
Big Drilling Decline in Promising Oklahoma Play

Anadarko production not stacking up.

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Data Sources for This Publication

Baker Hughes
EIA

To discover more about the data sources used, [click here](#).

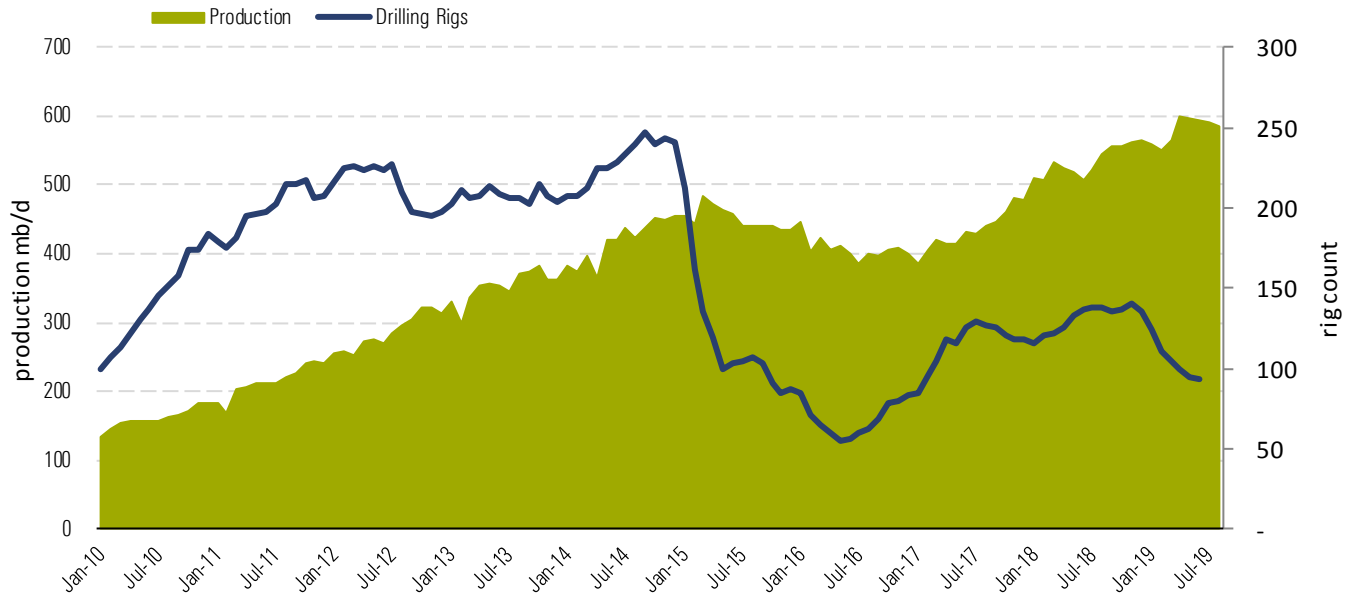
High Initial Promise

While overall domestic crude production continues to increase, the rate of growth is slowing down according to the Energy Information Administration's July Drilling Productivity Report. Investment in new drilling as measured by the rig count is down 10% across the board between December 2018 and June 2019 in the seven shale basins the report covers. The rig count fell most rapidly—by 31%—in the Oklahoma Anadarko region. That decline follows a two-year period of drilling and production growth between 2016 and 2018 in the Anadarko after crude prices recovered from the 2015 crash. Producers were attracted to the basin's SCOOP and STACK plays that promised high initial production rates in a location close to the Cushing, Oklahoma, Midwest oil trading hub. Now that early promise is fading as producers pull back investment. This note looks at reasons behind falling Anadarko drilling and the implications for this and other shale basins.

