OKLAHOMA 2006 DRILLING ACTIVITY

By Dan T. Boyd, Oklahoma Geological Survey

This article is the second in an ongoing series outlining annual drilling activity in Oklahoma. The first was published in the winter 2005 issue of the Oklahoma Geology Notes (Vol. 65, No. 4).

Regardless of spud or completion date, the wells discussed here were recorded prior to January 1, 2007. Because much activity is not registered until months or years afterward, a compilation of more than 90% of the activity for a given year cannot be completed before the third or fourth quarter of the following year. For this reason notable 2006 wells recorded after January 1, 2007 will not appear in this report, but those from 2005 recorded in 2006 are included. Significant wells completed in 2006, but registered in 2007, will appear in next year's report.

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General Activity

The number of working drilling rigs is a basic measure of oil and gas activity in any area. The Baker Hughes Company has tracked monthly rotary drilling rig counts for many years and has compiled these into annual averages for regions all over the world. According to Baker Hughes (2007) the average number of active drilling rigs in Oklahoma for 2006 was 179; significantly higher than the 2005 average of 152. Since 2004 the average number of active drilling rigs has remained above 150, reflecting the highest level of sustained activity since the 'boom' years from the late 1970s through the mid-1980s (Figure 1).

A similar pattern is seen in the annual number of well completions compiled by IHS Energy (2007). These data show that 1999 activity, with an average of 62 working drilling rigs and less than 2,500 total completions, was the lowest seen in the last twenty years. A dramatic rise in completion numbers for 2000 and 2001 was followed by a significant drop in 2002. Each year since then has added at least 3,700 completions. Through January 1, 2007 IHS Energy registered a total of 2,841 completions for 2006. The 4,460 completions shown is an estimate based on the addition of the same proportion of completions to the 2006 year-end total as that seen in 2005. The increase in the number of completions between 2005 and 2006 is roughly proportional to the increase in the number of working drilling rigs reported by Baker Hughes (Figure 2).

Gas has been the primary objective of Oklahoma operators since 1993. As a result, the price of natural gas has been by far the most important factor controlling drilling activity in the State. A wellhead price in 1999 of $2.06/MCF was the principal factor that pushed 1999 activity to the lowest level in recent history. The near doubling of prices only two years later (to $4.02/MCF) more than doubled the number of active rigs and added nearly 4,000 new completions. The last major drop in the average annual price for

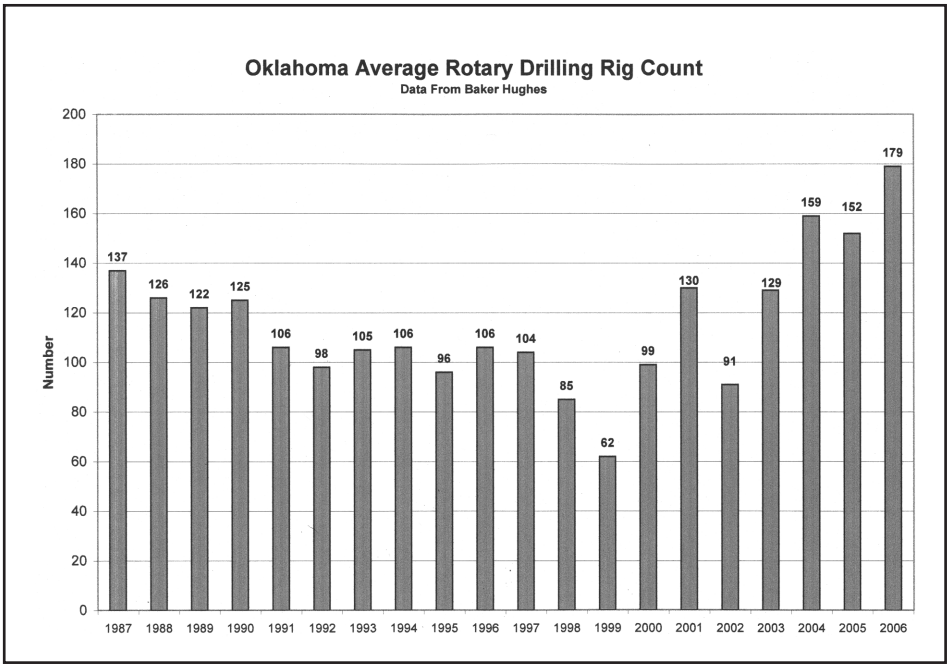

Figure 1. *Oklahoma Average Rotary Drilling Rig Count from 1987 through 2006, data from Baker Hughes, 2007.*

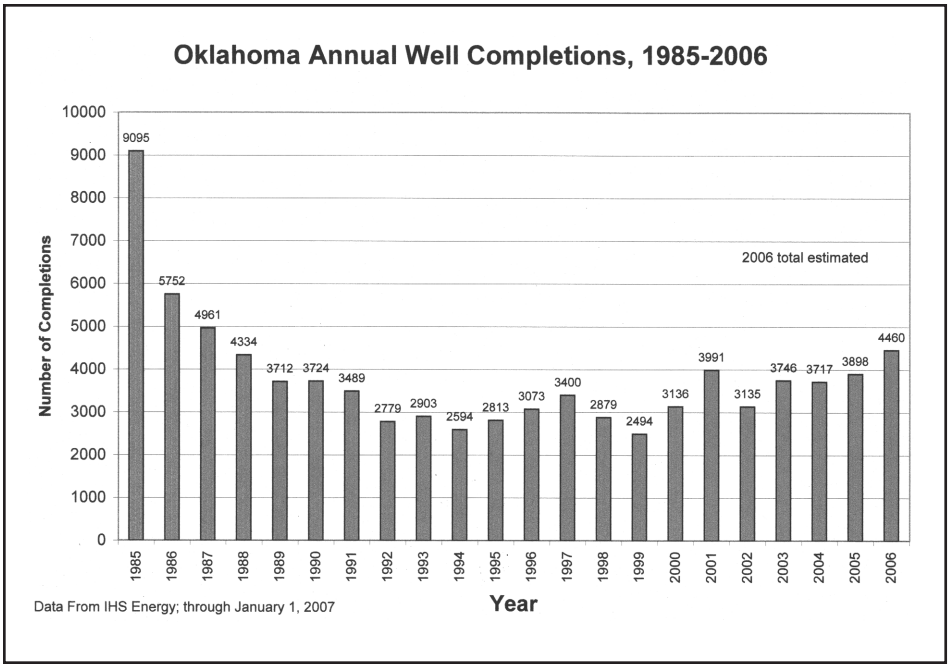

Figure 2. *Oklahoma Annual Well Completions from 1985 through 2006, data from IHS Energy, 2007.*

