APPRAISING OIL & GAS PROPERTIES

A Newsletter for Appraisal Professionals

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Market Discount Rates: Sources and Derivation

Pachelbel's Greatest Hit© - a metaphor. I happen to be one of those people who actually likes classical music. I buy CD's; have the local "good" music stations set up on all my radios; and can whistle a fair amount of Mozart. I lean toward the Baroque period but Beethoven is right up there, too. It can be very satisfying to roll up next to some yo-yo with his hat on backwards driving a boom box and blast'em with the first few bars of Beethoven's Fifth. On the other hand, I also like Alabama and the Beach Boys - wouldn't want to get in a rut.

"Good" music of any period - whether *Ode to Joy* (1) or *Good Vibrations* (2) - is often most enjoyable and enduring because, among other things, within the piece certain orchestral themes can be found to recur without being repetitious, and, in fact, each new variation throughout the piece, movement to movement, simply reinforces the basic theme while adding to the overall effect on the listener. Several examples come to mind but there is not time for an extended discussion. A similar effect can occur when the same piece is played and interpreted by different artists. No two pianists play Beethoven's *Emperor Concerto* the same way but there is no question as to what they are playing. The approach may be different but the theme is unmistakable and can often be enhanced by the new perspective.

Johann Pachelbel (1653-1706) was a contemporary of Bach, Handel, and others but was a relative unknown until the late 1960's when his Canon in D was found and made part of the orchestral repertoire. The Canon is now the most recorded and played piece of music from the period. I have a CD titled *Pachelbel's Greatest Hit* (3), singular. The CD contains about a dozen variations of and on the *Canon in D*, by a collection of diverse artists, ranging from the "traditional version" to a rendition of *Earth Angel*(4) that sounds like it could be original lyrics to the Canon. However, there is no question that the underlying music is Pachelbel.

The point of this detour through the 18th century is that simply because the perspective of the player and focus of the music is different the theme is not necessarily changed; the underlying principles are still there, immutable and constant. Oil property appraisal is not Mozart but the metaphor still holds - perspective and approach may differ but in the end we must always come back to the overriding theme which is good appraisal practice. We must always look at data, methods, conclusions, and value recommendations within the context of whether they make sense and add to or detract from good appraisal practice. The parts must fit into a concordant whole and all the players must be reading from the same score if oil property appraisal, whether for public or private purposes, is to have consistent relevance to the real world. The alternative is likely to be more like the atonal noise that passes for so-called New Music rather than something worthwhile such as *Song of the South* (5).

Within appraisal practice there is probably no single area that has as many differing perspectives as does the discount rate issue. Despite decades of discussion and dozens of learned (and some not-so-learned) articles, we still find a wide disparity in the definition, derivation, and application of discount rates for oil and gas property appraisal. This is demonstrated in this newsletter where various recommendations of discount rates for the appraisal of oil properties range from as low as 10% up to and including 30+%. Granted, there can be justifiable differences in discount rates among properties, but for appraisal purposes it is hard to imagine that the range is really that wide. We are either not talking about the thing - the theme is lost - or the interpretations of the theme have diverged to become two different pieces - sort of a Two Live Crew plays Stephan Foster Favorites conflict.

As I may have mentioned before, I think the subject of the discount rate can be very interesting. This is not just some dry old accounting number or arcane financial ratio. The discount rate is the tool that reduces all those futuristic production projections and economic expectations to the cold, hard present; it is the linchpin of virtually every capital budgeting method known to man; and, when thought about and selected from the investor's arsenal of analysis weapons and launched into his PC (that's personal computer, not some liberal foolishness), encapsulates all the investor's hopes and fears for his future well-being. Okay, maybe it's not that dramatic but it is interesting and has been known to be a source of great angst in appraisers' offices and in courtrooms. And well it should. Consider what a change of 1% in the discount rate causes in the present value of the Midway-Sunset field or the Yates field or the Altamont-Bluebell field.

So, for the next three issues (more or less) I thought we might talk about discount rates - specifically, market-derived discount rates. In this issue we will look into the sources of data for market discount rates and the method of deriving those rates on a consistent and useful basis. In the next issue we will examine the analysis done in one or more market studies including the annual WSPA[(6)] study. Finally, we will discuss the application of market-derived discount rates to various appraisal uses.

