

SOUTHWESTERN ENERGY CO

Form 10-K

February 23, 2017

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UNITED STATES  
SECURITIES AND EXCHANGE COMMISSION  
Washington, D.C. 20549

Form 10-K

Annual Report pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934  
For the fiscal year ended December 31, 2016  
Commission file number 001-08246

Southwestern Energy Company  
(Exact name of registrant as specified in its charter)

Delaware (State or other jurisdiction of incorporation or organization)	71-0205415 (I.R.S. Employer Identification No.)
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10000 Energy Drive,

Spring, Texas (Address of principal executive offices)	77389 (Zip Code)
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(832) 796-1000  
(Registrant's telephone number, including area code)

Securities registered pursuant to Section 12(b) of the Act:

Title of each class	Name of each exchange on which registered
Common Stock, Par Value \$0.01	New York Stock Exchange
Depository Shares, each representing a 1/20th ownership interest in a share of 6.25% Series B Mandatory Convertible Preferred Stock	New York Stock Exchange

Securities registered pursuant to Section 12(g) of the Act: None

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes  No

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act. Yes  No

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or

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for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes No

Indicate by check mark whether the registrant has submitted electronically and posted on its corporate Web site, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit and post such files). Yes No

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K (§229.405 of this chapter) is not contained herein, and will not be contained, to the best of registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K.

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, or a smaller reporting company. See the definitions of "large accelerated filer," "accelerated filer" and "smaller reporting company" in Rule 12b-2 of the Exchange Act. Large accelerated filer Accelerated filer Non-accelerated filer Smaller reporting company  
Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Act). Yes No

The aggregate market value of the voting stock held by non-affiliates of the registrant was \$4,913,492,123 based on the New York Stock Exchange – Composite Transactions closing price on June 30, 2016 of \$12.58. For purposes of this calculation, the registrant has assumed that its directors and executive officers are affiliates.

As of February 21, 2017, the number of outstanding shares of the registrant's Common Stock, par value \$0.01, was 497,953,968

Document Incorporated by Reference

Portions of the registrant's definitive proxy statement to be filed with respect to the annual meeting of stockholders to be held on or about May 23, 2017 are incorporated by reference into Part III of this Form 10-K.

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ANNUAL REPORT ON FORM 10-K  
For Fiscal Year Ended December 31, 2016

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This Annual Report on Form 10-K includes certain statements that may be deemed to be “forward-looking” within the meaning of Section 27A of the Securities Act of 1933, or the Securities Act, and Section 21E of the Securities Exchange Act of 1934, or the Exchange Act. We refer you to “Risk Factors” in Item 1A of Part I and to “Management’s Discussion and Analysis of Financial Condition and Results of Operations – Cautionary Statement about Forward-Looking Statements” in Item 7 of Part II of this Annual Report for a discussion of factors that could cause actual results to differ materially from any such forward-looking statements. The electronic version of this Annual Report on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K and amendments to those forms filed or furnished pursuant to Section 13(a) or 15(d) of the Exchange Act are available free of charge as soon as reasonably practicable after they are filed with the Securities and Exchange Commission, or SEC, on our website at [www.swn.com](http://www.swn.com). Our corporate governance guidelines and the charters of the Audit, the Compensation, the Health, Safety, Environment and Corporate Responsibility and the Nominating and Governance Committees of our Board of Directors are available on our website, and, upon request, in print free of charge to any stockholder. Information on our website is not incorporated into this report.

We file periodic reports, current reports and proxy statements with the SEC electronically. The SEC maintains an internet website that contains reports, proxy and information statements, and other information regarding issuers that file electronically with the SEC. The address of the SEC’s website is [www.sec.gov](http://www.sec.gov). The public may also read and copy any materials we file with the SEC at the SEC’s Public Reference Room at 100 F Street N.E., Washington, D.C. 20549. The public may obtain information about the operation of the Public Reference Room by calling the SEC at 1-800-SEC-0330.