Anadarko Basin

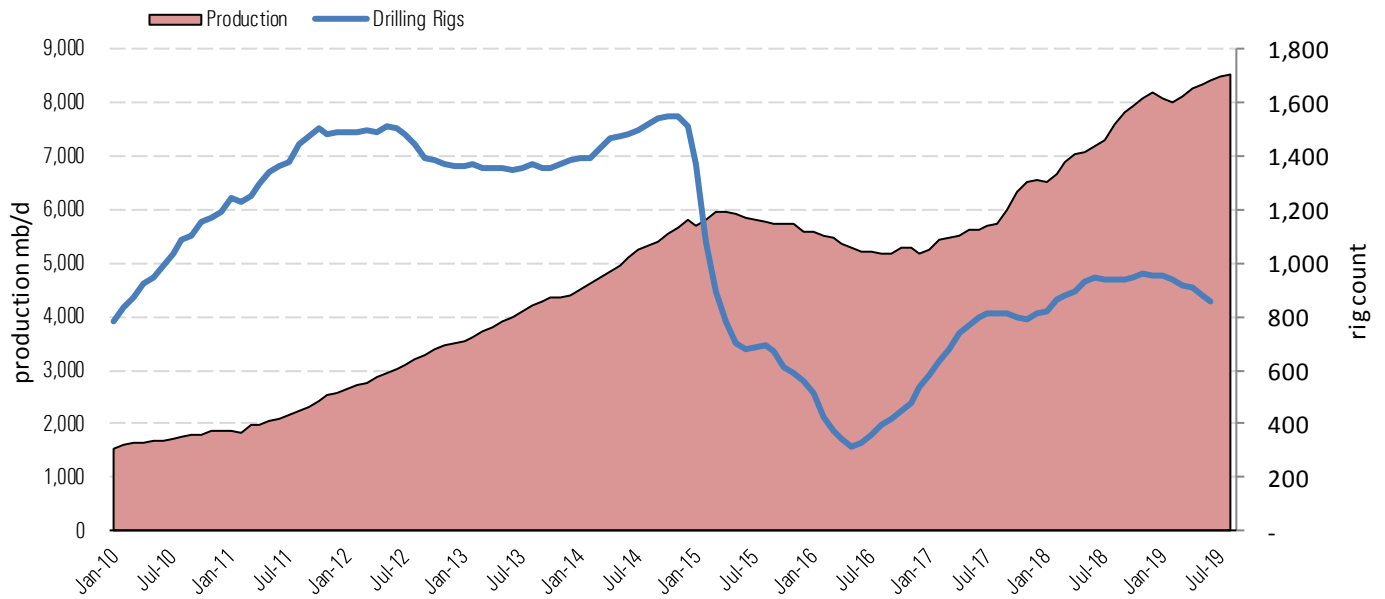
The 70,000-square-mile Anadarko basin spans Western Oklahoma, Southeast Colorado, Western Kansas, and northeast Texas panhandle. According to EIA's July Drilling Productivity Report published last Monday, output between January and August 2019 was estimated to increase from 559 to 585 mb/d—up 11% over the same period last year. That compares with an overall increase of 18% in shale production over the same period for all seven regions the report covers (Exhibits 1 and 2). The report also shows rig counts in Anadarko since the 2015 price crash peaked at 141 in November 2018 and are down 34% since then to 93 in June 2019 compared with a 10% decline in rig counts for all basins. The faster rig count decline in the Anadarko doesn't appear to be related to completion rates—the process of bringing newly drilled wells into production. The drilled but uncompleted, or DUC, well count increased at about the same rate as average for other basins through June 2019.

Exhibit 1 Drilling and Production in the Anadarko Basin



Source: EIA, Morningstar.

