHY

Glenn H. McCarthy was a Texas oilman straight out of central casting. In fact, he supposedly was Edna Ferber's model for oil baron Jett Rink in her novel *Giant*.

Whether the Houston wildcatter was Ferber's only inspiration is something for literary scholars to sort out, but McCarthy's biography reads like fiction.

Born in Beaumont on Christmas Day 1907, McCarthy got into the oil business at eight, hauling water in the oil fields where he father earned 50 cents a day as a roughneck. His dad later tried to make it as a wildcatter but succeeded only in getting McCarthy more interested in the same line of work.

After a rowdy and uncompleted college career revolving around his football prowess, McCarthy quit school, married, and decided to take up where his father left off as a wildcatter. Either more astute than his old man or just plain luckier, he struck oil 38 times from 1932 to 1942. Eleven of those strikes marked the beginning of new oil fields. Soon he was a millionaire many times over.

A Texan of Irish heritage who was never reluctant to swing his fists while in his cups, McCarthy in 1949 spent $21 million building a grand hotel in Houston, the Shamrock. Three thousand guests, many of them arriving from Hollywood on a special train McCarthy paid for, showed up for the hotel's grand opening.

At the peak of his entrepreneurial career, McCarthy owned two oil and gas companies, two chemical companies, two banks, a radio station, a chain of newspapers, a magazine, a movie production company and of course, the soon-famous Shamrock Hotel.

In 1955, McCarthy sold his hotel to the Hilton chain, and in 1987 the company decided to shut it down and convey it to the Texas Medical Center, which had it razed. The wildcatter's wildcatter died the day after his birthday in 1988.

J.R. EWING

Texas's best known oilman, who bore a striking resemblance to Texas-born actor Larry Hagman, lived only on the little or large screen, but millions of viewers all over the world came to love him no matter his conniving, ruthless nature.

From 1979 to 1991, J. R. could be seen every week on CBS's hugely popular series, *Dallas*. The show, which ran for 14 seasons and included 357 episodes, was a prime-time soap opera portraying a stereotypical Texas oil dynasty.

John Ross Ewing, just "J. R." to his family, friends and enemies, was the oldest son of John Ross "Jock" Ewing. Born on his family's Southfork Ranch north of Dallas in Parker, Texas, in 1935, he had two younger brothers, Garry and Bobby. Well, there was half-brother Ray, the love child resulting from his father's fling with an Army nurse during World War II. Oh, and a step brother from his mother's other marriage.

J. R. partied his way through four years at the University of Texas at Austin and served in the Army during the early years of the Vietnam War, but from birth he had been groomed to take over the family energy business, Ewing Oil. Unfortunately for J. R., his daddy liked Bobby more than him, which added to the show's conflict.

In 1971, J. R. married Sue Ellen Shepard, a gorgeous former Miss Texas. Not content with one pretty woman, the hard-drinking J.R. had numerous affairs, divorcing and remarrying Sue Ellen. For a while, he was married to Cally Harper.

As if a screenwriter was plotting his life, which of course several were, J. R.'s story took numerous twists and turns. But one thing remained constant: He would do anything to win at the oil game or to get anything else he wanted. And he genuinely loved his son, John Ross Ewing III.

Though J. R. is shot in a classic cliff-hanger end-of-season episode in 1980, he recovered and lived on through many wild ups and mostly downs until 2013, when he finally died at the end of a revived *Dallas* series. Fittingly, they had his memorial at the Dallas Petroleum Club.

LUCIEN FLOURNOY

A $5 bill got Lucien Flournoy started in the oil business.

A native of Greenwood, Louisiana, he dropped out of LSU in 1939 and hitchhiked to Corpus Christi to work as a roughneck. His sister, a school teacher, loaned him $5 to tide him over until he could land a job.

Eight years later, Flournoy founded a drilling company in Alice that became Flournoy Production Company. He and several welders started out in 1947 with a drilling rig they had designed and built. They called it "Old Bread and Butter." From that, the company grew into a major independent oil and gas operation, primarily doing business with drillers and producers in Texas and Louisiana.

"My mother was mighty disappointed that I'd dropped out of school, but I was tired of being broke and wanted to make some real money honestly," he recalled. "That was in 1939, and good paying jobs were not easy to find."

After a brief stint in the Army Air Corps early in World War II, he indeed started making that "real money." In 1957, he moved beyond drilling and became a producer.

"The oil business was essential to the development of our society," Flournoy said not long before his death. "The consumption of energy distinguishes our country and other advanced economies from so-called Third World nations …. After all, people throughout the world

do not truly reach middle class until they have a means of transportation, electricity, appliances, and climate control within their houses. All those things depend on energy."

While most oilmen are on the conservative side of the political spectrum, Flournoy had been a life-long Democrat who contributed a substantial amount of time and money to the Texas Democratic Party. He served two terms on the Alice city council and later as mayor. A generous philanthropist, among other efforts, he funded a scholarship program at Texas A&M Kingsville, donated a half-million dollars to the Boy Scouts, and paid off the mortgage for a women's shelter in Corpus Christi.

Flournoy died at 83 on March 27, 2003 in Corpus Christi.

MICHEL T. HALBOUTY

Michel T. "Mike" Halbouty, the son of Lebanese immigrants, was born June 21, 1909 in Beaumont.

The famed Spindletop well had ushered Texas into the oil age only eight years before Halbouty's birth, and Beaumont continued to boom. Just a tyke, he entered the oil business making four bits a day hauling water to the oil field.

That early experience convinced him the oil industry was for him. He got a degree in geology at Texas A&M in 1930, followed by a master's degree in the same field.

Graduating in one of the worst years of the Great Depression, Halbouty got a job on a Yount-Lee Oil Co. surveying crew and fell in love with the oil business.

Soon, Halbouty began building his legend. Only 22, at a drilling site on High Island, he took one more core sample from a hole the more experienced rig boss believed was a duster. Apparently not impressed with Halbouty's academic credentials, the foreman tossed him off the rig into a mud pit. Halbouty climbed out of the pit and drove straight to the home of company owner Miles F. Yount.

Yount was not particularly excited to see one of his most junior employees, especially since he was throwing a party for the former prime minister of Poland. But, by saying he would stake his job on the outcome, Halbouty finally managed to convince his boss that the rig in question would hit oil. Yount gave the OK to keep drilling.

The well came in, as did many other wells in the new field. The find got Halbouty a big raise and a new title, but when Yount died two years later, Halbouty moved on. He worked for Glenn McCarthy for another two years before going out on his own in 1937.

Following World War II military service, Halbouty focused on wildcatting. He found a lot of oil and made a lot of money.

An outspoken giant in the industry and generous benefactor who served on many non-profit boards, Halbouty died in 2004 at 95.

CLINT MURCHISON

Born in Tyler on April 11, 1895, Clinton Williams Murchison, Sr., developed the financial savvy that would make him one of Texas's richest and most powerful oil men not by going to college as his parents had hoped, but by working in the bank his father owned.

Following service as an Army lieutenant in World War I, Murchison and his lifelong friend, fellow East Texan Sid Richardson, traveled to the booming Burkburnett oil field as lease "hounds." Soon transitioning from buying and selling leases, he began drilling for oil on his own holdings. That made him a millionaire five times over by the time he sold his North Texas interests in 1925.

Four years later, Murchison founded the Southern Union Gas Company, which grew into a giant utility supplying natural gas to Texas and four other Southwestern states. When the giant East Texas oil field was discovered in 1930, Murchison became a major player in that part of the state.

Murchison opposed government regulation of the oil industry, which figured in the name of the next corporation he formed – American Liberty Oil Co. But when excessive production in the prolific East Texas field knocked the bottom out of oil prices, sending the value of a barrel of crude plunging to only a dime, he became more conservation minded. Still, he remained adamantly opposed to state and federal production controls.

After World War II, Murchison expanded his holdings to all of North America, organizing the Delhi Oil Corporation in 1945. A subsidiary, Canadian Delhi, developed extensive natural gas sources in Alberta. Murchison built a 2,100-mile pipeline from there to supply the densely populated northeaster, U.S. He also had a natural gas operation in Australia.

Following a series of mergers and acquisitions, the last company Murchison controlled was Kirby Petroleum. In addition to his energy companies, Murchison owned numerous other businesses, from life insurance firms and banks to building material supply companies and ranches.

One of his three sons, Clint Murchison, Jr., owned the Dallas Cowboys for many years.

The elder Murchison died in Athens on June 20, 1969.

Sid W. Richardson

Only eight, future oil tycoon Sid W. Richardson got an early lesson in business from his father.

The elder Richardson gave his son a downtown lot in his native Athens, in East Texas. Next he asked the youngster if he'd take a bull in trade for the real estate. Little Sid thought that sounded like a good deal, but he soon came to realize that one bull isn't much use to a cattlemen unless he has some cows to go with it.

"My daddy taught me a hard lesson with that first trade," Richardson later recalled, "but he started me tradin' for life."

Nine years after getting skinned in that first deal, when Richardson graduated from high school in 1908 at 17, he had earned $3,500 trading cattle that year. Back then, that was a lot of money.

Richardson never lost his interest in, and affinity for, trading cattle, but after several years of college with borrowed capital he turned to a new business model in 1919—drilling for oil. Within a year, at the ripe old age of 28, he and partner Clint Murchison were millionaires.

The next business lesson Richardson learned the hard way was that commodity prices don't hold. When the market for oil temporarily tanked in 1921, his fortune went into a decline that lasted until the early 1930s. After that, he went on to become one of the richest oilmen in the nation.

From churches to hospitals to art, he supported a wide range of causes. Also a power-broker, his friends ran from shoeshine boys to Presidents. Just about everyone called him Mr. Sid.

Summing up his formula for success in the oil and cattle business, he said, "I guess my philosophy of business life is: Don't be in too big of a hurry, don't get excited, and don't lose your sense of humor."

He might have added "keep your mouth shut." An unassuming man who never married, he kept his own counsel, seldom allowing media interviews.

Richardson died at his ranch on St. Joseph's Island across from Rockport on September 30, 1959.

H. L. HUNT

Haroldson Lafayette Hunt parlayed his poker winnings into what became a Texas oil dynasty.

Born in Illinois in 1889, he quit school after the fifth grade and knocked around the country doing everything from lumberjacking to cowboying before he decided to visit Ditch Bayou, in southern Arkansas. His father had fought in a Civil War battle near there, and had later told his son about the rich soil in the vicinity. With money he netted through gambling, the younger Hunt bought a cotton farm.

He married in Arkansas in 1914 and went on to have six children. But just like a pine-covered tract hiding deep reserves of oil below, there was more to H. L. Hunt than external appearances, including being a bigamist with a second family and more children.

In 1923, buying leases on credit, Hunt got his start in the oil business during a boom in El Dorado, Arkansas. He later maintained that he had made $600,000 within two years. In time, that amount of money would seem only like pocket change to Hunt, who went on to become one of the two wealthiest men in the nation, a billionaire many times over who at one point earned an estimated $1 million a day.

What got Hunt to Texas was the 1930 discovery of a huge oil pool in East Texas. Having acquired Columbus "Dad" Joiner's Daisy Bradford No. 3 and a lot of land around it, by 1932 Hunt operated a pipeline and 900 wells in East Texas. Two years later, he founded the Hunt Oil Co. in Tyler.

Hunt, who later moved his family and company to Dallas, continued to make money through oil and investments. But if there is such a thing as an ordinary billionaire, he was not one. Most of the time, he acted like he was down to his last dime, traveling coach and often packing his own lunch. Once, he stopped at a roadside watermelon stand and convinced a farmer to sell him a 75 cent watermelon for 50 cents.

"I hate to get skinned on any deal," he told the lawyer who was with him.

Hunt died on November 29, 1974 but the Hunt Oil Co., now known as the Hunt Family of Companies, remains in business.

APPENDIX

2014 INDUSTRY STATISTICS AT A GLANCE

Source: Texas Railroad Commission, May 2014.

APRIL PERMITS TO DRILL

The Commission issued a total of 1,919 original drilling permits in April 2014 compared to 1,996 in April 2013. The March total included 1,742 permits to drill new oil and gas wells, 40 to re-enter existing well bores, and 137 for re-completions. Permits issued in April 2014 included 579 oil, 89 gas, 1,149 oil and gas, 76 injection, two service and 24 other permits.

MARCH CRUDE OIL PRODUCTION

Texas preliminary March 2014 crude oil production averaged 2,014,480 barrels daily, up from the 1,615,735 barrels daily average of March 2013.

The preliminary Texas crude oil production figure for March 2014 is 62,448,869 barrels, up from 50,087,788 barrels reported during March 2013.

APRIL OIL AND GAS COMPLETIONS

In April 2014, operators reported 1,012 oil, 92 gas, 21 injection and four other completions compared to 1,894 oil, 505 gas, 88 injection and seven other completions in April 2013.

Total well completions for 2014 year to date are 11,259 up from 7,449 recorded during the same period in 2013.

Operators reported 350 holes plugged and zero dry holes in April 2014 compared to 69 holes plugged and zero dry holes in April 2013.

MARCH NATURAL GAS PRODUCTION

Texas oil and gas wells produced 593,191,901 Mcf (thousand cubic feet) of gas based upon preliminary production figures for March 2014 up from the March 2013 preliminary gas production total of 570,315,687 Mcf. Texas preliminary March total gas production averaged 19,135,223 Mcf (thousand cubic feet) a day.

Texas production in March 2014 came from 165,182 oil wells and 90,883 gas wells.

APRIL TEXAS OIL AND GAS DRILLING PERMITS AND COMPLETIONS BY DISTRICT

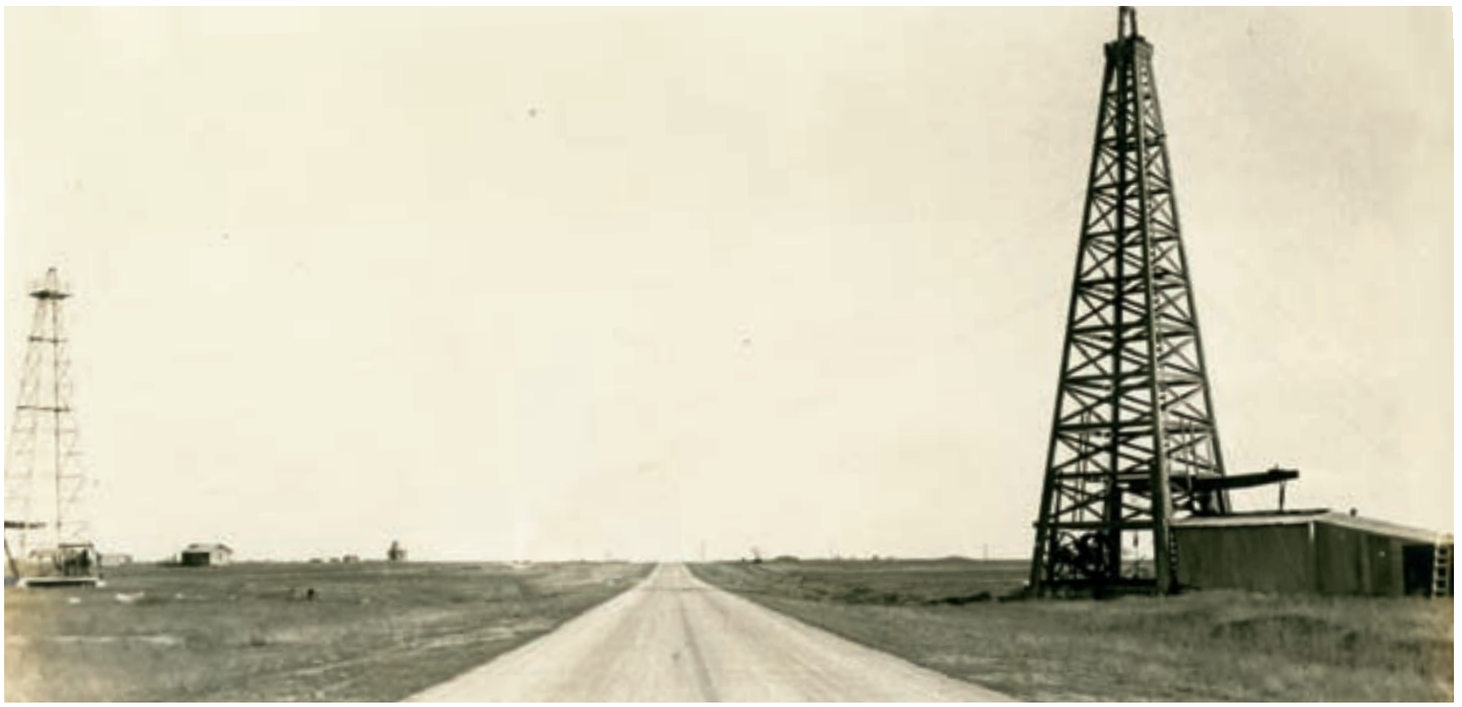
Railroad Commission District	Permits to Drill/Oil Gas Holes	Oil Completions	Gas Completions
(1) San Antonio Area	300	80	28
(2) Refugio Area	149	55	17
(3) Southeast Texas	117	5	4
(4) Deep South Texas	36	0	0
(5) East Central Texas	20	5	8
(6) East Texas	41	19	3
(7B) West Central Texas	81	29	0
(7C) San Angelo Area	210	101	1
(8) Midland	578	568	5
(8A) Lubbock Area	148	76	0
(9) North Texas	165	46	10
(10) Panhandle	74	28	16

MARCH TEXAS TOP TEN OIL PRODUCING COUNTIES
RANKED BY PRELIMINARY PRODUCTION

County	Crude Oil (BBLS)
1. Karnes	5,436,082
2. La Salle	4,447,030
3. Gonzales	3,623,800
4. McMullen	2,902,371
5. Andrews	2,879,809
6. Ector	2,307,138
7. Martin	2,247,359
8. Upton	2,213,441
9. Dimmit	2,181,602
10. Midland	2,119,847

MARCH TEXAS TOP TEN GAS PRODUCING COUNTIES
RANKED BY PRELIMINARY PRODUCTION

County	Total Gas (MCF)
1. Tarrant	58,112,366
2. Webb	32,534,028
3. Johnson	29,053,018
4. Panola	23,130,691
5. Wise	20,278,843
6. Denton	17,161,155
7. La Salle	16,503,122
8. Dimmit	16,312,333
9. Karnes	15,655,995
10. Wheeler	14,647,631



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Sharing the Heritage

Historic profiles of businesses, organizations, and families that have contributed to the development and continued growth of the Texas oil and gas industry

A replica of the Snavely No. 1 in downtown Gladewater. The gusher came in about a mile from town in 1931.

Special Thanks to

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Burnett Oil Co., Inc.

The Four Sixes Ranch

Burnett Ranches, LLC

PHOTOGRAPH COURTESY OF LARRY GALBIATI.

It would be impossible to tell the history of Burnett Oil Co., Inc., without recounting its relationship to the Four Sixes Ranch and Burnett Ranches, LLC. Together, these businesses and the family that founded them form the basis of one of the most fascinating stories in Texas history.

Burnett Oil Co., Inc., an experienced and well-regarded operator in the Permian and other basins, is privately owned and operated by Anne Burnett Windfohr Marion. Burnett Oil Co, Inc., operates producing properties in Southeast New Mexico (Loco Hills region in Eddy County), West Texas (Sand Hills region of Crane County), on the Triangle and 6666 Headquarters Ranches, the Fort Worth Basin, the Anadarko Basin of Oklahoma and the Texas Panhandle, the Appalachian Basin in Southwest Pennsylvania and West Virginia, and has ongoing exploration efforts in several other states.

Anne W. Marion, great-grand daughter of Samuel "Burk" Burnett, often called "Little Anne", formed Burnett Oil Co., Inc. in 1980, and became Chairman of the company. The properties of Windfohr Oil were a part of the foundation of the new company. These oil fields, in West Texas and Southeast New Mexico, were originally assembled and drilled by Robert F. Windfohr, a Burnett family member by marriage to Anne Marion's mother, Anne Valliant Burnett Tandy.

However, the roots of the Burnett family interests in oil and gas began with the assembly of the Burnett Ranches by Samuel "Burk" Burnett. At age 10, in 1858, Burnett moved with his family to Denton County, Texas, when conditions forced his parents—Jeremiah and Mary Turner Burnett—to leave Missouri. Although an experienced farmer, Jeremiah became involved in the cattle business, and Burk learned about cattle from a young age.

People grew up quickly in those days, so by age nineteen Burk had gone into business for himself. He started by rounding up wild longhorn cattle in South Texas and driving them north to sell. Then, in 1868, he purchased 100 head branded with "6666" from Frank Crowley of Denton. Title to the cattle included ownership of the brand, and Burnett realized the open-six design would be easy to fashion into irons, and the brand would be difficult to alter by cattle thieves. Thus was born an iconic brand that would come to represent much more than ownership of cattle.

At age twenty, Burk married Ruth B. Loyd, daughter of Martin B. Loyd, founder of the First National Bank of Fort Worth. Five years later, Burk survived the panic of 1873 by holding through the winter more than 1,100 steers he had driven to market in Wichita, Kansas. The next year, with the panic over, he sold the cattle for a $10,000 profit, an amount equivalent to more than $200,000 in 2013. Following this experience, Burk became one of the first ranchers in Texas to buy steers and graze them for market.

During the next winter, he bought 1,300 cattle in the Rio Grande Valley of South Texas and drove them north up the Chisholm Trail to the open range grazing lands near the Little Wichita River. He quickly came to

understand the importance of having control over the lands on which cattle fed, and with that in mind, Burk began buying property. He later built his first headquarters near what would become Wichita Falls.

A drought in the 1880s forced Burnett to search for grass to sustain his cattle, and when he discovered that Kiowa and Comanche tribal lands north of the Red River had not suffered from drought, he negotiated the lease of Indian lands. He made a deal with legendary Comanche Chief Quanah Parker (1845-1911) for access to 300,000 acres of grassland and, in the process, gained the friendship of the Comanche leader. Burk ran 10,000 head of cattle on the land until the end of the lease in the early 1900s.

As the nineteenth century drew to a close, the end of the open range became apparent. The only protection the cowman had was to purchase private land on which to graze his cattle. What would eventually become Burnett Ranches, LLC, began around 1900 with the purchase of the 8 Ranch near Guthrie in King County and the Dixon Creek Ranch near Panhandle. The 8 Ranch became the nucleus of the present-day Four Sixes Ranch. These two ranches, along with later additions, totaled one-third of a million acres.

Since 1900, Burk had maintained a home in Fort Worth, headquarters for his financial enterprises. He added to and developed his holdings, including building the Four Sixes Supply House, and a new headquarters in Guthrie. In 1917, Burk decided to build "the finest ranch house in West Texas" at Guthrie, at a cost of $100,000, an amount equal to more than $1.8 million in 2013. Prestigious architectural firm Sanguiner and Staats of Fort Worth designed the eleven bedroom home, built with stone quarried on the ranch, to serve as ranch headquarters, to house the ranch manager, and as a place for entertaining.

The Four Sixes Supply House was built several years before the main house. Burk lived in the back of the supply house until the main house was completed. His office remained in the supply house.

In 1921, oil was discovered on Burk's land near Dixon Creek in Hutchinson County in the Texas Panhandle. The Gulf No. 2 Burnett served as the discovery well of the giant Panhandle Oil Field. Drilling began in November 1920 and was completed in April 1921. The well was 3,052 feet deep, and 175 barrels were produced in the first twenty-five hours of pumping. It produced constantly for

ABOVE AND BELOW: PHOTOGRAPHS COURTESY OF WYMAN MEINZER PHOTOGRAPHY.

ABOVE AND BELOW: PHOTOGRAPHS COURTESY OF WYMAN MEINZER PHOTOGRAPHY.

fifty years. This was the first oil well brought in on the Texas Panhandle Field, relatively small compared to future wells, one of which produced 10,000 barrels a day. Following this discovery, hundreds of people flooded the town of Panhandle. Oil field workers, lawyers, firefighters, and lumbermen altered the city's look in short order. As drilling progressed in the 1920s, the West Panhandle Gas Field extended across most of Burnett's Dixon Creek Ranch in adjacent Carson County to the south. West Panhandle later coalesced into the mega-giant Hugoton-Panhandle Gas Field, the largest natural gas field in North America. The town of Borger, Texas, often considered a Phillips Petroleum company town, was also an outgrowth of Panhandle Field development.

At the time of Burk's death in 1922, Thomas Loyd Burnett, born December 10, 1871, was his only living child. Beginning as a ranch hand, Tom learned the cattle business in the 1880s and 1890s in Indian country between the Wichita Mountains. After attending school in Fort Worth, St. Louis, and the Virginia Military Institute, the sixteen year old began moving cattle on the Burk Burnett Ranch. Each autumn, he worked as a wagon hand in the Comanche-Kiowa Reservation.

He worked for five years as a line rider on his father's ranch, which spread over more than 50,000 acres on the Red River. As he approached twenty-one, Tom was named wagon boss of the Nation (Indian Territory) Wagon. That same year, on October 8, 1891, he married Olive "Ollie" Lake of Fort Worth, and the couple lived at the Burnett Ranch House while Tom ran the Indian Territory unit of the Four Sixes Ranch. They had one daughter, Anne Valliant, born in 1900.

In 1910, Tom bought the 26,000 acre Triangle Ranch at Iowa Park. When Martin B. Loyd died in 1912, Tom inherited one-fourth of his grandfather's Wichita County properties along with a large sum of money. Oil discoveries in the county added to his fortune. Tom continued to expand his Triangle holdings, purchasing five ranches in the next fifteen years, consolidating them into one vast range of more than 100,000 acres. Tom became a rodeo impresario, financing and promoting some of the biggest rodeos in the southeast, and developed a passion for good cow horses and later bred Palominos that he featured in fairs, parades, and rodeos.

George Humphreys, who began working on the Four Sixes Ranch in 1918 and retired fifty-two years later, served as the ranch's third ranch manager, as sheriff of King County from 1928 to 1948, and overseer to the ranch's horse operation. He turned the Four Sixes horses into the best in the country. Hollywood Gold, foaled on the Burnett Ranch in Iowa Park in 1940, became Humphreys favorite stud horse. Hollywood Gold's offspring won cutting contests across the United States and brought top prices for breeding. Other than the discovery of oil, the most important development on the Four Sixes Ranch was the addition of an equine breeding program in the 1960s under Humphreys management. Since then, the ranch has become known for its world-class American quarter horses used for ranch work, arena competition, and the racetrack. Later, the Four Sixes horse operation included the famous racing stallion, Dash For Cash, one of the greatest sires in the history of racing Quarter Horses. His offspring have earned more than $40 million. Today, the Four Sixes is home to 15 to 20 of the top racing, performance, and ranch quarter horse stallions anywhere in the world.

Tom died on December 26, 1938, leaving his estate to his only child, Anne Valliant Burnett. His death arrived in the midst of a campaign to build a fortune equal to that of his father. Although he fell short of that objective, he became known in the cattle world as a pacesetter, described by friends as a man who represented the Old West and stood for its traditional ideals of generosity and rugged fair play.

Throughout the Burnett family history, cattle have played an important role in their success and the success of the Four Sixes Ranch. Early on, Durhams and then Herefords were introduced to improve meat quality. Herefords played a large role in the ranch's cattle program until, under Mike Gibson's tenure as ranch manager, the ranch's base of Hereford cows was phased out and replaced with a Black Angus program. As a cow/calf operation, the ranch maintains a breeding herd of some 7,000 mother cows, and the Four Sixes reputation for quality makes it a frontrunner in the cattle industry.

Anne Valliant Burnett Tandy took the reins of the Burnett family fortune at the age of thirty-eight. Referred to as "Miss Anne," she was known for her knowledge of cattle, horses, and fine art. At the urging of her daughter, Anne Tandy started the Burnett Foundation in 1978. She appointed Anne W. Marion to be President of the Foundation and she remains President today. The Burnett Foundation was funded with about $28 million initially. These funds did not come from oil and gas revenue, but from the Charles Tandy estate. Since the inception, the Burnett Foundation has given away about $500 million, and today it is worth about $230 million.

Although schooled in the East and raised in a society atmosphere, Miss Anne valued her ranching heritage, dividing her time between her home near the Shady Oaks Country Club in Fort Worth and the Triangle Ranch that her father established near Iowa Park, Texas. Like her father, Miss Anne became a keen judge of horses and cattle, and along with her second husband, James Goodwin Hall, assisted in formation of the American Quarter Horse Association. She also helped found the American Quarter Horse Hall of Fame and was the first woman named honorary vice president of the Texas and Southwestern Cattle Raisers Association and American Quarter Horse Association.

PHOTOGRAPH COURTESY OF
WYMAN MEINZER PHOTOGRAPHY.

Miss Anne had only one child, often known as "Little Anne," from her marriage to James Goodwin Hall. In 1969, Miss Anne married Charles Tandy, founder of the Tandy Corporation, and that same year a large oil discovery on the Guthrie property led to

another rise in the Burnett family fortune. More than 100 million barrels of oil have been produced from these fields, and the Triangle Ranch, covering parts of Cottle, Foard, and Hardeman Counties, also had several significant oil and gas fields. Although the Triangle Ranch surface was sold in 1989, the mineral rights were retained.

PHOTOGRAPH COURTESY OF
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Prior to his death in 1922, Miss Anne's grandfather, Captain Samuel "Burk" Burnett, willed the bulk of his estate to Miss Anne in a trusteeship for her yet unborn child. At the time of Miss Anne's death on January 1, 1980, her daughter, Little Anne—Anne W. Marion—inherited her great-grandfather Captain Burnett's ranch holdings through directives stated in his will. She then sold the Triangle Ranch her grandfather, Tom Burnett, had developed and donated the Burnett home in Iowa Park to the city for use as a library. In addition to the Triangle Ranch, other parcels were sold, leaving the two main ranches—the 6666 Ranch near Guthrie and the Dixon Creek Ranch near Panhandle totaling 275,000 acres.

"Little Anne" is now known by the more adult name of Anne Burnett Windfohr Marion. She is president of Burnett Ranches, LLC, which includes the Four Sixes Ranch. She also serves as president of the Burnett Foundation and Burnett Companies and is chairman of the Burnett Oil Co., Inc.

The Windfohr name originates from her stepfather, Robert Frairy Windfohr (1894-1964), who married her mother in 1942 and adopted "Little Anne." Originally from Quantico, Maryland, he moved to Breckenridge in 1921 and formed an oil partnership with James P. Nash of Austin. He drilled his first well with Nash near Graham. The 4,300-foot venture—called a record for North Texas—was dry. But he later drilled some 350 producing wells with Nash and Herman Brown of Austin, including a 1,000 barrel a day producer in the Graham area drilled in 1930.

Windfohr was an outspoken conservationist and a member of the committee that championed the cause in Texas in the 1930s. He also fought to keep foreign oil from flooding the domestic market and sought the end of price controls in the 1950s. He fought just as hard on various fronts, including the arts in Fort Worth, helping guide construction of the Fort Worth Art Museum during his many terms as president of the Fort Worth Art Association.

As a young girl, "Little Anne" spent summers on the Four Sixes, earning the respect of the cowboys as she learned to ride horses and perform ranch chores like the cowhands did. Ollie Lake, who owned a home in Fort Worth, provided her granddaughter with the emotional support she needed and further established in the young girl a love for ranching and its traditions. Anne was educated at Briarcliff Junior College in New York, the University of Texas at Austin, and the University of Geneva in Switzerland, where she studied art history.

In 1988, Anne married John Louis Marion, honorary chair of Sotheby's Inc. She has one daughter, Anne "Windi" Phillips Grimes, who also has one daughter, Anne "Hallie" Grimes. Anne assumed management of the Four Sixes in 1980. Not since Captain Burnett founded and built the Four Sixes more than a century ago has any family member taken as much interest in the ranches as she, according to her former, long-time ranch manager, the late J. J. Gibson.

Anne is highly regarded as an arts patron and shrewd businesswoman. Her husband is proud of her strong will and determination and her ability to move easily from social settings to

business. She is a director emeritus at the National Cowboy and Western Heritage Museum and was inducted into its Hall of Great Westerners in 2009. Her great-grandfather, Samuel "Burk" Burnett; her grandfather, Tom Burnett; and her mother, Anne Valliant Burnett Tandy also are Hall of Fame inductees. Her own honors include the Golden Deed Honoree as selected by the Fort Worth Exchange Club, 1993; The Charles Goodnight Award, 1993; induction into the Texas Business Hall of Fame, 1996; The Governor's Award for Excellence in the Arts Award, 1996; The American Quarter Horse Association Merle Wood Humanitarian Award, 1999; The National Golden Spur Award, 2001; The Boss of the Plains Award from the National Ranching Heritage Center, 2003; and induction into the American Quarter Horse Association Hall of Fame, 2007. Anne Marion is the guiding spirit of the Modern Art Museum of Fort Worth. She is also a long time board member of the Kimbell Art Foundation. She also founded and remains chairman of the Georgia O'Keeffe Museum in Santa Fe, New Mexico.

While her civic and cultural activities extend throughout Texas and the nation, her deepest commitment is to her birthright and the continuing success of the historic Burnett Ranches, LLC, Burnett Oil Co., and Four Sixes Ranch, where superbly bred cattle and champion horses grace its pastures and oil flows freely from its depths.

ABOVE: PHOTOGRAPH COURTESY OF LARRY GALBIATI.

Below: Anne Windfohr Marion.
PHOTOGRAPH COURTESY OF
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Dan A. Hughes Company, L.P.

Left: Dan A. Hughes, founder and CEO of Dan A. Hughes Company, L.P.

Right: Dan Allen Hughes, Jr., president of Dan A. Hughes Company, L.P.

Below: Left to right, Dan, June, Dudley and Jane Hughes, Wichita Falls, Texas, c. 1935.

Dan A. Hughes Company, L.P. is a Hughes Family Limited Partnership in which Dan A. Hughes, Sr., is founder and CEO and Dan Allen Hughes, Jr., is the president. The company has both domestic and international operations with its main headquarters in Beeville, Texas. The company also has branch offices in San Antonio and Houston, Texas; Bogota, Colombia operating as Hupecol (Hughes Petroleum Colombia); and Rome, Italy, operating as Hupecol Italiano. The largest offices are the Beeville with fifty employees and the Bogota with forty-five.

Dan Allen Hughes and his identical twin brother, Dudley, were born in Monroe, Louisiana, on August 14, 1929. The twins' father worked for Magnolia Oil Company and was in the relatively new business of laying natural gas pipelines from the Monroe Gas Field to various towns and markets in the southern area. The pipeline division of the company, in an early stage, was merged into United Gas Pipeline Company to which the twins' father was employed until his retirement. After living in several towns along the pipeline system during the children's early age, the Hughes family settled in Palestine, Texas, where their father worked as superintendent of the United Gas Pipeline Company in the East Texas area. The twins grew up in Palestine, calling Texas their home for many years. While in high school, young Dan worked summers on a roustabout maintenance crew on the hundreds of miles of Untied Gas' natural gas pipelines. Dan worked at an adult job even though he was a teenager because World War II had led to labor shortages.

In college, he spent his summer vacations working in the Oklahoma oilfields as a roustabout and did other field jobs for Magnolia Oil Company. He graduated from Texas A&M in 1951 with a bachelor's degree in geology and went to work for Union Producing Company in Monroe, Louisiana. After a few months, he was called into the Army as an artillery officer, where he served in the Korean Conflict, receiving a Bronze Star for his actions.

After receiving his Army discharge, Dan again joined Union Producing Company (present day Devon), and went to work in New Orleans as a geological scout, which was the company training program for geologists. Oil exploration in South Louisiana was booming at that time and there were many oil and gas discoveries following the dormant period of World War II. It was a great time to live in New Orleans and share the excitement of the people involved.

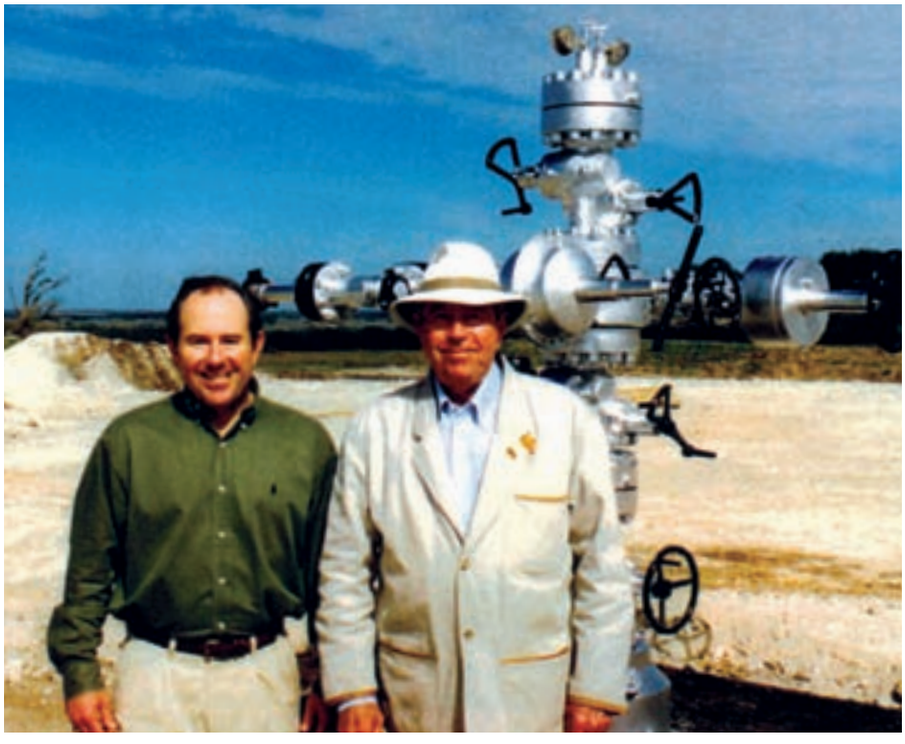
Later Dan was transferred to Beeville, Texas, and continued geological scouting. This period of scouting enabled him to travel throughout South Texas where he met many of the independent oil and drilling contractors and ranchers, thus becoming familiar with the South Texas oilfields. Following this training period, he spent several years mapping all of the Cretaceous, Wilcox, and Frio Trends of South Texas, and doing evaluations on many wells consisting of coring, testing, and logging. Union Producing Company leased thousands of acres and drilled many wells on his prospects. This was an invaluable experience that helped him later in becoming a success in the oil industry and developing numerous oil and gas fields.

In 1961, Dan resigned from Union Producing Company to become an independent geologist and accepted a retainer from Caddo Oil Company of Shreveport, Louisiana, to do consulting work in South Texas. He realized there were several "old" shallow oilfields in the San Antonio area that had only been partially developed. The new procedure of sand fracking made these marginal shallow wells commercial. Caddo purchased leases around the possible extensions to these old fields. Operating from Beeville, a massive field extension drilling program was conducted in the Bear Creek, Von Army, Leming, Somerset, and Taylor Ina Fields in Bexar, Medina, Frio, and Atascosa Counties, Texas. Approximately 450 shallow wells were drilled and completed as oil wells based on his geology. Dan received an overriding royalty for this work, which provided the funds needed to expand the company into larger projects.

In 1965, Dan formed the Hughes & Hughes Oil and Gas Partnership with his twin brother. Dudley lived in Jackson, Mississippi and worked primarily in the Mississippi and Alabama areas, whereas Dan lived in South Texas and worked the South Texas areas. They combined their resources and began drilling deeper wells, earning a larger share of the working interest because of it.

Above: George Riggs, #1 Hughes Federal Discovery Well for the Salazar Yates Oil Field near Carlsbad, New Mexico in 1956.

Below: Left to right, Dan Allen and Dan with Mansker Discovery Well, Bee County, Texas, South Texas Deep Wilcox formation.



Top: Discovery Well #1 Woodada, Woodada Gas Field, 175 miles north of Perth, Australia.

Above: Woodada Gas Field, West Australia, well flowing 30 million mcf on one inch choke, 1979.

Right: Termite mound, Canning Basin, 150 miles inland from Broome, Australia, 2000.

The first significant South Texas strike for the company came in 1967 with the drilling of the Hughes & Hughes No. 1 Beasley-Connevey in Webb County, Texas. The well, located in a remote area north of Laredo, was the discovery well for the Las Tiendas Gas Field. This shallow field has several gas sands in the interval 2,800 to 3,600 feet producing from the Wilcox sands. This 11,000 acre field was large enough to entice Houston Natural Gas Company to build a 114 mile pipeline to connect its Houston area gas system to this Las Tiendas Field in Webb County, Texas. Later, a deeper development in the seven thousand foot level resulted in many Olmos wells over the same acreage.

The Hughes & Hughes Partnership discovered a number of oil and gas fields in the Mississippi and Texas area. In 1972 the partnership was approached by Edwards Bates & Co., an English banking company, to purchase all of its production in Mississippi and South Texas. After an evaluation of all of the wells, the English company decided that it preferred the deeper Mississippi oil wells rather than the shallow wells in South Texas and the Mississippi production was sold.

Following the sale of its Mississippi Hughes & Hughes operations to the English company, Dudley joined Chesley Pruet to form a company under the name of Pruet & Hughes. Pruet would have half-interest in the company, and the Hughes & Hughes Partnership would jointly have the other half-interest. The company was very successful in finding some Smackover oilfields and various other fields in Mississippi and Alabama. The original purpose

of the company was to go public when a certain amount of production was developed. However, in 1975, an offer was made to purchase its production and leases by the French oil company, Elf Acquataine, and Pruet & Hughes was sold.

In considering whether to continue operation in Beeville or leave for a larger town, the company bought its first airplane in 1972. The company found it could operate from this smaller town and fly its personnel anywhere in the Gulf Coast—Texas, Mississippi, or Louisiana—and be back the same day, which allowed it to continue its large operation in Beeville. The company has since owned a series of planes that helped contribute to its growth. Another consideration for remaining in Beeville was that the South Texas quail hunting was the best in the United States.

In 1970 the company participated in a series of wildcat wells in western Canada with Anderson Exploration Company that resulted in several discoveries of relatively shallow oil and gas fields. The most significant of these was the Dunvegan Field, which turned out to be a 1.6 trillion cubic foot gas condensate reserve. Dan was fortunate to get into this program through his friend, Bob Gowdy, who was transferred in the mid-1960s from San Antonio to Calgary, Alberta, by the Midwest Oil Corp.

With the success in Canada, Dan started looking at the possibilities in other foreign countries and took a deal on a prospect in Western Australia in 1978. After doing seismic work and drilling a test well, the partnership discovered the Woodada Gas Field located about 175 miles north of Perth. Even though it was not a large field by international standards, it was at the right place at the right time, and Dan was able to sell gas to Perth and the project turned out to be a very lucrative venture.

