The 18th Annual Energy Conference **Recap**

Simmons & Company International® Energy Specialists of Piper Jaffray®

Piper Jaffray does and seeks to do business with companies covered in its research reports. As a result, investors should be aware that the firm may have a conflict of interest that could affect the objectivity of this report. Investors should consider this report as only a single factor in making their investment decisions. This report should be read in conjunction with important disclosure information, including an attestation under Regulation Analyst Certification, found at the end of this report or at the following site: http://www.piperjaffray.com/researchdisclosures.

Participants

REFINING PANEL

Jeff Dietert
VP, Investor Relations
Phillips 66 (PSX)

Kevin Mitchell
EVP Finance & CFO
Phillips 66 (PSX)

LARGE CAP E&P PANEL

John Christmann
CEO
Apache Corporation (APA)

Dave Stover
Chairman, President & CEO
Noble Energy, Inc. (NBL)

Timothy Dove
CEO
Pioneer Natural Resources (PXD)

GLOBAL OILFIELD SERVICES PANEL

Vicente Reynal
CEO
Gardner Denver Holdings, Inc. (GDI)

David Dunlap
President & CEO
Superior Energy Services (SPN)

Karl Blanchard
EVP & Chief Operating Officer
Weatherford International plc (WFT)

NATURAL GAS PANEL

Dan Dinges
Chairman, President & CEO
Cabot Oil & Gas (COG)

Michael Moore
CEO
Gulfport Energy Corp (GPOR)

Ray Walker
Chief Operating Officer
Range Resources Corporation (RRC)

PROPPANT & LOGISTICS PANEL

Laura Fulton
CFO
Hi-Crush Partners LP (HCLP)

Lee Beckelman
CFO
Smart Sand, Inc. (SND)

Greg Lanham
CEO & Director
Solaris Oilfield Infrastructure, Inc. (SOI)

DIVERSIFIED OIL SERVICES

Mark Cashiola
CFO
C&J Energy Services (CJ),

Cindy Taylor
President & CEO
Oil States International (OIS)

Holli Ladhani
President & CEO
Select Energy Services, Inc. (WTTR)

PERMIAN BASIN PERSPECTIVES

Mike Hollis
President
Diamondback Energy (FANG)

Zane Arrott
Co-Founder & Chief Operating Officer
RSP Permian (RSPP)

Dale Redman
CEO
ProPetro Holding Corp.

DEEPWATER OUTLOOK

Helge Haldorsen
VP, IR
Statoil ASA (STO)

Terry Bonno
SVP, Industry & Community Relations
Transocean Ltd. (RIG)

FIRESIDE DISCUSSIONS

Jeff Miller
CEO
Halliburton Company (HAL)

Clay Williams
Chairman, President & CEO
National Oilwell Varco (NOV)

Billy Helms
Chief Operating Officer
EOG Resources, Inc. (EOG)

Mark Little
Chief Operating Officer
Suncor Energy Inc. (SU)

MULTI-PLAY E&P PANEL

Kevin Lafferty
SVP, US Operations
Devon Energy Corp. (DVN)

Larry Massaro
EVP & CFO
Newfield Exploratin Company (NFX)

Clay Gaspar
President & Chief Operating Officer
WPX Energy (WPX)

SMID-CAP SERVICE PANEL

Fernando Aguilar
President & CEO
Calfrac Well Services, LTD (CFW CN)

Carey Ford
SVP & CFO
Precision Drilling Corporation (PDS)

Darron Anderson
President & CEO
Ranger Energy Services, Inc. (RNGR)

CONCLUSION

The following recap from our recent energy conference is comprised of our top ten takeaways from this year's gathering, plus 15 to 20 additional observations/data points we found noteworthy.

As a general observation, while industry protagonists are optimistic about durable, secular growth, they are also, increasingly, operationally stretched from the rigors of prosecuting the continuing industrial transformation of the domestic energy industry. The secular reality is that the depth and breadth of the domestic unconventional resource base is prodigious, while the cyclical verity is a depleted labor pool and stretched upstream value chain. Breadth and depth of resource vs. wherewithal to deliver colossal growth – this remains the most prominent tension characterizing the forward path for US production.

