

APPRAISING OIL & GAS PROPERTIES

A Newsletter for Appraisal Professionals

Richard J. Miller & Associates, Inc.

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Estimating Future Product Prices

For those who can remember that far back, the last three issues of this "Sometimes and Occasional" newsletter have dealt with the discount rate - a subject that never fails to fascinate and which has the power to alter and illuminate our Time - or at least occupy a significant portion thereof. Despite the importance of the discount rate, it tends to be treated in the abstract by many people in the oil business and related activities. It is thought to be one of those esoteric subjects about which people write newsletters and learned tomes but is way down the list for everyday folks like our friend Rocky and many evaluators. On the other hand, oil prices, gas prices, and the likelihood of future change in prices have a more direct impact on people, from the wellhead to the gas pump, and are wont to be discussed in a very serious vein.

Product Prices are no abstraction - an operator who has never heard of "Present Value" understands immediately the effect of an increase or decrease in oil and/or gas price. A price that substantially exceeds the cost of production will provide funds for re-investment in additional production or for new equipment or junior's college tuition. A price that falls below production cost means a loss of income and possibly default on loans, etc. If the loss continues for too long, it means shut-in production, layoffs and one more American oil operator gone. In recent years, there has been far more of the latter than the former.

Product Prices

The oil business is not about oil; like every other business, it is about making money. In an Income Approach appraisal, the Product Price along with the production projection provides the revenue stream which is the start of the valuation process. Deduction of operating costs, royalties, and production taxes results in an income stream which determines if the property is economic. If costs exceed revenue, it has no income; the property has reached economic limit. On the other hand, if revenues exceed costs, there may be funds that can be used for capital expenditures or be set aside for abandonment. The income remaining after investment provides the cash flow from the property. This is the purpose of the exercise.

The Product Price is that which is paid or offered for the oil and gas that is produced. There are often by-products of oil and gas production including natural gas liquids (NGL), sulfur, CO₂, and helium; NGL's are common products of gas produced from oil reservoirs and can be broken down to butane, propane, et al and can be priced and projected separately if one is so disposed. Sulfur, CO₂, and helium are less common and tend to be localized within limited markets.

We will concentrate on the major products, oil and gas. This is not to diminish the value of the secondary products. They often provide marginal income that may help to lengthen economic

life but which should not have that large an impact on value. We will look first at initial prices for use in appraisal and then consider how to expand the initial price over the expected life of the property.

Initial Oil Price

The first, but not exclusive, source for initial oil price for use in an appraisal is the actual price being paid for oil from the property. Sales statements or royalty check stubs are very useful in determining oil prices and may also provide data regarding transportation charges, severance and local taxes, and any other deductions from price. Three or four years of oil sales history, including volumes, gravity, and sales amount, can provide a useful view of the revenue performance of the property.

A second source for oil price is the so-called "posted" price for oil from the property. The posted price is the price offered by buyers for crude oil from a particular field and is contained in a published list which is effective for a period of time. The posted price for a given field is primarily a function of oil gravity. A typical posted price would be \$12.00 for Kern River 13° API crude oil. The use of posted price rather than actual price may be acceptable if there are other sales options available to the property. If oil is being sold to a particular buyer but there are several other buyers available, the posted price may be a more useful reflection of market value.

The actual price paid for oil may be equal to, or very close to, the posted price if the property is located in a "posted" field or area and has a gravity equal to the posted gravity. Otherwise, the posted price can be used to estimate the price of oil for a particular property after adjustment for location and gravity. The posted price sheet usually includes an adjustment factor that allows calculation of a price for a range of oil gravities. There also may be a difference between the actual and posted prices if the oil varies in some characteristic from the posted crude, such as higher sulfur or other composition. The actual price paid on a specific property may also reflect charges such as trucking, compression or pumping, diluent separation, and dehydration that do not apply to other properties in the "posted" field.

Finally, the actual price may differ from posted price because (1) the oil is not being sold to a buyer who posts prices for the field or area, or (2) the terms of the lease require payment based on other than actual sales or posted price. It is not uncommon for a lease to specify that payment (this usually applies to royalty interests) for crude oil be based on the highest posted price in the area regardless of the price actually obtained; such leases may even specify a minimum gravity.