In 1980, Dan Allen Hughes, Jr., graduated from Texas A&M University and joined the company, spending his first year in Australia developing the Woodada Gas Field. In 1982, in order to get each partners' grown children involved in the business, it was decided to dissolve the Hughes & Hughes Partnership. From that date on, each party operated individually. At times, the twins participated in each other's prospects, but there were no joint interests created automatically as in the partnership.

Quail shooting in South Texas, left to right, Dan with Clay Chiles and L. D. Hunter, 1991.

Searching for more foreign venture and new areas, in 1996, Dan A. Hughes Company, L.P. began looking at South America. After investigating Bolivia, Peru, and Colombia, the company settled on Colombia as areas with significant potential. Operating as HUPECOL (Hughes Petroleos De Colombia), a partnership was formed between Dan, Sr.; Dan, Jr.; and John Saunders, Jr. Several concessions were acquired and a discovery on one of these by the name of Caracara, was developed to the point of producing 26,000 barrels of oil per day. A thirty mile pipeline was built to deliver the oil to a major pipeline. After being developed and

Above: DAHC–HSU 26 #1 State Well, Pedregosa Basin, Hidalgo County, New Mexico, 2009.

Below: HUPECOL (Hughes Petroleum Colombia), Jaguar #T 5 Development Well, Llanos Basin, CaraCara Oil Field, Colombia, 2005.

produced for a period of time, this field was sold to the Spanish oil company, CEPSA. Three other concessions have been developed and sold to various companies. HUPECOL is continuing exploration in Colombia, and has several concessions with very favorable seismic that it plans to drill in the near future. The company had drilled 140 wells in Colombia at the present time.

Dan A. Hughes Company, L.P. became heavily involved in the horizontal shale plays. It was fortunate to get in on the early stages of the Barnett Shale Field in the Fort Worth-Denton area of North Texas. It initially purchased some federal leases that were up for bid in the area and followed by buying several thousand acres around and south of the city of Denton. The company then began drilling Barnett Shale wells and got its first experience in horizontal drilling. Approximately twenty wells were drilled, some of which were very good, particularly the horizontal ones. One of its best wells was a horizontal well drilled under the city of Denton airport. After several months of production, it was decided to sell the properties since the operations were very difficult in this highly populated area. The production and leases was listed for sale and was eventually sold to Dunes Petroleum Company.

Following the success in the Barnett Shale, the company began working other areas with the idea of finding other formations that might be a source bed for horizontal drilling as the Barnett Shale had been. In the Arkhoma Basin in Arkansas, there was an indication

of some activity on a formation called the Fayetteville Shale, which was the same age geologically as the Barnett Shale production. Several companies were leasing in the area and horizontal wells were being drilled on this play. Dan A. Hughes Company, L.P. began working in Arkansas, about forty miles ahead of the area that was being active and leased approximately 5,000 acres. Preparations were made to drill this acreage block when Chesapeake Production approached the company to buy its leases. The offer from Chesapeake was so strong that it was decided that this was the best course to take and a great return was made on the investment.

Another shale play, the Eagle Ford formation, was developing in South Texas in the company's main operating area. The company had drilled an old Edwards well in Karnes County, Texas, years earlier, which was plugged back and tested some oil from the Eagle Ford formation. This looked like an ideal place to begin purchasing leases. Dan A. Hughes Company, L.P. purchased about 15,000 acres around the well and began competing with EOG who was in the area also. A deal was made with EOG to jointly merge Hughes' acreage and together they formed a 30,000 acre drilling unit. Also, the Hughes Company continued acquiring lease on each end of the play outside of this unit and eventually had an interest in a gross of 60,000 acres. The first well was drilled on this unit in 2009 by Dan A. Hughes Company, L.P. Eighteen wells were drilled and completed jointly with EOG.

Plains Exploration and Production Company made Hughes an offer to buy all of its Eagle Ford wells and leases. Hughes accepted this purchase.

Dan A. Hughes Company, L.P. is working many new areas. It is drilling a series of new horizontal wells being completed in the Buda Lime in the western area of the Eagle Ford trend. The same area appears to have future potential in the Pearsall Shale. The company has since drilled several wildcat horizontal wells on large acreage blocks but so far none have been commercial.

In foreign operations, the company has completed a seismic program in Belize and is preparing to drill a wildcat well in the near future. A company was purchased in Italy, which had 3,000 barrels of oil per day net to the sale in Sicilia plus some natural gas production on the Italian mainland. This is being operated by Hupecol Italiano.

Both Dan, Sr., and Dan, Jr., plan to continue exploring and wildcatting for hydrocarbons in the Gulf Coast and worldwide. A long history of good partners, timing, excellent and loyal employees, and some luck has led to their continued success.

Above: Dan and Dan Allen at Hughes Hangar, Chase Field, Bee County, Texas, 2014.

Left: Oil and gas industry giants who led the panel discussion at the dedication of the Hughes-Berg Center, Texas A&M University. Left to right, Dan A. Hughes '51, Dan Pedrotti '53, Dudley J. Hughes '51, Clayton Williams, Jr., '54, Dan Allen Hughes, Jr., '80 and Kellam Colquitt '70.

Laredo Petroleum Holdings, Inc.

Above: Randy A. Foutch is the founder and has served as chairman and chief executive officer.

Laredo Petroleum Holdings, Inc., (NYSE: LPI), is the Tulsa-based parent company of Laredo Petroleum, Inc., Laredo Petroleum-Dallas, Inc., Laredo Gas Services, LLC, and Laredo Petroleum Texas, LLC. Laredo is focused on the exploration, development, and acquisition of oil and natural gas properties primarily in the Permian and Mid-Continent regions of the United States. The oil and liquids-rich Permian Basin in West Texas and the liquids-rich Anadarko Granite Wash in the Texas Panhandle and Western Oklahoma are characterized by multiple target horizons, extensive production histories, long-lived reserves, high drilling success rates and high initial production rates. As of December 31, 2012, Laredo had assembled more than 200,000 net acres in the Permian Basin and more than 37,000 net acres in the Anadarko Granite Wash and had proved reserves of 188.6 million barrels of oil equivalents, presented on a two-stream basis, and had a total enterprise value of approximately $3.4 billion.

Laredo began as a privately held company founded in October 2006 by Randy A. Foutch along with management support from industry colleagues who had worked together for a decade or more. Several former colleagues joined Foutch in his new venture at Laredo, contributing valuable knowledge and expertise that has driven the company's success while providing Laredo with the leadership needed to continue value-enhancing operations. Laredo's current management team can be found on their website www.laredopetro.com. Laredo became a publicly traded company in December of 2011 and is listed on the New York Stock Exchange.

Foutch's experience in founding and building three private oil and gas companies prior to starting Laredo, prepared him for his current role as chairman and chief executive officer of Laredo Petroleum Holdings, Inc. The three prior companies—Colt Resources Corp., Lariat Petroleum, Inc., and Latigo Petroleum, Inc.—focused on the same general areas of the Permian Basin and Mid-Continent in which Laredo Petroleum now operates, and they all executed the same fundamental business strategy that created significant growth in reserves, production, and cash flow. After building the three companies from the ground up, they were sold in private transactions whose combined value totaled more than $1.1 billion. Based on his twenty year track record of success, Foutch was given the 2012 Ernst & Young Serial Entrepreneur of the Year Award for the Southwest Area North.

Laredo's primary exploration and production fairway in the Permian Basin is centered on the eastern side of the basin approximately 35 miles east of Midland, Texas, and extends approximately 20 miles wide (east/west) and approximately 85 miles long (north/south) in Glasscock, Howard, Reagan and Sterling counties, and is referred to as the Permian-Garden City area. As of December 31, 2012, Laredo held approximately 145,800 net acres in more than 300 sections in the Permian-Garden City area, with an average working interest of approximately ninety-two percent in all producing wells.

The company has focused its Permian-Garden City activities in the Wolfberry and deeper horizons, including the Wolfcamp, Cline, Strawn and Atoka formations. Considering the geology and the reservoir extent of each contributing formation, the company has identified significant potential throughout its total acreage block for the entire Wolfberry interval from the shallow zones to the deepest.

The early success of Laredo's vertical drilling program, coupled with industry activity, has substantially reduced risks associated with future drilling programs in the Wolfberry interval. The company has expanded its drilling program to include a horizontal component targeting the Wolfcamp and Cline Shales, and was the first company to commercially confirm the horizontal development potential from the Cline Shale. The drilling of the Cline Shale, located in the lower Wolfberry, was initiated after extensive technical review that included coring and testing the Cline Shale separately in multiple vertical wells. Laredo believes the Cline Shale exhibits similar petrophysical attributes and favorable economics compared to other liquids-rich shale plays operated by other companies, such as in the Eagle Ford Shale and Bakken Shale formations.

Laredo believes in following a selective acquisition effort, concentrating on properties that present significant upside potential in addition to a solid base of production. The company confines its efforts to those areas where it has the regional geological and engineering expertise necessary to take advantage of development opportunities presented in its targeted basins. Laredo focuses on developing a balanced inventory of quality drilling opportunities that provide operational flexibility to economically develop and produce

oil and natural gas reserves from conventional as well as unconventional formations. In addition to Laredo's Permian Basin Wolfberry play, the company continues to evaluate opportunities in other areas within its core operating regions.

Operating results for yearend 2012 show that Laredo had an outstanding year. Laredo skillfully executed its delineation and development program to increase reserves, production, and identified-resource potential through a deliberate and disciplined approach designed to recognize the full value of the entire resource potential within the company's Permian acreage. This approach proved successful in 2012 as Laredo:

- Increased annual production approximately thirty-one percent from 2011 to a record 11.3 million barrels of oil equivalent (MMBOE);
- Increased oil percentage of total production to approximately forty-two percent from thirty-nine percent in the prior year;
- Increased proved reserves to a record 188.6 MMBOE, up approximately twenty-one percent from the prior year-end, and;
- Increased the oil percentage of proved reserves to approximately fifty-two percent.

Laredo's business plan includes growing reserves, production and cash flows through a balanced program of horizontal and vertical development of its core operating areas coupled with the evaluation of emerging opportunities and the pursuit of value-enhancing acquisitions, mergers and joint ventures. Laredo is applying its technical

expertise to reduce risk in its current asset portfolio, optimize its development programs and maximize resource recovery in the most prudent, cost-efficient manner.

Based on its 2013 capital budget of $725 million, Laredo expects its total annual production to increase around fifteen percent from its 2012 rate, climbing from 12.6 million to 13.1 million barrels of oil equivalent. Oil production is projected to increase more than twenty-five percent and represent approximately forty-six percent of expected total 2013 production.

The company's leadership understands the value of acquiring talented and enthusiastic people who are driven to succeed and thereby enable Laredo to succeed. Although headquartered at 15 West Sixth Street in Tulsa, Oklahoma and operating regional offices in Midland and Dallas, Texas, Laredo Petroleum Holdings is a team separated by distance only. The company acts as one, working together to achieve common goals. Laredo offers a variety of resources to reach its absolute potential, providing the tools, technology, and support to take care of the industry, the environment, and each other.

Laredo Petroleum Holdings is a company that embraces the enormous changes that accompany growth but always makes it a priority to retain its core values. Based on this philosophy, the company's record of success, management experience and a staff that is among the best in the industry, the future looks bright for Laredo Petroleum Holdings and its subsidiaries.

Denbury Resources Inc.

Above: Hastings separation facility, Alvin, Texas.

Below: Texas Green Pipeline.

One of the unique success stories associated with energy production in the United States, and certainly in Texas, has to be Denbury Resources Inc. Denbury's story did not start out much different from other successful small independents, but it did take a fork in the road that has allowed Denbury to successfully utilize carbon dioxide ("CO_2") injection to recover stranded oil from otherwise depleted fields. Denbury's business model has created an oil and gas company with the unique ability to improve local economies, reduce our country's dependence on imported oil, and permanently utilize and store man-made CO_2 that would otherwise be released into the atmosphere.

Denbury began as a small independent in 1990, as the brainchild of an English-born, Oxford-educated geologist, Gareth Roberts. Gareth left Texaco for a small independent and was developing oil and gas production opportunities in Mississippi and Louisiana. Upon deciding he could do things better himself, he formed Denbury with the backing of various domestic and international investors. Denbury, interestingly enough, was named after the street Gareth lived on while growing-up in London. Gareth's initial business strategy was to acquire older, mature and depleting oil fields from the majors, work them harder, smarter and more economically and scratch out the last remaining reserves—for a profit of course. In the early days, this strategy served Denbury well, allowing the company to grow quickly and steadily.

Denbury added sizeable field assets to its Gulf Coast inventory. In Louisiana, Lirette, Bayou Des Allemends, Chavin, Bayou Rambio, Bay Baptiste, DeLarge, Gibson/Humphries, Lake Chicot, and Lapeyrouse Fields were among the initial fields purchased in the Gulf Coast Region. Along the way, Denbury also added offshore Louisiana production from blocks in West Delta, East Cameron, West Cameron, High Island and Main Pass. Most of these fields have since been sold. Today onshore fields at Delhi and Lockhart Crossing are currently being produced as EOR fields. In Mississippi, Denbury acquired Tinsley, Eucutta, Yellow Creek, East and West Heidelberg, King Bee, McComb, Laurel and Little Creek Fields. In Texas, Conroe, Elwood, Fig Ridge, Gillock, South Gillock, Hastings, Oyster Bayou, Seabreeze, Thompson, Webster and Willow Slough were acquired.

In the mid-1990s, most companies were moving away from oil production and into gas production. Denbury, however, believed that oil production was quickly approaching "peak oil" on a global production basis and therefore would experience a sustained increase in price. In order to effectively capture the upside Denbury foresaw in oil price, Denbury seized an opportunity to position itself for the future and capture a mostly untapped reserve base in tertiary oil production.

This "fork" in the road came both quietly and decisively in the form of an obscure report found in the field files from an acquisition of properties from Amerada Hess, which indicated that large amounts of oil reserves could be economically recovered using CO_2 injection. Although this method of tertiary production was being widely used in many West Texas fields, CO_2 had not been produced or commercially injected into fields in Mississippi, Louisiana or Southeast Texas on any sustained basis.

The next piece fell into place for Denbury after studying an abandoned Shell CO_2 Project. The Shell Project began with the discovery of large CO_2 reserves located in an area known as Jackson Dome, just north of Jackson, Mississippi. Shell built a CO_2 pipeline from the Jackson Dome CO_2 source through Mississippi and down to Weeks Island on the Gulf Coast of Louisiana. Once the pipeline was constructed the CO_2 would allow Shell to capture otherwise stranded oil reserves all along the pipeline route. CO_2 injection began in the early 1980s in Little Creek Field in Mississippi, and at the terminus of the pipeline in Weeks Island, Louisiana.

Then in 1986, with the collapse of oil prices, the project had become uneconomic and Shell elected to stop investing in its development plan. The portion of the pipeline from Donaldsville, Louisiana, to Weeks Island was abandoned and the only remaining field under CO_2 injection was Little Creek Field in Mississippi. The CO_2 reserves being produced were sold to industrial customers for such various uses including carbonating soft drinks, making dry ice, and filling fire extinguishers. In 1999, Denbury acquired Little Creek Field and one year later, the CO_2 reserves at Jackson Dome. Denbury has been exploiting this tertiary niche ever since.

Under the direction of Gareth, who retired as CEO in 2009 and remained on the board until 2013, and now under President and CEO Phil Rykhoek, who was part of the original Denbury executive team, Denbury has steadily increased its Gulf Coast CO_2 footprint with the acquisition of oil fields in Mississippi, Louisiana and Texas. These combined acquisitions along with development of Jackson Dome CO_2 reserves and substantial CO_2 pipeline infrastructure have allowed Denbury to become the leading CO_2 enhanced oil recovery (EOR) developer in the Gulf Coast Region and one of the largest in the nation.

Above: Phil Rykhoek, president and CEO of Denbury.

Below: Oil derrick, Conroe, Texas.

Denbury's experience in CO_2 pipeline development extends to over 1,000 miles of pipelines, the vast majority of which was built specifically to transport CO_2. In 2010, Denbury commissioned the largest single project it had ever undertaken: the 325 mile Green Pipeline, a twenty-four inch CO_2 pipeline extending its existing pipeline system across Louisiana and into Texas. The Green Pipeline was initially designed to transport over 350 million cubic feet per day (MMcf/d) of CO_2, and can be upgraded to transport additional volumes when needed. In the construction of the pipeline, Denbury employed only the highest standards for compliance with wetland delineation, sensitive habitat, and cultural resource requirements. A key driver in the design and implementation of the Green Pipeline is the ability to capture man-made CO_2 from industrial sources such as refineries, chemical and power plants along its route. Denbury can accept large volumes of man-made (anthropogenic) CO_2 that will produce large quantities of otherwise stranded oil from existing oil fields, then permanently store the CO_2 in the depleted reservoirs.

Above: Solar powered well metering and telemetry system, Hastings Field in Alvin, Texas.

Below: Denbury employee at test manifold, Oyster Bayou Field.

The Green Pipeline is currently transporting CO_2 from its natural source at Jackson Dome to Lockhart Crossing Field in Louisiana and to Oyster Bayou and Hastings Fields both located in Texas. The company plans to expand the pipeline within the next few years to accommodate its most recent Gulf Coast acquisitions of Conroe, Thompson, and Webster Fields. Additionally, Denbury started to transport its first man-made anthropogenic CO_2 in December 2012.

All successful companies need to continue to add reserves in order to maintain growth. With the expansion and development of EOR in mind, Rykhoek was attracted to and subsequently acquired Encore Acquisition Company based on its significant potential for CO_2 EOR in their large oil fields in the Rocky Mountain region. This expanded Denbury's foothold in the area, and created a second CO_2 enhanced oil recovery core area to complement its leading position in the Gulf Coast Region. The acquisition nearly doubled Denbury's proved reserves and production, and provided Denbury with additional growth areas which included the assets of Bell Creek and the Cedar Creek Anticline (CCA). Denbury continued to expand in the CCA with the acquisition of additional properties in 2013.

Denbury's business model requires utilization of significant volumes of CO_2 and Denbury continues to focus on expanding its sources. In 2010, Denbury acquired nearly 100 percent of the working interest in the Riley Ridge Federal Unit, located in southwestern Wyoming and also the CO_2 rights adjacent to Riley Ridge in the Rands Butte area. The Riley Ridge Unit and Rands Butte area are significant resources that contain large volumes of natural gas, helium and CO_2. The natural gas and helium are processed and sold, and the remaining CO_2 will be separated and later injected into the reservoirs of our Rocky Mountain oil fields. The Riley Ridge Unit expansion could ultimately become Denbury's primary source of CO_2 for its Rocky Mountain EOR operations for many years to come. Other contracts Denbury has entered into for CO_2 acquisition rights will come from various anthropogenic sources being developed in the Rocky Mountain Region.

As with its Gulf Coast CO_2 model, pipeline transportation is required to efficiently move CO_2 from source to field in the Rocky Mountain Region. Denbury completed the first phase of its 232 mile Greencore Pipeline in 2012 and began CO_2 injection operations in Bell Creek Field during 2013. Future expansion to the CCA is currently in the planning stages.

Denbury has been fortunate over time to carve out a niche that not only secures a vast reserve base well into the future, but also provides technically and economically feasible options for our nation to permanently store anthropogenic CO_2 to meet growing Greenhouse Gas (GHG) management requirements through an expanded CO_2 pipeline network and EOR production capability. The company has grown considerably during recent years, adding key professionals who are experienced in guiding the expansion with great skill, efficiency and adherence to environmental health and safety regulations.

Denbury's commitment to operate with integrity, respect the environment and ensure the health and safety of its employees and the communities in which it operates.

Texas CO_2 EOR potential is vast. The U.S. Department of Energy estimates that in excess of twenty billion barrels of otherwise stranded oil reserves can be recovered here utilizing CO_2 EOR. A growing reserve and production base, and a commitment to respect for each other, the environment and the communities we work in help define Denbury as one of the oil and gas industry's success stories. Denbury's rise from humble beginnings in Louisiana and Mississippi to a respected Fortune 1,000 company has also highlighted the new opportunity CO_2 EOR has for expanded American oil production that contributes to our nation's energy security and independence.

Above: Reclaimed land—Texas Green Pipeline.

Below The Hastings facility, Alvin, Texas.

Spindletop Oil & Gas Co.

Giant Energy Corp.

Above: Christophe "Chris" G. Mazzini.

Below: Left to right, David Chivvis, Glenn E. Sparks, Chris G. Mazzini, Dick A. Mastin and Charles D. Howell, Jr.

Arriving at his first job out of college at Spindletop Oil & Gas Co. as a newly-degreed petroleum geologist in 1979, Christophe "Chris" G. Mazzini was not thinking that one day he would become chief executive officer of his first employer. Yet this is exactly what happened. Today, Mazzini is proud of Spindletop's expansion from its original roots in the Fort Worth Basin of North Texas to a portfolio of operated properties in six states and non-operated properties in eighteen states. But Mazzini credits much of Spindletop's success to the most valuable assets of the company, the hardworking and talented men and women of the Spindletop team. Without them, none of the success would have been possible. According to Mazzini, "all of our employees are considered part of the Spindletop family." The average tenure at the company is in excess of five years, and there are some returning employees—those who worked for Spindletop back in the 1980s and 1990s, who left the company and returned in the last several years. One of the company's strengths has been the experience of its technical staff. With over twenty years of average experience in the oil and gas industry, Spindletop's technical employees are capable of guiding the company through each successful new project.

Spindletop is an independent oil and gas company engaged in the exploration, development, production, and acquisition of oil and natural gas properties, rental of oilfield equipment, and gathering and marketing of natural gas through one of its subsidiaries—Prairie Pipeline Company. Its mission is to conduct business in an ethical and responsible manner, rewarding employees for hard work and diligence while generating shareholder returns by focusing on its business segments.

Publicly traded under the stock symbol "SPND," Spindletop has focused its exploration and production activities primarily in Texas, Louisiana, Arkansas, Oklahoma, New Mexico and Alabama. The company internally generates many of its drilling prospects and has been successful in joining forces with other companies to develop the projects. Another successful segment of Spindletop's business activity that has contributed to its growth and stability for the past several years is the acquisition of producing oil and gas properties.

Old-timers will tell you that the late 1960s and early 1970s were lean times for many oil and gas producers. Oil and natural gas prices were low, which made raising capital to fund new drilling sites difficult to come by. However, Paul E. Cash, a certified public accountant and independent oil and gas operator in Dallas, saw an opportunity to acquire producing properties and drilling prospects during this time period. Cash founded Spindletop Oil & Gas Co. in 1966.

Spindletop was posed for success when energy product prices began to rise. In the early 1970s, the Arab Oil Embargo led to petroleum shortages in the United States and other major industrialized countries. The crisis triggered a dramatic spike in petroleum prices, and Spindletop Oil & Gas Co. used profits from higher product prices to fund new drilling ventures. And, as natural gas prices rose, the company focused exploration and development in the gas-rich Fort Worth Basin of North Texas.

Spindletop expanded in the mid-1970s by joining forces with Jerry W. Heflin of Evansville, Indiana. Heflin

brought experience in both the raising of capital and exploration, and his efforts helped provide the necessary funding to finance an extensive drilling program that the company undertook between 1975 and 1982. During this time, the company focused exploration efforts in both the Fort Worth Basin of North Texas and the Illinois Basin. This partnership continued until 1982 when Heflin acquired Spindletop's oil interests in Illinois and Indiana and left the company to pursue other interests.

In 1979, the company hired Chris G. Mazzini as an entry-level geologist. By 1982, Mazzini was promoted to the position of vice president, exploration, and assigned the task of opening and managing a satellite office in Evansville, Indiana. Mazzini ran the Evansville office until 1984 when he returned to Dallas. A year later, Mazzini left Spindletop to start his own exploration company, named Giant Energy Corp., which explored for oil and natural gas and operated oil and natural gas properties in north Texas and southern Illinois. From its founding in 1985 through the present, Giant Energy Corp. has been successful in drilling and operating numerous wells in Texas as well as the Illinois Basin.

Spindletop Oil & Gas Co. was named after the famous oil gusher drilled on Spindletop Hill outside of Beaumont in 1901. The Spindletop discovery changed the landscape of Texas and made oil the liquid fuel source of the future, spurring the industrial age. The Spindletop name is synonymous with Texas oil. Spindletop Oil & Gas Co. has continued to find success in both its development of oil reserves as well as natural gas reserves.

In 1999, Mazzini, through Giant Energy Corp., acquired controlling interest in the Spindletop stock. As a result Spindletop Oil & Gas Co., a Texas corporation, became a wholly owned subsidiary of Giant Energy Corp. Mazzini has served as Spindletop's president and chief executive officer since that time. He also now serves as chairman

Top, left: Left to right, Tony Sanford, field supervisor and Chris G. Mazzini, president and CEO.

Top, right: Drilling of Olex U.S., #1 well, in Denton County, Texas. Left to right, Stephen Hoss, consultant; B. F. "Red" Sanford, field supervisor and thirty-year employee with the company; and Chris Mazzini, president.

Bottom, left: Left to right, Paul E. Cash and Jerry W. Heflin.

Bottom, right: Left to right, Stephen Hoss, Christopher Matthew, Michelle H. and Rachel Mazzini at well site.

of the board. During Mazzini's tenure, the company's operations have expanded from its north Texas roots to five additional states. Spindletop's oil and natural gas reserves have also grown through operated and non-operated exploration and acquisition of producing properties. Exploration projects are internally generated by the company's technical staff.

In 2005 the company purchased a 48,000 square foot building in the Galleria area of North Dallas to serve as its company headquarters. The company employs approximately thirty-two full time employees in the headquarters office plus approximately forty part-time, contract, and field personnel. Mazzini considers his employees to be part of his extended family, and he strongly encourages employees to give back to the community. The company periodically sponsors charitable events for nonprofit organizations from the Leukemia Society to the American Cancer Society to the Susan G. Komen Walk for the Cure to various nonprofit educational and outreach programs in the Dallas area. Several times throughout each year, Spindletop will collect donations for organizations such as Operation Kindness, hurricane and tornado relief through the American Red Cross, and other local charities. Spindletop is especially proud to match its employees' contributions to nonprofit organizations. The company and its employees have participated in a variety of fundraising walks and events.

Spindletop has been recognized in the Top 200 publicly traded companies in the Dallas-Fort Worth area for several years by *The Dallas Morning News*. Through its OGJ150 quarterly report in the first quarter of 2013, *The Oil & Gas Finance Journal* has also recognized Spindletop as a top company in three areas: its return on assets, return on total revenue and return on total stockholder equity.

Below: Left to right, Robert E. Corbin, Beverly Mohler, David Chivvis, Charles D. Howell, Jr., Chris G. Mazzini, Glenn E. Sparks, Dick A. Mastin, Wendi Crick and Michelle H. Mazzini.

Opposite, top: Employees at our Dallas Office.

Opposite, bottom: Left to right, Michelle H. Mazzini, vice president and general counsel and Chris G. Mazzini, president and CEO.

In 2013, Mazzini was named as a Top CEO in the *Texas Monthly* TIPRO Texas Top Producers competition. Also in 2013, Mazzini was named as a judge for the 2013 Southwest Oil and Gas Awards and was recognized by the *Dallas Business Journal* as a key player in their 2013-2014 Who's Who in Energy publication. Mazzini is responsible for several new field discoveries in the Fort Worth Basin. He is a Certified Petroleum Geologist and a Licensed Professional Geoscientist in the State of Texas. He is a member of the American Association of Petroleum Geologists, Society of Independent Professional Earth Scientists, Dallas Geological Society and past treasurer, Texas Independent Producers & Royalty Owners Association, Texas Alliance of Energy producers and other profession organizations. Mazzini is also a member of the Board of Directors of Texas Alliance of Energy Producers. In 2013, Mazzini was appointed to the University of Texas at Arlington Development Board.

Looking toward the future, Giant Energy and Spindletop both will continue to grow their oil and gas reserves with a strategy of combining development drilling of their leasehold acreage and continued acquisitions of oil and gas properties in selected areas.

WFW Production Company, Inc.

Raymond (Handsome) Walterscheid was born and raised in Muenster, Texas. He was a big, strong man. Big enough to pull and service his North Texas stripper wells by himself, normally a three-man job, using a homemade rig with a Wilson Drawworks. He did this because, frankly, he could not afford to hire a well-service crew. When his young sons, Glenn and Mel, were old enough to work (when they were not in school) they would help with the rod elevators and with sliding out the rods. When Dad would start pulling the tubing, well, they would have to get a little older to help with that. Mel once said, "I don't know what I'm gonna do when I get older, but I know what I'm not gonna do—pull wells!" However, the work ethic Raymond taught to his boys paid off.

In May 1981, Glenn, 20, Mel, 19, and their brother-in-law, Tim Felderhoff, 23, each borrowed $7,000 to purchase that homemade rig with the Wilson Drawworks and started WFW Well Service. They figured the only way to stay busy was to pull wells faster and cheaper than their competitors, and that is just what they did. They often finished wells by headlights just to get the well finished that night. They paid off that rig and purchased two more over the next few years. In 1982, they purchased a Wich-Tex C-30 double-pole service rig and in 1983 purchased a Wich-Tex TE2 spudder. By 1985, they were each running their own crews, but since they did not want to run a well-service rig all their lives, they started buying stripper oil leases.

Above: Raymond Walterscheid, better known as "Handsome," purchased his first oil lease in 1962.

Below: Glenn, Mel and Tim tubing and swabbing a well using their first rig, 1981.

The office of the business was run out of their parents' home with their mother, Peggy, doing all the bookkeeping and production reports. It remained there until the business outgrew the small office. In 2005, they purchased the land located at 204 North Walnut Street in Muenster and built an office building and hired their sister, Carol Grewing, to do all the accounting for the business. Their younger brother, Lloyd, started pumping and doing roustabout work in the fall of 1990. He pumped leases located in the North Texas area until March of 2013.

In 1989, WFW Well Service, Inc. purchased the J. F. Trubenbach A. They permitted to drill their first well, the J. F. Trubenbach A #17 in 1990. In the next few years an additional nine wells were drilled. Even though these were not prolific producers this lease prompted them to start a production company.

On July 1, 1991, they started WFW Production Company, Inc., and purchased quite a few leases in the following years. Their leases are concentrated in the North Texas and Southern Oklahoma areas. A couple of the most successful purchases were the Tony Trubenbach and the Dangelmayr leases. These two purchases were what eventually got these boys off the rigs.

On March 25, 1993, WFW Production Company purchased the Tony Trubenbach lease from Texaco Exploration and Production, Inc.

using sealed bids. This lease had fifty-one wells drilled on it by the time WFW purchased it. Texaco had open-hole completed the blanket 700 foot zone on each drill-site, never once drilling a well deeper. Turns out there was another blanket zone at 1,000 feet! WFW drilled seventy-one additional wells on that lease over the next few years. This lease has produced more than 875,000 barrels of oil since it was purchased. Still, today the Tony Trubenbach continues to be one of WFW Production Company's best producers.

On a Tuesday afternoon, June 27, 1995, word arrived at the WFW office that an auction would take place in Houston on that Friday for an oil property in the area that was owned by Phillips Petroleum Company. Mel flew down to Houston to attend the auction. With a bid of $165,000, WFW had the highest bid on the Dangle, Dangelmayr, and Dangle Strawn leases; these leases were currently making four barrels of oil per day. By reworking several of the existing wells the company was able to increase production to eighty barrels of oil per day within a few months. With the drilling of additional wells, WFW now has production of more than 150 barrels per day. Since their purchase by the company, these leases have produced more than 500,000 barrels of oil.

WFW has come a long way since 1981, buying or starting other oilfield related businesses. Today those businesses employ more than seventy-five people. And those three boys have drilled more than 250 wells. WFW operates more than 550 wells with cumulative production surpassing 5 million barrels. All of this is possible because of a strong work ethic from their parents, a little common sense, and a $7,000 loan.

Tim Felderhoff married Ramona Walterscheid on July 29, 1978, and they have four children: Kelly, Lisa, Derek, and Travis. Kelly graduated from Texas Tech University

Above: Tim and his oldest granddaughter Alexa, standing in front of the Tony Trubenbach #114.

Below: Tim and Ramona Felderhoff and their family.

Above: Glenn and his son Collin at the tanks located on the Tony Trubenbach, in 1998.

Below: Glenn and Jean Walterscheid and their family.

with a bachelor's degree in business and a master's of business administration in finance. She is employed by JCPenney's as a finance manager. She is married to Jesse Luke and they have two daughters, Alexa and Abby. Lisa graduated from Texas Women's University with a bachelor's degree in mathematics. She is a high school math teacher for Magnolia Independent School District. She is married to David Phillips and they have one son, Jaxon. Derek graduated from University of Texas at Austin, earning his bachelor's degree in accounting and went on to earn his master's degree in business administration from Texas State University. He is currently the logistics specialist at ScaleFactor Partners. Travis graduated from Oklahoma State University with a degree in aerospace administration and operations. He is currently serving as a second lieutenant in the United States Marine Corps training to become a naval aviator. He is married to Kayla Hess. Tim and Ramona love to spend time in the country with their family at T&R Ranch, where Tim enjoys hunting and tending to his cattle.

Glenn Walterscheid married Jean Trubenbach on November 23, 1985. They have two children: Melinda and Collin. Melinda graduated from Baylor University with a bachelor of arts degree in business administration. She then graduated with her MD from the University of Texas Southwestern Medical Center. She is currently completing her pediatric residency at Children's Medical Center. She is married to Cody Cory. Collin graduated from Texas Tech University with a bachelor of science degree in petroleum engineering. He is currently working for Pioneer Natural Resources and is engaged to Kaitlan Benham. Glenn and Jean enjoy spending time with their family.

Mel Walterscheid married April Truebenbach on June 17, 1994. They have four children: Amber, Cole, Allie, and Kody. Amber attends Texas Tech University majoring in business. She still enjoys being competitive, participating in intramural flag football and basketball. She is also a member of the Kappa Kappa Gamma sorority. Cole is a senior at Muenster Independent School District. He has been active in football, basketball, track, and baseball. He has accepted a scholarship to play football for Oklahoma State University. Allie also attends Muenster High School where she is active in cross-country, cheerleading, basketball, UIL, and track. Kody is in Muenster Junior High. He loves football, basketball, track, and especially hunting and fishing. When the family is not busy with sports, they enjoy the peacefulness of their Double W Ranch, where they hike, hunt, fish, cut wood, cook out around the campfire, and ride four-wheelers.

We are old enough to remember $3 oil in the early 1970s and the lean times that came with that. We remember the crash of 1985 and the oil prices of the 1990s. Although we are looking forward, we do not take $100 oil for granted. Oil prices can change in a heartbeat. But, we have seen and lived through tough times before; that is why we really appreciates the good times!

Above: Mel and his daughter Amber in front of the Dangelmayr #2, in July 1995 after they purchased this lease.

Below: Mel and April Walterscheid and their family.

Muenster Drilling Company, Inc.

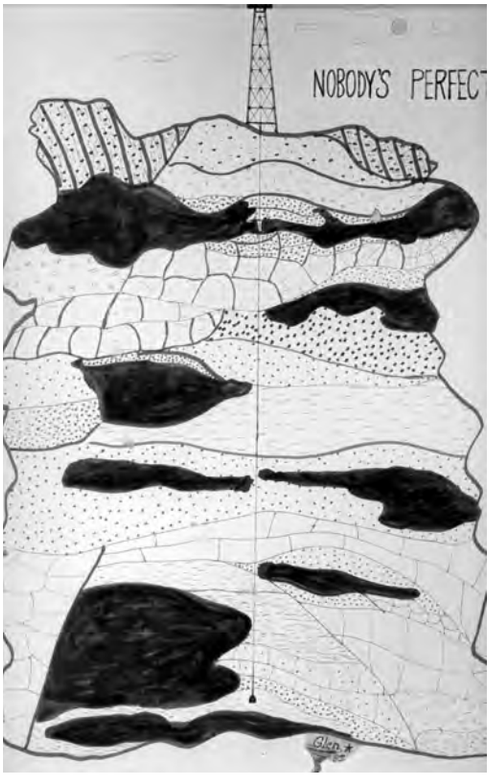
I. N. Monroe Well #1, September 1983. Shown are (from left to right): Jimmy Grewing (partial), Glenn Grewing, Bill Holt, David Reed, Angelo Nasche, Gary Hess, unknown Reed Perforating employee, Frankie Hess, Bill Reed, James Hess, Larry Grewing, and Jason Hess.

Muenster Drilling Company, Inc., (MDC) is a family owned and operated business and is a testament to the belief that hard work and blessings from above go a long way toward success. The company's founders had no idea the boom times in which they founded the company on April 1, 1980, would give way to $10/barrel oil and that the company would have to turn to drilling water wells to make ends meet.

And they could not have known that a single well—heralded in company lore as the "Make-or-Break Well"—would make the difference between the successful company Muenster Drilling Company has become and a mere footnote in the history of the Texas oil and gas industry.

Although not as old as many Texas companies, MDC's roots go back several generations, beginning with Frank J. Hess, grandfather of the company's owners. Born in 1881, Frank partnered with A. G. Hutton to form Hess & Hutton, which in 1932 drilled the first water well for the city of Muenster. Hess & Hutton also drilled the Farmers Market Association water well, which provided the city's water supply until the city drilled its own well.

Frank and his wife, Mary, had eight sons and one daughter, and three of the sons—Gary, John, and Ed—formed Hess Brothers Drilling Co. in the early 1940s. They had two cable tool rigs and were very active in



the drilling business. Later in that same decade, a partnership formed between Albert, Gary, Arnold, and Arthur Hess, keeping the name Hess Brothers Drilling Co. They purchased a double pole rotary rig and were active in drilling wells in Cooke, Montague, Clay and Denton Counties. Their first production was in Bulcher, just south of the Red River in North Central Texas. They then obtained production on several other leases. However, many a wildcat dry hole had to be drilled in the process. Hess Brothers sold their rig in the 1950s but kept their production.

Gary Hess, the father of MDC's founders, and his wife, Caroline, had ten sons and three daughters. He encouraged sons Chris and Quintin to purchase a drilling rig. They followed their father's advice, which would eventually pay great dividends.

Eight months after the company started, Angelo Nasche, Gary's son-in-law, joined the firm. MDC purchased its second rig and became a corporation. Frankie Hess, another of Gary's sons, joined the company in January 1981, and the firm soon began acquiring dozers, trucks, and other oilfield equipment.

My Lord God, I have no idea where I am going. I do not see the road ahead of me. Nor do I really know myself, and the fact that I think I am following your will does not mean that I am actually doing so. But I believe that the desire to please you does, in fact, please you. And I hope I have that desire in all that I am doing. And I know that if I do this you will lead me by the right road, though I may know nothing about it. Therefore, I will trust you always though I may seem to be lost and in the shadow of death. I will not fear, for you are ever with me, and you will never leave me to face my perils alone. Amen. **Written by Thomas Merton**

The company expanded again in August 1981 with the addition of two more of Gary's sons—James and Doyle Hess. Years later, Quintin and James left the company. Present owners are President Chris Hess, Vice Presidents Frankie and Doyle Hess, and Vice President and Secretary LaVerna Hess Nasche.

The company stayed busy in the 1980s running two rigs and employing around forty people. Then, during a six-month period beginning in January 1986, oil prices plummeted, falling from $30 a barrel to $10 a barrel. Falling prices put a halt on drilling as it became less financially feasible to drill. With oil prices so low, few customers were willing to gamble on drilling; many bided their time, hoping oil prices would return to previous levels.

Above: Back in 2008 on his way home one day, Doyle stopped to visit his mother-in-law who had just come from a stay in a nursing home. There he met her new caregiver who explained to Doyle how she got lost finding her way to the small farm house even though she thought she knew where she was going. She explained to him how happy she was to have this job and how she had been praying every day since she had been out of work for several weeks. After visiting for a while, Doyle left but before he made it home something compelled him to turn around and give a copy of the above prayer to the woman because he thought it might help her. He felt in his heart after the story she told him that she was a living example of the prayer. He turned around, went back to his mother-in-laws and handed the prayer to the woman. She took it from him without even looking at the prayer. That afternoon Doyle's wife called him and told him she had a story that would make his hair stand up. The caregiver said the prayer Doyle had given her was the very prayer she had prayed every night for weeks while she was searching for answers. Later in the week she brought the book written by Thomas Merton and there it was that very same prayer. That was the first prayer card Doyle had ever given out but certainly not the last. Over the years, he has handed out hundreds and hundreds of this very prayer and the prayer is printed on the back of all of Muenster Drilling Company's business cards.

Left: Brothers Doyle, Chris, and Frankie Hess, and sister LaVerna Hess Nasche.

Right: The day crew on Rig #3 in Oklahoma making a connection.

Opposite, top left: The day crew on Rig #3 in Oklahoma making a connection.

Opposite, top right: Rig #3 drilling for HEP Oil. Near Thackerville in Love County. Spud date: November 9, 2011.

Opposite, bottom: Left to right, Doyle and Frankie Hess, Angelo Nasche, Gary and Chris Hess.

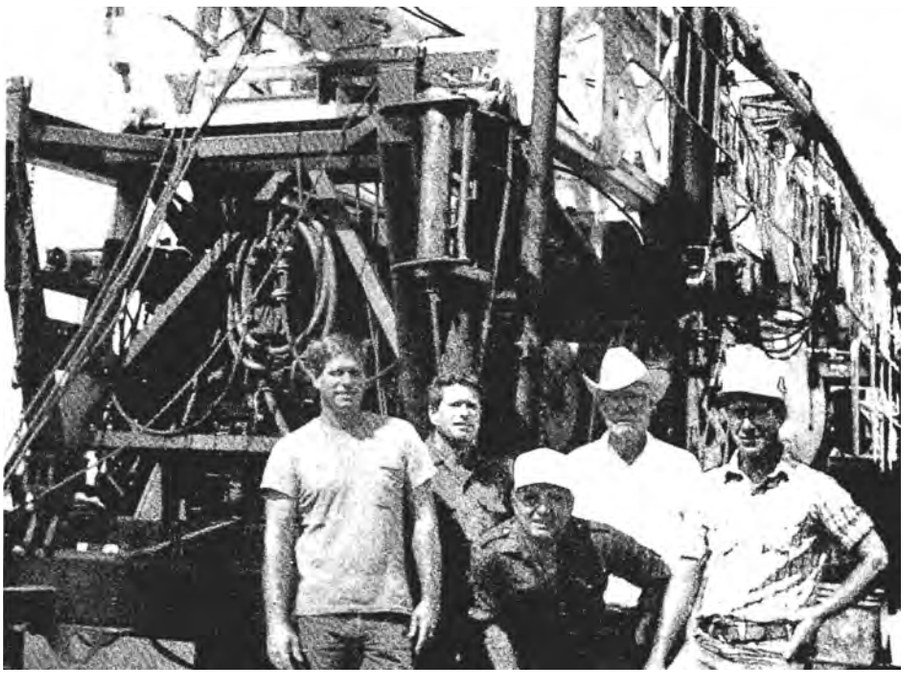
When oil prices dropped, MDC became less active as a drilling contractor. They survived by cutting costs and doing most of the work themselves. The company also began concentrating on gaining production, managing to do so despite the inevitable dry holes encountered along the way.

