MERCER CAPITAL

BUSINESS VALUATION & FINANCIAL ADVISORY SERVICES

VALUE FOCUS

Exploration & Production

Fourth Quarter 2017 // Region Focus: Marcellus & Utica

Executive Summary

Oil prices closed the year reaching $60 per barrel, WTI futures prices returned to backwardation, and oil price volatility was relatively calm as the price stayed within an $18 band all year ($42 – $60). Natural gas, on the other hand, continued its woes of declining prices, transportation constraints, and oversupply. Hope remains that increased natural gas exports will change the narrative, but that is still undetermined. For the oil industry, a repeat of 2017 would be a welcomed event, making the theme for the year ahead – “Steady as she goes.”

2017

Q1: Eagle Ford

Q2: Permian Basin

Q3: Bakken Shale

Q4: Marcellus and Utica

MERCER CAPITAL

Oil and Gas Industry Services

Mercer Capital provides business valuation and financial advisory services to companies in the energy industry.

Services Provided

- Valuation of energy companies
- Transaction advisory for acquisitions and divestitures
- Valuations for purchase accounting and impairment testing
- Fairness and solvency opinions
- Litigation support for economic damages and valuation and shareholder disputes

Industry Segments

Mercer Capital serves the following industry segments:

- Exploration & Production
- Oil Field Services
- Midstream Operations
- Alternative Energy

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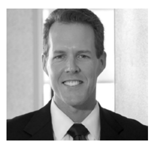

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In This Issue

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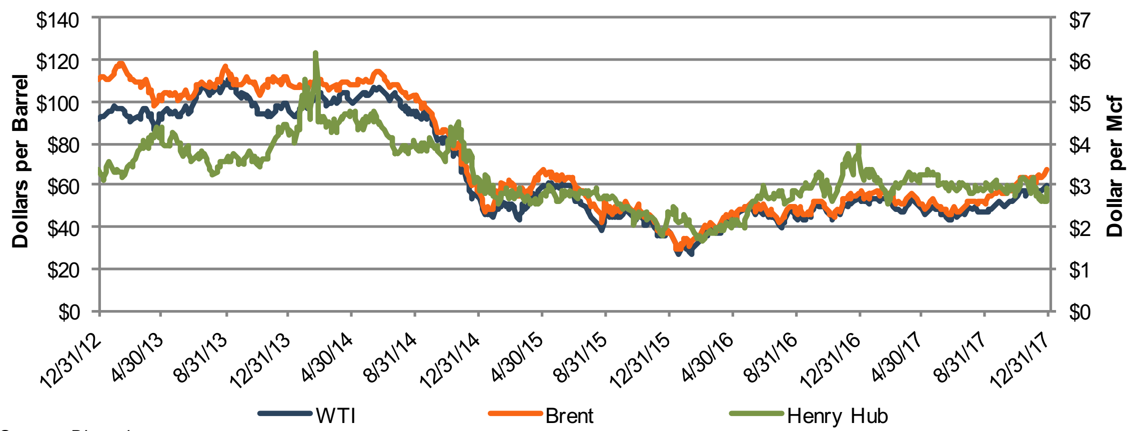
E&P Industry

Oil and Gas Commodity Prices

If bottom needs to be found before rebound can happen, 2015 and 2016 provided a solid foundation for the oil and gas price gains in 2017. This past year brought about the feeling of stability for oil prices and continued declines for natural gas. For the year, WTI increased 12% and Henry Hub natural gas decreased 20%. This is the second consecutive year-over-year increase for WTI.

Total Oil and Gas Production



Source: Bloomberg

E&P Industry

Additional Perspective from Mercer Capital's *Energy Valuation Insights* Blog

In a commodity-focused industry, commodity prices set the overall framework. With last year's oil and gas prices as the framework, here are a few posts that provide additional color to the 2017 oil and gas industry.

Are S&P Energy Stock Valuations Really Crazy Right Now?

The *Wall Street Journal* published an article discussing what the author described as "crazy" stock valuations, and in particular the inflated valuations of oil and gas stocks from the perspective of operating earnings ratios. While we certainly are believers that value is driven by future operating earnings, and that earnings in the energy sector have fallen precipitously since 2014, earnings are not the sole determinant of the market's pricing of the S&P 500 energy sector. As we reflect on this for a moment, a few additional considerations come to mind that may explain these "crazy" valuations more fully. **Read More >**

Are Oil and Gas Bankruptcies a Thing of the Past?

