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Determining the Fair Market Value of Oil and Gas Interests

I. INTRODUCTION

The occurrence of oil and gas in commercial quantities in sub-surface land areas has a substantial effect upon the value of the land itself. In connection with the Federal Estate and Gift Tax Laws, the value of the various interests in sub-surface oil and gas deposits is an important and often elusive fact which an attorney must determine. The rapid expansion of oil exploration into hitherto undeveloped areas has often presented the tax and probate counselor with the problem of having to evaluate and prove the value of oil and gas interests. The problem is further complicated in that there are very few cases and regulations to serve as precedent and law. In addition, in areas where development is new, sales of comparable interests may be non-existent or in a state of rapid fluctuation, and the attorney may have no previous experience of his own from which to draw.

An attempt is made in this paper to present the various methods of valuation which are presently available and then to analyze or evaluate them from the standpoint of their efficacy in the area of persuasion of the Federal Internal Revenue Service (hereinafter called the Service). The writer makes no attempt herein to improve upon or criticise any of the various technical or scientific methods of calculating sub-surface oil reserves.

It is also recognized that the value of a given oil and gas interest may be greatly affected by the composition of the legal arrangement under which the interest is held. For example, if the interest is funneled through corporate ownership, the interest will carry additional value if it happens to contain the balance of power in a closely held corporation. This aspect is not covered herein because it is not peculiar to the field of oil and gas. There is also a myriad of ownership arrangements which are peculiar to oil and gas and which directly or indirectly affect the valuation of a particular interest. The great variation in the structure of these interests renders a discussion of their influence on valuation under this topic somewhat impractical. It is felt that the particular individual who designed or administers such arrangements is best able to calculate its effect upon the interest to be valued.
A. **Estate Tax Code**

§ 2031, 1954 I.R.C. provides that the value of all real and personal, tangible or intangible property as of the date of death shall be included in the gross estate.

§ 2032 provides that:

1. Property disposed of within one (1) year of the date of death shall be valued as of the date of disposal.
2. The executor may elect to value the property as of one (1) year after the date of death.
3. An estate affected by a mere lapse of time must be valued as of the date of death with allowance for any difference of value as of the later date which is not due to a mere lapse of time.

§ 2033 provides that the value of the gross estate shall include all property to the extent of the interest of the decedent therein at the time of his death.

B. **Gift Tax Code**

§ 2511, I.R.C. 1954 provides that the gift tax applies to all transfers regardless of whether the transfer is:

1. In trust or otherwise.
2. A direct or indirect gift.
3. Of property
   - real, or
   - personal
4. Of property
   - tangible, or
   - intangible.

§ 2512 provides that:

(a) the value of the gift is to be determined as of the date of the gift, and that
(b) where property is transferred for less than full consideration in money's worth, the amount of the value of the property which exceeds the consideration is taxable as a gift.

C. **Regulations**

The regulations for both estate, and gift taxes are nearly identical. They provide that "value" means fair market value. Fair market value is described as the price at which the property

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COMMENTS

would change hands between a willing buyer and a willing seller, and that forced sales are not to be used.

The income tax regulations provide a more substantial guide for determination of the fair market value of oil and gas properties. In determining the basis from which to compute depletion on a producing oil or gas well, it is often necessary to determine the fair market value of the property as of a given date. The income tax regulations\(^2\) provide that value is to be determined by the property owner, with the approval of the commissioner, considering only conditions known at the date of valuation, regardless of subsequent developments or knowledge. In determining market value, the commissioner will consider the following factors:

1. Cost or recent sales of same property.
2. Actual sales of similar properties.
3. Market value of stock, shares, royalties and rentals for some property.
4. Valuation fixed by owner for
   (a) capital stock tax
   (b) local or state taxation
   (c) partnership accountings
   (d) values determined in other litigation
   (e) probate inventory values.
5. Analytic appraisals by approved methods. This regulation also states that where market value must be determined as of a certain date, analytic appraisals will not be considered if other methods will produce a reasonable determination. Where analytic appraisal is used to determine the present value of future net income to a prospective purchaser, the following factors must be determined for each deposit valued:
   (a) total expected profit
   (b) rate at which profit will be obtained
   (c) interest rate commensurate with risk involved
   (d) total quantity of oil and gas in customary measuring units which was paid for
   (e) quantity expected to be recovered
   (f) quality or grade of oil and gas reserves

\(^2\) U.S.Treas. Reg. 118, §39.23(m)-7 (1953).
Where there has been sufficient development, the above factors may be determined from past operating experience and then a full allowance may be made for probable future variations in costs, interest rates, prices and exhaustion rates.

Where past operating figures are not available for determination of present value, the above ten factors must be deduced from concurrent evidence, such as:

(1) General type of deposit.
(2) Characteristics of the district in which it occurs.
(3) Habit of the mineral deposits in property.
(4) Intensity of mineralization.
(5) Oil-gas ratio.
(6) Rate of disclosure by exploitation of additional minerals.
(7) Stage of the operating life of the property.
(8) Any other evidence tending to establish a reasonable estimate of the required factors.

In determining the rate of exhaustion, the following are to be considered:

(1) Limitations imposed by plant capacity.
(2) Character of the deposit.
(3) Ability to market the mineral product.
(4) Labor conditions.
(5) Present or future operating program.

The operating life of oil and gas wells is influenced by:

(1) The natural decline in pressure and flow.
(2) Voluntary or enforced curtailment in production.

Operating cost includes all current expense of:

(1) Marketing (including taxes).
(2) Producing.
(3) Preparing the product sold.
(4) Cost of repairs;

But not including

(1) Capital additions.
(2) Deductions for depletion and depreciation.
Estimates of average grade, rate of exhaustion, operating life and operating costs will ordinarily not be allowed by the commissioner unless developed from operating experience of the property valued.

The present value is arrived at by:

1. Expected gross income. (Estimating the number of recoverable units of oil or gas multiplied by an estimated market price per unit.)
2. Less operating cost.
3. Reduced to present value as of date of valuation by a rate of interest commensurate with the risk involved for the period of the operating life.
4. Further reduced by the value of depreciable assets and the amount of capital additions necessary to realize the profits.

It is stated that the risk factor is lowest where the other valuation factors are derived from prior operation records and that a higher risk attaches to factors derived from any other basis.

D. Scope

Although the above regulations are used for the purpose of determining income tax deductions, their object is precisely the same as the valuations necessary for Estate and Gift Tax computations. Although the Service is not expressly bound to follow the income tax regulations, it would be difficult to deny the logic of their utilization in the Estate and Gift Tax field.

The entire problem of valuing oil and gas interests is one of fact, supported almost entirely by opinion. Therefore, the objective is merely one of persuasion. The preparation of value-facts, supported by opinion-fact for the purposes of persuading the Service and, if necessary, the Federal and Tax Courts, to accept a particular valuation, comprise the scope of this paper.

The writer proceeds herein under the dogma that adherence and compliance with the income tax regulation previously set out will produce the maximum amount of persuasion with the Service with the least amount of wasted effort.