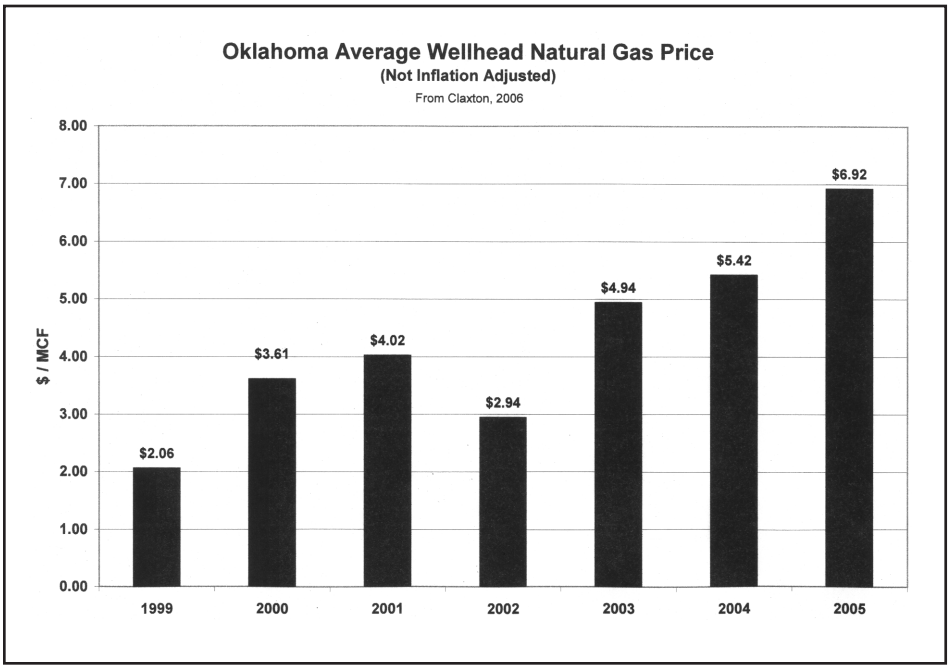

Figure 3. *Oklahoma Average Annual Wellhead Natural Gas Price from 1999 through 2005 (not inflation adjusted), data from Claxton, 2006.*

natural gas occurred in 2002, when a fall to $2.94/MCF produced a slump in that year's activity and State income. Since 2003 prices have been near or above $5.00/MCF, and this has had a corresponding effect on drilling activity. An average natural gas price of $6.92/MCF for 2005 (Claxton, 2006), and an average that will likely be somewhat higher than that for 2006, has driven the increased drilling activity (Figure 3).

On a barrel of oil equivalency, years of gas-focused drilling activity have resulted in a fundamental shift in hydrocarbon production in the State from oil, to one in which more than 80% of production is in the form of natural gas. This trend continues, with completions in 2006 registered by IHS Energy through January 1, 2007 being 67% gas and 21% oil. Factoring out non-producing wells, three out of four successful completions were made in gas reservoirs. Gas exploration is far more active than oil, but drilling for both is still overwhelmingly developmental in nature. Dry holes, which comprise all plugged and abandoned wells, including those junked for mechanical reasons, accounted for only 10% of drilling in 2006 (Figure 4).

The most active play in the State continues to be coalbed methane (CBM). Cardott, 2007 reported that at the beginning of 2007 there were about 4,600 CBM completions in Oklahoma, 372 of which have been registered thus far for 2006 (IHS Energy, 2007). This level of activity is about 20% below what was reported last year at this time for 2005. About 600 CBM completions have been registered for 2005 thus far. If reporting trends remain constant, 2006 CBM completions should total about 475 by this time next year. The bulk of 2006 activity is contained within well-established areas of CBM production, suggesting that the decline in drilling may result from a progressive development of the most prospective areas (Figure 5).

Cumulative coalbed methane production Statewide now stands at 360 BCF, with daily production (~200 MMCFPD) representing slightly less than 5% of all State gas production. The 3,341 active wells in this play (IHS Energy, 2007) each produce an average of 63 MCFPD. Ongoing active drilling has caused CBM production to increase geometrically, which insures that its share

of Oklahoma's gas production will continue to increase.

Coalbed methane wells in Oklahoma are located in two geologic regions: the Arkoma basin and the Cherokee platform. The Arkoma basin accounts for roughly one half of all coalbed methane completions, and almost all of these are in the Hartshorne Coal. Most Hartshorne Coal completions are made in horizontal wells. The most active CBM operators in the Arkoma basin are El Paso Production and Vectra CBM LLC with 31 and 21 completions registered for 2006 thus far. Activity in 2006 was concentrated in northwest and northern Pittsburg County in the areas of Scipio Northwest and Canadian Fields, western and central Haskell County in the area of Kinta Field, and east central Le Flore County in the areas of Poteau Southeast and Poteau-Gilmore Fields (Figure 5).

A variety of coals produce on the Cherokee platform, but the most popular in 2006 were the Rowe, Mulky, and Riverton coals - the bulk of these completed in vertical wells (IHS Energy, 2007). As in 2005, the most active CBM operators on the shelf in 2006 were Newfield Exploration (81 completions), K & E Field Services (27 completions), and Endeavor Energy Resources (17 completions). Activity in 2006 was concentrated in southern Washington, northwest Rogers and western Nowata Counties, along a wide trend extending from the Kansas border to just north of Tulsa (Figure 5).

Although the coalbed methane play is the most active in Oklahoma, other reservoirs were also industry favorites in the past year. Excluding coals, the top ten for 2006 based on completions reg-

