Natural Gas Production Report

April to June 2020

Q2

This report uses data reported to the Pennsylvania Department of Environmental Protection (DEP) from natural gas operators to develop statewide tabulations of production volume and well counts. These data are presented on a quarterly basis to show recent trends in natural gas activity in the Commonwealth. Production and well count data pertain only to gas produced from unconventional sources (e.g., shale). The production and well count data throughout this report focus on horizontal wells, which comprise over 99 percent of unconventional production in Pennsylvania. The report also provides (1) state production comparisons from the U.S. Energy Information Administration (EIA) and (2) recent regional price trends from Bentek Energy.

Production Volume and New Wells Spud

Recent data from DEP show that natural gas production volume from horizontal wells was 1,717 billion cubic feet (bcf) in the second quarter of 2020 (see **Table 1**). This output represents an increase of 2.8 percent from the second quarter of the prior year, the lowest such growth rate in over three years. Year-over-year growth in production has decelerated over the last four quarters after recording very strong gains from the first quarter of 2018 to the second quarter of 2019. Furthermore, second quarter production declined from the first quarter of 2020, the second consecutive quarter-to-quarter decline. The continued slowdown in production has likely resulted from the combination of (1) a persistently low-price environment and (2) impacts from the COVID-19 pandemic on the demand for natural gas.

There were 113 new horizontal wells spud in the second quarter of 2020. This figure represents a decrease of 51 wells (-31.1 percent) from the same period in the prior year, and the fifth consecutive quarter in which there was a year-over-year decline in new wells spud. The figure also represents the lowest number of new wells spud in a quarter since the second quarter of 2016.

Table 1: Production Volume and New Wells Spud

	2019				2020	
	Q1	Q2	Q3	Q4	Q1	Q2
Production	1,654	1,670	1,717	1,775	1,766	1,717
Growth Rate	14.7%	14.7%	9.5%	7.6%	6.8%	2.8%
New Wells Spud	198	164	135	117	153	113
Growth Rate	2.6%	-22.6%	-21.1%	-41.2%	-22.7%	-31.1%

Note: Growth rates are year-over-year. Production in billion cubic feet. All data exclude vertical wells, which account for less than one percent of production.

Figure 1 displays the year-over-year growth rates of horizontal well production over the last 16 quarters. After reaching the lowest quarterly growth rate on record in the first quarter of 2017 (2.3 percent), production growth accelerated in six consecutive quarters, reaching the strongest recorded year-over-year growth rate of 18.6 percent in the third quarter of 2018. Since reaching this peak, quarterly production growth has decelerated in six of the last seven quarters.