The worst of bankruptcies are over. Since the start of the oil downturn, more than 120 upstream and oilfield service companies declared bankruptcy. However, the decision to file for bankruptcy did not always signal the demise of the business. Now more prepared, many E&P companies who reorganized are looking to grow. **Read More >**

Oil and Gas Investors Note Move Away From Contango

The movement in the future spread away from a contango environment and toward backwardation is positive from a supply and demand perspective. Expectations are a backwardation environment will move crude oil prices higher. However, the exact cause of this change is unknown. While it is good news for the industry, company specific risk and investors' fickle attitudes create volatile equity markets. **Read More >**

WTI Futures and Inventories

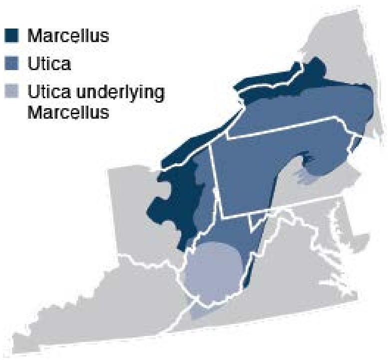
U.S. oil inventories declined as oil exports surged. In this post, we address why the shift in oil futures from contango pricing to backwardation is a bearish sign for those in crude oil storage. **Read More >**

Current Regulatory Environment Affecting the Oil and Gas Industry

As business valuation experts, we have to consider the outlook for the economy, industry, and business in every valuation; therefore, we pay attention to the oil and gas regulatory environment to assess what it means for our clients. Given the new administration, there is much to consider. **Read More >**

Appalachian Basin

Production

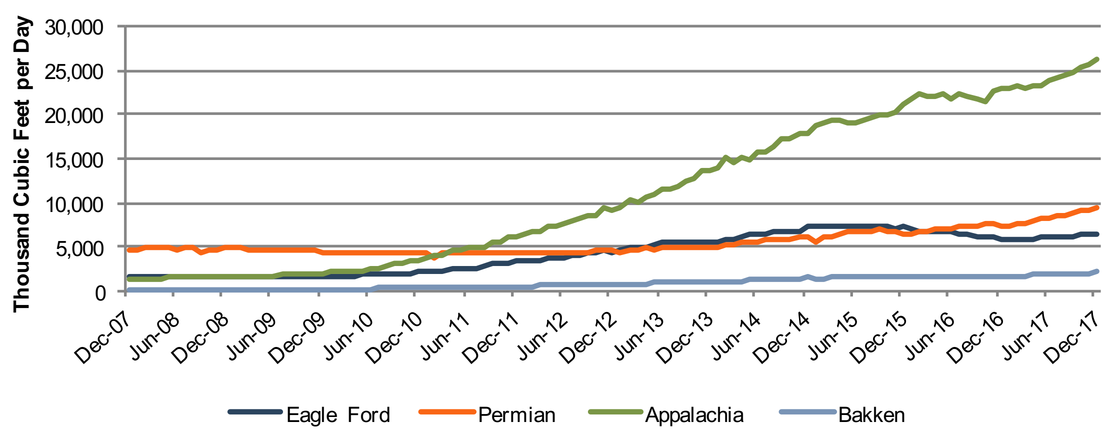


The economics of oil and gas production vary by region. Mercer Capital focuses on trends in the Eagle Ford, Permian, Bakken, and Marcellus and Utica plays. The cost of producing oil and gas depends on the geological makeup of the reserve, depth of reserve, and cost to transport the raw crude to market. We can observe different costs in different regions depending on these factors. This quarter we take a closer look at the Marcellus and Utica.

The Marcellus formation and the underlying Utica are two large shale layers in the Appalachian basin. The Utica is the larger and denser of the two layers and rests a few thousand feet below the Marcellus. Producers must use techniques such as hydraulic fracturing, horizontal drilling, and pad drilling to make these wells economically viable.

As shown in the chart below, the region produces more than 2.5x as much natural gas as any other region in the U.S. The Marcellus is already the second most prolific natural gas producer in the world after the Pars/North Dome field in Iran. Additionally, since the productivity of both plays is newly discovered, most of the recoverable gas is still in the ground. It appears as though the region will remain the center of natural gas production in the coming years.

Daily Production of Natural Gas



Source: EIA

Appalachian Basin

Production

Though production in the region multiplied, regional well-head prices fell. The amount of natural gas being produced in the Northeast far exceeded the infrastructure available to move supplies across the U.S. resulting in a supply surplus. This supply surplus caused the price of natural gas in the region to fall below the already depressed price of natural gas across the U.S.

Midstream oil and gas companies recognized the need for pipeline capacity in the Northeast, and many companies are in various stages of completion of new pipelines and/or existing pipeline reversals. These projects have already proved successful at transporting low-cost Marcellus shale gas out of the region. The **EIA reported in August 2017** that the difference between the price of Henry Hub (the national benchmark for natural gas) and the price at hubs in Appalachia has narrowed as new pipeline projects and expansions are completed.

