

How to Value an Oil & Gas Royalty Interest

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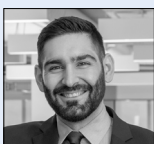
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A royalty interest in the oil and gas industry is “an interest in an oil and natural gas lease that gives the owner of the interest the right to receive a portion of the production from the leased acreage (or of the proceeds of the sale thereof), but generally does not require the owner to pay any portion of the costs of drilling or operating the wells on the leased acreage.” Often called net revenue interests (NRI), royalty interests do not bear the costs of production and only participate in the potential upside of a resource. The value of a royalty interest, however, is often difficult to observe because it is typically closely held. In addition, once discovered and drilled, the natural resources are physically depleted, resulting in a declining asset as opposed to a growing one. Lastly, there are a myriad of factors (mostly out of a royalty holder’s control) impacting the economics of a royalty interest.

The ownership of every asset or business interest changes hands eventually. It is inevitable. People do not live forever, so investment and familial assets must be passed on in one way or another. Whether someone sells assets outright, a court of law orders it, or they pass down their assets, all transfers of wealth must invariably address the question of value.

Well informed buyers and sellers are critical to an efficient market for royalty interests because there is a specialized and relatively complex body of knowledge to consider in the transfer of these types of assets. A lack of knowledge regarding the worth of a royalty interest could be very costly. This can manifest itself in a number of ways. A shrewd buyer may offer a bid far below the interest’s fair market value; opportunities for successful liquidity may be missed; or estate planning could be incorrectly implemented based on misunderstandings about value. Understanding how royalty interests are properly appraised will ensure that you maximize the value of your royalty, whenever and however you decide to transfer it. The purpose of this whitepaper is to provide an informative overview regarding the valuation of mineral royalty interests within the oil and gas industry.

When Do You Need to Know What Your Royalty is Worth?

A royalty owner with the potential to enter any kind of transaction or agreement based on their interest's value needs to know what it is worth. This includes selling and/or using your royalty interest as collateral for a loan. Additional examples of when you need to know what your royalty is worth are outlined below.

Liquidating

In the most obvious case, someone who is planning to sell their royalty interest needs to know what it is worth. There are a variety of reasons to cash out your interest for a lump-sum payment, whether an inflow of cash would help you make ends meet or finance a large purchase; you no longer want to deal with the administrative paperwork or accounting cost of reconciling monthly revenue payments; or you would prefer to diversify your portfolio or move your investments to a less volatile industry. There is a market for royalty interests, making them somewhat liquid. Most of the time, the difficulty is not finding a buyer, but determining whether the buyer's offer is appropriate.

Given that many royalty owners have little connection with the oil and gas industry aside from the monthly payments they receive, buyers may bid substantially below a royalty's fair market value hoping to earn a profit at the expense of an uninformed seller. As such, it is critical that royalty owners looking to liquidate their interest understand its value to ensure that they can negotiate more effectively.

Estate Planning

If you decide to pass down your royalty rights, understanding the value of your interest will be crucial in organizing your estate. Having a legitimate value for your royalty interests will ensure that estate planning is correctly implemented. A credible value will also help you understand what kind of taxes you, or your heirs, will be accountable for and allow you to be prepared when the tax payments come due.

Other Ownership Transfer Scenarios

For years, our professionals have spoken about the "things that happen to you" and the "things you make happen." As mentioned before, royalty owners generally have little connection to the oil and gas industry and like most people, are consumed with the day-to-day activities of their lives. Many fail to acknowledge that life cycle events do happen to them and their families, and that these events will require that their family wealth, including their royalties, be valued.

Maybe you are not currently contemplating transitioning your royalty interest. You do not plan to sell your royalty interests in the next few years, you are not currently thinking about transferring the rights to your children, nor do you anticipate any of the other events listed in the Ownership Transfer Matrix. Then why do you care? An understanding of the value of all your familial assets, including your royalty interest, is critical in preparing yourself for any of these eventualities.