The comparison of actual price to posted price may be important in other regards. Some taxes, such as severance tax, are a percentage of revenue and therefore directly influenced by price. In some areas, sliding scale or incremental royalty agreements may be triggered by changes in oil price. Also, there have been, and may still be, certain income tax provisions or benefits that are functions of crude oil price. These issues would be of interest in an appraisal of a property, so an analysis of actual prices should not be overlooked.

Deductions from oil price have been briefly mentioned but deserve some further discussion. For the most part, these are charges that could be treated as operating costs in an appraisal. They

are discussed here because they are the type of costs that, in some cases, are deducted by the crude purchaser before payment is made for the oil.

Production and Severance Taxes - These can range from the \$0.22/Bbl production tax levied by the City of Huntington Beach to the 4.6% severance tax in Texas. Where these taxes are subject to change, (and what tax isn't?) it may be preferable to treat them as operating costs and use the oil price before deductions.

Transportation Costs - These can include trucking, pipeline access, and/or pumping charges ranging from a few cents per barrel up to some serious tariffs on production. One operator I know pays \$1.00+ per barrel for trucking on \$8-9/Bbl crude oil. I suspect the high charge is levied because they have to jack-hammer the stuff out of the truck but, just the same, it means the actual price received is only \$7-8/Bbl.

Dehydration, Diluent and Other Things - Generally, crude oil must meet certain standards of water and entrained solids content (BS&W) to be accepted for sale. This dehydration is the responsibility of the crude seller. It is not unknown, however, for dehydration charges to be made by the crude purchaser. More common is a charge against the oil price for diluent separation. In many areas of California and other parts of the country, production of low gravity oil requires the mixing of lighter gravity oil or other products, to serve as a diluent or solvent, either in the well or in flow lines. If the crude buyer is also the seller of the diluent, the cost of the diluent is netted out of the final price paid for the crude which is based on a so-called "native" gravity. This latter issue is tricky enough but often there is also a charge for separation and the analysis to determine the native gravity. Another deduction might be for heating pipelines or transportation facilities to handle certain types of low gravity or high wax crudes. Where these conditions are prevalent, the resulting costs may be factored into the posted price, but then again maybe not.

Selecting Initial Price for Appraisal

At some point you can no longer put off the task of selecting the starting price of oil for the appraisal. This is not as simple as it sounds. Oil is a commodity and prices are volatile. If the appraisal of Boggy Bottoms lease has an effective date of January 1, what oil price should you use as the starting price? If the January 1 posted price is the same as actual at \$15/Bbl but over the past 24 months price has varied by \$2 - 3/Bbl with no particularly definable pattern, what price should be used?

The possible answers could be classified into two schools of thought. The first, which I will call the "Date of Appraisal School", suggests that the price on the date of appraisal, whatever it is, should be the initial oil price. This approach is simple, direct, and saves a lot of time. Further, it is psychologically satisfying since it requires no tendacious rationale.

The second school could be called the "Some Other Way" group of selection methods. These approaches tend to be less formalized and take forms ranging from a ballpark guess to an average of the prior 3, 6, 12, or (fill in the blank) months. These "Other Ways" attempt to account, in some way, for the volatility of prices over time. There is some virtue in this. However, there is little empirical evidence to show that a 3 or 12 month simple average, moving average, or weighted

average is a more representative oil price than a 9 or 24 month average. In my experience, these "Other Ways" tend to be moving targets with little rationale or justification. On the other hand, if it can be shown that a 3-month or 6-month moving average reveals a recurring feature in the oil price of a property then maybe it should be used to help select a starting price.

A large part of the controversy stems from confusion about the goal. The "Some Other Way" approach seems to focus on deriving a representative price for the first year of appraisal and to treat this as a starting price. This may not be the same as the appraisal date price.