With respect to investors, energy specialists are increasingly optimistic about market balances for oil, and the concurrent evolution in E&P capital allocation, while generalists remain resistant to committing incremental capital to energy due to volatility, systemic underperformance and complexity. The biggest source of investor mystification is the continued divergence between crude net length exposure, which is close to an all-time high, and energy equity weightings, which are close to a century low.

Finally, we extend our profound thanks to those who attended this year's conference and contributed to an exceedingly stimulating week in discussing the key issues confronting the energy industry.

1. Upstream Value Chain, Particularly Labor, Is Much Tighter than Appreciated: Virtually every single corporate participant at this year's conference expressed that the labor tightness remains unyielding and housing in the Permian remains at critically unaccommodating levels (more under "Additional Observations" below). Understanding the cyclical constraints is critical in formulating a plausible path for L48 production growth. While the domestic resource base remains vast and prolific, the tightness of the value chain will likely lead, in our estimation, to increased operational and cost friction. Interestingly, the Permian industry leadership, through the recently established Strategic Permian Partnership, is collaborating and brainstorming about resolving the singular challenge confronting the industry – the likelihood of drilling 110,000 horizontal wells over the next several years, with a depleted labor pool, an acute housing shortage (only 200 houses currently for sale in Midland), a woefully inadequate school system, stretched healthcare delivery and exceedingly taxed infrastructure. The contest and collision between the cyclical and the secular is amplifying.

2. 2018 will be the Year of Differentiation: Last year FANG authored the aphorism of the year by synthesizing 2017 as the "The Year of the Stumble" in characterizing the industry's operational challenges. This year FANG expects more of the same due to the tightness in the value chain. Thus, we are drawn to PUMP's characterization of 2018 as "The Year of Differentiation" – the difference between those who can execute and those who can't is likely to be acutely manifested this year. RSPP characterized 2018 as "The Year of Execution."

Bill Herbert
Sr. Research Analyst, Piper Jaffray & Co.
+1 713 546-7203
william.a.herbert@simmonspjc.com

Guy Baber
Sr. Research Analyst, Piper Jaffray & Co.
+1 713 546-7201
guy.a.baber@simmonspjc.com

John Daniel
Sr. Research Analyst, Piper Jaffray & Co.
+1 713 546-7215
john.m.daniel@simmonspjc.com

Kashy Harrison, CPA
Sr. Research Analyst, Piper Jaffray & Co.
+1 713 546-7330
kashy.o.harrison@simmonspjc.com

David Kistler
Sr. Research Analyst, Piper Jaffray & Co.
+1 713 546-7237
david.w.kistler@simmonspjc.com

Ian Macpherson
Sr. Research Analyst, Piper Jaffray & Co.
+1 713 546-7287
ian.x.macpherson@simmonspjc.com

John Watson
Sr. Research Analyst, Piper Jaffray & Co.
+1 713 546-7256
john.h.watson@simmonspjc.com

Buddy Alpaugh
Research Analyst, Piper Jaffray & Co.
+1 713 546-7253
buddy.b.alpaugh@simmonspjc.com

William Alpaugh
Research Analyst, Piper Jaffray & Co.
+1 713 546-7261
william.r.alpaugh@simmonspjc.com

Tyler Bradshaw
Sr. Research Analyst, Piper Jaffray & Co.
+1 713 546-7294
tyler.m.bradshaw@simmonspjc.com

INDUSTRY RISKS

Oil prices are influenced by a wide array of variables including: 1) Global GDP and demand prospects, 2) Central bank influences impacting F/X, 3) OPEC supply, 4) Non-OPEC supply, and 5) Geopolitical risks.

3. Wide-Range of E&P Capital Allocation Agendas: While balance and calibration has become fashionable amongst the leading lights of publicly traded E&Ps, private equity sponsored enterprises are living well outside of cash flow due to the need to display operational delivery of cash flows. Moreover, PE sponsored entities are a considerably more prominent driver of domestic activity than many may imagine. Energy PE stalwart EnCap, for example, has 26 rigs running today (and rising).