II. METHODS OF VALUATION

Within the area of valuation of oil and gas interests, the courts have provided little, if any, penetrating analysis of the problem. In a few cases, the method itself is briefly analyzed. In most of the cases, the method is mentioned and a final figure quoted in an often arbitrary manner. In several of the cases, a value is arbitrar-
ily assigned without reference to method or reason. Although the cases provide little in the way of analysis of the problem, it is felt that a review and later tabulation may provide a scintilla of understanding about the judicial method of handling this problem when it has reached the litigation stage.

A. WHERE NO METHOD IS MENTIONED

Certain cases have been placed in this section not because of the arbitrary manner in which the value was determined, but merely because the method used might today be considered unorthodox.

In E. C. Laster\(^3\) the Commissioner attempted to tax a capital gain where the taxpayer received completed wells in exchange for oil payments of limited amount. The Commissioner assigned an arbitrary fair market value of $22,000.00 to each well and the taxpayer offered no evidence to refute. The Board of Tax Appeals (hereinafter called B.T.A.) indicated that they would have accepted the Commissioner's valuation, but found that there was no taxable gain.

In H. B. Folk\(^4\) the issue was the fair market value of an interest in an oil reserve, as of date of acquisition, for depletion basis. The Commissioner's figure of $56,000.00 was derived by adding $2,000.00 to an appraisal of the property for state property and Federal Estate Tax purposes. The taxpayer produced a petroleum engineer who testified to a value of $227,076. Two of his valuation factors which the Tax Court refused to accept were:

1. A price of $2.25 per barrel plus a 75¢ premium which were the maximum prices ever paid in the mid-continent field, and

2. A new cement process of plugging off salt water which had been developed near the time of acquisition.

The court felt that the second factor did not increase the recoverable reserve but merely shortened recovery time.

The court held that while the commissioner's valuation was favored with a presumption of correctness, the taxpayer's testimony rebutted this presumption to the extent of $44,000. The court merely compromised the opposing contentions. It is interesting to note that the court did not feel bound to accept the Estate Tax valuation.

In C. B. Shaffer\(^5\) the taxpayers in 1919 had declared the value

\(^3\) 43 B.T.A. 159, 166 (1940).
\(^4\) 25 B.T.A. 599 (1932).
\(^5\) 29 B.T.A. 1315 (1934).
of certain oil properties, as of March 1, 1913, to be $7,091,000 for the purpose of determining profit from the sale of assets in 1919. The court listened to and considered extensive testimony from several expert witnesses produced by the taxpayers to establish a valuation in excess of $10,000,000 on May 1, 1913. The B.T.A. also looked at production figures and profits subsequent to 1913, but finally held that the valuation asserted by the taxpayer of $7,091,000 in 1919 was controlling. The court was influenced by the fact that the taxpayers were themselves experts in valuing oil and gas properties and felt that the taxpayers knew more about the 1913 value in 1919 than their witnesses knew in 1930. They stated that taxpayers do not ordinarily undervalue when assigning a March 1, 1913 value. They also stated that their finding of value was derived from evidence rather than by estoppel of taxpayer to claim a higher value. In this instance, the court preferred a prior valuation made for other purposes to a subsequent valuation sought to be established by expert analytical testimony.

In *Olinda Land Co.* both taxpayer and commissioner used expert witnesses to establish value and the Tax Court accepted the valuations of the taxpayer on the basis of the overall cumulative effect of his witness, without further expounding. The Commissioner's witness had made prior inconsistent statements while employed by the Federal Government.

In *Effie W. Keery* the petitioner filed an estate tax return in 1941 listing the value as $16,000. In figuring long term capital gains from a sale of the property, she attempted to establish that its value, when acquired (1941), was $77,000. The Commissioner did not plead estoppel and the court did not assert estoppel to support their holding, but the petitioner had no success in trying to establish a value different from that in the estate tax return. The Tax Court pegged their finding on a consideration of the evidence as a whole.

In *Est. of Charles B. Longcor*, the petitioner asserted a value of $12,100 and the Commissioner asserted $26,900. Petitioner failed to introduce any competent evidence, and therefore failed to meet the burden of proof. In addition, the Commissioner had produced "convincing" expert testimony.

In *Brown v. United States* the Commissioner's valuations of

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fractional oil interests in estate tax proceedings were set aside. The Commissioner and the taxpayer both used expert testimony to establish the value of various working and royalty interests. Both sides considered the following factors:

1. Character of production.
2. That on the date of death, the property was in a state of flush production.
3. The oil business was in a state of excess production.
4. Marketing factors were difficult at the time.
5. Storage would be necessary for future production.
6. Forecasts indicated downward oil price trend.
7. The market for oil properties prevented sale except at sacrifice.

The Commissioner's valuations were often two to two and one-half times as high as those of the taxpayer because a much higher price was used and because material and equipment were added to the values of the working interests. The District Court sided generally with the maximum values offered by the taxpayer's experts. The court determined average daily production for the three months preceding the date of death and assigned the taxpayer's maximum figures of $300 per barrel (royalty interest) and $200 per barrel (working interest). It is interesting to note that in this case, where the court felt they had good reason to overthrow the Commissioner's figures, they held the taxpayer to the highest figures presented by his several experts which would appear to be completely justified and should serve as a reminder to those who would offer experts in the future. The average daily production method used here appears to be more arbitrary than many of the newer methods in popular use.

In *Leland J. Allen*, the taxpayer owned a 21/2% royalty interest in the oil wells that had become whipstocked and from which only gas was produced in paying quantities. The taxpayer's witness stated that the market price of a royalty interest would be about 21/2 to 3 years' production but that a whipstocked well had a negligible life expectancy. He also estimated that monthly income from gas would be $5,500 to $6,600. The commissioner had valued the interest at $3,483. The Tax Court took 21/2% of the taxpayer's monthly income estimate which amounted to $137-170. They then took the taxpayer's 2 (21/2-3) year figure for market price of a pro-

10 *T.C. 1232 (1945).*
ducing royalty interest and produced values of $3,288-4,080 which bracketed and supported the commissioner's valuation of $3,483. This is an interesting example of using a taxpayer's evidence, out of context, to destroy his own contentions.

In Cotton v. Commissioner, ten expert witnesses testified as to values ranging from $2,701,361 to $5,335,000. Without any further explanation, the tax court valuation of $4,500,000 was upheld because it was bracketed.

The cases in this section indicate nothing in the way of a general trend. In the Shaffer and Keery cases, it is well to note that where the taxpayer has voluntarily assigned a fair market value to property, which has previously been accepted by the Service for some other purpose, he will be substantially estopped to assert a different value unless he can come up with an extremely credible explanation and evidence of good faith. In sustaining the burden of proof, the taxpayer must use extreme caution in refraining from introducing evidence which can be maneuvered by the court into supporting the Commissioner's position.

