

VALUE FOCUS

Exploration & Production

Third Quarter 2019 // Region Focus: Bakken

EXECUTIVE SUMMARY

WTI crude prices edged above \$60 per barrel to begin the quarter but only crossed that threshold once more in the first trading day after the attack on Saudi Aramco oil processing facilities. Those gains were erased in the last two weeks of the quarter, however, as prices fell to under \$55 by September 30th.

Infrastructure development and acreage value are two areas under the spotlight in the third quarter of 2019. Pipeline constraints largely eased with the opening of the DAPL, and current Bakken price differentials are relatively low considering how far they are from the Gulf Coast refineries and export markets. Acreage values in the regions are decreasing as a result of capital discipline and returns that investors are seeking. Investor appeasement has led to operators hemming their capital expenditures and emphasizing drilling efficiencies in order to generate acceptable returns.



Oil and Gas Industry Services

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

Services Provided

- Valuation of oil & gas 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

Contact Us



Bryce Erickson, ASA, MRICS
214.468.8400
ericksonb@mercercapital.com
Dallas Office



J. David Smith, ASA, CFA
713.239.1005
smithd@mercercapital.com
Houston Office



J. Michael Sousoulas, CPA
sousoulasm@mercercapital.com



Jake M. Stacy
stacyj@mercercapital.com



Don Erickson, ASA
214.468.8400
ericksond@mercercapital.com
Dallas Office



Alex M. Barry, CFA
214.468.8400
barrya@mercercapital.com
Dallas Office



David W. R. Harkins
harkinsd@mercercapital.com

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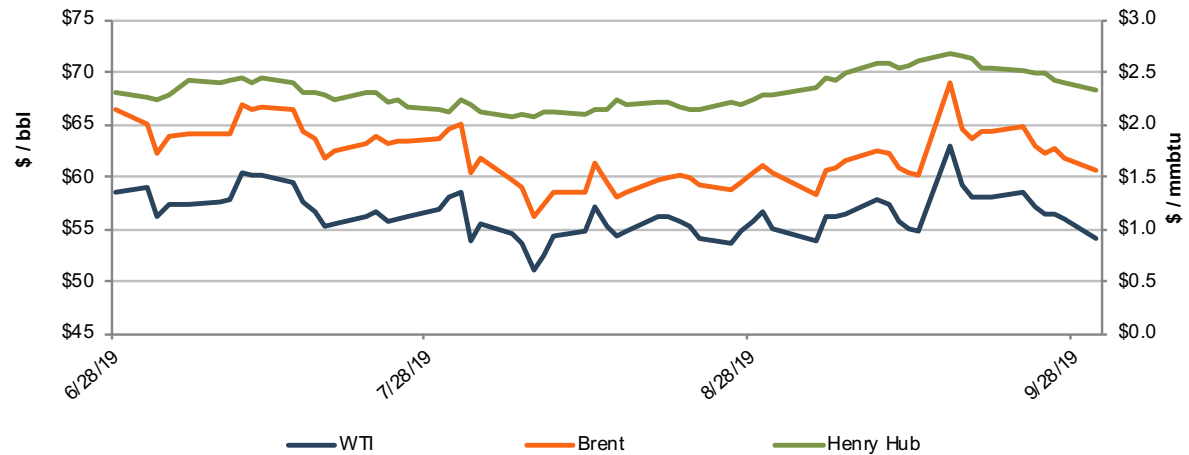
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Oil and Gas Commodity Prices

Crude prices have lingered for a while now with WTI largely staying below the \$60/bbl threshold since mid-May. Brent crude prices followed a similar path as the spread between Brent and WTI began and ended the quarter around \$6-7/bbl. This fell to a low of about \$3.50/bbl in mid-August as additional capacity continues to come online, which should ultimately narrow this gap further. Natural gas prices have fallen even further, down 42% from 2019 highs seen in January. Prices reached a recent low of \$2.07/mmbtu in early August, though seasonal temperature declines should help buffer prices to close the year.

Realized pricing in the Bakken has improved markedly relative to last fall when a **combination of Midwest refinery turnarounds and a glut of Canadian production** sent the Clearbrook Bakken / WTI differential to more than \$20/bbl. At the end of September, the differential stood at approximately \$2.50/bbl. While thinly traded, basis futures indicate expected differentials of \$2.50 to \$4.30/bbl over the next several years.

Crude Oil and Natural Gas Prices



Source: Bloomberg

Macro Update

Missile Attack on Saudi Aramco Processing Facility

While crude prices have generally slid in recent months, a notable spike occurred when there was an attack on Saudi Arabia's Abqaiq facility on September 14th. This was the largest oil disruption in history with 5.7 million b/d of production affected, or approximately 5% of the world's daily production. Both WTI and Brent crude prices surged more than 10% in the immediate aftermath of the Saudi missile attack. However, the price reaction was short-lived, as the Saudis were **able to bring 2 million bbl/d of production** back online within days, with the remainder expected to be back online within weeks. WTI and Brent prices ended September lower than on the day prior to the attack.