Further, the lack of refining and cracking capacity in the region has kept prices low and hampered growth. In June 2016, Shell announced that it would invest $3-4 billion building an ethane cracker plant and petrochemical complex in Beaver County. Shell estimates that 70% of North American polyethylene consumers are within 700 miles of this facility. They began construction in late September 2017 and have signed **10-20 year supply agreements** with 10 natural gas producers in Appalachia.

According to a presentation by the United States Department of Energy (USDE) at the NARO Appalachia conference, there have been four crackers announced to date in the region, bringing a combined capacity of 4.0 million metric tons to the region.

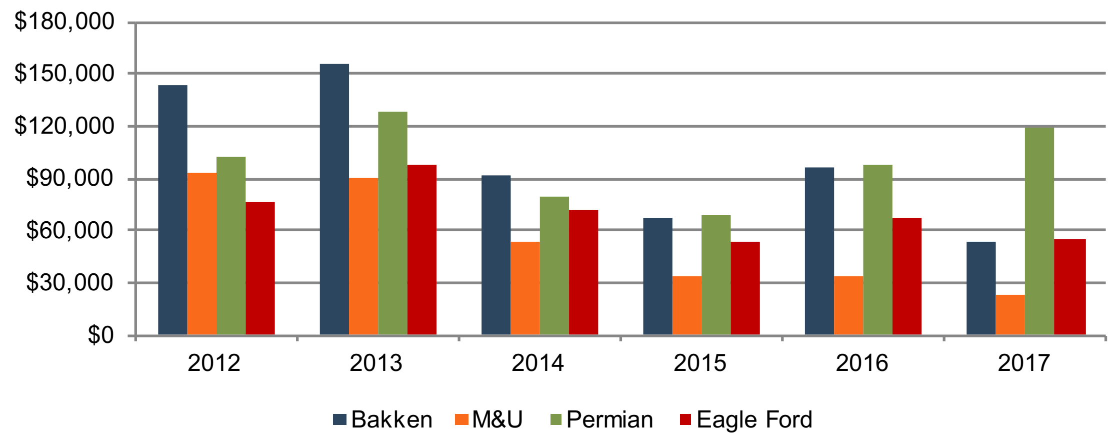
Natural gas producers have been dealing with low prices for over ten years. However, there is now hope of some relief in the next few years as new infrastructure in the region helps to reduce the supply glut. Additionally, demand for natural gas has been increasing as **electricity generation fueled by coal** has decreased and natural gas has taken its place.

Appalachian Basin

Valuation Implications

Over the past few years, valuation multiples have been falling in the region as enterprise values have remained relatively constant and production has been increasing. As infrastructure projects near completion and the possibility of higher regional natural gas prices starts to materialize, we expect valuation multiples in the Marcellus and Utica to increase.

Price per Flowing Barrel



Source: Bloomberg

Appalachian Basin

Market Valuations & Transaction Activity

Transaction activity in the Marcellus & Utica shale was generally steady throughout the year and individual transactions were typically smaller in size. Rationale for these deals was varied, from bankruptcy sales, consolidation of acreage, strategy changes to more liquid rich plays, leverage reduction, and more. The table below provides transaction detail and comparative valuation metrics.

Transactions in the Marcellus & Utica

Announced Date	Buyer	Seller	Deal Value ($MM)	$ / Acre	$ / Mcfe / d	$ / Boepd
Acreage Transactions						
12/21/17	Alta Resources Llc	Ultra Petroleum Corp.	$130	$1,597	$3,833	na
12/12/17	Kalnin Ventures	Warren Resources Inc.	105	19,853	na	359,589
12/11/17	Eclipse Resources Corp.	Travis Peak Resources LLC	94	2,106	13,386	na
10/9/17	Kalnin Ventures	Reliance Industries Limited, Reliance Marcellus II, LLC	126	2,019	na	na
10/6/17	Kalnin Ventures	Carrizo Oil & Gas Inc.	84	19,535	2,100	na
9/5/17	Not Disclosed	*Carrizo Oil & Gas Inc.*	62	2,394	13,964	na
8/1/17	Not Disclosed	Consol Energy Inc.	130	11,818	na	na
6/14/17	Antero Resources	*Not Disclosed*	130	12,621	7,647	311,005
5/5/17	Diversified Exploration Inc	Atlas Resource Partners, L.P., Titan Energy LLC	84	na	2,476	na
5/2/17	HG Energy Llc	Noble Energy, Inc.	1,225	3,182	2,952	806,983
4/4/17	Carbon Appalachian Company, LLC	Not Disclosed	20	na	5,556	980,392
2/9/17	EQT Corp	Stone Energy Corp.	527	9,869	6,588	na
2/1/17	EQT Corp	Not Disclosed	130	9,286	na	na
Median			**$126**	**$9,286**	**$5,556**	**$583,286**
Average			**$219**	**$8,571**	**$6,500**	**$614,492**
Corporate Transaction						
6/19/17	EQT Corp	Rice Energy	8,200	19,477	6,308	2,047