B. Value From Sales of Same Property

There can be little question but that recent sales, under normal conditions, provide the best compliance with the definition of "fair market value" in the regulations. Recent sale or cost is one of the two or three available methods of establishing the value of unproved interests or interests in unproved lands. With proved interests, it obviates the necessity of expensive and often unpersuasive professional appraisals which may often be prepared on the basis of a firm figure now and substantiating factors later, if and when they are needed. The persuasive content of a recent sale value would necessarily be lessened by the following factors:

1. Lapse of time between sale and valuation date.
2. Change in prevailing interest rates.
3. Change in physical properties of interest.
4. Change in marketing and labor conditions.
5. Change in prices.

11 165 F.2d 987 (9th Cir. 1948).
12 See note 5, supra.
13 See note 7, supra.
(6) Change in costs and expenses.
(7) Voluntary or governmental regulatory changes.

Leland E. Fiske has stated:

Perhaps the best evidence of the value of an oil property is the price for which it was sold in an arm's length sale within a short time of the valuation date. This sale price needs to be adjusted because of any events which happened between the sale date and the valuation date which would affect the value, such as a change in the price of oil, the completion of a new well or the abandonment of an old well, the commencement of the wells to produce water, and similar events. Subject to these adjustments, the sale should establish the value of the property.

In Sian Oil and Gas Co., it was necessary to determine the value of certain leases as of March 1, 1913 for depletion purposes. Estimates of taxpayers' witnesses varied from $1,000,000 to $2,268,000, and the Commissioner determined a value of $600,000. The B.T.A. mentioned that 1/10 of the lease acreage had been twice sold in 1916 for $700,000 and $1,000,000, but upheld the Commissioner's valuation in light of conditions known to exist at the time. The court also considered several other factors.

In T. B. Noble, the taxpayer purchased a lease at public auction for $52,650 and exchanged it 15 days later for corporate stock. Due to the short lapse of time and lack of evidence of any change in conditions, this purchase price was controlling as to the value of the lease on the date of the exchange.

In Elisha Roper, the fair market value as of the date of discovery was in issue. The taxpayer introduced evidence of sales of entire royalty interests of $700 per acre prior to discovery and $2000 per acre after discovery. The sales were of undivided interests in a tract of 345 acres. The taxpayer also contended, to his own entrapment, that the total reserves for the entire area were 117,000. By simple mathematics the B.T.A. found that $2000 times 345 acres gave a value of $690,000 and that 117,000 times the prevailing price of oil ($2.75) times the royalty was much less than $690,000. The court held that if they accepted taxpayer's fair market value of $690,000 based upon the post-discovery sales price of $2000 per acre,

15 Reviewing Engineer, Int. Rev. Service, Dallas, Texas.
17 3 B.T.A. 670 (1926).
18 12 B.T.A. 1419 (1928).
19 7 B.T.A. 1112 (1927).
20 134 F.2d 380 (5th Cir. 1943).
that the per-barrel depletion rate could not be figured on the basis of total reserves of 117,000 barrels.

In Boudreau v. Comm.,20 a corporation, on liquidation, distributed uncollected oil payments of $347,492.18 among its 495 outstanding shares. Shortly after liquidation, certain of the shares were sold for $380.748 each. In using these sales as evidence of the fair market value at the time of distribution for the purpose of computing capital gains, the CCA affirmed the Tax Court, stating:

In the case at bar, the Commissioner determined that each 1/495 interest received by the taxpayers had a fair market value of $380.748. This finding as to value is prima facie correct, and the burden was on the taxpayers to produce evidence sufficient to overcome the presumption. Commissioner v. Swenson, 5 Cir., 56 F.2d 544, 545; Trippett v. Commissioner, 5 Cir., 118 F. 2d 764. The record made by petitioners does not show that the fair market value of their interests was lower than that found by the Commissioner. Rather than overturning the presumption of correctness attaching to the Commissioner's determination of value, the record evidence lends support and weight to that finding.

... Here, the rights received in exchange for stock are shown to have a fair market value at the time of the distribution.

It is submitted that valuation problems will seldom reach the litigation stage where the taxpayer can present evidence of this category to sustain his position.

C. VALUE FROM OTHER PROPERTY IN THE AREA

This is practically the sole factor by which an opinion as to the value of interests in unproved lands may be substantiated. Sale prices on unproved interests may often be obtained from cooperative landsmen and independent lease brokers in the area or from local recordings of the leases and deeds. All of the limitations which attach to the use of sales of the same interest also apply to the use of this method of proof. In addition, any dissimilarity between the property value and that sold will limit the worth of the figures derived therefrom.

In connection with proved interests, Leland E. Fiske has this to say:

In the absence of sales or offers of sales for this property, resort can be had to the prices for which similar properties sold in the same oil field, or in comparable oil fields. In order to use the sales prices of these other properties as a measure of the value of the property under consideration, it is necessary to have a means of comparison, since no two properties will be exactly alike. In comparing the prices paid for various properties oil men use one of several methods.21

21 See note 16, supra at 78.
The methods described by Fiske are:

1. **Price per barrel of daily production method.**

   \[
   \text{Sale price of comparable property} \div \text{Its net daily production in barrels} = \text{Price per barrel}
   \]

   This price per barrel is then multiplied by the net daily production attributable to the interest to be valued to arrive at its fair market value. Fiske warns that this method is inaccurate where the property to value is not in a stage of settled production. It is submitted that this method is even more worthless where voluntary or governmental production regulations are present.

2. **Payout method.**

   \[
   \text{Sales price} \div \text{Monthly net income of property sold} = \text{Payout in months}
   \]

   This payout term is then multiplied by the monthly net income of the property to be valued and fair market value results. Normal payout is expected to be one-half the producing life of the property, i.e., 2:1. Fiske warns that properties compared should have similar life expectancies and that properties with divergent sand depths should not be compared.

3. **Well method.**

   \[
   \text{Sales price} \div \text{Number of wells} = \text{Well price}
   \]

   The well price is then applied to the wells to be valued. Fiske points out that the wells to be valued should have similar life expectancies and net incomes to those sold.

4. **Price paid for oil in the ground.**

   \[
   \text{Sale price} \div \text{Estimated recoverable oil} = \text{Price paid for oil in the ground}
   \]

   This method involves estimating the recoverable reserves in the ground of both interests. Fiske points out that the comparison should be made only between properties with similar operating costs and that adjustments must be made for price changes.

   In *Sian Oil and Gas Co.*,22 the final valuation determined by the B.T.A. was 2-3 times the sales price paid for nearby properties close to the date of valuation.

   In *Premium Oil Co.*,23 the value of leasehold interests as of March, 1913 was in issue. The production records and proximity

22 See note 17, supra.
23 12 B.T.A. 68 (1928).
of producing wells on adjoining property were introduced but ignored because of lack of comparison factors and any sales of the adjoining property.