¹ <http://www.mineralweb.com/library/oil-and-gas-terms/mineral-rights-definition/>

| THE OWNERSHIP TRANSFER MATRIX | |
|--|---|
| VOLUNTARY (THINGS YOU MAKE HAPPEN) | <ul style="list-style-type: none"> Sale to Outside Investor(s) Gifting Programs Asset Transfer Collateralization Liquidity Needs |
| INVOLUNTARY (THINGS THAT HAPPEN TO YOU) | <ul style="list-style-type: none"> Divorce Bankruptcy Death |

The Basic Concepts That Must Be Defined in Every Valuation

Before covering specific details related to the oil and gas industry and your royalty interest, it is important to understand basic concepts related to all valuation analyses. Our purpose in this section is to provide a general overview of a few fundamental and universal concepts that materially impact any valuation.

The Valuation Date

Every valuation has an “as of” date, which simply means that it is the date around which the analysis is focused. The date may be set by legal requirements related to a death or divorce, or be implicit, such as the closing date of a transaction.

The Purpose of the Valuation

The purpose of the valuation is important because it is linked to the transfer event (such as a sale, estate planning, fair value accounting, bankruptcy, etc.). A valuation prepared for one purpose is not necessarily useful for another.

The Standard of Value

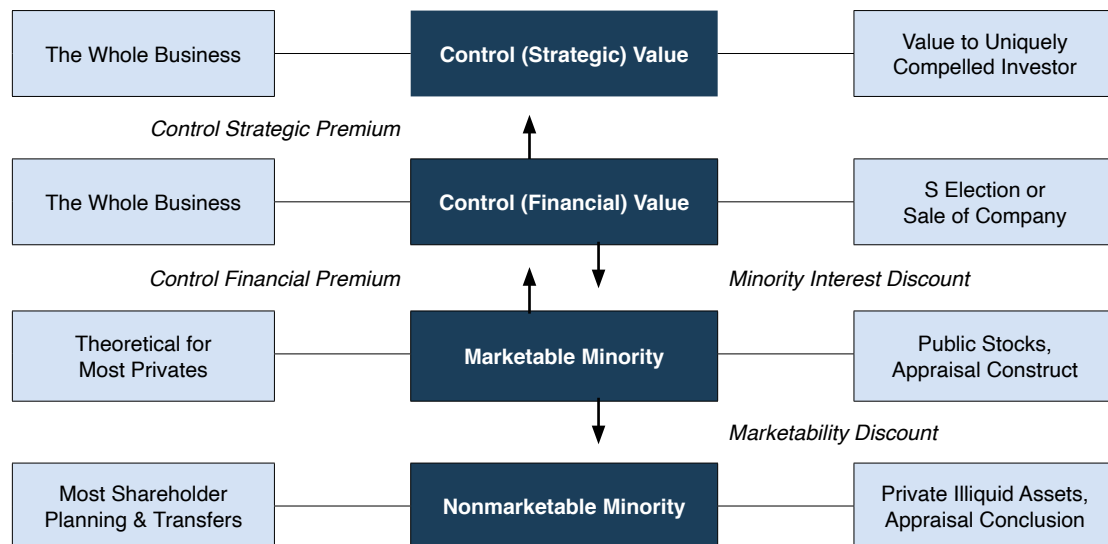
The standard of value is an important legal concept that must be addressed in every valuation assignment. “Fair market value,” most commonly used in tax matters, is the most familiar standard of value. Other important standards of value are “investment value” (purchase and sale transactions), “statutory fair value” (corporate reorganizations), and “intrinsic value” (public securities analysis). Using the proper standard of value is crucial in obtaining an accurate determination of value. The standard of value will influence the selection of valuation methods as well as the level of value.

The Levels (Premise) of Value

Valuation theory suggests that there are various “levels” of value applicable to a business or business ownership interest. The levels of value can be described as:²

- **Controlling interest basis** (levels) refers to the value of the enterprise as a whole. The controlling interest level of value is considered to include two components, the **financial control level** and the **strategic control level**.
- **Marketable minority interest basis** (level) refers to the value of a minority interest, lacking control, but enjoying the benefit of liquidity as if it were freely tradable in an active market. The marketable minority level of value is also on an enterprise level of value, meaning that it is developed based on 100% of the expected cash flows of the enterprise.
- **Nonmarketable minority interest basis** (level) refers to the value of a minority interest, lacking both control and market liquidity.