4. Scale and Scope Yields Advantaged Execution: With an increasingly constrained upstream value chain, operators and service companies alike highlighted that scale and scope of operations are leading to differentiated support from service companies and more seamless execution vs. smaller companies which are in the early stages of developing their assets. With respect to service, winners will be either: 1) biggest-of-breed execution machines able to leverage scale and possess a mastery of logistics and supply chain and provide a suite of value-added solutions, or 2) acutely focused smaller/specialist enterprises able to provide exceptional, low-cost execution and service and whose local knowledge and long-standing relationships result in meaningful barriers to entry with regard to being displaced.

5. Maintenance Capital Spending is Rising: Given the relentless, and increasing, service and capital intensity, maintenance capital spending required to field a frac fleet has risen demonstrably since peak 2014. SPN's maintenance cap ex to field 750k HP is $70-100M (as much as ~45% of this year's capital spending budget) – considerably higher than in 2014. Meaningfully increased requirements in order to stand in the same place, let alone move forward, was a comprehensively recurring theme from this conference.

Billy Helms, COO, EOG Resources, Inc.

Jeff Miller, CEO, Halliburton Company (HAL)

6. Frac Pricing – Highly Variable: The mythology on Wall Street is that pricing is uniform. The reality is that it is highly variable. Discounted providers are witnessing commendable convergence with leadership pricing. The rate of change regarding leadership pricing has slowed and pricing is only expected to modestly improve from current levels. Accordingly, the primary driver of leadership margins from this point forward is expected to be utilization and technology.

7. M&A – Limited Appetite for Big Deals: Consistent refrain across almost all the energy sub sectors – companies have limited appetite for big deals due to valuation and integration complexity. Plenty of ongoing appetite for tuck-in deals but valuation is a challenge. The exception appeared to occur amongst the gas levered E&Ps. With multiple E&P's trading below proved reserves, and striving to reduce unit costs in order to adapt to current commodity prices and realizing the benefits of increased scale, as well as benefiting from a more rational industry structure due to less fragmentation, there appears to be a higher probability within Appalachia of consolidation.

8. Refining – 2018 Expected to be Best Year in last 2 to 3 years: The macro refining outlook is the most constructive it has been in the last the last few years. A combination of tailwinds include: 1) tax reform related cash flow benefits, 2) strong global demand due to synchronized global economic growth, 3) improved global manufacturing, 4) well-behaved refined product inventories relative to demand levels (especially for distillate), 5) accommodating export optionality, and 6) reasonably accommodating crude differentials. Canadian heavy differentials, in particular, are expected to remain wider for longer, while tightening fuel specifications (IMO 2020) materially enhance the medium-term outlook – especially for heavy distillate producers and highly complex refiners. Crude export capacity out of the Gulf Coast is expected to continue to grow over time (max crude export capability may be 3 MBD currently) important for domestic oil pricing and the US crude oil inventory trend.

Source: Macro - Energy: Key Takeaways from Simmons/Piper Jaffray Las Vegas Energy Conference Industry Note - March 4, 2018

9. Deepwater Major Project Economics Have Improved Dramatically, but Protagonists Remain Disciplined: Offshore major project economics have improved to a greater degree than expected over the last few years, with much of these advancements structural in nature (STO major project break-even of $21/bbl for next generation portfolio). The offshore outlook is therefore improved, with panelists cautiously optimistic on the forward activity outlook in the North Sea, Gulf of Mexico (US & Mexico), and Brazil. Yet despite improved economics and better spot oil prices, operators remain laser-focused on continuing to drive down costs. Thus, the pace of new sanctions could be measured.

10. Investor Sentiment – Energy Specialists Increasingly Bullish, Generalists are Indifferent: Energy specialists are becoming increasingly bullish due to their expectation that L-48 production growth will moderate due to cyclical constraints and the convergence with the reset in global long cycle production – against a backdrop of improved prospects for ongoing OPEC/Russian rational guardianship, stronger global economic growth, and elevated geopolitical risk and civil unrest (see Venezuela). This thesis, however, needs to play out in order to galvanize generalists, who are in show-me mode due to a high level of energy complexity, extreme equity volatility in recent weeks, and sustained relative underperformance. There is continued mystification over max net long crude exposure and eviscerated energy equity weightings.