The attack has largely been much ado about nothing. In the immediate aftermath, there were concerns about supply in the short-term and the potential for more attacks. Such geopolitical instability has formerly been baked into crude prices and the attacks spawned questions as to whether this was truly being considered. However, there were no additional attacks and supply was largely uninterrupted. The United States' willingness to **release oil from reserves** and expedite approvals of oil pipelines to keep markets well supplied likely also played a role in easing markets and lowering crude prices.

From what seemed to be an incident that would be a detriment to oil supply overseas for an extended period of time, OPEC's oil production rebounded in October from an **eight-year low** as Saudi Arabia quickly recovered from the attack. The faster than anticipated recovery in production dropped oil prices back to the \$50-\$55 range.

Short-Term Outlook

According to the EIA's latest Short Term Energy Outlook ("STEO"), global economic indicators continue to decline, contributing to oil price declines and volatility. Frequent trade negotiations between the United States and China also contributed to daily movements in global crude oil prices. On August 23, WTI prices fell by 2% when China announced a 5% tariff on its imports of U.S. crude oil; however, from 2018 to 2019 year-to-date, China has imported more crude oil from Saudi Arabia than the United States. The EIA is reducing its fourth quarter expectation of Brent crude oil price to \$63/bbl, reflecting recent global crude oil price fluctuations and lower forecast global oil demand growth.

The EIA forecasts Brent spot prices will average \$62/bbl in 2020 and WTI prices will average \$5.50/bbl less than Brent prices. The spread between the two should continue to narrow over time as more infrastructure is added, particularly in West Texas. The EIA's assessment is that natural gas production will be sufficient to meet expected demand and export levels at a lower price than previously forecasted. This, along with recent price movements, has resulted in the EIA lowering its Henry Hub price forecast for 2020 to an average of \$2.55/MMbtu.



Region Focus: Bakken

Infrastructure Issues

The economics of oil and gas production varies 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 Bakken.

While fracking techniques have existed in prior forms since the 1940s, the innovations in fracking technology have allowed companies to stimulate previously uneconomic wells. This revolutionized production and reframed the mindset as to whether oil recovery was at a peak or not. In fact, production patterns improved so quickly over the past five years that infrastructure such as pipelines, processing, and logistics have had trouble **keeping up**.

The Bakken and Three Forks formations located in the Dakotas and Montana are one example of this. For years there has been a dearth of pipeline access to the formation and most of the oil produced has been transported out of the region by rail, a less efficient solution compared to pipelines. This issue has been even more acute for natural gas transportation. According to the EIA, in 2017 Bakken operators flared 88.5 billion cubic feet of gas, worth about **\$220 million and enough to heat 1 million homes**.

The Dakota Access Pipeline, which was much discussed in the news due to protests, opened in 2017 and is **proposed to expand**. It helped correct steep **pricing differentials** relative to WTI spot prices at Cushing, Oklahoma. With the proposed expansion of the pipeline, the **announced Liberty Pipeline**, and excess crude-by-rail capacity, E&P operators should see constraints lessen over time.

However, gas flaring is still prevalent and, both Whiting and Oasis indicated that issues with natural gas processing infrastructure adversely impacted performance during the quarter. In the Q2 earnings call, Whiting CEO Brad Holly stated, "To minimize flaring, we are producing some wells at constrained oil rates, while we focus on increasing gas capture through the installation of mobile combustion units, building out gathering systems, and completing our ray gas processing plant. Constraints also impacted the pace of planned operating activity." Oasis CEO Tommy Nusz put a finer point on his commentary, specifically stating that downtime at the company's Wild Basin gas complex reduced 2Q19 production by 3,000 boe/d. These constraints should moderate, though, as additional natural gas infrastructure **comes online in late 2019 and early 2020**.

MLP Simplification Trend Continues

The recent trend of MLP simplifications, driven in part by tax reform, FERC policy changes, cost of capital considerations, and a desire to reach a broader investor base, continues. Hess Midstream Partners (HESM) announced that it is acquiring Hess Infrastructure Partners (HIP) in a **\$6.2 billion transaction**. HIP owns HESM's General Partner (GP) units and Incentive Distribution Rights (IDRs), as well as an 80% interest in HESM's oil and gas midstream assets. Unlike most simplifications that have occurred once GP/IDR distributions are "high in the splits" (with the GP/IDR holder typically taking 50% of incremental distributions above a certain threshold), HESM was only at the 25% split level. Fellow Bakken midstream operator Oasis Midstream Partners remains on a rapidly shortening list of MLPs that still have IDRs.

Market Valuations & Transaction History

Acquisition and divestiture activity in the Bakken for last twelve months has been minimal. The lack of deals, however, does not mean that activity or production hasn't been meaningful. In fact, production has grown approximately 10% year-over-year through September with new well production per rig increasing over 29%. Also, while other major basins have been decreasing rig counts, the Bakken has remained steady year-over-year as of the end of September.

While the fundamentals of this basin are strong, relatively few companies remain interested. As such, deal activity has largely involved the familiar faces in the region. Companies with smaller positions in the region have continued to divest "non-core" positions as they focus their efforts in other regions. Contrast this trend to the controlling acquisitions or takeovers **like those that have been popular in the Permian**.

