Natural Gas Royalties Increase in 2017

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Natural gas royalties are an important source of income for many Pennsylvania landowners. Firms pay royalties based on the revenues received from the sale of natural gas extracted from wells located on a landowner's property. Pennsylvania law mandates a minimum royalty rate of 12.5 percent of the market value of the sale.[1] Some contracts allow firms to deduct post-production costs from gross revenues prior to the application of the relevant royalty rate. Post-production costs reflect various expenses incurred to bring the gas from the wellhead to the point of sale and include costs related to gathering, processing and transporting gas to markets.

Firms do not publish the dollar amount of royalties paid to Pennsylvania landowners, and those amounts must be inferred from other data sources. Royalty income is taxable and recipients must report those amounts on the Pennsylvania personal income tax return (Form PA-40, line 6). Unfortunately, royalty income is not reported separately on the tax return, but is combined with rental, patent and copyright income. However, given (1) the relatively recent surge in natural gas drilling (and by extension royalty payments) and (2) the high concentration of natural gas production in a small number of rural counties, it is possible to use tax data trends for those counties to derive a rough estimate of total natural gas royalties paid over time. A technical explanation of the methodology used to estimate those payments can be found at the end of this brief.

The table on the next page displays estimates of royalty payments for the top eight producing counties and the rest of the state for the most recent eight-year period that data are available.[2] The analysis estimates that natural gas royalty payments totaled $905 million in tax year 2010, peaked at $1.62 billion in tax year 2014, and then declined to $1.15 billion in tax year 2017.[3] The collapse of natural gas prices in 2015 and 2016 motivated the large reduction in estimated royalty payments, although statewide production increased in both years. For 2017, natural gas prices recovered and estimated royalty payments did too.

The estimates from the table represent a lower bound for natural gas royalty payments for two reasons:

- There may be cases where leaseholders reside and file returns from counties (or states) other than the land under contract and do not reside in one of the top eight producing counties shown in the table. This outcome would cause the methodology used to understate royalty payments.
- The estimates only reflect payments to individuals who file a personal income tax return and report such income on line 6 of the tax return. However, some payments could flow to firms that report royalty income as net profits (line 4) on the personal income tax return.

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[1] Research finds that the average royalty rate in Pennsylvania is 13.5 percent. See Brown et al. "Capturing Rents from Natural Resource Abundance: Private Royalties from U.S. Onshore Oil and Gas Production," Federal Reserve Bank of Kansas City RWP 15-04 (July 2016).

[2] Top eight producing counties for 2017.

[3] It should be noted that these estimates include any "signing bonus" payments that leaseholders may receive prior to the drilling and extraction of natural gas.

The potential magnitude of the understatement cannot be estimated based on available data. As discussed in the methodology, the analysis does include adjustments for non-compliance and counties that have relatively small amounts of production.

For tax year 2018, the analysis projects a further increase in royalties paid to Pennsylvania landowners. Compared to 2017, the average spot price at major Pennsylvania hubs increased by more than one-third, while total output increased by 14 percent. If those gains were passed through to landowners, then royalty payments would increase by roughly 50 to 55 percent. The projection assumes that extraction firms deduct a similar amount of post-production costs in 2018 as deducted in 2017.

Estimated Pennsylvania Natural Gas Royalty Income

	2010	2011	2012	2013	2014	2015	2016	2017	2018
Susquehanna	$134	$80	$105	$202	$272	$162	$119	$218	n.a.
Washington	176	227	182	245	427	258	181	297	n.a.
Bradford	161	161	123	182	230	107	63	110	n.a.
Greene	59	58	55	112	143	101	90	137	n.a.
Lycoming	47	64	62	72	78	40	18	34	n.a.
Wyoming	58	28	32	68	108	45	29	66	n.a.
Tioga	95	70	48	50	58	75	30	48	n.a.
Butler	85	106	220	116	138	102	50	127	n.a.
All Other Counties	90	88	92	116	162	99	65	115	n.a.
TOTAL	**905**	**883**	**919**	**1,163**	**1,616**	**988**	**645**	**1,152**	**$1,785**
Growth Rate		-2.4%	4.0%	26.6%	38.9%	-38.9%	-34.7%	78.5%	55.0%

Note: Figures in dollar millions. Estimates include a 7 percent adjustment for non-compliance. Assumes All Other Counties comprise roughly 10 percent of total production and they would report 10 percent of total royalty income. Estimate for 2018 based on production gains and growth in average hub spot prices. Counties ranked by production in 2017.