The appraiser should always be free to exercise judgement and to use another price so long as there is appropriate support for the choice. For mandated appraisals such as for ad valorem or estate tax, change should not be arbitrary. It seems reasonable that if the appraisal is based on a mandated appraisal date whether January 1 or March 1 or Mother's Day then the price on that date should be used as the starting price. If there is evidence that oil prices could be expected to change in some direction after the initial date then the price in subsequent months can be changed to reflect that expectation. In appraisals for other purposes, such as acquisition, there may be more leeway to use an average of some sort or an other representation of the price history of the property or to run several evaluations at different prices to gauge the impact. All that is required is that a rational support for the price selection be provided.

Natural Gas Prices

Gas prices used to be easy. I worked for PanHandle Eastern one summer when I was in school and couldn't imagine anything simpler than a long-term gas contract at \$X/MCF. While many properties continue to sell gas under contract, the contracts tend to be shorter and may often have pricing formulas that require input or action by third parties. In many areas, gas is a true commodity and subject to supply and demand offered for sale to the highest bidder. In other cases, gas is (a) sold into the spot market or (b) sold in short-term volume deals to specific end-users. The "spot-market", operating through dealers or clearing houses, offers some of the aspects of posted pricing for gas but, as the term implies, it is more transitory than the oil price postings. Spot prices can and do change daily.

(Writer's Note: There are numerous methods available that allow oil and gas sellers to "hedge" or otherwise attempt to reduce price risk. I do not plan to get into any of that but, if the reader is interested, there are publications that explain these methods in excruciating detail.)

In appraising a property with a gas sales contract or other sales arrangement, it is essential to understand how the terms of the contract effect the price paid. If the price is fixed for a specific period, use the contract price. If there is a formula involved in defining price for a given period, the formula and other contract terms should be used to appraise the property. When appraising a property where gas is sold into a spot or other transitory market, some determination of an appropriate initial price must be made based on the actual experience of the property in selling gas and on the expectations of the marketplace.

An argument is occasionally made that the contract price should be ignored in favor of a "fair market" price that maybe, could be, should be otherwise obtained. If the contract relates to the

property and would be transferred to a new property owner, the contract price would be the appropriate price to use. If not, then it could be assumed that the new owner (seller) would be able to obtain market price. It should not be assumed that the new property owner is a super negotiator able to obtain the best possible contract, but rather is able to obtain a price and terms similar to those in effect for other properties.

Natural gas sales or prices, like oil, may be subject to deductions or charges for compression, transportation, production and/or severance taxes, and commissions for sales in some markets. As with oil, these charges must be defined and treated as deductions from the price or, separately, as operating costs.

Other Products - NGL, Sulfur, Etc.

Products which are produced along with, or derived from, oil and gas (such as NGL and sulfur) and for which a market exists, should be included in a property appraisal IF there is a demonstrated history of sales for the property and/or similar nearby properties. Associated gas may be sold as "wet" gas with no specific value given for NGL or other products. The best source of data is actual production and sales over a reasonable period prior to the appraisal date. The longer the period the better. In some cases, such as for NGL, it may be necessary to determine product breakdowns to propane, butane, etc. to see if price variation occurs due to seasonal demand. This can get into a lot of work that may not be reflected in an improvement in the quality of the appraisal. The efficient approach may be to aggregate gas sales and NGL sales into a "wet" gas price to be applied to sales gas.

These secondary products are also subject to deductions and charges. Processing fees for NGL are often taken in kind as a portion of the NGL being processed.

To Escalate or Not to Escalate: That is the Question.

Up to now, the discussion has been about initial prices for oil, gas, and other products. However, an appraisal requires an estimate of future revenue which, as a precedent, requires an estimate of future product prices.

Here, again, two schools of thought vie for recognition and supremacy. One group - the "Flat Price" School says that the initial price, however determined, should be held flat over the life of the projection. Thus, if oil price is \$20 per barrel, then \$20 is used throughout the appraisal of that property with no changes. Note that we have carefully used the term "Flat Price" here to avoid confusion with terms such as Constant or Current Price which have different meanings in relation to inflation.

The second group - the "Escalation" School - says that future prices should be increased and/or decreased over time according to expectations for future oil (or gas) markets. The term escalation is usually construed to mean an increase in price over time; de-escalation indicates a decrease in price. In this discussion, escalation means a change in price in either direction.