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ITEM 1. BUSINESS

Southwestern Energy Company (including its subsidiaries, collectively, “we”, “Southwestern” or the “Company”) is an independent natural gas and oil company engaged in development and production activities, including related natural gas gathering and marketing. Southwestern is a holding company whose assets consist of direct and indirect ownership interests in, and whose business is conducted substantially through, its subsidiaries. Currently we operate only in the United States. Southwestern’s common and preferred stock are listed and traded on the NYSE under the ticker symbols “SWN” and “SWNC”, respectively.

Southwestern, which was incorporated in Arkansas in 1929 and reincorporated in Delaware in 2006, has its executive offices located at 10000 Energy Drive, Spring, Texas 77389, and can be reached by phone at 832-796-1000. The Company also maintains offices in Conway, Arkansas; Tunkhannock, Pennsylvania; and Jane Lew, West Virginia.

Our Business Strategy

We aim to deliver sustainable and assured industry-leading returns through excellence in exploration and production and midstream performance from our extensive resource base and targeted expansion of our activities and assets along the hydrocarbon value chain. Our Company’s formula embodies our corporate philosophy and guides how we operate our business:

Our formula, “The Right People doing the Right Things, wisely investing the cash flow from our underlying Assets will create Value+,” also guides our business strategy. We always strive to attract and retain strong talent, to work safely and act ethically with unwavering vigilance for the environment and the communities in which we operate, and to creatively apply technical and financial skills, which we believe will grow long-term value. The arrow in our formula is not a straight line: we acknowledge that factors may adversely affect quarter-by-quarter results, but the path over time points to value creation.

In applying these core principles, we concentrate on:

- Financial Strength. We are committed to rigorously managing our balance sheet and risks. We budget to invest only from our net cash flow (along with the remaining portion of proceeds from our equity issuance in 2016 that we previously earmarked for capital investment), protect our projected cash flows through hedging, and continue to ensure strong liquidity while de-levering the Company.
- Increasing Margins. We apply strong technical, operational, commercial and marketing skills to reduce cost, improve the productivity of our wells and pursue commercial arrangements that extract greater value from them. We believe our demonstrated ability to improve margins, especially by leveraging the scale of our large assets,

gives us a competitive advantage as we move into the future.

- **Dynamic Management of Assets Throughout Life Cycle.** We own large-scale, long-life assets in various phases of development. In early stages, we ramp up development through technical, operational and commercial skills, and as they grow we look for ways to maximize their value, through efficient operating practices along with commercial and marketing expertise.
- **Deepening Our Inventory.** We continue to expand the inventory of properties that we can develop profitably by converting our extensive resources into proved reserves, targeting additions whose productivity largely has been demonstrated and improving efficiencies in production.
- **The Hydrocarbon Value Chain.** We often expand our activities vertically when we believe this will enhance our margins or otherwise provide us competitive advantages. For example, the Company developed and operates the largest gathering system in the Fayetteville Shale area. We operate drilling rigs and own a sand mine that provides a low cost proppant in hydraulic fracturing. These activities help protect our margin, minimize the risk of unavailability of these resources from third parties, diversify our cash flows and capture additional value.
  - **The Next Chapter of Unconventionals.** Our company grew dramatically in the 2000s by harnessing and enhancing the newfound combination of hydraulic fracturing and horizontal drilling technologies. Our people constantly search for the next revolutionary technology and other operational advancements to capture greater value in unconventional hydrocarbon resource development. These developments – whether single, step-changing technologies or a combination of several incremental ones – can reduce finding and development costs and thus increase our margins.

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- Innovative Environmental Solutions and Policy Formation. Our Company is a leader in identifying and implementing innovative solutions to unconventional hydrocarbon development to minimize the environmental and community impacts of our activities. We work extensively with governmental, non-governmental and industry stakeholders to develop responsible and cost-effective programs. We demonstrate that a company can operate responsibly and profitably, putting us in a better position to comply with new regulations as they evolve.