MDC also survived by drilling commercial water wells for cities and developments. Many wells were drilled from Muenster to Forney, including Little Elm and the U.S. Corps of Engineers at Lake Ray Roberts. MDC purchased production on various oil leases, many of which were bought from bigger companies looking to shed liabilities. The company was able to buy these leases and limit their liability because they could repair, maintain, and drill themselves.

Despite MDC's initiative, ingenuity, and cost-cutting measures, MDC would not have survived had it not been for the "Make-or-Break Well" drilled in the late 1980s, officially known as the I. N. Monroe lease in Montague County. Several companies, individuals, and heirs wanted to lease this land for drilling. MDC—with help from the women working at the Montague County Abstract Office—contacted landowners willing to lease the I. N. Monroe lease.

After obtaining a majority interest in the lease, MDC offered to take the remaining interest owners in as partners, requiring them to pay for their share of the expenses in exchange for a percentage of income. In the end, all lease owners agreed to assign their interest to MDC instead of partnering with the company because they feared large drilling expenses and a dry hole. A short time later, the company drilled a well and struck oil, a discovery that kept the company in business.

Today, MDC employs twenty full-time workers, has a customer base of around seventy, and anticipates continued growth. On average, the company drills sixty-five to seventy wells per year with a total footage of 168,000 feet per year. Its plans for the future are much like its accomplishments in the past, to continue drilling oil wells and serving North Texas and Southeastern Oklahoma and giving back to the community by donating time, equipment, and financial support to schools, charities, and worthy fundraisers.



In the fall of 2014, Doyle Hess will become the sole owner of Muenster Drilling Company continuing the family tradition.

Select Industries, Inc.

For more than fifty years, Select Industries, Inc., in Wichita Falls has been helping oil and gas producers maximize well production and solve a variety of problems through the manufacture and sale of solid chemical stick products. Founded in 1957 by William G. Harrison, Select Industries is an industry leader in the manufacture and sale of soap/foam sticks, acid sticks, and other products designed to provide solutions for the oil and gas industry while maintaining an unsurpassed commitment to excellence.

Founder William G. Harrison.

Harrison is a graduate of McCallie Military School in Chattanooga, Tennessee, and attended the University of Virginia. After college, he went to work as a field and service engineer with Dowell Well Service (a subsidiary of Dow Chemical) for several years, assisting in fracturing and acidizing wells throughout North Texas.

Harrison then started his own business and shortly thereafter developed and trademarked the widely acclaimed "acid stick." Its success led to a complete line of stick products, including the highly popular foam sticks created to remove water from gas and oil wells.

Many gas wells have water that eventually seeps into the wells as they age or as a part of normal production. Each foot (or meter) of water in the pipe exerts a back pressure (PSI) against the formation, which reduces the flow of gas due to the hydrostatic pressure (column of water) on the producing formation. The foam sticks foam this water which reduces the back pressure on the formation, thereby allowing for considerably more gas to be produced. Special foamers are often required due to the well fluid containing salt and some hydrocarbons.

Acid sticks combine a soap material with acid crystals and other ingredients in a stick form. These sticks can be very helpful in reducing scale build up at the bottom of water injection wells. Often, oil and gas wells will have an oil coating on the scale and the soap contained in the acid stick will help remove and disperse this oil coating so the acid can dissolve the scale. The periodic use of acid sticks in a producing well can and will produce more oil or gas with this simple clean up. Water injection wells will often take much more water at a reduced pressure and this will save energy in running water disposal pumps.

In the case of gas wells, the removal of scale buildup around the perforations by the acid stick will be very useful before dropping the foam sticks; therefore, more gas is produced with the increase in surge of gas through cleaner perforations and more water is removed by the foam stick from the well.

Select Industries was formally incorporated in 1964. Eventually, other operations were merged into the present-day enterprise. Today, the large volume of sticks produced by Select Industries includes the manufacturing of paper tubes and the extrusion of water soluble (polymer) tubes. Not only does Select Industries sell these tube products directly to its customers, it also sells a significant amount of solid products to other stick manufacturers that put their private label on the product and sell to other customers. These sticks are sold worldwide.

Early in the company's development, and as stick manufacturing was beginning, hydrochloric acid was sold in bulk. The early business involved the sale of gelling agents and fluid loss additives directly to independent acidizing and fracturing companies. Around 1970, Select Industries developed soluble "pipeline pigs" to remove water and

paraffin build-up in gas and oil pipelines and well-flow lines. These pigs, which are manufactured as a ball or a small cylinder, are made for various sized pipes. The pigs are either oil or water soluble and are useful for the minor problems that develop in the oilfield during the production of oil and gas.

Select Industries products are used in a number of countries to deal with problems particularly related to their area. Select Industries' group of sales personnel and management team members has a collective experience of more than 100 years in solving oil and gas related problems in the industry. Together, they have achieved great success in helping customers maintain their oil and gas production.

In 2001, after two years of on-and-off negotiations, Harrison reached an agreement with Edward (Eddie) Dale Huber that launched Huber's career and relationship with Select Industries, Inc., as an active partner in the business and vice president of the oil and gas chemical stick market. He now serves as vice president of marketing, while Harrison serves as president and chief executive officer.

Huber, a native of Victoria, Texas, began working for an oilfield service equipment company during his senior year in high school. After high school, he attended Victoria College, working on an engineering degree and continued to work part-time. After attending college for two years, Huber decided to work full time.

In July 1976, at age twenty, he began working for a major oil and gas chemical company located in Victoria, Texas working as a chemical sales representative. Within a year, he was promoted to Gulf Coast regional manager, responsible for all sales and operations of the Texas and Louisiana coast areas. He continued to work in the oil and gas production chemical industry for more than twenty-five years.

Harrison's knowledge and mentorship in business practices and Huber's knowledge and experience of oilfield equipment and operations made for a positive and solid chemistry not often found between partners. They have been in business together for more than a decade, and their mutual stewardship of Select Industries has led to growth that continues to this day.

Ethics, morals, and honesty have played an important role in the company's growth and relationships. In the past twelve years, Select Industries has experienced five major manufacturing expansions, from manufacturing area expansions to developing an outside contracted manufacturing facility in another part of the United States. Select Industries has overcome adverse situations such as losing a major structure of part of its manufacturing facility due to excessive ice and snow build-up on the roof. Throughout its struggles, however, the company has overcome and grown stronger

and more effective in manufacturing as well as meeting the ever-increasing needs of the oil and gas industry with quality and consistently manufactured products.

Select Industries has played and continues to play an important role in supporting local youth sports programs from baseball, soccer, softball, rodeo, and various other youth- and adult-related programs. Select Industries has also been supportive in various organizations such as Man to Man Ministries, Habitat for Humanity, Salvation Army, Samaritan's Purse Ministry, church mission trips, and other related programs.

Select Industries has experienced positive growth throughout the company for the past twelve years. This is mainly due to industry growth and the dedication and hard work

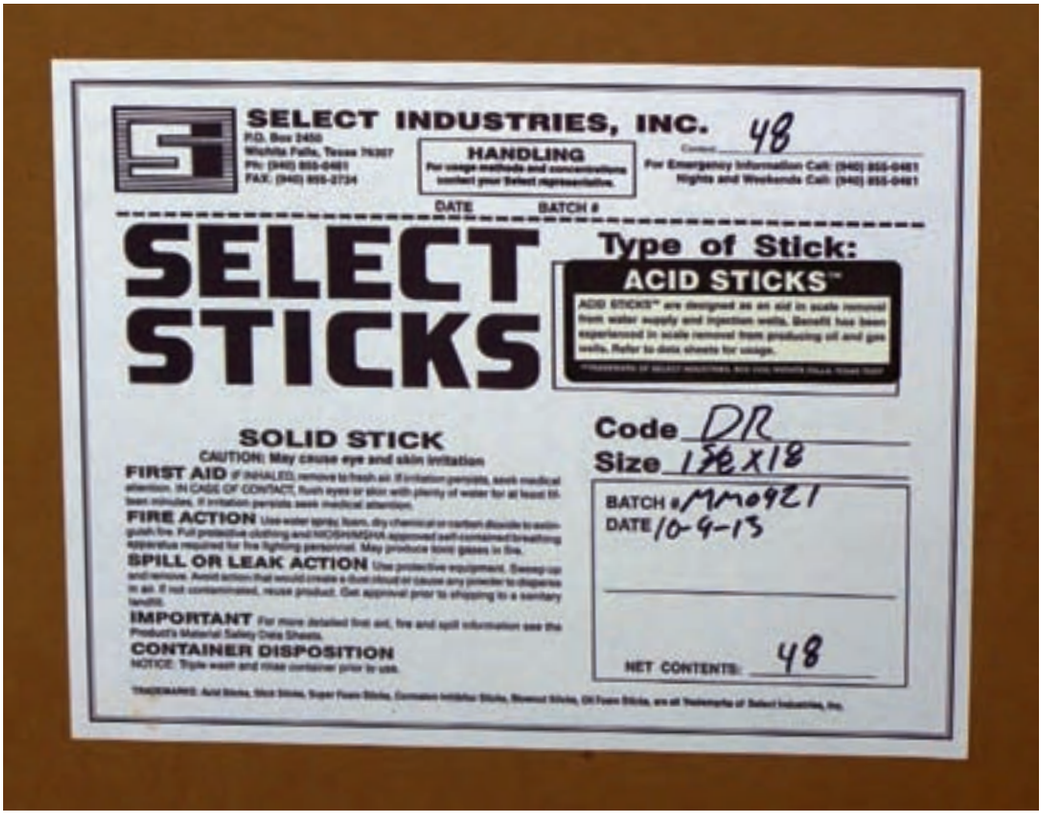
Select Industries employees display on a daily basis. Select Industries regularly tests all incoming raw materials for quality assurance and then tests finished batches of sticks for performance after they are manufactured.

Beyond simply chemical stick sales, Select Industries is committed to providing personal attention and advice along with step-by-step instructions to ensure that customers have the optimal chance to increase the production rates of their wells (based on the well information provided to the Select Industries representative.) Customers have often experienced "payback" of the cost of the chemical sticks in a few hours.

Select Industries has experienced growth in production manufacturing volumes from 2001 to early 2013 by 600 to 700 percent. Volume grows daily. With Select Industries being the oldest and largest privately owned manufacturer of solid chemical stick products and with continued blessings, the company hopes to continue to grow day by day. Its goal is to continue to be the leading manufacturing and developer of new solid chemical technologies for the oil and gas industry today, tomorrow and well into the future.

Above: Edward (Eddie) Dale Huber.

Missions Statement: Select Industries, Inc. and its personnel are committed to manufacturing, distributing, selling and servicing the highest quality of solid chemical innovations and solutions that improve the quality and recovery of oil and gas production worldwide.



Permian Production Equipment, Inc.

Above: Deer watching a Permian Production Equipment installation.

Bottom, left and right: Hydraulic Beam Gas Compressors (HyBGC).

In the beginning, Charles David McCoy was a man with many hats and job paths.

In the early fifties McCoy married Ann Elise Cook (his childhood sweetheart) and quickly started his family and career. At this time they started their family with a daughter and son, Melanie McCoy (now Mrs. Mark Lancaster) and David McCoy, while working with a junior department store chain as assistant manager in training. This training gave him the beginning of his business training.

McCoy then operated two cattle ranches raising beef cattle, one ranch of his own and one belonging to his wife's family. At the same time, he was working with management for Arkansas Louisiana Gas where he was the local union president and founder. This was all prior to his attending Louisiana Tech to study mechanical engineering. While attending college, he worked for the local newspaper, *The Rustin Daily Leader*, as circulation and business manager, which gave him more insight into business management.

After college, the McCoy family moved to Dallas. He became president of National Property Exchange Mart, Inc. where he created the computerized database system that is now widely used by the Real Estate Industry today (Multiple Listing System or MLS). With a group of partners he also opened a chain of restaurants called the "Hole in the Wall."

Always the innovator and with an engineering education from Louisiana Tech, he soon began looking at how to better produce oil and gas from existing wells in Texas. One day while getting his car serviced, McCoy watched the car lift as it lifted his car for service and wondered if a string of sucker rods in an oil well could be lifted in the same manner.

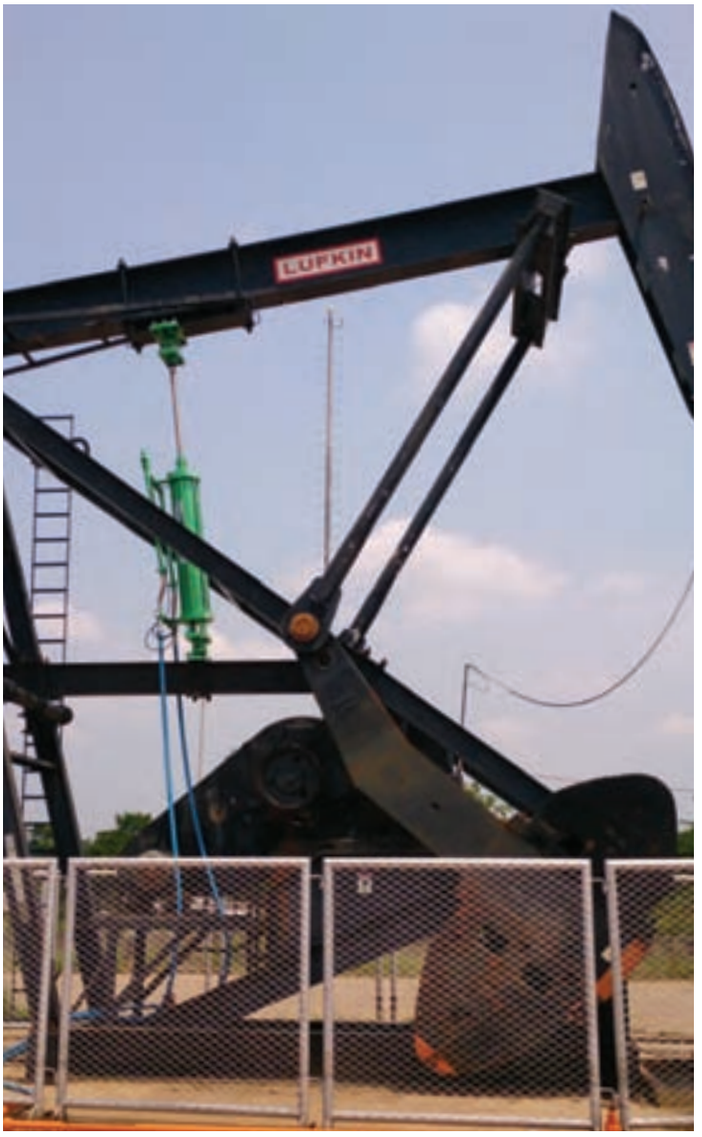
Permian Production Equipment, Inc. (PPEI) began life in 1979 manufacturing a Pneumatic Pumping Unit. The Pneumatic Pumping Unit (PPU) was a cylinder and piston combination that was used to lift the rod string and activate the down hold pump in a pumping action. This unit was used on deep wells to produce production from older wells and allow existing conventional pumping units to be moved to new, higher fluid production wells. At this time conventional pumping units were often in short supply and high demand. So a new form of pumping unit was created to move the rod string up and down pneumatically. This system was far ahead of its time and allowed many operators to move their existing pumping units to more demanding locations and install the Pneumatic Lift System in lower volume wells. His vision and foresight allowed him to be able to create, design, manufacture and sell these items to an oil industry desperate for innovation and void of economical alternatives.

He then developed and manufactured a complete line of Plunger Lift Systems. The Plunger Lift Systems provided an interface between liquids and gas in the wellbore and prevented liquid fallback—a part of the liquid load that effectively is lost because of fall back and is left in the well bore in a flowing well. Because the plunger provides a "seal" between the liquid and flowing gas, a well's own energy can be used to lift liquids out of the wellbore efficiently. These plungers were his own design and manufacture, and provided added value to all his clients through increased production. In the early 1980s and 1990s, McCoy strived to provide new and inventive methods to economically increase production on existing wells.

His invention with the greatest application to the oil field began with just a trip to the oil fields of Monahans, Texas, where McCoy could not believe his eyes. Gas was flowing from the casing of a well between two sand domes, and lying on the ground in the middle of it were dead quail. The operator's engineer accompanying McCoy said the well had a problem producing because of gas locking (gas interference) in the down hole pump.

"I watched that pumping unit run and thought, 'How can we use the pumping unit as energy to take the gas and pressure off the well casing and not kill the quail?" said McCoy. His response was design of the Beam Gas Compressor®, which he tried out on the well, and soon the operator was buying his design. That was about 1982. Today, McCoy sells the Beam Gas Compressor throughout the United States, Europe, and Latin America, as well as the Middle East. Beam Gas Compressors are increasingly in high demand in oil-producing countries. That demand keeps the mechanical engineer trotting around the globe. McCoy's travels have taken him around the world more than once as he oversees installation of his inventions. "When I first came here and looked at all the production and wells within 200 miles of Midland, I thought I would be spending every night at home the rest of my life," McCoy reflected. Instead, he spends many nights each month in some other part of the world.

The Double Acting Beam Gas Compressor was the beginning of a new product line that had never before been conceived; that is, using as the prime mover a pumping unit to remove the back pressure holding fluid in the formation and to discharge it into the flowline. This innovative idea would allow a well to operate as if the gas pressure was being vented to atmosphere but the gas instead would be captured and sent to market. All of this was decades before anyone spoke of carbon emissions or footprints. For this the Beam Gas Compressor® has earned the trademark The Green Machine®.



Below: Beam Gas Compressor equipment in Russia.

When McCoy designed his Beam Gas Compressor, he never considered exporting it. The Permian Basin was in the midst of a drilling boom and he had moved his family to Midland from Dallas. With an office in Midland, McCoy located the manufacturing plant south of Midland International Airport. Many sales were generated by word of mouth. Today, Beam Gas Compressors are sold to nearly every oil field in the United States, even Alaska and Canada. Internationally, these units are found in Indonesia, Peru, Ecuador, Columbia, Venezuela, Argentina, Austria, Germany, Hungary, Romania, Kuwait, Oman, England, and Russia.

Innovation is the driving force that has led to two new additions to the product line: High Temperature Beam Gas Compressors used in Steam Flood fields and Hydraulic Beam Gas Compressors used for high volumes and well clusters.

In many parts of the world, steam is used to "soften" up the oil so that it can be pumped to the surface by a pumping unit or other means. The process begins with pumping high temperature steam down the well bore to the formation that surrounds the well bore. Once the steam has been able to mix with the crude oil it is allowed to flow back up the well bore, except for high pressure as a result of the steam injection. This pressure prevents all of the oil from flowing to the well bore and must be removed. With the option of venting the well no longer an environmentally safe procedure for companies the world over, they have turned to the High Temperature Beam

Gas Compressor to do the same job it has for decades: removing back pressure from a well bore.

The Hydraulic Beam Gas Compressor (HyBGC) was also created from another necessity. Often the pumping unit does not have enough strokes per minute or run time to allow the BGC to perform at its maximum to reduce the back pressure to an optimum level. By using hydraulic power to move the piston in the BGC, the system no longer is at the mercy of the pumping unit as its prime mover as it was before. Now it can run as slow or fast and for as many hours as needed to get the job done for the producer.

Just like its older brother, the BGC, the HyBGC can be used to move steam or high temperature gases but unlike its sibling, the HyBGC can also move fluid. The HyBGC can draw fluid into the gas cylinder of its system and discharge as if it were gas. No other gas compression system can do that; they all require a secondary vessel or scrubber and pump arrangement.

At present, McCoy has a new idea as to how to operate the Beam Gas Compressor with a mechanical system. This new system will emerge soon. The ideas of how to improve the way of doing things in the oil patch has always been his goal.

And all because he could not stand seeing dead quail in a pool of sour (H^2S) gas being vented to the atmosphere from the casing of a well in order to relieve back pressure and gas interference in the pumping system in order to produce more oil.

Pitts Oil Company, LLC

L. Frank Pitts, founder

Pitts Oil Company is a third generation family-run business, founded by L. Frank Pitts, a legend among leaders in the independent oil and gas industry. He was an independent producer for seven decades until his passing in 2009 at the age of ninety-eight. From his earliest involvement in the industry Pitts was a consensus-builder, spokesman, and activist who worked tirelessly for deregulation and the industry's future. Known as "The Texas statesman of oil and natural gas," Pitts' vision, energy, and perseverance shaped the oil and natural gas industry.

Pitts was born October 7, 1910, on a farm in rural Mississippi, and was involved in politics and community service from an early age. Joining his father's mission to bring higher education to their community, Pitts gave public speeches for the sale of bonds to fund the creation of a junior college in nearby Wesson. His father died when he was a senior in high school but Pitts went on to join the college debate team and graduate from the new Copiah-Lincoln Community College. He maintained a keen interest in current affairs and an advocacy for education throughout his long life.

In 1931, Pitts launched his career, moving to Chicago to work for fledgling Nu-Enamel Paint Co. He successfully opened hundreds of paint stores during the great depression. Pitts directed the company's international expansion from 1934 to 1937 throughout Europe, Asia and Africa. A witness to rising fascism in Italy and Germany, Pitts returned to the U.S. in 1937 and was named president at the age of twenty-eight.

Scarcity of wartime taught Pitts the importance of a company's ability to control the resources necessary to manufacture its product. He pursued the purchase of lead and zinc mines to secure his company's future. Through these efforts he was exposed to oil. Pitts began drilling wells in 1939 but every hole was dry. Finally, he was offered three prospects in Texas—Menard, Grimes, and Montague Counties. The first and second were dry, but the third in Montague was flush, and it put Pitts in the oil business. He opened an office in Bowie, Texas in 1942 and drilled forty wells that year.

Right: L. Frank Pitts and Martha, his beloved wife of fifty-eight years. Martha died in 1993 following a lengthy illness.

Below: Frank Pitts, created a map to illustrate the potential areas of undeveloped reserves in the U.S. distributed to the U.S. Congress and the public; over one million copies requested, 1975.

In 1948, Pitts established Pitts Oil Company, moved his wife and young daughter to the prairie of Dallas, Texas, and became a full-time wildcatter. "I saw that we had the greatest industry and the greatest economy in the world, and I wanted to be part of it." Pitts joined the Texas Independent Producers and Royalty Owners Association (TIPRO) in 1949 and the Independent Petroleum Association of America (IPAA) soon thereafter. So began his passionate immersion in the oil and gas industry for the next sixty-eight years.

As federal price controls impacted drilling in the 1950s, Pitts shifted his focus in 1960 to the purchase of geophysical company Exploration Surveys Inc. (ESI) and, for a decade, ESI identified geophysical structures for major U.S. producers using advanced seismic technology. Pitts'

knowledge of potential basins would become material to his lobbying efforts for the future of the oil and gas industry in the mid-1970s and 1980s, amid the national energy crisis and depressive policies of the Carter administration.

By 1970, Pitts believed the market for natural gas in Texas was increasing and it was time to drill for new production. He sold ESI to U.S Industries, and started acquiring thousands of acres of new leases in the Fort Worth Basin and aggressively drilling in Wise, Denton, Parker and Palo Pinto Counties. Increases in gas prices spurred additional drilling in the industry. Between 1972 and 1974, drilling increased in the Fort Worth Basin by 283 percent, and the natural gas supply increased by 900 percent. Pitts, dissatisfied with the limitations of pipeline access and contracts, created a new Texas gas sales contract in 1973 enabling producers and royalty owners to receive full value for liquids in their gas stream.

The public did not understand the regulatory issues confronting the industry and did not trust the industry. Pitts galvanized industry leaders in a coordinated campaign to educate Americans and lawmakers on the benefits of natural gas and importance of deregulation. "If the consumer wanted more clean and efficient natural gas, they had to encourage the legislators to vote for deregulation. Only in this way could the producers increase the price sufficiently to encourage the production of the industry throughout the United States."

In 1975, Pitts enlisted 26 producers and 4 industry suppliers, created a speaker's bureau and installed 2 WATS lines with 4 full-time staff at Pitts Oil Company. In a single year, they scheduled over 1,183 interviews through radio, television, newspapers, and speeches in 265 cities and forty-two states. Pitts spoke persuasively to the American public. He was interviewed by Walter Cronkite and Dan Rather, appeared on the *MacNeil Lehrer Report*, *Firing Line*, *NBC Today*, and *Good Morning America*. He published a map showing potential basins for hydrocarbons in the U.S. of which only two percent had been drilled. It was utilized in congressional hearings; one million copies were distributed nationwide.

In 1976 the producers believed they had achieved their goal of deregulation in Congress. Although the bill was approved in the Senate, it was lost by two votes in the House. Two years later, in 1978, Congress passed the Natural Gas Policy Act, a bill for phased deregulation of new-found gas, to reach total deregulation in 1985.

The Barnett Shale became of interest in the early 1980s. Pitts Oil played a role, partnering in the early days with George Mitchell and Mitchell Energy to develop the North Texas Barnett Shale as Mitchell pioneered the technology that led to hydraulic fracturing. Pitts Oil became a leading driller in the North Texas Barnett Shale in the 1990s.

Pitts remained a dynamic representative for the energy industry as a frequent expert witness and conferee in Washington and Austin, with members of the Senate, the House of Representatives, and Executive leadership concerned with oil and natural gas policy. He was a member of the National Petroleum Council, an advisory group to the Secretary of the Department of Energy, and served continuously under every Secretary of Energy since the Department's inception in 1977 until his death 2009. Son-in-law, Bill Custard, is also an appointee and continues to serve on the National Petroleum Council.

Pitts served on the Natural Gas Committee of the Independent Petroleum Association of America (IPAA) and the Industry Forum of the American Petroleum Institute. Texas Governor Mark White appointed him to the Interstate Oil and Gas Compact Commission (IOGCC), an organization headed by the governors of twenty-nine oil and gas producing states; he continually served under every subsequent Texas Governor for the next twenty-five years. He was among the first independent oilmen to serve on the Gas Research Institute in Chicago; he served on the Southwest Research Institute and the American Gas Foundation. He served as chairman of TIPRO from 1980-1982, followed by his brother, Shelby. Exploration Manager David F. Martineau, with Pitts for forty years, served as chairman of TIPRO from 2012-2014.

Frank Pitts, in the mid-1970s to mid-1980s, became the catalyst, coordinator and spokesman for the industry in its drive to educate the public and elected officials about the issues of deregulating natural gas. He gave hundreds of speeches and thousands of interviews nationwide.

Above: Frank Pitts in 2001, receiving a standing ovation when he received the Texas Railroad Commission Pioneer Award in Austin. Governor Rick Perry sent a proclamation praising him as "a true pioneer in the oil and gas industry."

Below: Announcement of the L. Frank Pitts Oil and Gas Lecture Series and the L. Frank Pitts Oil and Gas Scholars at the SMU Maguire Energy Institute in 2006, pictured with daughter, Linda, and Bill Custard. In 2010, the L. Frank Pitts Energy Leadership Award was established in Pitts' honor at the SMU Cox School of Business.

Pitts would become known as "Mr. TIPRO" among independent producers for his tireless advocacy, and was officially awarded the Texas Independent Producers and Royalty Owners' highest honor in 1989. The many honors from his industry associates include the IPAA Chief Roughneck Award; membership in the prestigious All-American Wildcatters; the TRC Pioneer of the Year; the IPAA Karney Cochran; the Texas Oil & Gas Association Distinguished Service Award; the American Association of Petroleum Landmen Distinguished Service Award and its Special Award for Industry Leadership; the Southwestern Legal Foundation John Rogers; the IOGCC Warwick Downing; the NSWA Hero of Industry, and Texas Alliance of Energy Producers' prestigious Legend Award.

Pitts was deeply committed to civic leadership for which he received the Dallas Council on World Affairs' H. Neil Mallon Award for Distinguished Civic Service. At SMU's Maguire Energy Institute Pitts endowed four Presidential Scholarships, a Scholars Fund and an endowed lecture series in oil and gas; he established student scholarships and faculty endowments at Copiah-Lincoln Community College, as well.

The inspirational legacy of L. Frank Pitts is proudly carried forward by the second, third, and fourth generations which are his daughter, Linda, and her husband, William A. (Bill) Custard; three grandchildren, W. Allen Custard, Martha E. (Marla) Custard, and Laura Custard Hurt; and five great-grandchildren, all of Dallas.

As a family-run business, the Custard-Pitts-Hurt families continue to move the company's legacy forward through the companies that comprise the 'Pitts Group' including Pitts Oil Company, Custard/Pitts Land & Cattle Co., Dallas Production Inc., and other affiliates, with their main offices located in Dallas, Texas.

Although Pitts is no longer with us, his wisdom, discipline, perseverance and judgment serve as a source of inspiration and guidance for the families' endeavors in the twenty-first century. They are continuing the pursuit of oil and gas exploration, actively generating new prospects, pursuing acquisitions and developing partnerships, and engaging in the legislative process. It is safe to assume that the family tradition that has infused the company for more than half a century will continue far into the future.

At the Texas Alliance of Energy Producers 2003 Legend Award ceremony, Governor Perry recognized Pitts. "You are a Texan second to none. Just as the Texans of days gone by, who worked tirelessly to build a foundation of excellence, you have served with distinction, displaying always the characteristic energy, entrepreneurship and vision that have defined a legacy that will live on for the generations to come."

L. Frank Pitts, "truest independent of them all."

Jaco Oil Company

The surplus of Saudi Arabian crude oil in the world market and the subsequent crash in oil prices in 1986, led to over 400,000 lost jobs domestically. It was in this depressed economic environment that Troy Jaco founded the Jaco Oil Company, with just a few years of experience as a landman working for Tracy Tucker Land Services. In 1986, Jaco began acquiring producing oil leases from successful companies like Damson Petroleum, Burke Royalty, TXO, Stephens Engineering, Samson Resources and others. In addition to purchasing already active wells, Jaco Oil Company began drilling wildcat wells in Arkansas, Colorado, Oklahoma, Kansas, and Texas.

One of the significant early oil leases acquired by Jaco Oil Company was the Joseph and Katie Hacker Lease, in Cooke County. In 1926 the Hacker family leased their 117 acre farm to D. W. Crawford, soon thereafter the Texas Company, now Texaco, drilled the Joseph Hacker No.1, which came in producing over 197 BOPD of high-quality Texas crude from a depth of less than 2,000 feet. In 1987, Jaco Oil Company acquired the Hacker Lease by auction from Texaco. Having declined to less than 10 BOPD, the Hacker Lease sold for less than $30,000. On July 17, 1987, Jaco Oil Company contracted with Waves Drilling Company to drill the Arianne Noel A-1 well on the Hacker lease. Coming in at more than 39 BOPD, the Hacker Lease had yielded yet another successful well. This historic continuously producing oil lease is estimated to have recovered more than 500,000 barrels of oil since its inception in 1926, making it one of the oldest continuously producing oil leases in the state of Texas.

In 1990, Jaco Oil Company, along with its associates, acquired the oil and gas leases that now make up the North and South Dead Horse Creek Field Units. This shallow water flood field has produced more than 2 million barrels of oil and still produces. The water flood was designed by petroleum engineers Thomas Jeffrey and Paul Abadie. The working relationship with mentor and friend Tom Jeffrey was invaluable.

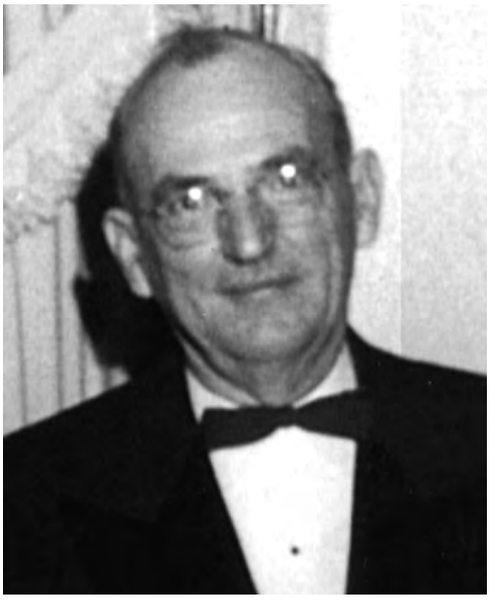
Many of the professionals directly and indirectly involved in the company's success whose professional knowledge and expertise contributed to the growth of the company include Cody Gilbreath, Ben Blackburn, Mike Travis, Jimmy Craig, Dick Schremmer, and Billy Don Wolf. Experts in their field that always had "can-do" attitudes, include Allen Gilbreath, Jerry Hess, George Butler, Ronnie Sicking, Darrel Sicking, Brian Love, Norman Koelzer, Merl Gilbreath, Keary Williams, Tim Sicking, Chuck Arend and countless others.

Mary West has been with the company since 1990. Her position as office manager has played a significant role in the success of the company. Her ability to master accounting, insurance, taxes, Texas Railroad Commission fillings, owner relations and many other office duties is and continues to be at the highest professional level.

Today, Jaco Oil Company owns producing oil and gas wells from Campbell County, Wyoming, to Galveston Island. The company's strategy of buying existing production with long-life reserves and low-risk drilling projects while building legacy assets continues to be its main goals.

Burk Royalty Co., Ltd.

GEORGE T. KIMBELL



George T. Kimbell was born April 19, 1901, in Pittsburgh, Texas, and worked on the family farm and as a cowboy for the large ranches in Clay County until 1922, when he was hired to manage the Bradford Supply store in Burkburnett, Texas. In 1927, he and John Bostic bought an old lease, junked it, and started, the Kimbell-Bostic Supply Company in Burkburnett. Kimbell-Bostic Supply bought the bankrupt American Refining Company in Wichita Falls, junked the refinery out and moved its offices there around 1935.

In the meantime, Kimbell and Bostic had joined with I.E. Harwell in 1929 to form a partnership known as Burk Royalty Company. After Bostic's departure, Harwell and Kimbell incorporated, making Kimbell president, Harwell vice president and Glen H. Bear secretary-treasurers.

In 1935, Burk Royalty moved to Wichita Falls and Clyde Bohner bought out Harwell, and the Burk Royalty Company, a corporation, was dissolved, Kimbell and Bohner operated as Burk Royalty Company, a co-partnership until March 1, 1956, when Burk Royalty Co., the present corporation, was formed.

Although Burk Royalty Co. is principally an oil and gas exploration and producing company, it, or its affiliates, were heavily involved in the independent refining business in the 1930s and 1940s, controlling Bryson Pipe Line and Refining Company of Bryson, Tydal Refining Company of Gainesville, Western Refining Company, near Fort Stockton, and Masters Refining Company in Dallas.

Some of G.T. Kimbell's labor policies were ahead of their time. He never docked his workers for being sick and when the price of oil in East Texas hit ten cents a barrel, he shut his leases in but kept his pumpers on the payroll to the extent of their grocery bills.

In addition to his oil interests, Kimbell was on the boards of directors of Kibo Compressor Company and City National Bank and served as a member of the North Texas Oil and Gas Association. He also loved the land and had various ranching operations in North Texas, Southern Oklahoma, and Australia.

Kimbell was active in the community. He was a member of Edgemere Church of Christ and was involved in the founding of the Community Chest in Wichita Falls, the ancestor of today's United Way, for which he served as president. He also supported the Boys Club of Wichita Falls (now the Boys and Girls Clubs of Wichita Falls), serving at one time as president and as its chairman of the board.

Kimbell's son, David, remembers his father for his sense of duty.

"My most vivid memory was of him coming home after two weeks of working without sleep after the New London School Disaster," Kimbell said, referring to the devastating 1937 natural gas explosion beneath the public school in the East Texas town of New London, killing hundreds of students and teachers. "Every company shut down and furnished men and equipment. It made quite an impression on me to see how unselfish the men and companies were."

Knowing the demands of his dad's operations at home the significance of his dad's decision to join with his colleagues in the disaster relief—at huge personal expense for all of them—was not lost on young David.

"It was just part of his philosophy," David said. "Yes, he believed in hard work, but he also knew that there was no such thing as a self-made man. We're all indebted to someone."

As a child growing up in Burkburnett, it would be an understatement to say he

George T. Kimbell.

enjoyed a front-row seat to the independent operator lifestyle.

"I spent the first six years of my life living in a duplex on 4th Street in Burkburnett," David said. "There was a squeaky pump jack in the backyard and we kids used to ride on the rods."

G.T. had his own philosophical take on the industry and the people in the industry taking those issues on.

"As for the industry as a whole and the issues they deal with, my dad used to say, 'It's the same things going on now that's always gone on. There's just a different gang doing it.'"

One thing that set George Kimbell apart from much of the gang was his laser-beam focus on setting—and achieving—his business goals, a trait that attracted David to the business as much as any other.

"I was always interested in going into the business. I appreciated how hard my father worked. He started out with zero capital," David said. "He used to say that the most difficult thing he'd done in his whole life was to accumulate that first $5,000 of savings."

George Kimbell lived in uncertain and sometimes harsh times, but he taught his son that you can only do what you can do.

"He must have had a world of concerns. Look at what his generation had to deal with: two world wars with a depression in between. But his philosophy was there was not time for worry, only time for work," David said. "His main pleasure was his family, but behind that would be his work. He loved company-building." Thanks to a wonderful support team, George Kimbell was able to remain active as CEO the rest of his life, working when it suited him and coming into his office only when needed.

"In his later years, he did a lot of traveling with my mother," David said. "Oh, she worshipped him. They were married in 1922 or 23. Until death do you part …"

G. T. Kimbell and Ruth Anderson were married December 29, 1923, and were together until G.T.s death in 1976.

CLYDE BOHNER

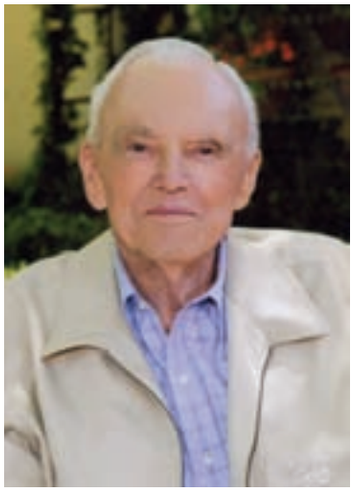
It seems some things are just meant to be.

More than a decade before Clyde Bohner would join forces with G.T. Kimbell and create one of the true North Texas oil and gas dynasties in Burk Royalty, without warning, his employer sent him to service a customer in Northeast Oklahoma—and went out of business while he was still on the road. The company's sudden collapse left Bohner stranded in Tulsa and forced him to start anew.

Clyde Bohner.

And start anew he did, first taking a job as production superintendent with Bell Oil & Refining Company in Grandfield, Oklahoma. He moved to Burkburnett in the early days of the boom as an employee of OP&B Gasoline Plant and, in 1920, went into business for himself, launching the Bohner Oil Company in Burkburnett. With his headquarters, machine shops and center of operations in the Northwest Field, Bohner held front-row seats to Burkburnett's boom days and over the years it was one of his great joys to share stories from that era. Among his favorites described an "engineering" process by which barrels of moonshine whiskey were mounted atop pump jacks, a technique that—according to the connoisseurs at the time—utilized the device's rocking motion to accelerate the aging process.

In 1935, Bohner bought into the Burk Royalty company in Wichita Falls, joining forces with oilman G.T. Kimbell. The company had started in 1929 as a partnership of Kimbell, John Bostic, and I.E. Harwell.



David Kimbell.

Following Bostic's departure, Bohner bought out Harwell's interest to form the new enterprise, which operated as a partnership until March 1, 1956, when they formed the Burk Royalty Company, which still operates today.

While continuing to operate Bohner Oil Company, Bohner focused most of his energies on Burk Royalty, where he carried most of the responsibility for production, as well as being involved in Burk's pipeline and refining operations. He served Burk Royalty Co. as a vice president and chairman of the board.

Bohner was very active in the community, lending particular support and leadership to the Boys Club of Wichita Falls, for which he served as president and chairman of the board. His support of Cal Farley Boys Ranch, the Boy Scouts of America, and the Future Farmers of America earned him honorary membership in all of those organizations. His lasting legacy, however, is one that he shares with many of his North Texas contemporaries, that of a true entrepreneurial spirit striving to compete—and prosper—in a business dominated by giant corporate powers.

Clyde Bohner was born September 10, 1890, in Kansas City, Missouri, and died June 30, 1971, in Wichita Falls. His wife, Mildred Doris (Reiney) Bohner, died May 21, 1987.

DAVID A. KIMBELL

D. A. Kimbell graduated from the University of Oklahoma with a degree in geology in 1951. Shortly after graduating, he founded Alan Drilling Company, a three-rig North Texas drilling company in 1952 with partner James C. Bohner of Burkburnett. They sold the drilling company in 1973 and he became the exploration manager for Burk Royalty Co. In 1962, he was elected president and took an active role in the management of the company. He held that position until his father passed away in 1976 when he assumed the position of chairman of the board.

The company, under his leadership, evolved from a pioneer of water flood projects in Texas, New Mexico, Oklahoma, and Arkansas in the 1960s and 1970s to an active exploration and production company. The company's exploration activities were concentrated primarily in East Texas, but also included projects in South Texas and Louisiana. In addition, the company was active acquiring producing properties in the Permian Basin.

He guided the company through the uncertainties caused by the adverse legislation creating crude oil price controls, limits on natural gas markets, and windfall profits tax. When the crude oil price collapsed in the mid-1980s, he developed a strategy of survival which allowed the company to prosper during a long period of low prices. His management style encouraged employees to make recommendations and decisions which developed a sense of loyalty and a sense of family among employees. As a result, the company became known for its long-tenured employees and low turnover.

He also developed a strategy that would allow the company to continue to be owned and managed by the Kimbell family for future generations, continuing the entrepreneurial spirit of a family-owned independent oil and gas company. He took great pride in being fair and honest in all his business practices and was well-respected among his peers.