In *North American Oil Consolidated*, the value as of March, 1913 was in issue. The following comparisons were disregarded:

1. Sales 3 years and 4 miles distant.
2. Sales 4 years and 18 miles distant.
3. Sales 4 years and 5 miles distant.
4. A sale immediately following a 6,000-7,000 barrel per day well on the same property.
5. A sale admitted to have been consummated on the strength of a gusher one mile distant.
6. A sale immediately following two gushers in the same and in an adjoining section.

The sales which were considered good evidence were:

1. Two sales in the same section three years prior to 1913 for $1500 per acre in the “gusher” zone.
2. One sale in the same section for $980 per acre three years prior to 1913.

The B.T.A. then used these allowable sales figures plus the present value of the reserves on hand in 1913 to determine the fair market value as of March 1, 1913. As an end result, the court would only consider sales from the same section.

In *Loula Mae Harrison*, the fair market value of certain oil and gas leases was in issue. The taxpayer introduced evidence to the effect that certain undeveloped deep sands in the lease had a market value in that production had occurred within a few miles of the lease in question from these deeper sands. The Commissioner asserted that these deeper sands had only a nominal value and asserted a valuation of $10,000. The taxpayer had urged $15,000 and was successful in persuading the Tax Court to compromise for $12,500.

In *Est. of Albert Patterson Humphrey*, the value of nine wells situated on 23 acres as of the date of death of the decedent was in issue. The Tax Court noted that:

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24 12 B.T.A. 68 (1928).
(1) A producing well on a one acre lease in a nearby field three days prior to death brought $32,000 subject to a 1/16 overriding royalty. On a comparable basis, the same well located on 2.3 acres would have been worth $40,000 for a 7/8 working interest. The court noted that the location of this lease and the sand thickness were not as favorable as the one to be valued.

(2) Three months prior to the date of death, eleven nearby wells were sold at a price of $50,000 each. It was noted that three of the wells were very similar to those in question and that eight of the wells were of lesser quality.

(3) Sales 5 months prior to the date of death of four wells as follows:

(a) 2.1 wells on 12.35 acres for $30,000.
(b) 1.3 wells on 4.03 acres for $70,000.
(c) .6 well on 2.5 acres for $30,000.

The Commissioner contended that the value of the lease was $450,000 and the taxpayer's figure was $225,000. The Tax Court found the value to be $400,000, considering:

All of the relevant facts, including comparative sales and all the various other factors affecting market value, and after giving consideration to the expert opinions of value as testified to by the . . . witnesses . . . in light of their particular qualifications, their knowledge of the actual facts . . . and their particular methods of valuation.¹

It is to be noted that the court failed to accord any preference to any of the various methods of valuation mentioned and took shelter under all of the methods as a precaution against possible disagreement by a reviewing jurist. It is to be noted that the final valuation is the same as the sale of an admittedly inferior interest three days prior to the date of death.

In U.S. v. Garbutt,²⁷ the Court of Appeals sustained a District Court valuation which was based upon evidence of actual sales of similar property in preference to an analytical appraisal determining present value through the use of estimated reserves and Hoshkold's formula. The court followed the forerunner of the present income tax regulations²⁸ in announcing their preference.

It may be noted that the Humphrey case²⁹ involved a determination for estate tax purposes and the court specifically declined to

²⁷ 35 F.2d 924 (10th Cir. 1929).
accord preference to any one of the several valuation methods considered therein. In the Garbutt case,\textsuperscript{30} the question involved a determination of profits for income tax purposes and the court accorded sales of similar property a preference over analytical appraisals as provided in the income tax regulations.\textsuperscript{31}

It is submitted that the logic of the income tax regulations' preference for actual sales of similar property over analytical valuations should apply with equal persuasive impact to valuations for the purpose of the Federal Estate and Gift Tax.

D. Value From Analytical Appraisal

In many situations where the physical properties of the interest are singular or the valuation is of large monetary importance, it will be necessary to utilize analytical valuations. It is submitted that an analytical appraisal, secured and prepared in a proper manner may have a persuasion content nearly equal to that of recent sales of the same property. To begin with, it must be kept in mind that the primary object of the appraisal is to persuade the Service to accept its figures and thereby avoid expensive and often disastrous litigation in competition with Revenue attorneys who are more often than not, extremely adept at persuading the court as to the merit of their valuation.

The person who prepares the appraisal will usually be an engineer who is unfamiliar with legal valuation proceedings and the extent to which his opinions must be supported by facts which to him might be considered common knowledge. When ordering the appraisal, it would be well to prepare in advance, a written list of the various factors, many of which are found in the income tax regulations,\textsuperscript{32} which must be determined prior to any calculation of fair market value. If possible, the entire problem should be discussed with the prospective appraiser and all records of past operation and any pertinent information of latent character which is known to the landowner should be placed at his disposal. The extra time and money spent in securing a thorough, fact-supported valuation will be more than compensated for in the persuasive character of the information received. It is often necessary to request that a written report containing the substantiating facts be furnished with

\begin{itemize}
  \item \textsuperscript{28} See note 2, supra.
  \item \textsuperscript{29} See note 26, supra.
  \item \textsuperscript{30} See note 27, supra.
  \item \textsuperscript{31} See note 2, supra.
  \item \textsuperscript{32} U.S. Treas. Reg. 118, §39.23(m)-7(b) (1953).
\end{itemize}
the valuation figure. This should be requested in each instance since the figure, by itself, is comparatively worthless.

In appraising a single interest, it is often necessary to evaluate an entire reservoir. This will be greatly facilitated if proper records have been kept and are at the disposal of the appraiser. A prominent petroleum engineer has stated:

An ideal program to be followed from the time of the discovery well through the producing history of the field, so far as pertinent engineering data is concerned, would be as follows:

1. Well logs, electric logs, radioactivity logs, temperature logs and sample logs.
2. Core analysis, including porosity, permeability and saturations.
3. Bottom hole samples.
4. Initial bottom hole pressures and temperatures and subsequent pressure surveys during the producing life of the field.
5. Accurate withdrawal data on oil, gas and water.
6. Individual well tests.
7. Maps: Structure, isopac, pressure and any other parameter that might appear desirable, depending upon the conditions existing in any particular reservoir.33

The above is set out to emphasize the particular complexity of evaluating a reservoir and the amount of recoverable oil therein. In valuing smaller holdings, much of the above reservoir information will, for various business reasons, not be available.

In order to properly utilize the appraiser's evaluation, it is imperative that the counselor, when conferences with the service are necessary, have a certain familiarity with reservoir mechanics and the manner in which oil and gas deposits accumulate in sub-surface "pools."

An excellent article on "Reservoir Mechanics"34 describes how crude oil is found in pressurized reservoirs composed of porous sandstone and limestone. The terms porosity and permeability are described and it is illustrated how porosity determines the volume recoverable and permeability determines the rate of recovery. Oil is usually found in association with water and gas in the reservoir. The water being heavier is below the oil and that amount of gas present, in excess of that which will mix with the oil under pressure, is found above the oil sands in a free state called a "gas cap."