Details of recent transactions in the Bakken, including some comparative valuation metrics, are shown below.

Transactions in the Bakken

Announced Date	Buyer	Seller	Deal Value (\$MM)	\$ / Acre	\$ / Boepd
8/15/19	Panhandle Oil and Gas Inc.	Undisclosed Seller	\$5	\$7,453	nm
7/31/19	Undisclosed Buyer	Whiting Petroleum Corp.	\$53	\$7,794	\$75,391
6/5/19	Undisclosed Buyer	Abraxas Petroleum Corp.	\$16	\$31,000	\$44,286
6/4/19	Resource Energy Can-am LLC	Undisclosed Seller	---	nm	nm
4/22/19	Northern Oil and Gas, Inc.	Flywheel Energy LLC	\$180	\$10,000	\$27,273
4/3/19	Empire Petroleum Corp.	Energyquest li Llc	---	nm	nm
12/17/18	Alliance Resource Partners Lp	AllDale Minerals LP , AllDale Minerals II, LP	\$176	nm	nm
11/21/18	Kimbell Royalty Partners LP	Undisclosed Seller	\$108	\$6,455	\$90,588
11/1/18	Encana Corp	Newfield Exploration Co.	\$7,700	\$8,810	\$38,693
Median			\$108	\$8,302	\$44,286
Average			\$1,177	\$11,919	\$55,246

Source: Shale Experts

*Does not include every transaction in the region for 2018-2019

Market Valuations & Transaction History

Flagging Prices for Undeveloped Acreage

We researched transaction data in the Bakken over the past two years. According to our research from the **fourth quarter 2017** going into the **fourth quarter 2019**, average prices for acreage in the Bakken dropped from \$14,250 per acre to \$11,919 per acre. While limited in sample size, what's particularly interesting about these statistics is that on a flowing barrel basis the average price for production increased (\$53,338 per flowing barrel in the period entering the fourth quarter 2018 vs. \$55,246 going into the fourth quarter 2019).

Bakken Area Transactions	Deal Count	Deal Value	\$ / Per Acre	\$ / Boepd
4Q 2018 - 3Q 2019 Average	9	\$1,177	\$11,919	\$55,246
4Q 2017 - 3Q 2018 Average	14	\$289	\$14,250	\$53,338

Source: Shale Experts

This indicates that current production valuations remain steady while acreage values for future production weaken. The explanation for this dynamic is layered yet connected, and it is not isolated to the Bakken area.

At Hart Energy's **A&D Strategies and Opportunities Conference**, industry participants emphasized a theme of seeking to buy current oil and gas production as opposed to longer term developmental acreage. It is a result of the capital discipline and returns that investors are demanding. Thus, with public markets struggling to show returns to many investors, acquisition and divestiture activity has slowed. The most prominent transaction oriented activity in the Bakken this year was ironically QEP's decision to **terminate a deal** to sell its assets for \$1.73 billion. Part of this is driven by public funding drying up. Some companies are turning to **creative asset backed bonds** to facilitate fundraising.

This dearth of funding incentivizes investors to be particularly selective in their asset purchases and be more weighted to near-term returns. Thus, there is less capital available to invest in longer term drilling inventory. The valuation theory is straightforward: there is more sensitivity of the price paid today for drilling inventory that may not be monetized for 10 to 15 years or more from a net present value perspective. It's not worth much in today's dollars, and thus becomes challenging to justify the significant capital outlay considering alternative investments.

Another factor driving declines in acreage values is large swaths of private equity backed properties that are considering monetizing their assets due to expiring fund holding periods. While perhaps up to \$5 billion of non-operated oil and gas packages are **potentially available in the Bakken**, many aren't currently transacting because of the low prices and wide bid-ask spreads. This may not last and funds will eventually have to sell their assets. When that happens, acreage prices could drop even further if commodity prices or other fundamentals do not improve. It may not appear reasonable to some sellers, but it is fair in many buyers' minds. It's a somewhat unexpected side effect alongside a global shift in energy markets.

Market Valuations & Transaction History

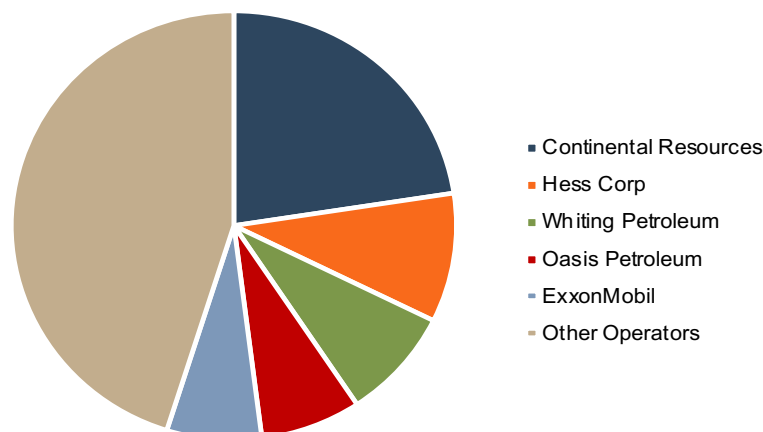
Balance Sheet Cleanup: Whiting and Abraxas

A recurring theme observed throughout the year in multiple basins has been optimization of assets. The theme continues in the Bakken for 2019 as transactions in the basin have primarily consisted of offloading portions of non-operated assets, the largest of which was the deal with Whiting Petroleum and an undisclosed buyer for \$53 million. However, Whiting remains the second largest holder of net acreage in the basin.

