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A COST-BENEFIT MODEL FOR NUCLEAR EXPLOSIVE STIMULATION OF NATURAL GAS RESERVOIRS

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PNE-3013

NUCLEAR EXPLOSIONS-PEACEFUL
APPLICATIONS (TID-4500)

A COST-BENEFIT MODEL FOR NUCLEAR EXPLOSIVE STIMULATION OF NATURAL GAS RESERVOIRS

by

Estela M. Bee Dagum

June 20, 1968

MATHEMATICA

Princeton, N. J.

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Estela M. Bee Dagum

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FOREWORD

One of the promising applications being developed under the Atomic Energy Commission's Plowshare program is the use of nuclear explosions to stimulate low-producing or "tight" natural gas fields. In a previous report Mathematica, under contract to the AEC, examined in general terms the economic potential of gas stimulation. One of the specific questions raised in the report was whether nuclear stimulation will release enough gas to make production from such fields economically attractive. Accordingly, on there own initiative, Mathematica prepared and made available to the AEC, a cost-benefit analysis of nuclear gas stimulation based on the amount of gas in-place, the expected total recovery rate, and the distribution law of the annual production rates. A total of 120 possible production cases are considered.

With the expectation that this analysis will be of interest generally, as well as to those involved in the Plowshare program, the AEC is pleased to make this report available.

John S. Kelly, Director
Division of Peaceful
Nuclear Explosives

INTRODUCTION

The purpose of this study is a cost-benefit analysis for nuclear stimulated gas reservoirs based on a set of technical hypotheses in respect to:

(a) The amount of gas in place;

(b) Expected total recovery rate; and

(c) The distribution law of the annual production rates.

In the working out of our set of technical hypotheses, we are mainly concerned with the investment profitability of only one kind of project, i. e., gas stimulation with nuclear technology, taking into account the repercussions in the future but not the side effects on many industries, regions, etc., which are highly unpredictable given the incipient stage for industrial applications of this new technology. At the same time, we are performing a kind of sensitivity analysis, where the calculations are repeated many times for different values of our main variables. This is an extremely important tool where estimates of costs and/or benefits are uncertain.

A total of 120 possible production cases are discussed, and for each of them, we calculate the present value of the total future net revenues at the following ten discounting interest rates: 6%, 8%, 10%, 12%, 14%, 16%, 18%, 20%, 22%, and 24%.

Part 1 of the paper is concerned with the technical feasibility of nuclear gas stimulation pointing out which would be the beneficial effects of a nuclear explosion in a tight gas formation.

Part 2 deals with the assumptions underlying the model building based, in some cases, on empirical observations and, in others, on predictions made by several projects on nuclear explosive stimulation of natural gas reservoirs.

Part 3 treats a cost-benefit model for each one of the possible production cases. The main variables of the model are: (a) investment cost, (b) rate of return, (c) amount of gas in place, and (d) total recovery rate. In our analysis, the rate of return and the amount of gas in place are considered exogenous variables, i. e., those unexplained by the model. In other words, the values of the exogenous variables are assumed to be known and taken as given for the purposes of the study.

To consider the rate of return or marginal efficiency of investment as an exogenous variable implies that the decision-makers decide, in advance, which discounting interest rate (greater than the current interest rate) would be required to render an investment profitable. This is a standard procedure in projects involving risks and/or uncertainties and, consequently, adequate to projects using nuclear technology. The total recovery rate and the investment cost are the endogenous variables, i. e., those explained by the model.

Part 4 refers to the workability of the model. There it is clearly shown, with some numerical examples, that the two major results of the model are:

(a) The determination of an economically profitable upper limit of investment cost for each production case. According to the way in which the model was built, the upper limits of investment costs are actually equal to the discounted present value of the total future net revenues. Therefore, the discounting interest rate is, in our analysis, the marginal efficiency of investment or the rate of return. The determination of an economically profitable upper limit of investment cost is very useful information for nuclear projects, where the presence of safety costs makes it very difficult to estimate the investment costs accurately.

(b) The determination of an economically feasible lower limit of the expected total recovery rate for each production case. Given an amount of gas in place and a rate of return fixed as desirable by the decision-maker, the model indicates which must be the minimum expected recovery rate for an investment cost to be profitable at that rate of return.

Part 5 refers to the general conclusions, and the last part of this study includes an Appendix of Tables on annual production, annual gross revenues, annual net revenues, and present values of the total net revenues for each production case.

1. THE TECHNICAL FEASIBILITY OF NUCLEAR GAS STIMULATION

The peaceful use of nuclear explosives as a new kind of technology has been intensively studied since the 1950's.

Briefly, this new technology consists of underground nuclear explosions grouped in two general categories: (a) complete containment, and (b) cratering. In the first type, the depth of emplacement of the explosive is such that the surface of the ground remains unchanged after the detonation and, in most media, creates an underground cavity or columnary-shaped chimney of broken and crushed rocks. In the second type, the explosions are set off at shallow depths and produce a parabolic-shaped crater in the surface above the shot point.

The actual stage of development achieved by the nuclear technology makes possible its safe use in most projects. There are many feasible potential applications. The completely contained underground explosions may prove to be economically more advantageous than other conventional techniques in cases such as: gas stimulation in very tight formations, in-situ oil shale recovery, copper mining in low-grade reservoirs, etc. [10, 12, 18, and 22]

Single charge craters may be useful in building a harbor, a turning basin at the end of a natural inlet from the sea, a storage basin or disposal pond, etc. Single detonations may also be utilized for aggregate production, landslide, earth-filled dams, etc.

By detonating rows of charges to form interconnecting craters, it is possible to execute larger and more complicated projects,

e. g., construction of channels to serve as waterways for large vessels, deep cuts through rocks for highways or railways, large harbors, et al.[6, 8, and 11]

In December 1967, the first industrial application of the nuclear technology was carried out for gas stimulation in a low gas-bearing formation at El Paso, New Mexico. The experiment consisted of an underground nuclear explosion of 26 KT[1] in the Pictured Cliffs formation, a gas reservoir of the San Juan basin. The feasibility study of this project, called Gasbuggy, was undertaken by El Paso Natural Gas Company, the U. S. Atomic Energy Commission, the U. S. Bureau of Mines, and the Lawrence Radiation Laboratory of Livermore. The maximum yield device that could be used for stimulation of the Pictured Cliffs formation was 30 kiloton due to the possibility of an acquifer about 600 feet above shot level. The general conclusions of the Gasbuggy report[9] were:

> ". . . The beneficial effects of a nuclear explosion in a gas reservoir should be:
>
> (1) A network of fractures radiating out from the shot point that will permit more effective drainage of the reservoir;
>
> (2) An expanded wellbore that will allow higher sustained rates of production after initial drainage of the fractured zone; and

---

1. KT is the abbreviation for kiloton, which is the unit of measure of the yield of nuclear devices, approximately equivalent to the amount of energy released by 1,000 tons to Trinitrotoluene (TNT). MT is the abbreviation for megaton and is equivalent to 1,000 kilotons.

(3) An effective storage volume for short-term high deliverability."

Several other proposals for nuclear gas stimulation were submitted to the U. S. Atomic Energy Commission by private companies. For example, the so-called Dragon Trail Project from Continental Oil Company studied the feasibility of a 40 KT nuclear explosion at the Dragon Trail-Douglas Creek gas area in Rio Blanco County, Colorado. Another relevant study was undertaken by Austral Oil Company and C. E. R. Geonuclear Corporation, for the Mesaverde formation of the Rulison Field in Garfield County, Colorado. According to the latter report[4]:

". . . The Rulison project is visualized as being commercial in nature because the reservoir formation will not produce economically using conventional techniques, but has sufficient gas in place to produce adequate quantities over its normal lifetime if properly stimulated. A market for the gas also exists."

Since the Mesaverde formation in the Rulison Field is about 2, 500 feet, a vertical emplacement of two 50 KT devices, at 7, 500 feet and 8, 500 feet, has been proposed. These depths are considerably greater than those in either Projects Gasbuggy or Dragon Trail.

In general, the most propitious gas formations for nuclear explosive stimulation are those which cannot be produced economically by conventional techniques due to their tightness or low reserve figures.

The economies associated with the extensive usage of gas nuclear stimulation could ultimately result in the development of vast areas in a far more efficient manner than has heretofore been considered possible. These goals will benefit not only the gas industry, but also the government and the household consumers.

2. ASSUMPTIONS UNDERLYING THE MODEL BUILDING

The model building is based on the following set of technical assumptions: amount of gas in place, expected total recovery rate, and distribution law of the annual production rate.

2(a) The Amount of Gas in Place

Six hypotheses based on empirical observations of the amount of gas in place are discussed:

(1) 10 BCF[2] per square mile section

(2) 30 BCF " " " "

(3) 50 BCF " " " "

(4) 100 BCF " " " "

(5) 150 BCF " " " "

(6) 200 BCF " " " "

Formations containing these quantities of gas per square mile section can be found in the major basins of two of the largest gas areas in the United States: the Rocky Mountain States and the Appalachian Region. For example, there are about 10 BCF in the Mancos B formation in Blanca County (Piceance Basin); about 30 BCF in the Pictured Cliffs formation of the San Juan Basin; about 120 BCF in the Mesaverde formation of the Piceance Basin; and about 200 BCF in the Fort Union formation, in the Pinedale Unit Area of the Green River Basin.

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2. BCF is the abbreviation for billion cubic feet.

2(b) Expected Total Recovery Rate

For each hypothesis of gas in place, we considered various possible rates of recovery, ranging from a minimum of 25 percent of total recovery up to a maximum of 70 percent, increasing at a constant rate of 5 percent. These maximum and minimum recovery rates are close to predictions made for several nuclear gas stimulation projects. For example, the conservative predicted recovery rate for Gasbuggy with a 10 KT device is 29 percent; the optimistic predicted recovery rate for the Mesaverde formation of the San Juan Basin, with a 100 KT device, is 63 percent.[9] Table I below indicates all possible combinations of amounts of gas in place and total recovery rates.