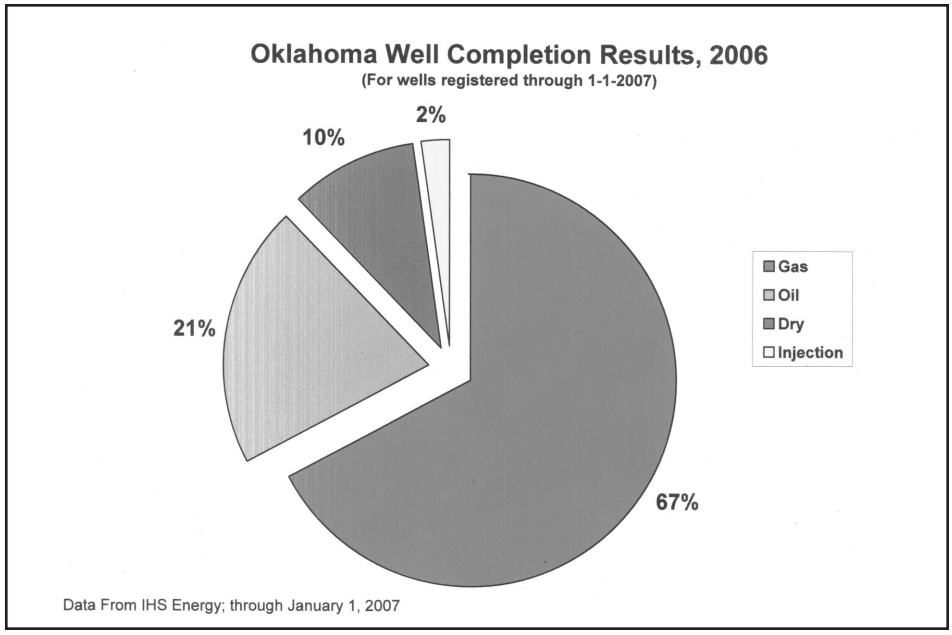

Figure 4. *Oklahoma 2006 Well Completion Results (wells reported through January 1, 2007 only), data from IHS Energy, 2007.*

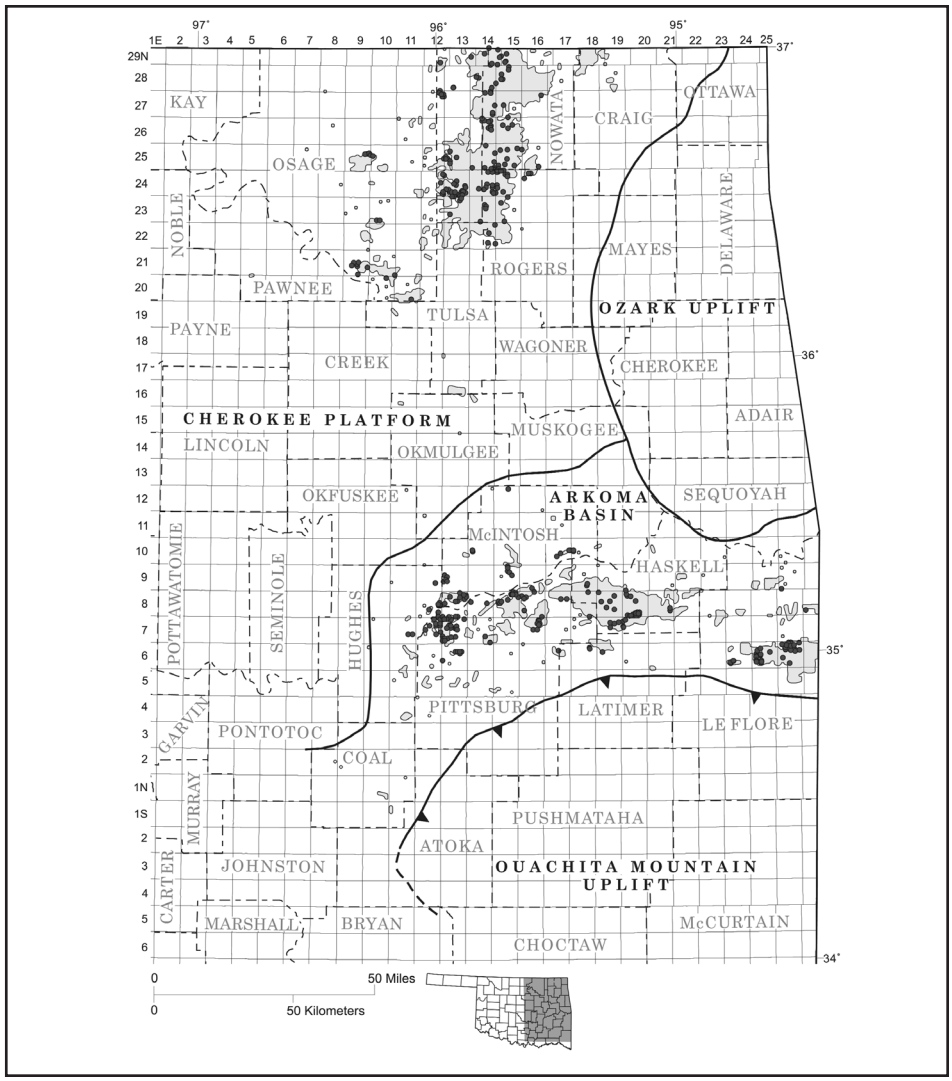

Figure 5. *Map of 2006 Eastern Oklahoma Coalbed Methane Activity. Map shows geologic provinces and areas of previous coalbed methane production overlain by 2006 completions. Pre-2006 productive areas and 2006 coalbed methane activity are from IHS Energy, 2007. Major geologic provinces boundaries modified from Northcutt and Campbell (1995).*