The relationship between these three levels of value is depicted in the following chart.



Although royalty interest owners do not own an interest in a business, we can consider their interest to be somewhat similar to that of a marketable or nonmarketable minority ownership interest in a business. A minority owner is often relegated to bearing witness to a process over which they have limited control or discretion. In effect, they often play the role of silent partners. They usually do not control the drilling activity of the operator or their royalty interest, and they certainly cannot dictate the strategic direction or management choices of the operator.

² Mercer, Z. Christopher and Travis W. Harms. *Business Valuation: An Integrated Theory, Second Edition*. John Wiley & Sons, Inc. 2008. See Chapter 3.

Further, royalty interests are not marketable to the same degree as a share in a publicly traded company. Unlike an ownership in a publicly traded company, a royalty interests does not enjoy instantaneous liquidity on a regulated exchange. The unique uncertainties related to the timing and favorability of converting a royalty interest to cash must be considered when determining the value of a royalty interest.

Important Industry Factors

It comes as a surprise to many royalty interest owners that there is not a standardized value for their interest. The value of a royalty interest is derived from expected future revenues generated by leasing and/or production, which are largely determined by oil and gas market prices and the current drilling environment. As such, the value of a royalty interest constantly changes based upon exogenous factors, including a myriad of economic and political variables that affect individual producers and consumers comprising the complex global oil and gas markets.

Consequently, a review of the oil and gas industry is important in establishing a credible value for any royalty interest. In addition, it is critical to understand specifically what exact bundle of rights is being valued. There are a number of different types of mineral interests, each with differing sets of rights, privileges, and restrictions. The three most common types of mineral rights are working interests, royalty interests, and overriding royalty interests. The chart below outlines some typical characteristics of these types of interests that are important to keep in mind when reviewing the effect of industry conditions on a mineral interest.

| | Control over Drilling Plan | Owns Net Mineral Acres | Owns a % of Oil & Gas Revenue | Finite Term | Liable for Ongoing Costs | Participates Fully in Profits |
|------------------------------------|----------------------------|------------------------|-------------------------------|-------------|--------------------------|-------------------------------|
| Working Interest | X | | | | X | X |
| Royalty Interest | | X | X | | | |
| Overriding Royalty Interest | | | X | X | | |

A review of the oil and gas industry should consider a wide range of issues (far too many to list in full here), with primary considerations as outlined below.

- **Price Volatility.** The oil and gas industry is characterized by high price volatility. Oil and gas prices are determined by the market and are bound by the basic laws of supply and demand. The size and global nature of this market mean that these prices are influenced by countless economic – and sometimes political – factors affecting individual producers, consumers, and other entities that comprise the global market. The price of oil and gas is influenced by endless variables in the industry, making it volatile.

- **Technology.** Technology in the oil and gas industry changes rapidly and has the potential to materially impact the market. Adoption of innovative drilling techniques, such as horizontal drilling and hydraulic fracturing, has made oil and gas production quicker, easier, and relatively cheaper. By decreasing production costs, technology has allowed producers to increase their margins in times of high-pricing and to keep drilling sites open in low-price environments. Developments in technology have also allowed producers to reach oil and gas that was previously regarded as unattainable, particularly in various shale plays.
- **Regulation.** The oil and gas industry is heavily regulated by various entities, including the Environmental Protection Agency (EPA), the Federal Energy Regulatory Commissions (FERC), the Bureau of Land Management (BLM), and the Department of the Interior (DOI). Regulations on operations have a substantial impact on the oil and gas industry. Legislation aimed at decreasing producer pollution can be financially burdensome to comply with while regulations on drilling techniques can make the production process more costly. It is important to note that the regulatory environment is constantly changing and that it varies across regions and countries.
- **Variation by Oil and Gas Play.** Drilling economics vary by region. There are geological differences between oilfields and reserves that make it harder to drill in some places than others. Whereas some wells can be drilled using traditional, conventional techniques like vertical drilling, less permeable shale wells must be drilled using unconventional methods, like horizontal drilling or hydraulic fracturing. These unconventional methods tend to bear higher operating costs. Location also tends to influence drilling and transportation costs, ultimately making break-even prices and profits vary across and within regions. Accordingly, the value of any royalty interest is strongly influenced by its location, and it is important to consider geological differences when valuing any mineral interest.