TABLE I. EXPECTED TOTAL RECOVERY OF GAS
(in BCF)

Amount of Gas In Place (in BCF)	Expected Total Recovery Rates									
	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70
10	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0
30	7.5	9.0	10.5	12.0	13.5	15.0	16.5	18.0	19.5	21.0
50	12.5	15.0	17.5	20.0	22.5	25.0	27.5	30.0	32.5	35.0
100	25.0	30.0	35.0	40.0	45.0	50.0	55.0	60.0	65.0	70.0
150	37.5	45.0	52.5	60.0	67.5	75.0	82.5	90.0	97.5	105.0
200	50.0	60.0	70.0	80.0	90.0	100.0	110.0	120.0	130.0	140.0

2(c) Distribution Law of the Annual Production Rates

By observing the patterns of predicted gas flow rates for both Projects Gasbuggy and Rulison, we have empirical support for the specification of a geometric model for the distribution of the producing rates over a 20-year period.[3] Further, we work with two assumptions, namely: (1) a production rate in the first year equal to 13 percent of the expected total recovery and a ratio q = 0.88, and (2) a production rate in the first year equal to 10 percent of the expected total recovery and a ratio q = 0.92. That is:

(1) $$A_{i+1} = A_1 q^i, \quad i = 1, \ldots, n-1$$

where: A_{i+1} = Production at year i + 1;

$A_1 = \alpha \sum_{i=1}^{n} A_i$ Production at year 1

(α = 0.13 in Assumption 1, and α = 0.10 in Assumption 2. $\sum_{i=1}^{n} A_i$ is given by the entries in Table I on page 9.);

q = ratio of the geometric progression; and,

n = period of time.

The expected annual production figures for a 20-year period are shown for Assumption 1 in Tables 1 to 6; and for Assumption 2 in Tables 21 to 26.

---

3. The estimated average life of a nuclear well would probably be greater than 20 years. But for our cost-benefit analysis, a greater period of time loses economic significance.

3. COST-BENEFIT ANALYSIS

To perform a cost-benefit analysis for each of the 120 possible production cases, the first task was to determine the expected future gross revenues, i. e.:

(2) $$Y_i = pA_i$$

where: Y_i = Expected future gross revenue for year i;

A_i = Total production at year i; and

p = Price of gas at the wellhead.

The actual price of gas at the wellhead is regulated by the Federal Power Commission for all the areas of the United States. For the purposes of our study, we have chosen the price of $0.15 per thousand cubic feet of gas at the wellhead that corresponds to the Rocky Mountain Region. We based this decision on the following reasons: (a) the area has the greatest potential reserve of gas propitious for nuclear stimulation; and (b) this price lies in the lower range, thus making our calculations conservative.

The expected future gross revenues are indicated for Assumption 1 in Tables 7 to 12; and for Assumption 2 in Tables 27 to 32.

The expected future net revenues were calculated as the difference between gross revenues and the operational costs only. While private profit-making decisions should allow for income and other production taxes, this is not relevant in the public sector. Since this analysis is made from a national point of view, we are mainly concerned with a

measurement of cost which corresponds to the use of real resources but excludes transfer payments. We will see, however, in the next section that these considerations do not significantly affect the use of the model as a guide for the decision-making of the private sector.

For our calculations, operational costs were fixed at $7,200 per year, a figure which may be much lower for nuclear wells.

The expected future net revenues are shown for Assumption 1 in Tables 13 to 18; and for Assumption 2 in Tables 33 to 38.

The profitability of an investment for each production case is measured by the present value of the future net revenues at various discounting interest rates. The rates chosen were: 6%, 8%, 10%, 12%, 14%, 16%, 18%, 20%, 22%, and 24%.

In our model, both criteria--the marginal efficiency of investment and the net discounted present value--are in agreement because the present value curve for each case has a negative slope; i. e., a rise in the discounting interest rate will always reduce the present value of an investment. Therefore, either criteria can be used.[4]

---

4. The marginal efficiency of an investment is defined as that rate of interest or return which would render the discounted present value of its expected future yields exactly equal to the investment cost. This criterion tells management to undertake an investment as long as its marginal efficiency exceeds the rate of interest.

On the other hand, the discount present value criterion approves any investment whose net discounted present value (i. e., the present value minus investment cost) is positive. When the net present value curve has a negative slope, both criteria are in

The present values of the expected future net revenues of each possible production case are:

$$(3) \qquad V = \sum_{i=1}^{n} \frac{(Y_i - O_{ci})}{(1 + r)^i} = \frac{Y_1}{(1 + r)} \sum_{i=1}^{n-1} \frac{q^i}{(1 + r)^i} - \sum_{i=1}^{n} \frac{O_{ci}}{(1 + r)^i}$$

Therefore:

$$(4) \qquad V = Y_1 \frac{\left[(1 + r)^n - q^n\right]}{(1 + r)^n (1 + r - q)} - O_c \frac{\left[(1 + r)^n - 1\right]}{r(1 + r)^n}$$

where:

V	=	Present value of the total net revenues;
Y_1	=	Expected future gross revenue for the first year;
r	=	Discounting interest rate;
n	=	Period of time;
q	=	Ratio of the geometric progression; and,
O_{ci}	=	Operational costs at year i.

The final results are given for Assumption 1 in Tables 19 and 20, and for Assumption 2 in Tables 39 and 40.

---

4 (continued from preceding page):
agreement. For example (see Figure I), suppose that the net discounted present value of an investment project is positive, indicated by point A at a current interest rate C. Then the point B, at which VV^1 crosses the horizontal axis must clearly lie to the right of C; i. e., the marginal efficiency must also exceed the current interest rate.

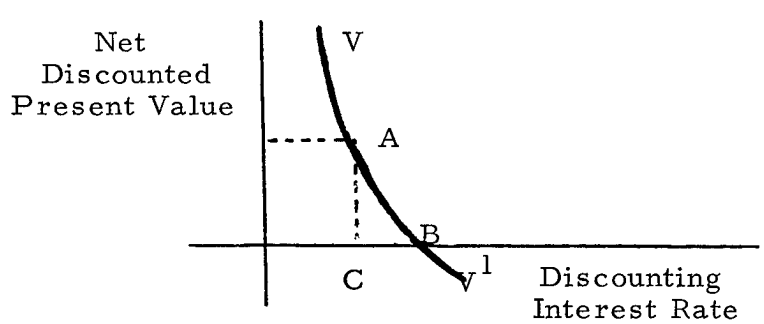

Figure I

4. WORKABILITY OF THE MODEL

The variables of our cost-benefit analysis are:

(a) Amount of gas in place;

(b) Internal rate of return;

(c) Investment cost; and

(d) Total recovery rate.

For the purpose of our analysis, the amount of gas in place and the internal rate of return are considered as exogenous variables, i. e., those left unexplained by the model. To treat the internal rate of return as an exogenous variable implies that the decision-makers decide, in advance, which discounting interest rate (greater than the current interest rate) would be required to render an investment profitable. This practice is usual in projects involving risks and/or uncertainties.

The total recovery rate and the investment cost are the endogenous variables, i. e., those explained by the model.

Investment costs involved in nuclear stimulation may be grouped as follows:

(a) Cost of the devices;

(b) Emplacement hole cost;

(c) Post-shot reentry well cost; and

(d) Safety cost.

According to the latest information made by the Atomic Energy Commission, the projected charges for nuclear explosives will range from $350,000 for a 10 KT device to $600,000 for yields of 2 MT. These charges include arming and firing, but not safety studies, site preparation, transportation, emplacement, or support.[9]

Emplacement costs are mainly a function of the depth, diameter of the hole, and hardness of the soil.

The costs of drilling and completion of a post-shot reentry well should be no greater than twice a conventionally completed well.[9]

Safety costs must cover safety studies which have to be made prior to any particular project to evaluate potential effects, expected economic damage, and decontamination facilities.

The investment cost and the expected total recovery rate are highly correlated. In effect, the larger the yield of the devices, the larger the expected total recovery rate. The cost of the devices, one of the components of the investment cost, is a logarithmic function of the yield of the explosive. On the other hand, the radius of the chimney (one of the factors that influence on the recovery rate) created after an explosion, also seems to behave as a logarithmic function of the yield of the explosive. However, the exact relation between both variables is more complex. In effect, as we increase the yield of the devices, the investment cost increases not only by the amount of the device cost but also by the amount of safety costs which now become larger. Therefore, we conclude that an increase in investment cost, resultant from larger device yields, does increase the total recovery rate proportionally less than the investment cost increment.

This cost-benefit analysis provides the following useful information:

4(a) An Upper Limit of Initial Investment Cost

The model allows the determination of an economically feasible upper limit of initial investment cost for each production case, given the amount of gas in place, the rate of return fixed by the decision-makers, and the expected total recovery rate. This kind of information is very useful for nuclear projects, whose investment costs are often difficult to estimate due to the presence of safety costs as one of their components.

We can illustrate this point with some numerical examples:

Example 1:

Suppose that the amount of gas in place is 50 BCF per square mile section; the rate of return is 10%; and the total expected recovery rate is 50%. Then, using Table 19 we find that the amount of investment costs must not exceed $1,778,000 to be profitable at a discounting interest rate of 10%.

When dealing with the decision-making of private firms, our estimate of $1,778,000 must include not only investment costs but also the present value of royalties[5] and production taxes. This situation results from our previous definition of net revenues as gross revenues minus operational costs only. Royalties and production taxes were regarded as side payments funded out of profits.

5. Royalties to the Federal Government are 12.5% of the gross revenues, and production taxes are $3.00 per million cubic feet of gas produced.

Example 2:

Given an amount of gas in place of 100 BCF and a total recovery rate of 60%, Figure 1 shows the upper limits of the investment cost for various rates of return. The corresponding values are obtained from Tables 19 and 20.