The Income Approach to Value - Short Version

The Income Approach to Value is the dominant appraisal method for oil and gas properties. The income approach has two parts - a cash flow and a discount rate. The cash flow, if properly constructed, consists of a projection of future production and income and reflects all the identifiable and quantifiable characteristics of the property. The discount rate reduces the cash flow to present value and, if selected to define fair market value, can be used to contain the expectations of risk and required return of a knowledgeable participant in the marketplace.

Discount Rates

There are two sources of a discount rate: Cost-of-Capital analysis and Market Sales. The cost-of-capital approach is straight forward and can be readily applied, as shown by the new "Manual for Discounting Oil and Gas Income" just released by the Office of the Comptroller of Public Accounts, State of Texas. The drawback to the Cost-of-Capital approach is that it is a minimum and is strictly valid only for valuing companies, not individual properties which are inherently higher-risk investments (lack of diversity, liquidity, etc., etc.).

An analysis of real market sales can, however, provide the information to define the range of discount rates necessary to account for the risks attributed to specific property market appraisal.

Market Discount Rates in Appraisal Practice and Regulation

The importance of market-derived discount rates for use in the income approach is recognized by appraisal practice and by the regulations that control appraisal procedures in some jurisdictions. "The Appraisal of Real Estate"[7] makes this point many times in several ways - one or two will suffice.

"The capitalization rate selected for valuation... should represent the annual rate of return necessary to attract investment capital. Because rates of return are prospective.... (the) rates chosen should simulate market expectations." This requirement can only be satisfied by obtaining data from actual market transactions, which reflect current required returns. Also, "The selection of the yield rate is critical to DCF analysis.... an appraiser must verify and interpret the attitudes and expectations of market participants, including buyers, sellers, advisors, and brokers.... An appraiser can verify investor assumptions directly by interviewing the parties to comparable sales transactions or indirectly by estimating the income expectancy to a comparable property and deriving a prospective yield rate."

There are really only two ways to accomplish the above. First, through timely and comprehensive surveys of market conditions and the attitudes of participants in the market. Second, by obtaining and analyzing actual sales to determine the returns anticipated by investors. The results of surveys and actual sales should be expected to correlate reasonably well. As we will see, the major surveys and sales studies conducted within the oil industry do indicate compatible results.

Where regulations or non-statutory guidelines exist, the primacy of market-derived data is recognized. California SBE Rule 8[8], for example, offers appraisers two clearly defined sources for a discount rate; cost-of-capital and derivation from market sales and states, "This method (the market-derived source) of deriving a capitalization rate is preferred when the required sales prices and incomes are available." Assessors Handbook (AH) 501A, published by SBE[9] (1988) says.. "Market analysis is the preferred method of obtaining capitalization rates. Actual selling prices (reduced to cash equivalents) of comparable properties can be related to the anticipated income."

Sources of Market Sales Data

If you are in the market to buy or sell a house and want to know what the market is in your area, you can visit your local realtor and have almost instant access to detailed sales information on all sorts of houses that is current to within a few days. Beyond this there are services that track sales by area, region, and nationally. I recently received a brochure from the Appraisal Institute for a service called "Market Source" that will provide all the information you ever wanted to know about residential and other real estate transactions, updated every quarter.

There is no such data source for oil properties. The oil industry is a highly competitive business. Oil people are generally independent-minded and can be real touchy about disclosing data about their business dealings - particularly about how they buy, sell, and value property. Various

companies and individuals have some data but it is usually limited to a small circle of contacts and is not publicly available. So where do you get data?

Public Documents - Some information can be obtained from public documents which may indicate a purchase price or allow one to be estimated from filing fees. If the company is public, some data may be squeezed out of documents filed with the SEC or state authorities.

Publications - Newspapers, trade journals, and professional papers may provide some information such as purchase price, location, and (estimated) reserves but the useful data is often very limited.

Private Data - Some banks, investment banking firms, consultants, and companies can accumulate sales data from the transactions of clients but, as noted above, this data is often limited to their part of the market and is not publicly available.

Required Disclosure - Disclosure of data can be required by statute and/or encouraged by convention. As far as I know, California is the only jurisdiction that requires disclosure of transaction data by buyers. The statute is written to provide tax assessors with a database of market information for use in implementing - among other things - Rule 8. But this is not public data either. The trade-off to requiring this data of buyers is that it is kept confidential by the assessor. So once again there is no public database.