This issue is not an easy one. While it is readily apparent that oil prices are not flat and do change, suggesting that some form of escalation (\pm) may be appropriate, there are also numerous examples of escalations that tended to depart from reality. Each of us can remember price projections in the 1970's and early 1980's that escalated at 10% per year to \$80 or \$100 per barrel or more because we were "running out of oil". A lot of companies and fortunes were built and lost on these expectations of crude oil Nirvana. The rig count set a record, reserves were bought and sold, governments created new departments and agencies, regulations and taxes increased, and all sorts of new production came into being based on the expectation of \$100 oil. Many otherwise intelligent people went along with this, including governments, commercial and investment banks, major oil companies, and not a few consulting firms.

Of course, it never happened and, with 20-20 hindsight and an embarrassed grin, we can now all say that we should have known better. While a peak of about \$40 was attained, the market for oil attracted (a) so much additional production and (b) brought about sufficient conservation that by the early 1980's oil price was not only not going to \$100 but there was such an abundance of oil that price began to drop. Eventually, the Saudi government couldn't make ends meet and decided to stop supporting artificially high prices which resulted in the 1986 Great Dose of Reality from which the industry has yet to recover. Over-enthusiastic projections for oil (and gas) prices left a legacy of business losses and failures, uneconomic projects, reduced employment, and probably the greatest transfer of wealth since Spain looted the New World. The most enduring remnant of that period are the regulations.

HISTORICAL MARKER: As this newsletter is being edited, the House has just voted to repeal the 55 MPH speed limit enacted in 1974 to save oil.

The point of this history lesson is not that oil price escalation is a bad thing - the escalation of the oil price in income projections was not the culprit, only the symptom. The problem was, and remains to some extent, a failure to temper expectations with realistic market analysis. In a market economy no relation is static - all are dynamic. If oil or gas price is really expected to increase for some reason, it must also be expected that there will be a reaction in the form of greater production, reduced demand, conservation, or use of alternative fuels (burning federal paperwork) that will eventually impose some restraint. The restraint could take the form of a slower rate of price increase, a price cap, and/or an actual decline in price. In the real world, government action can not be ignored - remember price controls and the so-called Windfall Profits Tax? The same thing happens if you increase the price of any commodity or service that is free to respond to supply/demand impulses whether that be wheat, steel, labor, or taxes.

So, where does this leave us? Is escalation **WRONG** as an appraisal concept? If the purpose of appraisal is to estimate value, then some consideration must be given to the future price of oil over the life of the projected production. One of the arguments for flat pricing is that projections are difficult to make and are generally wrong, so why bother? A second argument is that, over time, prices end up at about the same level anyway so why not assume that they will remain at the current level? There is a certain amount of truth and rationale, if not logic, to both arguments but not enough to negate the primary argument for escalation which is: Oil prices do change in response to market circumstances and that potential for change should be reflected.

If there is reason to believe that oil price will go up or down over time, then the appraisal should include a price escalation. (I am reminded here of a quote that is, correctly or incorrectly, attributed to the late Elliot Janeway who was supposedly asked, "Will the stock market go up or down?" to which Mr. Janeway replied, "Yes, but not soon.")

The trick in escalation is to avoid two errors. The first is "Wishful Thinking Syndrome" which causes prices to be escalated independent of market conditions because the appraiser really wants prices to be higher. There are several sub-classes to "Wishful Thinking Syndrome" that are based on the needs of the evaluator:

- Need to Justify Our Budget
- Need to Beguile the Stockholders
- Need to Obtain Financing, and
- Need to be Optimistic in Order to:
 - (a) Stay in Business
 - (b) Rationalize Last Acquisition
 - (c) Maintain Tax Value

The second major error that occurs in escalation is the "Blinders On - Straight Ahead" approach which projects price changes in a straight line based on the most recent trendline. The error here is to allow short-term events to govern and control long-term projections. A decision to continue or to drop sanctions on Iraq may cause short-term changes in oil price but the long-term impact is far less certain. Allowing ANS crude sales to Japan may result in an increase in California oil prices but the short-term effect would probably be mitigated over time as market demands cause supply adjustments. We can all probably all think of examples of both errors and maybe add a few others.