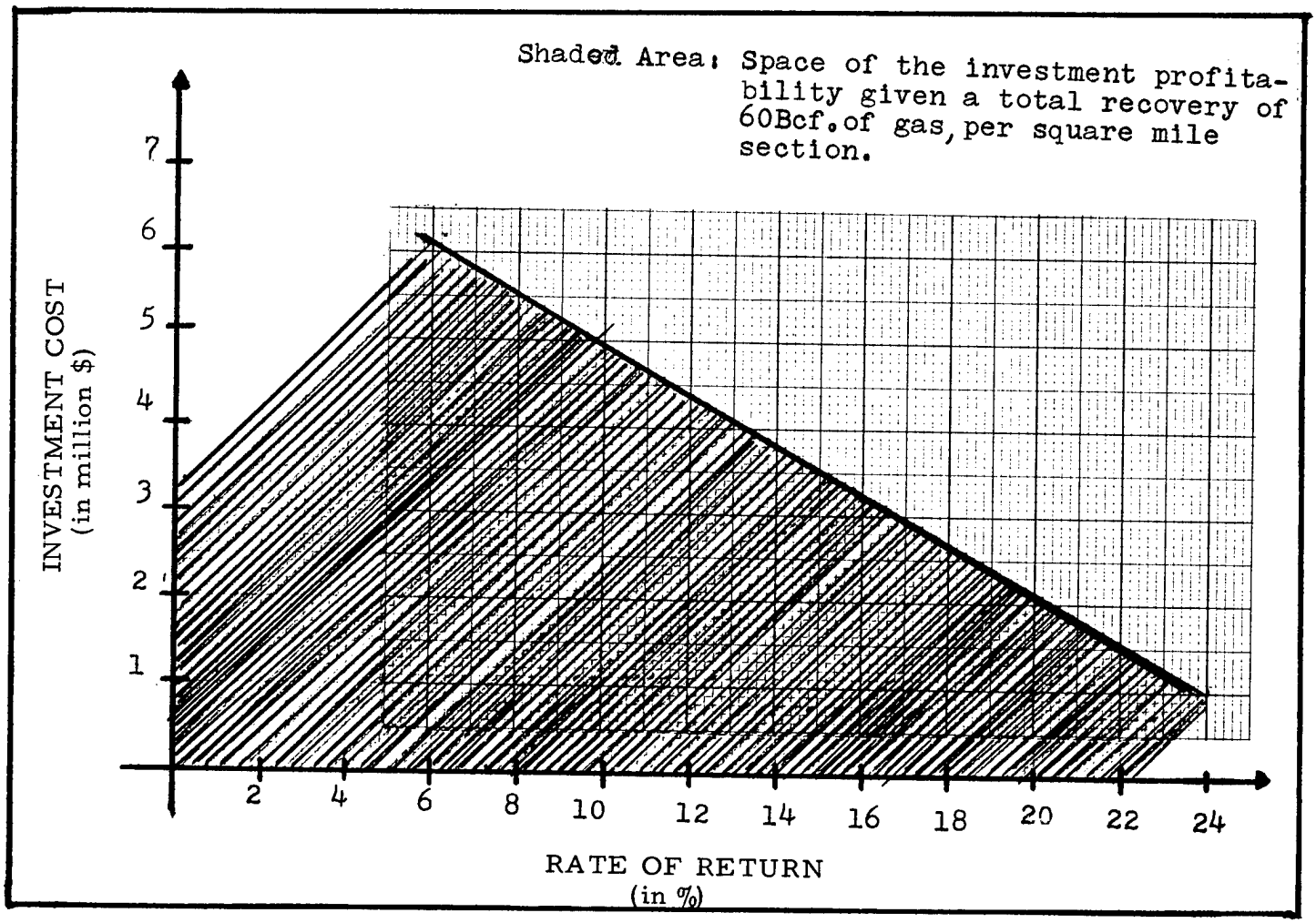

Figure 1. Upper Limits of Investment Costs for Various Rates of Return

Example 3:

Given an internal rate of return of 8% and a total recovery rate of 50%, Figure 2 indicates the upper limits of investment costs for various amounts of gas in place. The corresponding values were obtained from Table 39, Assumption 2.

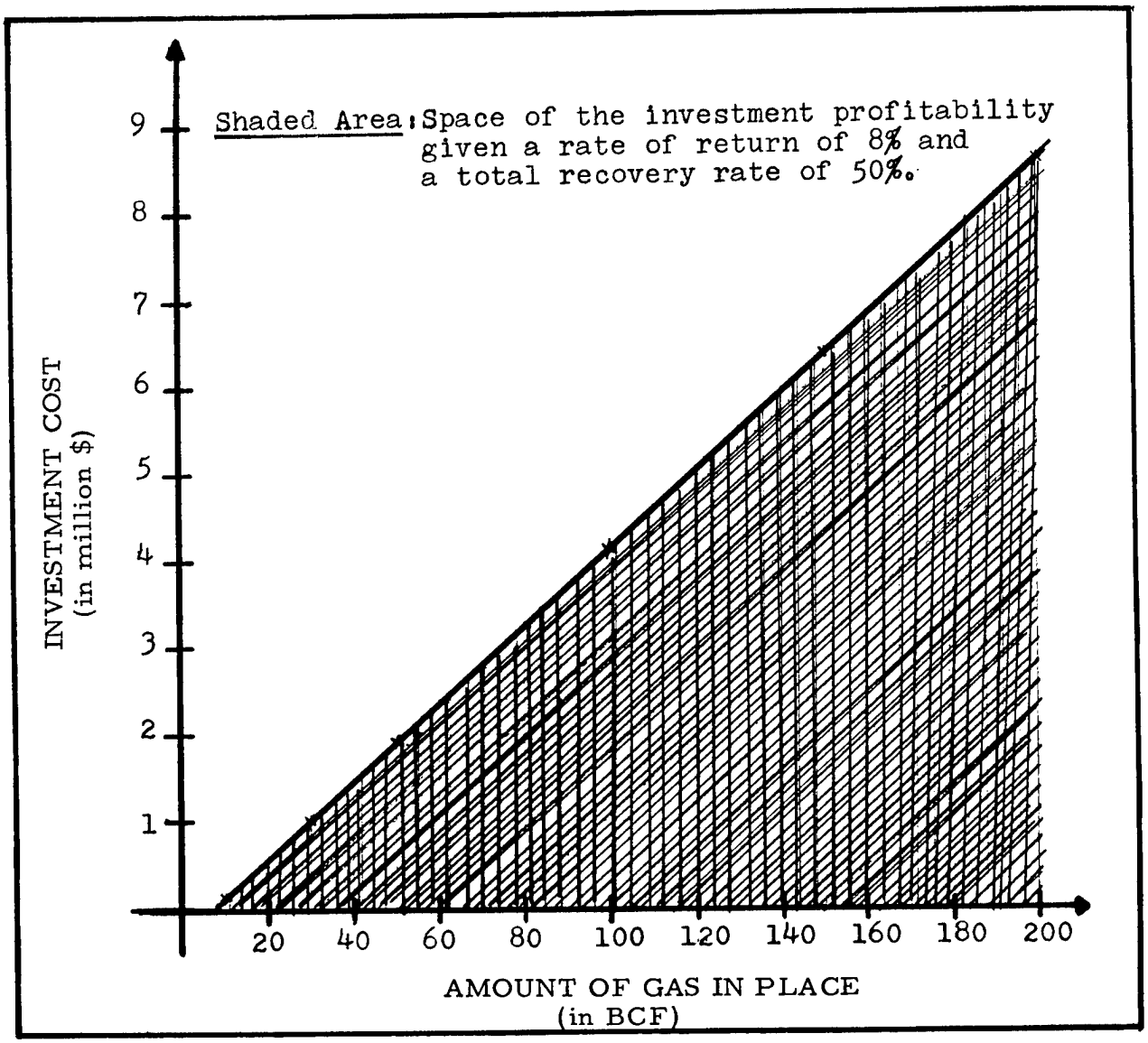

Figure 2. Upper Limits of Investment Costs for Various Amounts of Gas in Place.

Finally, it is clear that the upper limits of investment costs are actually equal to the present values of the future net revenues. Therefore, in our case, the discounting interest rate is the marginal efficiency of investment or the internal rate of return.

4(b) An Economically Feasible Lower Limit of the Expected Total Recovery Rate

Another important conclusion obtained from the model is the determination of a lower limit of the total recovery rate that would render an investment profitable, given the amount of gas in place, the rate of return, and the investment cost. This point can be illustrated by the following examples:

Example 1:

Suppose that the decision-makers want to invest $2,000,000 and they are faced with various possible projects. Moreover, they have fixed 8% as a desirable rate of return. If the reservoir has an amount of 50 BCF of gas in place per section, Table 19 tells us that the expected total recovery rate must be at least equal to 50% for the investment to be profitable at that rate of return.

Example 2:

Given an investment cost of $2,000,000[6] and a rate of return

---

6. A similar amount is estimated for the Rulison Project, broken down as follows:
   Cost of the explosives (two devices of 50 KT each) = $850,000
   Emplacement cost (at a depth of 7,500 feet) = $600,000
   Reentry well cost = $280,000
   Miscellaneous = $200,000
   Total Investment Cost = $1,930,000
   For this project, the expected recovery rate is estimated about 59% for an amount of gas in place of 50 BCF in a 50-year period, and about 36% in a 20-year period.[4]

of 10%, Figure 3 shows the economically feasible lower limits of total recovery rates for various amounts of gas in place. The corresponding data were obtained from Table 19.