However, the full disclosure doctrine in California provides the opportunity for industry cooperation in the collection of data and the analysis of economic valuation parameters. Since 1970 WSPA has sponsored the collection and analysis of sales data by an independent consultant. Companies that buy properties are encouraged to provide data on the transactions to the consultant - preferably the same data that is supplied to the assessor. This is strictly voluntary and entirely confidential. The data supplied is protected as a trade secret. Only the results of the analysis are published. This is about as close as we come to a database of market sales, discount rates, and other parameters and - even here - the details of the transactions are not disclosed.

Sales data obtained from any of the above sources can be used to derive market data that could be useful in appraising other properties. However, the full disclosure of all relevant data, including cash flows, is the only way to establish reliable market-based information. The purchase price can be directly compared to the cash flow to obtain an Internal Rate-of-Return (discount rate). Other information such as price- and cost-escalation rates can be extracted from each cash flow and compared. Access to full information allows the appraiser to examine all aspects of a transaction, determine if the derived data is germane to the intended use, and even experiment with the effects on value (and/or other extracted data) of changes in the content of the buyers appraisal.

<u>Using Market Data to Derive Discount Rates</u>

Obtaining the necessary data is the hardest part of market sales analysis - but it is only the first step. The next step is to determine if the data obtained is useful for analysis of market discount rates. This requires much of the same work as would be done for a Comparative Sales Approach. Assuming the optimal case where the buyer provides sales documents, cash flows, supporting evaluations of the property, and details of financing and tax treatments, and everything else

imaginable, there still remain a number of questions. I have never seen this case but hope springs eternal.

C Was the transaction fair market value? There are several fair market value definitions, however, all require a knowledgeable and willing buyer and seller with no exigencies, exposure to the market, etc. Of course, if every sale were carefully contrasted with the requirements for a FMV transaction none would be found to meet all the criteria. However, the appraiser must review the transaction with both buyer and seller to ensure that it reasonably fits the prevailing definition(s) and to be sure that there are no conditions that would make it a non-market transaction. We generally find that non-exposure to the market is the primary flaw in some sales, followed closely by terms and conditions that make the sale not "arms length". Again, oil properties are not residential real estate - there are no multiple listings or large numbers of buyers and sellers - so sale conditions have to be considered in the context of the overall market for properties. This allows the use of sales that had limited markets or short exposure if a reasonable presumption can be made that the value obtained would not have been appreciably different if the market had been larger or the exposure longer. In other words - common sense, good judgement, and experience in reviewing sales play an important role.

C Do you have all the pertinent data? The answer is no. You can never duplicate what went on in the minds of the buyer and seller, individual or corporate, when deciding what to pay or accept for the property. But you can get close. You can review the cash flow(s) and other documents and make sure you have all the necessary pieces. Mostly you can ask a lot of questions. Buyer: Why did you pay $X+10 when your decision criteria said $X? Were there any considerations in the purchase price that were not explicitly in the cash flow? We have noted that buyers often reduce the offering price by an estimate of abandonment costs or other liability associated with the property but - unless you ask - you would not find it in the cash flow. If the amount was a specific consideration, it should be made part of the analysis. Contingent-payment or set-aside requirements may have been considered part of the purchase price and they may need to be reduced to a cash equivalent.

The other part of this issue is that you will never think of all the right questions and, when you do, it may be too late to get an answer. We have been reviewing some old sales (1986-87) to determine if risk adjustments were made in the cash flow but, because of the passage of time, the information is often unavailable.

C Are all the parts of the data understandable and relevant to the property? We have had several cases in which cash flows contained income or cost streams that did not seem to fit and which turned out to be a co-generation plant or pipeline revenue. Then the question becomes, "Is that revenue and/or cost part of, or extraneous to, the value of the property?" The answer depends largely on the buyer's reason for the acquisition and the purpose of the "extra" item. A clue may be in the cash flows. Were separate cash flows run and summarized or was there one inclusive cash flow? Can the purchase price be allocated on a rational basis? Better yet, can the buyer separate the parts for you?

C Were there any terms and conditions that must be reduced to cash equivalent? We already mentioned contingent future payments in addition to the initial purchase price and required

set-asides of funds but there are many of others: deferred payments contingent on price increases; financing terms that require security deposits or equity back-ins; escrow accounts to assure specific performance; and/or scheduled abandonment requirements. All of these can represent a benefit or cost that may add to the purchase price. If they were not, or cannot, be made a part of the cash flow, then the appraiser has to consider how to reduce the condition to a cash equivalent.