Oil will only move through the porous sands when it is pushed by an outside force. This pressure is normally supplied from the water below or the gas cap from above in their natural state. Additional recovery may be obtained by artificially increasing the water pressure from below or the gas pressure from above. The ideal method of recovery is to produce similar quantities of pressure from above and below and thus contain the oil deposits in their original area. When the oil is shoved into "dry" sands, much of it is lost when it soaks into the new sands much in the same manner as water into a sponge.

Crude oil and gas originate from organic tissues which have undergone chemical reactions due to (1) time, (2) pressure (3) temperature and (4) reaction with surrounding rock or liquid material. The crude oil product of these reactions is found in certain rock strata near the earth’s crust. There is a great variation in the various types of crude oil, the three general types being (1) asphalt base, (2) paraffin base and (3) mixed base crudes.

Rock forming minerals containing connate (trapped) water are generally deposited at the bottom of a water body along with the organic matter. The rock forming minerals, lime, clay and sand form beds of limestone, shale and sandstone. These beds form irregular layers due to the fact that the earth’s surface is continuously folding, squeezing and breaking. The petroleum particles formed from the organic material in the presence of the connate water within the rocks, being lighter than the water, move up through the porous spaces in the rocks. Where there is insufficient pore space, this movement is stopped and when enough petroleum particles are stopped in the same place, a pool is formed. The oil may remain in this manner, resting on the water which forced it upward, for millions of years. A non-porous rock strata prevents further upward movement.

We turn now to the engineer’s analytical appraisal. Fiske sets out its preparation in the following manner:

(1) An estimate of the recoverable oil in barrels under the property, belonging to the interest in the property which is to be valued, is made.

(2) The estimated oil reserves are multiplied by the current price of oil to determine the expected future gross oil sales.

(3) An estimate of the expected life of the property is made.

An estimate is made of the expense to be incurred in the operation of the property over its life.

The estimated expense is deducted from the estimated oil sales, to produce the expected future net income over the life of the property.

The salvage which will be realized from the equipment on abandonment of the property is determined and added to the future net oil income to arrive at the total expected future income.

The total expected future income is discounted by a proper factor to arrive at the present value of this future net income to a prospective purchaser.\textsuperscript{38}

A noted text writer on the subject has diagramed the method more simply as:\textsuperscript{37}

\begin{align*}
\text{Estimated recoverable oil} & \text{ less Royalty interests} = \text{Net oil reserves} \\
\text{Net oil reserves} \times \text{Price} & = \text{Estimated income} \\
\text{Estimated income} \text{ less Production and Operating costs} & = \text{Estimated profits}
\end{align*}

To estimated profits the elements of (1) timing of production, and (2) discount for present worth are applied.

E. \textsc{Estimates of Recoverable Reserves}

Paine states that, "The range within which estimates of reserves fall is a wide one and is probably the most uncertain single variable in estimates of oil property values."\textsuperscript{38} (Emphasis supplied.)

In considering reserves, the two important factors are (1) the actual volume of estimated recoverable oil and (2) the timing of its production.

The two principal methods for determining reserves are:

(1) The volumetric or saturation method, and

(2) The decline curve method.\textsuperscript{39}

F. \textsc{Volumetric or Saturation Method}

In using this method, the volume of the sands is first determined. The physical facts (porosity and permeability) about the

\textsuperscript{36} See note 16, supra at 83.

\textsuperscript{37} Paine, Oil Property Valuation 139 (1942).

\textsuperscript{38} Id. at 57.
sands, and their oil and gas content are then determined and then the recovery factor is applied. The following formula is used:

\[
\text{Barrels} = A \times S \times S \times P \times O \times R \times 7758
\]

- **A** — Area of proved tract in acres
- **S** — Sand thickness in feet
- **P** — Porosity expressed as a fraction of the sand volume
- **O** — Space occupied by oil and dissolved gas, expressed as a fraction of the pore space.
- **R** — Percentage of oil recoverable (recovery factor) expressed as a fraction
- **7758** — Number of 42 gallon barrels which equal one acre-foot of volume.

Of the above elements, "R" is the most difficult to determine.

The location of the well on the reservoir, well spacing and withdrawal rates also affect estimates by this method.

G. **DECLINE CURVE METHOD**

This method utilizes plotted records of nearby wells which are extrapolated into future estimates for existing and potential wells. With curtailment of production and proration, this method becomes less useful. These curves depend upon normal conditions and normal behavior of a large number of wells for optimum utility. In practice, the well record is plotted on logarithmic coordinate paper and shifted until a straight line plot is achieved. Extending this line supplies the future estimates.

Secondary recovery methods may also be considered in computing reserves.

Concerning dry gas, estimates are usually made by a saturation method which is similar to the volumetric method for oil, or by observing pressure drops due to withdrawal of a known volume of gas.\(^40\)

H. **MARKETING**

Except in unusual situations, this element presents no difficulty in valuing oil interests. In the case of gas, because it is impractical to store in large quantities, this element is the primary factor in its valuation. Evidence of recent sales to local marketers is generally sufficient to establish the marketing effect on valuation. Marketing

\(^{39}\) Id. at 63.

\(^{40}\) Id. at 91.
is often controlled by state regulation of the pipe-lines and prices of competitive fuels.

I. PRICING

There appears to be no set standard for pricing oil for appraisal purposes. One method, which is advantageous for Estate and Gift tax purposes in periods of rising prices, is to take an average price over a period of prior production. This method was specifically followed in at least one Tax Court Decision. The other method, and probably the best, is to use the "posted market price" found in one of the trade journals as of the date of death, date of transfer, etc. This method was followed in J. B. Cage.

As previously mentioned, the price of gas is largely controlled by local marketing conditions and there is often no posted market price. Gas prices should be determined as those prevailing in the area as of the date of death etc., much in the same manner as valuations are placed on unlisted stocks.

41 See note 23, supra.
42 Paine, supra note 37, at 101.
44 Concerning gas pricing and marketing, the above comments are a gross over-simplification. The fair market value of a gas interest should be determined along the same principles by which an oil interest is valued. The greatest difficulty is encountered where there are no sales or valuations of the same or nearby interests and it is necessary to resort to an analytical appraisal. Where this is necessary, pricing and marketing are of primary importance. 3A Summers, Oil and Gas §589 (1958), Sneed, Value of Lessor's Share of Production Where Gas Only is Procured, 25 Texas L. Rev. 641 (1946). It is often impossible to separate the price element from the fair market value itself.

After the quantity of gas within an interest has been determined, it must be priced and then reduced by marketing costs before it acquires any market value. Where costs are high in comparison to the price so determined, it may develop that the interest may have a high intrinsic value but no fair market value.

Where the field in which the interest is situated is serviced by a pipeline, the price can be determined by the price paid for gas at the well. 3A Summers, op. cit. supra, Phillips Petroleum Co. v. Bynum, 155 F.2d 196 (5th Cir. 1946), Sartor v. United Gas Public Service Co., 186 Ta. 555, 173 So. 103 (1937). Where there are no prices from the same interest, comparative prices from similar interests can be used. Miller, Williams and Beirne, Gas Production Depletion, 2 Oil & Gas Tax Q. 148 (1953). Another source of price is the payments to the royalty owners.