A Historical Perspective

With all this discussion in mind, then how do we make a reasonable estimate of future price changes? Some historical analysis may help. A table and/or graph of oil price over time shows some relatively spectacular price changes every now and then but, for the most part, oil price history is unremarkable. Similarly, a plot of annual change in oil price over time shows three or four sharp increases (and subsequent declines) interspersed with long periods of comparatively small changes. A comparison of annual oil price change with the annual change in the Consumer Price Index (CPI) over a longer period (1926-1994) indicates some relation between the two. In several periods when oil price increased or declined, CPI seems to follow close behind. This result should be expected in an energy intensive economy, particularly one that is based on petroleum for fuel and feedstock.

The relationship between oil price and inflation can be useful. If the annual change in oil price is converted from Nominal to Real by deducting Inflation (as measured by CPI) it can be shown that, except for three or four very distinct, short periods (1948-49, 1973, 1979-80, and 1989-90) the annual REAL change in oil price is very small. In fact, oil price has declined in REAL terms over most of the period from 1926 to 1994. For most of the period since 1981, REAL oil price has declined.

A plot of West Texas Intermediate posted price for the period from January, 1987 through 1994 indicates (a) a somewhat cyclical behavior and (b) except for the Gulf War aberration, a modest uptrend through 1991. Since 1991, the trend is sharply down with a cumulative decline in Nominal WTI price of -23.1% through 1994. If the plot is converted to REAL terms by reducing the average annual change in price by the CPI for that year, an average REAL price decline of about 3.9% per year is obtained for 1988 through 1994.

How does this help estimate future oil price escalation? A comparison of this sort suggests:

- T Major changes in oil price (\pm) are short-lived and are subject to correction by supply/demand in the marketplace.
- T Real oil price tends to decline under "normal" conditions of price change and inflation.

Ergo - future price escalation should include long-term expectations for inflation, not just oil price alone, so that over the long-term, the REAL oil price escalation rate is zero. While price changes may be less than or greater than inflation for short (1-2 years) periods, over long periods oil price escalation should be no greater (and may be less) than inflation.

IMPORTANT POINT! A corollary to the escalation as a function of the rate of inflation approach is that operating costs are also escalated at the rate of inflation or other demonstrated rate so that the rates of change of price and cost are very similar. This latter point is historically and logically correct and can be used as a reality check on income projections. Beware of the 8% price increase and 4% cost escalation.

A good argument can be made for using the Producer Price Index rather than the Consumer Price Index. The Producer Price Index measures changes in costs related to producers of goods and services. This is closer to the function of oil and gas production than is the Consumer Price Index which includes housing, haircuts, and other things that are not normally part of oil production. Not a big issue to be sure, but one worth considering.

Gas Prices

The discussion above has been directed toward oil price projection. The principles, however, relate just as well to natural gas and by-product pricing but with a few additional wrinkles. While gas prices have attained more of the status of commodity pricing the markets for gas from a particular area region can still be limited. Gas is still not as transportable, world-wide or across large regions, as crude oil or other liquid products. Further, gas is subject to greater non-market or extra-market influences such as government and/or regulated utility rule-making. This situation is, to be sure, much less of a restriction than it was 20 years ago but must still be dealt with in an appraisal.

Some Reflections

Expectations for future product prices is not a subject that can be easily put into an analytical straight-jacket. There is some hesitation about discussing past trends in nominal or real prices lest those trends be used indiscriminantly for the future. There is a fair amount of room for judgement on the part of the appraiser here but, as always, that judgement must be tempered by knowledge and common sense. It is of interest then to note that, in the SPEE Survey and Kern County Assessor 1995-96 parameters (reported below), the Nominal escalation rates are moderate and the Real rates all essentially zero.