ADDITIONAL OBSERVATIONS

1. Permian Secular Growth Agenda: The Permian Strategic Partnership is comprised of eight of the leading operators (PXD, OXY, et al) and two of the top service companies in the Permian Basin. PXD's CEO revealed that over the next several years, 110,000 horizontal wells are expected to be drilled in the Permian Basin. Mr. Dove's expectation for YE'18 vs. YE'17 industry basin production growth is at least 720 to 840 KBD or 60 to 70 KBD/month.

2. Permian Challenges – Housing: Housing remains critically unaccommodating – currently only ~200 houses currently for sale in Midland. Increasingly, the upstream value chain is importing human capital on two weeks on/one week off rotations – expensive as well as inefficient.

Dave Kistler, Sr Research Analyst, Piper Jaffray & Co.
Timothy Dove, President & CEO, Pioneer Natural Resources
Dave Stover, Chairman, President & CEO, Noble Energy, Inc.

3. Permian Challenges – Labor: We've written repeatedly that the current Midland unemployment rate of 2.5%, hovering at all time low, converging with the secular increased call on US oil production presents an unprecedented challenge for the domestic energy industry. Virtually every single company at this year's conference identified labor as a critical and growing constraint. A few SMID service companies at this year's conference revealed that their human capital onboarding needs in the Permian are averaging +100/month – extrapolate this well beyond this subset, the constraints we've been highlighting migrate from an abstraction to a tangible reality/constraint.

4. Permian Challenges – Quality of Local Schools: The Midland school system, according to a leading upstream employer in the state, ranks amongst the worst in the state. Accordingly, convincing families to move to Midland is difficult due to the inadequacy of the education system.

5. Midland Basin Downspacing Limitations: According to RSPP, vertical/horizontal spacing beneath 400 ft results in well-performance degradation. Specific to RSPP, the company tested 350' to 400' spacing and experienced 6% to 7% degradation of well performance in some of the wells. Accordingly, RSPP will develop the Spraberry formation with 10 to 12 wells and has backed off 14 wells within that zone.

Source: Macro - Energy: Key Takeaways from Simmons/Piper Jaffray Las Vegas Energy Conference Industry Note - March 4, 2018

Bill Herbert, Sr. Research Analyst, Piper Jaffray & Co.
Clay Williams, President & CEO, National Oilwell Vacro

6. Cost Inflation Expectations: Prior to taking the impacts of the steel tariffs into considerations, the E&P's highlighted expectations of 10% to 20% cost inflation during 2018. Our multi-play panel highlighted expectations of stronger inflation in the Permian vs. other basins in the country. Moreover, uniformly, virtually every service provider with operations in multiple basins admitted that the Permian is their least efficient basin – while pricing is strongest in the Permian, margins are not.

7. Steel Tariffs Impact to E&Ps: The steel tariffs are primarily expected to impact tubulars. Based on commentary from one of our panelists and EOG's current presentation, tubulars currently represent ~10% of the well cost.

8. Investor STACK Sentiment: Poor following the Q4 earnings season given questions surrounding the appropriate spacing for development and resulting per well EUR's. Accordingly, all eyes will be on DVN's 24-well Showboat pilot (3 Meramec; 1 Woodford) which is expected to come online in Q2'18.

9. Frac Sand Pricing: Public players continue to expect delays in the Permian and forecast additional price increases in 1H'18 followed by flattish pricing in 2H'18, despite the wave of inbasin capacity additions projected.

10. Rail Delays: Since they operate a rental business model, last mile players will not be affected in the same way that certain mines might be.

11. International Rig Tenders – Beginning to Slowly Revive: Long-awaited international rig tenders, which have been characterized as long on optionality and dormant on pull-through, are finally beginning to awaken.

12. Offshore Rig Newbuilds – ~Permanently Impaired: Barring a few one-off harsh environment newbuilds, notwithstanding the resurgence in Brent, the outlook for offshore rig newbuilds is essentially permanently impaired due, in part, to the shift in capital allocation away from DW and, more importantly, the overhang of idle rigs.

13. Offshore Rig Reactivations – Percolating: While newbuilds are seemingly dead, 2018 should be decent year for rig reactivations due to the resurgence in Brent.