Sales from nearby fields (Shamrock Oil & Gas Corp. v. Coffee, 149 F.2d 409 [5th Cir. 1944], sales in neighboring towns (Krettni Development Co. v. Consolidated Oil Corp., 74 F.2d 497 [10th Cir. 1934]), prices paid at the nearest market point less cost of transporting the gas to market.
J. Costs

The two principal cost areas are development and operation.

As for development costs, they depend upon an accurate estimate of the number of new wells necessary in a proved tract to produce the maximum recovery for the minimum cost. When the number of wells needed to be drilled is determined, the average depth of sands in the tract can be compared with known costs of drilling other wells in the area at a comparable depth. A liberal figure is often easy to justify in this element.

Other development costs include physical equipment less salvage value and intangible items such as labor, fuel and repairs. *Paine's Oil Property Valuation* contains a table of well development costs in depth ranges for the various states.

Operating costs include pumping or lifting costs and field expenses. These are usually determined from past records on the

(Haynes v. Southwest Natural Gas Co., 123 F.2d 1011 [5th Cir. 1941], Hemler v. Union Producing Co., 40 F.Supp. 524 [W.D. La. 1941]) and the value of certain gas received in exchange for dry sweet gas from the interest to be valued (Phillips Petroleum Co. v. Ochsner, 146 F.2d 138 [5th Cir. 1944]) have been allowed as evidence of price in determining the royalty share of gas production. Where there is no prevailing price nor marketing facility in the field, any competent evidence (Kretini Development Co. v. Consolidated Oil Corp., supra; Cartor v. Arkansas Natural Gas Corp., 321 U.S. 620 [1944]) or other reasonable determination (Miller, Williams and Beirne, *Gas Production Depletion, 2* Oil and Gas Tax Q. 148 [1953]) should be utilized.

To summarize, actual sales of the same or similar interests should first be consulted to arrive at fair market value. Where these are lacking, the analytical appraisal should be used and the price applied therein should be determined in much the same manner as the fair market value of the interest, viz., sale price of gas at same interest, or sale price at similar interests, or price used in determining royalty payments, or lastly, by any other reasonable evidence.

Public utility gas valuation cases are of little assistance in this problem because the values determined therein are nearly always something other than fair market value. Eminent domain and other condemnation cases provide little discussion of the problem. The bulk of the cases in which the fair market value of a gas interest is involved are those in which a royalty share is to be based upon the fair market price of the gas, Sartor v. Arkansas Natural Gas Corp., supra; Phillips Petroleum Co. v. Bynum, supra; Shamrock Oil & Gas Corp. v. Coffee, supra; Phillips Petroleum Co. v. Ochsner, supra; Phillips Petroleum Co. v. Record, 146 F.2d 485 (5th Cir. 1944); Brown, *Gas Royalty Provisions and the Rights of Lessors and Lessees With Respect to Sale of Gas, 30* N. Dak. L. Rev. 1 (1954); Sneed, supra.

45 Supra note 37, at 112.
same property on a per well basis or a fixed unit cost (per barrel) is estimated. The former is preferred. The withdrawal rate is important in determining operating costs because it determines both the cost per well and per barrel basis.

K. Taxes

The following types of taxes may need consideration as a valuation factor:

1. Capital stock
2. Franchise
3. Privilege
4. Ad valorem
5. Use
6. Stream pollution
7. Federal transfer stamp
8. Unemployment (social security)
9. Production or severance
10. Income
11. School
12. Sales
13. Proration
14. Old age assistance

L. Present Value

When the “total expected future income” or the “estimated profits” have been determined by the use of the previous factors, the figure produced must then be discounted to determine its present worth. Present worth can be defined for our purposes as total expected future income less compound discount for the spread of years over which the income is figured.

A straight discount method is often used which involves but a single rate of discount and the annual net revenues are subtracted from the investment remaining at the beginning of the year and allocated to earnings and return of capital. Lyon F. Terry has described this method thus:

This method of valuation recognizes that the net revenue from the property for any year consists of two parts: (1) current earnings, and (2) a return of capital through which the investment is reduced from year to year and ultimately will be paid out. The rate of discount used in the valuation of equivalent to the rate of current

46 Id. at 115.
47 Id. at 122.
48 Supra, note 16.
49 Supra, note 37, at 139.
50 Engineer, Department of Petroleum Economics, Chase National Bank; formerly associated with several large oil companies and also with the Service in valuation work.
earnings or yield on that portion of the net capital remaining invested in the property during any year.\textsuperscript{51}

It should be cautioned at this point that this system is completely independent from any systems set up for other purposes to amortize, deplete or depreciate the interest. Earnings used in the appraisal must be earnings \textit{before depreciation, depletion or amortization}.\textsuperscript{52}

Another formula, called Hoskold's Theory is often used. This theory applies a "speculative" discount rate to an annual sum of unequal amount and an additional "safe" rate to a sinking fund calculated to amount to the investment by the time the property becomes exhausted. The straight discount method appears to be a better method because only one discount rate is necessary. Terry states that for properties of 10-15 years life, Hoskold factors of 8 and 4\% are nearly equal to a straight discount of 10\%.\textsuperscript{53}

Concerning the selection of a proper discount rate, much could be written for the proposition that it should be limited to mere return of capital plus a further stable amount for the use of the money. In following this principal, it is difficult to justify any rate in excess of 6 or 7\%. There is, however, widespread use of an additional "risk" factor of 3-4\% which is severely criticized by Paine as a poor substitute for thorough and accurate estimates of costs, reserves and prices. He does note, however, that:

At other times the 10\% may be found without any explanation other than that it is permitted by the Internal Revenue Bureau when used in matters relating to Federal gift and inheritance taxes.\textsuperscript{54}

On the other hand, Fiske, who works for the Service, says that:

Because of the hazards of investment in oil properties, it is believed that the rate of interest should not \textit{usually} be less than 10 per cent. (Emphasis supplied.)\textsuperscript{55}

It is submitted that 10\% is not unreasonable in view of the vast uncertainties as to the future price of oil and gas.

In \textit{Est. of Albert Patterson Humphrey}\textsuperscript{56} a discount factor of 12\% was urged by the taxpayer and was reduced to approximately 10\% by the court.

\textsuperscript{51} Terry, \textit{The Valuation of Oil and Natural Gas Properties as Distinguished from Mines}, 21 Mining and Metallurgy 227 (1940).
\textsuperscript{52} 10 Mertens, \textit{Law of Federal Income Taxation} \$59.91 (1958).
\textsuperscript{53} Terry, supra note 51, at 228.
\textsuperscript{54} Paine, supra note 37, at 133.
\textsuperscript{55} See note 16, supra at 84.
\textsuperscript{56} See note 26, supra.
In the following cases, analytical appraisals were used by either the Service or the taxpayer, or both.