He served as president of the North Texas Oil & Gas Association (now the Texas Alliance of Energy Producers) and on the Board of Governors of the Independent Producers Association of America. He was a member of both organizations for more than 50 years. He also served as president and chairman of the board of the Boys & Girls Club of Wichita Falls and as chairman of the board of its endowment fund. He was on the Board of Regents of North Texas State University in Denton and was active in the affairs of Midwestern State University, co-chairing the President's Excellence Club. He also served on the Alumni Advisory Council for the Department of Geology at the University of Oklahoma.

David Kimbell passed away in February 2013. Burk Royalty Co., Ltd., continues under the leadership of his three sons: G. T. Kimbell II, David A. Kimbell, Jr., and Stan Kimbell.

PITCOCK, INC.

The Pitcock family, which owns and operates Pitcock, Inc., based in Graham, Texas, has been involved in the oil well drilling and production industry for almost a century. Along with interests in oil and gas development and production, the company has investments in ranching and real estate.

The company's roots go back to the late 1920s when Louis Pitcock, Sr., went to work for Jerome McLester, an early oil producer in North Central and West Texas. Louis, Sr., worked for McLester as a tool-pusher and later as production superintendent in the Texas counties of Young, Stephens, Jack, Palo Pinto, Loving, Upton, and Pecos.

In 1945, Louis, Sr., and Ben Rankin, an early geologist in the North Central Texas area, became partners as Rankin & Pitcock. Ed Karper joined them at a later date, forming a company known as Rankin, Pitcock & Karper. In 1954 the partners separated and Louis, Jr., J. Duff, and Roy T. Pitcock joined Louis, Sr., to form Louis Pitcock Drilling Company and Louis Pitcock Operating Company.

The family left the drilling business in 1967 and formed Pitcock, Inc. Louis, Sr., served as president of Pitcock, Inc., until his death in 1969, when Roy T. Pitcock was elected president. Following family tradition, Louis Pitcock III joined the company full-time in 1977 and Roy, Jr., followed in 1979. With the passing of Duff in 2009, Randy Pitcock and Bob Pitcock became partners in the company. The family lost Louis, Jr., in 2013.

Louis, Jr., Roy, Sr., Louis III, and Roy, Jr., have all served on the boards of directors of the West Central Texas Oil & Gas Association (WCTOGA), the North Texas Oil and Gas Association (NTOGA) and the Texas Alliance of Energy Producers. Roy, Sr., is a past president of WCTOGA and Roy, Jr., served as that organization's president in 2000 then as vice president of the Texas Alliance of Energy Producers (the successor organization to WCTOGA and NTOGA). He became chairman of the alliance in 2002.

Pitcock, Inc., is a Texas corporation and currently operates primarily in North Central and West Texas. Pitcock, Inc., sold its drilling rigs in 1968, though the company still operates well-servicing and completion units. The company business now is primarily exploration and development of oil and gas properties. Pitcock, Inc., was an early proponent of secondary recovery, (water floods and pressure maintenance projects) and continues to work to keep up with technological advancements in exploration and production.

With the fourth generation coming of age, the Pitcock family intends to continue as a family owned and operated business.

Above: Louis Pitcock, Sr., 1898-1969.

Scully Exploration, LLC

As a CPA, Noel B. Scully began his career counting other people's money. Today, he spends time counting the black ink numbers of his balance sheet. Scully Exploration, LLC, is now a leading Texas oil and gas exploration firm. It began in 1978 when Scully, owner of a certified public accounting firm, began investing in client-owned oil wells. Their success then became his, and Scully realized he was making more from energy investments than his CPA practice.

Today, Scully Exploration is a successful oil and gas exploration company with annual gross revenues expected to reach $50 million in 2013. However, the road to success has had its ups and downs, including a steep decline in 1984 when the bottom fell out of the energy market and Scully went bust. However, what others saw as a tragedy, Scully saw as an opportunity, turning to the private sector to negotiate the purchase of oil-rich acreage other wildcatters had lost. On November 20, 1991, Scully and then-partner, Michael C. Smith, brought in the Threadgill No. 1 in Caldwell County, in District 1, producing 475 barrels of oil in eleven hours. Flowing freely through four-and-a-half inch casing, the Threadgill No. 1 potentialed 1,036 barrels per day, becoming the largest producing well since 1927.

Above: Noel Scully.

10

DRILLING REPORTS

SCULLY AND SMITH HIT BIGGEST VERTICLE WELL IN 64 YEARS

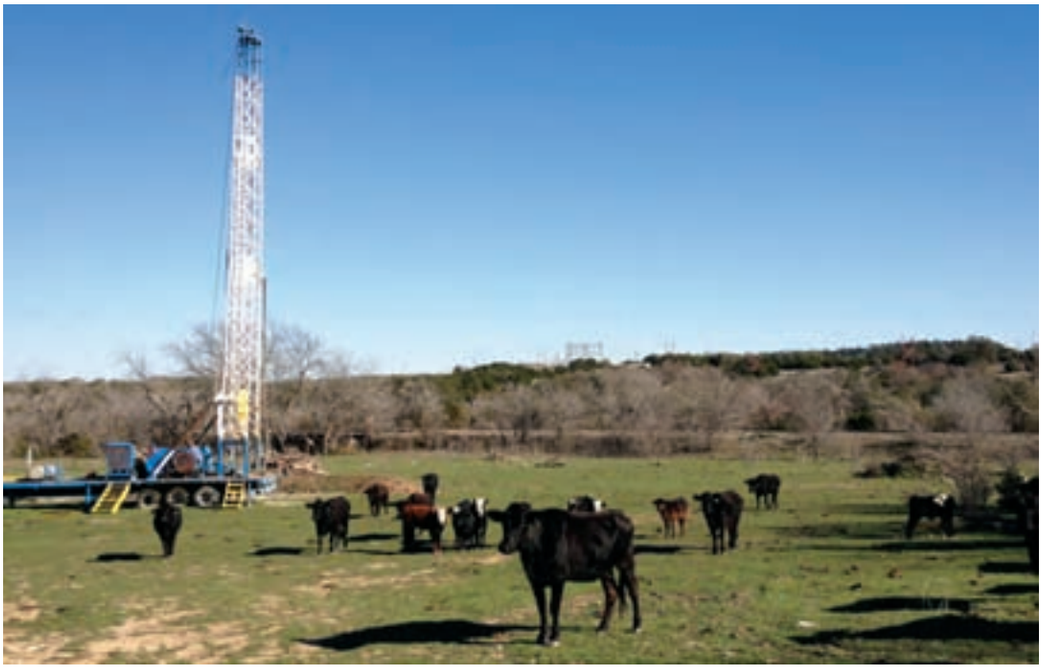
WELL SIGHT THREADGILL #1

Scully Energy has had great success drilling fault/fracture prospects. Note: the Threadgill #1 well, the largest producing well since 1927, came in at 1036 bopd ! – second only to a Texaco well that came in at 1890 bopd. The "Nash Creek" Project is considered a "mirror image" to that of the Threadgill #1 well area.

In 2004, Scully decided to return to an area in several Central Texas counties where, in 1990, he had abandoned drilling operations after hitting seven dry holes. Scully discovered this remote wildcat project, located in an area the Texas Railroad Commission had long-ago classified as nonproductive, after learning about a well drilled in the 1920s that had an excellent oil show. A second well drilled in 1949, Scully learned, had been plugged due to low natural gas prices. Based on activity from these two wells, Scully Exploration began leasing oil and gas rights along a geological formation known as the Lampasas Arch. After drilling two wells, Scully knew he was on to something, but never anticipated the field would grow to massive proportions.

In the domestic exploration environment, a field of six to eight producing wells was considered a large find. Compare that with the more than thirty wells successfully drilled and anticipation of another 200 to 400 to be drilled, and you come up with the largest discovery ever in the four Texas counties of Bell, Burnet, Coryell, and Lampasas.

One industry professional described Scully's find as the "motherload." The play along the



Lampasas Arch became known as the Heart of Texas Field, and Scully, in an effort to define the field's limits, had struggled to drill a dry hole.

Production estimates for the Heart of Texas Field could exceed 30 billion cubic feet of natural gas. To date, Scully Exploration had drilled approximately fifty wells in the play with around eighty percent with multiple pay zones representing the first commercial gas wells in both Bell and Lampasas Counties. The limits of these fields have yet to be delineated, and no one anticipated they would be as extensive as they have turned out to be. Total leasehold acreage in the Heart of Texas Field is now approaching 18,000 acres, and Scully Exploration currently has in excess of 150 proven undrilled locations.

In 2013, Scully Exploration completed its first commercial oil producer, with oil shows evident in several additional wells in zones that will be tested. More than 13,000 acres have been leased and more than thirty-five wells have either been completed as oil or gas wells or capable of commercial completions. All of these wells have virgin reservoir pressures, as this play has never been exploited by previous production.

Scully Exploration, LLC, is the pioneer in this play, and has conservatively identified 10 million barrels of recoverable oil and 10 billion cubic feet of natural gas from wells that are less than 4,200 feet. Scully prefers shallow drilling as investors receive their payout more rapidly and with a higher return on investment.

One Heart of Texas well test indicated as much as 8.2 MMCFGPD-calculated absolute open flow, an astonishing result at such shallow depths. The remoteness of the field encouraged Scully to acquire all drilling, completion, and other peripheral equipment to drill in the region as contractors and support-service companies could not justify the long distance moves involved in servicing the area.

The infrastructure was not in place, and finding a midstream company to transport the company's natural gas became a challenge. Scully Exploration eventually inked a deal with Lampasas Midstream to build the necessary infrastructure to support the transportation of natural gas.

At age sixty, Scully looks with satisfaction at a business built through careful research and the courage of a battle-hardened general. Since beginning his oil exploration career in 1978, Scully has drilled more than 360 wells and recorded more than 115BCF of natural gas and 13.55MM barrels of oil in Texas. In addition to running a successful oil and gas exploration company, he is the proud father of two grown daughters and four beautiful grandchildren, representing Scully's greatest entries on the positive side of the ledger.

TerraFina Energy

Unlike many in the petroleum industry, Marsha Hendler did not grow up in the oil patch or in a family with black gold running through its veins. From her very unconventional launch she never imagined she would pursue a career in the petroleum industry until she met several operators and service company owners who hired her to handle their marketing.

As in any marketing project, Hendler studied as much as possible about the industry in order to help increase market and promote their companies. The more she learned the more she wanted to know and soon found herself up to her eyebrows in publications recounting the history and inner workings of an industry that has played a pivotal role in the state's economy, culture, and history.

With urging from several wildcatters and operators, Hendler applied for an operator's license from the Texas Railroad Commission, and when the commission granted the license TerraFina Energy was born. The San Antonio-based energy company develops oil and natural gas resources. TerraFina owns numerous oil and natural gas wells in Central Texas with new ventures in South Texas and the Permian Basin. Hendler, president and chief executive officer, learned everything she could about the oil business, with support from several wildcatters as her mentors' Hendler, who experienced the "glass ceiling" that has limited so many women in the corporate world, found no such ceiling as owner and operator of her own company. Success in the oil and natural gas industry, known for its good-ol'-boy culture, is measured and rewarded by a single overmastering standard—results.

Above: Marsha Hendler.

Below: Marsha Hendler and Sheri Noland.

Hendler quickly realized the single obstacle to success she would need to overcome would be her own reluctance to grab for the brass ring. The company's success, however, would have come much harder and taken much longer had it not been for the support of Hendler's wildcatter mentors, who spotted her determination, nurtured it, and opened doors to facilitate her success.

Initially Hendler would collaborate with other operators in their project, but her success would come from stepping out to operate and direct her own field projects. Sheri Noland, who started as an investor in TerraFina Energy and took every opportunity to learn more about the company, joined TerraFina as vice president, working to open up oil and gas investments to women. TerraFina Energy intends to continue in this endeavor while ensuring future success as an independent operator and with an eagerness to contribute to the vital Texas oil and natural gas industry.

MKS Natural Gas Co.

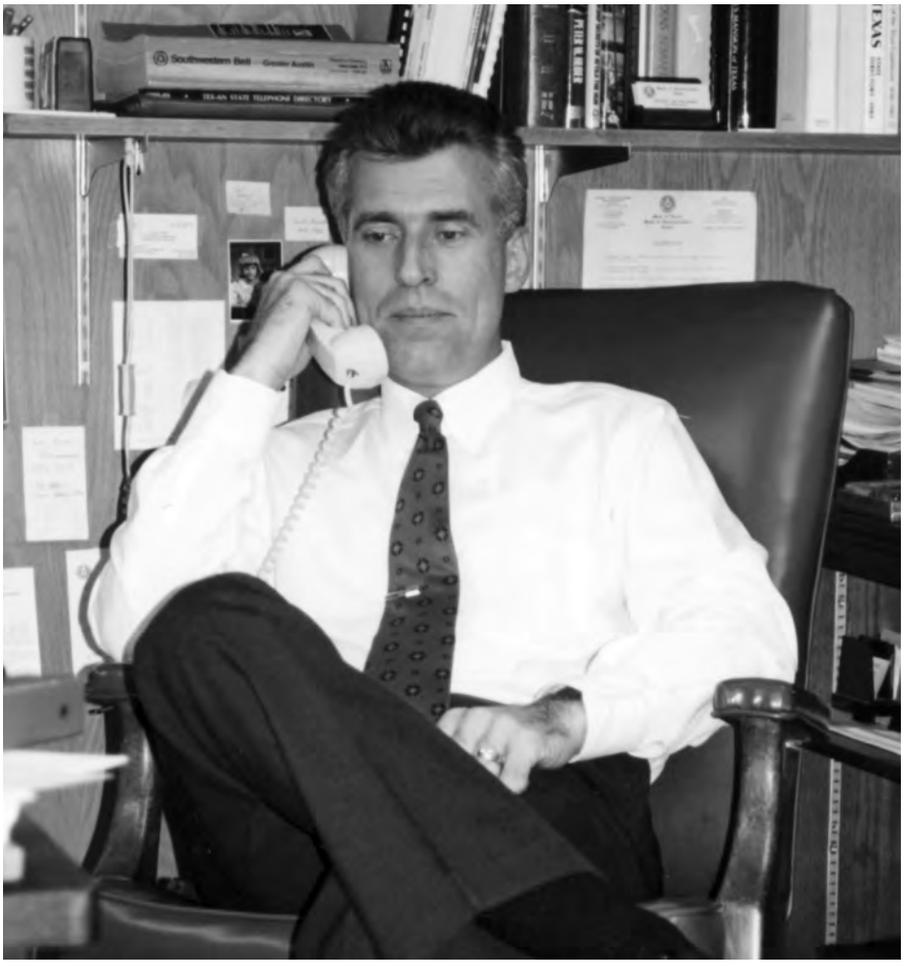
After Ric and Mary Ann Williamson graduated from the University of Texas and were married, they assumed their future would be occupied in large part by operating a muffler shop in Abilene that they planned to purchase. Once those plans fell through, Ric took a job as a contract landman and spent most of his time putting together oil and gas deals in the Fort Worth Basin.

His travels often brought him to Weatherford, and Ric quickly realized that this small Texas town west of Fort Worth would be a great place to work, buy land, and raise a family. In the late 1970s, Ric started a business known as RAW Energy Corporation, jointly owned with Mike Richards and Bill Arledge. Unfortunately, the industry went through rough times in the 1970s, and RAW Energy eventually closed its doors. So Ric, a third-generation oilfield worker, and Mary Ann, a certified public accountant, formed MKS Consulting Corporation, now known as MKS Natural Gas Co.

In the 1980s, the company leased many of its own prospects, drilled using rigs owned by another company Ric formed, and operated the successful prospects. MKS originally focused on drilling and producing, but after the second downturn in that decade, MKS stopped drilling and focused on operating properties owned by MKS as well as acquisitions made from area producers. In that same period, Ric successfully ran for state representative and served the people for thirteen years. When he was in Austin, Mary Ann managed the oil and gas business.

Many early landowners lived in the same community as Ric and Mary Ann, and that contributed to a sense of connectedness as social and church circles sometimes overlapped into royalty owner business. In addition to Richards and Arledge, key individuals included Mark Smith, Tim Mitchell, and Sid Hicks. All started with RAW Energy. Sid, who retired in 2009, remained with Ric and Mary Ann when they started MKS.

Weatherford was a small community when Ric and Mary Ann moved there in 1978. They rented office space at a lumberyard and later built a small office building on North Waco Street. As the company grew, MKS moved into a large building on York Avenue until the company purchased land three miles north of town and built a full office, yard, and shop. This rural location continues to be home to MKS.



Ric Williamson.

Today, MKS operates stripper wells in Parker County and historically has provided most of the well service required, including workover and plugging. Many wells are on small gathering systems, which MKS also owns and operates. A small group of family and friends form the majority of MKS' working interest owners.

At its peak in the early 1980s, the company employed forty, and for many years payroll hovered at around twenty. The company transitioned into an operating company only, and today the company is run by two people as all operational work has been contracted to an affiliated company. Mary Ann now serves as president and owner, and eldest-daughter Melissa handles all legal and land work.

Enrich Oil Corporation

Above: Left to right, Allan, Jack, Pat and Lane Frizzell, 1994.

Below: Jack Frizzell, 1984.

Enrich Oil Corporation was founded in 1977, but its origin reaches back to 1950 with my graduation from The University of Texas with a degree in geology and finding my first job in the oil field as a geologist for Delaware Drillers, Inc. in San Angelo. That was my first lucky break in the oil business since the drilling company was owned by Richard King, Jr., a King Ranch heir and adventurous entrepreneur, who assumed that since I was a university grad and a geologist that I was capable of doing everything necessary to run an independent oil business. Thus my real education began and under his five year employ as I learned to lease land, drill and complete wells, and generate drilling prospects utilizing subsurface mapping, not only in Texas but also in the D-J Basin of Colorado and Nebraska (we lived in Denver twice) and in the Powder River Basin of Wyoming (lived in Casper), all being invaluable hands-on learning experiences for a novice geologist. However, in late 1955, Mr. King sold his drilling company and oil production, and again I was on my own but with a greatly enhanced knowledge of the oil field and how it works.

Oil field history of the Frizzell companies began after leaving San Angelo, as recited later under "personal histories," my next seventeen years were spent in various jobs in the oil and uranium business until finally in 1972, after relocating to Abilene, from Denver and after Allan, our older son, graduated Texas Tech University with his geological degree, the time came to fulfill my goal of having a family-owned independent oil and gas company. Thus was born Frizzell Exploration Company with Jack and Allan as partners and geologists, wife Pat as partner and office manager, and son Lane in 1974, after graduating Texas Tech, joining as partner and field operation manager.

From 1972 to 1976, Frizzell Exploration Company drilled 40 wells throughout the West Central Texas area and developed several oil fields having about 3.5 million barrels of reserves, such early success resulting in creation in 1977 of Enrich Oil Corporation. Since that beginning, Enrich Oil Corporation has drilled 485 wells in the Abilene area, completed 137 oil wells and 19 gas wells, has cumulative production of 4.0 million BO plus 3.5 BCFG, and has proven remaining reserves of 4 million BO plus 3 BCFG. The company has drilled and operated properties in several counties of West Central and South Texas and has participated in drilling wells in Colorado, Montana, New Mexico and Utah.

In 1986, Palrich Oil Corporation was formed as a subsidiary of Enrich to develop their Lane Chapel Field, our Paluxy Sand discovery in Smith County. Palrich, operating from Tyler, drilled 75 wells, completed 39 producers, and produced 1.4 million BO plus 3.8 BCFG before selling the production and East Texas operations in late 2009.

More recently, as a result of Allan managing a 3-D seismic acquisition program covering an area in Runnels County within which Enrich had previously produced 2.0 million BO from the Goen Reef (Strawn), the company has completed 10 wells and developed additional reserves of 2 million BO with several undrilled seismic anomalies yet to be explored.

During the past forty years of operation, Enrich has formed or owned interests in several companies, including Frontier Drilling Company, Bilbo Well Service Company, Erdol Resources, Palrich Oil Corporation, Frizzell Investments, and Frizzell Management Company, and is fifty percent owner of Crescent Supply Company, which for the past twenty-three years has actively served oil field operations throughout West Central Texas.

Personal history of key individuals are:

Jack Q. Frizzell: Born June 24, 1923, the second child of J. O. "Tad" Frizzell and Frances A. (Matzen) Frizzell, on a farm north of Weslaco in the Lower Rio Grande Valley of Texas. The family moved into Weslaco in 1929 during the Great Depression, where three more children were born with all five siblings graduating from Weslaco High School by the late 1940s. In September 1942, I joined the U. S. Navy, was assigned to Naval Intelligence as a cryptoanalyst of Japanese encoded radio transmissions, with our unit operating from a base near Pearl Harbor, and at war's end returned home after discharge in December 1945.

My good fortune continued when after enrolling at Edinburg Junior College in 1946 I met pretty Patricia Ann Day, and after being married in June 1947, we entered the

University of Texas to pursue my degree in geology and business administration for Pat. Our first son, Allan Douglas, was born September 7, 1949, and after graduation in August 1950, we moved to San Angelo for my first oil field job, as recited earlier, where son Lane was born in 1951 and daughter Joni was born in 1954. In 1955, I moved my young family to Albuquerque to join in the booming hunt for uranium sweeping across the states of New Mexico, Utah, Arizona and Colorado. After prospecting for U308 in all four states, I found by drilling a promising uranium deposit near Grants, New Mexico, which allowed me to sell out and return to Texas and the oil business. In late 1958, I became manager of the Allison and Prestridge Company in Abilene, a long-time partnership with substantial oil and gas holdings throughout West Central Texas. A successful drilling program resulted in new production and growth of their established production, all of which came to an end in 1964 with the untimely deaths of both gentlemen within a thirty-day period. After closure of that venture, I became an independent geologist-operator and, in spite of the late 1960s oil "bust," managed to find enough oil and gas to survive the industry downturn.

In September 1968, I became president of International Energy Corporation, a subsidiary of Texas American Oil Company of Midland, which required moving my family to Denver in order to become involved in the "Rocky Mountain Oil Boom" generated by discovery of the Bell Creek Oil Field in Montana. The company participated in drilling wells in Colorado, Wyoming, and North Dakota, where we completed a Bakken Shale producer (semi-successfully since we were far too early for horizontal drilling and mega fracing), but the parent company divested of IEC in mid-1972, giving me the opportunity to return to Abilene and start Frizzell Exploration Company, the rest of the story being told herein.

Service and oil industry awards for Jack include becoming Certified Petroleum Geologist No. 923 by the AIPG in 1965, President of West Central Texas Oil and Gas Association from 1977-1979, John Emery Adams Science Award in 1993 and Monroe G. Cheney Science Award in 1999, awarded by the Southwest Section of the AAPG, President of Abilene Geological Society 1977-1978, and Lifetime Member of the Abilene Geological Society in 2003; and Lifetime Member of the AAPG since 1963.

Allan Douglas Frizzell: Born September 7, 1949 in Austin, graduated from Abilene High School in 1967, and upon receiving his geological degree in 1972 from Texas Tech University, became a partner in Frizzell Exploration Company beginning work at a drilling well running samples, conducting drill stem tests and electric logs, and making decisions for running casing for completion or otherwise. Thus his oil field education began, soon thereafter moving on to geological mapping and generating drilling prospects and earning a well-deserved reputation as an oil finder for all of the West Central Texas oil province. Becoming self-taught as an interpreter of 3-D seismic data, his expertise in finding oil and gas was greatly enhanced leading to discovery and development of previously overlooked reserves under some of our producing properties. During his forty-two years with our company, Allan's geological expertise and keen business sense has been an invaluable asset to the growth and longevity of Enrich Oil Corporation.

Above: Jack Frizzell on the Frontier Drilling Company Rig 3 The Lucky Jack, *1990.*

Below: Seated, left to right, Judy Boeshart, Jack and Pat Frizzell. Standing, left to right: Allan and Lane Frizzell.

Top: Left to right, Allan and Jack Frizzell.

Above: Left to right, Allan and Lane Frizzell.

Oil industry awards and recognition of service for Allan are becoming an AAPG Certified Geologist No. 4186 in 1989, IPAA Board of Directors for West Central Texas Region Crude Oil Policy Committee 2003 to 2005, IPAA Crude Oil Policy Chairman 2009 to 2011, Abilene Geological Society President 1977 and 2013, and West Central Texas Oil and Gas Association President 1989 to 1991. He also serves on several community boards and civic organizations for the city of Abilene.

Married to his high school sweetheart, Linda Ruth Long, in May 1970, they are parents of Tad Daniel, now Father Alexander of the Russian Orthodox Hermitage Monastery in West Virginia, and Jill Christen Flores, who with husband, Chano, have grandchildren Jack Allan, Caroline Vallie, and Tad Alexander.

Lane Patrick Frizzell was born September 5, 1951, in San Angelo, graduated from Abilene High School in 1969 and from Texas Tech University in 1974 with a degree in Business. Lane joined Frizzell Exploration Company in 1974, where he started his real learning experience in the oil field by being in charge of well completions and production operations for the company. He soon became proficient in all phases of that work and proved to be a valuable asset to Frizzell Exploration Company and later to Enrich Oil Corporation in both our local operations and East Texas during our Paluxy Sand oil field development.

Lane Frizzell: Married Miriam Holly Lutz, in June 1975, and together had Matthew Patrick, owner of a successful commercial real estate firm in Austin and recently married to Clare Winfrey, and Jennifer Lane, who with Raul recently gave them their first grandchild, Quentin Raul Garcia.

Patricia Ann Frizzell: Born March 29, 1928, in Minden, Louisiana, and during the early 1930s lived with her mother, Helen (Maxey) and father, Sam T. Day, in a tent in the desert near Boulder City, Nevada, while Sam operated a drag line in Black Canyon building Boulder Dam, and later for eight years on Catalina Island while Sam built the harbor breakwater still in place today. During her senior year they moved from Lomita, California, to McAllen for her dad's contract with the Mexican government building a major irrigation project. Pat graduated from McAllen High School in 1945, graduated from Edinburg Junior College in 1947, married Jack on June 21, 1947, and recently they celebrated sixty-seven years together. Pat remains involved with the daily operations of the Frizzell companies, serving as office manager and valued critic of oil ventures proposed by management.

Judy Boeshart: Has been with the company thirty-five years beginning as secretary but soon evolving into her role as financial manager, oil and gas lease and division order specialist, accounting and investor relations manager, and general overseer of corporate affairs. Judy and husband, Thomas Hicks, are very involved with SHOT events and are consistent winners with horses trained by them for competition.

Joni Ann Wood: Partner in Frizzell Investments, was born February 11, 1954, in San Angelo, received her degree in Fashion Merchandising from Texas Tech University in 1976, and is married to Bill O. Wood, a successful oil operator in his own right. Joni and Bill have three children; Britni Ann, Nicholas Owen and Kelsey Catharine, all enterprising young business persons.

PLATITUDES

The greatest rewards for Pat and I over the past forty years of being in the oil business comes from working with our sons and watching them grow from being novices to becoming competent, successful oil men, and also from our longstanding relationships with loyal investors in our drilling ventures. Hunting for oil has forever been an exciting and challenging adventure, but times they are a-changing and fortunately a younger generation of oil finders can utilize the rapidly changing high-tech advances in drilling and production to find more oil than we did. But you still have to find it with the drill bit, so KEEP ON DRILLING!

Jack Q. Frizzell, President

Reed Production, Inc.

Above: Bill Reed, 1972.

Below: The Monroe, August 1983.

Success is not always measured in size. Small, private oil production companies sometimes are more wholesome and happier places than the megliths.

In the case of Bill Reed, a lifetime of hard work and enjoyment contributed most. Born in 1925, Bill grew up a pumper's son, living on a lease near Burkburnett in North Texas at boom time. As such, oil was in his veins as sure as blood. He started perforating in 1949 and started his own business, Bill Reed Perforating Company, in 1961.

Even in times of great adversity, Bill was determined enough to stand up to life and say "Bring it on!" Three heart operations, four months of hepatitis from a stint in Venezuela, Hepatitis C from one of the heart operations, floods, fires, and the usual dry holes played their part in his story. And who can forget the under $3 oil.

But Bill enjoyed the strong sense of ethics and trust that prevails in the small producers. Even today, much business is conducted over coffee in the early morning. Someone would mention starting a new well and needing partners. Someone else would yell, "I'll take a quarter, a thirty-second, or whatever," and it was done.

Luck and hard work always played a part, and Bill was lucky enough that the first well he drilled, the Wimmer, was a good one—most were less than 2,000 feet at the time. Grabbing his wife when he came home that night, he danced around shouting, "We're rich! We're rich!" Even though that was not true, and while there was not much to see at the well, she had to see it anyway. It was very dark, but with enthusiasm running wild, she took off toward the well and immediately fell in the slush pit up to her waist.

Through it all, Bill came out a winner, with help from his son, David, who started working for his dad in 1974, grandsons Clint and Chris, and friends. So, when it was time for him to go, they were able to take over for the next twenty years. These years have been fine, too, adding up to sixty-five good and successful years for the Reed family. Put us all together, and the independent oil companies have contributed much, and still do, to North Texas oil.

David adds, "Reed Production would not exist today benefitting all the investors without my dad's help and knowledge. Last year the 'baton' was passed down to Chris to make his mark on the industry. With a little continued luck and traditions of honesty and fairness, he will build the business forward."

Salida Exploration LLC

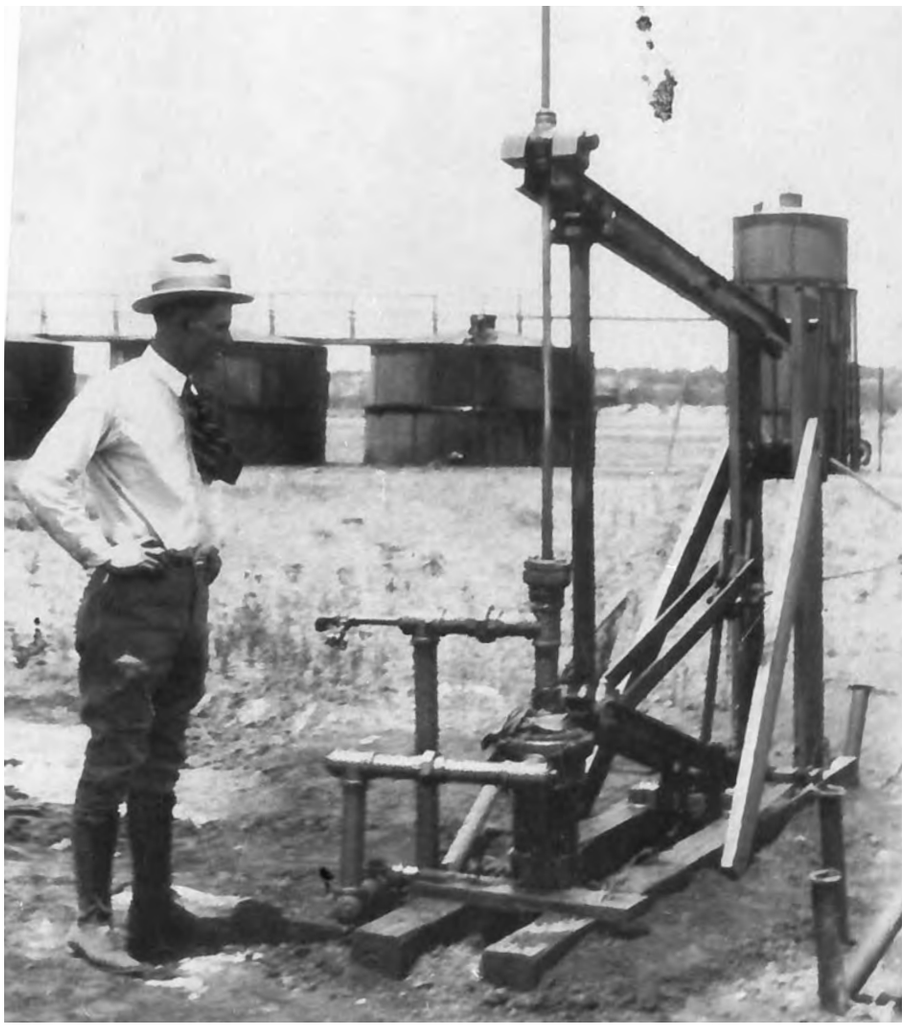
K-W Airborne Surveys

Above: Left to right, unknown, L. A. and Coy Warren in front of cable tool rig.

Below: L. A. Warren next to pumping unit.

Bottom, right: Left to right, L. A. and Coy Warren going over acreage to lease.

Salida Exploration, LLC, is an oil and gas operating company involved in prospect generation, leasing, drilling and producing oil and gas. K-W Airborne Surveys is a company that utilizes a helicopter platform with equipment on board to identify areas where oil and gas accumulations may be found and later brought up to prospect status.



These two companies work in tandem with one another with one working as a reconnaissance tool and the other getting prospects drilled and bringing successful projects into production. Both companies have an office in Abilene.

The owner of these companies, Greg N. King, a geologist, got started in the oil business in 1979. Greg's wife, Leigh, also a geologist, helped where she could in the early days of the business. She worked several years for various drilling companies and operators.

The fascination with oil started much earlier in Greg's family. Greg's step-grandfather was L. A. Warren, an ex-school teacher and operator of spudder rigs. He was not an educated geologist but quickly learned what it took to prospect and make drilling deals. L. A. drilled wells in the East Texas oil field, sold out, and operated shallow wells in Callahan County and sold out again.

Above: Helicopter with exploration equipment mounted for airborne surveys.

Below: Keathley Roan and her father, Greg King.

Bottom, left: Left to right, Greg King and Coy Warren, 1981.

PHOTOGRAPH COURTESY OF THE *CENTENNIAL* AND STAFF PHOTOGRAPHER DON BLAKLEY.

He then lost everything in the depression. He recovered and brought on his son Coy Warren, a geologist. They continued to drill shallow wells in the counties surrounding Abilene.

Coy always said that L. A. could sell a snake a pair of shoes. They operated under the name of Laco Oil Company for many years. Coy became Greg's stepfather when Greg was thirteen and helped Greg develop a fascination with geology. Greg became very interested in the oil business when Coy informed him that it was the only way he knew to make money when you are sleeping.

He told Greg that those pump jacks run twenty-four hours a day; sounded good to Greg. Greg then got his education and degree in geology and after several years of watching wells and turning deals to other operators formed Salida Exploration and K-W Airborne Surveys.

Greg named his company Salida because he met his wife Leigh in Salida, Colorado, when they were there at Texas Tech Geology Field Camp. He continues to operate wells on the Gulf Coast and in Central and North Central Texas. K-W continues to collect and analyze data for future projects in these areas.

These three families have spanned many years in oil and gas exploration and production and will continue to do so with Salida Exploration. The oil and gas industry has been good to these families enabling them to make a good living and provide many benefits for the local communities they are involved in. Greg's oldest daughter has joined him in the business and hopefully will continue the legacy.

Breitling Energy Corporation

Above: Chris Faulkner, CEO.

Breitling Energy Corporation is an independent exploration and production company based in Dallas and engaged in the development of high-probability, lower-risk onshore oil and gas properties. The company's dual-focused growth strategy primarily relies on leveraging management's technical and operations expertise to grow through the drill-bit, while also growing its base of non-operating royalty interests.

The publicly traded company (OTCBB: BECC) features Chris Faulkner as CEO, steering the strategic direction of the company. Faulkner is a high-visibility energy company executive, who often appears on CNBC, Fox Business Channel, CNN International among others, and is quoted frequently in major newspaper and magazine publications. Faulkner believes communication and branding is important, particularly to help the public understand the intricacies of hydraulic fracture stimulation and its importance for America's energy future and national security.

Breitling has operations in the Permian Basin of West Texas, Kansas and Oklahoma, as well as non-operating leases in conventional wells in South Texas.

Breitling's exploration activities are focused on adding profit-generating production to existing core areas and increasing its current non-operation positions. The company's primary goal is to increase shareholder value by increasing the value of acquired properties through a combination of exploration, drilling, and proven engineering extraction practices.

As part of its corporate strategy, the company believes in the following fundamental principles:

- Maximize the value of properties by increasing productions and reserves while controlling cost.

- Maintain a highly competitive team of experienced and incentivized personnel.
- Remain focused in specific regions where the company has a competitive advan-tage as a result of its ever-expanding infra-structure, or where it believes it can ultimately obtain it.
- Acquire properties where the company believes additional value can be created through secondary recovery operations and a combination of other exploration, development, and marketing techniques.

In addition to steering the company's strategy, Faulkner also travels the globe taking part in conferences, giving speeches, accepting awards, and frequently appearing in the media. Because of his extensive travels, Faulkner has a unique understanding of the global energy picture, and is highly sought after to share that information.

Largely due to his outspoken advocacy for "American Oil from American Soil," the company received the award for Excellence in Social Corporate Responsibility at the Southwest Region Oil and Gas Awards held in October 2014. The awards presentation, which recognized top-performing companies in the industry, covers seven regions including Canada.

In 2014, Faulkner released his first book, *The Fracking Truth*, written on a layperson's level about hydraulic fracture stimulation and its effect on American jobs, local and state economies, and outlines future scenarios of how more American crude production will affect foreign markets.

Faulkner also produced a documentary movie called *Breaking Free*, which is an hour expose on the benefits of fracking. The film chronicles shale activities in key production areas of Texas and North Dakota, and features various experts from the industry and academia who discuss the safety, advocacy and positive impacts of the shale oil revolution. The film was directed by independent filmmaker, Robin Bossert.

Breitling Energy Corporation is headquartered in downtown Dallas and can be found online at www.breitlingenergy.com.

Bachtell Oil & Gas, Ltd.

Bachtell Oil & Gas, Ltd. represents the merger of two families raised in the oil patch who collectively have built a successful company based in Longview and operating in East Texas. Although officially the company's history goes back only to 2004, it took several generations of Bachtells and Garretts to lay the groundwork for the company as it exists today.

Above: Charlie's dad, Buck Bachtell 'roustabout' in East Texas Oil Field (second from the right.)

Right: H. U. "Hugh" Garrett (Dorothy's dad), at his desk at Garrett Oil Tools Longview, Texas, in the 1960s.

The two main ingredients in this successful formula were O. O. "Buck" Bachtell and Henry Udell "Hugh" Garrett, who hailed from hearty oil patch stock that preceded them in an industry that has contributed greatly to the success of both Texas and the nation.

Bachtell arrived in the bustling East Texas oil field in the 1930s, a young buck from Oklahoma, who eventually made his way to Gladewater, where he worked long hours on drilling rigs as a roughneck, working his way up years later to become a tool-pusher. His son, Charlie, eventually followed in his father's footsteps, joining the oil business in later years.

Garrett enjoyed a similar background, working long, dirty hours on drilling rigs before finding his niche in oil tool design work. The Texas native received his first taste of the oil patch in 1928 with W-K-M Company of Houston, working as an assistant to the purchasing agent. He eventually went to work for Gearench Manufacturing Company, Shell Refining Company, and Guiberson Corporation of Dallas, where he designed equipment, earning six gas lift patents within his first two years.

After serving in World War II, Garrett signed on with Longview's Olsco Manufacturing Company to manufacture his own specialized gas lift valve. His business soon outgrew Olsco's facilities, so he purchased a Houston plant to house his burgeoning operations, and founded Garrett Oil Tools. By 1949 the company exported its first tool shipment and Garrett found himself leading an organization once dubbed "The World's Largest Manufacturer and Distributor of Gas Lift Valves." Early on in his career, Garrett married Christine Dyche Garrett and raised three children, Betty Walden, John Garrett, and Dorothy Bachtell. He also became grandfather to four boys, Douglas and Garrett Walden and Michael and David Bachtell. Garrett enjoyed success in the petroleum business until his death on October 9, 1979.

In 1970, Charlie Bachtell graduated from the United States Naval Academy and married Garrett's daughter, Dorothy, merging the two families. Charlie and his family returned

to Longview in 1975, and Garrett took his son-in-law under his wing, teaching him the basics of the oil business "from the ground down," challenging Charlie's engineering training. Their partnership continued until Garrett's death in 1979.

Seven years later, Charlie purchased all the oil properties owned by the Garrett Estate. This proved to be unfortunate timing. Soon after Charlie purchased these properties, oil dropped below ten dollars per barrel. Charlie quickly learned about the "bust" part of the oil patch. Through hard work, long hours, and determination he survived the "bust" of 1986. Throughout the following years, he accumulated wells throughout East Texas that seemingly no one else wanted. These were mostly "stripper" wells that made very little oil or gas. Charlie used methods that Garrett taught him early on, but came up with many others on his own. By 2003, Charlie had more work on his hands than he had time.

David graduated from Texas A&M University with a Bachelor of Science degree in petroleum engineering in 1997. After graduation he went to work for Anadarko Petroleum. After six years with Anadarko, David moved back to East Texas and partnered with his father where they created Bachtell Oil & Gas, Ltd. in 2004. David is currently the vice president of operations.

Michael Bachtell graduated from the United States Air Force Academy in 1995. After graduation he was accepted into pilot training and became an A-10 fighter pilot. In 2004, Michael became part owner in Bachtell Oil & Gas, Ltd. After fourteen years as a pilot and pilot instructor, Michael joined Bachtell Oil & Gas, Ltd. full-time in 2008. Michael is currently the vice president of land.

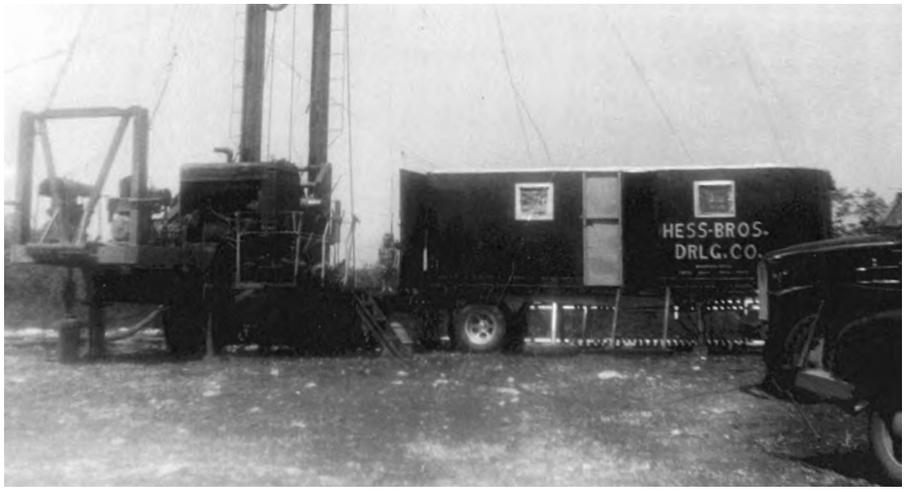
Charlie and his sons generally continue the same successful recipe today. They buy wells and improve production. When the workload becomes too much, they sell some properties. Charlie and his sons feel very blessed that they are able to work together and carry on the family tradition of working in the oil patch.