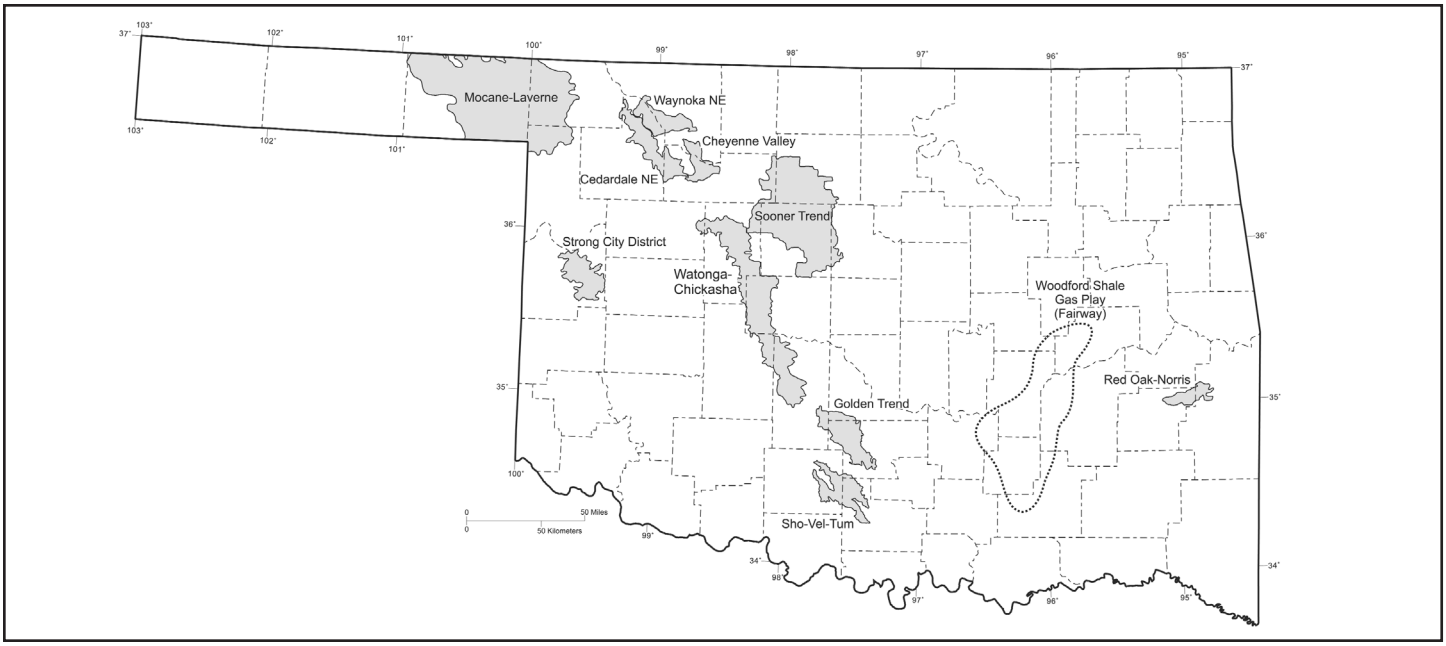

Figure 6. *Map of Oklahoma showing location of ten fields with most active 2006 development (exclusive of coalbed methane fields) and the Woodford Shale gas play fairway. Data from IHS Energy, 2007, field outlines from Boyd, 2002.*

istered through January 1, 2007 were the: Chester (144), Morrow (143), Oswego (138), Atoka (118), Red Fork (105), Hunton (101), and Mississippian (101). Also of note were 48 Woodford Shale gas completions that are part of an expanding play being made primarily in the western and southwestern parts of the Arkoma basin (Figure 6). Completions in this play are now mostly in horizontal wells, with drilling activity in 2006 roughly double that seen in 2005.

From the standpoint of field development in Oklahoma, gas drilling in the Anadarko basin and shelf was the most important in 2006. The top ten fields in terms of completions registered through January 1, 2007 were: Strong City District (88), Cedardale Northeast (83), Mocane-Laverne (82), Sho-Vel-Tum (59), Waynoka Northeast (45), Watonga-Chickasha (44), Red Oak-Norris (43), Golden Trend (36), Cheyenne Valley (33), and Sooner Trend (31) (Figure 6). Coalbed methane fields, which are classified by IHS Energy as county-wide gas areas, are not included in this list.

Hundreds of companies drilled wells in the State in 2006, but Chesapeake Operating continues to be by far the most active operator. Based on completions registered through January 1, 2007, they accounted for about 11% of all wells drilled. Their 322 completions are scattered through almost every region of the State, and nearly double the 179 completions made by the second most active operator: Newfield Exploration. The Dominion Group (Dominion Exploration Midcontinent Inc., Dominion Oil Company, Dominion Oklahoma Texas Exploration and Production Inc., New Dominion LLC), Apache, and BP America complete the list of Oklahoma's top five operators in 2006 (Figure 7).

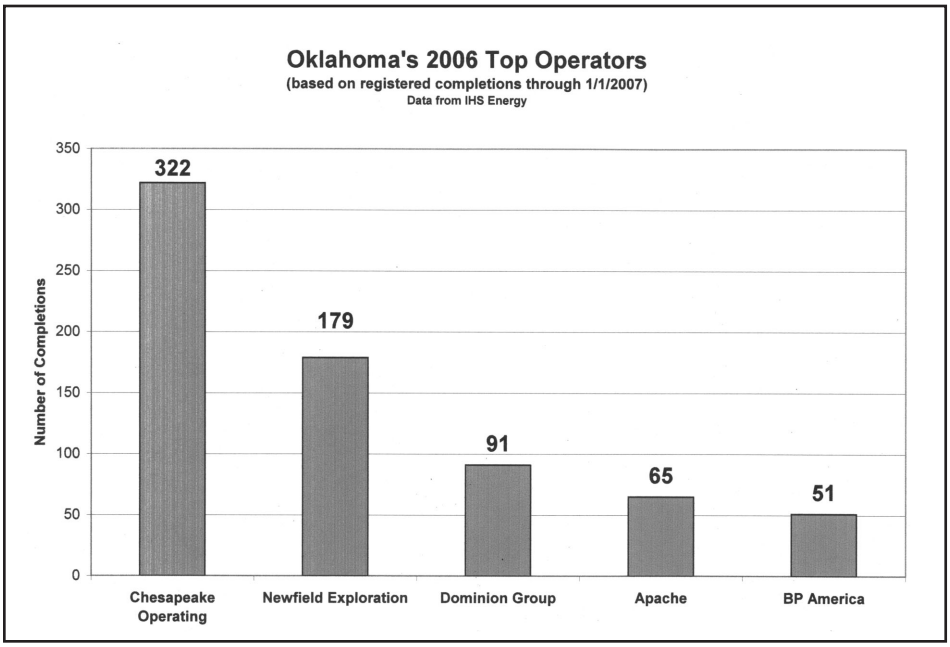

Figure 7. *Top 5 operators in Oklahoma in 2006, based on number of completions registered through January 1, 2007. Data from IHS Energy, 2007.*

Significant Wells in 2005

The following is a list of what are, or may become, significant wells for 2006 in Oklahoma. It is based on a review of the wells that were described in issues of the monthly Oil and Gas Investor (2006) and the IHS Energy Energy News on Demand Midcontinent activity reports available online. These were compared to the IHS Energy well data CD released on January 1, 2007 (IHS Energy, 2007). An initial list of 86 possibilities compiled from these publications was distilled to a total of 19 potentially significant wells. Such a listing is necessarily subjective, and may miss wells that could eventually become noteworthy. Due to confidentiality issues, wells that may be notable for technical reasons will probably be missed. For instance, wells that may have confirmed some new type of trapping style or proved the benefit of a different kind of completion technique will be difficult to identify until information is disseminated years later.

Such subtleties aside, the wells shown here are of two general classes; those that are more than one mile from production in the same reservoir, which is the standard to be considered a discovery, and those that are notable for other reasons. The latter include rank wildcats, major play expansions, or new production types and/or completion techniques.