In *Sian Oil and Gas Co.*,\(^{57}\) the taxpayers analytical appraisals from 8 different appraisers ran from $1,000,000 to $2,268,000. The end result was $600,000. It is submitted that the taxpayer discredited his own evidence by using excessive numbers of appraisers.

In *Premier Oil Co.*,\(^{58}\) the court accepted the taxpayers estimate of recoverable oil in barrels but refused to accept his price of $.50-1.00 per barrel. They chose instead the average price of $.461 over the five years prior to the valuation date. They also accepted the taxpayers estimate of $.27 per barrel for costs.

In *North American Oil Consolidated*,\(^{59}\) the court accepted the taxpayers estimate of 4,300,000 barrels of recoverable reserve and extended this times the then market price of oil, then they subtracted the taxpayers estimate of 60 additional wells at $8,000-9,000 @ and assigned a present value of $700,000 expected net future income.

In *Albert Fleming*,\(^{60}\) the taxpayer argued that the Commissioner should not be permitted to compute gain on the exchange of stock, having a par value, for oil interests because the Commissioner's valuations were based upon "estimates, assumptions and speculations." The court did not discuss the Commissioner's valuation methods but affirmed because the taxpayer offered no evidence to refute. The case merely recognized the value of analytical appraisal where better evidence was lacking.

Judge Orie Phillips of the Tenth Circuit in *Emerald Oil Co. v. Commissioner*,\(^{61}\) upheld the decision of the Board, which was based on the opinions of the Commissioner's analytical expert, in preference to evidence of offers to buy at about the same time. He stated:

> The Board had before it the evidence with respect to the location and structure of the field, the number, average production and probable life of the wells located therein, market conditions and transportation facilities, and the sums invested therein. This evidence, in our opinion, affords a substantial basis for the Board's finding of value. * * *

> The opinion of the expert as to value is not binding on the Board. A fact-finding body may disregard the opinion of an expert

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\(^{57}\) See note 17, supra.

\(^{58}\) See note 23, supra.

\(^{59}\) See note 24, supra.

\(^{60}\) 4 T.C. 168 (1944).

\(^{61}\) 72 F.2d 681 (10th Cir. 1934).
and use its own judgment in arriving at value. . . . It may not reject opinion evidence and make an arbitrary finding of value based on mere conjecture and unsupported by any substantial evidence. 62

In U. S. v. Garbutt, 63 the Court of Appeals preferred acquisition and development costs over the opinion of an analytical appraiser.

In John Vaccaro, 64 the Tax Court accepted the Commissioner's analytical appraisal apparently for the sole reason that the taxpayer offered nothing to refute.

*Edith R. Craig,* 65 provides an interesting insight as to how a court must unravel conflicting estimates by several experts. This case involved the separate valuation of two separate interests, on two separate dates for gift tax purposes, by four different experts. In both instances, the taxpayer made gifts of a part of a royalty interest in the same property. As to the first gift, the Tax Court accepted the taxpayer's estimate because he offered only one expert who happened to agree with one of the Commissioner's experts as to the amount of recoverable oil in one of the two properties involved. As to the later gift, the court preferred a reserve estimate determined by the volumetric method to one determined by using the decline curve method. The court then compromised between the opinions of the two experts who used the volumetric method.

In J. B. Cage, 66 the taxpayer's and Commissioner's experts determined values of $42,525 and $69,356 respectively. The two experts were in complete agreement as to the amount of recoverable oil in place under the interest. The Commissioner's expert accepted the figure of the taxpayer's expert as to physical features of the structure, sand thickness, porosity, conate water, shrinkage, the recovery factor of 70 per cent determined therein, and the formula used in applying these factors. The two experts differed because the government expert felt that additional oil would be forced into taxpayer's sands from water drive located outside the taxpayer's property. The taxpayer countered this by bringing in another expert to show that the normal recovery factor in the area was 56% and that since the taxpayers expert had used a factor of 70% he must have considered the potential recovery due

62 Id. at 683.
63 See note 27, supra.
66 See note 43, supra.
to this outside water drive. The court, apparently feeling that there was merit to both estimates, compromised for $51,000. The case is an interesting example of two well prepared estimates having equal persuasion abilities with the court.

In *Est. of Albert Patterson Humphrey*, the Tax Court considered an analytic appraisal as one of several factors in deriving at a valuation of $400,000. The taxpayer and the Commissioner urged $225,000 and 450,000 respectively. It stated:

In valuation engineering a 10 per cent valuation in appraisals is recognized as reasonable and as not affecting the soundness of the result.

III. CONCLUSION

There are certain threads of thought or conclusions which may be drawn from a tabulation of the cases under this section. The old saying that “too many chickens running through the soup will destroy its savor” apparently holds good in this area. It is submitted that the use of more than one estimate to prove the value of the same interest is either contradictory or repetitive. The object of this paper is to state the various factors by which a counselor may pre-judge or assist in the preparation of the valuation. Where either side has used two widely divergent estimates on the same interest, the court is very likely to disregard them both and turn to the opposing side for its “reasonable value.”

It is also apparent that where both sides have done a careful and exacting job of valuation and a divergence of opinion still exists, the courts are happy to accommodate both by compromise. This compromise may be pro-rated as to degree of persuasion.

A basic appraisal from a qualified engineer will cost a minimum of $150.00 and can run up into thousands of dollars. The appraisal can not be effectively utilized in a Federal Tax proceeding unless the advocate is completely familiar with all of the elements which comprise his final figure, and has the correct explanation of each factor readily available for oral delivery. One who fails to thoroughly “wash” and re-hash his analytic appraisal or valuation figure before it is submitted, may learn too late that one or more of its composite factors can be easily discredited and the credability of the entire appraisal will be diminished.

The best appraisal is merely an educated guess which must be thoroughly analyzed and understood before it acquires any persuasion value.

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67 See note 26, supra.
It is also important to consider valuation problems in light of the alternate valuation provisions of § 2032 of the Estate Tax Code. Many interests, such as straight and overriding royalties and unproved lands, may have a highly speculative or rapidly fluctuating value on the date of death. Such interests may be susceptible to unrealistically high valuations on the date of death which will force undue liquidation of the estate's assets in order to pay the tax. The alternate valuation provisions give the personal representative up to one year to sell the interest, thereby choosing its valuation date himself after he has had time and opportunity to properly evaluate the interest and estimate its potential future value if retained. This is largely a question of business judgment with which the owner of the interest should acquaint his future executor and attorney prior to death, and for which a power of sale, where necessary, should be included in the owner's will or trust.

The following tabulation provides a rapid and generalized comparative analysis of the cases considered herein. The tabulation is broken down into the various valuation categories under which the cases were discussed. It may be used to compare cases within a given category and then to compare the categories themselves.

The tabulation under Category I suggests that where sales or analytical appraisals are not used by the taxpayer he will not be able to meet the burden of proof, and his only remedy will be to point out inconsistencies and fallacies in the Service's position. The taxpayer's prior valuations for other purposes can and will be held against him.