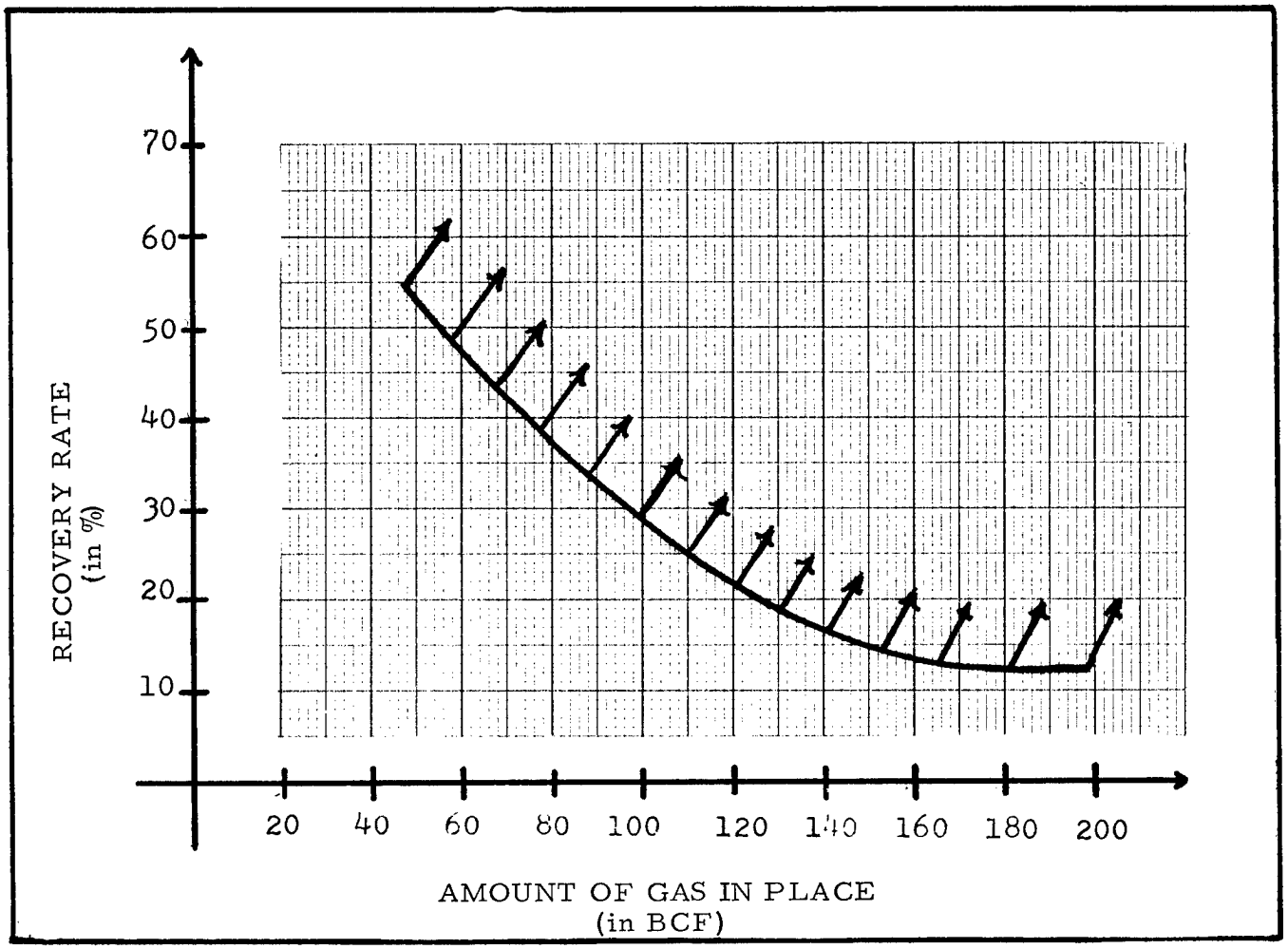

Figure 3. Lower Limits of Total Recovery Rates Economically Profitable for Various Amounts of Gas in Place, Given an Investment of $2,000,000 and a Rate of Return of 10 Percent

Example 3:

Given an investment cost of $2,000,000 and an amount of gas in place of 50 BCF, Figure 4 indicates the economically feasible lower limits of total recovery rate for various rates of return. The corresponding data were obtained from Tables 19 and 20.

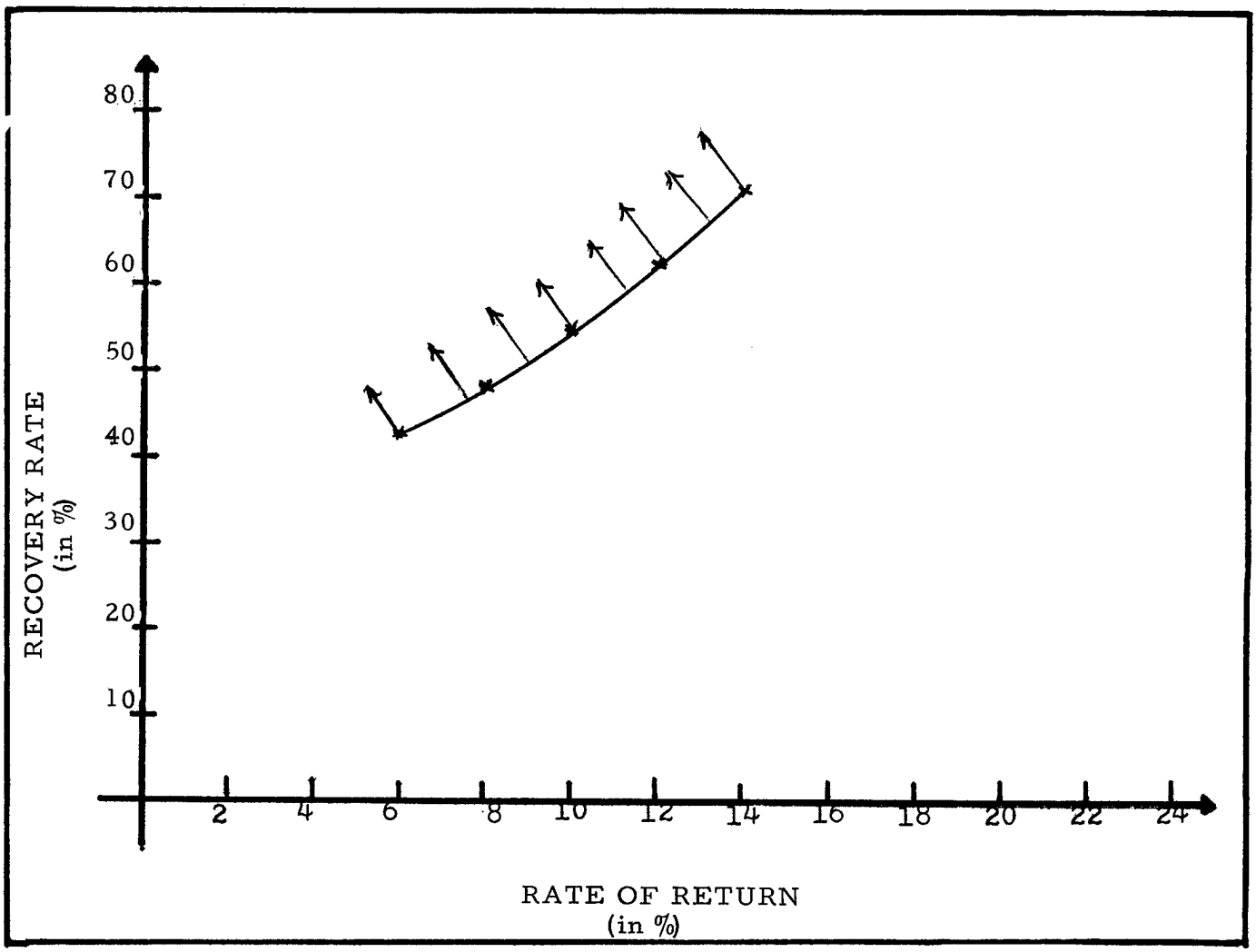

Figure 4. Economically Feasible Lower Limits of Total Recovery Rate for Various Rates of Return, Given an Investment of $2,000,000 and an Amount of Gas in Place of 50 BCF.

5. CONCLUSIONS

According to Prest and Turvey[21], cost-benefit analysis "is a practical way of assessing the desirability of projects, where it is important to take a long view (in the sense of looking at repercussions in the further, as well as the nearer, future) and a wide view (in the sense of allowing for side effects of many kinds on many persons, industries, regions, etc.); i. e., it implies the enumeration and evaluation of all the relevant costs and benefits."

In our study, we are mainly concerned with the long view and do not take into account any side effects because they are very difficult to measure for nuclear projects. Moreover, we are not facing choices among several alternatives but deciding whether a particular project should be undertaken. At the same time, we perform a kind of sensitivity analysis, where the calculations are repeated many times for different values of the main variables. This is an extremely important tool when estimates of costs and/or benefits are uncertain.

Therefore, our study is a nonorthodox[7] approach to cost-benefit analysis for a nonorthodox economic activity, namely, nuclear explosive stimulation of natural gas reservoirs. The change from

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7. By orthodox cost-benefit analysis, we shall mean that type of analysis in which the aim is to maximize the present value of all benefits less that of all costs, subject to specified constraints. Where no projects are interdependent, the choice is made selecting all projects whose internal rate of return exceeds the current interest rate.

the standard procedure is mainly due to the difficulty of accurately estimating investment costs for nuclear projects, given that safety aspects involved in any nuclear detonation may not be adequately foreseen. However, this situation does not significantly affect the calculations of the amount of gas in place, the total recovery rate, the stream of annual productions, and their corresponding annual revenues, for any gas reservoir. Consequently, we can determine the present value of the future net revenues without knowing the exact amount of investment costs. It is also a common practice in projects involving risk and/or uncertainty for the decision-makers to decide, in advance, what rate of return would be required to render an investment profitable. With these two variables (rate of return and stream of annual net revenues), we are able to determine a third one, namely, an upper limit for the profitable investment cost. In other words, according to the way in which our model is built, the decision-makers are able to calculate straightforwardly what the economically feasible upper limit on the investment cost is for a given amount of gas in place, total recovery rate, and a desirable rate of return.

The other major finding of this study is concerned with a technical aspect of the project, i. e., the determination of an economically feasible lower limit on the total recovery rate. In this case, we are assuming that the decision-makers want to invest a given amount of money and that they face various alternative projects, having

decided, in advance, what rate of return would be desirable. Moreover, they would know the amount of gas in the reservoir where a nuclear explosive stimulation could be carried on but ignore the expected total recovery rate. Again, given these three variables--rate of return, gas in place, and the investment cost--the model allows the decision-makers to estimate what is the least expected total recovery rate, for the investment to be profitable at that rate of return.

The production cases studied cover a wide range of possibilities that result from the combinations of six hypotheses of amount of gas in place, based on empirical observations, and ten hypotheses of expected total recovery rates, based on predictions made for several nuclear gas stimulation projects. For each of the 60 combinations, we predicted the stream of annual productions, for a 20-year period, by observing the patterns of the expected gas flow rates for both Projects Gasbuggy and Rulison. Two assumptions about the distribution of the annual production rates are made and, consequently, a total of 120 production cases are investigated.

Finally, we can conclude that this kind of study may prove to be very useful as a guide for decision-making in the public as well as the private sector for nuclear explosive stimulation of natural gas reservoirs. Moreover, the approach is easily extended to all nuclear projects where the stream of annual output follows a geometric law of behavior. This behavior is typical in the extractive industries, particularly in mining.