Reports and Studies

Taos, N.M. - The Society of Petroleum Evaluation Engineers (SPEE) held its annual meeting in Taos, N.M. in June this year. In addition to being in a great location, the meeting produced several good papers and presentations. SPEE also issued the results of its annual "**Survey of Economic Parameters Used in Property Evaluations**". The results of the survey are based on data collected in March - May, 1995. The survey and the presentation of data continue to improve and become increasingly useful to appraisers particularly since the survey results tend to provide parameters that are consistent with both sales and capital market data analysis.

Average Annual Escalation Rate, % (1995-2004)

Oil Price	-	3.29%
Gas Price	-	4.19%
Operating Costs	-	3.29%
Drilling Costs	-	3.36%
Inflation	-	3.35%

If oil price escalation is reduced by the Operating Cost escalator or by Inflation, the REAL Oil Price escalation becomes 0.09-0.03% respectively.

Minimum Rate of Return - 17.64%

Survey respondents would apply Risk Adjustments to Reserves (39.7%) or Cash Flow (43.5%). Proved Producing reserves or Cash Flow would be adjusted to 96.29% of the unadjusted value, while Proved Undeveloped would be adjusted to 55.23%.

"**Summary of USA Oil & Gas Production Taxes**", Society of Petroleum Evaluation Engineers, May, 1995. A useful and well researched summary, by state, of production and severance taxes for oil and gas.

Both the Survey and Tax Summary are available from: SPEE, 1201 Louisiana, Ste. 312, Houston, TX 77002, 713-651-1639.

"Analysis of Oil and Gas Property Transfers and Sales and Derivation of a Band of Investment - 1983 through 1994," prepared for Western States Petroleum Association and California Independent Petroleum Association by Richard J. Miller & Assoc., Inc., March 1, 1995.

This annual study of market sales of oil and gas properties in California is done under contract to WSPA and provides current market-derived economic parameters including discount rates, price and cost escalation rates, and any other information that may be useful in appraising oil and gas properties. The primary purpose of the study is for ad valorem tax but the base data obtained for the study is applicable to appraisal for almost any purpose, although adjustments may be required to conform to specific regulations.

Database - The analysis in the 1995 report is based on data from 177 fair market value sales from 1983 through 1994. Data for each of these transactions includes the buyer's cash flow and/or sufficient data to replicate the buyer's economic analysis.

Price/Cost Escalation Rates - Of the 177 sales, 59% were based on escalated price and/or cost projections. Sales that were evaluated in 1992 showed oil price increases of 1.75% for 1993 and an average of 4.5% per year thereafter. The operating cost escalation was essentially the same, resulting in no effective real price increase from 1992. Sales evaluated in 1993 showed no real price increase over the period of study.

Discount Rates - For this study, discount rates are derived as the Internal Rate-of-Return on the purchase price (cash equivalent) using the buyer's cash flow. No alterations are made to the buyer's cash flow. The discount rate is derived as a before income tax (BFIT) and as a "risk-inclusive" value. The 177 sales have a mean discount rate of 23.7%; an absolute range of 10-39%; and standard deviation of $\pm 6.6\%$. Small-sample analysis indicates that if "all oil and gas properties had been sold during the 1983-1994 period there is a 95% certainty that the mean DCR for all those sales would be between 22.7% and 24.7%."

Regression analysis suggests that properties with 100% Proved Producing reserves should have discount rates of 19-20% while properties with 100% Proved Undeveloped reserves should have discount rates in a (wider) range of 28-34%.

Cost-of-Capital - One goal of the study is to calculate a BFIT cost-of-capital for prospective purchasers of oil and gas properties. At December 31, 1993, the BFIT cost-of-capital for 51 major and independent companies was about 13.2% with a standard deviation $\pm 3.0\%$. Over the period of the study (1983-94), the mean market-derived DCR has exceeded the mean cost-of-capital by varying amounts but the average has been about 9%. The difference is about 4-5% for Proved Producing properties which suggests a moderate return to compensate for risk. Of the 177 sales, 92% have derived discount rates that exceed an average 15% cost-of-capital for the period.

"Environmental Site Assessments and Their Impact on Property Value: The Appraiser's Role", Colangelo, Robert V. and Miller, Ronald D.; Appraisal Institute, July, 1995. Until API or other oil industry group puts together some usable data and assessment procedures for including

environmental contamination, etc. in oil property appraisals, we will be forced to rely on the real estate people for help on this issue. This book is heavy on appraiser exposure and regulations governing site assessment but is nonetheless useful.