Source: Shale Experts

* Does not include every transaction in the Appalachian Basin for the last twelve months ended 12/31/2017

Appalachian Basin

Transactions: Moving to Bigger and Better Things

In one of the few large transactions last year, Noble Energy exited the Marcellus in order to focus on more liquid rich regions with its **$1.2 billion sale to HG Energy**. David L. Stover, Noble Energy's Chairman, President and CEO, commented, "The Marcellus has been a strong performer for Noble Energy over the last few years, which is a direct result of the success of our employees' efforts. During the same time period, we have also significantly expanded the inventory of investment opportunities in our liquids-rich, higher-margin onshore assets, which has led us to now divest our Marcellus position."

In a similar vein, Carrizo Energy, a Houston-based producer, **exited the play**, utilizing the familiar "non-core" term to describe its position in the Appalachia region. S.P. "Chip" Johnson, IV, Carrizo's President and CEO, commented, "With the announced sale of our Marcellus package, we have continued to execute on the divestiture program we outlined earlier this year. We expect to close the sale of both of our Appalachian packages during the fourth quarter and remain on track to reach our divestiture program goals." Carrizo stated its desire to focus on liquid plays and reduce leverage which these sales went towards achieving.

Transactions: Moving Out and Moving In

Looking at the other end of the rationale spectrum, there were a number of buyers that were enthusiastic about the opportunities that companies like Noble & Carrizo left behind. Kalnin Ventures, a Thai-based coal and power generation company, made their **5th acquisition in the play** in the past two years by buying positions from Carrizo's and Reliance Marcellus II, LLC. **They also made a 6th** in December by taking out Warren Resource's entire Northeast Marcellus position for $105 million. In contrast to Carrizo's sentiment, Kalnin thinks these assets fit within their strategy of acquiring profitable, consolidated, low-risk assets that provide strong cash flow yields.

Believe it or not, Kalnin's activity did not top the acquisition charts in 2017. That distinction belonged to EQT, beginning with its **$527 million bankruptcy auction bid** of Stone Energy's Marcellus and Utica acreage in February 2017. EQT, who made nearly $9 billion of Marcellus & Utica acquisitions in 2017, went on to highlight the year with its **merger with Rice Energy** in June. Steve Schlotterbeck, EQT's president and chief executive officer said, "This transaction complements our production and midstream businesses and will deliver significant operational synergies to help us maintain our status as one of the lowest-cost operators in the United States." For a more in-depth valuation-oriented discussion on the Rice Energy transaction, a **Mercer Capital blog post breaks down the deal**.

Appalachian Basin

Transactions: What Kind of Deal Did They Get?

Valuations for these transactions were relatively spread out depending on the metric observed, but were within an observable range. Kalnin appeared to pay more than other buyers in a few deals from a $/Acre perspective (over $19,500/Acre), but it can be argued that they baked in economies of scale in light of their overlapping positions and infrastructure. EQT appeared to buy in a very tight range from a $/Mcfe/Day perspective ($6,300-$6,600). That said, due to the steady activity and universe of buyers and sellers, pricing, and values appeared to be fairly consistent.

Appendix A

Selected Public Company Information

Mercer Capital tracks the performance of Exploration and Production companies across different mineral reserves in order to understand how the current pricing environment affects operators in each region. We created an index of seven groups to better understand performance trends across reserves and across the industry. The current pricing multiples of each company in the index is summarized below.