Exhibit 2 Drilling and Production in Seven Major Shale Basins



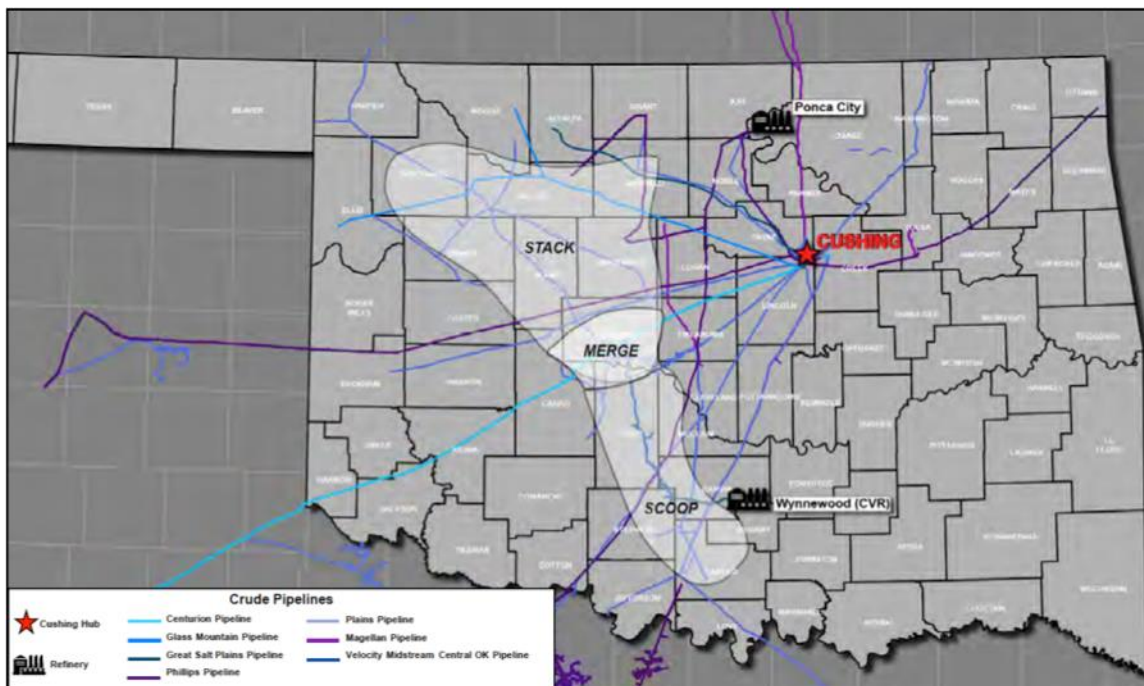
Source: EIA, Morningstar.

SCOOP, STACK, and Merge

Shale drilling interest in the Anadarko is focused in the South Central Oklahoma Oil Province, or SCOOP, and the Sooner Trend Anadarko basin Canadian and Kingfisher counties, or STACK, plays as well as the “merge” region between them (Exhibit 3). These liquids-rich plays are located in an 11-county section of central Oklahoma. Drilling activity in the SCOOP/STACK/merge plays primarily targets crude, natural gas liquids (NGLs), and condensates in the Cana Woodford formation of the Anadarko Basin.

The Cana Woodford plays attracted producers in recent years because they seemed to offer high initial production rates and competitive break-evens compared with other basins. Low break-evens mean producers achieve higher rates of return faster as crude prices rise. Typical acreage costs in the Cana Woodford are lower than for more popular basins like the red-hot West Texas Permian. Proximity to Midwest refineries such as CVR Partners’ 70,000 barrels/day Wynnewood, Oklahoma, and Phillips 66’s 207 mb/d Ponca City, Oklahoma, plants as well as the crude oil trading hub at Cushing, Oklahoma, also mean lower transport costs to market. These advantages attracted new drilling as crude prices recovered from the 2015 downturn. Horizontal rigs deployed in the Cana Woodford basin tripled from 24 in June 2016 to 76 in June 2018 according to Baker Hughes rig count data. Over the same two-year period, oil production in the wider Anadarko increased by 27% from 400 mb/d to 506 mb/d.

Exhibit 3 Oklahoma SCOOP, STACK, and Merge Plays



Source: Chaparral Energy

Cracks Appear

During the last year, however, cracks appeared in the upbeat picture as some producers pulled back drilling investment in response to lower returns. The Baker Hughes Cana Woodford rig count has fallen

37% to 48 rigs since early June 2018 although four rigs have been added since mid-June 2019. The highest profile failure was Alta Mesa Resources that was forced to make a \$3.1 billion write-down in February 2019 after its wells in the STACK play produced less than expected. Other, larger players have reduced their drilling and investment in the plays. Continental Resources is the largest player in the SCOOP and has increased drilling and production there every year since 2012, but while their annual average output increased by 13.5% a year from 40.4 thousand barrels of oil equivalent/day in 2014 to 62.2 mboed in 2017, the increase slowed to 8% in 2018 (67.2 mboed) and just 1% in the first quarter of 2019 (according to SEC filings). And although the play continues to produce outstanding results according to the company's April 2019 investor presentation, Continental reduced proven reserves by 33 million barrels during 2018. Another large independent producer, Devon Energy focused new investment on the STACK play in the past, but recently switched that focus to the Permian, Eagle Ford (Texas), and Powder River (Rockies) basins, in part due to lower results than expected. In March 2018, Devon expected STACK output to reach 140 mboed by the end of that year, but actual output averaged only 123 mboed during the first quarter of 2019. These results are not disastrous but represent reason for caution in an era of tighter drilling budgets.