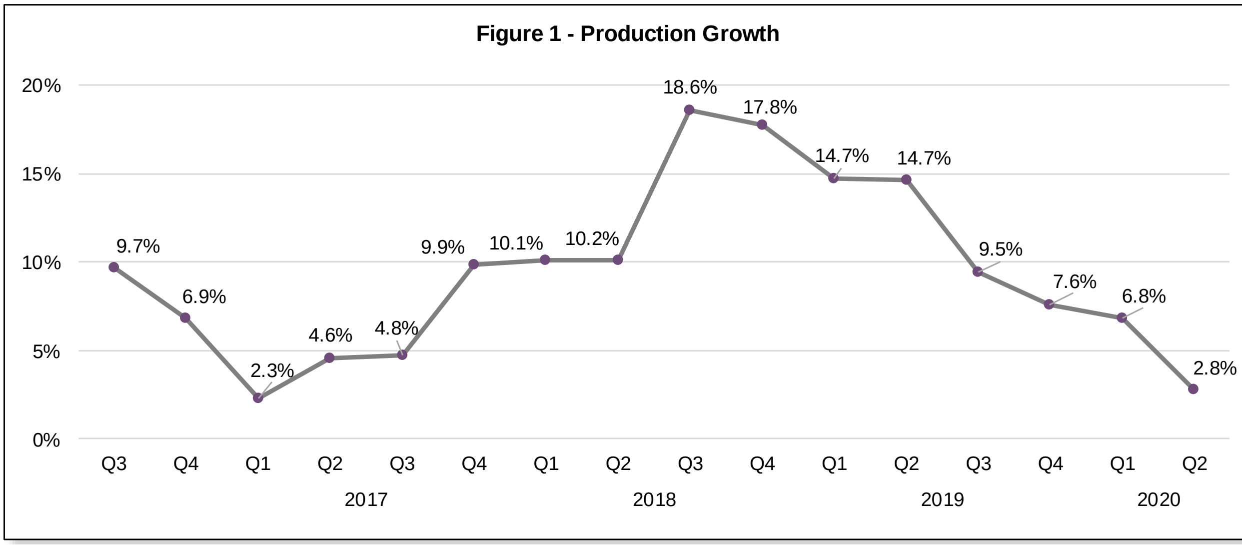
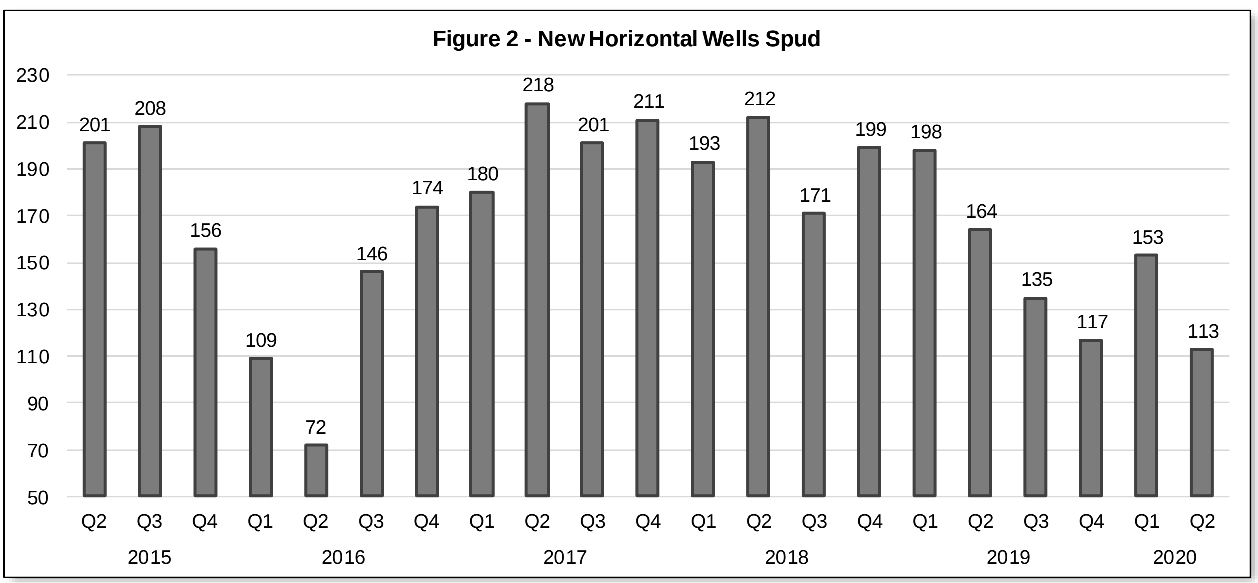


Figure 2 shows the quarterly number of new horizontal wells spud since the second quarter of 2015. The number of wells spud in the second quarter of 2020 was the lowest second quarter spud count since 2016. The spud count for the first half of 2020 represents a decline of 96 wells (-26.5 percent) from the first half of 2019. Preliminary data for the third quarter show that the number of wells spud in July and August declined by roughly 35 percent from same period in the prior year.



Well Count Trends

Table 2 displays the number of producing wells over the last six quarters. There were 10,056 total producing wells in the second quarter of 2020, which represents an annual increase of 7.2 percent. Horizontal producing wells, which account for over 99 percent of production, recorded an annual increase of 7.7 percent. This is the smallest year-over-year increase in quarterly horizontal producing wells on record. Decelerating growth in producing wells is the result of less drilling activity and older wells being shut in or plugged.