Source: Pennsylvania Department of Revenue, Personal Income Tax Statistics, various years. Computations by the IFO.

Methodology Used to Estimate Royalty Payments

Royalty income is not reported separately on the Pennsylvania income tax return, but is combined with rental, patent and copyright income on line 6 of the PA-40 return. In order to isolate natural gas royalty payments reported on the tax return, the IFO used the following methodology:[4]

- Identify the top producing counties that comprise the great majority of natural gas production. For this analysis, the following eight counties were used: Susquehanna, Washington, Bradford, Greene, Lycoming, Wyoming, Tioga and Butler. For 2017, those counties comprised nearly 90 percent of total state production.[5]

[4] The analysis excludes royalties paid to the Commonwealth for production on state lands. For CY 2017, the Department of Conservation and Natural Resources collected $73.4 million in royalties and the Game Commission collected $25.3 million in royalties.

[5] Data are from various IFO natural gas production reports that are posted to the office website: www.ifo.state.pa.us.

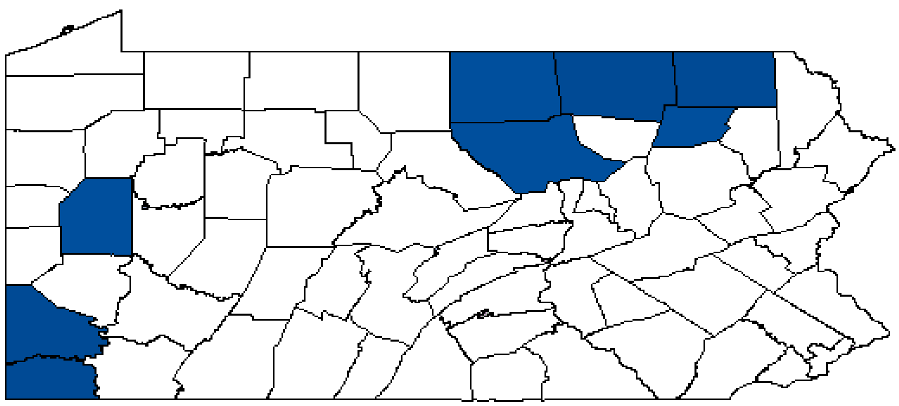
- Identify the most recent year in which little to no natural gas royalty income was received in those eight counties. For this analysis, tax year 2006 was used and the analysis assumes that 10 percent of the relatively small amounts reported in line 6 was attributable to natural gas royalty payments.[6]

- After removing estimated natural gas royalty income in 2006, assume a counterfactual growth rate if natural gas royalties had not been paid in those eight counties from 2006 to 2016. Based on an analysis of comparable or "control" rural counties, a counterfactual growth rate of 4 percent per annum was used for other income (rentals, patents and copyrights) reported on line 6. For 2017, the analysis assumed no growth in those income sources due to income shifted out of tax year 2017 due to the federal Tax Cuts and Jobs Act. Data for other counties support that assumption.

- Compute the differential between the actual and counterfactual scenarios. The difference is assumed to be natural gas royalty payments in those counties. Those payments explain the very strong growth rates observed for amounts reported on line 6.

- Apply two factors that increase the estimate. The first factor is a 10 percent gross-up to convert the eight counties into a statewide total. The second factor is a 7 percent gross-up to account for non-compliance and misreporting.[7]

Top Eight Counties in Natural Gas Production



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[6] The analysis is not sensitive to this assumption. The percentage could be 0 or 25 percent and it would only change the total royalty dollar estimate by 2 to 3 percent for most years. For 2006, the U.S. Energy Information Administration estimates that total marketed natural gas production in Pennsylvania was 176 billion cubic feet (bcf). For 2017, the estimate is 5,464 bcf, a more than 30-fold increase.

[7] Firms must report royalty payments on IRS Form 1099-MISC. Those forms are used by the IRS and Pennsylvania Department of Revenue to ensure compliance with the tax code. Recent IRS tax gap studies find that the net misreporting percentage (i.e., the share of income that should have been reported but was not) for income subject to "substantial information reporting" (such as a 1099-MISC) averaged 7 percent for tax years 2008 to 2010. See "Federal Tax Compliance Research: Tax Gap Estimates for Tax Years 2008-2010," Internal Revenue Service (May 2016).