"Appraisal Methods and Regulatory Takings: New Directions for Appraisers, Judges, and Economists", Walter, William S., The Appraisal Journal, July, 1995.

Boy, as if eminent domain and takings appraisal wasn't interesting enough, the recognition by the courts (finally) that excessive regulation constitutes a "Taking" under the Fifth Amendment subject to "just compensation", opens up all sorts of exciting possibilities. Just what is the impact on the value of mineral rights that a county will not allow you to develop because the project might inhibit someone's view of the ocean? Look for a future newsletter on this topic.

News and Information

Sacramento, CA - June 1, 1995 - The California State Lands Commission and CalResources (formerly Shell Western E&P) reached agreement to modify the royalty provisions on several State Tidelands leases offshore Huntington Beach held by CalResources. The original leases had a range of fixed royalties based on volume of production. The production weighted range royalty for the part of the field effected by the leases was 15.5%. At anticipated prices for Huntington Beach oil, the current royalty was a significant impediment to new development and continued operation of the leases. The Royalty Modification has a fixed royalty of 16.67% for an oil price between \$14.00 to \$17.50. The royalty slides from 16.67% to 4.0% when oil price drops below \$14/Bbl; it also slides from 16.67% to 25.0% when oil prices rise above \$17.50/Bbl.

This is the first such Royalty Modification but it may set a precedent for the numerous State Lands leases in California tidelands including Wilmington and the remaining state leases in the Santa Barbara Channel. From an appraisal standpoint, of course, the reduction in royalty could result in increased revenue and possibly value. From a more practical standpoint, the agreement may extend production in the Huntington Beach field for a few more years, preserving jobs, tax revenue, and income to the state.

Bakersfield, CA. - The Kern County Assessor has released the annual "Oil and Gas Properties Appraisal Parameters" to be used for 1995-96 tax appraisals. The parameters are important because Kern is the largest producing county in California and derives a large percentage of property tax revenue from oil properties. The Kern County parameters are often followed by other counties. Lien date in California is March 1.

<u>Escalation Rates</u>	<u>Oil & NGL</u>	<u>Gas</u>	<u>Operating Cost</u>
	1995 64 3.00%	1995-98 10.00%	1994 64 3.00%
		1999 64 3.00%	

Starting oil price is based on a gravity schedule (13 API = \$13.00). The oil price escalation in real terms is 0%.

<u>Discount Rates</u>	<u>Low Risk</u>	<u>Average Risk</u>	<u>High Risk</u>
Good Quality	12.0	14.0	16.0
Average Quality	14.0	16.0	18.0
Poor Quality	16.0	18.0	20.0

Selection from the range is to be based on (1) Property Quality as measured by the type of production (Primary oil, Cyclic steam, Steam flood) and a Gross/Net (Income) ratio classification of Good, Average, or Poor, and (2) Property Risk as measured by three ratios; Reserve Ratio, Capital Ratio, and a Rate Ratio which have ranges of values and allow classification of the property as Low, Average, or High (risk). These ratios and classifications are "to provide an indication as to the appropriate rate for general development and (or) investment scenarios". It is our understanding that the classification is not rigid and actual rates for specific properties are based on history, characteristics, and market sales data analysis.

For further information contact: Mr. James Maples, Kern County Assessor, 1115 Truxton Ave., Bakersfield, CA 93301.

Richard J. Miller & Associates, Inc. is a petroleum engineering and economic evaluation firm specializing in the appraisal of oil, gas, and geothermal properties. The firm provides traditional reservoir and production engineering evaluation services for operators and investors, financial institutions, and for forensic purposes. RJM&A provides clients with evaluation and appraisal services for project planning and development, financing, trust and estate management and taxes, ad valorem taxes, and other purposes throughout the United States and Canada. Clients include major oil companies, financial institutions, and individuals. The firm does not do appraisals for acquisition of properties. RJM&A is a California corporation founded in 1977.

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