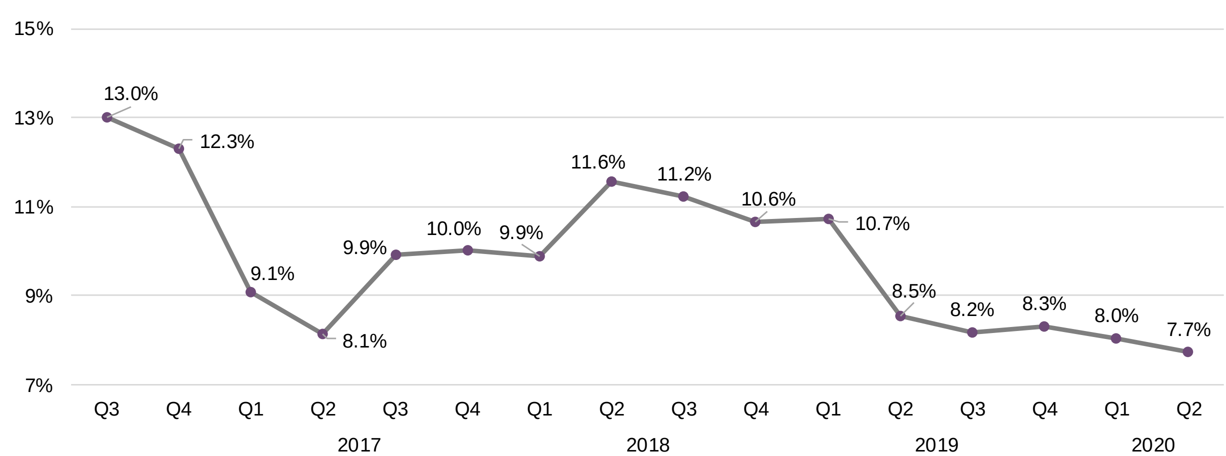
Table 2: Quarterly Producing Well Count

	2019				2020	
	Q1	Q2	Q3	Q4	Q1	Q2
Horizontal	8,766	8,897	9,121	9,321	9,470	9,584
Growth Rate	10.7%	8.5%	8.2%	8.3%	8.0%	7.7%
Total	9,245	9,379	9,600	9,789	9,942	10,056
Growth Rate	9.9%	8.1%	7.6%	7.7%	7.5%	7.2%

Note: Growth rates are year-over-year. Vertical wells are not shown separately, as they account for less than one percent of production.

Figure 3 shows the year-over-year growth in horizontal producing wells over the last 16 quarters. Growth in producing wells over the last four quarters has remained near levels in early 2017, when quarterly production growth was at its lowest level on record. Without a significant uptick in new wells spud, producing well growth will likely continue to decelerate.

Figure 3 - Producing Well Growth



County and State Comparison

Table 3 shows county-level production volume and producing well counts through the second quarter for 2019 and 2020. Ranked in order of production, the table shows (1) the top five counties, (2) the next five counties combined into one group and (3) the remaining counties as another group. The top five counties accounted for 73.9 percent of production and 67.1 percent of producing wells statewide. The top two producing counties, Susquehanna and Washington, recorded year-over-year declines in year-to-date production. Bradford, Greene and Lycoming Counties have accounted for nearly 60 percent of statewide production growth over the prior year.

Table 3: County Production Comparison

		Production Volume				Producing Wells			
		Year-to-date		2020 Metrics		Year-to-date		2020 Metrics	
Rank	County	2019	2020	Share	Growth	2019	2020	Share	Growth
1	Susquehanna	822	806	23.1%	-1.9%	1,401	1,545	16.0%	10.3%
2	Washington	586	571	16.4%	-2.6%	1,539	1,640	17.0%	6.6%
3	Greene	493	529	15.2%	7.3%	1,058	1,141	11.8%	7.8%
4	Bradford	429	452	13.0%	5.3%	1,235	1,291	13.4%	4.5%
5	Lycoming	180	215	6.2%	19.8%	814	863	8.9%	6.0%
6-10	Next 5 Counties	572	630	18.1%	10.2%	1,645	1,762	18.2%	7.1%
	All Other	240	279	8.0%	16.3%	1,301	1,415	14.7%	8.8%

Note: Data through the second quarter. Horizontal wells only. Production in billion cubic feet. Next 5 Counties includes Tioga, Wyoming, Butler, Allegheny and Sullivan Counties.

Table 4 provides a state comparison of gross natural gas production from all well types. Ranked in order of production, the table shows (1) the top five states, (2) the next five states combined into one group and (3) the remaining states combined into one group. Through May 2020, all states in the top five except for Alaska recorded a deceleration in production growth or a decline in production volume compared to 2019.

