Perspectives on Oil & Gas Reserve Due Diligence and Technical Evaluation by Capital Providers

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E&P Sector Capital Providers
Reserve Based Finance Continuum

Various financing tools are available to E&P companies throughout their full life cycle.
An E&P company whose assets are in the exploration and/or appraisal phases is typically equity funded.

- **Focus on Management Team**
  - Relationship based
  - Track record

- **Growth Objective**
  - Sources and magnitude of upside
  - Likelihood of upside realization
  - Risk factors, correlation, joint probabilities
  - Downside scenarios

- **Control**
  - Voting rights

- **Governance**
  - Board composition

- **Exit Strategy**
  - 5 to 10 year investment horizon
  - A variety of rights with respect to liquidity and/or sale
Secured Bank Debt

At some point during the development phase of its assets, an E&P company would be able to obtain secured bank debt. The capital structure would then comprise of a combination of secured bank debt and common equity.

- In the United States, lenders employ a Reserve Based Loan (“RBL”) structure for offering secured bank debt
  - Secured with 1st lien mortgages on proved reserves
  - Negative pledge on all other assets
  - Total leverage (debt to ebitda) < 3x
  - Requirements for commodity hedging and balance sheet liquidity
  - Interest rate typically in the range of 2% to 4% over LIBOR
  - 3 to 5 year tenor

- Reliable Source of Capital
  - Loans syndicated to experienced participants in a large bank market

- Illustrative Borrowing Base (“BB”) Parameters
  - Advance Rates: PDP 65%, PDNP 45%, PUD 25% subject to a limit on non-PDP contribution to BB
  - Computation takes into account roll-off period, reduction for sub debt, and price hedges

- Periodic Borrowing Base Redeterminations
  - PDP focused analysis
  - Typically semi-annual redetermination
  - Balance sheet liquidity critically important
  - 100% lender consent required for an increase in the Borrowing Base

• Discussed on the previous slides
Leveraged Finance

Seeking balance between business growth and cost of funds, E&P managers find the Leveraged Finance ("LevFin") markets to be an attractive source of capital for subordinated debt.

- **Secured Bank Debt**
  - Discussed on the previous slides

- **Unsecured Bonds**
  - Greater disclosure requirements
    - Historical audited financials
  - Minimum size (~$400 million)
  - 5 to 7 year tenor
  - Minimal covenants providing the greatest flexibility
  - Total leverage (debt to ebitda) < 3x
  - Split between bank and bonds is based on asset mix (producing vs. developmental)

- **2nd Lien Secured Term Loans**
  - Issuers who cannot access bond markets
  - Less disclosure but more covenants
  - More inter-creditor issues due to its secured position
  - Generally cheaper than bonds
  - Market depth has reduced since downturn

- **Uni-Tranche Secured Facilities**
  - Attractive acreage, however, with very little PDP value

- **Common Equity**
  - Discussed on the previous slides
Due Diligence Focus
Factors Banks Consider When Granting Loans

Financial Structure and Cash Flow Analysis
- Liquidity
- Sufficient capital to execute strategy
- Reliance on events or strong pricing

Asset Profile
- Diverse asset base
- Well / field concentration
- Production seasoning
- PUD limitations

Borrowing Base Analysis
- Ownership reviewed by legal counsel
- Reserves reviewed by independent consultants and in house engineer
- Loan amount based on PV 9 of proved reserves and Advanced Rate Method
- Determined by banks in their sole discretion and then re-determined every 6 months

Quality of Management and Sponsors
- Track record
- Reputation
- Access to capital
- Company strategy
- Financial reporting systems

Economic Risks
- Oil and gas price evaluated using lender’s own pricing parameters
- Hedging
- Capital program

Source: Ballard, 2018
Using a conservative approach, the Bank engineering analysis is solely based on the proved (1P) reserves with the PDP assets being its primary focus.

**Technical Due Diligence Focus – RBL**

- **Operator**
  - Comfort with the management team

- **Production**
  - Do the forecasted rates tie with historical rates? If not, what explains the difference?
  - Is the production history sufficient for the new wells? Does the portfolio have significant value concentrations?

- **Product Prices**
  - Use of an approved bank price deck and the hedge book

- **Basis Differentials**
  - Do the forecasted differentials tie with historical differentials? If not, what explains the difference?

- **Operating Costs**
  - Do the forecasted costs tie with historical costs? If not, what explains the difference?
  - Treatment of costs associated with uneconomic or non-commercial wells

- **Capital Costs**
  - Past performance versus AFE
Equity evaluation is more comprehensive and includes an analysis of both the magnitude and the likelihood of upside / downside scenarios.