Horizontal drilling is by far the most important drilling/completion technique to be recently applied in the State. It has greatly increased oil and gas recovery in lower permeability and dual porosity reservoirs, and operators are now applying it in a wide variety of reservoirs in areas throughout Oklahoma. Horizontal drilling has consistently made formerly unproductive areas and reservoirs profitable, and through improved recovery efficiency has revitalized reservoirs that have been producing for years. Because of its huge impact on State drilling activity and production, and the potential for this to grow geometrically in the future, it is the common thread running through most of the notable 2006 wells that are listed here.

For convenience, the State is divided into two parts along the Indian Meridian: with twelve wells located in the western ranges and seven in the eastern. In each area the wells are generally listed from west to east and north to south, although wells in the same province or reservoir are usually discussed together (Figure 8).

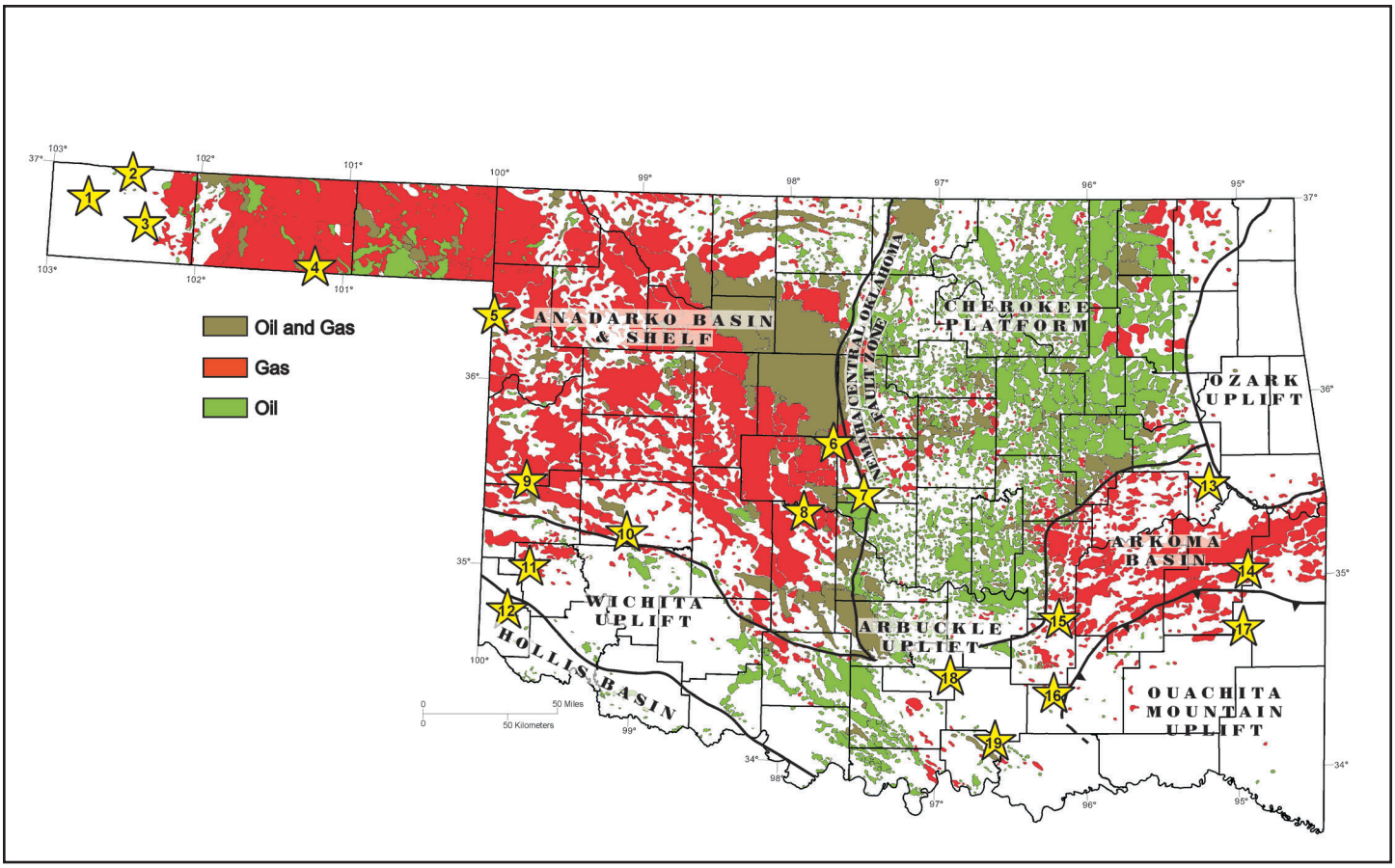

Figure 8. *Map of Oklahoma oil and gas fields, distinguished by GOR, showing location of significant wells reported for 2006. Modified from Boyd (2002). Major geologic provinces boundaries modified from Northcutt and Campbell (1995).*