Abraxas Petroleum also sold approximately \$16 million in non-operated assets in June. These assets were not part of Abraxas' core Williston position. However, Abraxas appears to be open to conversations with parties interested in acquiring both operated and non-operated assets, **as the company is seemingly in deal talks with Whiting.**

Given the age of the basin and smaller number of players, consolidation and strategic deals between operators have been prevalent. Several players have left the Bakken for the Permian, and as a result, the top five net acreage holders account for roughly half of the existing operating acreage in the basin. Abraxas undertook a sizable debt load in 2018 to finance further capital expenditures and restructure debt maturities (\$180 million due in 2020-2021¹). An exit from the Bakken to pay down its debt and expand their Permian operations does not seem unreasonable.

Top Five Net Acreage Holders in the Bakken



Source: Estimates from Shale Experts and Oil and Company Annual Reports

¹ Abraxas Petroleum Corporation Annual Report December 31, 2018

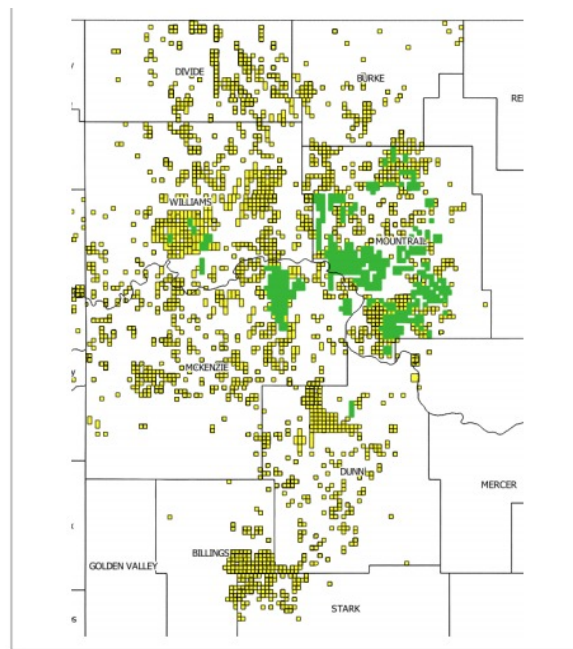
Market Valuations & Transaction History

Continued Non-Operator Acquisitions: Northern Oil and Gas

Similar to **trends observed in the Bakken last year**, acquisitions by non-operators have continued into 2019. For instance, Northern Oil and Gas has made several deals in the basin and its **acquisition of private equity backed Flywheel Energy LLC** in April 2019 was one of the largest of the year, and represents a continuance of this trend.

Northern Oil and Gas has been the basin's most consistent acquirer of non-operating interests. As a nonoperator, Northern can enjoy cash flows received from acreage without the operator risk that has become ever more prevalent in the current environment, and consequently, the company has the luxury of continuing to strategically consolidate acreage in the basin. Since the start of 2018, the company has made four large publicly announced transactions totaling more than \$820 million. Below is a map of the acreage Northern Oil and Gas acquired in the Flywheel transaction as well as existing acreage to show its overall footprint in the basin.

Northern Oil and Gas Acreage



Source: Northern Oil And Gas, Inc. April 2019 Presentation

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 the industry. The current pricing multiples of each company in the index are summarized below.

							as of 9/30/2019	
Company Name	Ticker	9/30/2019 Enterprise Value	YoY % Change in Stock Price	EBITDAX Margin	EV/ EBITDAX	Daily Production (mboe/d)	Price per Flowing Barrel*	
Global Integrated								
Exxon Mobil Corp	XOM	\$352,129	-16.95%	14.4%	9.0x	3,975	\$88,576	
Royal Dutch Shell PLC	RDSA	\$314,278	-13.63%	14.6%	5.7x	3,699	\$84,953	
Chevron Corp	CVX	\$252,334	-3.01%	23.6%	7.0x	3,080	\$81,927	
BP PLC	BP	\$188,284	-17.59%	11.5%	5.6x	3,821	\$49,277	
Equinor ASA	EQNR	\$75,340	-32.80%	40.5%	2.5x	2,130	\$35,370	
Group Median			-16.95%	14.6%	5.7x	3,699	\$81,927	
Global E&P								
Marathon Oil Corp	MRO	\$14,813	-47.29%	68.3%	3.8x	418	\$35,418	
Hess Corp	HES	\$24,693	-15.51%	50.6%	7.3x	292	\$84,538	
ConocoPhillips	COP	\$72,648	-26.38%	43.1%	4.7x	1,342	\$54,137	
Occidental Petroleum Corp	OXY	\$48,995	-45.88%	51.6%	5.2x	986	\$49,688	
Noble Energy Inc	NBL	\$18,971	-27.99%	30.6%	13.6x	360	\$52,699	
Apache Corp	APA	\$19,878	-46.30%	70.0%	4.0x	462	\$43,016	
Murphy Oil Corp	MUR	\$8,903	-33.68%	71.7%	4.7x	182	\$48,788	
Group Median			-33.68%	51.6%	4.7x	418	\$49,688	

Source: Bloomberg L.P.