During 2016, we executed on our business strategy by:

- Investing within our cash flow plus a portion of the proceeds from our successful equity offering earmarked for this purpose, with the remainder to debt reduction
- Investing in only those projects that meet our rigorous economic hurdles at strip pricing
- Rearranging and extending our bank credit facilities and successfully tendering for approximately \$700 million of near-term senior notes, which enhanced and stabilized our liquidity and eliminated the overhang of near-term debt maturities
- Generating cash flow from operations of about \$500 million, which reflects the impact of an aggressive assault on costs and improved drilling and completion performance
- Intelligently managing our portfolio, including disposing of acreage we were not planning to develop until well into the next decade and using the over \$400 million of proceeds to reduce debt

Our predominant operations, which we refer to as Exploration and Production (“E&P”), are focused on the finding and development of natural gas, oil and natural gas liquid (“NGL”) reserves. We are also focused on creating and capturing additional value through our natural gas gathering and marketing segment, which we refer to as Midstream Services. We conduct substantially all of our business through subsidiaries.

Exploration and Production – Our largest business is the exploration for and production of natural gas, oil and NGLs, with our current operations principally focused within the United States on development of unconventional natural gas reservoirs located in Pennsylvania, West Virginia and Arkansas. Our operations in northeast Pennsylvania are primarily focused on the unconventional natural gas reservoir known as the Marcellus Shale (herein referred to as “Northeast Appalachia”), our operations in West Virginia are also focused on the Marcellus Shale, the Utica and the Upper Devonian unconventional natural gas, oil and NGL reservoirs (herein referred to as “Southwest Appalachia”) and our operations in Arkansas are primarily focused on an unconventional natural gas reservoir known as the Fayetteville Shale. Collectively, our properties located in Pennsylvania and West Virginia are herein referred to as the “Appalachian Basin.” We have smaller holdings in Colorado and Louisiana along with other areas in which we are testing potential new resources, including New Brunswick, Canada whose development is subject to a moratorium. We also have drilling rigs located in Pennsylvania, West Virginia and Arkansas and provide oilfield products and services, principally serving our production operations.

Midstream Services – Through our affiliated midstream subsidiaries, we engage in natural gas gathering activities in Arkansas and Louisiana. These activities primarily support our E&P operations and generate revenue from the



gathering of natural gas. Our marketing activities capture opportunities that arise through the marketing and transportation of the natural gas, oil and NGLs produced in our E&P operations.

Historically, the vast majority of our cash flow from operations has been derived from our E&P business. In 2016 and 2015, depressed commodity prices significantly decreased our E&P results. In 2016, our E&P segment generated cash flow from operations of \$297 million, which constituted 60% of our total cash flow from operations. This compares to E&P-generated cash flow from operations of \$1.1 billion and \$2.1 billion in 2015 and 2014, respectively. Our E&P segment constituted 71% and 89% of our total cash flow from operations in 2015 and 2014, respectively. The remainder of our consolidated cash flow from operations in each of these years was primarily generated from our Midstream Services segment.

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Exploration and Production

Overview

Operations in our E&P segment are primarily in the Appalachian Basin and Arkansas. We also are conducting activities in other basins targeting various formations as potential new resources.

Our E&P segment recorded operating losses of \$2.4 billion and \$7.1 billion in 2016 and 2015, respectively, and operating income of \$1.0 billion in 2014. The operating losses in 2016 and 2015 were primarily the result of \$2.3 billion, or \$1.4 billion net of taxes, and \$7.0 billion, or \$4.3 billion net of taxes, respectively, of non-cash impairments of natural gas and oil properties due to decreased commodity prices. In May 2015, we divested of our East Texas and Arkoma properties, previously referred to as the Ark-La-Tex division.

Cash flow from operations from our E&P segment was \$297 million in 2016, compared to \$1.1 billion in 2015 and \$2.1 billion in 2014. Our cash flow from operations decreased in 2016 as the effects of lower realized natural gas prices and decreased natural gas production more than offset our reduction in operating expenses. Our cash flow from operations decreased in 2015 as lower realized natural gas prices and increased total operating costs and expenses, due to increased activity levels, more than offset the revenue impacts of higher production volumes.