**Operator**
- Corporate and field office personnel/capabilities
- Field communication, data feeds, software packages
- Joint operating agreements (“JOA”) and the ongoing management of relationships with working interest partners and surface owners

**Oil & Gas Assets**
- Detailed evaluation of geological and geophysical (“G&G”) data
- Leasing, acreage acquisitions/trades
- Lease expiration schedule, pooling, unitization, farm-in, farm-out, right of way
- Oilfield services/equipment availability, contracting, and project management

**Sales and Hedging**
- Midstream strategy with detailed plans
- Transport and capacity issues
- Offtake arrangements
- Hedging strategy for non-PDP assets

**Other**
- Environmental; Insurance; Performance bonds
- Legal impacting reserves/value (carried interests, reversionary interests, preferential purchase rights, non-competes)
- Ongoing strategic evaluation of assets for acquisitions and divestitures (“A&D”)

*Source: Devashish, 2014; SPE-169858-MS*
Positioning of Capital Providers in the Investment Space

- **High IRR**: Common Equity
- **Medium IRR**: Leveraged Finance
- **Low IRR**: RBL

**Cash Flow Producing Risk** | **Development Risk** | **Exploration Risk**

*Source: Homier, 2008 includes author's changes*
Due Diligence Focus Shifts and Expands Based on Investment Attributes

Source: Homier, 2008 (After Zorich) includes author's changes
Update on Reserve Based Lending
**Structural Enhancements from Lessons Learned**

As a result of lessons learned from the downturn and credit challenge, banks have enhanced Credit Agreements to be more Lender friendly and Regulator compliant.

| Security | • Increase in the mortgage percentage to 85 to 95%  
|          | • Inclusion of Deposit Account Control Agreements  
|          | • Inclusion of Anti Cash Hoarding |

| Proforma Structure | • Maximum leverage < 4.0x  
|                    | • Opening Leverage 2.0 - 2.5x  
|                    | • Opening Liquidity of 15 - 20%  
|                    | • Minimum Equity checks of 50%  
|                    | • Minimum initial Hedging of 3 - 5 years at 80 - 95% of estimated production |

| Restricted Payments | • Tighten constraints on distribution, based on leverage (< 2.5 – 2.75x) and liquidity (> 15 – 20% availability of borrowing base) |

*Source: Ballard, 2018*
### Considerations for Leverage

**Historical Leverage**
- Interpretation on which EBITDA to use when measuring against the OCC’s guidance of 3.5x for a Pass credit
- Have seen the use of LTM, L6M, or LQA depending on the cash flow profile of assets, and the underlying commodity price environment

**Projected Leverage**
- Banks typically require all projected periods to be below 3.5x leverage when originating loans

**Gross vs. Net Leverage**
- Gross vs. Net Leverage is not explicitly addressed in the OCC guidance
- OCC guidance describes the leverage test as: “Total funded debt ÷ EBITDAX”

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**Source:** Ballard, 2018
Since the downturn that began in 2H 2014, systemic leverage in this sector has been reduced by 1x on average while utilization of the credit facility has remained the primary low cost capital source for liquidity and capex.

<table>
<thead>
<tr>
<th></th>
<th>Fall 2018</th>
<th>Fall 2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Utilization</td>
<td>43%</td>
<td>46%</td>
</tr>
<tr>
<td>Average Leverage</td>
<td>2.3x</td>
<td>3.3x</td>
</tr>
</tbody>
</table>

Note: 2018 leverage as of 9/30/18, 2014 leverage as of 9/30/14.

Source: Ballard, 2018
RBL Market Themes

Fall Redetermination Results

- Capital deployment / improved pricing buoyed borrowing bases on average this Fall
  - 42% of credits increased by an average of 33%
  - 36% of credits remained flat
  - 22% of credits decreased by an average of 9%
- Majority of redeterminations / new transactions completed prior to recent oil price drop
  - Benefitted from the sticky nature of bank price deck adjustments
- Select clients successfully refinanced exit-facilities into new 5 year deals at market terms, generally accompanied by a strong balance sheet and business opportunity set

Bank Market

- Bank market remains robust for well structured and regulatory compliant transactions
  - Several banks sidelined in 2016/17 came back into the market
  - Lower supply of new deals (size/number) feeding more aggressive bank behavior
  - While we estimate ~60 banks were active in the space at its peak, we believe only ~30 are actively seeking out new RBL exposure
  - Regulatory outlook remains stable
- Borrower-friendly shifts started in earnest in early 2018 – with decreases in drawn pricing, some loosening of Restricted Payments (“R/P”) baskets and lighter security package requirements

Source: Ballard, 2018
RBL Market Themes (continued)

Acquisition Financings

- Recent transactions continue to showcase conservative capital structures
  - Low / moderate leverage
  - Extensive hedging for multiple years
  - Free cash flow driven business models
- Transactions largely oversubscribed with banks committing above invite levels
  - Retail syndication participants focusing on drawn balances, ongoing hedging, growth, and capital markets activities
- Wave of upstream de-SPAC transactions demonstrate Lender willingness to support large, complex transactions with protracted commitment periods on RBL / Bridge financings

Price Deck Expectations

- Bank price decks are expected to remain sticky absent material price swings
- Current oil sentiment – 1Q19 pricing should mimic the levels and shape of the strip at a slight discount (similar to 1H17); though not discounted to the extent seen in 1H18
- Current gas sentiment – 1Q19 pricing could benefit from recent prompt year uptick, but consistency across the curve is needed for a more material upward trend