- Price per Flowing Barrel is EV/daily production (\$/boe/d)
- We review 10-K's and annual reports from guideline companies to ensure companies continue to operate in the regions and groups we have identified.

Appendix A

Selected Public Company Information

as of 9/30/2019							
Company Name	Ticker	9/30/2019 Enterprise Value	YoY % Change in Stock Price	EBITDAX Margin	EV/ EBITDAX	Daily Production (mboe/d)	Price per Flowing Barrel*
North American E&P							
Encana Corp	ECA	\$14,200	-64.91%	50.0%	4.1x	564	\$25,185
Devon Energy Corp	DVN	\$11,097	-39.76%	40.6%	3.0x	442	\$25,079
QEP Resources Inc	QEP	\$2,930	-67.31%	-20.8%	nm	83	\$35,211
WPX Energy Inc	WPX	\$6,615	-47.37%	68.9%	4.2x	164	\$40,379
Chesapeake Energy Corp	CHK	\$13,761	-68.60%	25.3%	5.8x	495	\$27,787
Group Median			-64.91%	40.6%	4.2x	442	\$27,787
Bakken							
Continental Resources Inc/OK	CLR	\$17,451	-54.91%	73.5%	5.0x	336	\$51,941
Whiting Petroleum Corp	WLL	\$3,615	-84.86%	63.3%	3.2x	126	\$28,617
Oasis Petroleum Inc	OAS	\$4,208	-75.60%	47.0%	4.2x	88	\$47,957
Group Median			-75.60%	63.3%	4.2x	126	\$47,957

Source: Bloomberg L.P.

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Company Name	Ticker	9/30/2019 Enterprise Value	YoY % Change in Stock Price	EBITDAX Margin	EV/ EBITDAX	Daily Production (mboe/d)	Price per Flowing Barrel*	
Appalachia								
Range Resources Corp	RRC	\$4,808	-77.52%	-23.4%	nm	381	\$12,609	
EQT Corp	EQT	\$7,746	-75.94%	37.4%	4.5x	690	\$11,230	
Cabot Oil & Gas Corp	COG	\$8,369	-21.98%	66.9%	5.1x	393	\$21,274	
Antero Resources Corp	AR	\$7,871	-82.95%	31.7%	5.5x	534	\$14,751	
Gulfport Energy Corp	GPOR	\$2,630	-73.97%	72.5%	2.2x	229	\$11,475	
Southwestern Energy Co	SWN	\$3,312	-62.23%	29.8%	3.0x	353	\$9,393	
Group Median			-74.96%	34.6%	4.5x	387	\$12,042	
Permian Basin								
Concho Resources Inc	CXO	\$18,181	-55.55%	48.2%	8.5x	327	\$55,649	
Parsley Energy Inc	PE	\$7,662	-42.56%	76.2%	5.5x	137	\$55,754	
Diamondback Energy Inc	FANG	\$20,274	-33.49%	74.1%	9.0x	283	\$71,766	
Jagged Peak Energy Inc	JAG	\$2,225	-47.51%	75.5%	5.3x	40	\$55,680	
Centennial Resource Development Inc/DE	CDEV	\$2,270	-79.34%	72.8%	3.4x	73	\$30,936	
Callon Petroleum Co	CPE	\$2,227	-63.80%	75.1%	4.7x	39	\$56,902	
Laredo Petroleum Inc	LPI	\$1,568	-70.50%	66.8%	2.6x	78	\$20,190	
Pioneer Natural Resources Co	PXD	\$23,001	-27.80%	32.7%	7.9x	338	\$68,015	
Cimarex Energy Co	XEC	\$7,192	-48.42%	66.5%	4.6x	270	\$26,675	
Group Median			-48.42%	72.8%	5.3x	137	\$55,680	

Source: Bloomberg L.P.

- Price per Flowing Barrel is EV/daily production (\$/boe/d)
- We review 10-K's and annual reports from guideline companies to ensure companies continue to operate in the regions and groups we have identified.

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						as of 9/30/2019	
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Eagle Ford							
Carrizo Oil & Gas Inc	CRZO	\$2,844	-65.93%	69.9%	na	66	\$42,961
EOG Resources Inc	EOG	\$48,039	-41.82%	50.9%	5.4x	811	\$59,248
Magnolia Oil & Gas Corp	MGY	\$3,184	-26.05%	na	na	67	\$47,836
SilverBow Resources Inc	SBOW	\$590	-63.67%	72.8%	2.7x	39	\$15,056
Penn Virginia Corp	PVAC	\$961	-63.91%	74.5%	2.8x	27	\$34,960
Group Median			-63.67%	71.4%	2.8x	66	\$42,961
OVERALL MEDIAN			-47.44%	50.9%	4.7x	337	\$42,989

Source: Bloomberg L.P.