Treasury Regulations Section 1.611

Treasury Regulation Section 1.611-1(d)(2) also provides guidance in determining the fair market value of oil and gas properties. It provides that “the fair market value of an [oil and gas] property is the amount which would induce a willing seller to sell and a willing buyer to purchase.” Additionally, Section 1.611-2(g) outlines some considerations that a valuation of mineral properties must include for tax-oriented appraisals. A summary of these considerations is shown in the chart on the next page.

What does all this have to do with your asset? A lack of basic knowledge of these concepts can leave you short of the required vocabulary and understanding needed to comprehend the context with which the value of your royalty interest is developed.

Summary of Treasury Regs 1.611-2(g)

| Considerations for an Oil and Gas Valuation | Description |
|---|--|
| Maps and descriptions of property | Number of acres by reserve type |
| History of the property | Lease terms Date of initial acquisition and cost basis Cost of mineral improvements |
| Valuation date | |
| Accounting information | Allocation of value and/ or cost to the mineral property and property improvements Method used to determine property improvements Depletion/depreciation expense details |
| Reserve estimates | Break down of reserves by mineral type (oil, gas, NGL) Break down of reserves by classification (PDP, PDNP, PUDs) Other pertinent geological information |
| Reserve characteristics | Number of producing zones and average depth of each |
| Operating conditions | Changes in proration, flooding, vacuum, etc. |
| Details regarding previous transactions | Including dates of transactions and the terms of the leases |
| Interest characteristics | Type of interest (royalty, overriding royalty, working interest) Percent/fraction of interest owned |
| Well descriptions | Number of wells, date of completions, and/ or abandonment Annual production per well per day |
| Other Necessary Items | Description |
| Sales history | Revenue generated from reserves over the last five years |
| Historical oil and gas prices | Important in understanding benchmark price differentials |
| Future NYMEX pricing | Important in estimating future cash flow |

Financial Considerations

One of the most important things to consider when valuing a royalty interest is the availability of minerals and the ability of the operating E&P company to bring the minerals to the surface. This depends on both the well economics and the operator's financial condition.

Well Economics

Because a royalty interest is paid out as a percent of revenue and revenue depends on production volume, well economics has a substantial impact on value. Well economics refer to the production rates, decline curve and costs of a well, which can be captured by decline curves. Well production rates change over time as wells age and as technology changes. Each well has a unique decline curve, which illustrates the rate at which production is decreasing. It is important to remember that oil and gas is a depleting asset. Thus, each year after a well is drilled, production will decline. A variety of factors can affect the shape of a well's decline curve; for example, decline curves are generally much steeper if the well is drilled using unconventional techniques, like horizontal drilling, or hydraulic fracturing. Additionally well spacing can affect productivity of a well. Traditionally, wells were thought to need relatively less acreage (<100 acres) for vertical wells, and it was thought that more wells implied more recovery. Often-times, however, when more wells are drilled, well spacing is decreased, and operators see a decrease in production rates. Horizontal wells generally need more acreage, and typically, more than one lateral well is drilled from each vertical well. It is important to keep in mind that there are a variety of factors that can affect well productivity and the rights of mineral owners are generally limited to a portion of the revenue and nothing else.

Further, horizontal drilling has complicated the way royalty revenue is distributed. It is relatively easy to determine who owns the rights to the minerals drilled by a vertical well because a well is drilled straight down from the surface. However, since horizontal wells cover significantly more acreage, one well may be drilled through multiple revenue owners' acreage (it is much more complex to determine who owns what share of the mineral rights). The revenue sharing arrangement for these types of wells is known as "pooling".