Category II, excluding the Sian case which actually belongs in an anomalous category, intimates that a case should never reach the litigation stage where the Service has a recent sales price to sustain their position. Category III indicates that sales of other property in the area are equal to or slightly better than a well prepared analytical appraisal. Such sales have been bested by an analytical appraisal in at least one instance.

Category IV appears to be the sole area in which the taxpayer can engage the Service on equal footing. The courts have appeared quite willing to accept an analytical appraisal, particularly where its compositional factors can be understood and believed. The courts indicate a substantial willingness to compromise in this area.

Comparing the categories, it would appear that the most profitable situations for litigation on the part of the taxpayer are where:

1. Taxpayer uses an analytical appraisal and the Service uses an analytical appraisal or lesser evidence, and
2. Taxpayer use sales of other property and the Service uses an analytical appraisal or lesser evidence.

It is submitted that the taxpayer should ordinarily not contest the value assessed by the Service where:

1. The service has a recent sale price of the same property to sustain their position, or
2. Taxpayer does not have sales or an analytical appraisal to sustain his position.

**TABULATION**

<table>
<thead>
<tr>
<th>Case</th>
<th>Gov't Value Upheld</th>
<th>T/P Value Upheld</th>
<th>Gov't Method Used by</th>
<th>T/P Method Used by</th>
<th>Controlling Factors</th>
<th>Remarks</th>
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An attempt has been made to tabulate all of the cases considered in which the valuation of an oil interest was in issue. It is admitted that the facts and holdings of a few of the cases do not lend themselves to an accurate tabulation but such an error factor is necessarily present in any study of this nature. Due to a scarcity of reported cases, it was necessary to include memorandum decisions of the Tax Court. The tabulations should give some indication as to the relative merits of the several valuation methods.
### CATEGORY II: Sale Price(s) of the Same Property

<table>
<thead>
<tr>
<th>Case</th>
<th>Gov't Method Used by</th>
<th>T/P Method Used by</th>
<th>Gov't Value Upheld</th>
<th>T/P Value Upheld</th>
<th>Method Used by T/P</th>
<th>Controlling Factors</th>
<th>Remarks</th>
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<td>Not Mentioned</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td>Interest evidenced by shares of stock</td>
</tr>
</tbody>
</table>

### CATEGORY III: Sales of Other Property in the Area

<table>
<thead>
<tr>
<th>Case</th>
<th>Gov't Method Used by</th>
<th>T/P Method Used by</th>
<th>Gov't Value Upheld</th>
<th>T/P Value Upheld</th>
<th>Method Used by T/P</th>
<th>Controlling Factors</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sian**</td>
<td>General Expert</td>
<td>Sales &amp; General Expert</td>
<td>x</td>
<td></td>
<td></td>
<td>T/P didn't sustain burden of proof used —Sales of nearby property ignored</td>
<td></td>
</tr>
<tr>
<td>Premier</td>
<td>Sales &amp; Arbitrary</td>
<td>Analytical</td>
<td>x</td>
<td></td>
<td></td>
<td>Analytical Expert not refuted</td>
<td></td>
</tr>
<tr>
<td>North American</td>
<td>Accounting Methods</td>
<td>Sales &amp; Analytical</td>
<td>x</td>
<td></td>
<td></td>
<td>Appraisal &amp; Sales of distant property were disregarded</td>
<td></td>
</tr>
<tr>
<td>Harrison</td>
<td>Tie</td>
<td>Tie Arbitrary</td>
<td>Sales</td>
<td></td>
<td></td>
<td>Partial Acceptance of Sales</td>
<td>Equal compromise Achieved</td>
</tr>
<tr>
<td>Humphrey</td>
<td>Tie</td>
<td>Tie Sales</td>
<td>Arbitrary</td>
<td></td>
<td></td>
<td>Partial Acceptance of Sales</td>
<td>Result most favorable to gov't</td>
</tr>
<tr>
<td>Garbutt</td>
<td>Analytical Appraisal</td>
<td>Sales &amp; Costs</td>
<td>x</td>
<td></td>
<td></td>
<td>Sales over Analytical</td>
<td>Followed §39.23(m) — income regs.</td>
</tr>
</tbody>
</table>
### CATEGORY IV: Analytical Appraisal

<table>
<thead>
<tr>
<th>Case</th>
<th>Gov't Value Upheld</th>
<th>T/P Value Upheld</th>
<th>Method Used by Gov't</th>
<th>Method Used by T/P</th>
<th>Controlling Factors</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Humphrey</td>
<td></td>
<td>T/P</td>
<td>Analytical &amp; Others</td>
<td>Arbitrary</td>
<td>Composite of several Methods</td>
<td>Result most favorable to gov't</td>
</tr>
<tr>
<td>Sian**</td>
<td>x</td>
<td>General &amp; Analytical Expert</td>
<td>General Expert &amp; Sales</td>
<td>T/P didn't sustain burden of proof appraisals</td>
<td>T/P used too many methods</td>
<td></td>
</tr>
<tr>
<td>Premier</td>
<td>x</td>
<td>Sales &amp; Arbitrary</td>
<td>Analytical</td>
<td>T/P's Expert</td>
<td>Not Refuted</td>
<td></td>
</tr>
<tr>
<td>North American</td>
<td>x</td>
<td>Accounting Methods</td>
<td>Analytical</td>
<td>Appraisal</td>
<td>Gov't made obvious accounting errors</td>
<td></td>
</tr>
<tr>
<td>Fleming</td>
<td>x</td>
<td>Analytical</td>
<td>None</td>
<td>Analysis</td>
<td>Appraisal</td>
<td>T/P offered no rebuttal</td>
</tr>
<tr>
<td>Emerald</td>
<td>x</td>
<td>Analytical</td>
<td>Offers To Buy</td>
<td>Analytical Appraisal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Garbutt</td>
<td>x</td>
<td>Analytical</td>
<td>Sales &amp; Costs</td>
<td>Sales</td>
<td>Sales preferred over analytical</td>
<td></td>
</tr>
<tr>
<td>Vaccaro</td>
<td>x</td>
<td>Analytical</td>
<td>None</td>
<td>Analytical</td>
<td>Appraisal</td>
<td>Best evidence available</td>
</tr>
<tr>
<td>Craig</td>
<td>In Part</td>
<td>In Part</td>
<td>Analytical</td>
<td>Analytical</td>
<td>Volumetric over Decline Curve</td>
<td>Use of too many experts</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Reserve Estimate</td>
<td>injured gov't position</td>
</tr>
<tr>
<td>Cage</td>
<td>Tie</td>
<td>Tie</td>
<td>Analytical</td>
<td>Analytical</td>
<td>Water Drive Ct. from Outside Promised Area of</td>
<td>disagree-ment over effect of water drive</td>
</tr>
</tbody>
</table>

*The term “GENERAL EXPERT” is used to describe an appraisal by other than analytical engineering methods.

**This case should be disregarded in any comparison of cases within this section.

C. E. Wright, '58