Oilfield Services Vertical Integration

We provide some oilfield services that are strategic and economically beneficial for our E&P operations when our E&P activity levels and market pricing support these activities and we can do so more efficiently or cost-effectively. This vertical integration lowers our net well costs, allows us to operate efficiently and helps us to mitigate certain operational environmental risks. Among others, these services have included drilling, hydraulic fracturing and the mining of sand used as proppant for certain of our well completions in the Fayetteville Shale from a 570-acre complex in Arkansas.

We have conducted drilling operations for a majority of our operated wells. As of December 31, 2016, we had a total of five rigs drilling in Pennsylvania, West Virginia and Arkansas. In 2016, we provided drilling services for all of the wells that we operate in Northeast Appalachia, Southwest Appalachia and the Fayetteville Shale. Our drilling and

completion services, along with our sand mine servicing our operated wells in the Fayetteville Shale, were inactive during our suspension of drilling and completion activities in the first half of 2016, but resumed, in part, as these activities were reinitiated during the third quarter of 2016.

We ceased providing hydraulic fracturing services in early 2016 at the same time as we suspended drilling and completion activities. To date, we have not resumed the provision of hydraulic fracturing services ourselves and instead are utilizing third parties who are offering lower costs. This may change as industry activity resumes, should that lead to higher prices or lower dependability from third-party providers of these services.

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Our Proved Reserves

Our estimated proved natural gas, oil and NGL reserves were 5,253 Bcfe at year-end 2016, compared to 6,215 Bcfe at year-end 2015 and 10,747 Bcfe at year-end 2014. The decrease in our reserves in 2016 was primarily due to our production in 2016 and downward price revisions associated with decreased commodity prices, partially offset by upward performance revisions in Northeast Appalachia, Southwest Appalachia and the Fayetteville Shale. The significant decrease in our reserves in 2015 was primarily due to downward price revisions in our proved undeveloped reserves associated with decreased commodity prices and our production, partially offset by upward performance revisions in Northeast Appalachia and Southwest Appalachia and our successful development programs in the Northeast Appalachia, Southwest Appalachia and the Fayetteville Shale. The significant increase in our reserves in 2014 was primarily due to the acquisition of approximately 413,000 net acres in Southwest Appalachia, our successful development drilling programs in Northeast Appalachia and the Fayetteville Shale and upward performance revisions in Northeast Appalachia. Because our proved reserves are primarily natural gas, our reserve estimates and the after-tax PV-10 measure, or standardized measure of discounted future net cash flows relating to proved natural gas, oil and NGL reserve quantities, are highly dependent upon the natural gas price used in our reserve and after-tax PV-10 calculations. In order to value our estimated proved natural gas, oil and NGL reserves as of December 31, 2016, we utilized average prices from the first day of each month from the previous 12 months for Henry Hub natural gas of \$2.48 per MMBtu for natural gas, West Texas Intermediate oil of \$39.25 per barrel for oil and \$6.74 per barrel for NGLs, compared to \$2.59 per MMBtu for natural gas, \$46.79 per barrel for oil and \$6.82 per barrel for NGLs at December 31, 2015 and \$4.35 per MMBtu for natural gas, \$91.48 per barrel for oil and \$23.79 per barrel for NGLs at December 31, 2014.

Our after-tax PV-10 was \$1.7 billion at year-end 2016, \$2.4 billion at year-end 2015 and \$7.5 billion at year-end 2014. The decrease in our after-tax PV-10 value in 2016 compared to 2015 was primarily due to lower reserve levels. The decrease in 2015 compared to 2014 was primarily due to comparatively lower average commodity prices. The difference in after-tax PV-10 and pre-tax PV-10 (a non-GAAP measure which is reconciled in the 2016 Proved Reserves by Category and Summary Operating Data table below) is the discounted value of future income taxes on the estimated cash flows. Our year-end 2016 estimated proved reserves had a present value of estimated future net cash flows before income tax, or pre-tax PV-10, of \$1.7 billion, compared to \$2.4 billion at year-end 2015 and \$9.5 billion at year-end 2014. Our year-end 2016 and 2015 after-tax PV-10 computations do not have future income taxes because our tax basis in the associated oil and gas properties exceeded expected pre-tax cash inflows, and thus do not differ from the pre-tax values.