Left: Michael, David, and Charlie Bachtell.

Below: Michael and David Bachtell at job site.

Jerry Hess Operating Co.

Jerry Hess Operating Co. began in 1980 in the home of Monica and Gerald "Jerry" Hess of Muenster, Texas. Through the years, the company evolved into a successful business that, while focused on oil and gas production, development, and operations, has remained true to its roots as a family owned company.



The Hess family's involvement in the oil industry spans several generations. Jerry spent his early years, starting as a roughneck in the 1950s, for Hess Brothers Drilling and Production Company owned by his father and uncles. Later, in 1961, he drilled for Felderhoff Brothers Drilling, learning every aspect of the oil industry.

Having paid his dues, Jerry decided to purchase a drilling rig and formed Jerry Hess Drilling Company, operating from home. Jerry handled permitting, filings and paperwork, along with coordinating drilling, completion, and operation of wells, while Monica handled the books and raised four children. They eventually decided to focus on the operations side of the business, forming Jerry Hess Operating Co. They worked from home between 1980 and 1993 until moving the office to the home of daughter, Laura Pagel, who came to work for them in 1993. Laura's kitchen table served as the company's first conference table.

Monica completely turned over all the bookkeeping duties to Laura in 1996, and from that point on Jerry and Laura ran the business with hired contract labor for the field work. As the business grew, the need for space grew, and in 1998-1999, the company converted the front half of an old shop into its first official office.

Following the move from Laura's home, Jerry and Monica's oldest daughter, Penni Danglemayr, began working for the company to assist with paperwork at the end of each month. As the company grew, so did the paperwork, and the once-a-month job evolved into a part-time and then full-time job. The spare office, originally a nursery for Laura's children, became Laura's office, while Penni occupied the front desk.

By this time, most of Laura's and Penni's children had reached school age, allowing the two moms to concentrate on work. But after school, the kids spent much of their time at the office playing, sitting on grandpa's lap, and providing background for clients who called the office. The business grew along with the families, and everyone involved felt doubly blessed.

In April 2006, Jerry decided to venture into the saltwater disposal business, forming J & B Transport, LLC, with Jerry Hess Operating Company owning a sixty percent share. Following several partnership changes, the company became known as J & P Transport, LLC, with Jerry Hess Operating Co. owning 60 percent, Paul Swirczynski 10 percent, and GPLR Holdings 30 percent. GPLR Holdings is owned by Jerry and Monica's children: G–Glenn Hess, P–Penni Danglemayr, L–Laura Pagel, and R–Ryan Hess. The four siblings have invested with their father since July 1993. To handle the administrative side of the new business, the company set up another desk in the front office and Tina Hess (Ryan's wife) came to work, handling books for J & P Transport, LLC.

Prior to that point, Quintin Hess (Jerry's brother) and Quintin's son, Chris D. Hess, handled field operations for the company. Quintin, who had worked for some of the major oil companies overseas, had acquired considerable knowledge about drilling and completions, while Chris learned the business growing up in the oil patch. Quintin worked for the company until 2011 when his health declined. He passed away in April 2012. Chris continues to work for the company as a field supervisor. In 2005 the company hired Jason Brogdon to assist with field operations and supervision, and, to date, Jason and Chris coordinate, supervise, and oversee all aspects of field operations.

As the operating and trucking business continued to grow, the company experienced a need for more space, so in the summer of 2008, Jerry Hess Operating Co. moved to new offices at 310 North Magnolia Street. The new office has more space, an actual conference room, and room to accommodate future growth. In December 2011, Penni left the company to spend more time with her family. Today, all administrative aspects are handled by Laura, Tina, and Carol Koelzer, who joined the company in May 2010.

Prior to that, in January 2009, Glenn and Ryan came to work for the family business along with Laura's husband, Joe Pagel. Ryan and Joe continue to work for the company, mainly supervising and working at the commercial disposal well, which operates round the clock. Glenn decided the oil and gas business was not for him and left to pursue other interests.

Jerry Hess Operating Co. currently operates wells throughout Cooke, Montague, Wise, Parker, Clay, Jack, Denton, Palo Pinto, Callahan, Comanche, Eastland, Runnels, and Stephens Counties. It also owns a non-operated working interest in dozens of wells in various Texas counties, and has invested in exploration in other states.

The upswing in oil and gas production in recent years bodes well for the Texas oil and gas industry, and as a fifth generation of Hess family comes of age the future looks equally bright for Jerry Hess Operating Co.

Medders Oil Company, Inc.

Right: Tom Medders, 1978.

Below: Tom Medders at wellsite.

Tom "Bryant" Medders III, co-owner and president of Medders Oil Company, Inc., is a third generation oilman with roots deep in the Texas oil patch.

In 1839, architect, soldier and adventurer, Charles Grandison Bryant, and his eldest son, Andrew Jackson "A. J." Bryant, sailed from Maine to Galveston. Mexico was slow to accept Texas' independence, and Bryant's years in the new republic were occupied with architecture and military service. By 1840, Bryant had been hired by the San Luis Development Company as an architect and builder. He also joined the Galveston Artillery Company and the Galveston Fusiliers.

A. J. enlisted in the Texas Navy, established to protect supply lines between Texas and New Orleans. At fourteen, while serving as a midshipman on the Texan sloop-of-war *Austin*, A. J. was severely wounded in the 1843 naval Battle of Campeche. The next year, he was lost at sea when the schooner, *Galveston*, sank.

C. G.'s wife, Sarah, and their four remaining sons joined him in Texas. C. G. continued his building trade and military service, and another son and a daughter were born. St. Mary's Cathedral in Galveston, designed by C. G. in 1847, stands as an example of his skills as an architect and builder. Between 1849 and 1850, C. G. served as a major in the Texas Rangers. In January 1850, C. G.'s Ranger duties required him to travel from Corpus Christi to Austin. While en-route, forty-six year old C. G. was killed and scalped by an Apache raiding party. In 1871 the Texas legislature issued lands in Montague County to the heirs of C. G. Bryant and A. J. Bryant in recognition of their status as Republic of Texas immigrants and for their service.

Tom Bryant Medders was born in 1896 in Dallas, the son of

Charles Grandison Bryant's granddaughter, Helen Bryant Medders, and her husband, William Thomas Medders. In 1917 at age twenty-one, Tom headed west, traveling 120 miles and settling in Wichita Falls. Tom was well established in Wichita Falls in the summer of 1918 when the No. 1 Fowler well at the north edge of Burkburnett was completed with a flowing potential of 2,500 barrels per day.

In 1917, Tom opened a tire store in Wichita Falls. He bought his first oil lease, a ten acre lease in Wichita County, within a few months of opening the store. Tom drilled two successful wells and sold the lease by the end of the year. He quickly sold the tire store and devoted his energy to the oil business. His name is now synonymous with North Texas oil exploration and development.

During the mid and late 1920s, Tom focused exploration activities in northern Archer County, south of Wichita Falls. He drilled more than fifty "dusters" before hitting oil in the 1920s. Tom worked the East Texas oilfields in the early 1930s, and used techniques learned there on North Texas leases. In the late 1930s and 1940s, Tom successfully completed numerous wells in Wilbarger, Clay, Montague and Wise Counties. Tom's "Hancock" leases in northern Archer County, completed in the Vogtsberger formation, produced over a million barrels of oil.

Left: Tom B. Medders, Jr.

Below: Tom Bryant Medders III.

In the 1940s, Tom took up ranching in addition to his oil exploration enterprise. Starting with a 500 acre ranch south of Wichita Falls, he and his son, Tom B. Medders, Jr., established the Tom B. Medders & Son Lake Creek Ranch and raised registered Hereford cattle on lands that eventually covered over 40,000 acres in Archer, Clay and Montague Counties.

In the mid 1950s, after graduating from Southern Methodist University School of Law and a stint as a trial judge advocate in the Air Force, Tom, Jr., joined Tom in the oil business. Father and son formed the partnership Medders Oil Company. Among their many successful ventures was participation in the Taubert, Steed, Gunn & Medders discovery and development of oil on the Burnett 6666 Ranch in King County.

The partners sold their interests in the Burnett 6666 Ranch oil leases in the late 1970s and in 1980 leased over 100,000 acres and made the first oil discovery on the Pitchfork Ranch in King and Dickens Counties. After Tom's death in 1983, Tom, Jr., continued the business "Medders Oil Company" as a sole-proprietorship and continued to explore and develop oil on the Pitchfork Ranch. Tom, Jr., died in 1990 and his widow, Rosemary Medders and the couple's son, Tom B. "Bryant" Medders III, continued the business and the business name.

Rosemary incorporated Medders Oil Company, Inc., in 1996. She served as chairman of the board until immediately before her death in 2008 and Bryant has been president since the company's incorporation.

The 1990s were lean years for Medders Oil Company, Inc., and dry holes outnumbered producing wells by more than two to one. In late 1999 and early 2000, Bryant ended the dry spell by successfully completing three consecutive wildcat wells. The wells sparked drilling activity that continues today. Combined with the wells drilled by Tom, Jr., the Medders family has produced almost ten million barrels of oil from wells on the Pitchfork Ranch.

In 2004, Bryant acquired a lease from the Burnett 6666 Ranch in King County. The first well he drilled on the 6666's resulted in a producer. Bryant named the discovery the Legacy (Tannehill Sand) Field. To this day, it has produced over three-quarters of a million barrels of oil.

The Medders family's generous contributions to their community and industry are extensive. Examples include Tom Medders' participation in establishment and lifelong support of the North Texas Easter Seal Rehabilitation Center. Now known as the North Texas Rehabilitation Center, Bryant continues his grandfather's work as a life director. Tom, Jr., served as president of the Independent Petroleum Association of America (IPAA) from 1971 to 1973, at that time the youngest oilman to ever lead the organization. He also served as president of the North Texas Oil & Gas Association, and he and Rosemary established the Rosemary and Tom Medders, Jr. Foundation.

Medders Oil Company, Inc., with offices in Wichita Falls, is owned by Bryant and his sister, Marilyn Winters. Marilyn lives in Houston, not far from where Charles Grandison Bryant landed almost 175 years ago. Bryant lives with his family in Wichita Falls in the same neighborhood where in 1917 his grandfather made his home.

Basic Energy Services

Basic Energy Services, founded in 1992 in the Permian Basin of West Texas, has grown into one of the largest well site service companies in the United States, expanding its geographic reach while adding to its impressive array of services that assist clients throughout the entire lifecycle of the well.

The company is committed to remaining a leader in the oil and gas industry by providing a comprehensive range of well site services fundamental to establishing and maintaining the flow of oil and gas. Its services are essential to exploration and production companies throughout each phase of the well, from drilling, to completion and remedial services, to maintenance throughout the well's productive life, to plugging and abandonment.

Technology plays a key role in Basic's ability to meet its clients' needs, as the company continually evaluates new technologies to improve productivity and the quality of its services. The company supports its services with one of the industry's most modern well servicing fleets, and its trucks are equipped with the latest GPS satellite tracking equipment to accelerate response times in emergencies.

Basic Energy Services maintains an extensive range of equipment suited to the unique requirements of each market. This equipment includes over 900 fluid service trucks, more than 3,000 frac tanks, 70 disposal wells, pressure pumping units with a combined 291,000 hhp, rental and fishing tools equipment, a fleet of 12 drilling rigs and more than 400 well servicing rigs.

The company's extensive geographic footprint and diversity of services allows its customers to access its well site solutions on a regional or national basis. Its "lifecycle" exposure gives Basic the ability to reposition equipment to its established business presence in the busier markets, whatever they may be.

The company's operations cover approximately seventy percent of the existing oil and gas production in the United States. Basic has more than 5,500 employees working at more than 100 service points throughout the major oil and gas producing regions in Texas, Louisiana, Oklahoma, New Mexico, Arkansas, Kansas, the Rocky Mountain States and the Appalachian region. The company strives to maintain its exposure to the broadest possible portion of the oilfield services market, with a customer base that includes more than 2,000 active oil and gas producers with more than 900,000 existing wells.

Basic provides a comprehensive range of expertly executed services managed by local people who have worked and lived in their regions for years. Diversified services for the life of the well include drilling, completion and remedial services, well servicing, fluid services, water recycling services, plugging and abandonment, and well site construction.

With its employees each year working more than 10 million man-hours and driving more than 100 million miles, an effective safety and accident prevention program is essential to the company. With that in mind, Basic Energy Services has instituted its Basics-to-Success training program to make sure its people have the proper safety training and environmental courses to meet the company's high standards.

Basic also believes in caring for the environment and seeks to be a leader in environmental performance. As a reflection of that commitment, the company has twice received Safety

and Health Achievement Recognition Program (SHARP) awards from the New Mexico Occupational Health and Safety Bureau. The program recognizes employers who commit to management of health and safety that goes beyond mere compliance and embodies the principles of continuous quality improvement.

As part of its commitment to the environment, Basic uses a fleet of LNG trucks primarily for water hauling. This cleaner-burning fuel delivers a twenty-two percent decrease in greenhouse gas emissions. Basic also provides environmentally friendly water treatment services that efficiently recycle water, reducing the number of trucks needed for off-site disposal while increasing productivity.

Taking an active role in the communities in which it operates also is important to Basic. The company has established long-term relationships with community leaders and townspeople, and has established a high standard of service through support for youth organizations and volunteerism.

The company's footprint has grown consistently throughout its history, and it has developed a solid reputation among U.S. oil and gas operations. Since 2003, the company has completed approximately sixty acquisitions that have significantly expanded its operational footprint as well as its service fleet capabilities. Basic traditionally enters a new market or service by acquiring a well-positioned company as the platform upon which to build. That allows the company to expand on that local reputation with additional investments in new equipment.

Basic Energy Services is built to weather the cyclical nature of the oil and gas business, and that strength will help it help its customers. The company will continue to keep its eyes on the horizon even as it maintains its status as one of the industry's leading well site service companies. In doing so, it will continue to meet its objective of helping as many customers produce as much oil and natural gas as safely, responsibly, and cost-efficiently as possible. As exploration and production operators drill new wells and work to keep old wells on production, Basic Energy Services plans to remain a trusted source of well site services.

Larance Engineering Company

Lane Operating Company

Larcoe, Inc.

A. Lane Larance, Owner/ Operator/ Entrepreneur

These four corporations evolved as A. Lane Larance became an oil and gas entrepreneur as an industry consultant. Preceding the consulting venture was twenty years of experience with a major oil company and two independents.

Lane graduated from Louisiana Polytechnic Institute in June 1954 with a petroleum engineering degree and quickly accepted an offer to work for Magnolia Petroleum Company. He had worked for Magnolia the previous summer as a roustabout in its sour-gas-producing area near Luling and the Guadalupe River.

He later worked in Four Corners, New Mexico, as a roughneck on a company-owned drilling rig as part of a crew that lived in Portales, New Mexico. Magnolia required that every new engineer have three to four months experience as a roustabout and roughneck before entering its Petroleum Engineering Department.

In October 1954, Lane transferred to Morgan City, Louisiana, and classified as a junior petroleum engineer to work in the offshore operations of the MCN (Magnolia, Continental and Newmont) Company. Magnolia was the operator and Lane held titles of junior drilling engineer and area drilling engineer.

Much drilling activity at that time was thirty miles south of Morgan City in the offshore areas of Eugene Island, Ship Shoal and South Pelta. Lane and toolpusher(s) usually made the transfer by speedboat from Morgan City down the Atchafalaya River into the Gulf of Mexico. This trip was almost always exciting as the native skippers contended with changes of tide, fog and rain as well as river traffic and uncharted sand bars. Excitement turned to tension when the fog became so dense deckhands had to ring a bell to announce the boat's position. He worked seven day tours, living on a Navy YF barge converted to a drilling tender and anchored to a drilling platform.

In the spring of 1956, Lane suffered appendicitis while working on a self-contained platform in the Gulf of Mexico. The weather was unsuitable for travel by speedboat, so he was transferred to a converted shrimp boat used as a stand-by boat, transported to a point behind a near-shore island, and rushed by speedboat up the river to Morgan City. There an ambulance waited to deliver him to the hospital.

In June 1956, Lane transferred to Midland and worked with Magnolia's drilling operations in the Permian Basin and the Four Corners area. On January 1, 1960, when Magnolia Petroleum Company became Mobil Oil Corporation, Lane transferred to Wichita Falls, where he assumed responsibilities as production engineer, drilling and completion foreman, and senior petroleum engineer.

In October 1963, George W. Graham, Inc., hired Lane to serve as operations manager. In October 1968, the L. T. Burns Estate hired him as manager of secondary recovery operations.

Above: Magnolia Petroleum Company's Brown-Bassett No. 1, Terrell County, Texas, 1957-1958. Left to right, A. Lane Larance, area drilling engineer and Paul McNeil, toolpusher review plans for this discovery well.

Right: A. Lane Larance, president and CEO for Larance Engineering Company, Lane Operating Company and Larcoe, Inc.

In 1974, with twenty years experience in the oil and gas industry, Lane capitalized on an opportunity to become his own boss as a consulting engineer. Shortly thereafter, Lane incorporated the business as Larance Engineering Company. With headquarters in Wichita Falls, the company soon had thirty employees and provided consulting services to Taubert & Steed, L. T. Burns Estate, Bridwell Oil, Perkins-Prothro, Medders Oil Co., Dillard Oil Company and others. The business grew so diversified and widespread that it became desirable to move key personnel on short notice. In 1980, Larance Engineering Company bought a Cessna 421 and hired an experienced pilot, Gobel Nash. Subsequently, they sold the Cessna and purchased a used KingAir 200.

In 1980, Larance Engineering Company was asked to supervise the drilling, completion and operations of approximately thirty wells in Neuhoff Field in Wood County. An office was established in Longview and consulting operations were expanded to include the Arkansas-Louisiana-Texas area. As the development of the Neuhoff expanded to 3,000 BOPD and 3-5 MMCFPD, the processing of casinghead gas and the marketing of liquids recovered became desirable.

Therefore, A. Lane Larance, petroleum engineer and Doug Coe, chemical engineer formed Larcoe, Inc., with Lane named president. Larcoe, Inc., became the operator of a leased processing plant, processed the casinghead gas and managed the processing plant and the sale of residue gas and liquids.

Larance Engineering Company and Larcoe, Inc., later transferred the Neuhoff Field operations to others. Lane then purchased Coe's interest in Larcoe, Inc. and invested in oil and gas development projects in North Texas.

In 1992 the decision was made to separate field operations from the technical side of Larance Engineering Company. The technical side of the business included the engineering and geological work, and Lane was recognized as a registered professional engineer in Texas. A new corporation, Lane Operating Company, formed in order to manage drilling, completion and operating business for clients. This business covered operations in North Texas, East Texas, South Texas, Southern Arkansas, Northern Louisiana and Southern Oklahoma. Lane was designated as president, with the business headquarters in Wichita Falls, Texas.

For more than thirty-seven years, these three corporations have provided quality services, knowledge and personnel to develop prospects, drill and complete wells, and operate producing properties.

Lane and wife, Mary, have been blessed with seven children, eleven grandchildren and nine great-grandchildren. He states, "We are eternally grateful for our experiences with our family."

Above: Lane Operating Company's Jameson Strawn Unit Well # B-29, Coke County, Texas. A. Lane Larance and workover unit's crew review plans to complete this well.

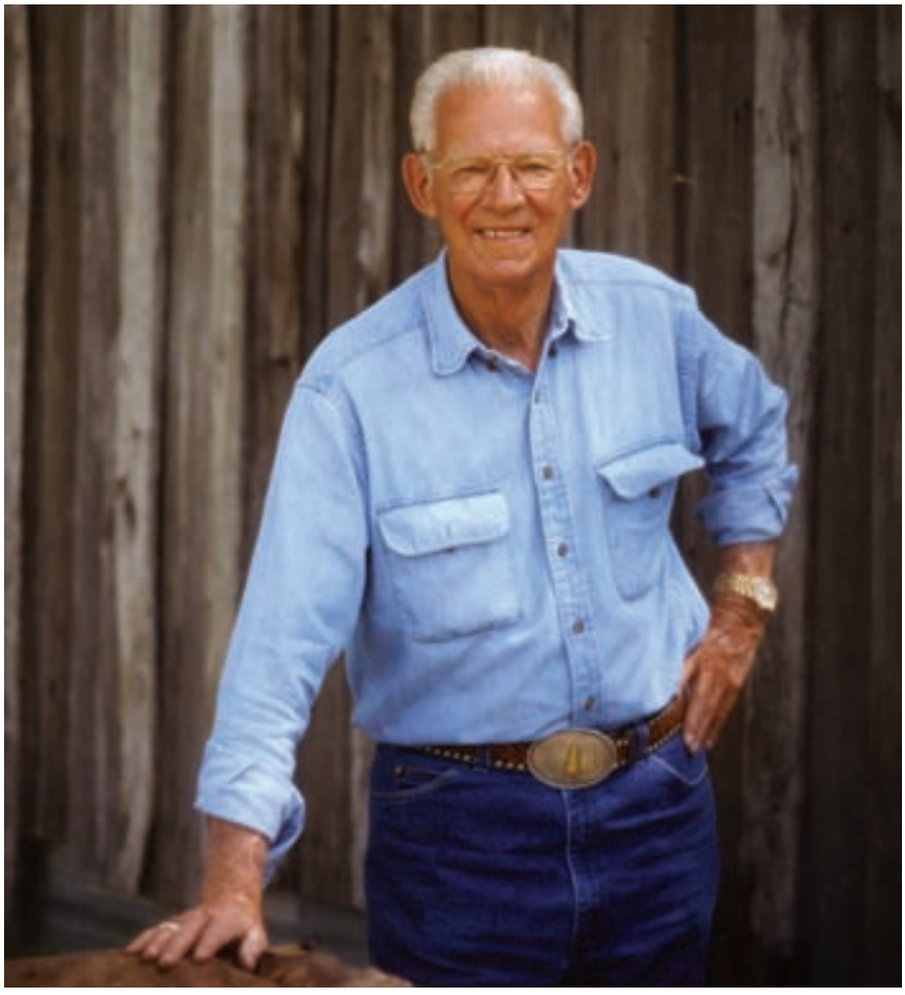
Below: Lane Operating Company's Edwards #4, Clay County, Texas. The drilling rig attempts to extend oil and gas production in the Buffalo Springs, South (Ellenburger) Field.

Ryder Scott Oil Company

Above: Producing well and drilling development, Denton County, Texas.

Below: John N. Moffet.

Ryder Scott Oil Company of Wichita Falls was founded by John N. Moffet, whose roots as owner and operator of oil and gas exploration company began on November 3, 1961, with the formation of Moffet Oil Company. Prior to this date, Moffet started in the oil and gas business in Midland, Texas, in 1945 as production and drilling superintendent for Cascade Petroleum Company of Fort Worth, Texas. His responsibility was oversight of company-owned rigs and the production found as a result of this drilling. He was transferred to Wichita Falls, Texas in 1957. Four years later, Cascade sold to Pure Oil Company. This resulted in his formation of Moffet Oil Company. Three years after starting the company, Moffet merged his oil and gas exploration firm with Ryder Scott Management Company, a subsidiary of Ryder Scott Engineering.



The resulting company, operating under the name of Ryder Scott Management Company, for the most part contracted with owners of oil and gas leases to operate and produce their properties and, on occasion, drilled on company-owned leases. For success, it relied on its operating expertise in Texas, Oklahoma and New Mexico.

In the mid-1960s, Ryder Scott Engineering moved to Houston from Wichita Falls to continue the consulting engineering firm. Moffet and two Ryder Scott Engineering owners continued to own and operate Ryder Scott Management Company.

In 1971, Ryder Scott Management Company drilled its first gas well in the Fort Worth Basin, a Boonsville Bend Conglomerate producer with seven pays. This well still produces to this day. The well, the Marie Waggoner No. 1, began a leasing program followed by a drilling program that exists today. In the 1980s, Ryder Scott Management Company was the second largest producer of gas, trailing only Mitchell Energy, in Wise and Denton Counties in Texas.

On July 8, 1980, Ryder Scott Management Company changed its name to Ryder Scott Oil Company because, by this time, Moffet was for the most part drilling and exploring for his own benefit rather than those of clients. In fact, the company was operating only one property in which the company did not own an interest. Later that same year, on October 22, 1980, Moffet bought out the two remaining partners of Ryder Scott Oil Company.

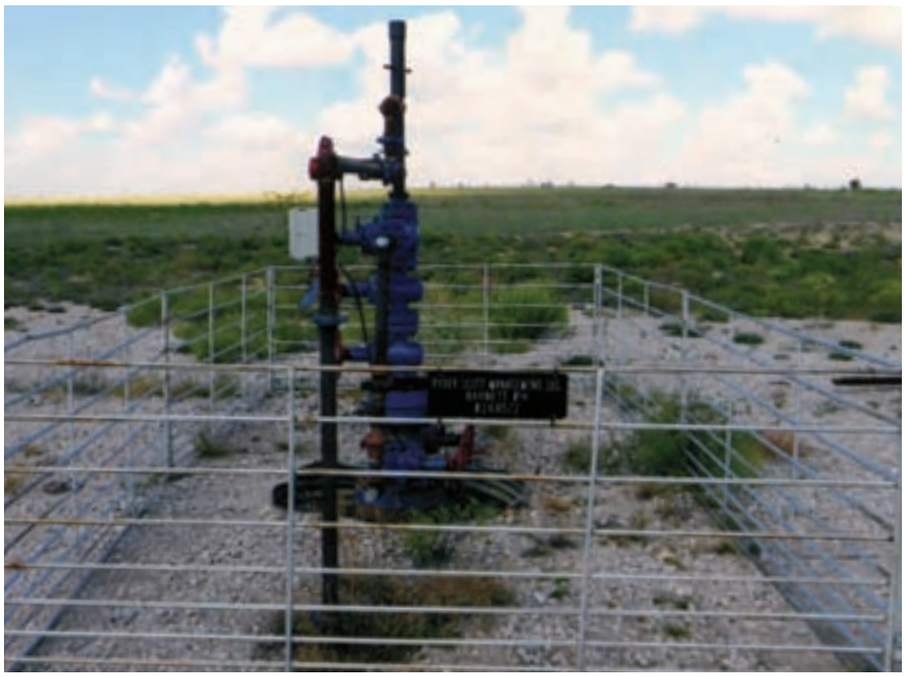
Throughout the 1980s, Ryder Scott Oil Company continued to develop its leasehold position in Wise and Denton Counties by drilling as many as thirty wells a year to the Boonsville Bend Conglomerate formation. Natural gas prices continued an upward trend through most of the 1980s, and Ryder Scott Oil Company took advantage of product pricing.

During late 1985 to 1986, Ryder Scott Oil Company committed to drill five Barnett Shale wells in Wise County. At the time, the only other operator to attempt a vertical Barnett Shale completion was Mitchell Energy, the founding company of the play. These five wells were drilled and completed with large gel frac jobs and 1 million pounds of sand. These exploratory wells produced for several years with poor-to mixed results.

By the late 1990s, Mitchell Energy had pioneered the slick water frac and the boom began. Ryder Scott Oil Company would later rejoin this play of new gas in the Barnett Shale Field and develop its leasehold. Because of its aggressive lease acquisitions, both currently and dating back to 1971, Ryder Scott Oil Company still continues to develop these reserves.

In 1978, Ryder Scott Management Company was experiencing difficulty contracting drilling rigs and the company found it necessary to start its own drilling company. M and M Drilling Company was formed in 1980 and by the end of 1982 two 10,000 foot rigs had been built. These rigs drilled for the Ryder Scott Oil Company account only and were divided between development in Wise and Denton Counties and exploratory drilling in North and West Central Texas.

After 1988, however, Ryder Scott Oil Company found it increasingly difficult to keep these rigs working exclusively for the company.



The decision was made not to take outside contracts, so the rigs were sold at auction. Ryder Scott Oil Company went back to contracting its drilling as the industry experienced change due to pricing of oil and gas.

Since its beginning, Ryder Scott Oil Company has followed a business plan to incorporate exploration, drilling, completion and production into profitable ventures. Throughout the years, there have been some production purchases, but nearly all growth has come from drilling and production.

Having started as an operating entity and then developing into an exploration and production company, Ryder Scott Oil Company relies heavily on its operating expertise to further its success. The company owes much of its success to the hard work of its employees through the years, including the ten full-time employees now working for Ryder Scott.

Top: Producing well, Wise County, Texas.

Above: Wellhead, Wise County, Texas.

Veritas Energy, LLC

Top, left: Fetch A#2, Hollis R. Sullivan, Inc., early days.

Top, right: Hollis Sullivan with his daughter, Lindsay, in the mid- to late 1980s, well unknown.

Below: Veritas Energy, LLC., well, Palo Pinto County, Texas.

Veritas Energy is a Texas-based private, independent oil and gas company that represents the culmination of more than three decades of hard work, knowledge of the oil and gas industry, and a commitment to integrity and responsibility.

The company was founded by Hollis R. Sullivan, a third generation oil and gas industry executive, Wichita Falls native, and industry enthusiast, who started Veritas Energy in 2011 to focus on grassroots leasing, developing, completing, and operating oil and gas properties in Texas and Oklahoma. Sullivan serves as president of the Fort Worth-based company, which employs more than twenty-five people and operates from offices in Fort Worth and Wichita Falls.

His grandfather, Hollis G. Sullivan, the son of a cotton farmer, who saw the long and hard hours his father worked, was lured into the oil and gas industry to "make money while you sleep." He began as a tool pusher, and in the early 1950s, formed an odd partnership with a florist and local doctor to purchase a drilling rig.

Together, they started C & N Drilling Co. and began looking for deals nearby their hometown of Electra. Their first discovery was serendipity on the Waggoner 'A' Lease in Wilbarger County. Their target formation was non-productive, but the terms of the lease required a well to be drilled to a specific depth if production was not established. While drilling deeper, C & N discovered oil in the last hundred feet they were required to drill. This was the beginning of several lifetimes to be spent in the oil and gas business.

Hollis G. ultimately formed S & H Oil Co. with his son, Hollis E. While in high school, Hollis R. began his career by painting tanks and engaging in roustabout work or other odd jobs on the S & H operated leases. In 1979, he graduated from Midwestern State University in Wichita Falls with a bachelor's degree in accounting. Despite his oilfield roots, he sought a more stable career in accounting. That did not lead him too far from the oil patch, as he ended up taking a job as an accountant for Cobra Oil & Gas in Wichita Falls.

Shortly thereafter, his grandfather had taken ill and he was faced with a difficult decision. Weighing the options of his desired stable career with a good company versus helping his family keep the company they started, he decided to help his father. Just like any good father would do for a son, he brought him on as a contract pumper until he could prove he was worth his salt. The junior Sullivan started driving 150 miles a day checking leases. His accounting degree went unused—at least in the conventional sense—as he learned the ins and outs of the oil and gas industry.

After working for his father for more than eleven years, he formed his own company in 1990, Hollis R. Sullivan, Inc., a small oil and gas company based in Wichita Falls.

During his tenure as president, the company drilled more than 400 wells throughout Texas. There were several times he was scrambling for partners to help pay bank drafts for leases, but after growing the company assets for fifteen years, Hollis R. led a divestiture of producing properties and leaseholds in the Barnett Shale to Encana Corporation. Three years later, Hollis R. Sullivan, Inc., sold additional assets owned in the Barnett Shale to Fort Worth-based XTO Energy. His formula for success was to seek guidance from the more experienced, hire the best people, and then recognize and reward them for their hard work and sacrifice.

For the next four years, Hollis R. served as chairman of Titan Operating, LLC, a $350 million Riverstone, LLC-backed portfolio company, primarily assisting in an advisory role. Despite his recent success, this advisory role is about as close as he will get to "retirement." Hard work has been engrained in him, and it did not take long before he realized that no amount of golf would give him the same satisfaction as persisting through the lows and relishing the highs of the oil and gas industry.

During his tenure at Hollis R. Sullivan, Inc., Hollis R. served as chairman of Texas Alliance of Energy Producers, bringing his experience as an independent oil and gas producer to the elected position. He brought firsthand knowledge of the history of independent oil and gas company struggles, giving him the inside track in conveying that knowledge to producers and the public. Veritas Energy accomplishes its focus with an ongoing commitment to integrity and responsibility.

Hollis R. has served on the board of the Texas Golf Association, Pathway to Victory, and Shady Oaks Country Club. He is a member of Texas Alliance of Energy Producers, Independent Producers Association of America, American Association of Petroleum Landmen, North Texas Association of Petroleum Landmen, Southern Oklahoma Association of Petroleum Landmen, Dallas Association of Petroleum Landmen, and Fort Worth Association of Petroleum Landmen.

Hollis R. and his wife, Donna, married in 1977. Throughout their time together they expanded their family with three children—Lindsay, Parker (and daughter-in-law Lauren), and Houston (and daughter-in-law Alexandra). They also have two grandchildren, Ivy and Bear.

Above: Veritas Energy, LLC., tanks in Palo Pinto County.

Below: Hollis R. Sullivan, Inc., well, Barnett Shale, Tarrant County.

Swanner Properties

Above: John L. Swanner and son, Roger in front of a homemade wooden under-pull jack.

Below: Wooden-sided spudder using an engine by Clark Machine Company of Wichita Falls.

Swanner Properties, as it exists today, would never have come about if not for the desertion by Walter Parker in 1877 of his destitute and pregnant wife, Barbara, in California. Walter would marry again in 1880, but without an effective legal divorce. Upon his death in 1908, leaving a substantial estate in Texas, Barbara sought the aid of attorney Roger Yates Williams of California to contest Walter's will. As compensation for Williams and the Texas attorneys needed to pursue her claims, Barbara offered them an interest in any property recovered. In 1916 a final judgment was made by the Dallas federal court awarding her lands in Texas.

In 1919, R. Y. would send his nephew, John Lynn Swanner, twenty-six, who had oilfield experience in California, on an exploration of the lands Barbara had acquired in Wichita County. Renting an Indian motorbike, John rode over the dusty, rough roads to investigate. This was during the Burkburnett oil boom, and wildcatting era, so his report to Uncle Roger was encouraging.

After John married Elizabeth Shepard in 1920, Uncle Roger sent the couple to Wichita Falls. John was an "oil scout," establishing leases and managing properties and possible oil production. Within ten months, John, Jr., arrived. John L. was dumbfounded and confronted Elizabeth. Her retort was, "Don't blame me you're the producer." After living in a hotel with a new baby and running low on funds, they returned to California.

In 1922, with another advance from R. Y., the Swanners returned to Texas, this time to stay. Many letters would be exchanged between R. Y. and his nephew: some with instructions and ideas, others with progress reports and intentions of production of new leases.

The Williams/Parker, W. J. Short, Etheridge/McCormick, L. Chilson, Roy King and Norman leases were among those acquired during the early years. These were in the location of the Kamay Y, ten miles west of Wichita Falls. Some of these wells are still in production.

In the 1920s and 1930s, shallow wells were established with a Wichita Falls Spudder using a Clark Machine Company engine run by Watt Hobbs. Early pump jacks were homemade wooden bodied under-pull units operated by rods from a central powerhouse. Later, metal Oklahoma and Jensen pump jacks were used for shallow wells. Oil would be collected in wooden barrel holding tanks. Deep-well production used American D-80 Pumping units. In 1938, John's first rotary well was drilled to 3,993 feet and later completed to 4,050 feet with his Spudder. For three- to four-thousand-foot wells, oil was collected in metal separators and holding tanks. Early collection of oil was by Texaco Co. trucks. Later, pipelines served Texaco and Atlantic Richfield (ARCO) for collection. By 1990 trucks again handled collection. Conoco/Phillips 66 are the current purchasers.

Throughout this time, the Swanners would live in rented homes. The last one was next door to Sybil Kell Cahoon, daughter of

Frank Kell, a prominent city father. After the arrival of their second son, Roger Edgar, in 1937, John L. bought what turned out to be their only residence on Bullington Street in Wichita Falls.

R. Y., sometimes joined by Elenora Parker (daughter of Barbara), would come to Texas to visit the Swanners and their oil leases. On his last visit in 1939, R. Y. held his namesake, two year old Roger, having no idea the toddler would someday become sole owner of Swanner Properties.

Roger Yates Williams died in 1940, leaving all his Texas and California oil production and leases to his nephew, John L. Swanner. John remained an independent oil and gas producer, using as the company name—John L. Swanner.

When John, Jr., came back from the war after flying numerous missions as a pilot, he went to work for his father, and married Ruth Raborn. John acquired leases in Young County in the 1950s with Strawn Drilling with backing from his father.

For years the Swanner office was behind their home, which they later expanded for more space. Elizabeth did the bookkeeping, followed by Ruth then Christine Kovarik. The last ladies to work at the Bullington office were Mary Carlton and Sharon Lear.

Field foreman Jess Johnson worked many years for the Swanners. In 1964, the same year Roger married Joan Hokuf of California, Gary Chandler was hired.

John, Sr., passed away August 20, 1972, at the age of seventy-nine. The business went from Swanner estate to Swanner Properties. Elizabeth, John, Jr., and Roger became partners. Later, Swanner Properties took oil and gas leases with WES-MOR Drilling, Inc. in Young County.

In 1992, Elizabeth and John, Jr., decided to retire; so on September 5, 1992, Roger bought the business from his family and continued to run it under Swanner Properties. Chandler, field foreman, and his son Gary "Lindy" and Roger's eldest son, Christopher, work for the company. John, Jr.'s son, Stephen, worked for a while. In 2001, Roger relocated his office to 2608 Kemp Boulevard, Suite E, with the arrival of Ruth Ann Sadberry as his secretary/office manager in 2004.

With old production came the plugging of many wells, which was left up to Roger. Fortunately, oil prices increased and he was able to keep the business afloat. John L., Sr., had seen 10- and 25-cent oil but never 5 dollar-a-barrel oil.

The Swanner family is going into its third generation with complete ownership since 1922. In his lifetime, John, Sr., drilled more than 300 wells producing in excess of four million barrels of oil.

Thank you to all the valuable employees who have worked for the Swanner Family through the years. Without their efforts, Swanner Properties would not exist today.

Above: John L. Swanner and son, John L. Swanner, Jr.

Below: John L. Swanner in front of a rotary rig, 1942.

Crude Energy, LLC

Crude Royalties, LLC

President Parker Hallam.

Crude Energy, LLC and Crude Royalties, LLC were founded upon the fundamental principle of providing accredited investors with the opportunity to obtain working interests or royalty interests in oil and gas wells, while seeking to package offerings that have the potential to generate above-market returns for its investors.

Oil and gas investments allow accredited investors the option to diversify and reinforce their investment portfolios with a commodity that is in steady demand, while providing the known tax advantages available through oil and gas investments.

Historically, Crude Energy and Crude Royalties have offered a broad array of royalty and working interest offerings in many of the major shale formations across the United States, including the Bakken, Permian, Eagle Ford, Marcellus/Utica, Fayetteville, and the Haynesville, to name a few. However, due to a farmout agreement, Crude Energy is now focusing on approximately 3,600 acres in the Wolfcamp formation of the Permian Basin. The Permian is one of the legacy oil fields in the United States, and now with the hydraulic fracture stimulation revolution having unlocked new reserves, the Energy Information Administration raised its estimates of potential total Permian reserves to upwards of 75 billion barrels of oil. The Wolfcamp is only one of the potential shale layers in the Permian, affording Crude Energy the opportunity to penetrate other shale formations within the zone as well.

Through Crude Royalties, the company offers investors the opportunity to own royalty interests in existing production. Royalties are akin to participating as a mineral rights owner would if they owned the drilling rights and an oil and gas company developed them. Royalties are commonly traded as a tangible asset and Crude Energy's management team has over a decade of experience putting royalty packages together for its investors.

In addition to tax advantages, oil and gas royalty investments can allow real estate investors who have sold property at a profit to exchange part or all of that profit into an oil or gas royalty under the IRS 1031 "Like Kind" exchange laws. Crude Royalties has developed an expertise advising clients and investors whether such exchanges into royalties are favorable in their individual situation.

These strategies fit well with Crude Energy's mission to provide safe and reliable energy for generations to come, and have fun doing it. Their reputation is flourishing around the country as a respected independent energy company of the future relentlessly pursuing targeted investments, maximizing the value of its assets and resources for its clients, while working in a responsible, caring and productive manner.

Crude Energy's President, Parker Hallam, hosts a daily podcast called "Oil and Gas Investing Report," in which he discusses top industry trends and news stories. The podcasts are available on the company's website at www.crude.com/podcasts and on iTunes.

KB Wellbore Solutions, LLC

KB Wellbore Solutions, LLC, officially came into existence in October 2008 when Kevin Gressett and his business partner at the time decided to start their own well site management consulting firm. The two partners, who had previously worked together for another company, began KB Wellbore Solutions out of their homes until establishing their first headquarters in Pearland in December 2008.

In 2010, Kevin bought out his original business partner, leaving him and his wife, Jamie Gressett, who works as office administrator, as sole owners of the company. Between 2009 and 2012, KB doubled and tripled revenues and today employs forty and has regular working relationships with fifteen key clients. Annual revenues reach approximately $11 million to $14 million annually.

In June of 2011, due to the industry demand, Kevin decided to expand KB by not only providing well site management consulting services but also provide well testing/flowback services. This was a turning point for KB in which led to the hiring of Kelley Player as well testing/flowback manager.

Although now based in Iola, KB did not plan it that way. In May 2012, Kevin and Jamie acquired land and created Gressett Cattle Company, LLC, with the intention of going into the cattle business part time with Kevin's grandfather, David L. Gressett, Sr. Unfortunately, Kevin's grandfather passed away in July 2012 after an unexpected and rapid battle with cancer.

Because of this, in August 2013, they moved their corporate headquarters from Pearland to Iola, where they rented a temporary office until their newly constructed office was complete in June 2014. The timing could not have been better on Kevin's part because since that time economic growth in the region has resulted in a booming business.

From stakes to sales, KB Wellbore Solutions has the mentality that "the sky's the limit" for their clients oil and gas assets. Because of the company's collective team experience, KB does not focus on the cheapest and easiest method for drilling or completing wells, but instead concentrates on the most efficient, cost-effective approaches available to capitalize on production. This strategy helps KB align its team with the clients' goals including the NPV, EUR, and the ROI of their assets, all while keeping in line with the AFE and safety guidelines set by KB and the client.