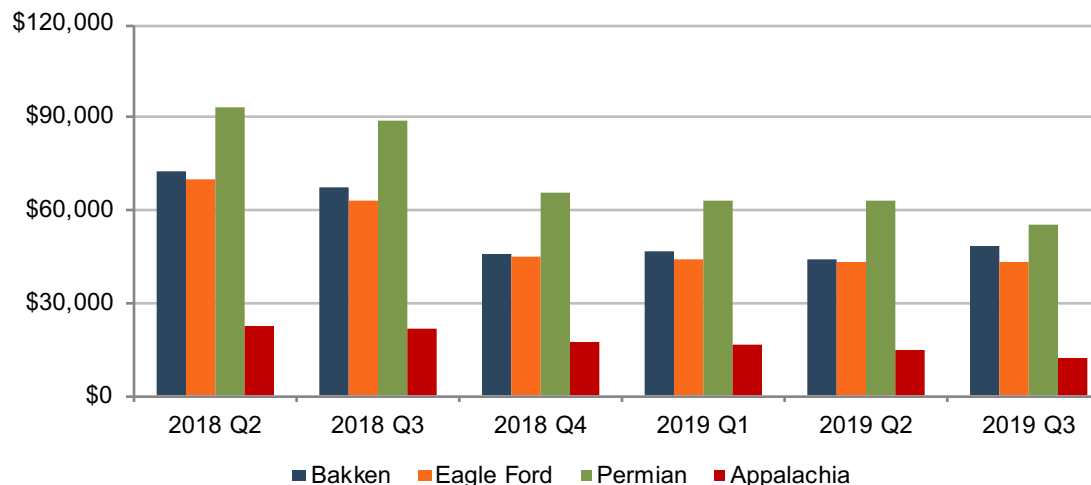
- Price per Flowing Barrel is EV/daily production (\$/boe/d)
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Appendix A

Selected Public Company Information

The following graph depicts the median of EV/production multiples, also known as price per flowing barrel, at the end of the past six quarters. As has been the case for some time now, operators in the Permian continue to lead the other regions in terms of valuation. However, this gap has narrowed. The Bakken is the only basin covered that saw an increase (8%) in its price per flowing barrel, with Appalachia, the Permian, and Eagle Ford declining 16%, 12%, and 1%, respectively. Low commodity prices have negatively impacted operators regardless of region, as all four basins have seen a decline in price per flowing barrel in the range of 34% to 46% since Q2 2018.

Price per Flowing Barrel



Source: Bloomberg

- Price per Flowing Barrel is EV/ daily production (\$/boe/d)
- This is simply a graphic depiction of median figures of our selected public companies for each region. This should be interpreted solely in the context of relative valuation between the various basins over time. Bloomberg aggregates this raw data, and Mercer Capital does not represent or warrant these figures as indicative of valuation multiples attributable to E&P companies or other interests.

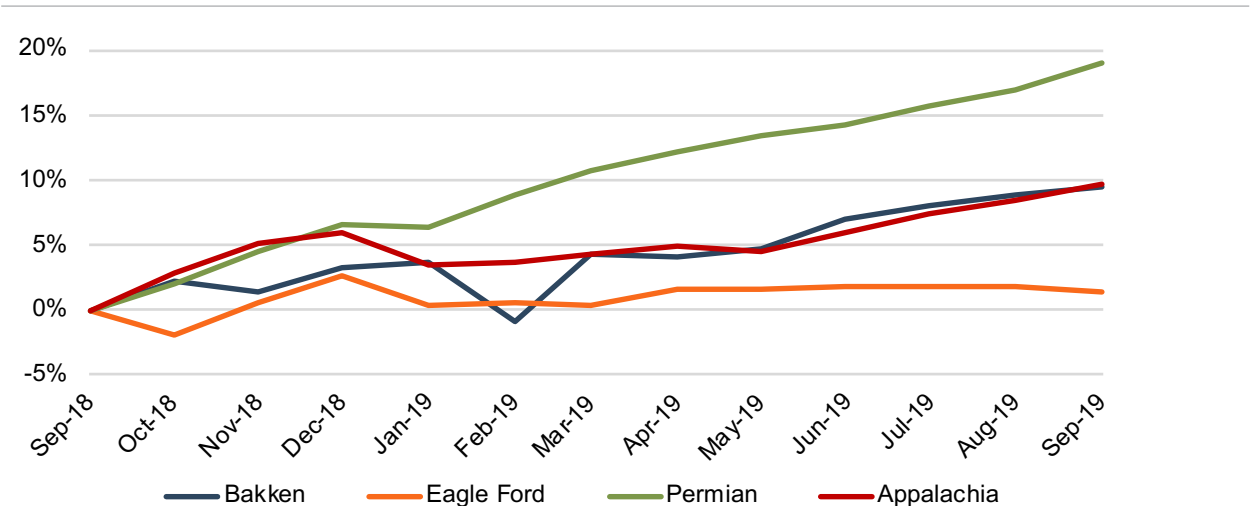
Appendix B

Production

The Bakken has also seen the biggest gain in new-well production per rig relative to our other coverage basins. While this metric doesn't cover the full life cycle of a well, it is a signal of the increasing efficiency of operators in the area. New-well production per rig in the Bakken increased 29% on a year-over-year basis through September, compared to increases of 2%, 12%, and 7% in the Eagle Ford, Permian, and Appalachia, respectively.