We believe that the pre-tax PV-10 value of the estimated cash flows related to our estimated proved reserves is a useful supplemental disclosure to the after-tax PV-10 value. Pre-tax PV-10 is based on prices, costs and discount factors that are comparable from company to company, while the after-tax PV-10 is dependent on the unique tax situation of each individual company. We understand that securities analysts use pre-tax PV-10 as one measure of the value of a company's current proved reserves and to compare relative values among peer companies without regard to income taxes. We refer you to "Supplemental Oil and Gas Disclosures" in Item 8 of Part II of this Annual Report for a

discussion of our standardized measure of discounted future cash flows related to our proved natural gas, oil and NGL reserves, to the risk factor “Our proved natural gas, oil and NGL reserves are estimates. Any material inaccuracies in our reserve estimates or underlying assumptions could cause the quantities and net present value of our reserves to be overstated or understated” in Item 1A of Part I of this Annual Report, and to “Management’s Discussion and Analysis of Financial Condition and Results of Operations — Cautionary Statement about Forward-Looking Statements” in Item 7 of Part II of this Annual Report for a discussion of the risks inherent in utilization of standardized measures and estimated reserve data.

At year-end 2016, 93% of our estimated proved reserves were natural gas and 99% of total estimated proved reserves were classified as proved developed, compared to 95% and 93%, respectively, in 2015 and 91% and 55%, respectively in 2014. We operate, or if operations have not commenced, plan to operate, approximately 98% of our reserves, based on the pre-tax PV-10 value of our proved developed producing reserves, and our reserve life index approximated 6.0 years at year-end 2016. In 2016, natural gas sales accounted for 89% of total operating revenues, compared to 93% and nearly 100% in 2015 and 2014, respectively.

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The following table provides an overall and categorical summary of our natural gas, oil and NGL reserves, as of fiscal year-end 2016 based on average fiscal year prices, and our well count, net acreage and PV-10 as of December 31, 2016, and sets forth 2016 annual information related to production and capital investments for each of our operating areas:

## 2016 PROVED RESERVES BY CATEGORY AND SUMMARY OPERATING DATA

	Appalachia		Fayetteville Shale	Other (1)	Total
	Northeast	Southwest			
Estimated Proved Reserves:					
Natural Gas (Bcf):					
Developed (Bcf)	1,540	293	2,954	2	4,789
Undeveloped (Bcf)	34	–	43	–	77
	1,574	293	2,997	2	4,866
Crude Oil (MMBbls):					
Developed (MMBbls)	–	10.2	–	0.3	10.5
Undeveloped (MMBbls)	–	–	–	–	–
	–	10.2	–	0.3	10.5
Natural Gas Liquids (MMBbls):					
Developed (MMBbls)	–	53.8	–	0.1	53.9
Undeveloped (MMBbls)	–	–	–	–	–
	–	53.8	–	0.1	53.9
Total Proved Reserves (Bcfe) (2):					
Developed (Bcfe)	1,540	677	2,954	5	5,176
Undeveloped (Bcfe)	34	–	43	–	77
	1,574	677	2,997	5	5,253
Percent of Total	30%	13%	57%	0%	100%
Percent Proved Developed	98%	100%	99%	100%	99%
Percent Proved Undeveloped	2%	0%	1%	0%	1%
Production (Bcfe)	350	148	375	2	875
Capital Investments (in millions)					
(3)	\$ 204	\$ 288	\$ 86	\$ 19	\$ 597
Total Gross Producing Wells (4)	820	306	4,217	16	5,359
Total Net Producing Wells (4)	439	216	2,932	13	3,600
Total Net Acreage	245,805 (5)	321,563 (6)	918,535 (7)	3,023,386 (8)	4,509,289
Net Undeveloped Acreage	146,096 (5)	161,607 (6)	285,692 (7)	3,010,908 (8)	3,604,303