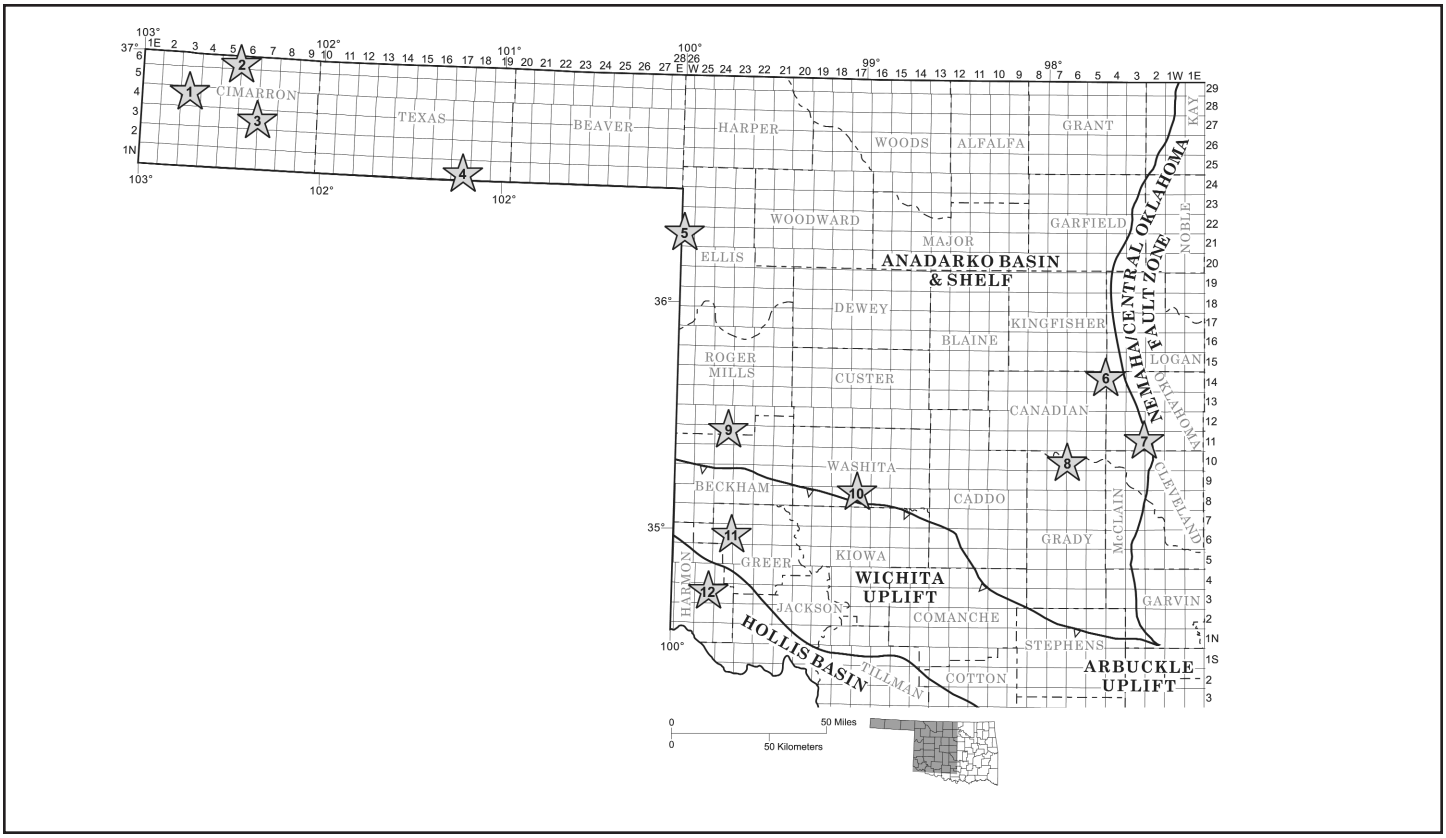

Figure 9. *Map of western Oklahoma showing location of significant wells reported in 2006. Major geologic provinces boundaries modified from Northcutt and Campbell (1995).*

Western Oklahoma
(Figure 9)

1) Sec. 9-4N-3ECM (Cimarron County): Energy Operations continues their series of rank wildcats in the western Panhandle. The OK Coyote #1-9 will be their third well in this township, where the OK Coyote #1-4 and Wolf #1-22 were both plugged in 2006. The #1-4 Coyote was a 6,873' Arbuckle test that unsuccessfully tested the Red Cave (2,344-2353') and the Wolf well was a dry 5,807' Morrow test. The proposed Coyote #1-9 is 13 miles southwest of the nearest production in Castaneda South Field, and if successful would establish the westernmost production in the State.

2) Sec. 25-6N-5ECM (Cimarron County): Energy Operations announced a discovery at another rank location in Cimarron County in August. Their Oklahoma #1-25 well tested 37 BOPD of 45 gravity crude from the Marmaton on pump through perforations from 4,050-4,058'. This well is located about 6 miles north-northwest of the nearest production in Castenada Field, which is identified as Granite Wash. Energy Operations has staked an additional seven wells in the area, three of which spudded between October and November 2006. This discovery has not yet begun producing.

3) Sec. 18-3N-7ECM (Cimarron County): Spectra Energy spudded the #1-18 Stafford (PTD: 5,300') in October seeking to extend production from Sampsel NE Field, which is the nearest production and located over five miles to the southeast. The Stafford comes after the plugging by K F Walker Oil and Gas of the #1-28 Jazz (TD: 5,373'), located three miles southeast. The Stafford is Spectra's second well in this section, with the original, the 5,515' #1-18 Billy Ray, plugged in July. The Billy Ray finished drilling in the Cherokee and was plugged back and tested the Marmaton from 4,080-4,180'. No results were reported, but apparently these were encouraging enough to justify drilling the Stafford.

4) Sec. 26-1N-17ECM (Texas County): Conoco-Phillips discovered a prolific oil reservoir in the Atoka of Guymon-Hugoton Field. Their Clawson B #1-26 tested 269 BO of 44 gravity crude with 705 MCF and 9 BWPD from perforations from 6,340-6,420'. Completed in September, a follow-up well drilled in section 23 of the same township confirmed the discovery with an initial potential from the same zone of 631 BO + 777 MCFPD with no water. Both wells were tested on a 1" choke and had flowing tubing

pressures of 112 and 472 psi respectively. The first full month's production from the #1-26 Clawson was 5,420 BO, which is an average of 181 BOPD. Conoco-Phillips is drilling three additional wells in these two sections.

5) Sec. 16-21N-26W (Ellis County): Jones Energy drilled a notable horizontal development well in Shattuck West Field. The Sally Jo #1-16H had an initial potential from the Cleveland Sandstone of 1,200 BO + 3,338 MCF + 12 BWPD on a 20/64" choke with a FTP of 1,325 psi. Production is from a horizontal lateral that extends from 8,081-10,094' MD. This well is one of seventeen Cleveland producers in the field and is the second horizontal well. In less than two months the Sally Jo has produced 35,706 BO + 179 MMCF, with an average rate in its first full month of 704 BO + 4.6 MMCFPD. Combined, the two recent horizontal wells account for 95% of Cleveland production in Shattuck West Field, and in less than two months have increased cumulative oil recovery by one quarter in a reservoir that has produced for 30 years.

6) Sec. 13-14N-5W (Canadian County): Another notable horizontal well was completed by Avalon Exploration in the Hunton on the western edge of Edmond West Field. The #1-13 Velvet Elvis had an initial pumping potential of 743 BO + 441 MCF + 807 BWPD from a measured depth of 7,264-8,462'. This well is the latest and the highest rate producer of six (3 horizontal, 3 vertical) Hunton wells drilled in 2006. Production in the first two months from the Velvet Elvis is 18,888 BO + 27 MMCF with an average rate in the last month of 127 BOPD.

7) Sec. 24-11N-3W (Oklahoma County): New Dominion is continuing their de-watering efforts in the Arbuckle in the Oklahoma City Field with the drilling of three more multi-lateral horizontal wells. These new five to eight lateral wells are located in Sections 24 and 25 11N-3W and Section 19-11N-2W. The wells are located in a part of the Oklahoma City Field where many high-volume Arbuckle wells were drilled in the 1930s. New Dominion has produced about 219 MBO and 604 MMCF of gas with a current production rate from six wells of about 550 BO and 2.3 MMCFPD. Water production is not reported, but is undoubtedly very high. Water is disposed into downthrown Arbuckle via the Deep Throat #1-29, located in Sec. 29-11N-2W. Oklahoma City Field is the second largest oil field in the State, with cumulative recovery of 823 MMBO.