Bakken production (mboe/d) grew approximately 10% year-over-year through September. While this growth rate lags behind the Permian, it is in line with production growth in Appalachia and meaningfully bests the Eagle Ford. The Bakken produces the least natural gas of these basins, and its natural gas production increased 16.2% in the past year, trailing only the Permian. Similarly, Appalachia's minimal crude oil production increased 14.5% in the past year, the majority of which occurred in Q3.

1-Year Change in Production

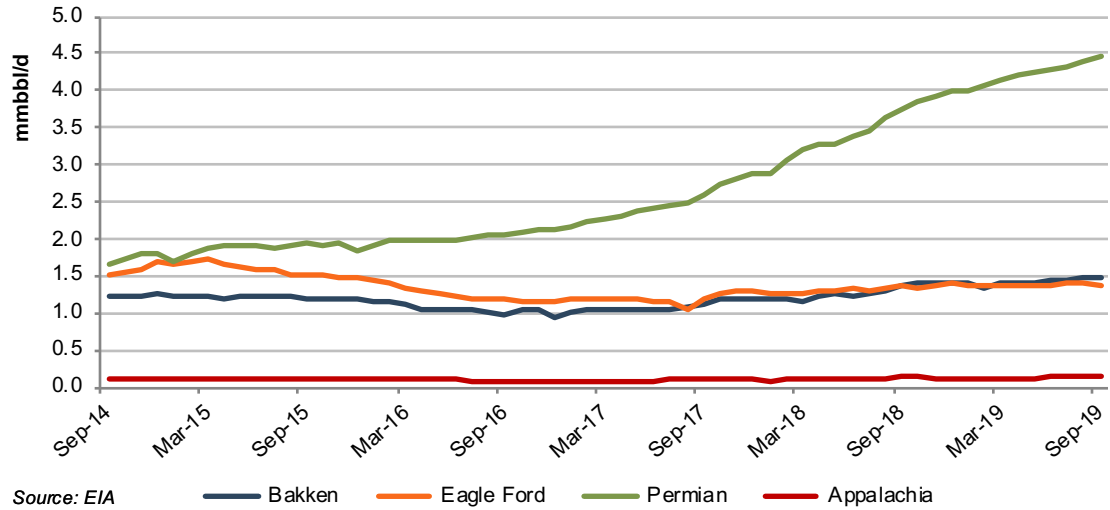


Source: EIA

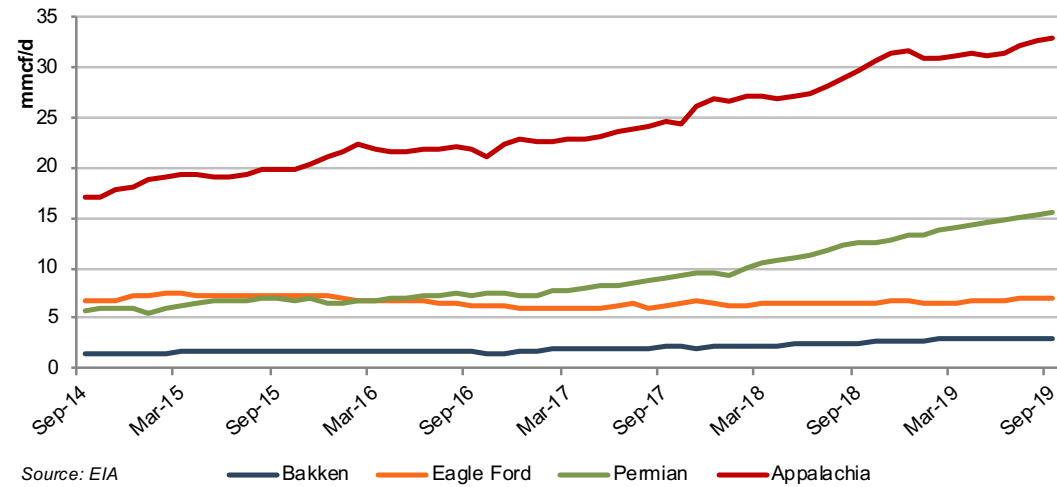
Appendix B

Production

Daily Production of Crude Oil



Daily Production of Natural Gas



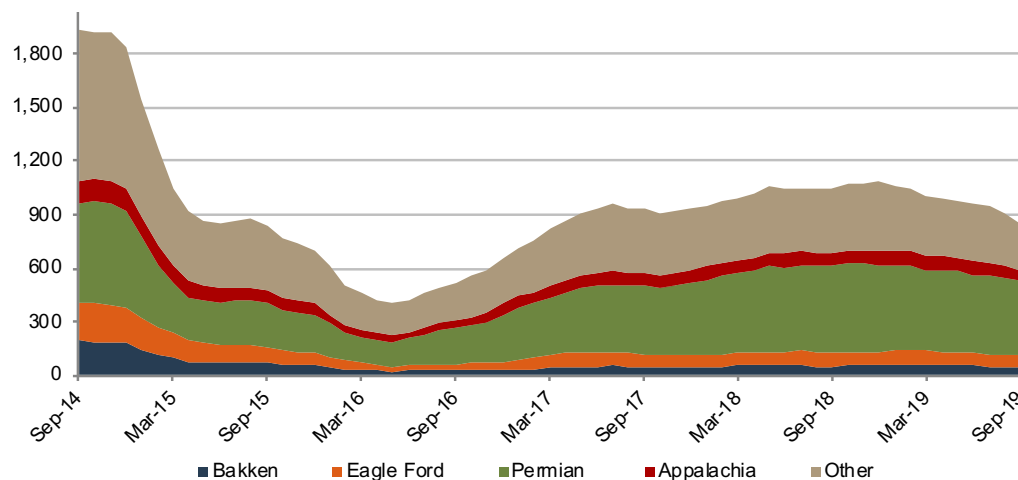
Appendix B

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 September 30, 2019 stood at 859, an 11.1% decrease from June 30, and an 18.3% decline from September 2018. Activity was down across the board in Q3. The rig count in the Bakken at the end of September was unchanged from the year prior at 53. While not impressive at first glance, all other basins saw