PV-10:

Pre-Tax (in millions) (9)	\$ 183	\$ 163	\$ 1,325	\$ (6)	\$ 1,665
PV of Taxes (in millions) (9)	—	—	—	—	—
After-Tax (in millions) (9)	\$ 183	\$ 163	\$ 1,325	\$ (6)	\$ 1,665
Percent of Total	11%	10%	79%	0%	100%
Percent Operated (10)	95%	100%	99%	100%	98%

(1) Other consists primarily of properties in Canada, Colorado and Louisiana.

(2) We have no reserves from synthetic gas, synthetic oil or nonrenewable natural resources intended to be upgraded into synthetic gas or oil. We used standard engineering and geoscience methods, or a combination of methodologies in determining estimates of material properties, including performance and test date analysis offset statistical analogy of performance data, volumetric evaluation, including analysis of petrophysical parameters (including porosity, net pay, fluid saturations (i.e., water, oil and gas) and permeability) in combination with estimated reservoir parameters (including reservoir temperature and pressure, formation depth and formation volume factors), geological analysis, including structure and isopach maps and seismic analysis, including review of 2-D and 3-D data to ascertain faults, closure and other factors.

(3) Total and Other capital investments excludes \$26 million related to our E&P service companies.

(4) Represents all producing wells, including wells in which we only have an overriding royalty interest, as of December 31, 2016.

(5) Assuming successful wells are not drilled to develop the acreage and leases are not extended in Northeast Appalachia, leasehold expiring over the next three years will be 63,900 net acres in 2017, 16,066 net acres in 2018 and 11,413 net acres in 2019.

(6) Assuming successful wells are not drilled to develop the acreage and leases are not extended in Southwest Appalachia, leasehold expiring over the next three years will be 39,429 net acres in 2017, 12,267 net acres in 2018 and 10,824 net acres in 2019. Of this acreage, 21,760 net acres in 2017, 3,767 net acres in 2018 and 8,150 net acres in 2019 can be extended for an average of 4.8 years.

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(7) Assuming successful wells are not drilled to develop the acreage and leases are not extended in the Fayetteville Shale, leasehold expiring over the next three years will be 453 net acres in 2017, 60 net acres in 2018 and 432 net acres in 2019 (excluding 158,231 net acres held on federal lands which are currently suspended by the Bureau of Land Management).

(8) Assuming successful wells are not drilled to develop the acreage and leases are not extended, our leasehold expiring over the next three years, excluding the Lower Smackover Brown Dense area, the Sand Wash Basin and New Brunswick, Canada, will be 68,556 net acres in 2017, 21,982 net acres in 2018 and 103,172 net acres in 2019. With regard to our acreage in the Lower Smackover Brown Dense, assuming successful wells are not drilled and leases are not extended, leasehold expiring over the next three years will be 50,778 net acres in 2017, 83,021 net acres in 2018 and 5,793 net acres in 2019. With regard to our acreage in the Sand Wash Basin, assuming successful wells are not drilled and leases are not extended, leasehold expiring over the next three years will be 36,527 net acres in 2017, 51,260 net acres in 2018, and 12,810 net acres in 2019. With regard to our acreage in New Brunswick, Canada, exploration licenses for 2,518,519 net acres were extended through 2021.

(9) Pre-tax PV-10 (a non-GAAP measure) is one measure of the value of a company's proved reserves that we believe is used by securities analysts to compare relative values among peer companies without regard to income taxes. The reconciling difference in pre-tax PV-10 and the after-tax PV-10, or standardized measure, is the discounted value of future income taxes on the estimated cash flows from our proved natural gas, oil and NGL reserves.

(10) Based upon pre-tax PV-10 of proved developed producing activities.