14. Best Behaved International Markets in 2018 other than the ME: Argentina, Norway, Russia.

15. Weakest Int'l Markets: AP, SA.

16. Int'l Pricing: Corrosive.

17. Int'l Revenue Growth: Activity gains are expected to be largely offset by savage pricing. Thus, overall revenue growth for larger cap service is expected to be only grudgingly (low-to-mid single digits) higher y/y in 2018.

Kevin Mitchell, EVP Finance & CFO, Phillips 66
Jeff Dietert, VP, Investor Relations, Phillips 66

Source: Macro - Energy: Key Takeaways from Simmons/Piper Jaffray Las Vegas Energy Conference Industry Note - March 4, 2018

Source: Macro - Energy: Key Takeaways from Simmons/Piper Jaffray Las Vegas Energy Conference Industry Note - March 4, 2018

IMPORTANT RESEARCH DISCLOSURES

Notes: The boxes on the Rating and Price Target History chart above indicate the date of the fundamental Equity Research Note, the rating and the price target. Each box represents a date on which an analyst made a change to a rating or price target, except for the first box, which may only represent the first Note written during the past three years.

Legend:
I: Initiating Coverage
R: Resuming Coverage
T: Transferring Coverage
D: Discontinuing Coverage
S: Suspending Coverage
OW: Overweight
N: Neutral
UW: Underweight
NA: Not Available
UR: Under Review

Distribution of Ratings/IB Services
Piper Jaffray

			IB Serv./Past 12 Mos.	
Rating	**Count**	**Percent**	**Count**	**Percent**
BUY [OW]	395	58.52	107	27.09
HOLD [N]	259	38.37	24	9.27
SELL [UW]	21	3.11	0	0.00

Note: Distribution of Ratings/IB Services shows the number of companies currently covered by fundamental equity research in each rating category from which Piper Jaffray and its affiliates received compensation for investment banking services within the past 12 months. FINRA rules require disclosure of which ratings most closely correspond with "buy," "hold," and "sell" recommendations. Piper Jaffray ratings are not the equivalent of buy, hold or sell, but instead represent recommended relative weightings. Nevertheless, Overweight corresponds most closely with buy, Neutral with hold and Underweight with sell. See Stock Rating definitions below.

Analyst Certification — Bill Herbert, Sr. Research Analyst
— Guy Baber, Sr. Research Analyst
— John Daniel, Sr. Research Analyst
— Kashy Harrison, CPA, Sr. Research Analyst
— David Kistler, Sr. Research Analyst
— Ian Macpherson, Sr. Research Analyst
— John Watson, Sr. Research Analyst

The views expressed in this report accurately reflect my personal views about the subject company and the subject security. In addition, no part of my compensation was, is, or will be directly or indirectly related to the specific recommendations or views contained in this report.

Piper Jaffray research analysts receive compensation that is based, in part, on overall firm revenues, which include investment banking revenues.

Time of dissemination: 4 March 2018 18:00EST.

Affiliate disclosures: Piper Jaffray is the trade name and registered trademark under which the corporate and investment banking products and services of Piper Jaffray Companies and its subsidiaries Piper Jaffray & Co. and Piper Jaffray Ltd. are marketed. Simmons & Company International is a division of Piper Jaffray & Co. This report has been prepared by Piper Jaffray & Co. and/or its affiliate Piper Jaffray Ltd. Piper Jaffray & Co. is regulated by FINRA, NYSE and the United States Securities and Exchange Commission, and its headquarters are located at 800 Nicollet Mall, Minneapolis, MN 55402. Piper Jaffray Ltd. is authorized and regulated by the Financial Conduct Authority, and is located at 88 Wood Street, 13th Floor, London EC2V 7RS. Disclosures in this section and in the Other Important Information section referencing Piper Jaffray include all affiliated entities unless otherwise specified.