declines; Eagle Ford, Permian, and Appalachia rig counts declined 22%, 15%, and 16%, respectively. This trend is largely expected to continue through the end of 2019 as E&P operators are increasingly focused on not overrunning their capex budgets to appease investors. This became an issue last year when operators outspent their budgets as prices rose through the first three quarters of 2018. However, there is less of an incentive this year with commodity prices remaining under \$60/barrel. To meet budget constraints and keep production growth, operators continue to work through DUC's which continue to play a more prominent role as a measure of activity over purely looking at rig counts.

Rig Count by Region



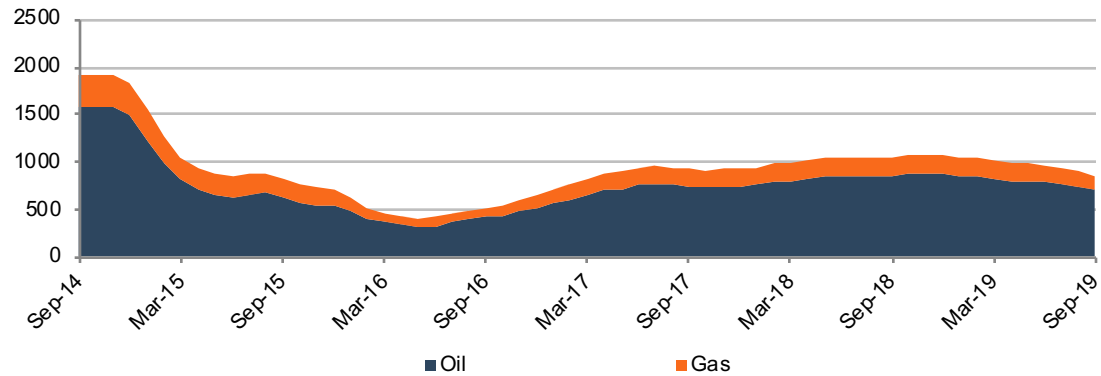
Source: Baker Hughes

¹ Calculations based on monthly crude oil and gas production and EIA drilling report by region.

Appendix B

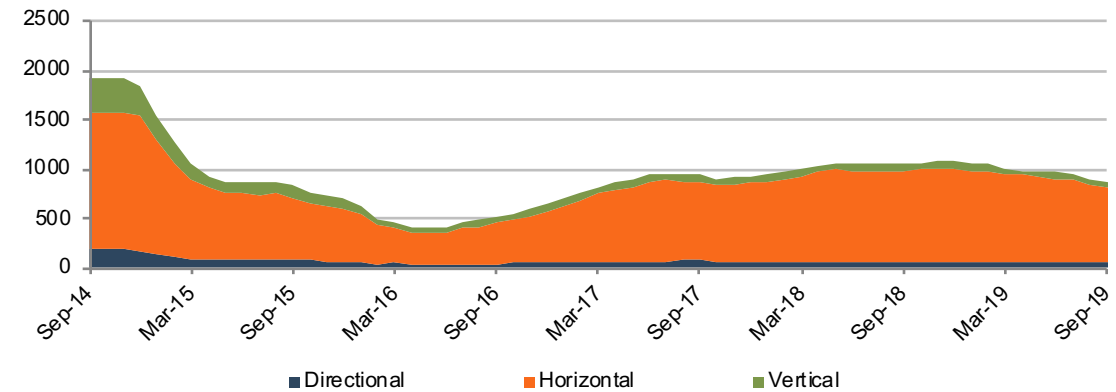
Rig Count

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



Source: Baker Hughes

U.S. Rig Count by Trajectory



Source: Baker Hughes



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