The reasons behind lower rig counts and poor returns are hard to pinpoint because some companies have done better than others. Lower rig counts can be driven by improved efficiency. Or, pushed by investors for better returns, producers could just be targeting locations where they see better results. But the region's uneven geology has presented challenges. On paper and in early successful wells, the multi-layered formations in the Cana Woodford were reminiscent of rich plays like the Permian's Delaware basin. However, producers encountered more complexity in the underground rock structures that reduced initial production. And wells in the SCOOP formation are gas rich — meaning they produce less high value liquids and more lower value natural gas. In June, Reuters reported data from Rystad Energy indicating higher median break-even prices of \$54.53 and \$53.15 /barrel were needed to cover costs in the SCOOP and STACK, respectively. These break-evens were higher than those seen in the Permian, Bakken, North Dakota, Denver-Julesburg, and much of the Eagle Ford shale basins. While prices for U.S. benchmark West Texas Intermediate crude at Cushing are currently above \$55/barrel, Cana Woodford drilling is vulnerable to any downturn in crude prices.

Infrastructure

Infrastructure hasn't so far been a challenge in the Anadarko with adequate crude takeaway available to the nearby Cushing hub on the Velocity Midstream Central Oklahoma, Blueknight Energy Oklahoma, Navigator Glass Mountain, Plains/Phillips 66 Stack, and Cimarron Express pipelines. Getting crude beyond Cushing to the Gulf Coast has become a challenge due to competing high crude volumes coming into Cushing out of the Permian as well as stricter quality specifications for the 850 mb/d Enbridge/Enterprise Seaway pipeline between Cushing and Houston. As we explained in a May note (see "[Quality Adds to Domestic Variety](#)"), increased volumes of lighter crude and condensate are being produced in basins like the Cana Woodford. The new quality rules make it difficult to blend lighter crude and condensate with heavier Canadian barrels at Cushing to produce West Texas Intermediate spec barrels — which was previously common practice. Now these lighter grades are discounted and must be batched and shipped separately to market at additional expense. Congestion caused by inadequate

Permian takeaway capacity has also impacted Cushing WTI prices that have at times traded \$7/barrel below prices for WTI in Houston, meaning Oklahoma producers get lower returns if they don't have pipeline capacity to deliver to the Gulf Coast.

Increased capacity is being planned between Cushing and Houston in the shape of the Magellan Midstream and Navigator Energy 300 mb/d Voyager project due online at the end of 2020 and the Phillips 66 and Plains All American 400 mb/d Red Oak project due in early 2021. Connectivity between Cushing and the eastern Gulf is also being planned. The proposed 800 mb/d Tallgrass Seahorse project connecting Niobrara Rockies production with the Mississippi River at Plaquemine Parish, Louisiana, runs through Cushing and is expected online in 2021. In addition, plans to reverse the 1.2 mmb/d Capline pipeline between Patoka, Illinois, and St. James, Louisiana, would allow crude flowing east from Cushing to Memphis on the 200 mb/d Plains/Valero Diamond pipeline to reach St. James via Collins, Mississippi. These routes offer prospects for Cana Woodford crude to reach export markets where most incremental shale crude production is headed nowadays.

Flight to Quality

Recent market commentary is full of speculation that the shale boom is slowing—in the Permian and elsewhere in the U.S.—although production remains at record levels. Our belief is that any Permian slowdown is prompted by current takeaway capacity constraints, and we expect output there to increase as new pipelines come online at the end of this year. Casting more of a cloud over shale output is the impact of lower international demand for crude. The latest OPEC and International Energy Agency reports indicate demand for crude is not increasing as fast as supply. If true, that will lead to a world crude inventory build that weighs on prices. Pressure in international markets leads to lower domestic prices because incremental production is now exported and must be discounted to find buyers. With higher break-even prices than other regions, Anadarko producers could find themselves underwater faster as prices fall, with rigs pulling back more rapidly than they are today. Geology challenges and constraints getting their output to the Gulf Coast make life harder for them compared with Permian producers with lower costs.

Producers constantly re-evaluate drilling investment to improve returns and keep investors happy, particularly when break-even prices are high and crude markets weak. These pressures can cause a flight to quality drilling locations that may explain lower rig counts in the Anadarko since last year. However, if demand remains below international supply, the drilling pullback in the Anadarko could prove to be just the first of many across shale basins. ■■

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