We refer you to “Supplemental Oil and Gas Disclosures” in Item 8 of Part II of this Annual Report for a more detailed discussion of our proved natural gas, oil and NGL reserves as well as our standardized measure of discounted future net cash flows related to our proved natural gas, oil and NGL reserves. We also refer you to the risk factor “Our proved natural gas, oil and NGL reserves are estimates. Any material inaccuracies in our reserve estimates or underlying assumptions could cause the quantities and net present value of our reserves to be overstated or understated” in Item 1A of Part I of this Annual Report and to “Management’s Discussion and Analysis of Financial Condition and Results of Operations — Cautionary Statement about Forward-Looking Statements” in Item 7 of Part II of this Annual Report for a discussion of the risks inherent in utilization of standardized measures and estimated reserve data.

Proved Undeveloped Reserves

Presented below is a summary of changes in our proved undeveloped reserves for 2014, 2015 and 2016:



## CHANGES IN PROVED UNDEVELOPED RESERVES (BCFE)

	Appalachia		Fayetteville	Other (1)	Total
	Northeast	Southwest	Shale		
December 31, 2013	1,075	–	1,655	7	2,737
Extensions, discoveries and other additions (2)	589	–	573	–	1,162
Total revision attributable to performance and production (3)	307	–	(130)	(6)	171
Price revisions	11	–	24	–	35
Developed	(384)	–	(406)	–	(790)
Disposition of reserves in place	–	–	–	–	–
Acquisition of reserves in place (4)	–	1,481	–	–	1,481
December 31, 2014	1,598	1,481	1,716	1	4,796
Extensions, discoveries and other additions	138	4	34	–	176
Total revision attributable to performance and production (3)	513	158	62	–	733
Price revisions	(1,447)	(1,413)	(1,357)	–	(4,217)
Developed	(488)	(226)	(330)	–	(1,044)
Disposition of reserves in place	–	–	–	(1)	(1)
Acquisition of reserves in place	–	–	–	–	–
December 31, 2015	314	4	125	–	443
Extensions, discoveries and other additions	–	–	25	–	25
Total revision attributable to performance and production (3)	204	–	(1)	–	203
Price revisions	(303)	(4)	(67)	–	(374)
Developed	(181)	–	(39)	–	(220)
Disposition of reserves in place	–	–	–	–	–
Acquisition of reserves in place	–	–	–	–	–
December 31, 2016	34	–	43	–	77

- (1) Other includes properties principally in Colorado and Louisiana along with Ark-La-Tex properties divested in May 2015.
- (2) Primarily associated with the undeveloped locations that were added throughout the year in 2014 due to our successful drilling program.
- (3) Primarily due to changes associated with the analysis of updated data collected in the year and decreases related to current year production.
- (4) Our acquisition of reserves in place is attributable to the purchase of undeveloped locations in West Virginia and southwest Pennsylvania.

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As of December 31, 2016, we had 77 Bcfe of proved undeveloped reserves, all of which we expect will be developed within five years of the initial disclosure as the starting reference date. During 2016, we invested \$103 million in connection with converting 220 Bcfe, or 50%, of our proved undeveloped reserves as of December 31, 2015 into proved developed reserves and added 25 Bcfe of proved undeveloped reserve additions in the Fayetteville Shale. As a result of the commodity price environment in 2016, we had downward price revisions of 374 Bcfe which were slightly offset by a 203 Bcfe increase due to performance revisions. As of December 31, 2015, we had 443 Bcfe of proved undeveloped reserves. During 2015, we invested \$869 million in connection with converting 1,044 Bcfe, or 22%, of our proved undeveloped reserves as of December 31, 2014 into proved developed reserves and added 176 Bcfe of proved undeveloped reserve additions in the Appalachian Basin and the Fayetteville Shale. As a result of the depressed commodity price environment in 2015, we had downward price revisions of 4,217 Bcfe which were slightly offset by a 733 Bcfe increase due to performance revisions. As of December 31, 2014, we had 4,796 Bcfe of proved undeveloped reserves. During 2014, we invested \$767 million in connection with converting 790 Bcfe, or 29%, of our proved undeveloped reserves as of December 31, 2013 into proved developed reserves and added 2,643 Bcfe of proved undeveloped reserve additions in the Appalachian Basin and the Fayetteville Shale.