Table 4: State Production Comparison

		Production Volume			Annual Growth Rate		
Rank	State	CY 2018	CY 2019	CY 2020	CY 2018	CY 2019	CY 2020
1	Texas	8,814	10,223	4,386	10.2%	16.0%	8.4%
2	Pennsylvania	6,207	6,962	3,002	13.6%	12.2%	5.9%
3	Alaska	3,255	3,250	1,456	0.1%	-0.1%	1.2%
4	Oklahoma	2,946	3,175	1,217	17.2%	7.8%	-6.5%
5	Louisiana	2,830	3,156	1,336	31.8%	11.5%	6.9%
6-10	Next 5 States	9,260	10,166	4,303	13.0%	9.8%	6.2%
	All Other	3,697	3,773	1,480	-2.6%	2.0%	-5.9%

Source: U.S. Energy Information Administration. Production does not directly correspond to DEP data. CY 2020 production and growth rate is through May. Includes all production sources and well types. Production in billion cubic feet. Next 5 States includes Ohio, Colorado, West Virginia, Wyoming and New Mexico.

Price Trends

Table 5 displays recent trends in natural gas spot prices at the Henry Hub and two major Pennsylvania hubs. These data show that both prices have been declining dramatically over the last four quarters. From the first quarter of 2019 to the second quarter of 2020, the Pennsylvania average price declined by 49.7 percent. This significant decline in prices is the result of sustained production growth (supply), from already record levels, outstripping demand.

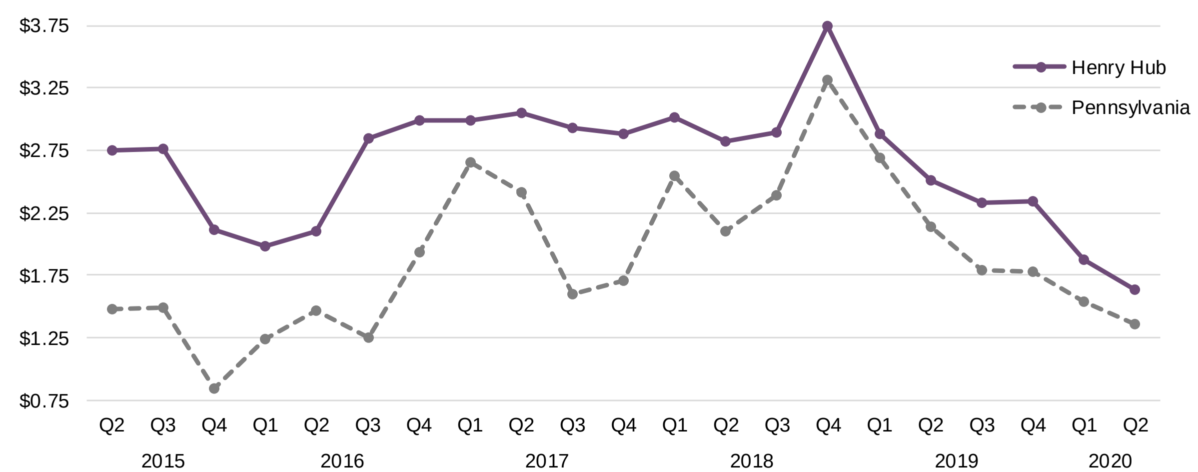
Table 5: Regional Spot Price Trends

	2019				2020	
	Q1	Q2	Q3	Q4	Q1	Q2
Henry Hub	$2.88	$2.51	$2.33	$2.34	$1.88	$1.65
Growth Rate	-4.3%	-10.9%	-19.6%	-37.5%	-34.9%	-34.3%
PA Average	$2.70	$2.14	$1.80	$1.78	$1.54	$1.36
Growth Rate	5.8%	1.9%	-24.7%	-46.5%	-42.9%	-36.6%

Source: Bentek Energy. The PA Average is a weighted average of the Dominion South and Transco Leidy trading hubs. The Henry Hub is located in Louisiana. Growth rates are year-over-year.

Figure 4 displays trends in the same prices over the last 20 quarters. The figure shows the precipitous decline in both national and regional prices since late 2018. Prior to 2020, both prices were declining due to oversupply, as growing production outpaced record levels of demand for natural gas. For 2020, the EIA projects that national demand for natural gas will decline for the first time since 2009, largely due to the impact of the COVID-19 pandemic and related mitigation efforts.

Figure 4 - Regional Spot Price Trends



Staff Acknowledgements

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