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APPENDIX

ASSUMPTION 1* INCLUDES TABLES FROM 1 TO 20.

* Calculations of the annual production rates are based on a geometric law of behavior with a first year production equal to 13 percent of the total recovery and a ratio q = 0.88.

TABLES 1 TO 6

EXPECTED FUTURE ANNUAL PRODUCTION

These tables indicate the expected future annual production in a 20-year period for each entry of Table I, page 9. Each entry of Table I is the total amount of gas recovered for each combination of gas in place and expected recovery rate.

TABLE 1
ASSUMPTION 1* - EXPECTED FUTURE ANNUAL PRODUCTION FOR 10 BCF OF GAS IN PLACE
(in BCF)

YEAR	TOTAL RECOVERY RATES									
	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70
1	0.3250	0.3900	0.4550	0.5200	0.5850	0.6500	0.7150	0.7800	0.8450	0.9100
2	0.2860	0.3432	0.4004	0.4576	0.5148	0.5720	0.6292	0.6864	0.7436	0.8008
3	0.2515	0.3019	0.3522	0.4025	0.4528	0.5031	0.5534	0.6037	0.6540	0.7043
4	0.2213	0.2656	0.3099	0.3541	0.3984	0.4426	0.4869	0.5312	0.5754	0.6197
5	0.1950	0.2340	0.2730	0.3120	0.3510	0.3900	0.4290	0.4680	0.5070	0.5460
6	0.1716	0.2059	0.2402	0.2746	0.3089	0.3432	0.3775	0.4118	0.4462	0.4805
7	0.1511	0.1814	0.2116	0.2418	0.2720	0.3022	0.3325	0.3627	0.3929	0.4231
8	0.1329	0.1595	0.1861	0.2127	0.2393	0.2658	0.2924	0.3190	0.3456	0.3722
9	0.1170	0.1404	0.1638	0.1872	0.2106	0.2340	0.2574	0.2808	0.3042	0.3276
10	0.1030	0.1236	0.1442	0.1648	0.1854	0.2060	0.2267	0.2473	0.2679	0.2885
11	0.0907	0.1088	0.1269	0.1451	0.1632	0.1814	0.1995	0.2176	0.2358	0.2539
12	0.0796	0.0955	0.1115	0.1274	0.1433	0.1592	0.1752	0.1911	0.2070	0.2229
13	0.0702	0.0842	0.0983	0.1123	0.1264	0.1404	0.1544	0.1685	0.1825	0.1966
14	0.0617	0.0741	0.0864	0.0988	0.1111	0.1235	0.1358	0.1482	0.1605	0.1729
15	0.0543	0.0651	0.0760	0.0868	0.0977	0.1085	0.1194	0.1303	0.1411	0.1520
16	0.0478	0.0573	0.0669	0.0764	0.0860	0.0955	0.1051	0.1147	0.1242	0.1338
17	0.0419	0.0503	0.0587	0.0671	0.0755	0.0838	0.0922	0.1006	0.1090	0.1174
18	0.0370	0.0445	0.0519	0.0593	0.0667	0.0741	0.0815	0.0889	0.0963	0.1037
19	0.0325	0.0390	0.0455	0.0520	0.0585	0.0650	0.0715	0.0780	0.0845	0.0910
20	0.0286	0.0343	0.0400	0.0458	0.0515	0.0572	0.0629	0.0686	0.0744	0.0801

* Annual production rates follow a decreasing geometric law of behavior with a ratio q = 0.88

TABLE 2
ASSUMPTION 1* - EXPECTED FUTURE ANNUAL PRODUCTION FOR 30 BCF OF GAS IN PLACE
(in BCF)

YEAR	TOTAL RECOVERY RATES									
	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70
1	4.8750	5.8500	6.8250	7.8000	8.7750	9.7500	10.7250	11.7000	12.6750	13.6500
2	4.2900	5.1480	6.0060	6.8640	7.7220	8.5800	9.4380	10.2960	11.1540	12.0120
3	3.7732	4.5279	5.2825	6.0372	6.7918	7.5465	8.3011	9.0558	9.8104	10.5651
4	3.3199	3.9838	4.6478	5.3118	5.9758	6.6398	7.3037	7.9677	8.6317	9.2957
5	2.9250	3.5100	4.0950	4.6800	5.2650	5.8500	6.4350	7.0200	7.6050	8.1900
6	2.5740	3.0888	3.6036	4.1184	4.6332	5.1480	5.6628	6.1776	6.6924	7.2072
7	2.2669	2.7202	3.1736	3.6270	4.0804	4.5337	4.9871	5.4405	5.8939	6.3472
8	1.9939	2.3926	2.7914	3.1902	3.5890	3.9877	4.3865	4.7853	5.1841	5.5828
9	1.7550	2.1060	2.4570	2.8080	3.1590	3.5100	3.8610	4.2120	4.5630	4.9140
10	1.5454	1.8544	2.1635	2.4726	2.7817	3.0907	3.3998	3.7089	4.0180	4.3270
11	1.3601	1.6321	1.9042	2.1762	2.4482	2.7202	2.9923	3.2643	3.5363	3.8083
12	1.1944	1.4332	1.6721	1.9110	2.1499	2.3887	2.6276	2.8665	3.1054	3.3442
13	1.0530	1.2636	1.4742	1.6848	1.8954	2.1060	2.3166	2.5272	2.7378	2.9484
14	0.9262	1.1115	1.2967	1.4820	1.6672	1.8525	2.0377	2.2230	2.4082	2.5935
15	0.8141	0.9769	1.1398	1.3026	1.4654	1.6282	1.7911	1.9539	2.1167	2.2795
16	0.7166	0.8599	1.0033	1.1466	1.2899	1.4332	1.5766	1.7199	1.8632	2.0065
17	0.6289	0.7546	0.8804	1.0062	1.1320	1.2577	1.3835	1.5093	1.6351	1.7608
18	0.5557	0.6669	0.7780	0.8892	1.0003	1.1115	1.2226	1.3338	1.4449	1.5561
19	0.4875	0.5850	0.6825	0.7800	0.8775	0.9750	1.0725	1.1700	1.2675	1.3650
20	0.4290	0.5148	0.6006	0.6864	0.7722	0.8580	0.9438	1.0296	1.1154	1.2012

* Annual production rates follow a decreasing geometric law of behavior with a ratio q = 0.88

TABLE 3

ASSUMPTION 1* - EXPECTED FUTURE ANNUAL PRODUCTION FOR 50 BCF OF GAS IN PLACE

(In BCF)

YEAR	TOTAL RECOVERY RATES									
	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70
1	1.6250	1.9500	2.2750	2.6000	2.9250	3.2500	3.5750	3.9000	4.2250	4.5500
2	1.4300	1.7160	2.0020	2.2880	2.5740	2.8600	3.1460	3.4320	3.7180	4.0040
3	1.2577	1.5093	1.7608	2.0124	2.2639	2.5155	2.7670	3.0186	3.2701	3.5217
4	1.1066	1.3279	1.5493	1.7706	1.9919	2.2132	2.4346	2.6559	2.8772	3.0985
5	0.9750	1.1700	1.3650	1.5600	1.7550	1.9500	2.1450	2.3400	2.5350	2.7300
6	0.8580	1.0296	1.2012	1.3728	1.5444	1.7160	1.8876	2.0592	2.2308	2.4024
7	0.7556	0.9068	1.0579	1.2090	1.3601	1.5112	1.6624	1.8135	1.9646	2.1157
8	0.6646	0.7975	0.9305	1.0634	1.1963	1.3292	1.4622	1.5951	1.7280	1.8609
9	0.5850	0.7020	0.8190	0.9360	1.0530	1.1700	1.2870	1.4040	1.5210	1.6380
10	0.5151	0.6181	0.7212	0.8242	0.9272	1.0302	1.1333	1.2363	1.3393	1.4423
11	0.4534	0.5440	0.6347	0.7254	0.8161	0.9068	0.9974	1.0881	1.1788	1.2694
12	0.3981	0.4777	0.5574	0.6370	0.7166	0.7962	0.8759	0.9555	1.0351	1.1147
13	0.3510	0.4212	0.4914	0.5616	0.6318	0.7020	0.7722	0.8424	0.9126	0.9828
14	0.3087	0.3705	0.4322	0.4940	0.5557	0.6175	0.6792	0.7410	0.8027	0.8645
15	0.2714	0.3256	0.3799	0.4342	0.4885	0.5427	0.5970	0.6513	0.7056	0.7598
16	0.2389	0.2866	0.3344	0.3822	0.4300	0.4777	0.5255	0.5733	0.6211	0.6688
17	0.2096	0.2515	0.2935	0.3354	0.3773	0.4192	0.4612	0.5031	0.5450	0.5869
18	0.1852	0.2223	0.2593	0.2964	0.3334	0.3705	0.4075	0.4446	0.4816	0.5187
19	0.1625	0.1950	0.2275	0.2600	0.2925	0.3250	0.3575	0.3900	0.4225	0.4550
20	0.1430	0.1716	0.2002	0.2288	0.2574	0.2860	0.3146	0.3432	0.3718	0.4004

* Annual production rates follow a decreasing geometric law of behavior with a ratio q = 0.88

TABLE 4

ASSUMPTION 1* - EXPECTED FUTURE ANNUAL PRODUCTION FOR 100 BCF OF GAS IN PLACE
(in BCF)