Source: Ballard, 2018
Historic Bank Price Deck vs. Forward Curve

Oil

<table>
<thead>
<tr>
<th>Quarterly % of Strip</th>
<th>Annual Avg. % of Strip</th>
</tr>
</thead>
<tbody>
<tr>
<td>75%</td>
<td>50%</td>
</tr>
<tr>
<td>($68 / $93)</td>
<td>($60 / $65)</td>
</tr>
<tr>
<td>82%</td>
<td>60%</td>
</tr>
<tr>
<td>($75 / $95)</td>
<td>($45 / $44)</td>
</tr>
<tr>
<td>86%</td>
<td>70%</td>
</tr>
<tr>
<td>($76 / $90)</td>
<td>($50 / $50)</td>
</tr>
<tr>
<td>86%</td>
<td>80%</td>
</tr>
<tr>
<td>($77 / $84)</td>
<td>($51 / $55)</td>
</tr>
<tr>
<td>95%</td>
<td>90%</td>
</tr>
<tr>
<td>($80 / $84)</td>
<td>($51 / $56)</td>
</tr>
<tr>
<td>89%</td>
<td>100%</td>
</tr>
<tr>
<td>($85 / $89)</td>
<td>($55 / $60)</td>
</tr>
</tbody>
</table>

Note: Quarterly forward curve assumes first day of quarter. Data unavailable for 2Q17 and 3Q17 as source report was not published during those quarters.

Source: Macquarie Energy Lender Price Survey.

Gas

<table>
<thead>
<tr>
<th>Quarterly % of Strip</th>
<th>Annual Avg. % of Strip</th>
</tr>
</thead>
<tbody>
<tr>
<td>86%</td>
<td>50%</td>
</tr>
<tr>
<td>($4.77 / $5.34)</td>
<td>($2.63 / $2.70)</td>
</tr>
<tr>
<td>83%</td>
<td>60%</td>
</tr>
<tr>
<td>($3.83 / $4.50)</td>
<td>($2.83 / $3.08)</td>
</tr>
<tr>
<td>86%</td>
<td>70%</td>
</tr>
<tr>
<td>($3.67 / $4.24)</td>
<td>($2.77 / $2.83)</td>
</tr>
<tr>
<td>91%</td>
<td>80%</td>
</tr>
<tr>
<td>($3.81 / $4.20)</td>
<td>($3.08 / $3.20)</td>
</tr>
<tr>
<td>96%</td>
<td>90%</td>
</tr>
<tr>
<td>($3.47 / $3.67)</td>
<td>($3.20 / $3.30)</td>
</tr>
<tr>
<td>89%</td>
<td>100%</td>
</tr>
<tr>
<td>($2.63 / $2.70)</td>
<td>($3.30 / $3.40)</td>
</tr>
</tbody>
</table>

Note: Quarterly forward curve assumes first day of quarter. Data unavailable for 2Q17 and 3Q17 as source report was not published during those quarters.

Source: Ballard, 2018
Crude Oil Forward Curve as a Predictor of Actual Price

NYMEX WTI Crude ($/Bbl)

Source: Ballard, 2018


Update on Reserve Based Lending
Natural Gas Forward Curve as a Predictor of Actual Prices

NYMEX Nat Gas ($/Btu)

Spot price as of 9/4/2018. Source: Ballard, 2018

Source: Ballard, 2018
Last Commodity Downturn

Oil and Gas Prices Dropped Precipitously after September 2014

Source: Devashish, 2016; SPE-179987-PA

Spot Price ($/Barrel) of WTI Crude Oil on Left Axis
Spot Price ($/MMBtu) of Henry Hub Natural Gas on Right Axis

Source: Devashish, 2016; SPE-179987-PA
Over a third of E&P companies lost >90% of equity value; Some Fared Well

Equity Performance of 71 Public E&P Companies Operating in the United States

Source: Devashish, 2016; SPE-179987-PA
Conclusions

Knowledge of reserve based capital providers and their due diligence focus is key to prudent E&P management

- A variety of reserve based capital sources are available to E&P companies.
  - RBL
  - Leveraged Finance
  - Common Equity

- The focus of technical due diligence shifts and expands based on the investment attributes targeted by the capital provider.
  - Bank engineering analysis is solely based on the proved (1P) reserves with the PDP assets being its primary focus
  - Leveraged finance evaluates the growth story; keeps the 1P assets as its primary focus
  - Equity analysis expands to include other reserve and resource categories

- Bank market remains robust for well structured and regulatory compliant transactions.
  - Bank price decks are expected to remain sticky absent material price swings
  - 1Q19 oil pricing should mimic the levels and shape of the strip at a slight discount
  - Debt capacity can dramatically reduce following a commodity downturn
  - By hedging production adequately, an E&P company could neutralize the adverse effect of debt on its equity value
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