					as of 12/31/2017		
Company Name	**Ticker**	**12/31/17 Enterprise Value**	**YOY % Change in EV**	**EBITDAX Margin**	**EV/ EBITDAX**	**Daily Production (mboe/d)**	**Price per Flowing Barrel***
Global Integrated							
Exxon Mobil Corp	XOM	$397,658	-5.71%	14.3%	12.5x	4,169	$95,377
Statoil ASA	STO	$81,602	12.17%	34.1%	4.2x	2,093	$38,994
Royal Dutch Shell PLC	RDS/A	$353,239	na	14.6%	8.5x	na	na
Chevron Corp	CVX	$274,299	4.99%	17.8%	12.4x	2,786	$98,464
Occidental Petroleum Corp	OXY	$64,388	8.06%	38.9%	14.0x	626	$102,901
BP PLC	BP	$180,103	15.52%	11.0%	7.4x	3,856	$46,707
Group Median			**8.06%**	**16.2%**	**10.5x**	**2,786**	**$95,377**
Global E&P							
Marathon Oil Corp	MRO	$19,078	-4.56%	51.7%	8.4x	388	$49,185
Hess Corp	HES	$21,143	-16.04%	-13.9%	-29.0x	302	$70,005
ConocoPhillips	COP	$77,231	-11.00%	18.3%	15.2x	1,226	$62,992
Anadarko Petroleum Corp	APC	$42,812	-20.99%	48.9%	7.7x	625	$68,531
Noble Energy Inc	NBL	$21,645	-5.21%	4.3%	125.1x	384	$56,308
Apache Corp	APA	$24,086	-27.13%	67.3%	6.3x	451	$53,426
Murphy Oil Corp	MUR	$7,289	-2.87%	65.1%	5.6x	170	$42,834
Group Median			**-11.00%**	**48.9%**	**7.7x**	**388**	**$56,308**

Source: Bloomberg L.P.
* Price per Flowing Barrel is EV/ daily production ($/boe/d)
** Companies included in the Guideline Group were selected from a broader guideline group, detailed **here**. The selected companies' market caps exceed $1 billion and revenues exceed $500 million.

Appendix A

Selected Public Company Information

Company Name	Ticker	12/31/17 Enterprise Value	YOY % Change in EV	EBITDAX Margin	EV/ EBITDAX	Daily Production (mboe/d)	Price per Flowing Barrel*
				as of 12/31/2017			
North American E&P							
Ultra Petroleum Corp	UPL	$4,098	na	48.8%	9.6x	136	$30,246
Encana Corp	ECA	$16,297	9.61%	37.8%	10.6x	336	$48,484
Devon Energy Corp	DVN	$34,183	-7.87%	29.7%	9.1x	563	$60,665
Enerplus Corp	ERF	$2,625	-5.51%	91.6%	4.2x	87	$30,290
QEP Resources Inc	QEP	$3,548	-34.27%	55.0%	4.0x	132	$26,973
WPX Energy Inc	WPX	$8,691	18.49%	57.0%	12.7x	130	$66,871
EQT Corp	EQT	$20,921	33.62%	55.9%	13.9x	507	$41,258
Chesapeake Energy Corp	CHK	$15,416	-19.70%	14.8%	11.6x	563	$27,366
Newfield Exploration Co	NFX	$8,299	-16.86%	55.4%	8.6x	169	$49,165
Group Median			**-6.69%**	**55.0%**	**9.6x**	**169**	**$41,258**
Bakken							
Continental Resources Inc/OK	CLR	$26,479	1.39%	72.9%	13.9x	278	$95,335
Whiting Petroleum Corp	WLL	$5,322	-28.97%	23.1%	17.0x	126	$42,253
Oasis Petroleum Inc	OAS	$4,713	-17.18%	53.4%	8.3x	72	$65,502
Crescent Point Energy Corp	CPG	$7,424	-27.56%	61.8%	5.6x	177	$41,878
Group Median			**-22.37%**	**57.6%**	**11.1x**	**152**	**$53,878**

Source: Bloomberg L.P.
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Marcellus & Utica							
Range Resources Corp	RRC	$8,215	-33.31%	39.2%	9.3x	363	$22,650
Cabot Oil & Gas Corp	COG	$14,239	19.81%	26.6%	32.0x	317	$44,984
Antero Resources Corp	AR	$11,215	-17.32%	51.8%	7.0x	411	$27,296
Gulfport Energy Corp	GPOR	$4,170	3.36%	50.9%	8.3x	214	$19,514
Southwestern Energy Co	SWN	$8,031	-21.75%	36.1%	7.3x	435	$18,465
Group Median			**-17.32%**	**39.2%**	**8.3x**	**363**	**$22,650**
Permian Basin							
Concho Resources Inc	CXO	$25,143	20.02%	90.9%	11.1x	202	$124,366
Parsley Energy Inc	PE	$10,508	36.68%	69.3%	18.7x	82	$128,462
Diamondback Energy Inc	FANG	$14,307	49.01%	76.0%	18.8x	90	$158,517
RSP Permian Inc	RSPP	$7,884	12.10%	69.2%	16.8x	65	$122,107
Halcon Resources Corp	HK	$961	-48.56%	134.7%	1.3x	8	$118,507
Laredo Petroleum Inc	LPI	$3,993	-15.82%	50.9%	9.5x	63	$63,234
Pioneer Natural Resources Co	PXD	$30,157	-3.20%	30.9%	17.5x	297	$101,508
Cimarex Energy Co	XEC	$12,686	-7.36%	60.4%	12.3x	201	$63,217
Energen Corp	EGN	$6,361	11.57%	65.9%	12.2x	86	$73,818
Group Median			**11.57%**	**69.2%**	**12.3x**	**86**	**$118,507**

