Volumes and Value, a Banking Reservoir Engineer’s Perspective

Presented by:

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Senior Reservoir Engineer/Executive Director
The following opinion does not represent the opinions of BBVA and are based on my observations for US domestic Reserve Based Loans (RBL).
Which one is a better representative of the current value?

1. SEC
2. PRMS
3. 3rd Party Reserve Report
SEC Reserve Report

Fixed cost and the average of the previous 12 month prices

SEC Revision effective January 1, 2010 –

Page 1 – “The revisions are intended to provide investors with a more meaningful and comprehensive understanding of oil and gas reserves, which should help investors evaluate the relative value of oil and gas companies.”

Page 13 – “The objective of reserves estimation is to provide the public with comparable information about volumes, not fair value, of a company’s reserves available to enable investors to compare the business prospects of different companies.”
PRMS

- SPE has been at the forefront of leadership in developing common standards for petroleum reserves and resources definitions.

- SPE’s initial involvement in establishing petroleum reserves definitions began in 1962 following a plea from US banks and other investors for a consistent set of reserves definitions, that could be both understood and relied upon by the industry in financial transactions, where petroleum reserves served as collateral.

- Focused primarily on estimated recoverable sales quantities
3rd Party Quotes from Reserve Report

Estimates of oil, condensate, and gas reserves, future net revenue, and contingent resources should be regarded only as estimates that may change as further production history and additional information become available. Not only are such estimates based on that information which is currently available, but such estimates are also subject to the uncertainties inherent in the application of judgmental factors in interpreting such information.

The estimated reserves presented in this report, as of July 1, 2016, are related to hydrocarbon prices based on escalated price parameters. As a result of both economic and political forces, there is significant uncertainty regarding the forecasting of future hydrocarbon prices. The recoverable reserves and the income attributable thereto have a direct relationship to the hydrocarbon prices actually received; therefore, volumes of reserves actually recovered and amounts of income actually received may differ significantly from the estimated quantities presented in this report. The results of this study are summarized as follows.
The Real Challenge

The Proved Reserves are 200 MBOE.

Just give me what they are worth. What is the cash flow?
The RBL typically is a revolving facility secured by lower-risk proved reserves.

 Governed by a borrowing base determined by a valuation of those reserves.

 Most RBLs have a term of three to five years.

 Redeterminations typically occur semiannually.
Three C’s of Banking

1. Connection
2. Costs
3. Consistency
Connection

Historical production and the forecast rates tie

- Increasing production rates are not included in the PDP category
- Forecast on plateau should be given a high amount of scrutiny
- An established production history in order for reserves to be classified as PDP
- Evaluate wells individually as opposed to forecasting a number of wells in aggregate
SUM PLOT OF PDP HISTORICAL PRODUCTION WITH REVISED FORECAST
31% reduction in Volume
38% reduction in Value
36% reduction in PV9
PDP SUMMED HISTORICAL PRODUCTION WITH FORECAST

0.4 % reduction in Volume
2.9 % reduction in Value
2.5 % reduction in PV9
Observed Reserve Reporting

- Reliance on Type curves for forecasting
- Not updating to current production trend
- A desire for a particular outcome motivated by current situation
New area with 5 new wells
Longest production is 1 year from wells #1 & #2 with 3 months for newest well #5

20 PUD’s are booked at results from well #5 based on anticipated PUD lateral length

Do the historical production and the forecast rates tie?
Establishing current economic conditions should include relevant historical petroleum prices and associated costs and may involve an averaging period that is consistent with the purpose of the reserve estimate, appropriate contract obligations, corporate procedures, and government regulations involved in reporting the reserves.
Price differentials are calculated sales point, or by field if a common field price is received based on historical
## Product Pricing