Rating Definitions

Stock Ratings: Piper Jaffray ratings are indicators of expected total return (price appreciation plus dividend) within the next 12 months. At times analysts may specify a different investment horizon or may include additional investment time horizons for specific stocks. Stock performance is measured relative to the group of stocks covered by each analyst. Lists of the stocks covered by each are available at www.piperjaffray.com/researchdisclosures. Stock ratings and/or stock coverage may be suspended from time to time in the event that there is no active analyst opinion or analyst coverage, but the opinion or coverage is expected to resume. Research reports and ratings should not be relied upon as individual investment advice. As always, an investor's decision to buy or sell a security must depend on individual circumstances, including existing holdings, time horizons and risk tolerance. Piper Jaffray sales and trading personnel may provide written or oral commentary, trade ideas, or other information about a particular stock to clients or internal trading desks reflecting different opinions than those expressed by the research analyst. In addition, Piper Jaffray offers technical and event-driven research products that are based on different methodologies, may contradict the opinions contained in fundamental research reports, and could impact the price of the subject security. Recommendations based on technical or event-driven analysis are intended for the professional trader, while fundamental opinions are typically suited for the longer-term institutional investor.

- **Overweight (OW):** Anticipated to outperform relative to the median of the group of stocks covered by the analyst.
- **Neutral (N):** Anticipated to perform in line relative to the median of the group of stocks covered by the analyst.
- **Underweight (UW):** Anticipated to underperform relative to the median of the group of stocks covered by the analyst.

Other Important Information

The material regarding the subject company is based on data obtained from sources we deem to be reliable; it is not guaranteed as to accuracy and does not purport to be complete. This report is solely for informational purposes and is not intended to be used as the primary basis of investment decisions. Piper Jaffray has not assessed the suitability of the subject company for any person. Because of individual client requirements, it is not, and it should not be construed as, advice designed to meet the particular investment needs of any investor. This report is not an offer or the solicitation of an offer to sell or buy any security. Unless otherwise noted, the price of a security mentioned in this report is the market closing price as of the end of the prior business day. Piper Jaffray does not maintain a predetermined schedule for publication of research and will not necessarily update this report. Piper Jaffray policy generally prohibits research analysts from sending draft research reports to subject companies; however, it should be presumed that the fundamental equity analyst(s) who authored this report has had discussions with the subject company to ensure factual accuracy prior to publication, and has had assistance from the company in conducting diligence, including visits to company sites and meetings with company management and other representatives.
Notice to customers: This material is not directed to, or intended for distribution to or use by, any person or entity if Piper Jaffray is prohibited or restricted by any legislation or regulation in any jurisdiction from making it available to such person or entity. Customers in any of the jurisdictions where Piper Jaffray and its affiliates do business who wish to effect a transaction in the securities discussed in this report should contact their local Piper Jaffray representative, or as otherwise noted below. **Canada:** This research report is distributed in Canada by CIBC World Markets Inc. Investors in Canada wishing to effect a transaction in the securities discussed in this report should contact their CIBC sales representative. This research report has not been prepared in accordance with the disclosure requirements of Dealer Member Rule 3400 – Research Restrictions and Disclosure Requirements of the Investment Industry Regulatory Organization of Canada. For further disclosure related to CIBC conflicts of interest please visit https://researchcentral.cibcwm.com. **Europe:** This material is for the use of intended recipients only and only for distribution to professional and institutional investors, i.e. persons who are authorised persons or exempted persons within the meaning of the Financial Services and Markets Act 2000 of the United Kingdom, or persons who have been categorised by Piper Jaffray Ltd. as professional clients under the rules of the Financial Conduct Authority. **United States:** This report is distributed in the United States by Piper Jaffray & Co., member SIPC, FINRA and NYSE, Inc., which accepts responsibility for its contents. The securities described in this report may not have been registered under the U.S. Securities Act of 1933 and, in such case, may not be offered or sold in the United States or to U.S. persons unless they have been so registered, or an exemption from the registration requirements is available.
This report is produced for the use of Piper Jaffray customers and may not be reproduced, re-distributed or passed to any other person or published in whole or in part for any purpose without the prior consent of Piper Jaffray & Co. Additional information is available upon request.
Copyright 2018 Piper Jaffray. All rights reserved.

simmonspjc.com

Since 1895. Member SIPC and NYSE. © 2018 Piper Jaffray & Co. 3/18 CM-18-0211