Source: Bloomberg L.P.
* Price per Flowing Barrel is EV/ daily production ($/boe/d)
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				as of 12/31/2017			
Eagle Ford							
Carrizo Oil & Gas Inc	CRZO	$3,430	-8.86%	66.0%	7.7x	61	$55,906
SM Energy Co	SM	$4,929	-5.88%	24.3%	16.0x	115	$42,719
EOG Resources Inc	EOG	$67,937	5.79%	41.4%	16.1x	648	$104,805
Group Median			**-5.88%**	**41.4%**	**16.0x**	**115**	**$55,906**
Overall Median			**-5.51%**	**0.5x**	**9.6x**	**287**	**$56,107**

Source: Bloomberg L.P.
* Price per Flowing Barrel is EV/ daily production ($/boe/d)
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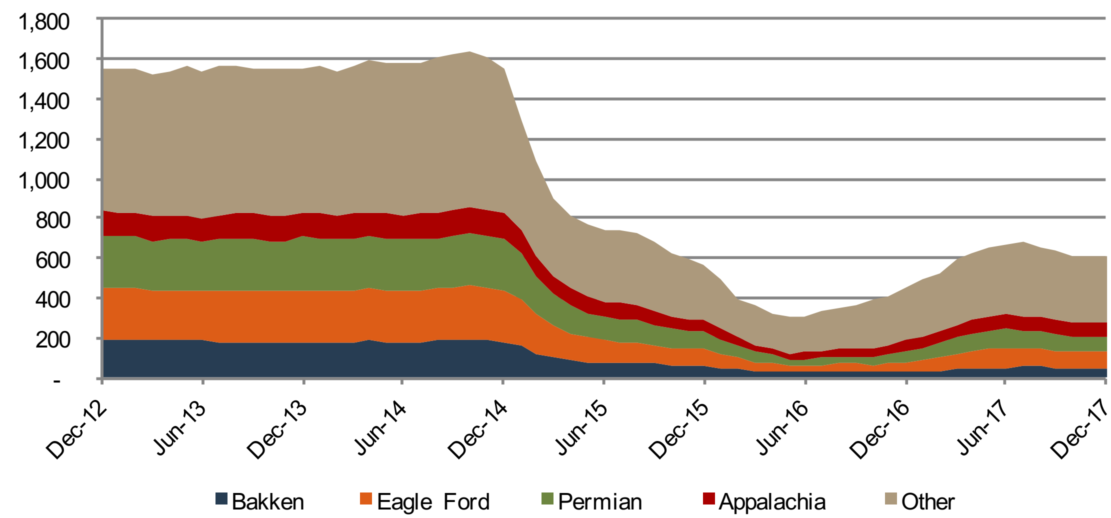
Appendix B

Rig Count

Baker Hughes collects and publishes information regarding active drilling rigs in the United States and internationally. The number of active rigs is a key indicator of demand for oilfield services & equipment. Factors influencing rig counts include energy prices, investment climate, technological changes, regulatory activity, weather, and seasonality.

The number of active rigs in the United States as of December 31, 2017, stood at 929, a 41.2% increase from December 2016. The increase reflects a pickup in drilling activity from the stabilization of oil prices around $50/ bbl, enabling companies to increase drilling activities. Activity increased in the Appalachian Basin with the number of active rigs increasing by 25.4% to 74 rigs in December 2017.