Each Bank sets Energy Product Pricing

<table>
<thead>
<tr>
<th></th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
<th>2023</th>
<th>2024</th>
<th>Cap</th>
<th>Discount Rate</th>
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<tr>
<td><strong>Oil Price ($/BBL) - WTI</strong></td>
<td></td>
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<tr>
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<th>2024</th>
<th>Cap</th>
<th>Discount Rate</th>
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<tr>
<td><strong>Gas Price ($/MMBtu) Henry Hub</strong></td>
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<td>9.0%</td>
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</table>
Current Futures Contracts
Oil WTI Price Differentials
History – Forecast and 12 month average
Lease Operating Expenses (LOE)

- Lease Operating Expenses are calculated based on historical data provided by the borrower - LOS, 10 K or 10 Q

- The LOE projected is compared to historical values
  - Marginal or uneconomic wells that are below the economic limit are a common source of the discrepancy
  - Other reasons could include past work overs and recent acquisitions
  - Non-recurring expenses may be excluded from LOE

- LOE must tie within a tolerance of the forecasted LOE or LOE is increased to historical level
LOE tied To Forecast (PDP)

Historical & Forecasted LOE ($/Mcfe)

History
Forecast
Consistency Matters

Changing how you calculate Reserves on a regular basis is not good for forecasting, and does not give credibility to the Reserves you report.
Consistency Matters

- **PDP** – Produced what you forecasted
- **Costs** – Tie to historical
- **PUD** – conversion/results/costs
What is value?

The bank reservoir engineer’s goal is the assessment of the value and Assets Cash Flow.
The Real Challenge

The reserves are in this range

Just give me the answer
Future Net Revenue

Revenue - Sum of the estimated productive life of a proved area based on the economic limits and cash flow of the producing asset

- certain price
- cost parameters
- estimated royalties
- production costs
- development costs
- production and ad valorem taxes
- other income - Hedges
- future capex
- well abandonment
Determining value of the borrowing base

Roll forward value 6 months
PDP + Hedges $\geq 75\%$ of total value
PDNP risked $@ 25\%$
PUD Risked $@ 50\%$
= Total Risked Discounted Value

$* 65\% = \text{Borrowing Base} / \text{cash flow}$

Banks limit the contribution of undeveloped - PDNP and PUD
OCC - Office of the Comptroller of the Currency

- Asset Diversity
- Repayment of RBL
- Repayment of Total Secured Debt
- Collateral Coverage
- Liquidity
- Leverage Ratio
- Susceptibility to Price Changes
- Total Debt Coverage

# OCC Guidelines

## RBL Loan Classification Summary
Calculated from the NYMEX unrisked total cash flows

<table>
<thead>
<tr>
<th>Test</th>
<th>Test Details</th>
<th>Criticized</th>
<th>Classified</th>
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</thead>
<tbody>
<tr>
<td>Repayment RBL</td>
<td>&lt; .60 Reserve Life</td>
<td>.60 - .75 Reserve Life</td>
<td>&gt; .75 Reserve Life</td>
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<tr>
<td>Repayment Total Secured</td>
<td>&lt; .75 Reserve Life</td>
<td>.75 - .90 Reserve Life</td>
<td>&gt; .90 Reserve Life</td>
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<td>Funded Debt / EBITDAX</td>
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<td>3.5 - 4.0 X</td>
<td>&gt; 4.0 X</td>
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<tr>
<td>Funded Debt / Capital</td>
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<td>.50 - .60</td>
<td>&gt; .60</td>
</tr>
<tr>
<td>Committed Debt / Total Reserves</td>
<td>&lt; .65</td>
<td>.65 - .75</td>
<td>&gt; .75</td>
</tr>
</tbody>
</table>

- **Special Mention**: Debt <100% Risked Reserves
- **Unrisked Reserves**: Incremental Debt Above Substandard < 100% Unrisked Reserves
- **Remaining Debt**: > 100% Unrisked Reserves
Repayment of the loan with interest – This is the best possible case

The Bank Reservoir Engineer’s goal is the assessment of the value from the standpoint of protecting the bank’s interest and realizing the full value of the clients’ assets.