Financial & Strategic Condition of Operator

A financial analyst has certain diagnostic markers that tell much about the condition of a business. As previously mentioned, a royalty interest owner receives a payment as long as production occurs. However, if production stops, so do royalty payments. During low commodity price cycles, many operators may be forced to cease operations as low market prices make it uneconomical to continue operating their wells – leaving many royalty owners without their monthly revenue checks. Thus, it is important to consider whether or not your operating company has the financial capability to meet short-term obligations to continue daily operations and operate efficiently to keep production costs low.

Capital Budgeting and Drilling Plans

Because reserves are depleting assets, it is critical to understand how E&P companies are approaching their capital budgeting and drilling plans. In order to maintain current rates of production, operators must drill new wells or improve production of existing wells. Many operators have an inventory of drilled, uncompleted wells (DUCs), which are wells they began drilling but ran out of funding to complete. While DUCs are less costly to bring online than PUDs, both require substantial capital expenditures. When looking at your operator's financials, it is important to understand their CAPEX plans in the near term, because this can impact the value of potential future well production.

Break-even Analysis

Another way to understand an operator's financial well-being is through a break-even analysis. A breakeven analysis can be used to compare how much it costs to produce one barrel of oil to the revenue generated per barrel. This can reveal whether a company is losing money throughout the production process and determine at what market price per unit your company would begin to earn (or lose) money. It is helpful to understand your operator's financials in relation to other E&P companies that focus in the same plays. If your operator's financials deviate strongly from their peers it is important to consider the affect this may have on the value of your royalty interest.

Post Production Deductions

Although royalty owners do not bear costs of production, they still must pay taxes and some even pay their portion of gathering, transportation, and treating costs. Depending on the lease agreement some operators are allowed to deduct post production costs from the royalty owners' portion of revenue. Post production deductions can significantly lower the value of a royalty interest. Thus it is important to analyze the details of a royalty owner's lease agreement when determining value.

What Does the Valuation Process Entail?

Without offering a full dissertation on valuation, you need to understand that there are three commonly accepted approaches to determining value: asset-based, market, and income. Approaches refer to the basis upon which value is measured.

In the realm of business valuation, each approach incorporates procedures that may enhance awareness about specific economic attributes that may be relevant to determining the final value. Ultimately, the concluded valuation will reflect consideration of one or more of these approaches (and perhaps several underlying methods) as being most indicative of value for the subject interest under consideration. However, due to fundamental structural differences between businesses and assets, when valuing royalty interests the available valuation methodologies tend to be utilized differently.³

³ Treasury Regulations 1.611-2(d) asserts that the income approach will not be used if the value of a mineral property can be determined using the cost-approach (under the asset approach) or the market approach. However, those circumstances are rare and not consistent with industry norms. The income approach is most often employed to estimate the fair market value of mineral properties.

The Asset-Based Approach

The asset-based approach can be applied in different ways, but the general idea is that the enterprise value of a business is given by subtracting the market value of liabilities from the market value of assets. While the asset-based approach can be useful when valuing companies operating within the oil and gas industry, this approach is not typically employed to determine the value of a royalty interest itself. The asset-based approach can be used as a basis for estimating net asset values of an entity that holds royalty or mineral assets, however. Oftentimes, a royalty owner purchased land which included the mineral rights and an allocation of surface versus mineral rights was not performed. Additionally, considerable time may have passed between the time the surface and mineral rights were purchased and the valuation date. Adding to the ambiguity of the cost basis of the asset, royalty interests are often family assets that are handed down for generations. For this reason, the asset approach is typically not used to directly determine the market value of royalty interest assets unless the mineral rights were purchased recently. It is most often used to help determine entity and equity values of royalty and mineral asset holding entities..

The Market Approach

The market approach utilizes transaction pricing from guideline transaction data or valuation multiples from a group of publicly held companies to determine the value of a privately held enterprise or asset. To develop an indication of royalty interest value using the market approach, you can utilize data from market transactions of mineral interests in similar plays. This data can be derived from direct transactions of royalty interests or from publicly traded royalty trusts and partnerships.