The company prides itself on its ability to be creative in solving problems, providing the best value, and performing excellent services for its clients' project issues and challenges. KB is a leader in extended lateral multistage wells with its team performing more than 20,000 stages a year. The company utilizes multistage technologies including packer

systems, plug and perf methods and swellable packers in formations from the Gulf Coast to the West Coast dealing with temperatures ranging from 190°F to 310°F and pressures from 2,000 to 14,000 psi. KB has been on the forefront of three of the prolific shale plays in the United States and has been part of several very successful redevelopment projects across the country.

KB has the combined benefit of not only real-world field operations but also has the corporate experience with AFE budgeting, monthly capital reports, and production quotas. Company consultants are handpicked seasoned experts in all stages of the well-construction process.

KB Wellbore Solutions specializes in:

- Extended laterals.
- Horizontal wells.
- Tight gas.
- Unconventional reservoirs.
- Shale production.
- Saltwater disposal systems.
- Exploration wells.
- Redevelopment projects
- The ability to be creative problem-solvers for circumstances that may arise during any procedure.

On the well testing and flowback side of the business, KB provides the latest real-time technology along with maintained custom equipment that is recertified annually by a third party. The company also employs qualified and trained personnel to assist in well-testing and completion flowback services.

Equipment used in this area includes:

- Three-phase test separators of as much as 2,000 pounds with real-time data communication.
- Manifolds of as much as 15,000 pounds.
- Single- and dual-plug catchers of as much as 10,000 pounds.
- Portable flare stacks with auto ignite and know-out to catch any fluid that breaks out.
- Mobile observation stations.
- Torque and test units, and
- Pressure pumps.

KB is also very involved in various communities and local charities including The Bridge, POST Hope Foundation, numerous 4-H and Future Farmers of America livestock show associations, Grimes County Fair, the local fire department, Down Syndrome Association, numerous school fundraisers, Joshua Young Life, and support for those battling cancer.

With Iola only having a population of 430, KB has brought growth to Iola by using local business services and providing new career opportunities.

KB is currently performing work in various locations throughout the United States. KB Wellbore Solutions is an innovative project management company with emphasis on well drilling, completion, stimulation, production, and workover services. KB Wellbore Solutions should be the choice for all of your consulting and well testing needs!

"Logic will take you from A to B but imagination will take you everywhere."

-Albert Einstein.

Cornerstone N. G. Engineering, LP

Cornerstone N. G. Engineering, LP (CNGE) was founded in 2002 by H. Lee Matthews after spending his previous nine years working at Mitchell Energy and Devon Energy in the Fort Worth Basin on conventional reservoirs as well as the first unconventional reservoir—The Barnett Shale. As a member of the horizontal task force in Devon's Barnett Shale Development Team, Lee worked with other engineers including Bill Buckler, Nick Steinsberger and Jim Addison to develop the understanding and techniques to stimulate horizontal wellbores in tight shale reservoirs. He began his engineering practice with numerous small independent operators including Hollis R. Sullivan, Inc., Hallwood Energy, Republic Energy, Antero Resources, Marshall R. Young Oil, Collins & Young, Dallas Production, Ray Richey Management, Edge Resources and Bagby Energy among others.

The continued refinement and optimization of horizontal completion designs and techniques was an ongoing pursuit as Lee expanded his business beyond the Barnett Shale of Wise, Denton and Northern Tarrant Counties to Southern Tarrant, Johnson and Parker Counties, where dangerous subsurface obstacles called Karsts were found that could potentially cause economic disaster. Utilization of 3D seismic to understand subsurface complexity was realized as a vital instrument to reduce potential contact with the water-bearing Ellenberger formation which could reduce the well's economic performance.

In 2003, Cornerstone experienced its first personnel expansion by the addition of Steve Ricks as a completion consultant, who had worked with Lee at Mitchell Energy. Steve was directly involved in the field activities of the horizontal completion technology development at Mitchell and then Devon Energy. Lee and Steve worked closely together to further refine and expand the application of these techniques to other unconventional resources throughout the history of Cornerstone's activities.

In 2005, Don Pearce joined Cornerstone as a partner and manager of the drilling operations across all of its project areas. With Don's recent experience in the deep water of the Gulf of Mexico, Cornerstone led the way in urban development by working with local municipalities to minimize the number of drill sites required to develop the subsurface resources. CNGE's clients Bagby Energy and Edge Resources filed the first special use permits for a drilling pad accommodating up to thirty-six wells on a single location. Prior to this approach, the maximum number of wells permitted was less than six. By transitioning the technology of the deep water to the urban arena, Cornerstone encouraged responsible natural resource development by minimizing surface impact.

As the development of the Barnett Shale became more widely understood, other unconventional resources in North America began to unfold and Cornerstone was there to assist its clients in understanding the unique attributes of the new resource and how to modify and optimize its plan for development. The reality that geologic variations occur over relatively short distances was clearly understood in the Barnett and that same reality was expected as Cornerstone entered into a new unconventional development project. CNGE was active in frontier areas of the Delaware Basin pioneering work for Alpine Energy in the West Texas Barnett Shale and Woodford formations as well as the Marcellus for Republic Energy, the Haynesville for Exco Resources and more recently, the EagleFord for Dan A. Hughes, Texas International and Paloma Resources.

As natural gas prices softened and the resulting Barnett Shale activity declined in 2008, CNGE realized that its future required diversification into liquids rich unconventional resources. One of its prior Barnett clients, Dan A. Hughes, Inc. was beginning to amass a large acreage position in Karnes County with plans to start development of the EagleFord and reengaged CNGE to assist with its completion operations. Additionally, Pioneer Natural Resources was testing the EagleFord on its legacy acreage position that it had acquired with deeper production. Don was contracted to go in-house at Pioneer to assist them in ramping up their EagleFord horizontal program. This transition to the EagleFord during 2009 was a tremendous benefit for Cornerstone and provided the opportunity to expand their understanding and technology into the oil producing sector of unconventional development.

While Lee handled the reservoir, completion and production engineering activities of Cornerstone and Don provided the drilling engineering expertise, the well-site supervision activities were supported by a very strong group of seasoned veterans. While these men were not employees of CNGE, they were a very important part of Cornerstone's success. In 2011, Brian Benge joined Cornerstone to manage the construction and production operations function for its services. The small engineering firm environment staffed with senior level professionals provided for efficient and effective decision making. From the start of location construction, through drilling, completions, pipeline and facility construction to daily production monitoring, Cornerstone utilized the latest technology coupled with extensive industry experience to provide its clients with engineering and operations support competitive with that of large independents.

Cornerstone N. G. Engineering has been the fulfillment of a lifelong dream of Lee Matthews and it was made possible through the relationships and experience gained while working for George Mitchell and his staff at Mitchell Energy, the encouragement and support of his dear wife, Jacquin and their two sons, Luke and Jacob and most importantly the namesake of the firm, Jesus Christ—The Cornerstone.

Ridge Oil Company

Above: Owen D. Woodward, 1973.

Right: Bryan A. Woodward, president of Ridge Oil Company.

Below: (Left to right) Bryan A. Woodward, Owen D. Woodward, Cindi Woodward, and Brad Woodward, 2006.

Owen D. Woodward, president, and Richard Collins, vice president, incorporated Ridge Oil Company in 1973 to operate oil and gas properties. Their wives, Sandra Woodward and Elwana Collins initially served as secretary and treasurer respectively.

Mr. Woodward began his career in the oil patch at fifteen years old wrenching rods on a workover rig and steadily worked his way up to a frac/acid supervisor with BJ-Hughes, an oilfield service company, by age thirty-three. Richard was a certified public accountant in Midland, Texas. Collins and Woodward had previously formed C & W Transports, which at its peak, operated 125 oilfield transport trucks in Breckenridge and El Dorado, Texas.

After forming Ridge Oil, the two founders went to work acquiring stripper leases and as the 1970s came to a close, they ventured into the exploration side of the industry through drilling and production wells in the Fort Worth Basin gas play. Natural gas prices had escalated disproportionately in comparison with oil prices, so Ridge Oil secured a contract to sell gas to Texas Utilities Fuel Company for a lucrative long-term fixed price per MMBTU.

Ridge Oil had acquired an acreage position in western Parker County close to a field discovery made by Mitchell Energy (Lake Mineral Wells 4,000 feet Congl.). Ridge extensively developed its acreage position in this field, benefiting from the gas contract and the low cost of drilling and completion.

In December 1982, Bryan A. Woodward (BBA 1982, University of Texas) joined his dad's company as land manager and vice president. The Woodwards bought out Richard Collins' share of the company in 1983.

The early 1980s saw an increase in oil prices and Ridge Oil focused its attention on more oil-prone areas. The company's main interest became the Ranger area in Eastland County, Texas, which had a long history of oil production from multiple stacked reservoirs. With many years of prior production, the reservoirs in this area were known to have low bottom-hole pressures.

Well stimulations (fracs) were very difficult to perform due to "screening out" at the initial stage of the job. Owen's past experience with BJ-Hughes allowed him to design a frac job that incorporated a fluid-loss agent (rock salt) pumped during the initial stage that eliminated this problem and completed jobs were achieved with successful production results. Treatment success resulted in the drilling and completion of approximately 140 wells in the Ranger NW (Marble Falls) Field with enough associated gas production to build a gas plant to extract the liquids from the rich 1,500 BTU stream.

A sign-of-the-times story from the 1980s: In 1984, Owen built a three-story, 30,000-square-foot office building in Breckenridge to serve as company headquarters. Bank financing covered about two-thirds of the cost. By 1986 oil prices had plunged to around $10/bbl. and the savings and loan crisis was peaking. The company's loan bounced around with the many bank failures and by 1989 the company faced eviction. Owen and Bryan drove to Fort Worth to meet with the loan holder of the building.

Unable to agree on a resolution of the debt, they left the meeting with thirty days to vacate the building. On the return trip to Breckenridge, they stopped to fill Owen's Cadillac with gasoline. When Owen opened his door, a tow truck came by too close and hit the door, bending it backward and shattering the window. The Woodwards roped the door almost shut and duct-taped a cardboard box over the shattered window and drove 100 miles home in a cold, sleeting rain. They gave up the building and moved to a smaller, renovated building overlooking Hubbard Creek Lake outside of Breckenridge, where the company headquarters remains to this day. In 2008, Bryan reacquired the office building that his father had built.

During the later 1980s, the company began drilling in the Breckenridge area Caddo Lime waterflood initiated by Texas Pacific Oil Company, which had expanded to the Breckenridge city limits. Because of the complexity of leasing and development within an incorporated city, most operators elected not to pursue such a task.

But led by Owen's optimism, Ridge pursued this opportunity of leasing town lots and developed their acreage position in spite of all the logistical obstacles that had to be overcome, including the installation of produced water trunk lines that snake throughout the city of Breckenridge.

By the late 1990s, Ridge had pieced together 8,000 contiguous acres in Young County, Texas, for a Caddo Lime (4,000 feet) waterflood project and established the Indian Mound (Caddo) Unit. After three bridge loans the company finally secured a $21.6 million multi-draw credit facility with Shell Capital, Inc., Houston, Texas, to fully develop the project. The debt structure was tied to an oil hedging program with Shell Trading (U.S.). In 2000, Ridge drilled 23 producers, 10 injection wells, and 3 water-supply wells back-to-back in Stage I of development.

Initial results were as expected and oil prices were rising, but the out-of-the-money hedge collar made servicing the debt difficult. The hedging program ultimately cost Ridge $2.4 million that would have otherwise gone against the debt. Regardless, thresholds were met to trigger Stage II of funding and development, but Shell Capital had been acquired by the Royal Bank of Scotland and they were unwilling to fund Stage II.

After legal action and extended negotiating over the course of a year, the First National Bank of Breckenridge stepped in and loaned Ridge the capital to buy out the debt in early 2004. First National Bank President James Shelton and Vice President Kevin Simmons (now president) were instrumental and ultimately trusting that the project would succeed. The First National Bank debt was retired in February 2006. Today, the Indian Mound (Caddo) Unit consists of 137 producing, injection and water supply wells. Further expansion of this unit is the current primary company focus.

Owen was known throughout the North Central Texas area as a keen businessman who always went forward with pride and determination. He had a memory like an "elephant" and could recite numbers, people, places, and procedures done on wells decades old. He was a gambler and taking risks never seemed to bother him. As he told his son, Bryan, one day when he wanted to spend $400,000 that they did not have on a seismic project "it's the chicken or the egg, we are broke now and we will stay broke unless we do something about it." Owen was tragically killed in an automobile accident in October 2007. He is missed every day.

Many employees and associates contributed to Ridge's success over the course of the last forty years. L. Kyle Yeates, independent geologist (BS, 1972, TCU) has maintained his office with Ridge since the early 1970s. Jess Williams (Lieutenant Colonel U.S. Air Force, retired) joined Ridge in 1985 as a pilot and overseer of inventory control and pipeline systems supervisor and still works every day at eighty-five years old. Ted Hasley, pumper, has been with Ridge for fifteen years. Russell Burrows, field superintendent, has been employed by Ridge for fourteen years. Bryan became president of Ridge upon his father's death and he continues to lead the company that his father established.

Below: A family hunting trip in 2006. Back row: Bryan A. Woodward, Owen D. Woodward, and Brad Woodward. Front row: Owen Woodward and Jackson Woodward.

McCommons Oil Company

Above: William E. (Bill) McCommons.

William E. (Bill) McCommons had served in the Alamo Scouts in World War II. He knew after five years of military service that he had those years of his life to make up, and he realized that many of his fellow soldiers would not be going home. He owed them a duty to do something worthwhile with the years of life they had given him. After graduating with a degree in Geology from the University of Illinois, he worked briefly for Halliburton as a mud engineer in Southern Illinois and then for Coy Oil, a small independent in Indiana. Another independent, George Engle, hired him as its chief geologist in 1950. Engle sent him to the swamps of Southern Louisiana and then to North Texas. He identified several potential oilfields from the single-fold seismic data Engle had acquired and was sent to Dallas to set up an exploration office. All of the identified prospects proved to be substantial discoveries. Bill moved his wife, Mary, and their four young sons from Indiana to Texas and opened an office in downtown Dallas.

Several of Engle's employees, including Bill, formed a new entity, Nortex Oil and Gas, in 1954 and went public with it that year. Bill served as vice president in charge of exploration. Nortex bought out Engle's interests and proceeded to drill a number of wells in North and Central Texas. In 1956, Bill sold his stock in Nortex and with the proceeds created McCommons Exploration Company. This company was incorporated in 1958 as McCommons Oil Company. His early investors generally participated for small interests, but most of them remained active investors for many years.

Times were tough in the late 1950s. Oil production was prorated such that wells were restricted to as little as eight days per month production. Success came early with the #1 Owens, which flowed its maximum allowable for several years. The company was one of the earliest drillers in the Boonsville Bend gas field. Mitchell Energy had discovered the field in the late 1940s and had arranged for Natural Gas Pipeline Company of America to lay a pipeline from Chicago to North Texas. The company joined with several other independent operators to petition the Texas Railroad Commission to force ratable take from the field. This petition was successful and allowed all producers to have an equal percentage of their wells' production taken by the pipeline. After this issue was settled, he spent the next twenty years with virtually the entire independent sector of the industry in federal court challenging the government over pricing of gas in interstate commerce.

Bill was especially proud of the people he worked with. Clarence Netherland and Fred Sewell were early cohorts prior to forming Netherland, Sewell and Associates. Other respected and talented engineers and landmen worked for the company but always with an eye to set up their own companies. In 1972, Bill, tired of losing his engineers, hired two of his sons. James, who had graduated from Washington and Lee had recently returned from Vietnam where he served as an artillery officer, became the company's landman. Bruce with his recent

New Discovery at Fruitland Revives Area Oil Interest

By H. I. Trout

What is declared to be the most interesting oil development in Bowie area in a long time is the bringing in of the W. J. Owens No. 2, at Fruitland, four and a half miles Southeast of Bowie Monday, by the McCommins Oil Company of Dallas.

While the crew was swabbing Sunday night, oil and gas broke loose. Oil flowed over the top and covered timber seventy-five yards way. But it was soon brought under control, the men having a narrow escape from fire which frequently breaks out under such circumstances.

The location is near the northwest corner of the W. J. Owens 156 acre tract, Block 34, Panola County School Land. And it is about 1400 feet west of the first of the two wells drilled several months ago. It is still flowing on an allowable of 120 barrels daily. The No. 2, an extension of the pay, it is said, will be given the same allowable. The new well is at 45 feet higher ground level than No. 1.

The new well had been perforated at 5987 to 6019 feet. Total depth was reported at 6125 feet. It had 525 pounds of tubbing gas pressure. The Bowie Well Service was swabbing in the test, with J. C. Tomlinson and Buddie Miller on duty, when the sudden blow-out occured and started the excitement.

Monday morning Haliburton pumped into the hole 2,000 gallons of acid, under supervision of H. K. Coale, McCommins' superintendent, who said the response was prompt and highly satisfactory. It flowed immediately into the pits from two-inch tubbing at estimated rate of around 300 barrels an hour. The oil is 42 gravity.

Bill McCommins, head of the producing company, said another test will be drilled soon, an offset to the North of No. 2, on the Owens. Elmer Caswell, the company's land man, has leased several other tracts in the area.

The wells are on the B. F. Owens' estate, Mrs. Owens resides in Oklahoma City, and Mrs. B. H. Roberts of Bowie is her daughter.

ELMER CASWELL of Bowie, land man for the McCommins Oil Company, watches oil under its own pressure gush from a new discovery, the McCommins Company's Owen's No. 2, at Fruitland, when it was opened up Monday. At that time it was flowing around 600 barrels per day. (Photo by H. I. Trout)

The Bowie News

"Twice Weekly Town and County Newspaper"—Consolidated with Montague County Times April 1, 1933

BOWIE, TEXAS, THURSDAY, AUGUST 30, 1956 4 PAGES—5c PER COPY

BILL McCOMMINS, left, of McCommins Oil Company, Dallas, discusses with H. K. Coale, superintendent, their second oil discovery in a row at Fruitland, the W. J. Owens No. 2. (Photo by H. I. Trout)

degree from The University of Texas became operations manager.

In 1973, Bill joined with Sanford Fagadau and Bob Lindsay in acquiring a drilling rig. They created Big D Drilling Company. Only a few months later the OPEC countries raised the price of oil from $3/Bbl to $7/Bbl in an effort to keep their purchasing power constant with the following value of the U.S. dollar. Overnight, every drilling rig in the country was booked for years into the future. Not only did Bill have access to a rig, but Big D had just received delivery of a new string of drill pipe, which overnight had become impossible to purchase. Fagadau and McCommons kept the rig running steadily for nearly ten years.

The company's interest in Big D was sold in 1983, but the company maintained a call on the rig for preferential drilling rights. Proceeds from the sale were used to build a 7,000 square foot hunting lodge on the company's 7,200 acre ranch in Montague County. Bill named the ranch after one of his favorite geology phrases—Running High Ranch—as in "Runnin' High and Lookin' Good." Besides being an active cattle ranch, quail, white-winged dove and duck were hunted in season and quail and pheasant were hunted on a released basis. Over the next ten years, thousands of hunters utilized the club's facilities.

Around 1991, Bill retired from active geology with the company but continued as a consultant until his death in 1998. His sons have continued the operations with Bruce as its president and James as vice president, but the company has focused on investments as a non-operator since 2000. It recently participated with Navidad Resources in drilling and ultimately selling fifty-four wells in the Gulf Coast Carbonate trend in Houston County. While the company continues to operate wells in North Texas and to participate in drilling ventures around the state, its royalty income and mineral holdings sustain its future.

Walsh & Watts, Inc.

F. Howard Walsh of Fort Worth and Wayne O. Watts of Wichita Falls established Walsh & Watts as a partnership in 1946. The company's mission was to pursue the purchase of producing crude oil properties and to look for good drilling prospects. Leases that showed potential for water-flooding were also pursued.

Walsh & Watts, Inc. incorporated in 1964 and have been operated as a closely held corporation since then. Soon after incorporation, Alfred B. Guinn was named vice president and general manager. F. Howard Walsh, Sr., served as president, and George S. Williams served as secretary treasurer for many years.

Walsh, born in Waco in 1913, was an oilman, rancher, and arts patron who played a significant role in the development of Fort Worth and Texas Christian University. He entered the workforce during the Great Depression, landing a job with the Armour Company, where he later was promoted to head of the test department. The job paid only eighteen dollars a week, and so Walsh, who had a flair for math and problem-solving, decided he would be better off working for his father-in-law.

Mary D. Fleming Walsh, his wife of sixty-one years, said Walsh mostly just worked hard after striking out on his own. Hard work and a shrewd mind helped him build a successful independent oil production company as well as an extensive cattle ranching business. Yet he remained down-to-earth, often telling jokes on himself. He and Mary D. shared their good fortune with family, friends, and community. Their parties, which included regular square dances, often included fabulous gifts and trappings. Friends traveled to town (at the Walshes' expense) for *The Littlest Wiseman* (a Nativity pageant performed annually in Fort Worth) and to receive extravagant gifts (more than once he gave mink coats to all his female employees).

The Walshes also gave to the community, bestowing millions on hospitals, churches, arts groups, schools (especially Texas Christian University) and community organizations. Everyone knew that if there was a need, the Walshes would help out in any way possible. Along with scholarships and other large gifts, the family gave one of the largest single gifts in TCU history—$3.5 million for the Mary D. and F. Howard Walsh Center for Performing Arts.

Watts was born in Moran in 1914 and grew up in Breckenridge, graduating from Breckenridge High School before attending the University of Texas at Austin, where he earned a degree in petroleum engineering. He worked for several years with W. J. Rhodes, his uncle, who also hailed from Breckenridge, and conducted oil property evaluations for the Baptist Foundation of Texas. He later joined Walsh to form Walsh & Watts in 1946.

In the 1950s, Watts worked with many oil and gas associations, including serving as president of North Texas Oil & Gas Association, predecessor to the Alliance of Energy Producers, with headquarters in Wichita Falls. He also served as a member of such organization as Texas Midcontinental Oil & Gas Association, Independent

Petroleum Association of America, and West Central Texas Oil and Gas Association of Abilene.

Watts was a dedicated Christian layman who, around 1965, took early retirement from the company to devote most of his time to Christian endeavors, working with many organizations to enlarge outreach for Christian principles. Some of the organizations he supported and worked with were Billy Graham Evangelistic Association, International Evangelism Association (where he was chairman of the board for many years), Bible Memory Association, New Orleans Baptist Seminary, Cal Farley's Boys Ranch, The Navigators, and The Methodist Foundation of Wichita Falls District.

Around 1973, he sold most of his interest in oil and gas leases to devote all his time to Christian endeavors and to use his resources where needed in the organizations he supported. Many character-building organizations as well as Christian organizations benefited greatly from his generosity. Watts used much of his wealth to benefit his fellow man.

Watts and his wife, Frances, were very generous (she always supported his work and generosity) and gave to many worthwhile organizations. Watts, a man of wisdom, generosity, and dedication, died in 2004 and his wife, a loving and joyful person and dedicated Christian, died in 2008, leaving many lives touched and changed.

Decades later, after its start in 1946, Walsh & Watts, Inc., remains in the crude oil production business, with additional interest in natural gas production. Acquisition of producing properties and drilling for new reserves continues to be the principal thrust of the company, and a number of wells, leases, and fields have been acquired in the past twenty-five years.

Vice President and CEO Alfred B. Guinn of Wichita Falls, and Vice President G. Malcolm Louden of Fort Worth, lead the staff of more than fifty employees headed by engineer and production superintendent, William Womble (plus crews of contract pumpers) in the company's continuing mission to produce oil and gas leases to their maximum potential. Through the years, many of the leases have been successfully water-flooded. The company has been blessed with many loyal, dedicated long-term employees, many of whom spent thirty to forty years in dedicated service to the company and its success.

Above: McDonald Unit, Ward County, Texas, showing frac job.

Below: Walsh & Watts, Inc., Wristen Brothers, #101, new well in 2014.

Nosivad Oil, Inc.

Nosivad Oil, Inc., was formed in 1984 by Jimmy and Annette Davison, after Jimmy retired from Davis Brothers Oil Operators in Abilene. Jimmy loved fishing, and would take Annette, or his kids and later grandkids to his favorite fishing holes about a mile east of the place he bought near Dudley. The fishing rules were: Papa always caught the first fish, the biggest fish, and the most fish. These rules were seldom broken.

There was an area near the fishing hole that always intrigued Jimmy as looking like an oilfield. After retiring as a Landman/Office manager with Davis Brothers for thirty years, Jimmy pursued his dream of finding this oilfield. His oldest son, Phil, had worked with Jimmy at Davis Brothers as a geologist and worked the geology of the area where Jimmy had envisioned this oilfield. In this study, Phil found two areas that looked promising. Jimmy formed the company, bought the leases and assembled partners, which would be helpful if there were indeed an oilfield discovered. He had a driller (Buz McGill, Hack Drilling Co.), a log expert (Paul Goodlett), and an engineer (Earl Jones), along with a few friends and family to partner with him in drilling these two wells.

On August 6, 1984, (Jimmy and Annette's daughter Debbie's birthday), Nosivad Oil, Inc. began drilling the Barnard No. 1 in search for the Cook Sand. Phil and Van, who was also studying to be a geologist, were well sitting the well and found a show in the Cook Sand at 1,700 feet. A drill stem test was ordered and the well flowed oil to surface. They continued drilling the hole to the objective total depth in search for the Hope Sand at 1,800 feet, which also was found productive of oil. Pipe was run into the hole and the Nosivad Hope Sand 1800 Field was discovered. On the second well the Nosivad Cook Sand 1700 Field was discovered. The Nosivad Field has produced over 1 million barrels of oil and still produces today.

Jimmy and Annette always felt that God had blessed them with this discovery and continue to this day to give all the credit and Glory to God. Through their support of The Lord's Church and support of missionaries all over the world, they have continued to give back to the Lord.

Phil officially joined the company as a geologist in 1986, after working for John R. Thompson Operating from 1980-1986. It was with Thompson that Phil learned how an operating company works to put together deals, find partners and get wells drilled and operate these wells. Van had to make a career change due to the downturn of the oil business in 1986. Phil and Jimmy continued to look for oil in various areas around Abilene. Nosivad tried, unsuccessfully, to find production in the King Sand play in Concho County in the early 1990s,

Top, right: Jimmy and Phil Davison and crew casing swabbing the Simpson #1 in King County, November 1995.

Bottom, right: Phil Davison casing swabbing the Elvin Jones #5, Stonewall County, February 2000.

Below: Jimmy and Phil Davison casing swabbing the Windy #1, Stonewall County, June 2002.

and later in that decade went to Stonewall County to partner with Greg King, a local geologist, in search for the Tannehill Sand. It was in the Tannehill that they were able to find channel sands similar to the Cook channels in the Dudley area. They were successful in finding several productive leases in the Bobcat Canyon field area in Stonewall County, which are still active today. They learned how small, yet prolific, these channel sands can be and how important it was to maintain the reservoir with secondary recovery effort. In the early 2000s, Fred Harendt, Debbie's husband, joined the company as a production superintendent and Debbie came on as a bookkeeper for the joint interest billing. Debbie and Fred left the company in 2008, and in 2009 both Debbie and Van were bought out of the company.

Nosivad Oil, Inc., continues to look for shallow oil production in the Abilene area and now employs the services of grandson Mark, who is the third generation of Davisons involved in Nosivad Oil, Inc. Mark, like his dad, got his geology degree at Hardin-Simmons University. He learned to mud-log wells working in the Barnett Shale play and later working with his dad, watching wells Nosivad Oil, Inc., had taken working interests in or were drilling for the company. He and his Dad now look for new prospects for Nosivad and have drilled several prospects that are now being followed up on with subsequent wells. We anticipate several new discoveries in the near future. Jimmy, Phil and Mark all work together in keeping the oil production going by doing their own field work as well as the day to day operations of Nosivad Oil, Inc. Annette, being an excellent cook, feeds the guys and sometimes the crews of men necessary to do the field work. They have found that these crews like to work for them because of these great meals and their timely paying of the bills for the work that is performed.

Above: Jimmy and Phil Davison and crew completing a well in Stonewall County.

Below: Annette Davison's eightieth birthday with (from left) Mark, Jimmy, and Phil Davison at Perini Ranch, July 2014.

Cholla Petroleum, Inc.

Like the cactus from which it draws its name, Cholla Petroleum, Inc., based in Dallas, is a durable, vigorous, and tenacious, company. These qualities have enabled Cholla not only to survive since its inception in 1957, but to thrive under conditions that have led other companies to close up shop.

This third-generation family-owned company combines the wisdom and cautiousness of older generations, with the enthusiasm and optimism of the younger generation to create a formidable competitor that has made it a top-100 producer in Texas.

Above: Left to right, Loyd, Jr., and Loyd Powell, Sr.

Below: Retirement party for a thirty-year employee in Bowie, Texas.

Cholla Petroleum continually pursues new prospects and ideas to expand production throughout the United States. What separates the company from other oil companies is its focus on finding new oil and gas reserves, rather than trying to squeeze oil out of shales.

To that end, Cholla employs eighty people in offices in Dallas, Midland, Abilene, Sweetwater, Bowie, and Lamesa, drilling 30 to 50 wells a year and producing 2,000 barrels of oil per day. It is steadfast in its dedication to helping America realize energy independence and remains passionate about America's energy future. To help in this endeavor, the company has set a four year goal of doubling operated production to 4,000 barrels a day.

Such dedication stems, in part, from the company's roots, which extend back farther than the company's founding. The company's history can be traced back to Loyd W. "Slim" Powell, Sr., who ventured into the oil business at age sixteen with a sixth-grade education. Slim began his career working as a pumper on Caddo Lake in the East Texas oil field. In 1920, Slim's work led him to El Dorado, Arkansas, where he worked for Gulf Oil Company until 1926, when Southern Crude Oil Company sent him to Wink, Texas. There, he worked as a drilling superintendent and production manager, running twelve cable-tool rigs in the Hendrick's pool.

In the 1930s, Slim made a fortune in the East Texas field and then lost it in Louisiana drilling dry holes. He started over in 1944 contracting in East Texas with a broken down Cardwell drilling rig purchased for $30,000. In 1952, Slim moved to Dallas and began drilling in North Texas and Southern Oklahoma. He passed away in 1975 at age seventy-five.

Slim had one son, Loyd, who learned the industry at his father's knee. While other boys competed in school athletics, Loyd remained at his father's side going to the rigs, catching samples at the shale shaker, and absorbing the doghouse lingo, learning firsthand about life in the Texas oil patch. The smell of oil and the harsh West Texas wind contributed to molding Loyd into one of the state's most colorful and talented oil personalities.

Loyd is a self-taught oil explorer with a keen interest in the history of the oil business, and over the years has built up a large collection of Texas oil and gas history books. Through the years Loyd has also earned a reputation as a dynamic and successful oil finder and is well respected by his peers. Originally operated as L&M Oil Company, in 1989 the company selected Cholla Petroleum, Inc., as its new name.

Armed with a new name, Cholla Petroleum began expanding exploration and drilling activities, with production in Colorado, Arkansas, Oklahoma and North, West Central and, most recently, West Texas. Cholla has its own drilling rig, field equipment, trucks and workover rigs. It employs its own service crews and roustabouts to work on its operated wells. By servicing its own wells Cholla is able to maintain a high quality of work and keep costs down.

Although still very much a family owned company, Cholla Petroleum has grown to a level that has placed it among the state's leaders in the oil industry. In 2013 the Texas Independent Producers and Royalty Owners Association presented Loyd with its 2013 Texas Top Producers Award for being one of the top ten CEOs in the category for large oil companies in Texas. Cholla was the only private, family owned company among the honorees in that category.

Gideon Powell represents the third generation to work in the family business. Gideon grew up catching samples with his father and began visiting drilling sites on the weekends during college. After college he began a career in the oil and gas business in Midland. Then, in 2012, he joined Cholla Petroleum, and began aggressively expanding operations in West Texas and searching for new places to drill.

As one of the most active operators in Texas, Cholla has a track record of success and persistency. The company has a long history of working with all types of outside deal generators. Whether it is geologists, engineers, landmen or operators, Cholla enjoys the flexibility to pursue ideas and prospects in all stages with a broad range of deal generators. Additionally, Cholla has an extensive, internally developed drilling inventory.

With a focus on subsurface geology, the company has thrived by pursuing, acquiring and drilling prospects that have upside potential. If there is a viable prospect Cholla has always been willing to put in the time and effort required to get it drilled. As for the future, Cholla Petroleum plans to continue operating in areas it has existing operations while evaluating exploration opportunities in other states and internationally.

For more than five decades the Powell family has operated one of the more successful privately owned oil and gas companies in the Southwest, and with hard work, persistence, and a can-do spirit the Powell family and Cholla Petroleum employees plan to continue that legacy for years to come.

Clockwise, starting from the top:

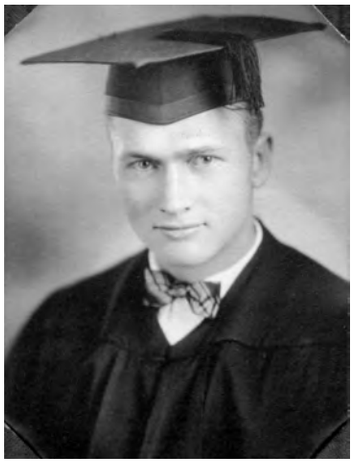
New rig 15 headed to Permian yard, August 2014.

Sweetwater, Texas, yard with our new Lamesa, Texas, crew celebrating the new yard.

Drilling under Possum Kingdom Lake.

Left to right, Gideon and Loyd Powell, Jr.

JDS Energy, LLC



Above: James L. Bole, 1926 graduate of the University of Colorado, Tau Beta Pi ChemE.

Right: David L. Bole, president and co-founder of Edwards & Leach Oil Company, 1981.

Below: James L. Bole, Cities Service Oil Company recognition for years 1926-1967.

As a teenager, David Bole often accompanied his father to the golf course. There, he witnessed firsthand how business could take shape.

More than a half century later, Bole, president of JDS Energy, LLC, still abides by his father's guiding principles.

"Dad spent his entire forty-one year career with Cities Service Oil Company, moving to the company's Bartlesville, Oklahoma, headquarters in 1934," Bole remembers. "More times than not, when business associates came to town, Dad would take them out to Hillcrest Country Club for a round of golf. Often, I got to tag along as a caddy.

"In the four or five hours he spent on the course and at the 19th-Hole in the clubhouse—where gin rummy was a high-stakes staple—Dad forged many of the relationships, which made him a success in his profession."

Those who know Bole, who have worked with him or benefitted from his business acumen, agree that he, too, is the consummate dealmaker. He understands that people want to do business with people they know, like and trust.

Bole also understands the energy sector. His ancestors were among the first settlers in Crawford County, Pennsylvania, not far from Titusville, where the nation's first "oil rush" began in 1859.

While the oil business is rooted in Bole's DNA, so, too, is the importance of education. His paternal grandparents were both college graduates and teachers. His father, J. L. Bole, graduated from the University of Colorado with a degree in Chemical Engineering. Bole himself is a University of Oklahoma graduate, having earned a Petroleum Land Management degree.

While pursuing his college education, Bole spent summers working both on- and offshore as a roughneck. He witnessed firsthand the relentless determination required to achieve success in the oil patch. His first job as a landman was with Humble Oil and Refining Company in Oklahoma City.

"A lot of my success in business comes from the fact I had a well-rounded education," Bole says. "My PLM degree at OU required classes in engineering, geology, finance and even law. That gave me the innate ability to look at a problem—or an opportunity—from many different sides, which in turn helped me learn how to construct a business deal which benefits all parties concerned."

During his long career, Bole has worn many hats: landman, investment banker, business developer, CFO and president. In each position, he took another of his father's dictums to heart: The path to success is getting the right people doing the right things.

And leading by example.

"Dad used to say, 'He who would be king, must first be servant to all,' and I really believe in that," Bole says. "Nothing in business is more important than your willingness to help others succeed. I've experienced that sort of support, guidance and mentoring from so many people in my own life, from working with roughnecks on an oil rig to negotiating with associates in the boardroom."

JDS Energy provides Bole a first in his long and storied career. He is now working alongside his children, Julia, David and Steve to continue a family tradition of success in the oil industry.

"Family means the world to me," Bole says. "I'm so pleased at this point of my life to be able to involve my children. Each of them has achieved success in their own right and while I'm proud of them all, I also have to say that the sum of the Bole family makes a formidable alliance for our partners."

"David Bole has spent his entire career connecting people and ideas," said S. Wil VanLoh, Jr., co-founder, president and CEO of Quantum Energy Partners. "He'll drop everything he's doing to help out a friend, and, as a result, he has more friends in this business than anybody I know."

While Bole remains active and successful in his pursuit of acquisition and divestiture opportunities for JDS Energy—and serves as a senior advisor to Ceres Energy Partners—he is also continuing his long-standing support of education, most notably through the JDS Energy Foundation and the Foundation for Energy Education, which supports energy understanding in Texas. His aim is to help the young people of today follow in his own path to become the oil industry business leaders of tomorrow.

"I had help every step along the way," Bole says. "I was fortunate to work with some of the best talent in the industry.

"Work is rewarding when you're part of a team," he continues. "One of the great things about the oil business is the opportunity we have to be a part of more than just one team. Every successful person I know works in tandem with multiple and often disparate groups. While the industry is constantly reinventing itself, it also provides many opportunities for reinvention on a personal level.

"Looking back, I'd have to say that's been a big part of what my life is all about. After all, in life, it's not about what happens to you that determines who you are, but rather how you handle the challenges that everyone faces."

Left: Left to right, David, Julia and Stephen Bole, became co-founders of JDS Energy, LLC in 2012. Photograph was taken in 1982.

Below: David and his wife, the former Joanne Cowen of Shawnee, Oklahoma, celebrated their fiftieth wedding anniversary in August 2008 with their three children and seven grandchildren. The couple give thanks and praise to the Lord for His many blessings their family has shared! Left to right, Garrett, Laura, Robert, Leslie and Julia Bole Atheron, Joanne, Anabelle, David, Jodi, David, Jr., Evan, Steve and Gabriela Bole, Maggie Baker and Lucas Bole.

Fair Oil, Ltd.

Born of humble beginnings near Arp in 1886, R. W. Fair became a highly successful farmer, oilman, philanthropist, and religious and civic leader.

His first job was a rural (horseback delivery) mail carrier during which time he became interested in growing peach and pecan trees. In 1923 he moved his family to Tyler and by the 1930s, he had established large peach and pecan plantations in Texas and Arkansas. Fair would later quip that businesses whose name begin with the letter "P" were always very good for him!

R. W. Fair.

In 1931, Fair leased one of his peach orchards to a Dallas oilman, H. L. Hunt, who had recently drilled the Daisey Bradford #3, the discovery well of the East Texas Field, just down the road. One of the early subsequent wells Hunt drilled was the R. W. Fair Peach Orchard Well that was completed in May 1931, producing 2,300 barrels per day. Although Fair had no experience in the oil business, shortly thereafter he became the first individual to finance 100 percent working interest in a well drilled on his own property with 100 percent royalty interest. The rest is history and Fair was in the "P"etroleum business.

Fair spent the next several years building his company largely of people outside of the oil business including a school teacher and bank officer as key managers. During this time, they drilled fifty-three wells within the East Texas Field.

Just three years after the Peach Orchard well, in 1934, Fair and his wife, Mattie, established the R. W. Fair Foundation, which continues their legacy of generosity and service to the community still today.

In 1938, Fair Oil took large positions in federal leases in Eddy and Lea Counties in New Mexico. Fair Oil has been highly successful over the years developing this acreage, which is still being drilled by Fair Oil today.

In 1941, Fair Oil participated with a bottom hole contribution in Bobby Manziel's discovery well of the Hawkins Field. Fair Oil drilled eight producers within the field before unitization and was the first independent to sign the Unitization Agreement.

By 1977, Fair Oil had discovered and participated in the early development of fields that had produced over 35 million barrels of oil and 23 BCF of gas. Other fields in which Fair Oil either discovered or participated in early development of including: Walter Fair Field, Kaufman County; and Woodlawn Field, Harrison County, Texas;

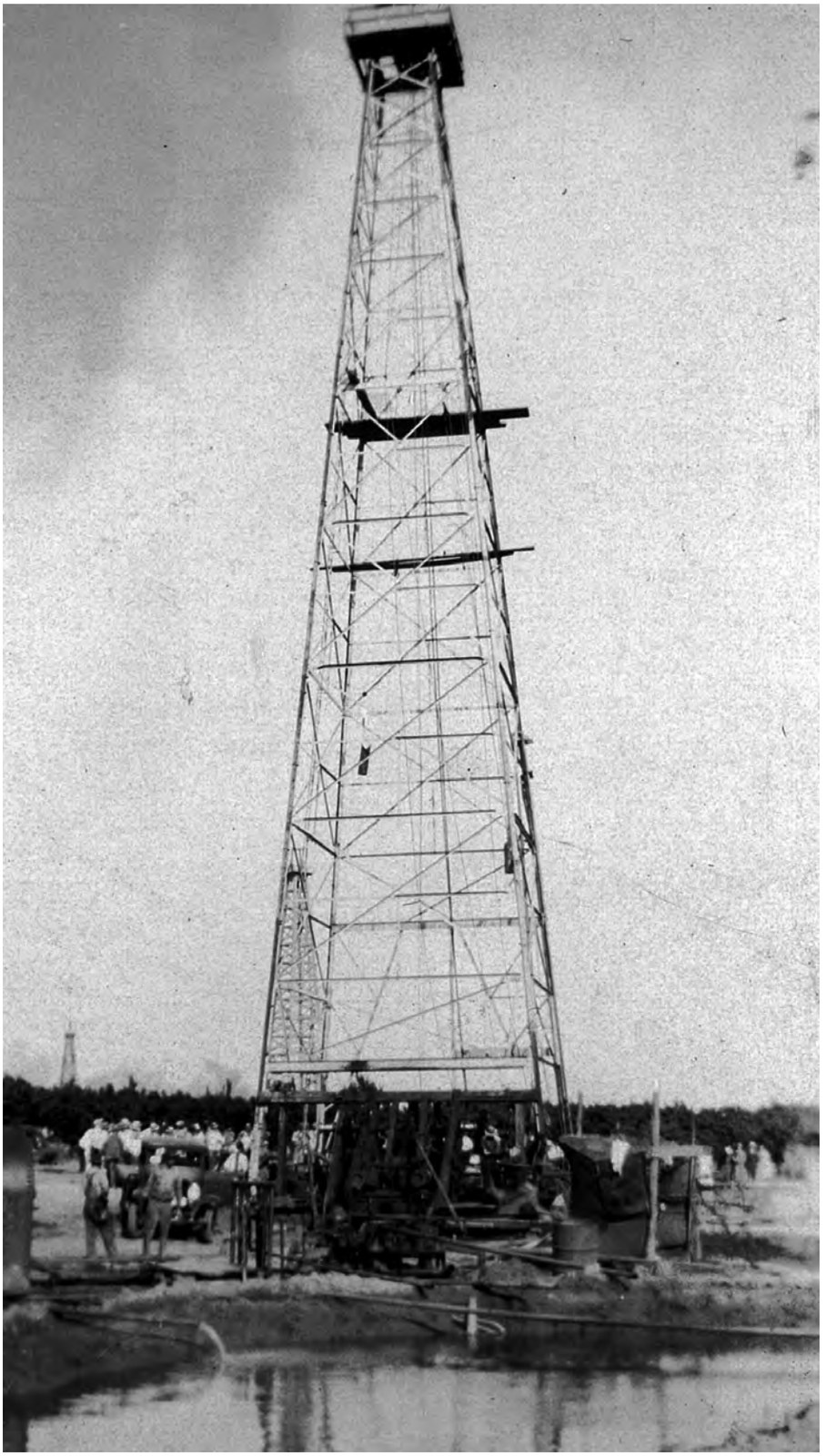
Redland Field, Bossier Parish, Louisiana; Glenn Pool Water flood in Tulsa and Creek Counties, Oklahoma, in which Fair drilled over 200 wells; Fairway Field, Anderson County; Tyler East Paluxy Field, Smith County; Green Fox Field, Marion County; Flint Paluxy Field, Smith County; Pearsall Austin Chalk Field, Frio County; drilling sixty-five wells; various fields in Wood County Texas, Arapahoe County, Colorado; Rosebud County, Montana; and Niobrara County, Wyoming.