C Is the buyer's production projection and cash flow reasonable in the context of the property and the market? This *does not* mean second guessing the buyer or imposing your own opinion or conditions. It *does* mean comparing the production projection, product prices, operating costs, capital investment, etc. with the history of the property and current economic conditions. In doing our sales analysis, we try to obtain "sale books" or other data provided by the seller or we compare the production history to the buyer's projections. The purpose is to look for inconsistencies; increased production but no investment, for example. We then ask the buyer about it - did we miss something - is there more data that we need? This kind of stuff has to be caught quick before the buyer forgets what he did and why - or sends the file to storage.

C Do you have enough data? This is an extension of the pertinent data issue and is really the foundation question. If you are trying to derive FMV discount rates from market sales, a data sheet that has only the before-tax cash flow column and the purchase price is not enough. A discount rate can be calculated but have no idea how the cash flow was generated or what the DCR represents. A misleading result is worse than no result. There are some companies that provide sales data but insist on providing only parts of the cash flow or, in some cases, only the input data. Some of these are usable, sometimes the blanks can be filled-in, but often you are left with a nagging question about what may be missing. There is a point at which there is not sufficient confidence in the data to allow a sale to be used. You may be better off trying to chisel more data out of the buyer.

C Is the data correct? The best you can do is ask questions and check the input data and calculations. In our analysis we duplicate every cash flow through our own evaluation program. The primary reasons for duplication are to (1) ensure consistent discount rate definition and derivation and (2) allow greater flexibility in testing and extracting information; but the secondary purpose is to attempt to find any errors or inconsistencies in the data. The effectiveness of this effort was brought home on one transaction where we were given only certain columns of the buyer's printout including the BFIT cash flow plus a set of descriptive notes regarding the missing columns. The notes said that the production projection was gross oil and that there was a 16% royalty, however, when we reproduced the cash flow we found it was net production not gross. The effect on the derived discount rate was significant. A simple comparison of the purchase price to the incorrect BFIT cash flow column would not have detected the error.

What about Partial Data?

Partial data can also be used to extract economic parameters for use in appraising oil properties; but both the interpreter and the user of the data must be aware of the source of the data, the methods of analysis, and the limits on use. I once reviewed a study in which the evaluator had obtained sale prices and property descriptions on a relatively large group of sales but had very little other data from either buyer or seller. Using what I will call "constructed analysis" he obtained historical production data, made a projection of future production, added in his own estimates of

prices and operating costs, and created cash flows for each property. He then calculated rates-of-return for each property using his cash flows and the actual sales prices. The discount rates he obtained included a reasonable range of values.

What is wrong with this? Nothing - so long as you don't kid yourself or anyone else that these are market data. The buyer may not have reached the same purchase price conclusion if he had appraised the property as the third party. This "constructed analysis" can serve a purpose, however, by indicating the discount rates that would result in known market values if certain parameters were used. The preferred way, however, would be to obtain and use the buyer's data and extract real market discount rates.

Comparison of Derived Discount Rates

One of the frustrations of analyzing oil property market data is that there is not very much of it. Another is that different evaluators do things differently. Not much can be done about the first part - the ratio of property sales to all properties is small whether in California, Texas, or wherever. Further, the number of sales on which data is available is always smaller than the number of sales.

Different appraisers do things differently. Even though the construction of an income stream is standard, as is the method of appraisal of oil properties, perceptions and definitions do differ. Reserves have long been defined by SPE, SPEE, and others but every petroleum engineer has a slightly different interpretation of what constitutes current methods of production, current economics, and (not least) the class of reserves and the risk associated with that class. Some companies define steamflood reserves as *Proved* while for others they are *Probable* at best.

Some appraisers use real price/cost projections while most companies use nominal; income tax treatment of future revenue and investment varies among companies and transactions; some apply risk adjustments in the cash flow while others accumulate risk in the discount rate (purchase price).

Because of the relatively small size of any sales database it behooves the appraiser to (1) be aware of whatever differences in definition, interpretation, or application may exist among the sales and (2) attempt to determine how those differences might impact the discount rates obtained from the sales. Measurable differences can be found in discount rates from sales evaluated AFIT prior to 1987 when compared to later tax rules. Large differences in derived DCR can occur between evaluations with internal risk adjustment and those where risk was absorbed in the purchase price.

Some quantification of the resulting differences in DCR can and should be done and, where possible, adjustments should be considered to reduce the differences in order to provide a more consistent database and reduce statistical noise. Internal risk adjustments can be backed out so that the DCR is made to include the equivalent risk. Income tax effects can be compensated in both the AFIT and BFIT cash flows. Cash flows which have been run on real rather than nominal terms can be converted to nominal if the buyer provides the deflator that was used.