These wells utilize a production strategy similar to that driving the Hunton dewatering play in which New Dominion is also active. Here operators seek to reduce reservoir pressure in depleted fields through aggressive water production. This triggers associated gas expansion in the poorer (unswept) parts of the reservoir, forcing oil into the natural and/or induced fracture system and ultimately into the wellbore. As the reservoir pressure declines, the oil cut gradually increases. High-volume water disposal facilities are a key element in exploiting this development play.

8) Sec. 30-10N-6W (Grady County): St. Mary Land & Exploration completed the first horizontal well in Grady County with their #1-30 Spurgin. Located in Minco East Field, the well had an initial potential from the Cottage Grove of 1,500 MCF + 276 BWPD on a 24/64" choke with a FTP of 1,400 psi. Production in the first four months, which is from 8,809-10,659' MD through a slotted liner, is 150 MMCF. The rate in the last month was 806 MCFPD. A vertical Cottage Grove well in the same section produced only 35 MMCF in 26 months.

9) Sec. 11-11N-24W (Roger Mills County): Chesapeake Operating completed yet another notable horizontal well in the Cherokee in Grimes Field. Producing from a MD of 14,788-16,416', the Beatrice #1-11H produced about 1.5 BCF in 9 months on stream and continues to produce at a rate of 3.4 MMCFPD. This well offsets a vertical 2004 Cherokee well in the same section that in 26 months produced 1.7 BCF. Chesapeake's horizontal drilling program in Grimes Field began in early 2005, with 8 out of 29 Cherokee wells now producing from Chesapeake-operated horizontal wellbores. These wells now represent more than half of Grimes Field Cherokee production.

10) Sec. 17-8N-17W (Washita County): Marathon has drilled a confirmation to a 2005 Chesapeake Springer discovery that has helped kick off a flurry of activity in the area, with eight additional wells drilling within two miles. Marathon's #1-17 Folks, after drilling to 19,700', was perforated in four intervals in the Springer from 19,048-19,532'. The initial potential was 10.842 MMCF + 20 BWPD on a 10/64" choke, with a FTP of 13,293 psi. Cumulative production in only eight months is 2.7 BCF, with a daily average in the last

month of about 12 MMCFPD. The Chesapeake #1-16 State discovery well, which is located 1 mile to the southeast, has produced 940 MMCF from the Springer in 20 months and continues to produce at a rate of 1.2 MMCF.

11) Sec. 24-6N-24W (Greer County): Marion Energy has staked the Francis #24-2 as a horizontal Brown Dolomite test in Jester SE Field. Production from Jester SE Field is from 37 vertical wellbores, with all but one producing from Granite Wash. The single Brown Dolomite well, located in the same section as the Francis, was abandoned in 1970 after producing 27 MMCF. The Brown Dolomite here is at a depth of about 1,300' and produces prolifically about 10 miles north in Erick Field. No details have yet been released for this new horizontal well.

12) Sec. 14-3N-25W (Harmon County): Chaparral Energy is drilling a rank wildcat in the extreme southwestern part of the State. The nearest production to the #1-14 Jones is located three miles to the southeast where the 1-well McQueen NW Field, which was abandoned in 1999, produced from the Bend Conglomerate. Cumulative production from the field is 32 MBO. Chaparral drilled the Jones to a total depth of 8,430', and appears to have had some encouragement, as casing has been run to TD. Chaparral has an additional location staked in section 12 of the same township (#1-12 Faulks) whose drilling is probably dependent on the results here.

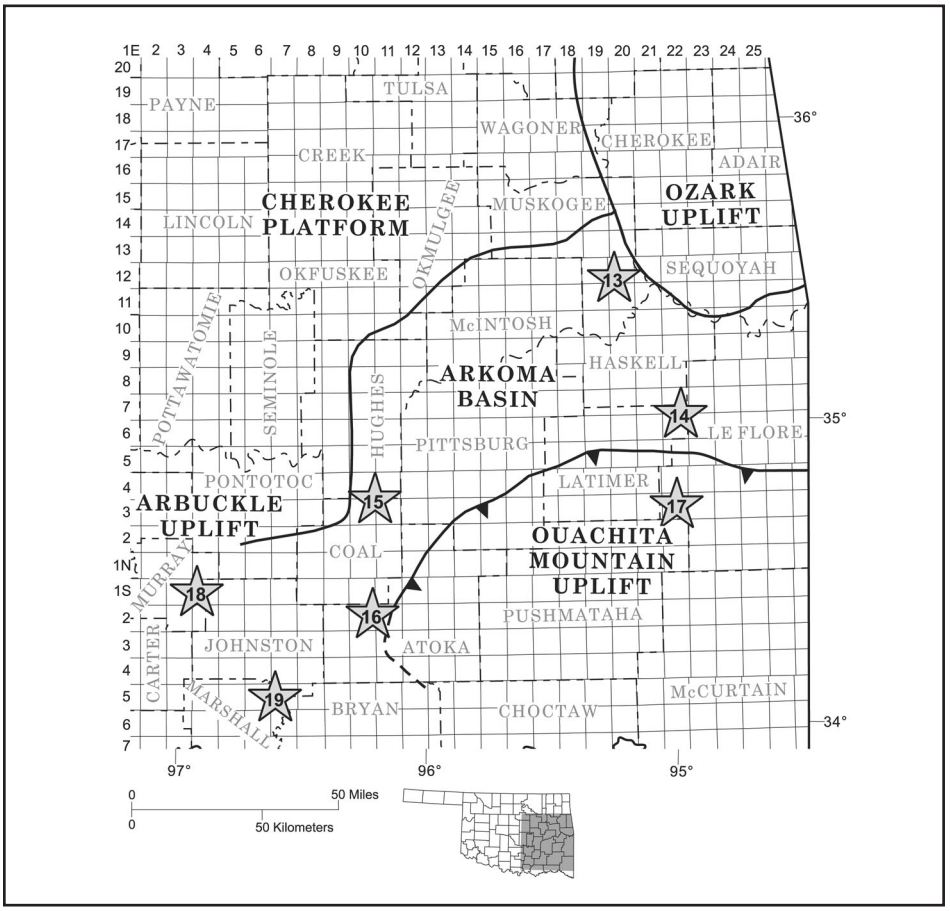

Figure 10. *Map of eastern Oklahoma showing location of significant wells reported in 2006. Major geologic provinces boundaries modified from Northcutt and Campbell (1995).*

Eastern Oklahoma
(Figure 10)

13) Sec. 29-12N-20E (Muskogee County): Located on the southwestern flank of the Ozark Uplift in a sea of dry holes, Tripower Resources is drilling a 3,000' Hunton wildcat called the Martin #1-29. The well is 3.5 miles northeast of the one-well Warner South Field, which was a 1999 Dutcher discovery now operated by Covington Oil Company. This well has produced 61 MMCF and is today producing 41 MCFPD.