Rig Count by Region

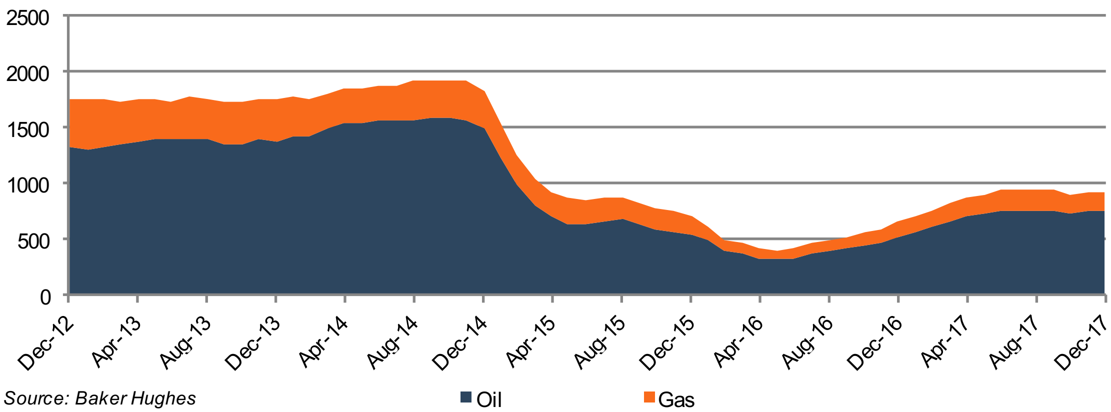


Source: Baker Hughes

Appendix B

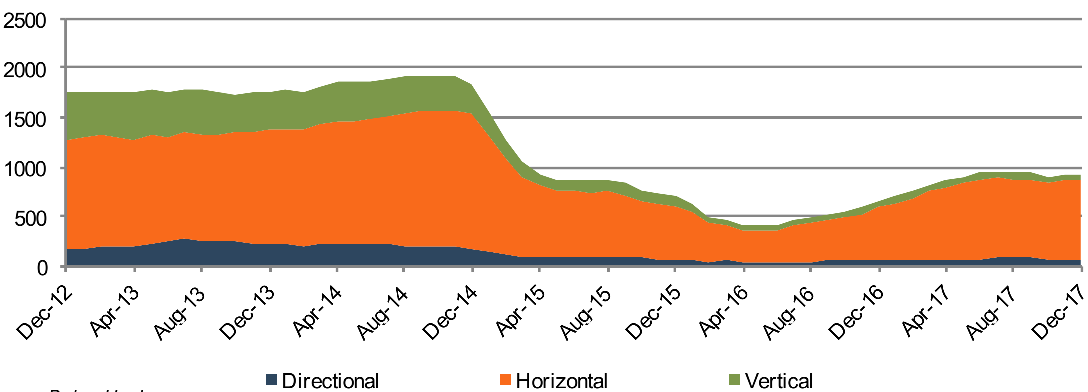
Rig Count

U.S. Rig Count by Oil vs. Natural Gas



Source: Baker Hughes

U.S. Rig Count by Trajectory

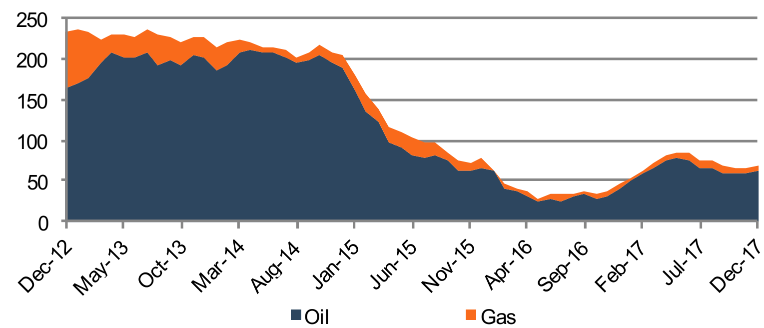


Source: Baker Hughes

Appendix B

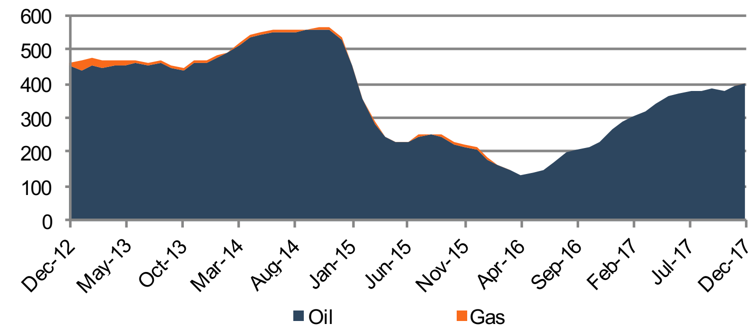
Rig Count // Oil vs. Natural Gas

Eagle Ford Rig Count by Oil vs. Natural Gas



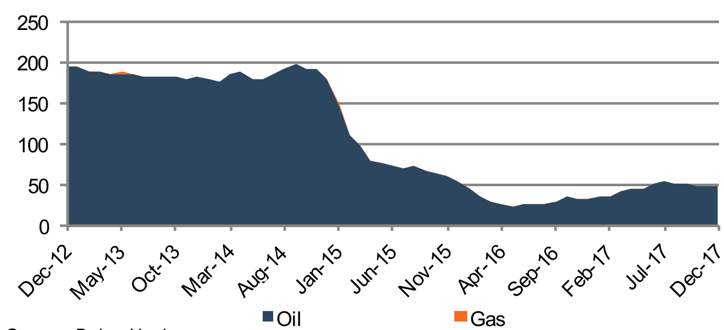
Source: Baker Hughes

Permian Rig Count by Oil vs. Natural Gas



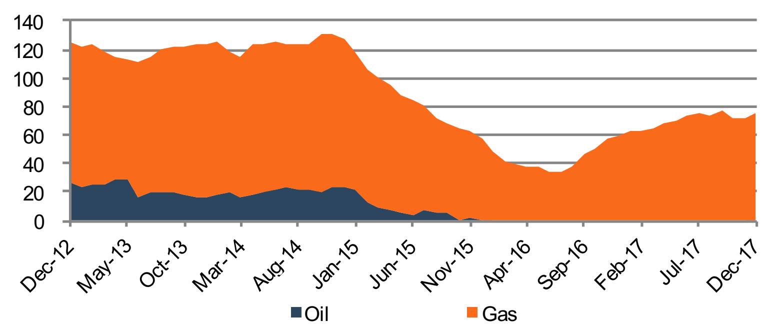
Source: Baker Hughes