Due to new IRS rules pursuant to the Internal Revenue Act 1969, Fair Oil Company sold many of its producing assets to Continental Oil and American Petrofina in 1974. Fair Oil was reformed as a closely held Limited Partnership in 1975 owned by family members and key employees. New leases were immediately taken and discovery wells were drilled in Frio (Pearsall), Marion (Green Fox), and Freestone (Teague) Counties, Texas.

Within the past ten years, Fair has drilled multiple wells in Kentucky, Utah, New Mexico, Kansas, Oklahoma, Mississippi, Louisiana and Texas. Fair Oil continues to operate wells throughout East Texas, South Texas, Louisiana and New Mexico and participates in several hundred non-operated wells.

Eighty-three years after the first well was drilled, Fair Oil offices are located in the same office building that Fair built in 1947, near downtown Tyler, Texas. Fair Oil continues to enjoy the rich heritage and reputation passed down through the years by R. W. Fair (1886-1965) and his two sons Wilton H. Fair (1921-2000) and James W. Fair, (1925-2009). Over the years, Fair Oil has benefited from the leadership of managers who spent their entire careers with the company. Men like Sam Bright, Dick Ray, Gus Arnold, Marvin Wilson, Nat Goodwin, Mac Bynum and many more dedicated employees, several with over forty years of service to the company.

Today, Fair's leadership team of Bob Garrett, CEO; Rodney Thomson, Production; Jay Bynum, Exploration; Sherri Harris, Land; and Rachel Larson, Accounting, have a combined total of over 125 years of service.



Barbara King Fair has been with Fair Oil for forty-six years and serves as president of the R. W. Fair Foundation, which continues serving the needs of others within the community and surrounding region.

J. G. Walker, Jr.

J. G. "Jimmy" Walker, Jr., was born in Oklahoma City, Oklahoma, in September 1912. Shortly thereafter, his family moved to Tampa, Florida, where he was raised and attended the University of Florida.

Above: J. G. (Jimmy) Walker, Jr.

Below: J. G. Walker, Jr., with his wife, Curtis H. Walker, both deceased.

Jimmy Walker was close to his family and his grandfather, James Hemphill Walker, who was commissioner of the Texas General Land Office from 1929 to 1936. James H. Walker, known as "Uncle Jim" to his friends, served thirty-eight years with the General Land Office, starting in 1899 as a Spanish translator.

After college, Jimmy migrated from Florida to West Texas working on a survey crew surveying the University of Texas fee lands prior to moving to the East Texas oil field area and settling in Tyler. While working in West Texas, Jimmy married Ellen Schauer, and they later had one son, Kelly. In 1935, Jimmy began his career in the oil and gas industry as a roughneck before working his way up to production foreman.

In the early days, Jimmy worked for Johnston & Owen Oil Producers of Tyler as a production foreman and later for Bobby Manziel prior to forming his own drilling company with Manziel as his limited partner. This company was sold in the late 1950s.

Moving to the East Texas oil field not only introduced him to the "black liquid-gold area" but also led to his meeting a special lady working for Humble Oil & Refining Company named Curtis Humphries of Mabank. He married Curtis in 1949 and together they raised three boys: Kelly, Scott and Gary Walker, all of whom have careers in the oil and gas industry. Jimmy and Curtis were also blessed with seven grandsons.

World War II took Jimmy away from the oil and gas industry for a while when he became a contract flight instructor for the U.S. Navy, teaching primary training at Gladewater, Texas. Later he expanded his aviation interests by purchasing a fixed-base operation at the Tyler airport, known in those days as Pounds Field, and also became a dealer for Beech Aircraft Corporation.

But the oil and gas industry has a way of getting into a man's blood, so Jimmy eventually returned to the business after World War II. His biggest impact on the industry came through ownership in Fairway Operating Company of Tyler. In 1960, the company, owned by Walker, A. Carroll "Pete" Clay, Thomas Clay and John Prothro, drilled the discovery well (Wofford #1) for the Fairway Field located near Frankston.

The James Limestone was the producing interval, and on initial test the well flowed 426 barrels of oil per day. Field development came rapidly and wells were drilled to a depth of approximately 10,000 feet. Spacing was established for 160 acre units and plans were formulated to create a unit for pressure maintenance and ultimate recovery.

The Fairway (James Lime) Unit was put into effect on October 1, 1963, with Hunt Oil Company named as operator, and the majority of gas produced was reinjected into the James formation for pressure maintenance purposes. Blowdown gas sales commenced in April 2000, and as of May 31, 2014, the Fairway (James Lime) Unit had produced 214,325,682 BBLS/Oil and 1,070,168,219 MCF/Gas (total wells = 145). The unit encompasses 30,000 acres and is one of the largest onshore fields discovered and developed in the United States.

In the early 1970s, Jimmy became a principal owner in Millican Oil Company along with the Clay brothers and other Tyler participants. This successful exploration and production company was headquartered in Tyler with additional offices in Houston and Victoria. The company was sold in 1984-1985 to Amax Oil & Gas of Houston. Other successful exploration areas were the Dorcheat-Macedonia Field in Columbia County, Arkansas, participating with Peyton McKnight; and drilling in the Illinois Basin through the operations of Booth Resources, Inc.

Jimmy shared his success with the Tyler and Smith County communities. He was very involved in the Boy Scouts of America as well as industry associations and participated in charitable causes. He helped fund the current YMCA headquarters in Tyler, and his personal and financial generosity touched many organizations and individuals, particularly as it pertained to education, including Tyler Junior College. In his honor, the J. G. Walker, Jr., Memorial Scholarship was set up through the University of Texas at Tyler to provide support for students enrolled at UT Tyler who meet the academic criteria for attendance and who are in need of emergency assistance.

The Mint Julep Golf Tournament, held at Willow Brook Country Club in Tyler each year, was a major community project for Jimmy. The tournament venue was modeled after the Masters Golf Tournament held annually in Augusta, Georgia. Numerous oil and gas associates were invited to play along with notables such as Darrell Royal and Frank Broyles. Other Southwest Conference football coaches invited to play included Jackie Sherrill and Grant Teaff.

After a battle with cancer, Jimmy passed away in July 1986. After his death, Jimmy's wife, Curtis, had the desire to learn the oil and gas industry to carry forward the business her husband started. She successfully accomplished this goal with her son, Kelly, until her death in 2011.

Today, the company that bears his name, J. G. Walker, Jr., Ltd., L.L.P., explores for oil and gas in a non-operating posture in mature basins using competent land and technical support people. The company utilizes minimal staffing by employing consulting geologists, land, and engineering parties. Exploration efforts are mainly in mature areas targeting shallower zones with the overall viewpoint of replacing reserves on a reasonable timetable.

Above: Left to right, Scott H., Gary M. and Kelly W. Walker, sons of J. G. Walker, Jr.

Below: Jimmy Walker with Darrell Royal at the 1977 Mint Julep Golf Tournament in Tyler, Texas.

H. P. Slagel Producing Co.

H. P. "Cap" Slagel, who founded H. P. Slagel Producing Co. in the late 1950s, came to Texas in 1914 at the age of nineteen from Mason City, West Virginia, a salt-mining community where Cap worked with his father drilling brine wells. Two years later, in response to Mexican Revolutionary leader Pancho Villa's incursion on U.S. soil, Cap joined the Texas National Guard and served with the U.S. Army as a member of General John J. "Blackjack" Pershing's expeditionary forces.

Cap went on to fight in World War I and in 1919 was discharged with the rank of Captain in the Texas National Guard, resulting in the nickname of "Cap." During this period, Cap met and married Lottie Landers of Colorado City, Texas, and after a stint as a messenger and dispatcher with Wells Fargo, he and Lottie returned to her hometown and Cap began his career in the oil business as a driller and pusher.

"I wasn't a cowboy and I didn't learn a hell of a lot in the Army," Cap told a reporter for a 1972 story for the *Big Spring Herald*. "Finally, my wife encouraged me to move to Colorado City, where I first began in the oil business."

Cap worked as a tool dresser or driller on many of the more important Mitchell County wells, which helped direct the eyes of the nation's oil industry on the Permian Basin for the first time. Cap worked on the Morrison No. 2 well, the second and best of the early producers in the Westbrook Field in 1922.

He also worked on several discovery wells, including the discovery well that started the oil boom in Loving County, New Mexico. Not only did Cap work on wells in West Texas and New Mexico, he spent ten years working rigs in the four corners area that included Arizona, Colorado, New Mexico, and Utah. In the late 1950s, Cap was the principal owner of some stripper (shallow-hole) oil wells near Ira in Scurry County, about thirteen miles southwest of Snyder. He continued to slowly grow and develop his production until his death in 1974.

In 1976, his daughter, Bette Slagel Bennie of Odessa became the manager of a family partnership made up of her older sister,

Above: (From left to right) H. P. Slagel Producing Co. manager Bette Slagel Bennie, Lease Operator Gus Sterling, and Catherine Slagel Shelton posing at the recently completed Sterling 1-5 well in 1979.

Top, right: H. P. "Cap" Slagel (left) and another Texas pioneer oil man and rancher Jack Frost (right). Slagel worked with Frost and his partner Harold Byrd for many years as a geologist.

Right: H. P. "Cap" Slagel, seated at right, receives his Hall of Fame award certificate from the Permian Basin Petroleum Museum, Library and Hall of Fame in May 1972. Slagel is recognized as a pioneer driller in the Permian Basin using cable tool rigs to drill key discovery wells like the Morrison #2 near Westbrook, Texas, that opened the Westbrook Field in 1922 and the Sloan-Miller #1 that extended the field.

H. P. Slagel Producing Co., family members and spouses gather for a photograph on a 2012 visit to one of the Slagel oil leases located just west of Ira, Texas. Shown are (from left to right) John Plummer, Drew Shelton, Sara Shelton, David Slagel, Jeff Smith, Shannon Smith, Arthur Spragg (manager), Dan Slagel, and John Dodgion.

Catherine Slagel Shelton of La Jolla, California, and Cap's brother, Robert B. Slagel of Ironton, Ohio. Working together, the trio successfully drilled and completed several wells on the Sterling 1, Sterling 2, and Sterling C leases with the aid of strong, highly experienced lease operators, Gus Sterling of Ira and Larry Bills from Snyder.

Bette Slagel Bennie served as manager of H. P. Slagel Producing Co. for almost thirty years from 1976 until a few months before her death in July 2006. Her son, Arthur W. Spragg, then assumed management of the H. P. Slagel Producing Co. and currently serves as general manager. Bette and Catherine worked with Robert Slagel and his sons Robert B. Slagel II and John Slagel to craft a successful drilling program with very little oilfield or drilling experience. Their combined efforts led to successful completions of eleven new wells that bolstered and built the Sterling 1, Sterling 2, and Sterling C leases.

Like any family, not everyone agreed on what the right patch or best way to proceed should be, but a consensus was always reached because everyone was—and still is—passionate about making the little oil company the best it could be. Perhaps the greatest contributor to the company's continued growth was creation of the Sharon Ridge (2,400 feet) Clearfork waterflood in the late 1980s that has steadily helped boost oil recovery and production numbers.

H. P. Slagel Producing Co.'s operations expanded and production figures began to grow with the addition of Ira-based Rick Graham as lease operator in September 2006. Graham brought a lifetime of oilfield experience to bear for this little family company and grew his reputation for having a nose for finding new oil within its old leases. Graham's field savvy intelligence, honesty, dependability, and dedication almost single-handedly helped broaden the little independent producer's vision and reach.

Through the years, H. P. Slagel Producing Co.'s production has grown from a few hundred barrels of oil a month to just under 100 barrels each day. The company has no employees and even the manager's position is handled through contract labor. The company prefers to work with small, hungry companies that maximize talent and experience to create intelligent, practical, and cost-efficient problem-solving solutions and opportunities. It does its best to do business with Scurry County and West Texas businesses.

H. P. Slagel Producing Co.'s mission is to fully develop and grow the foundation block of oil leases obtained by Cap, working as responsible, accountable, and environmentally conscious stewards of the earth to gather petroleum deposits held beneath it. It does this while keeping an eye toward future expansion through the acquisition of new leases and drilling opportunities in the Scurry, Mitchell, and Borden County areas.

As for the future, H. P. Slagel Producing Co. is determined to make the most of its drilling locations within existing acreage while exploiting all available depths to locate and tap behind-the-pipe opportunities with current production. The company also is vigilant and eager for expansion opportunities to grow and diversify its business outside its foundation leaseholds.

Nordan Oil & Gas Corp

Nordan Oil & Gas Corp owes its existence to the hard work of its founder, Russell N. Taylor, chief executive officer, president, and certified professional geologist, who combined his academic knowledge of geology with an entrepreneurial spirit common to oil and gas wildcatters to create a successful independent oil and gas operator known throughout the industry.

Russell N. Taylor.

Born in the state of New York, Taylor earned a bachelor's degree in geology from Colgate University in 1948 and went on to earn a master's degree in the same subject from Lehigh University in 1950. Originally, Taylor planned to pursue a degree in botany, but a professor urged him to sign up for a geology course. He enjoyed the course so much he took another one, and soon geology had a hold on him.

"I was in love," he told the *Abilene Reporter-News* in an article published March 13, 1983. "I don't know how I fell in love, but I decided to make geology my career. I've always told my students that a man has two loves in his life—his work and his mate," said Taylor, who for twenty-four years worked as a lecturer at McMurry College in Abilene.

While at Lehigh University, Stanolind Oil recruited Taylor to work for the company, and so after earning his degree he joined the company in Wichita Falls in 1951. He moved to Abilene a year later. He worked there until 1955, when he left to go into business for himself as a consulting geologist and, in 1957, formed Nordan Oil & Gas Corp.

In an August 25, 1994 article in the *Abilene Reporter-News Business Journal*, Taylor said he came to Texas at the right time. "I was ready to come to Texas. I was ready to get out of that cold climate," he said. He recalled one winter when the temperature fell to thirty-eight degrees below zero. He also realized that the oil business in New York was on its last legs. "This (Texas) was where the action was."

Taylor first became interested in the Menard County area in the mid 1970s. Nordan drilled its first well in August 1976, which resulted in the discovery of the Bar-F Field. The discovery well potentialed for 7.9 MCFGPD from a depth of 1,700 feet. The South Branch Field was discovered using a downdip well as a subsurface indicator. Nordan discovered the West Menard Field in January 1981 and produced 352,000 barrels of oil.

He performed a hydrocarbon based analysis in 1979 covering approximately 120 square miles of the north half of southwest Menard County, and it suggested that approximately 6.5 million barrels of oil and gas equivalent remained to be discovered. Nordan had production at that time in Taylor, Menard, and Glasscock Counties. One well completed in June 1993 potentialed for 450 barrels per day, both wells producing from Wolfcamp turbidites at 8,400 feet.

Taylor retired in 2007 after Nordan sold its production, but boredom set in and in 2010 he drilled the No. 1 Powell in Menard County, resulting in a new field discovery. The company began developing the field.

Through the years, Taylor and Nordan Oil & Gas Corp have been involved in helping the Abilene and oil and gas communities through charitable work, monetary donations, and lending their knowledge and experience to whatever the cause might be.

Charities include West Texas Rehabilitation, Disability Resources, and Ben Richey Boys Ranch. Taylor is former president of the West Central Texas Oil & Gas Association. He is former committee chairman of the Texas Independent Producers & Royalty Owners (TIPRO). In 1998 he received the regional oil

and gas industry's highest awarded, known as The Wildcatters Award. Bestowed by the West Texas Central Texas Oil and Gas Association Board of Directors, The Wildcatters Award, which is not given annually, is bestowed upon a person who has made significant contributions to the industry.

Other professional organizations in which Taylor was involved include the Abilene Geological Society, Independent Petroleum Association of America, and American Association of Petroleum Geologists.

Nordan Oil & Gas Corp, which employs six people, plans to continue drilling and exploring for oil and gas. Taylor, eighty-eight, plans to remain involved in the company, sharing his knowledge and experience with the generations of oil and gas industry workers who have followed him.

Taylor remains an optimist in regard to the oil and gas industry and in regard to drilling for and finding oil and gas, and he continues to believe in following your instinct. As he told the *Abilene Reporter-News* in 1994, "When you're convinced there's an oil field in a particular area, stay with it. Don't give up on it. If you have a dream, don't give up on it."

Above and left: John A. Powell No. 1 Well, Menard County, Texas.

Fossil Oil Company, LLC

Fossil Oil Company, LLC, is an independent oil and gas investment, exploration, production and drilling company founded in 1999 by Dennis R. Kittler, president. Fossil specializes in developing and offering oil well investment opportunities. Prior to his establishment of Fossil Oil, Kittler held the position of chairman and chief executive officer of several other privately owned oil and gas drilling and operating companies. These companies specialized in the acquisition of producing properties and the generation of seismic based oil drilling prospects along the mid and upper Texas and Louisiana Gulf Coast. Kittler and his management team have more than 130 years of experience acquiring mineral leases, oil drilling operations and positioning them to provide high quality oil and gas investment opportunities for high net worth individuals, institutional and equity funding groups who are seeking significant investment opportunities in reserves of oil and natural gas. Our team is made up of engineers, geologists, project managers, and financial consultants that deal exclusively in the oil and gas industry. We select projects based only on strong seismic data offering considerable economic upside and high year-end tax write-offs. Understanding every facet of the process—from discovery to assessing value—is what allows us to present you with smart oil investments and gas investments.

Fossil's team concentrates on the generation of lower risk oil drilling investments primarily in South Central Oklahoma utilizing its exclusive proprietary brand new thirty-four square mile 3D seismic shoot and in Southwest Mississippi drilling the prolific Lower Tuscaloosa channel sands.

Above: Famed oilman Michael T. Halbouty and Dennis Kittler reviewing 3D seismic data on one of their many joint ventures, 2001.

Below: Dennis Kittler flaring oil and gas in South Liberty County, Texas, on salt dome oil discovery, 1982.

Opposite, top: Dennis Kittler on Fossil Oil's drilling rig in the Antioch Oil Field in Garvin County, Oklahoma, 2014.

Opposite, bottom: Fossil Oil's new oil discovery in Liberty County, Texas, 2012.

Kittler is responsible for the direction of Fossil Oil Company's overall corporate activities, including administration, legal, finance and marketing Fossil's oil investment drilling programs. He is actively involved in acquiring mineral leases, oil drilling and positioning himself and his company to provide high quality energy investment opportunities for high net worth individuals, institutional and equity funding groups seeking investment opportunities offering significant reserves of oil and natural gas. Kittler held management and executive level positions with several nationally recognized corporations including Ampex Stereo Tapes, International Business Machines (IBM) and the Miami Dolphins, Inc., before his oil career began in 1975. Kittler has forty years of experience in the oil industry involving hundreds of oil and gas wells.

After having earned his Bachelor of Arts (BA) degree in Finance at Coe College in Iowa, Kittler received his master of business administration (MBA), with honors, in marketing management at St. Cloud State University in Minnesota. Following his term of active duty with the U.S. Army and the U.S. Army Reserves from 1967 through 1972, he held management and executive level positions with several nationally recognized corporations until he began his oil career in 1975 as a marketing specialist in the Rocky Mountain region for ENI Exploration Company. He soon became a partner and vice president with that firm, which structured, sponsored and marketed more than fifty diversified oil and gas drilling programs that involved dozens of industry partners and drilled hundreds of oil and natural gas wells throughout the United States and Canada, as the largest fundraiser within the independent oil and gas industry.

In 1979, Kittler became president and CEO of a Houston-based independent oil and gas exploration and production company involved in drilling and operating wells throughout the mid and upper Texas Gulf Coast region. In late 1986, after the company had divested and sold its Texas producing properties, Kittler traveled overseas to form a joint venture with the Republic of China (China National Oil Co.), along with selected clients in South Korea, including Lucky Gold Star Corp., pursuing producing oil drilling properties to supply their refinery feed stock source needs.

Fossil Oil Company's current drilling operations, in addition to its lower risk oil drilling investments and operations in South Central Oklahoma, is currently active along Southwest Mississippi's prolific Lower Tuscaloosa oil play, outside the city of Natchez in Lincoln, Pike, Franklin Counties. Fossil Oil also has oil drilling operations in the Mid and Upper Texas and Louisiana Gulf Coast (onshore), and in Southwest Alabama's Smackover oil play.

For additional information on Fossil Oil Company, LLC, visit www.fossiloil.com.

Seely Oil Company

In 1975, Charlie Seely, then president of Armer Oil Company (Armer) sold the company but retained operations of about forty wells. Then in January 1976, with three former Armer employees, he started Seely Oil Company (Seely) in Fort Worth, Texas. Many of the existing working interest owners continued to invest with the new company. The original business plan was to increase the number of wells operated by drilling and acquisition. The first well Seely drilled was a replacement in the Oceanic Canyon Reef Field in Borden County, Texas and it still continues to produce some thirty-nine years later. Then most of the company's activity was in the North and West Central Texas region drilling for the Mississippian Chappel Reef using surface geology, seismic, and dip meters. Dry holes were re-entered and dip meters run to determine the presence of nearby Mississippian Reefs. This program had been very successful for Armer and Jones Company and resulted in their discovery and development of the northeast Shackleford Mississippian Field, which consisted of about twenty connected reefs that made in excess of ten million barrels of oil.

Also a drilling program was started in the Mississippian Sooner Trend in Garfield, Major, and Kingfisher Counties, Oklahoma. The field was originally developed on 640 acre spacing but despacing allowed infill drilling on eighty acres. Most of the wells drilled then are still producing.

Above: Charlie Seely.

Right: Left to right, Charles Seely, Jr., Charlie Seely and David L. Henderson.

A number of Wildcats were drilled in the Midland Basin playing the Ellenberger and Strawn Limestone formations. Several discovery wells were drilled by Seely at this time, but nothing significant resulted.

In 1990, Seely returned to his roots in waterflooding in Lea and Eddy Counties, New Mexico. A new federal unit was formed on part of the E. K. Queen Field that was not previously in the Mobil E. K. Queen Unit. Successful flood results in the new unit caused Seely to buy the old Mobil E. K. Queen Unit. Since then several wells have been drilled and the flood extended and another extension is currently planned. Another Federal Unit was formed as the E. K. Penrose Unit.

Seely also drilled for the Atoka Conglomerate in Denton and Wise Counties. This area had also undergone despacing from original units of 320 acres to 160 acres. Seely purchased numerous larger gas units for the purpose of infill drilling. In addition to the Atoka Conglomerate, this area was in the Barnett Shale play and Seely drilled and participated in the play from 2000-2005. Most of this production was sold in 2006.

The purchase of the E. K. Queen Units led to further wells being drilled for the Bone Spring Carbonate and Bone Spring Sands, Morrow, and Delaware zones. Several horizontal wells were drilled in the Bone Spring and Delaware formations.

After sixty years in the industry, Seely is in the process of retiring and has turned over most of the responsibility for future planning and operations to his nephew, President David Henderson and to Vice President Charles (Chuck) Seely, Jr. In the future, the company will continue to pursue acquisitions for the purpose of secondary recovery and exploitation and follow the same general business plan.

Sojourner Drilling

W.C. "Bill" Sojourner, Sr., founded Sojourner Drilling in 1946, and, although he had no way of knowing it at the time, the company he created would not only experience great success but become a family-owned business spanning—at present—three generations. The company is based in Abilene, Texas.

Sojourner served as president and overseer of all aspects of the drilling business. His son, William C. "Bill, Jr." Sojourner, Jr., took over as president in 1960 and served through 1996, when he passed the mantle of leadership to his son.

William Sojourner III purchased the company from family members and outside shareholders in 1990. Sojourner, who attended Angelo State University and Abilene Christian University, has built a well-respected team that

Above: W. C. Sojourner, Sr., discovery well site, Sojourner Field, Haskell County, Texas, 1949.

includes an accountant, in-house attorney, land department, regulatory specialist, geologist, and petroleum engineer/field engineer.

The staff uses seismic technology and is experienced in vertical as well as horizontal exploration and has knowledge of current drilling and completion techniques associated with resource plays. The company operates its own equipment, including roustabout, well-service units, tank-bottom reclamation, and a repair/fabrication facility. The company operates with no debt and its significant growth has been achieved with internally generated cash flow.

On September 28, 2006, the Texas Alliance of Energy Producers, at its Celebrating Our Heritage Oil Legends Luncheon, awarded W. C. "Bill" Sojourner, Sr., and William C. Sojourner, Jr., with the "Legends Medal Award" for their many years of participation and perpetuation of the oil and gas industry.

Under the leadership of Sojourner III, the company has grown significantly. The company owns interests in and operates more than 300 wells, primarily in the Eastern Shelf as well as the Permian Basin, Fort Worth Basin, and Gulf Coast. The company takes an integrated approach to the exploration and production business.

Murjo Oil & Royalty Company

Murjo Oil & Royalty Company was incorporated in Texas in August 1937 and was one of many businesses formed by Francis Kirk Johnson. The name was derived by combining the name of one of his partners, F. H. Murphy, with Johnson.

When you get started on the activities of F. Kirk Johnson, there is no stopping place. He was an oilman first and foremost; however, he owned an airline, a foreign car distributorship, television and radio stations, cattle ranches, an olive ranch, and a racing stable. He collected paintings, and of all his possessions Kirk cherished most his collection of thirty-five original oil paintings of African game by the great German artist, William Kuhnert. The second-largest collection of eighteen Kuhnert paintings resided in the National Museum in Enschede, Holland. Many of Kirk's Kuhnert paintings now comprise an exhibit at the Fort Worth Zoo.

Johnson was born in Nebraska and spent his early years in Western Canada, where he studied civil engineering. He later studied geology at the University of Chicago. He married Elizabeth McGhee, a Chicago girl, in 1921 and entered the oil business that same year. He was called "Fran" by his family and close friends, but many business associates called him Kirk. The Johnsons moved to Texas, and he drilled his first dry hole on the Waggoner Ranch. One of his partnerships, Gibson and Johnson, made a big discovery in Winkler County, Texas, in 1929.

In January 1928, one of Johnson's companies, Leck Royalty and Oil, was incorporated. A few months later, the former Gibson and Johnson partnership was incorporated. Most of the properties originally purchased by Gibson and Johnson were later sold to Leck in 1930. Many mineral interests currently owned by Murjo Oil & Royalty Company were purchased from individuals who had purchased them from Leck Royalty. Leck was subsequently acquired by Ambassador Oil Company.

In the early thirties, the Johnsons moved to Fort Worth and, as an individual, Kirk got into producing, refining, and marketing. Kirk had three refineries in Texas and discovered fields in Texas, Michigan, and Kentucky. In 1942, he started the Live Oak Stable, which he owned with Jimmy Stewart, the actor. They owned horses in England, Ireland, Panama, and California. Jimmy and Gloria Stewart often accompanied Kirk and Elizabeth on expeditions, one of which was a forty-day safari in Africa. Kirk was president of the Fort Worth Zoological Association. In 1949 he financed and activated Central Airlines, Inc., a local-service airline.

Ambassador Oil Corporation was formed in 1956, with Kirk as president and chairman of the board. Many field discoveries made

This painting, titled A World of Memories, *was presented to F. Kirk Johnson at the annual board meeting of Ambassador Oil Company in 1961. The painting depicts many of Johnson's hobbies and businesses.*

by Ambassador were named after Kirk, such as Wendkirk Field, Frankirk Field, Abkirk, Kenkirk, Newkirk, etc. Ambassador was sold to Anadarko in 1965.

The Johnsons had two children. Their daughter, Elizabeth Ann Johnson Mitsch, had a son, Donald Bond Ehrhart, and a daughter, Cynthia Ann Mitsch Bearden. Their son, F. Kirk Johnson, Jr., had three children, Debbie Johnson Head, DeMar Johnson Hopson, and F. Kirk Johnson, III. Francis Kirk Johnson died in 1963.

Effective January 1, 1992, Murjo Oil & Royalty Company was divided along family lines. This was accomplished by fifty percent redemption-in-kind, leaving the corporation intact and providing continuity of operations.

Murjo owns oil and gas properties in seven states. Most properties are mineral interests in many Texas counties. Usually the company leases the minerals to others and retains a royalty interest; however, sometimes the company participates in the development to the full extent of its mineral interests. Murjo drilled some wells in the late 1970s and 1980s that are still producing and continue to be operated by the company. The company also owns working interests in wells drilled and operated by others. Murjo has both oil and gas production, royalty and working interests, operated and non-operated properties.

As of July 1, 2014, the directors of Murjo Oil & Royalty Company were Cynthia M. Bearden, Bettye B. Davis, D. Lee Thomas, Jr., and Colt Bearden. Murjo officers and other employees who have been with the company twenty-five or more years are: Bettye B. Davis, Cynthia M. Bearden, D. Lee Thomas, Jr., Becky W. Young, and Doug Huckabee.

Murjo Oil & Royalty Company is located in the historic Livestock Exchange Building in the Fort Worth Stockyards.

In 1960, Ambassador Oil Company took a concession of 20 million acres covering all of the Republic of Ireland, except the six North British counties. These photos show Mr. and Mrs. F. Kirk Johnson on a trip to Ireland with their close friends Jimmy and Gloria Stewart.

J. C. & W. F. Reynolds Oil Producers

Founded in 1964 as a partnership of John C. Reynolds and his son, William F. Reynolds, the J. C. & W. F. Reynolds Company has roots that travel deep into North Texas history.

John Clifford Reynolds was born on June 25, 1894, in Chicago. Not long after the turn of the century, his family moved to Denver in hopes that the dry mountain air would help his brother's tuberculosis. The family lived on a dairy farm, and one long winter John was left alone there to care for the cows until the farm sold. The experience convinced him to never again live on a farm.

John's father, William Francis Reynolds, a real estate developer, decided to try his hand at promoting and drilling oil wells in Wyoming. He succeeded in drilling some of Wyoming's earliest wells, and his introduction to wildcatting set in motion the forces that would drive the family's lives and pursuits for generations.

W. F. organized the Double Standard Oil and Gas Company with headquarters in Denver and in 1921 launched a strategy to develop the company's leaseholds in the burgeoning fields in near Burkburnett, Iowa Park, and Petrolia, Texas. W. F. had also organized a second company, Big Flow Oil Company, selling stock at fifty dollars per share. These companies provided the impetus for the Reynolds family to remain in Texas.

In 1917, John joined the Army to fight in World War I. He was discharged in 1918, and returned to work in the oil fields in Burkburnett. The Big Flow Oil Company brought in Well No. 1 on the Musick Lease, Burkburnett Town Site, in December 1918. The well flowed 500 barrels per day the first week. During the next six months, the well yielded 72,000 barrels.

In 1922, John married Lucile Olive Kephart, and the couple moved to Wichita Falls. They lived in a house on Fillmore Street,

where they raised five children. John and his father rode the train from Wichita Falls to Burkburnett daily in their best clothes, joining others in promoting oil deals, and then put work clothes over their "best" to perform the hard work associated with drilling and producing wells.

When the Burkburnett Boom subsided, John took on the challenge of developing other oil fields in Clay County and Ranger, Texas, as well as the towns of Duncan and Seminole in Oklahoma for King Oil Company. He was active in the development of the Panhandle oil field at Pampa and Borger as well as fields at K. M. A. and in South Texas. After the King Oil Company dissolved in 1941, John continued in the oil business as an independent oil producer. In 1964, he and his son, Bill, organized J. C. & W. F. Reynolds Oil Producers.

Following completion of their studies at the University of Texas at Austin—William's degree was in geology, while Stanley's was in petroleum engineering—the Reynolds sons joined their father in Wichita Falls.

Then, as now, the company was active in numerous Texas counties as well as in Oklahoma, Louisiana, Wyoming, Alabama, New Mexico, and Kansas. John's daughter, Jacelyn Hall, now serves as the partnership's managing partner. J. C. & W. F. Reynolds continues to pursue interests in energy projects across the region.

John was one of the original members of the North Texas Oil & Gas Association. He was a member of the Petroleum Club, The Wichita Club, and the Pat Carrigan Post 120 of the American Legion.

J. C. died on June 23, 1974, in Wichita Falls, two days before his eightieth birthday. His wife, Lucile, died in 1980. The couple had five children: Jacelyn Lucille Reynolds Hall, Barbara Ruth Reynolds Crowell, William (Bill) Francis Reynolds, John Clifford Stanley Reynolds, and Martha Sue Reynolds Brady.

The Thacker Family

3-T Exploration, Inc.

5-T Properties, Ltd.

The Thacker family's involvement in the oil and gas industry began in 1953 when W. M. (Bill) Thacker, Jr., accepted a position as attorney/landman with Fain & McGaha, a partnership of Charles McGaha, Lamar Fain, and Marvin E. McCullough of Wichita Falls. Fain and McGaha were longtime independent oil and gas operators originating in 1918 as Murchison-Fain Oil Company, later becoming Fain & McGaha Oil Corporation. In 1960, following the death of Lamar, Bill became a partner in Expando Production Company with the remaining partners of Fain & McGaha and Minnie Rhea Fain. The remaining partners, along with Ruth McGaha and John Crumpler, formed Expando Oil Company in 1975 after the death of Charles. Both partnerships were active in oil and gas exploration and production in Texas, and subsequently, they opened an office in Corpus Christi to operate the South Texas properties, which were managed by John. In the early 1990s, both partnerships were dissolved, and the properties were distributed to the partners. Ruth, John, and Bill combined their partnership interests distributed to them, so that they could continue operating together. This resulted in Bill forming 5-T Properties, Ltd.; a family limited partnership. Ruth and John formed similar family limited partnerships. John and Bill formed CTR Petroleum, Inc. to manage the partnership's properties in the Corpus Christi area.

Left to right: Ty, Bill and Thomas Thacker.

Bill's middle son, Ty, graduated from the University of Texas in 1978 with a bachelor's degree in petroleum engineering and was employed by Expando for several years before starting his own company in 1981, 3-T Exploration, Inc. (3-T). After the Expando companies were dissolved, Bill moved his offices in with Ty's. Ty's son, Thomas, graduated from the University of Texas in December of 2008 with a bachelor's degree in geology and joined 3-T in February of 2009.

3-T develops, acquires, and operates exploration projects for itself, other family entities, and other investors in Texas, Oklahoma, Arkansas, and Louisiana. The principal offices are in Wichita Falls and the production offices are in Tyler. 3-T's current exploration/drilling programs are located in East Texas (Smith County), North Texas (Montague County), West Texas (Midland County), and North Central Oklahoma (Garfield and Logan Counties). These areas include multi-well drilling programs based on detailed subsurface geology/3D seismic with conventional vertical drilling, as well as resource plays with horizontal drilling. 3-T has drilled, operated, and managed more than 200 wells in Arkansas, Louisiana, Mississippi, Oklahoma, and Texas.

Since 2004, 3-T has had its offices in the Three Eagles building in Wichita Falls named for Bill's three sons, who all became Eagle Scouts. Ty, as president of 3-T, oversees the operation and exploration side of the company. Bill serves as the president of the general partners of 5-T Properties, Ltd. (5-T), which manages the legal and accounting. Bill's youngest son, Jeff, manages the investments for all of the family entities. His oldest son, Billy, after retirement from thirty years in civil service at Sheppard Air Force Base, now manages the Three Eagles Building. Thomas, Bill's grandson, is vice president of 3-T and manages the prospect creations and presentations to investor groups.

Thomas' responsibilities include the geological evaluations of current exploration projects, management of day-to-day operations, being the contact person for investors, and overseeing business development. Thomas has been very involved in the

Wolfberry exploration in Midland and the Mississippian and Woodford exploration projects in Oklahoma.

3-T and 5-T have a strong support staff to manage and operate the oil and gas properties. Jerry Hickman serves as seismic exploration manager with four decades of experience in all phases of exploration. Mike Allen, located in Tyler, serves as operations manager, with more than thirty years of experience in field operations, including drilling, completion, production, and gas processing.

Bill was born in 1924 in Austin, and, after living in several different cities in Texas, moved to Wichita Falls in 1939, where he graduated from high school in 1941. Bill attended the University of Texas in Austin in 1941 and received a Bachelor of Business Administration degree in 1947 and his law degree in 1949. In 1942, Bill joined the Air Force Reserves and was called to active duty in February 1943. Arriving in England in June 1944, he was a gunner on a B-17 bomber and was involved in thirty missions over Europe, receiving four Bronze Stars and the Air Medal with four Oak Leaf Clusters. Bill was discharged from the service in 1945 and returned to the university to continue his studies. After law school, he served three years as assistant district attorney before beginning his oil and gas career. Bill has been involved in many businesses and civic organizations during his career, including the Independent Petroleum Association of America, vice president of the Texas Oil and Gas Association, president of the North Texas Oil and Gas Association, which later became the Texas Alliance of Energy Producers, and twelve years as a Regent for Midwestern State University, serving as chairman during his tenure. Bill received the Senator Tom Haywood Lifetime Achievement Award from the North Texas Oil and Gas Association in 2006.

The 5T Properties family celebrates Bill's ninetieth birthday. Bill is pictured with his three sons and grandson. Left to right, Jeff, Billy, Bill, Ty and Thomas Thacker.

Bill and his three Eagle Scout sons have also been active in the Boy Scout program. Bill received the Silver Beaver award in 1976, the Silver Antelope award in 1985, and the Baden Powell Award in 1990. After the United Way ended funding for the Boy Scouts and seven other agencies in 2009, Ty was instrumental in forming the Hands to Hands Community Foundation to continue securing funding for these agencies, serving as its first chairman. This effort has been successful, securing over $400,000 annually for these agencies. He is now conducting an effort to put together an endowment fund to support these efforts in the future. Ty holds numerous sporting clay events at his ranch south of Wichita Falls for various charities. He is also active in the Texas Alliance of Energy Producers and serves as a director of the Texas Oil and Gas Association.

Since 1953, Bill and his family have seen the industry throughout its highs and its lows, and have managed to continue as a viable operation in the industry. While luck, no doubt, will play a part in the future of 3-T and 5-T, the Thacker family will continue to abide by Bill's belief that "hard work is an equal, if not greater, factor in any company's success."

Block "T" Petroleum, Inc.

South Texas sunset on the B. A. Box Lease in Jim Wells County, Texas. Lease negotiations aided by the late Bruce Shanklin.

Block "T" Petroleum, Inc., was incorporated April 1, 1986 by John M. Trosclair, P.E. Before beginning an oilfield history, John must pay tribute to a great man and his family, the late James C. Ledlow, Sr., Aggie petroleum engineer, class of 1953. It was Ledlow who made it all possible. Special thanks goes out to Joe, his son and my friend since the seventh grade, to JoAnn his wife, to Jim, Jr., who still mentors me today. And finally to all their kids and the other Aggies for making me feel like family wherever I traveled!

Big Jim, as he was known to his closest friends and family, was an extraordinary man and the visionary who said, "Trosclair, you want to be a petroleum engineer." "All through school, no matter the personal trials faced, Jim and JoAnn were always supportive and insistent that I persevere, and so I did," said John.

After working both offshore and onshore for Getty Oil, Block "T" was formed to assist individuals and independents within the oil and gas industry with petroleum engineering of the highest integrity and technical level.

The first partners were John Trosclair and David Dennard, a fellow petroleum engineer at Getty Oil, where both had worked prior to the Texaco merger. Norris Dennard assisted with the incorporation. The company's first year of existence was aided by its financial advisor and bookkeeper, Cheryl Baughman, who each time she was paid for her services, would "donate" the funds back into the company account. I will forever be indebted to Cheryl. Thank you, my friend.

Block "T" was founded as a "contract operating" and "consulting engineering" entity.

During the lean years of 1986 and 1987, both engineers as well as Baughman's tight rein on the purse strings, contributed greatly to the early success of the company. Then, in 1987, Dennard elected to pursue employment in Dallas, assigned his share of Block "T" over to Trosclair.

Initial clients like Victoria Bank & Trust's Tom Barry, will always be remembered. And it was work on the bank's leases in Sour Lake, Texas, that gave Block "T" an insight to one of Texas' great oilfields and ironically the birthplace of Texaco. That experience led to work for Terra Resources, assisting Steve Keene with the drilling of Terra Resources first prospect in their redevelopment of the Sour Lake Dome in 1986. Then in 1987, with geologist Roxie Voran and a "farm-out" from George R. Brown Partnership, Block "T" put together its first prospect and facilitated the drilling of the Hart #1 well by Sour Lake Drilling. Although the directional well encountered obstructions while drilling and was eventually P & A'd, a valuable lesson was learned in choosing partners and prospects carefully.

The year 1988 brought a lot of changes to the oilfield. Work was slow and the six acre Block T Ranch had to be sold in March 1988.

Downsizing to an apartment/office in Victoria, Block "T" was blessed once again by fellow Aggies. Fred Nasser introduced John to Herb Minyard, who hired Block "T" to do contract drilling engineering for Union Texas Petroleum in Houston. That contract was truly a blessing that seemed to signal the end of the lean years and the beginning of a promising future for Block "T" Petroleum, Inc.

Houston accommodations were graciously provided by Jeff Musselwhite (formerly with Davis-Lynch) who provided a home away from home in Houston. Then another Aggie stepped in.