YEAR	TOTAL RECOVERY RATES									
	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70
1	3.2500	3.9000	4.5500	5.2000	5.8500	6.5000	7.1500	7.8000	8.4500	9.1000
2	2.8600	3.4320	4.0040	4.5760	5.1480	5.7200	6.2920	6.8640	7.4360	8.0080
3	2.5155	3.0186	3.5217	4.0248	4.5279	5.0310	5.5341	6.0372	6.5403	7.0434
4	2.2132	2.6559	3.0985	3.5412	3.9838	4.4265	4.8691	5.3118	5.7544	6.1971
5	1.9500	2.3400	2.7300	3.1200	3.5100	3.9000	4.2900	4.6800	5.0700	5.4600
6	1.7160	2.0592	2.4024	2.7456	3.0888	3.4320	3.7752	4.1184	4.4616	4.8048
7	1.5112	1.8135	2.1157	2.4180	2.7202	3.0225	3.3247	3.6270	3.9292	4.2315
8	1.3292	1.5951	1.8609	2.1268	2.3926	2.6585	2.9243	3.1902	3.4560	3.7219
9	1.1700	1.4040	1.6380	1.8720	2.1060	2.3400	2.5740	2.8080	3.0420	3.2760
10	1.0302	1.2363	1.4423	1.6484	1.8544	2.0605	2.2665	2.4726	2.6786	2.8847
11	0.9068	1.0881	1.2694	1.4508	1.6321	1.8135	1.9948	2.1762	2.3575	2.5389
12	0.7962	0.9555	1.1147	1.2740	1.4332	1.5925	1.7517	1.9110	2.0702	2.2295
13	0.7020	0.8424	0.9828	1.1232	1.2636	1.4040	1.5444	1.6848	1.8252	1.9656
14	0.6175	0.7410	0.8645	0.9880	1.1115	1.2350	1.3585	1.4820	1.6055	1.7290
15	0.5427	0.6513	0.7598	0.8684	0.9769	1.0855	1.1940	1.3026	1.4111	1.5197
16	0.4777	0.5733	0.6688	0.7644	0.8599	0.9555	1.0510	1.1466	1.2421	1.3377
17	0.4192	0.5031	0.5869	0.6708	0.7546	0.8385	0.9223	1.0062	1.0900	1.1739
18	0.3705	0.4446	0.5187	0.5928	0.6669	0.7410	0.8151	0.8892	0.9633	1.0374
19	0.3250	0.3900	0.4550	0.5200	0.5850	0.6500	0.7150	0.7800	0.8450	0.9100
20	0.2860	0.3432	0.4004	0.4576	0.5148	0.5720	0.6292	0.6864	0.7436	0.8008

*Annual production rates follow a decreasing geometric law of behavior with a ratio q = 0.88

TABLE 5

ASSUMPTION 1* - EXPECTED FUTURE ANNUAL PRODUCTION FOR 150 BCF OF GAS IN PLACE
(in BCF)

YEAR	TOTAL RECOVERY RATES									
	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70
1	0.9750	1.1700	1.3650	1.5600	1.7550	1.9500	2.1450	2.3400	2.5350	2.7300
2	0.8580	1.0296	1.2012	1.3728	1.5444	1.7160	1.8876	2.0592	2.2308	2.4024
3	0.7546	0.9056	1.0565	1.2074	1.3584	1.5093	1.6602	1.8112	1.9621	2.1130
4	0.6640	0.7968	0.9296	1.0624	1.1952	1.3280	1.4607	1.5935	1.7263	1.8591
5	0.5850	0.7020	0.8190	0.9360	1.0530	1.1700	1.2870	1.4040	1.5210	1.6380
6	0.5148	0.6178	0.7207	0.8237	0.9266	1.0296	1.1326	1.2355	1.3385	1.44[illegible]4
7	0.4534	0.5441	0.6347	0.7254	0.8161	0.9067	0.9974	1.0881	1.1788	1.2694
8	0.3988	0.4785	0.5583	0.6380	0.7178	0.7975	0.8773	0.9571	1.0368	1.1166
9	0.3510	0.4212	0.4914	0.5616	0.6318	0.7020	0.7722	0.8424	0.9126	0.9828
10	0.3091	0.3709	0.4327	0.4945	0.5563	0.6181	0.6800	0.7418	0.8036	0.8654
11	0.2720	0.3264	0.3808	0.4352	0.4896	0.5441	0.5985	0.6529	0.7073	0.7617
12	0.2389	0.2866	0.3344	0.3822	0.4300	0.4777	0.5255	0.5733	0.6211	0.6688
13	0.2106	0.2527	0.2948	0.3370	0.3791	0.4212	0.4633	0.5054	0.5476	0.5897
14	0.1852	0.2223	0.2593	0.2964	0.3334	0.3705	0.4075	0.4446	0.4816	0.5187
15	0.1628	0.1954	0.2280	0.2605	0.2931	0.3256	0.3582	0.3908	0.4233	0.4559
16	0.1433	0.1720	0.2007	0.2293	0.2500	0.2866	0.3153	0.3440	0.3726	0.4013
17	0.1258	0.1509	0.1761	0.2012	0.2264	0.2515	0.2767	0.3019	0.3270	0.3522
18	0.1111	0.1334	0.1556	0.1778	0.2001	0.2223	0.2445	0.2668	0.2890	0.3112
19	0.0975	0.1170	0.1365	0.1560	0.1755	0.1950	0.2145	0.2340	0.2535	0.2730
20	0.0858	0.1030	0.1201	0.1373	0.1544	0.1716	0.1888	0.2059	0.2231	0.2402

* Annual production rates follow a decreasing geometric law of behavior with a ratio q = 0.88

TABLE 6

ASSUMPTION 1* - EXPECTED FUTURE ANNUAL PRODUCTION FOR 200 BCF OF GAS IN PLACE
(in BCF)

	TOTAL RECOVERY RATES									
YEAR	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70
1	6.5000	7.8000	9.1000	10.4000	11.7000	13.0000	14.3000	15.6000	16.9000	18.2000
2	5.7200	6.8640	8.0080	9.1520	10.2960	11.4400	12.5840	13.7280	14.8720	16.0160
3	5.0310	6.0372	7.0434	8.0496	9.0558	10.0620	11.0682	12.0744	13.0806	14.0868
4	4.4265	5.3118	6.1971	7.0824	7.9677	8.8530	9.7383	10.6236	11.5089	12.3942
5	3.9000	4.6800	5.4600	6.2400	7.0200	7.8000	8.5800	9.3600	10.1400	10.9200
6	3.4320	4.1184	4.8048	5.4912	6.1776	6.8640	7.5504	8.2368	8.9232	9.6096
7	3.0225	3.6270	4.2315	4.8360	5.4405	6.0450	6.6495	7.2540	7.8585	8.4630
8	2.6585	3.1902	3.7219	4.2536	4.7853	5.3170	5.8487	6.3804	6.9121	7.4438
9	2.3400	2.8080	3.2760	3.7440	4.2120	4.6800	5.1480	5.6160	6.0840	6.5520
10	2.0605	2.4726	2.8847	3.2968	3.7089	4.1210	4.5331	4.9452	5.3573	5.7694
11	1.8135	2.1762	2.5389	2.9016	3.2643	3.6270	3.9897	4.3524	4.7151	5.0778
12	1.5925	1.9110	2.2295	2.5480	2.8665	3.1850	3.5035	3.8220	4.1405	4.4590
13	1.4040	1.6848	1.9656	2.2464	2.5272	2.8080	3.0888	3.3696	3.6504	3.9312
14	1.2350	1.4820	1.7290	1.9760	2.2230	2.4700	2.7170	2.9640	3.2110	3.4580
15	1.0855	1.3026	1.5197	1.7368	1.9539	2.1710	2.3881	2.6052	2.8223	3.0394
16	0.9555	1.1466	1.3377	1.5288	1.7199	1.9110	2.1021	2.2932	2.4843	2.6754
17	0.8385	1.0062	1.1739	1.3416	1.5093	1.6770	1.8447	2.0124	2.1801	2.3478
18	0.7410	0.8892	1.0374	1.1856	1.3338	1.4820	1.6302	1.7784	1.9266	2.0748
19	0.6500	0.7800	0.9100	1.0400	1.1700	1.3000	1.4300	1.5600	1.6900	1.8200
20	0.5720	0.6864	0.8008	0.9152	1.0296	1.1440	1.2584	1.3728	1.4872	1.6016

* Annual production rates follow a decreasing geometric law of behavior with a ratio q = 0.88

TABLES 7 TO 12

EXPECTED ANNUAL FUTURE GROSS REVENUE

Each entry of these tables, i.e., gross revenue per year, is equal to the price times the corresponding expected annual production as given in Tables 1 to 6. The price chosen is $0.15 per thousand cubic feet of gas produced.

TABLE 7

ASSUMPTION 1* - EXPECTED FUTURE GROSS REVENUE FOR 10 BCF OF GAS IN PLACE
(in dollars)

YEAR	TOTAL RECOVERY RATES									
	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70
1	48750.	58500.	68250.	78000.	87750.	97500.	107250.	117000.	126750.	136500.
2	42900.	51480.	60060.	68640.	77220.	85800.	94380.	102960.	111540.	120120.
3	37732.	45279.	52825.	60372.	67918.	75465.	83011.	90558.	98104.	105651.
4	33199.	39838.	46478.	53118.	59758.	66397.	73037.	79677.	86317.	92956.
5	29250.	35100.	40950.	46800.	52650.	58500.	64350.	70200.	76050.	81900.
6	25740.	30888.	36036.	41184.	46332.	51480.	56628.	61776.	66924.	72072.
7	22669.	27202.	31736.	36270.	40804.	45337.	49871.	54405.	58939.	63472.
8	19939.	23926.	27914.	31902.	35890.	39877.	43865.	47853.	51841.	55828.
9	17550.	21060.	24570.	28080.	31590.	35100.	38610.	42120.	45630.	49140.
10	15454.	18544.	21635.	24726.	27817.	30907.	33998.	37089.	40180.	43270.
11	13601.	16321.	19042.	21762.	24482.	27202.	29923.	32643.	35363.	38083.
12	11944.	14332.	16721.	19110.	21499.	23887.	26276.	28665.	31054.	33442.
13	10530.	12636.	14742.	16848.	18954.	21060.	23166.	25272.	27378.	29484.
14	9262.	11115.	12967.	14820.	16672.	18525.	20377.	22230.	24082.	25935.
15	8141.	9769.	11398.	13026.	14654.	16282.	17911.	19539.	21167.	22795.
16	7166.	8599.	10033.	11466.	12899.	14332.	15766.	17199.	18632.	20065.
17	6289.	7546.	8804.	10062.	11320.	12577.	13835.	15093.	16351.	17608.
18	5557.	6669.	7780.	8892.	10003.	11115.	12226.	13338.	14449.	15561.
19	4875.	5850.	6825.	7800.	8775.	9750.	10725.	11700.	12675.	13650.
20	4290.	5148.	6006.	6864.	7722.	8580.	9438.	10296.	11154.	12012.