Direct comparable transactions of royalty interests are often the best indication of fair market value. However, the data with which to benchmark a subject royalty interest against is often unavailable. If it is available, a careful comparative analysis must be made. Royalty aggregators (such as Sitio or Kimbell for example), royalty trusts and partnerships hold various royalty interests in wells operated by large exploration and production companies. Royalty aggregators, trusts and partnerships tend to have very low, if any, operating expenses and can be an investment to provide exposure to oil and gas prices. Acquisition data from these types of entities can be utilized to calculate valuation multiples on the subject royalty's performance measure(s). This will often provide a meaningful indication of value as it takes into account industry factors (or at least the market participants' perception of these factors) far more directly than the asset-based approach or income-based approach.

Metrics such as EBITDA, distribution yield, and production multiples are commonly considered in this space. In addition, value is also considered for potential for future revenue streams from new wells not yet drilled, to the extent it is not captured in the analysis already.

In many ways, this approach goes straight to the heart of value: mineral rights are worth what someone is willing to pay for them. However, the market-based approach is not a perfect method by any means, for businesses or for mineral rights. Transaction data may not provide for a direct consideration of specific mineral right characteristics; it is imperative that the value conclusion be adjusted for differences in value level and in well economics, potential future drilling locations, among other factors. In any valuation, the more comparable the transactions are, the more meaningful the indication of value will be.

The Income Approach

The income approach can be applied in several different ways. Generally, such an approach is applied through the development of an ongoing earnings or cash flow figure and the application of a multiple to those earnings based on market returns. For royalty interests, however, we oftentimes perform a discounted cash flow analysis. This approach allows for the consideration of characteristics specific to the subject royalty interest, such as its well economics making it the most commonly used approach for royalty interest valuations.

To perform a royalty's DCF analysis, production levels must be projected over the well's useful life or planned or even potential future wells. Given that well production typically decreases at a decreasing rate, these projections can be calculated through considering and/or deriving a decline rate from historical production. Revenue is a function of both production and price; as such, after developing a legitimate prediction of production volumes, analysts must predict future price values. The stream of income (revenue less expenses, taxes and deductions) is then discounted back to present value using a discount rate that accounts for risk in the industry. For more mature royalty investments, sometimes a capitalization of cash flow can be appropriate as well, depending on the situation.

Because revenue cash flows are the main driver of mineral royalty values, the income approach is, many times, the most reasonable and supportable valuation approach when determining the value of a mineral royalty interest.

Synthesis of Valuation Approaches

A proper valuation of a mineral royalty interest will factor, to varying degrees, the indications of value developed utilizing the market-based and income-based approaches outlined above. A valuation, however, is much more than the calculations that result in the final answer. It is the underlying analysis of the mineral royalty and its unique characteristics that provide relevance and credibility to these calculations. This is why industry "rules-of-thumb" are dangerous to rely on in any meaningful transaction. Such "rules-of-thumb" fail to consider the specific characteristics of an interest and, as such, often fail to deliver insightful indications of value. A mineral royalty owner executing or planning a transition of ownership can enhance confidence in the decisions being made only through reliance on a complete and accurate valuation of the interest.

Conclusion

Mercer Capital has extensive experience valuing mineral and royalty interests in the oil and gas industry. Despite attempts to homogenize value through the use of simplistic rules of thumb, our experience is that each valuation is truly unique given the purpose for the valuation and the circumstances of the interest. We hope this information, which admittedly only scratches the surface, helps you better shop for royalty valuation services and understand valuation mechanics.

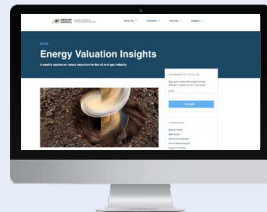
We encourage you to extend your wealth planning dialogue to include valuation of any mineral interests, because sooner or later, a valuation is likely going to happen. Proactive planning and valuation services can alleviate the potential for a negative surprise that could complicate an already stressful time in your personal life.

For more information or to discuss a valuation or transaction issue in confidence, do not hesitate to contact us.

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