Our December 31, 2016 proved reserves include 77 Bcfe of proved undeveloped reserves from 15 locations that have a positive present value on an undiscounted basis in compliance with proved reserve requirements but do not have a positive present value when discounted at 10%. These properties have a negative present value of \$11 million when discounted at 10%. We have made a final investment decision and are committed to developing these reserves within five years from the date of initial booking.

We expect that the development costs for our proved undeveloped reserves of 77 Bcfe as of December 31, 2016 will require us to invest an additional \$42 million for those reserves to be brought to production. Our ability to make the necessary investments to generate these cash inflows is subject to factors that may be beyond our control. The decreased commodity price environment has resulted, and could continue to result, in certain reserves no longer being economic to produce, leading to both lower proved reserves and cash flows. We refer you to the risk factors “Natural gas, oil and natural gas liquids prices greatly affect our business, including our revenues, profits, liquidity, growth, ability to repay our debt and the value of our assets” and “Significant capital expenditures are required to replace our reserves and conduct our business” in Item 1A of Part I of this Annual Report and to “Management’s Discussion and Analysis of Financial Condition and Results of Operations – Cautionary Statement about Forward-Looking Statements” in Item 7 of Part II of this Annual Report for a more detailed discussion of these factors and other risks.

Our Reserve Replacement

Since 2005, the substantial majority of our reserve additions have been generated from our Fayetteville Shale division. However, over the past several years, Northeast Appalachia has also contributed to an increasing amount of our reserve additions as a result of increased development activity, totaling 81 Bcf, 420 Bcf and 835 Bcf in 2016, 2015 and 2014, respectively. Additionally, we added 157 Bcfe and 123 Bcfe of reserves in 2016 and 2015, respectively, as a result of our drilling program in Southwest Appalachia, which was acquired in December 2014. We expect our drilling programs in Northeast Appalachia, Southwest Appalachia and the Fayetteville Shale to continue to be the primary source of our reserve additions in the future; however, our ability to add reserves depends upon many factors that are beyond our control. We refer you to the risk factors “Significant capital expenditures are required to replace our reserves and conduct our business” and “If we are not able to replace reserves, we may not be able to grow or sustain production.” in Item 1A of Part I of this Annual Report and to “Management’s Discussion and Analysis of Financial Condition and Results of Operations — Cautionary Statement about Forward-Looking Statements” in Item 7 of Part II of this Annual Report for a more detailed discussion of these factors and other risks.

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## Our Operations

## Northeast Appalachia

We began leasing acreage in northeast Pennsylvania in 2007 in an effort to participate in the emerging Marcellus Shale. As of December 31, 2016, we had approximately 245,805 net acres in Northeast Appalachia and had spud or acquired 568 operated wells, 447 of which were on production and 536 of which are horizontal wells. Northeast Appalachia represents 40% of our total net production and 30% of our total reserves as of December 31, 2016. Below is a summary of Northeast Appalachia's operating results for the last three years:

	For the years ended December 31,			
	2016	2015	2014	
Acreage				
Net undeveloped acres	146,096 (1)	174,826	205,491	
Net developed acres	99,709	95,509	60,582	
Total net acres	245,805	270,335	266,073	
Net Production (Bcf)	350	360	254	
Reserves				
Reserves (Bcf)	1,574	2,319	3,192	
Locations:				
Proved developed	820	767	524	
Proved developed non-producing	39	23	13	
Proved undeveloped	2	36	200	
Total locations	861	826	737	
Gross Operated Well Count Summary				
Spud or acquired	32	177	(2) 106	(3)
Completed	33	92	104	
Wells to sales	24	100	88	

## Capital Investments (in millions)