* Annual production rates follow a decreasing geometric law of behavior with a ratio q = 0.88.

TABLE 8

ASSUMPTION 1* - EXPECTED FUTURE GROSS REVENUE FOR 30 BCF OF GAS IN PLACE
(in dollars)

YEAR	TOTAL RECOVERY RATES									
	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70
1	146250.	175500.	204750.	234000.	263250.	292500.	321750.	351000.	380250.	409500.
2	128700.	154440.	180180.	205920.	231660.	257400.	283140.	308880.	334620.	360360.
3	113197.	135837.	158476.	181116.	203755.	226395.	249034.	271674.	294313.	316953.
4	99596.	119515.	139435.	159354.	179273.	199192.	219112.	239031.	258950.	278869.
5	87750.	105300.	122850.	140400.	157950.	175500.	193050.	210600.	228150.	245700.
6	77220.	92664.	108108.	123552.	138996.	154440.	169884.	185328.	200772.	216216.
7	68006.	81607.	95209.	108810.	122411.	136012.	149614.	163215.	176816.	190417.
8	59816.	71779.	83743.	95706.	107669.	119632.	131596.	143559.	155522.	167485.
9	52650.	63180.	73710.	84240.	94770.	105300.	115830.	126360.	136890.	147420.
10	46361.	55633.	64906.	74178.	83450.	92722.	101995.	111267.	120539.	129811.
11	40804.	48964.	57125.	65286.	73447.	81607.	89768.	97929.	106090.	114250.
12	35831.	42997.	50164.	57330.	64496.	71662.	78829.	85995.	93161.	100327.
13	31590.	37908.	44226.	50544.	56862.	63180.	69498.	75816.	82134.	88452.
14	27787.	33345.	38902.	44460.	50017.	55575.	61132.	66690.	72247.	77805.
15	24424.	29308.	34193.	39078.	43963.	48847.	53732.	58617.	63502.	68386.
16	21499.	25798.	30098.	34398.	38698.	42997.	47297.	51597.	55897.	60196.
17	18866.	22639.	26413.	30186.	33959.	37732.	41506.	45279.	49052.	52825.
18	16672.	20007.	23341.	26676.	30010.	33345.	36679.	40014.	43348.	46683.
19	14625.	17550.	20475.	23400.	26325.	29250.	32175.	35100.	38025.	40950.
20	12870.	15444.	18018.	20592.	23166.	25740.	28314.	30888.	33462.	36036.

* Annual production rates follow a decreasing geometric law of behavior with a ratio q = 0.88

TABLE 9

ASSUMPTION 1* - EXPECTED FUTURE GROSS REVENUE FOR 50 BCF OF GAS IN PLACE
(in dollars)

YEAR	TOTAL RECOVERY RATES									
	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70
2	214500.	257400.	300300.	343200.	386100.	429000.	471900.	514800.	557700.	600600.
3	188663.	226395.	264128.	301860.	339592.	377325.	415057.	452790.	490522.	528255.
4	165994.	199192.	232391.	265590.	298789.	331988.	365186.	398385.	431584.	464783.
5	146250.	175500.	204750.	234000.	263250.	292500.	321750.	351000.	380250.	409500.
6	128700.	154440.	180180.	205920.	231660.	257400.	283140.	308880.	334620.	360360.
7	113344.	136013.	158681.	181350.	204019.	226688.	249356.	272025.	294694.	317363.
8	99694.	119632.	139571.	159510.	179449.	199387.	219326.	239265.	259204.	279142.
9	87750.	105300.	122850.	140400.	157950.	175500.	193050.	210600.	228150.	245700.
10	77269.	92722.	108176.	123630.	139084.	154537.	169991.	185445.	200899.	216353.
11	68006.	81608.	95209.	108810.	122411.	136013.	149614.	163215.	176816.	190417.
12	59719.	71662.	83606.	95550.	107494.	119437.	131381.	143325.	155269.	167212.
13	52650.	63180.	73710.	84240.	94770.	105300.	115830.	126360.	136890.	147420.
14	46312.	55575.	64837.	74100.	83362.	92625.	101887.	111150.	120412.	129675.
15	40706.	48847.	56989.	65130.	73271.	81412.	89554.	97695.	105836.	113978.
16	35831.	42997.	50164.	57330.	64496.	71662.	78829.	85995.	93161.	100327.
17	31444.	37733.	44021.	50310.	56599.	62888.	69176.	75465.	81754.	88042.
18	27787.	33345.	38902.	44460.	50017.	55575.	61132.	66690.	72247.	77805.
19	24375.	29250.	34125.	39000.	43875.	48750.	53625.	58500.	63375.	68250.
20	21450.	25740.	30030.	34320.	38610.	42900.	47190.	51480.	55770.	60060.

* Annual production rates follow a decreasing geometric law of behavior with a ratio $q = 0.88$

TABLE 10

ASSUMPTION 1* - EXPECTED FUTURE GROSS REVENUE FOR 100 BCF OF GAS IN PLACE
(in dollars)

YEAR	TOTAL RECOVERY RATES									
	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70
1	487500.	585000.	682500.	780000.	877500.	975000.	1072500.	1170000.	1267500.	1365000.
2	429000.	514800.	600600.	686400.	772200.	858000.	943800.	1029600.	1115400.	1201200.
3	377325.	452790.	528255.	603720.	679185.	754650.	830115.	905580.	981045.	1056510.
4	331988.	398385.	464783.	531180.	597577.	663975.	730372.	796770.	863167.	929565.
5	292500.	351000.	409500.	468000.	526500.	585000.	643500.	702000.	760500.	819000.
6	257400.	308880.	360360.	411840.	463320.	514800.	566280.	617760.	669240.	720720.
7	226688.	272025.	317363.	362700.	408037.	453375.	498712.	544050.	589387.	634725.
8	199387.	239265.	279142.	319020.	358897.	398775.	438652.	478530.	518407.	558285.
9	175500.	210600.	245700.	280800.	315900.	351000.	386100.	421200.	456300.	491400.
10	154537.	185445.	216353.	247260.	278167.	309075.	339982.	370890.	401797.	432705.
11	136013.	163215.	190417.	217620.	244822.	272025.	299227.	326430.	353632.	380835.
12	119437.	143325.	167212.	191100.	214987.	238875.	262762.	286650.	310537.	334425.
13	105300.	126360.	147420.	168480.	189540.	210600.	231660.	252720.	273780.	294840.
14	92625.	111150.	129675.	148200.	166725.	185250.	203775.	222300.	240825.	259350.
15	81412.	97695.	113978.	130260.	146542.	162825.	179107.	195390.	211672.	227955.
16	71662.	85995.	100327.	114660.	128992.	143325.	157657.	171990.	186322.	200655.
17	62888.	75465.	88042.	100620.	113197.	125775.	138352.	150930.	163507.	176085.
18	55575.	66690.	77805.	88920.	100035.	111150.	122265.	133380.	144495.	155610.
19	48750.	58500.	68250.	78000.	87750.	97500.	107250.	117000.	126750.	136500.
20	42900.	51480.	60060.	68640.	77220.	85800.	94380.	102960.	111540.	120120.

* Annual production rates follow a decreasing geometric law of behavior with a ratio $q = 0.88$

TABLE 11

ASSUMPTION 1* - EXPECTED FUTURE GROSS REVENUE FOR 150 BCF OF GAS IN PLACE
(in dollars)

YEAR	TOTAL RECOVERY RATES									
	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70
1	731250.	877500.	1023750.	1170000.	1316250.	1462500.	1608750.	1755000.	1901250.	2047500.
2	643500.	772200.	900900.	1029600.	1158300.	1287000.	1415700.	1544400.	1673100.	1801800.
3	565987.	679185.	792383.	905580.	1018777.	1131975.	1245172.	1358370.	1471567.	1584765.
4	497981.	597577.	697174.	796770.	896366.	995963.	1095559.	1195155.	1294751.	1394348.
5	438750.	526500.	614250.	702000.	789750.	877500.	965250.	1053000.	1140750.	1228500.
6	386100.	463320.	540540.	617760.	694980.	772200.	849420.	926640.	1003860.	1081080.
7	340031.	408037.	476044.	544050.	612056.	680062.	748069.	816075.	884081.	952088.
8	299081.	358897.	418714.	478530.	538346.	598162.	657979.	717795.	777611.	837427.
9	263250.	315900.	368550.	421200.	473850.	526500.	579150.	631800.	684450.	737100.
10	231806.	278167.	324529.	370890.	417251.	463612.	509974.	556335.	602696.	649057.
11	204019.	244822.	285626.	326430.	367234.	408037.	448841.	489645.	530449.	571252.
12	179156.	214987.	250819.	286650.	322481.	358312.	394144.	429975.	465806.	501637.
13	157950.	189540.	221130.	252720.	284310.	315900.	347490.	379080.	410670.	442260.
14	138937.	166725.	194512.	222300.	250087.	277875.	305662.	333450.	361237.	389025.
15	122119.	146542.	170966.	195390.	219814.	244237.	268661.	293085.	317509.	341932.
16	107494.	128992.	150491.	171990.	193489.	214987.	236486.	257985.	279484.	300982.
17	94331.	113197.	132064.	150930.	169796.	188662.	207529.	226395.	245261.	264127.
18	83362.	100035.	116707.	133380.	150052.	166725.	183397.	200070.	216742.	233415.
19	73125.	87750.	102375.	117000.	131625.	146250.	160875.	175500.	190125.	204750.
20	64350.	77220.	90090.	102960.	115830.	128700.	141570.	154440.	167310.	180180.