The purposes for reducing the variable conditions among the sales are to expand the useable database and to allow rational analysis of market discount rates. The purpose of rational analysis is to attempt to define a practical and supportable procedure for selecting discount rates for application to similar appraisals of oil properties.

Therein hangs the tale.

Endnotes and References

(1) Ludwig von Beethoven, Sym. No. 9, Opus 125
(2) The Beach Boys, Brian Wilson, 1967
(3) RCA Victor Records, 1991
(4) Pop Quiz - Who wrote and recorded Earth Angel?
(5) ALABAMA, Bob McDill, 1992
(6) Western States Petroleum Assn., Glendale, CA.
(7) The Appraisal of Real Estate, Ninth Edition, (1987), AIREA, Chicago, Ill.
(8) Calif. Admin. Code Title 18, Rule 8
(9) State Board of Equalization.

A Note from Rocky

On a lighter note, I got a postcard from our old friend Rocky the other day. Seems Rocky has been away for a few weeks checking out some leases down in No Trees, TX. (I remember that place. That's where Sinclair and PanAmerican wanted me to start working after I graduated way back when. Texaco sent me to Ventura - good move.) Anyway, Rocky says that the people were real friendly and all and that the oil actually poured into a bucket instead of standing up straight on a hot road like some California crude but, after 3 weeks in No Trees, he has decided not to complain about Kettleman City in the summer anymore. Rocky also said that now that oil price is creeping back up toward economic limit he is going to see if he can sell his property. He said according to his last tax statement it is worth a lot and he doesn't want to miss out on a good opportunity. He is going to use the money to pay off the fourth and maybe the third on his house and is planning a big family vacation to Tulare Lake in July.

While Rocky was feeling so upbeat, I prevailed on him to help out with the newsletter by contributing a short column every now and then about oil prices and operating costs - news from the Front as it were - stuff we tend to overlook in all our airy discussions of discount rate, cost-of-capital, and appraisal methods. Look for Rocky when he gets back from sunlit climes.

Another New Contributor....

While I was on a roll I talked to my good friend Elwood, the financial analyst and certified wizard in all things fiscal, about keeping us updated on interest rates, equity returns, opportunity costs and the like. He was pleased to "take on such a worthy endeavor" and immediately started describing something that sounded like a condensed version of the reports of the Federal Reserve, the Wall Street Journal, and the U.S. Budget rolled into one. I toned him down to a modest couple of paragraphs and maybe an occasional chart. He agreed but I've seen his computer so stand back.

While we were chatting, however, Elwood informed me that preliminary cost-of-capital data for 1993 looks to be only slightly below the 15-16% BFIT range of the prior 6-7 years and that interest rates are headed back up. He had a word to the monetarily savvy - watch those discount rates. If your investment funds cost 16%, an expected return of less than 16% is going to cost you money, reduce your kids inheritance, and probably cause your golfing buddies to snicker - politely, of course. He also noted, this is just about the point in Jimmy Carter's administration that the economic manure began to hit the proverbial spreader in a big way. Let's see, last time gold went to $800.

Elwood promised to have something ready for us in the next issue. I'm looking forward to it. He was muttering something about "suitable for framing."

...and the Loss of a Friend

A couple of weeks ago I got a letter from the Conservation Committee of California Oil Producers (CCCOP) which said that, due to funding difficulties, the publication of the bi-monthly and annual production data books would stop before the end of 1994. This is a real loss especially to those of us working here in California. The CCCOP is an industry group that has performed and will still perform many useful services but for consultants and others who need access to production and other information the CCCOP data books are invaluable - our set goes back to 1937. The data books provided monthly, annual, and cumulative data broken down by field, pool, and company and included well counts, injection volumes, geology, you name it. There is no other data source like it, anywhere, at any price. That data has bailed this engineer out of a few corners now and then and will be missed.

Reports and Studies

"Analysis of Oil and Gas Property Transfers and Sales and Derivation of a Band of Investment - 1984 through 1993," prepared for Western States Petroleum Association and California Independent Petroleum Association by Richard J. Miller & Assoc., Inc., March 1, 1994.