I. R. "Bud" Chalmers called and Block "T" was put on hold for a year while Trosclair was mentored in Lafayette, Louisiana, by veteran engineer and Aggie, Bud Chalmers, class of 1950.

But South Texas was calling and after a year in Lafayette, Block "T" reopened a South Texas office and resumed operations in Victoria.

From their offices in Houston, three fine engineers, Allen Moore, Sam Lynch and Steve Morrison, all with ARCO Oil & Gas, kept Block "T" busy working onsite in South Texas for all of 1989, 1990 and most of 1991. John M. Trosclair, P.E., sat drilling rigs and supervised deep high-pressure workovers in the Seven Sisters Field of Duval County. The onsite supervision in field operations provided a great wealth of experience during those years.

But one day a call from Dallas and the lure, a 20-MMCF/day flowing gas well with 1,000 barrels of condensate per day was too great, and it changed the course of history for Trosclair and Block "T".

Off to Dallas and as vice president of operations for Dantex, a privately owned family company, two years in Dallas went by fast. Drilling wells in both South Texas and South Louisiana, the company all but shut down when the Falcon #1 went from 20 MMCF/day to water almost overnight. Bud Tippens, vice president of land for the company, remains as close friend and associate over twenty years later.

A return to its roots of South Texas was short-lived when in July 1995 the price of gas fell to ninety-five cents/mcf and most of the Block "T"'s low MCF gas wells turned noneconomic.

God stepped in and determined the next step, as John Bird with the Oilfield Christian Fellowship, Houston Chapter (and John's spiritual mentor) told of a missionary family in need in Asia. A consulting job was open in Thailand and Bird mentioned that a care package was needed by a missionary family there in Bangkok. After prayer and deliberation, Trosclair, packed up the Victoria office, loaded out the care package for Asia and spent the next three years working in the region on various offshore Gulf of Thailand projects for POGO in Bangkok.

As turmoil in Thailand increased and oil prices collapsed, a return to the states and more specifically, Tyler, appeared to be an astute move in January-February 1998. Tyler was the childhood home of Trosclair's new bride, Laurel Anne (Ripp) Trosclair, Aggie accountant and MBA, and her parents were still residing in Tyler.

So family was the deciding factor in the Block "T" office being re-established here in East Texas.

Working out of Tyler for the last sixteen years and living in the same house on Lake Tyler, the Trosclairs have been busy raising three girls, Gyna, Claire and Truleigh. And through their company, Block "T" Petroleum, Inc, the couple has served both the domestic and the international oil and gas community. The services provided by Block "T" Petroleum, Inc., include in-house engineering, onsite well supervision and complete contract operations.

Block "T" with Freddie Geese and Jerry Wilder working in-house handle all aspects of well drilling, completion, and can even manage the wells while they are producing, as they do for several clients.

Currently Block "T" is an insured and licensed contract operator in the states of Texas, Louisiana, Mississippi, and Alabama.

Please feel free to view their website at www.blockt.com.

Oh and by the way, if anyone asks what the Block "T" stands for other than John's last name initial, just look at the photo on this page and Gig 'Em.

Top: John Trosclair.

Above: Left to right, Terry Bates, John Trosclair and OCF Co-Founder John Bird.

Stephens Engineering

Fred Stephens has been a part of the oil patch since his college days at the University of Texas in the late 1940s, working summers as a roughneck. In 1949, after graduating from UT with a bachelor of science in petroleum engineering, Fred accepted an engineering job in Wichita Falls with Cable Engineering, owned by Joe Cable.

He took the job working as an engineer for Cable despite the fact that it paid $175 a month compared with the $225 a month he had been making as a roughneck on a rig in Wink, Texas. Although the starting salary for an engineer was less than roughneck wages, it had its perks, namely working in an office behind a desk instead of wrestling with drilling equipment in the rain, heat and cold. Fred's wife, Jane, made the move with him to Wichita Falls, where they established a home and raised a family.

During the 1950s, the engineering firm went through various ownerships before ending up as Stephens Engineering. In 1959, Fred sold part of the company to Joe L. Johnson, Jr., and this partnership, formed during the latter days of the Eisenhower Administration, continues today with the family of Joe who passed away in 2011. In 1962, Fred and Joe partnered to form S & J Operating Company and began purchasing oil and gas producing properties and operating them along with properties for others.

Below: Fred Stephens and Joe L. Johnson, Jr.

Stephens Engineering is a consulting engineering firm working in all phases of the oil and gas industry, including the planning, installation, and supervision of secondary recovery projects. In this capacity, the firm is currently performing the direct engineering supervision of approximately thirty-five water injection projects. Stephens Engineering prepares valuations of oil and gas properties for clients to submit to the S.E.C., for estate tax purposes, bank loans, for purchases or sales of oil and gas properties, and for other purposes. The company also conducts oil and gas reservoir studies and supervision of secondary recovery programs. Stephens Engineering provides economic feasibility studies for the development of oil and gas properties and in the management and operation of oil and gas producing properties through Stephens & Johnson Operating Co. The firm provides services primarily in Texas, Oklahoma, and New Mexico and is experienced in a total of twenty states and Canada.

In 1993, Stephens & Johnson Operating Co. (SJOC) was formed and took over all of the property operations that had been handled by S & J Operating Company. SJOC continues to operate properties today in Texas, New Mexico, Oklahoma, Kansas and North Dakota and is a highly respected operator within the industry. At the present time, the company operates 371 leases with 874 active wells (678 producers and 196 water injection). The current

production from these producing wells is approximately 4,900 BOPD and 16,600 MCFPD. These operations are located in Kansas, New Mexico, North Dakota, Oklahoma and Texas. Stephens & Johnson Operating Co. also operates leases for clients that it has no ownership in. Recently, SJOC was ranked as one of the 100 largest operators in the nation, according to the December 2012 edition of the *Oil and Gas Financial Journal*.

As a result of his success in the oil and gas industry, Fred has been able to give generously to the University of Texas, as well as United Regional Healthcare System, Midwestern State University and hundreds of smaller charities. A longtime University of Texas Longhorns fan, Fred enjoys traveling to Austin to attend football games with friends and family and 100,000 of his closest friends. Some of his children and grandchildren have followed the UT tradition as graduates and fans.

Fred has many interests outside of the office. He owns more than 10,000 acres in Clay, Archer and Wichita Counties, Texas, where he runs cattle and "tries" to hunt quail. He has always said "he couldn't afford to be a cattleman if he wasn't an oilman!"

The family enjoys its home at Possum Kingdom, as well as a home in Gunnison, Colorado, where they spend almost every Christmas holiday together. In addition to ranching and hunting, he enjoys fly fishing, collecting "cowboy" art, and, of course, attending every UT football game he can.

Fred and Joe have built an organization that has become one of the most respected in the nation. Fred has three children with Jane, who passed away in 2001: Susan Geyer and Katherine Smethie, of Dallas, and Tom Stephens, who lives in Wichita Falls. He also has nine grandchildren.

In April 2013, Fred received the Senator Tom Haywood Lifetime Achievement Award presented by the Texas Alliance of Energy Producers at its annual meeting and exposition held at the Multi-Purpose Events Center in Wichita Falls.

Left: Among his many hobbies, Fred enjoys fly fishing.

Below: Fred Stephens.

Sabine Pipe, Inc.

The oil business has been in the Adamson family for close to 100 years.

W. L. Adamson authorized Humphreys Mexia Company to drill the family's first oil well on his family farm. The well was completed to a depth of 3,059 feet on August 21, 1921. Called the W. L. Adamson #1, it became the premier well in the Mexia Fault, producing 26,000 barrels of oil per day.

W. L.'s grandson, J. E. Adamson, chose a career with American Supply Company, an oilfield supply company in his hometown of Mexia. In 1930 the great East Texas Oilfield was discovered. Two years later, J. E. moved his family to Kilgore, home to the "World's Richest Acre."

J. E. earned twenty dollars per week working as a truck driver for American Supply before being promoted to pipe sales. His new interest in this career would change his life and open an amazing future for his family for generations to come.

J. E. left the company in 1945 and established his own service company, Sabine Machine & Supply in Kilgore offering tubing, casing, oilfield supplies, and pumping units.

From then through 1964, he sold pipe and drilled wells in three areas: West Texas, Luling, and Panola County.

J. E. had an incredible love for oil and gas production. He was in the process of growing his investments even more when tragedy struck. Following a trip to visit the Phillips Petroleum plant in Bartlesville, Oklahoma, he suffered a heart attack and died on July 4, 1964, at age fifty-three.

The company's performance bounced up and down with the economy for the next twenty-six years. Finally, in 1990, J. E.'s widow, Nova, convinced their youngest son Bill to take over the family business.

He had graduated from college in 1965 and was enjoying a successful career in the restaurant industry, developing franchises

for Whataburger and then becoming an executive for Domino's Pizza.

Bill began a series of smart business moves that would steady the business and place Sabine Pipe on its current path of stability and growth.

In the early 1990s, Sabine Pipe's primary objective was to buy, process and sell used oil field tubulars and equipment, and their core customers operated oil wells in the East Texas Oilfield.

William L. Adamson III (Will), became the third generation to assume the position of president of the family business. Like his father Bill, Will pursued a career beyond oil and gas out of college, graduating from Baylor University with a Bachelor of Business Administration degree. He then worked in commercial real estate for the Weitzman Group and Cencor Realty Services in Dallas.

Starting in 1994, Will led the company into an age of new technology, realizing that the proper financial tools could move the company dramatically forward.

The company marked a milestone in 1999 when it began selling new pipe in addition to reconditioned used pipe. This strategy opened the door to significantly larger volumes and opportunities with more oil and gas operators.

In 2001, Sabine Pipe acquired the former AMOCO location in Kilgore, at the intersection of Highway 31 and Highway 42, just south of I-20. This provided a superior facility, double the space and a much more functional pipe yard.

Sabine Pipe is still an East Texas company but is now a sales-driven operation with outside offices in key markets near their customers.

Starting in 2010, Sabine Pipe opened sales offices and moved inventory to opportunistic markets: Dallas, Houston and Midland, Texas; Denver, Los Angeles, Oklahoma City, and the newest office in Lafayette, Louisiana.

Today, Sabine Pipe, Inc. is a full-service oil country tubular goods distributor representing the most respected pipe mills in the industry.

Customers are national and regional oil and gas companies, including small independents, large independents, and majors.

The business model J. E. (Eddie) Adamson formed has changed based upon the dynamic needs of the industry, but the family's zeal and passion for the oil and gas industry has only grown stronger.

Left to right, Will and Bill Adamson.

"Our success is due to smart strategies implemented by our dedicated and committed team working together," says Sabine Pipe President Will Adamson. "We are indeed grateful for the hard work that has led Sabine Pipe into the twenty-first century."

WolfePak Software

WolfePak Software was founded in 1986 by Charles L. Wolfe, CPA, and has maintained a highly successful and steadily growing business. Wolfe's innovativeness and creativity sparked the creation of WolfePak after he realized that the new PCs being introduced back then were more than mere "toys"—he saw their potential as effective business tools once equipped with the right software. Capitalizing on both his extensive computer programming and accounting backgrounds, he set off to develop an accounting software system that would operate on a personal computer. WolfePak Software was soon "born" in the den of a little house in Abilene.

WolfePak has constantly evolved to optimize the latest features offered within affordable PC hardware and operating systems structures. WolfePak's first system ran on dual floppy, single-user systems that featured data-sharing via the old "Sneaker Net" of hand-carrying a floppy from computer to computer. As networks such as LANtastic and Novell became commonplace, Wolfe and his WolfePak team added full network support and file sharing to improve the efficiency of the office. It did not stop there! WolfePak offered pop-up lookups for master fields, with a hot-key master file setup configuration, all in a DOS application. Once Windows platforms became stable and commonplace, WolfePak was rewritten as a true Windows application, all the while offering the same reliable data entry features customers utilized every day to get more work done with less effort.

With hard drive capacities growing in size, WolfePak again evolved to handle larger coding elements so that handling over a million different properties would not be a problem. As existing and new customers became public companies with SOX and other requirements, WolfePak became an enterprise system adding client/server capabilities, enabling the system to support hundreds of concurrent users. Through each major upgrade of the software, WolfePak users on maintenance were always

provided a free and automated upgrade to the latest version. User data has always been automatically upgraded, making the installing of an update something to be looked forward to as additional capabilities were constantly being added. As the number of users increased, so did the feedback for new and wonderful features, so voting for the favorite feature was added to the annual user conferences.

What began with a few local companies requesting this "easy-to-use" accounting software has grown, one customer at a time, into a highly successful software company that boasts over 2,700 installations (estimated 6,000 plus users) in eight countries and thirty-eight states, making WolfePak the most popular oil and gas accounting software in the world.

WolfePak now employs more than thirty-five professional employees including high- and mid-level management, technical support, conversion services, sales staff, IT/ Network Services, and six full-time programmers. In addition, WolfePak has internal CPAs on staff to continually oversee the support and development of the finished product.

The concentration of WolfePak's accounting software suite has been dedicated to the oil and gas industry through development of modules targeted for oil and gas operators, investors, first purchasers, transporters, and service companies. Companies large and small seek out the software for its ease of use and highly recommended support of the product after the sale. In addition to providing a top-notch software product, WolfePak has a proven commitment to providing the best conversion services for both initial installation and acquisitions. An area that WolfePak takes advantage of with its size and popularity is the ongoing training options offered to customers. Not only are monthly "hands-on" training courses offered at the Abilene campus, WolfePak also offers onsite training at the customer's location, annual user conferences in multiple locations, training videos and one-on-one dedicated phone training.

WolfePak has overcome numerous obstacles in order to build a successful software business. With most of WolfePak's software sales coming from oil and gas operators, there have been many times when sales would rise and fall in direct relation to the price of a barrel of oil. Even during the bust times in the oil patch, WolfePak continued the business, without laying anyone off, by coming up with new ways to enable customers to join the Pak. Software was traded for other goods or services; rented to some; and when the price of oil hit rock bottom at $8 a barrel, a payment plan was developed that pegged repayment to the price of oil.

Charles L. Wolfe.

Over the years, WolfePak has evolved from a primary market of "mom-and-pop" small oil and gas companies to a diversified market which now also includes large enterprise users. WolfePak offers an affordable solution to many markets because of its modular design and scalability both from a "user" perspective and software "feature" perspective. WolfePak clients also appreciate the lower day-to-day overhead of operating the system, which is realized through streamlined data entry, electronic exchange of data, exceptional "built-in" reporting and analysis tools, and powerful correction utilities. This enables users to operate with fewer back-office personnel than any other system.

WolfePak's continuous growth through the years has been primarily based on word-of-mouth referrals and we look forward to future growth as we continue to serve our customers. Additional information may be found at www.wolfepak.com.

Quasar Energy Services

Above: One of Quasar's new state-of-the-art frac pumps.

Below: Welcome to Quasar Energy Services.

Bottom: Quasar's Gainesville, Texas, headquarters.

Tim Sicking, owner of Quasar Energy Services, began his career in the oil and gas industry in 1978 with Halliburton. He started his first oil and gas well servicing company, Jet Star, in 1994, which he subsequently sold in 2004. He began Quasar Energy Services, Inc., in 2008.

The company offers a wide range of services including acidizing, cementing, and fracturing. By employing some of the best hands in the business, Quasar Energy Services offers more than 100 years of combined field experience. The company now serves customers from two locations, including the home office in Gainesville and a second location in the Wichita Falls area. The company also has a satellite office in the Fox, Oklahoma, area.

Quasar operates three frac crews with a capability of 75,000 HP, allowing it to take care of everything from small foam frac jobs up to 120 BPM multistage fracs. Three crews handle the company's acid jobs and Quasar employs ten cementing crews. Cementers average ten years of experience and all units are equipped with densometers and data acquisition units. Quasar Energy Services operates more than 100 trucks and employs close to 100 people, including 80 drivers.

Sicking is entering his thirty-eighth year in the oil and gas servicing industry. He and his wife, Sherry, reside in Gainesville. They are very active in their church and community and are proud of the service they provide to the oil and gas industry. Sicking established Quasar's business model in the beginning, and it is a simple one: Utilize the best employees possible, be on time with good equipment and fair prices, and give God the glory.

Top: A little rain will not stop Quasar.

Middle: A Quasar frac job in progress.

Bottom: The men of Quasar, hard at work.

Carr Resources, Inc.

John P. Carr founded Carr Resources, Inc., in 1993. In the mid 1990s, the company worked in the tight gas plays of the East Texas Basin and by the end of the decade turned to the deep Cotton Valley pinnacle reef play. Carr Resources found a niche acquiring farmouts in the late part of the decade as larger companies left the area following the drilling of test wells for the reefs.

In the process of drilling for the reefs, several shallower fields were discovered but not put into production. Carr secured the farmouts to produce these new discoveries in the Rodessa Limestone, Pettit Limestone and Travis Peak Formation. Carr also pushed the frontier of exploration by acquiring the UPRC Dauntless #1 well in Robertson County and joining forces with Blue Star Operating to drill the first horizontal Cotton Valley Limestone barrier reef well.

Although not a great commercial success due to mechanical problems, the well was ahead of its time and laterally drilled 1,800 feet of reef below 15,000 feet in spite of high temperature and pressure conditions. Following the acquisition of the Broughton #1 Rachui and the #1 Savell, Carr and Blue Star created an opportunity for the thirteen mile extension of the sour gas line to the Savell (Bossier) Field area.

The Rachui well was brought on line as a pinnacle reef producer and the Savell well was tested. The Savell was the first Bossier well in the area. It flowed 2mm/day off the perfs and was in the course of being completed when it was discovered that the casing in the well would not stand the pressure of a frac treatment and could not be repaired. The well was plugged, but as the discovery well it generated the impetus for development of the Bossier gas play in the Savell area.

In 2000, Carr hired Richard Adams. In drilling his first prospect on a farmout from his past employer, Mitchell Energy, the Red Loop (Rodessa) Field was discovered in Rusk County. Other basement-related projects were drilled over the ensuing decade in East Texas. In 2007 a 23,500 foot Knowles Reef test was drilled in southern Grimes County with Winn Exploration Co., Inc. as operator. It discovered a 300 foot porous reef section in the Knowles on a basement high block which, although wet, did prove the existence of a new play for the Knowles Reef in this area. A second well drilled by Winn went to 16,000 feet, reaching total depth in the Buda Limestone. This Eagle Ford Shale, Woodbine Sand test discovered the gas leg of the lower Woodbine Maness Shale Play called the Eagle Ford Shale in Brazos and Burleson Counties.

In 2008, Carr began leasing the upper end of the OSR-Halliday (Woodbine) Field in Leon to exploit the tight Woodbine oil pay with horizontal wells. The play was eventually developed with another operator to the point of making 2,000 BOPD before being sold to Halcon Resources, Inc.

Following the sale of the OSR property, Carr focused on the earlier Woodbine Maness Shale discovery in Grimes County. The prospect moved from the gas leg of the reservoir into the optimum position in the oil leg. Carr began securing the largest leases available in 2010-2011.

New drilling in the area in 2012 confirmed the concept that long laterals in the organic rich shale of the lower Woodbine Formation would yield very commercial results. Carr joined its acreage and prospect with the operating and financial strength of PetroEdge Energy III, LLC to develop its 16,000 acre block. The first well commenced in November of 2013.

Ben J. Taylor, Inc.

Ben J. Taylor, Inc., is an independent oil and gas exploration and production company based in Fort Worth and founded by Ben J. Taylor.

Ben J. was born on November 26, 1908, in Texline, Texas. After studying geology at Texas Tech University, he moved to Tulsa, Oklahoma, during the Great Depression and worked for several prominent oil companies as a surveyor and landman.

In 1938, he moved to Illinois with Kingwood Oil Company as head of its land department. In 1941, after Pearl Harbor, he joined the U.S. Navy and after the war returned to Illinois and founded The Illinois Exploration Company with his business partner, Leo Schumacher. They drilled several field discoveries in Illinois, Kentucky, Oklahoma and Texas. In the mid-1950s, after the death of his business partner, Schumacher, Ben J. founded Toto Gas Company, which was an acronym for "Taylor owned and Taylor operated."

Toto drilled more than 1,000 wells in Texas, Oklahoma, Kansas, Colorado, Montana, and California. In 1985, Ben J. formed the corporation as it is currently named "Ben J. Taylor, Inc."

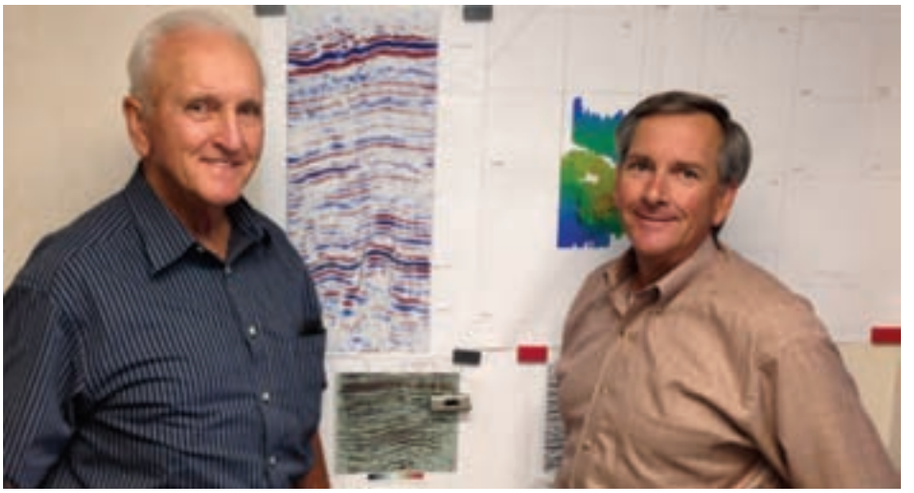
For his achievements in the oil business, the 71st Texas Legislature honored Ben J. in its 1989 session for being a pioneer in the oil and gas industry. He was also recognized by the State of Nebraska for discovering an extension to the Sleepy Hollow Field in Red Willow County.

The elder Taylor had two sons, Ben E. and John R., who were a part of the family oil company. Ben J. was succeeded as president and CEO of Ben J. Taylor, Inc. upon his passing in November 2000 by his grandson, Ben R. Taylor.

Ben J.'s longtime financial officer, Louise Reid, has played a large role in the company's history. She serves on the company's board of directors along with Ben E. Taylor, Ben R. Taylor, John R. Taylor, and Cheryl Taylor Majumder.

Ginnings Company

The Ginnings Company got its start in July 1984 when Jim Ginnings, who had moved to Wichita Falls with his wife, Ann, and their two children twenty-four years earlier, founded the company to operate the properties and mineral interest of GEM Exploration and, later, GEM Production, LC. Some producing properties acquired while Jim worked in his own name were merged into GEM Exploration, with Marke purchasing a small working interest. In July 1984, Ginnings Company, a Texas corporation, formed to operate, evaluate, and acquire oil and gas properties in North and West Central Texas.



Left: Ann Ginnings.

Right: Left to right, Jim and Marke Ginnings, Marke is Jim and Ann's oldest son.

The Ginnings Family moved to the Wichita County seat in April 1960 when Jim, who had spent the previous four years working for a major oil company, signed on to work for a local independent oil and gas company. He spent the next fourteen years working for this and another independent oil company in Wichita Falls, with the second providing a working interest opportunity. When the company sold in 1974, Jim became an independent, operating as J. I. Ginnings for three years. In July 1977, he formed GEM Exploration, to originate and develop deals with established oil and gas producing companies.

GEM Exploration represented a new direction for Jim, whose experience involved primarily the acquisition and operation of producing oil and gas properties. Fortunately, GEM Exploration started well, with three of the first four drilling deals hitting commercially, with new field discoveries in Montague, Clay, Jack and Haskell Counties.

In January 1983, Marke Ginnings, Jim and Ann's oldest son and, like his dad, a petroleum engineer, left a promising career with a major oil company to join his father in business.

The 1985 oil industry crash hit the company hard because of its reliance on bank financing to expand. The company cut expenses, adjusted its bank service by mutual agreement with its bank, and continued to operate and expand. As oil prices improved, the company repaid all of its loans according to terms.

In 1988, Marke became a full partner in GEM Exploration and by February 1998 had been named managing partner. In January 2000, Marke was named president of GEM Production Company, LC, which emphasized exploration rather than acquisitions, with the cash flow from its predecessor, GEM Exploration, helping fund new acquisitions and drilling. In March of 2000, Marke was named president of Ginnings Company. During this time the company was successful in initiating and developing secondary recovery projects in Jones, Coleman, Montague, Stonewall and Grayson Counties.

In 2007 the company added a third engineer and began applying more high-tech capabilities to exploring and producing oil and gas. In June 2013 the company elected to sell its operated oil and gas properties. Today, Ginnings Company, as an operating company, and GEM Exploration and GEM Production, LC, expect to rebuild their oil and gas properties.

Offenhauser Oil & Gas, LLC

Offenhauser Oil & Gas, LLC, is truly an upstart. Offenhauser, eight years old in 2014, is growing rapidly in production yet, as its principals openly acknowledge, it has a long way to go to reach its goals.

Unlike most of the other companies selected for inclusion in this publication, Offenhauser is not an operator, not an oilfield service company, not a drilling contractor and not a purchaser of any form of hydrocarbons. In the truest sense of the words, Offenhauser is not an oil and gas company at all. Offenhauser is actually an oil and gas investment company.

Offenhauser, headquartered in Wichita Falls, Texas, is an extremely active oil and gas investment company. It has participated extensively with Cholla Petroleum, Inc., of Dallas, has joint ventured a Wolfberry drilling program with The Eastland Oil Company of Midland and has participated in multi-well projects with Atoka Operating Company, Gunn Oil Company, Cogent Exploration Ltd. Co., Arrow Oil & Gas, LLC, Willowbend Investments, Inc., Apache Corporation, W & T Offshore, Inc., Devon Energy and others.

Offenhauser is currently active, through its affiliate, Calumet Energy, LLC in the Woodford Shale play in Grady and Stephens Counties of Oklahoma. Calumet Energy has participated with Continental Resources, Inc., Marathon Oil Company, XTO Energy, Inc. and Devon Energy in the development of the acreage it has leased.

Offenhauser's management is composed of Lonny D. Morrison, Pete R. McElvain and David A. Brite.

Lonny D. Morrison is well known in Texas as a lawyer although he has been focused on the oil and gas business since 2006. Prior to that, Lonny participated in numerous oil and gas drilling prospects through privately held companies other than Offenhauser. During his career as a lawyer, he served as President of the State Bar of Texas, Trustee of the Texas Bar Association, director of the State Bar of Texas and Chairman of the Texas Commission for Lawyer Discipline. He is the only person ever to receive more than once the "Presidents' Award" for exemplary service to the bar and to the public. He is a fellow of the American College of Trial Lawyers, the International Academy of Trial Lawyers and the American Board of Trial Advocates. Lonny is included in *The Best Lawyers in America* and is honored as a Texas Super Lawyer by *Texas Monthly* magazine. In 2014, Cameron University designated him as a Distinguished Alumnus and several months later he was the subject of an article in *Cameron Magazine* (Fall 2014, Volume 11, Issue 2, pp. 10-11).

Lonny holds memberships in the American Association of Petroleum Geologists, the North Texas Geological Society, the Texas Alliance of Energy Producers and the Independent Petroleum Association of America.

Pete R. McElvain holds separate degrees, each summa cum laude and each with a 4.0 grade point average, in physics and in geosciences. Pete received the President's Medal of Excellence each time he graduated as the outstanding student in the College of Science and Mathematics. He is a member of the American Association of Petroleum Geologists, the North Texas Geological Society, the Texas Alliance of Energy Producers and he has recently served as President of the North Texas Geological Society. Pete is certified by the State of Texas as a Professional Geoscientist.

Pete is a former officer and pilot in the United States Air Force. He is a Distinguished Graduate of the USAF undergraduate pilot training program, received the AETC Commander's Trophy as the outstanding pilot in his class, received the T-1 Academic Excellence Award and received the Flying Excellence Award. Pete received the Air Medal and the Iraqi Campaign Medal for combat missions flown in Iraq. In civilian life, Pete flies an F-90 King Air regularly and is widely recognized as a superb pilot.

David A. Brite, CPA, is the Comptroller of Offenhauser Oil & Gas, LLC. He previously was associated with Cobra Oil & Gas, Sterling Petroleum and Galaxy Oil Company. David holds a B.B.A. in accounting from Midwestern State University, is responsible for supervision of all accounting functions at Offenhauser, and verifies the accuracy of all financial statements prior to distribution. David is a Certified Public Accountant, is a former President of the Petroleum Accountants Society ("COPAS") of Wichita Falls and a member of the Texas Society of Certified Public Accountants.

Kendrick Oil & Gas Company

P. S. Kendrick, Sr., came to Texas from Kendrick, Mississippi, at age seventeen to become a cowboy and wound up in the oil and gas business instead. Drawing on his experience buying and selling oil and gas leases around Albany, in 1918, he bought a lease three miles northwest of the newly discovered Burkburnett Oilfield.

He helped organize a stock company to drill a well on the Burk Waggoner farm, sold enough stock to drill a well, ran out of money, sold more stock, and after delays and unexpected problems brought in a well flowing 4,200 barrels per day, the discovery well for the northwest extension of the Burkburnett pool. Kendrick, Sr., owned 100 percent interest in the offset ten acres and drilled two wells of his own that flowed 3,000 barrels a day each. Oil sold for $3 a barrel.

Above: Phil S. Kendrick, Sr., (on the left) supervising his cable tool drilling rig.

Below: Left to right, Phil, Jr., and Michael Kendrick.

In 1919, he bought a 2,000 acre ranch—known as the Kendale Ranch—three miles south of Albany and imported a herd of registered Poll Hereford cattle from Iowa. Two years later, he organized Albany's first cattle show held at the Albany Wagon Yard, where he showed his first Polled Hereford Champion. His steer Kendale II was crowned the International Grand Champion at the Chicago Hereford Show in 1930. He was president of the American Polled Hereford Association 1925 and 1926. The depression of 1933 ended his Polled Hereford business.

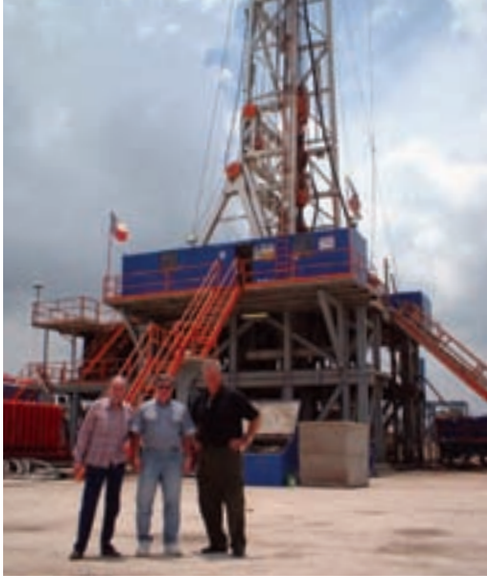
Three years later in 1936, he purchased a cable tool drilling rig and became a drilling contractor. He discovered a shallow sixty well field on One Mile Hill west of Albany and other fairly large fields in Haskell, Throckmorton, and Shackelford Counties. He died in 1984 at the age of ninety-four.

Phil Kendrick, Jr., came into the world on December 4, 1926, on the Kendale Ranch. He worked in the family oil company from 1951 to 1967 then headed for Wall Street and, later, Los Angeles, where he worked for an investment banking firm. In 1973, he organized his own oil company and named it Harken Oil and Gas.

Harken discovered and developed a large gas field in Palo Pinto County. Bateman and Eichler, based in Los Angeles, took Harken Oil public in 1979. The company opened offices throughout the country and in Australia. Harken owned 15 million net acres out of a gross 48,712,000 acres of oil and gas leases in Queensland, Australia. The company farmed out 21,564,000 acres to Esso Exploration Australia, a subsidiary of Exxon, USA, and under the farmout agreement, Esso conducted more than 6,000 miles of seismic lines.

In 1983, Kendrick, Jr., sold his Harken stock to a New York investment group. Harken received national attention when it purchased George W. Bush's oil company, "Spectrum 7" for Harken stock in 1986. Prior to that, in 1984, Kendrick, Jr., returned to run the family company, Kendrick Oil & Gas Company. He has been an officer in three oil and gas associations, named Mr. TIPRO in 2011, and presently serves as vice president of IPAA. In 2011, Michael Kendrick, a third-generation family member, joined the company and now serves as vice president of operations. He also is the managing partner of Kendale Oil & Gas, LLC, named for the Kendale Ranch in Albany.

The company, formed in 2013, is wholly owned by the Kendrick family. It was organized to participate in a Hunton Horizontal drilling program in Central Oklahoma. To date, the company owns interests in forty-five producing wells.



Loudon Exploration, Inc.

Founded in 1984 and later incorporated with the State of Texas in 1987, Loudon Exploration started exploration efforts primarily on the geological province known as the Eastern Shelf of the Midland Basin. The company has in the past and continues to work with industry partners with the purpose being to delineate high quality exploration projects using all geological, geophysical and petro-physical tools currently available.

Initially, Loudon Exploration experienced success in such areas as the Eastern Shelf of the Midland Basin along with the Hardeman Basin of Texas. Discoveries included wells drilled in Kent County, Texas for the Tannehill Sands, Stonewall County for the Strawn sands, Bend conglomerates and Ellenburger dolomite. Also, Loudon Exploration, Inc., experienced a field discovery in Haskell County, Texas for the Strawn sands.

Loudon Exploration, Inc., initiated a 3D seismic program in Hardeman County, Texas, for the Mississippian Chappel Lime. Several discoveries were made in the Mississippian lime from this 3D seismic program with some wells producing in excess of 500,000 barrels of oil apiece from the Mississippian.

The company continued exploring in other areas such as South Texas with the primary interest being conventional plays using both geological sub-surface mapping in association with 2D and 3D seismic data to delineate and drill wells for hydrocarbons.

Loudon Exploration obtained by farm-out agreement from Texaco, Inc. the right to explore for hydrocarbons within the Texaco operated Encinitas Field located in Brooks County, Texas. The primary zones of interest were the Frio/Vicksburg (Oligocene) Trend of South Texas, which produced from shallower pay intervals. The drilling program was a success for all parties involved as several deeper pool zones of Vicksburg gas and condensate were discovered along with an oil discovery in the Frio section.

Recently, an additional 3D seismic survey was initiated by Loudon Exploration, Inc., in an area known as the Knox-Baylor (Benjamin) Basin of Texas. This basin is directly south of the Hardeman Basin and is separated by the geological feature known as the Red River Uplift. Several areas were delineated from this survey and at the time of this publication, wells are being drilled and completed in zones ranging from the Rasberry (Caddo) Reef to the lower Ordovician Ellenburger and Cambrian Hickory sand formation.

Clockwise, starting from the top left:

McGill #90, Eddie with investors.

McGill #90 with Texaco #101 in the background.

McGill #89, Eddie and Tim.

Texaco #35, with McGill #90 drilling rig in the background. Well #35 is the best well in the field, making over 20 BCF gas.

Lenco Industrial Services, Inc.

Offering the best environmentally safe products while delivering accurate, friendly customer service has long been the driving focus behind Lenco Industrial Services, Inc., and its founder, Len Redmon. For many years, Len had dreamed of owning her own company, and that dream finally became a reality in March of 2002.

Len recalls,

> I had worked for many years as an employee and had always wanted to have my own business. I truly thought it was something that was impossible until I had an unusual conversation with a dear friend, Ted Lawson. His suggestion to me was to find a niche and fill it. He was the person to point me in the direction I needed to go. God rest his soul—he pointed several in the direction of being in business for themselves. He was the initial investor in my business, as well as so many others in the area, and I was elated to return that investment to him just prior to his passing due to a massive brain tumor. What a guy!

From the beginning, friends such as Charlie Kirkpatrick, Beth Lyn Kirkpatrick, and Ted Lawson gave great support to Len in her dreams for the future of the business. Len's parents, Maxine and Lyndal "Lynn" B. Preslar, were especially encouraging through their examples of hard work and faithful service. Maxine served as the secretary of the principal at Austin Elementary in the Ector County Independent School District for twenty-eight years. Lynn served as a United States Marine in the Bataan Death March, as a defender of Bataan and Corrigedor, and was a prisoner of war held by the Japanese for three-and-a-half years.

Upon his return to Ector County, Lynn began a twenty-eight year career as a fireman—a role in which his daughter Len realized her strong work ethic and focused determination. Her parents' unwavering encouragement and friendship sustained Len through the formative years of her company's growth. Len writes of the experience, in the early days:

> …things were very 'over-engineered' and we often worked eighteen to twenty hours a day manufacturing the wastewater treatment systems, delivering them, servicing them, keeping the growing list of customers happy, the bank happy, doing the bookkeeping, etc. And it was all done with no shop, one used truck, a hope and a prayer. After the first year, the company included eighteen systems, a new truck, and the foundation for a new shop …life was good.

Today, Lenco Industrial Services, Inc., serves as the parent company for a portable wastewater treatment rental business that primarily services the oil industry. The Industrial Parts Division is an entity of the parent company that specializes in Industrial Parts for the Gas Plants in West Texas and Southern New Mexico. Chem-Solv is an entity of the parent company and is a totally green chemical that is manufactured locally, which has products for all. Their chemicals cover everything from the home to the industrial plant to the drilling rig to the wastewater treatment plant.

Lenco has also grown to include from 12 to 19 full-time employees, 76 systems, and 7 trucks. It is a state-certified water-hauling business. The company's headquarters have expanded from 500 square feet to 1,800 square feet, while its shop has grown from 16 x 20 to 16 x 40. In 2008 the company purchased an additional four acres directly north of the original property for future growth and is currently negotiating for three acres directly south to expand its trucking operations. Len remains an active member of FDGE Church and serves the community as a member of the Ector County Children's Service Board.

Lenco Industrial Services, Inc., is located at 16956 North Sunflower Avenue, Suite B in Gardendale, and on the Internet at www.lencoindustrialservices.com.

Expro Engineering, Inc.

Like a phoenix, Expro Engineering Company ("EXPRO") rose from the ashes of Enterprise Energy Corporation. The principals, Jerry Eskew, petroleum engineer, Dennis Browning, geologist and Mark Tettleton, field supervisor were working together at Enterprise Energy when it was sold to Belden and Blake Corporation. EXPRO was formed to operate former Enterprise Energy properties and provide consulting services to others. EXPRO is short for exploration and production, but most friends asked if the principals were going amateur and if EXPRO meant Ex-Professionals. The company opened its door on January 1, 1986, at which time the price of North Texas crude oil was $28.00 per barrel. By August 1986 the price had dropped to less than $11.00 per barrel. Over sixty percent drop in less than eight months. In 1987, EXPRO was able to purchase the old Enterprise Energy wells from Belden and Blake. Timing is everything.

Contract operations were obtained in North Texas and West Texas. In the early 1990s EXPRO started operating in several counties along the Gulf Coast. Eskew moved first to Fredericksburg, Texas and then to Richmond, Texas to oversee the coastal operations. Additional operations were added in North Texas and the Bend Arch region. In 1995, Tettleton left EXPRO to start his own company.

Throughout the 1990s EXPRO added to their operations wells and leases located throughout the state of Texas. EXPRO operated wells in wet lands, state waters, urban town sites, ranch land and even on a prairie chicken reserve. During this time operations varied from drilling for Mississippian reefs to Caddo mud-mounds; restoring production in a shallow sandstone; to drilling out production packers to restore production in Frio sandstones along the Gulf Coast.

In the late 1990s a geological/geophysical workstation was added and Browning started evaluating 3D seismic in South Texas. The results of this geophysical interpretation lead to the drilling of Frio Sandstone targets previously overlooked by geology and 2D seismic.

Browning's geological study in the Barnett Shale, led EXPRO to join with Keystone Exploration, Ltd., in drilling some of the early Barnett Shale wells in Tarrant County. In 2006 the Dallas Geological Society made an analysis, by operator, of the average MCFPD per Barnett Shale well and Expro was number one on the list.

EXPRO currently provides engineering consultation and operates wells throughout Texas; EXPRO Minerals purchases producing and non-producing minerals; and Panther City Exploration Company LLC, a sister company, provides geological and geophysical services to several long time clients.

Above: Left to right, Jerry Eskew and Dennis Browning at the Woods Heirs # 1, 1986.

Below: Left to right, Jerry Eskew and Dennis Browning at the UDD # 2H, 2014.

Sponsors

About the Author

Mike Cox

Mike Cox, an elected member of the Texas Institute of Letters, is the author of more than a score of non-fiction books and hundreds of articles over the course of a career dating back more than forty years. In 2010 he received the A. C. Greene Lifetime Achievement Award and has earned numerous other recognitions for his writing over the years. His most noted work is a two-volume history of the legendary Texas Rangers, published in 2008-2009.

A long-time newspaper writer turned state government spokesman, Cox lives in Austin. When not writing, he spends as much time as he can fishing and hunting or traveling and otherwise enjoying life in Texas.

About the Cover

Gary Crouch

Born in Fort Worth, Texas, in 1946, Gary has lived in North Texas most of his life. A self-taught artist since the age of eleven, he was professional before he could vote and has had his own business since 1966. Although fine art commissions were scarce in the early years, Gary continued to develop his abilities, working in pencil, pen and ink, acrylic and oil and extensively in airbrush. In 1969, he was drafted into the U.S. Army and assigned as an illustrator in Vietnam. He received the Bronze Star, Meritorious Achievement, and Presidential Citation while serving in the military.

Fine art had been his focus early in his career, but as his family grew, it was necessary to diversify into advertising and marketing. He started creating brochures, logos, corporate literature, technical art and cover illustrations because it was more lucrative and there was more of that kind of business available.

Much of his reputation as an artist rests on the superior quality of the prints he has produced. In the late 1970s and early 1980s over 25 limited edition prints of his work were created and sold nationally. He also designed and illustrated educational posters on Creationism used in 110 countries at colleges and universities. Most of Gary's work today involves the history of Oil & Gas and the American West. His prints are collected nationally and even in Europe and Japan where the American West has gained significant popularity.

He is known as the “Western History Artist.” “There is a fine line,” he said, “between illustrations and fine art. I do some illustrations, some paintings, some posters, but I consider most of my prints fine art, not posters.”

Commissions for magazine designs, cover illustrations and brochures came from many Fortune 500 companies such as Xerox, American Airlines, Sony, Associates, Campbell Taggart, and Johnson & Johnson.

A few years ago, he downsized, closed his commercial studio and moved his business to his home in Burleson, a suburb of Fort Worth, where he and his wife Constance currently reside.

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