Bakken Rig Count by Oil vs. Natural Gas



Source: Baker Hughes

Marcellus & Utica Rig Count by Oil vs. Natural Gas

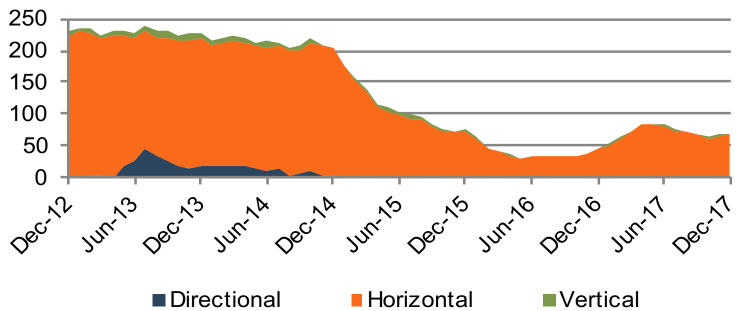


Source: Baker Hughes

Appendix B

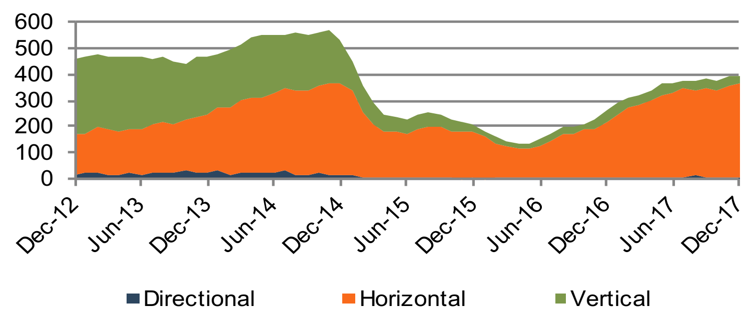
Rig Count // Trajectory

Eagle Ford Rig Count by Trajectory



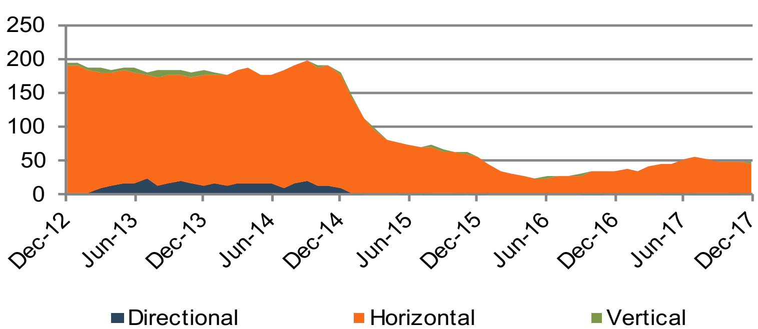
Source: Baker Hughes

Permian Rig Count by Trajectory



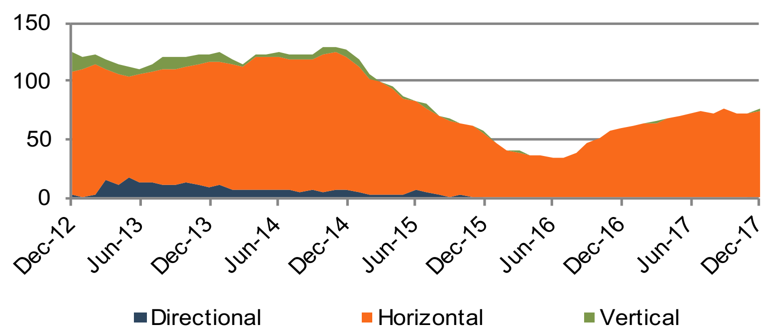
Source: Baker Hughes

Bakken Rig Count by Trajectory



Source: Baker Hughes

Marcellus & Utica Rig Count by Trajectory



Source: Baker Hughes

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