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 1994 report is based on data from 160 fair market value sales from 1984 through 1993 totaling over $2.5 billion for about 1.14 billion barrels of oil equivalent reserves. 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 - Over 60% of the 160 sales were based on escalated price and/or cost projections. Analysis presented in the report is for (a) escalated cases only and (b) a composite of escalated and non-escalated cases. The latter usage is new this year but is done to reflect the increasing trend toward non-escalation of prices and costs. On this basis, sales that were evaluated in 1992 showed oil price increases of 0.67% for 1993 and an average of 2.6% 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 entire 1993 to 2017 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. The discount rate is derived as a before income tax (BFIT) and as a "risk-inclusive" value. No alterations are made to the buyer's cash flow except in those few cases where the cash flow was reduced by a specific factor to account for risk. In that case, a second calculation is done to accumulate that risk adjustment in the discount rate. The 160 sales have a mean discount rate of 24.0%; an absolute range of 10-40%; and standard deviation of ±6.7%. Statistical analysis indicates that the data base is Normally distributed and is a valid representation of the marketplace for oil properties. Small sample analysis also indicates that if "all oil and gas properties had been sold during the 1984-1993 period there is a 95% certainty that the mean DCR for all those sales would be between 23.0% and 25.0%."

Regression analysis of the data base indicates no relation of discount rate to (a) Date of Sale, (b) Amount of Purchase Price, (c) Volume of Reserves, (d) Price/Cost Escalation Rates, or (e) Various ratios and other methods used to define Risk and/or Quality.

Analysis *does* suggest a reasonably good relation of discount rate to the reserves risk of a property as defined by the percentage of Proved Producing reserves in the total reserves anticipated by the Buyer. This analysis suggests that reserves properties with 100% Proved Producing 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%. Work is continuing in this area.

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, 1992, the BFIT cost-of-capital for 42 major and independent companies was about 13.7% with a standard deviation ±3.32%. The difference

between the cost-of-capital and the market derived discount rate represents the additional risk attributed to specific investments in producing properties as compared to investment in the company itself. Over the period of the study (1984-93) the mean market derived DCR has exceeded the mean cost-of-capital by varying amounts but the average has been about 8%. The difference is about 4% for Proved Producing properties which suggests a moderate return to compensate for risk. Of the 160 sales, 88.75% have derived discount rates that exceed an average 16% cost-of-capital for the period.

Copies of the 1994 report are available from RJM&A by written request for $7.50 postage and handling.

Appraising Oil and Gas Properties is a publication of the Petroleum Engineering and Appraisal consulting firm of Richard J. Miller & Associates, Inc. For further information, letters and comments, and/or additional copies, please write, call, or fax:

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News and Comment

Bakersfield, CA. - The Kern County Assessor has released the annual "Oil and Gas Properties Appraisal Parameters" to be used for 1994-95 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.

Escalation Rates	Oil Price		Gas & NGL		Operating Cost	
	1994	0%	1994	0%	199464	3.5%
	1995	9.52%	1995	3.50%		
	1996	4.35%	1996-97	4.50%		
	1997-2005	4.00%	1998-02	5.00%		
	200664	3.5%	2003-05	4.50%		
			200664	4.00%		

Starting oil price is based on a gravity schedule (13° API = $10.50). The oil price escalation in real terms is 6.02% in 1995 dropping to 0.5% for 1997-2005 and to 0% after 2005. Cumulative real growth for a 10-year holding period is 12%.

Discount Rates	Low Risk	Average Risk	High Risk
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.

Austin, TX. - I also received a summary tabulation of the 1994 economic parameters being used by the various appraisal firms in Texas for this year. References to "Comptroller" are to the oil price projection published by the Comptroller of Public Accounts, State of Texas, as required under HB925 (Craddick).

Pritchard & Abbott ("P&A") will hold WTI at $17.50 for 1994, then escalate 4.6% per year for 1995 and 1996; then 3.2% through 2008. The three other firms listed (T.Y. Pickett, Capital Appraisal, and Lone Star) will use the Comptroller's escalation starting 1995. Gas price escalations seem to use the Comptroller's escalation except for P&A which will escalate non-contract gas at 4% per year to a max of $3.50 or to 2003 - whichever comes first.

On operating costs, P&A and T.Y. Pickett escalate at 3%; Capital Appraisal at 2.5% and Lone Star at 4%. All firms say they will consider future estimated environmental costs, if documented. Does that include abandonment? How is it included?

Discount rates for oil range from 10-27% for P&A; 12-20% for T.Y. Pickett; and 16-27% for Lone Star. Capital Appraisal is 12% (base) plus the ad valorem add-on; however, they will run two cash flows - one on their parameters and one using HB-925 parameters (Comptroller), and will use the lower of the two. P&A has a separate range of 14-16% for gas properties.