14) Sec. 35-7N-22E (Latimer County): BP America is drilling a horizontal Simpson test in Red Oak-Norris Field. Only the forth Simpson well in the field, the Blair Unit #35-12 is located more than a mile northeast of a vertical Simpson well that had an initial potential after fracture stimulation of 1,100 MCF + 48 BWPD. Inactive since October 2004, this well produced 107 MMCF in four months. Although the Blair Unit is shown as drilling, no details have yet been released.

Elsewhere in eastern Oklahoma, activity in the Woodford Shale gas play continues in the western and southwestern Arkoma basin. 48 wells have been registered as 2006 completions in the play fairway thus far, with most recent activity located in a broad trend extending from western McIntosh through central Coal Counties (Figure 6). Newfield Exploration and Devon Energy are the most active operators with numerous wells recently staked, drilling, or in the process of completion.

Since early 2004 68 Woodford gas wells have been completed and begun producing in the fairway. Cumulative production for the play

thus far is about 5.0 BCF, with the average well producing about 324 MCFPD. Because this play has just started, most wells have been producing for only a few months. The following two wells are considered the most notable 2006 Woodford reported thus far.

15) Sec. 36-4N-10E (Hughes County): Newfield Exploration Mid-Continent completed one of the best horizontal Woodford gas wells to date in their #1H-36 Parker well. Located in the middle of the play, this well has one of the highest initial potentials yet documented for a Woodford gas well. Completed in a horizontal lateral from 7,820-9,980', the well tested at 5,312 MCF + 80 BWPD on a 36/64" choke and a FTP of 1,315 psi. Well depths are 10,250' (MD) and 7,202' (TVD). In its first 5 months the #1H-36 Parker produced 147 MMCF with a rate in the last month of 1.7 MMCFPD.

16) Sec. 14-2S-10E (Atoka County): Antero Resources completed a horizontal Woodford gas well just west of the town of Atoka. This well has pushed the southern limit of the play about ten miles south and has kicked off a flurry of drilling in the area. Completion details for the Carr Estate #14-1H are lacking, but production in its first three full months is 109 MMCF with a rate in the last month of 1.7 MMCFPD. The first offset well, the Carr Estate #13-1H, is probably indicative of the completion of the discovery. Drilled horizontally in section 13, it was completed in the Woodford from 8,687-11,031' at an initial rate of 3,980 MCF + 179 BWPD on a 1" choke and FTP of 300 psi. Well depths are 11,031' (MD) and 8,156' (TVD).

17) Sec. 15-3N-22E (LeFlore County): Buray LLC made what is described as a Stanley Shale discovery at their #1-15 Griffith well. It is located in the Ouachita Mountain Uplift 3 miles east of Talahina NW Field; a 2001 Stanley Shale discovery made by GHK. The Griffith was perforated in 4 zones between 4,430 and 7,018' and after an acid/fracture stimulation flowed 400 MCFPD with no water on a 20/64" choke with FTP of 200 psi. Since the discovery Buray has drilled two more wells, completed in what is described as Stanley Sand, in sections 16 and 17 of the same township with initial potentials of 1,565 and 65 MCFPD. A third Buray well is now drilling in section 14.

18) Sec. 17-1S-4E (Murray County): Cimarron Oil Company is drilling a rank Arbuckle wildcat three miles southeast of the town of Sulfur. The #1-17 Brock has a projected TD of 2,350' and is located 7.5 miles from the nearest production. This production comes from the Oil Creek Sandstone in Davis Field, with which it is on trend. Located on the flank of the structurally complex Arbuckle Uplift, the three nearest wells, which are all at least 1.5 miles distant, were drilled in 1975, 1957 and 1921.

19) Sec. 28-5S-7E (Marshall County): Cimarex Energy spudded in November the Metz #105-13H, the first horizontal Mississippian well in the Ardmore Basin. Because a reservoir called 'Mississippian' does not produce in this field, it is assumed that Mississippian refers to Sycamore, one of the major producers. The Metz offsets four vertical Sycamore wells that had initial potentials between 50 and 720 MCFPD. The closest, drilled in the same section, produced 682 MMCF in 11 years.

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ABBREVIATIONS:

BCF - billion cubic feet
BO - barrels of oil
BOPD - barrels of oil per day
BW - barrels of water
BWPD - barrels of water per day
MBC - thousand barrels of condensate
MBO - thousand barrels of oil
MCF - thousand cubic feet
MCFPD - thousand cubic feet per day
MD - measured depth
MMBO - million barrels of oil
MMCF - million cubic feet
MMCFPD - million cubic feet per day
PTD - proposed total depth
TD - total depth
TVD - true vertical depth

ABOUT THE AUTHOR

Dan Boyd is a petroleum geologist with the Oklahoma Geological Survey, where he has been employed since 2001. Dan received his Master of Science degree in geology from the University of Arizona in 1978. He spent the first 22 years of his career as an exploration and development geologist in the petroleum industry. From 1978 through 1991 he worked on a variety of areas in the United States from Houston, Dallas, and Oklahoma City for Mobil Oil and Union Texas Petroleum. In 1991 he moved overseas, working in Karachi Pakistan for four years and Jakarta Indonesia for the following four. He returned with his family to the U.S. in 1999 with Arco (the successor to Union Texas) where, until Arco's sale to BP, he worked on the offshore Philippines from Plano, Texas. He now enjoys a more settled life in Norman, Oklahoma with his wife and two children. Dan is a history buff, amateur astronomer, and violinist in the OU Civic Symphony.

Since joining the Staff of the Oklahoma Geological Survey in 2001, Dan has been involved in updating the Oil and Gas Map of Oklahoma in 2002 and preparing and presenting several published reports on the history, status, and future outlook of the oil and gas industry in Oklahoma. He chaired the 2002 Symposium on Cherokee Reservoirs in the Southern Midcontinent and edited the attendant publication, OGS Circular 108. Dan also prepared and presented his report on the Morrow-Springer gas in Oklahoma for the 2005 Springer Gas Play Symposium. Dan recently prepared and presented, with others, the study on the Booch gas play in southeastern Oklahoma and the subsequent OGS Special Publication 2005-1.