* Annual production rates follow a decreasing geometric law of behavior with a ratio q = 0.88

TABLE 12

ASSUMPTION 1* - EXPECTED FUTURE GROSS REVENUE FOR 200 BCF OF GAS IN PLACE
(in dollars)

YEAR	TOTAL RECOVERY RATES									
	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70
1	975000.	1170000.	1365000.	1560000.	1755000.	1950000.	2145000.	2340000.	2535000.	2730000.
2	858000.	1029600.	1201200.	1372800.	1544400.	1716000.	1887600.	2059200.	2230800.	2402400.
3	754650.	905580.	1056510.	1207440.	1358370.	1509300.	1660230.	1811160.	1962090.	2113020.
4	663975.	796770.	929565.	1062360.	1195155.	1327950.	1460745.	1593540.	1726335.	1859130.
5	585000.	702000.	819000.	936000.	1053000.	1170000.	1287000.	1404000.	1521000.	1638000.
6	514800.	617760.	720720.	823680.	926640.	1029600.	1132560.	1235520.	1338480.	1441440.
7	453375.	544050.	634725.	725400.	816075.	906750.	997425.	1088100.	1178775.	1269450.
8	398775.	478530.	558285.	638040.	717795.	797550.	877305.	957060.	1036815.	1116570.
9	351000.	421200.	491400.	561600.	631800.	702000.	772200.	842400.	912600.	982800.
10	309075.	370890.	432705.	494520.	556335.	618150.	679965.	741780.	803595.	865410.
11	272025.	326430.	380835.	435240.	489645.	544050.	598455.	652860.	707265.	761670.
12	238875.	286650.	334425.	382200.	429975.	477750.	525525.	573300.	621075.	668850.
13	210600.	252720.	294840.	336960.	379080.	421200.	463320.	505440.	547560.	589680.
14	185250.	222300.	259350.	296400.	333450.	370500.	407550.	444600.	481650.	518700.
15	162825.	195390.	227955.	260520.	293085.	325650.	358215.	390780.	423345.	455910.
16	143325.	171990.	200655.	229320.	257985.	286650.	315315.	343980.	372645.	401310.
17	125775.	150930.	176085.	201240.	226395.	251550.	276705.	301860.	327015.	352170.
18	111150.	133380.	155610.	177840.	200070.	222300.	244530.	266760.	288990.	311220.
19	97500.	117000.	136500.	156000.	175500.	195000.	214500.	234000.	253500.	273000.
20	85800.	102960.	120120.	137280.	154440.	171600.	188760.	205920.	223080.	240240.

* Annual production rates follow a decreasing geometric law of behavior with a ratio q = 0.88

TABLES 13 TO 18

EXPECTED ANNUAL FUTURE NET REVENUE

These tables indicate the expected annual future net revenues, in a 20-year period, defined as the difference between gross revenues and operational costs. Operational costs are fixed at $7,200 per year.

TABLE 13

ASSUMPTION 1* - EXPECTED FUTURE NET REVENUE FOR 10 BCF OF GAS IN PLACE
(in dollars)

YEAR	TOTAL RECOVERY RATES									
	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70
1	41550.	51300.	61050.	70800.	80550.	90300.	100050.	109800.	119550.	129300.
2	35700.	44280.	52860.	61440.	70020.	78600.	87180.	95760.	104340.	112920.
3	30532.	38079.	45625.	53172.	60718.	68265.	75811.	83358.	90904.	98451.
4	25999.	32638.	39278.	45918.	52558.	59197.	65837.	72477.	79117.	85756.
5	22050.	27900.	33750.	39600.	45450.	51300.	57150.	63000.	68850.	74700.
6	18540.	23688.	28836.	33984.	39132.	44280.	49428.	54576.	59724.	64872.
7	15469.	20002.	24536.	29070.	33604.	38137.	42671.	47205.	51739.	56272.
8	12739.	16726.	20714.	24702.	28690.	32677.	36665.	40653.	44641.	48628.
9	10350.	13860.	17370.	20880.	24390.	27900.	31410.	34920.	38430.	41940.
10	8254.	11344.	14435.	17526.	20617.	23707.	26798.	29889.	32980.	36070.
11	6401.	9121.	11842.	14562.	17282.	20002.	22723.	25443.	28163.	30883.
12	4744.	7132.	9521.	11910.	14299.	16687.	19076.	21465.	23854.	26242.
13	3330.	5436.	7542.	9648.	11754.	13860.	15966.	18072.	20178.	22284.
14	2062.	3915.	5767.	7620.	9472.	11325.	13177.	15030.	16882.	18735.
15	941.	2569.	4198.	5826.	7454.	9082.	10711.	12339.	13967.	15595.
16	-34.	1399.	2833.	4266.	5699.	7132.	8566.	9999.	11432.	12865.
17	-911.	346.	1604.	2862.	4120.	5377.	6635.	7893.	9151.	10408.
18	-1643.	-531.	580.	1692.	2803.	3915.	5026.	6138.	7249.	8361.
19	-2325.	-1350.	-375.	600.	1575.	2550.	3525.	4500.	5475.	6450.
20	-2910.	-2052.	-1194.	-336.	522.	1380.	2238.	3096.	3954.	4812.

* Annual production rates follow a decreasing geometric law of behavior with a ratio q = 0.88

TABLE 14

ASSUMPTION 1* - EXPECTED FUTURE NET REVENUE FOR 30 BCF OF GAS IN PLACE
(in dollars)

YEAR	TOTAL RECOVERY RATES									
	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70
1	139050.	168300.	197550.	226800.	256050.	285300.	314550.	343800.	373050.	402300.
2	121500.	147240.	172980.	198720.	224460.	250200.	275940.	301680.	327420.	353160.
3	105997.	128637.	151276.	173916.	196555.	219195.	241834.	264474.	287113.	309753.
4	92396.	112315.	132235.	152154.	172073.	191992.	211912.	231831.	251750.	271669.
5	80550.	98100.	115650.	133200.	150750.	168300.	185850.	203400.	220950.	238500.
6	70020.	85464.	100908.	116352.	131796.	147240.	162684.	178128.	193572.	209016.
7	60806.	74407.	88009.	101610.	115211.	128812.	142414.	156015.	169616.	183217.
8	52616.	64579.	76543.	88506.	100469.	112432.	124396.	136359.	148322.	160285.
9	45450.	55980.	66510.	77040.	87570.	98100.	108630.	119160.	129690.	140220.
10	39161.	48433.	57706.	66978.	76250.	85522.	94795.	104067.	113339.	122611.
11	33604.	41764.	49925.	58086.	66247.	74407.	82568.	90729.	98890.	107050.
12	28631.	35797.	42964.	50130.	57296.	64462.	71629.	78795.	85961.	93127.
13	24390.	30708.	37026.	43344.	49662.	55980.	62298.	68616.	74934.	81252.
14	20587.	26145.	31702.	37260.	42817.	48375.	53932.	59490.	65047.	70605.
15	17224.	22108.	26993.	31878.	36763.	41647.	46532.	51417.	56302.	61186.
16	14299.	18598.	22898.	27198.	31498.	35797.	40097.	44397.	48697.	52996.
17	11666.	15439.	19213.	22986.	26759.	30532.	34306.	38079.	41852.	45625.
18	9472.	12807.	16141.	19476.	22810.	26145.	29479.	32814.	36148.	39483.
19	7425.	10350.	13275.	16200.	19125.	22050.	24975.	27900.	30825.	33750.
20	5670.	8244.	10818.	13392.	15966.	18540.	21114.	23688.	26262.	28836.

* Annual production rates follow a decreasing geometric law of behavior with a ratio q = 0.88

TABLE 15

ASSUMPTION 1* - EXPECTED FUTURE NET REVENUE FOR 50 BCF OF GAS IN PLACE
(in dollars)

YEAR	TOTAL RECOVERY RATES									
	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70
1	236550.	285300.	334050.	382800.	431550.	480300.	529050.	577800.	626550.	675300.
2	207300.	250200.	293100.	336000.	378900.	421800.	464700.	507600.	550500.	593400.
3	181463.	219195.	256928.	294660.	332392.	370125.	407857.	445590.	483322.	521055.
4	158794.	191992.	225191.	258390.	291589.	324788.	357986.	391185.	424384.	457583.
5	139050.	168300.	197550.	226800.	256050.	285300.	314550.	343800.	373050.	402300.
6	121500.	147240.	172980.	198720.	224460.	250200.	275940.	301680.	327420.	353160.
7	106144.	128813.	151481.	174150.	196819.	219488.	242156.	264825.	287494.	310163.
8	92494.	112432.	132371.	152310.	172249.	192187.	212126.	232065.	252004.	271942.
9	80550.	98100.	115650.	133200.	150750.	168300.	185850.	203400.	220950.	238500.
10	70069.	85522.	100976.	116430.	131884.	147337.	162791.	178245.	193699.	209153.
11	60806.	74408.	88009.	101610.	115211.	128813.	142414.	156015.	169616.	183217.
12	52519.	64462.	76406.	88350.	100294.	112237.	124181.	136125.	148069.	160012.
13	45450.	55980.	66510.	77040.	87570.	98100.	108630.	119160.	129690.	140220.
14	39112.	48375.	57637.	66900.	76162.	85425.	94687.	103950.	113212.	122475.
15	33506.	41647.	49789.	57930.	66071.	74212.	82354.	90495.	98636.	106778.
16	28631.	35797.	42964.	50130.	57296.	64462.	71629.	78795.	85961.	93127.
17	24244.	30533.	36821.	43110.	49399.	55688.	61976.	68265.	74554.	80842.
18	20587.	26145.	31702.	37260.	42817.	48375.	53932.	59490.	65047.	70605.
19	17175.	22050.	26925.	31800.	36675.	41550.	46425.	51300.	56175.	61050.
20	14250.	18540.	22830.	27120.	31410.	35700.	39990.	44280.	48570.	52860.

* Annual production rates follow a decreasing geometric law of behavior with a ratio q = 0.88

TABLE 16

ASSUMPTION 1* - EXPECTED FUTURE NET REVENUE FOR 100 BCF OF GAS IN PLACE
(in dollars)

YEAR	TOTAL RECOVERY RATES									
	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70
1	480300.	577800.	675300.	772800.	870300.	967800.	1065300.	1162800.	1260300.	1357800.
2	421800.	507600.	593400.	679200.	765000.	850800.	936600.	1022400.	1108200.	1194000.
3	370125.	445590.	521055.	596520.	671985.	747450.	822915.	898380.	973845.	1049310.
4	324788.	391185.	457583.	523980.	590377.	656775.	723172.	789570.	855967.	922365.
5	285300.	343800.	402300.	460800.	519300.	577800.	636300.	694800.	753300.	811800.
6	250200.	301680.	353160.	404640.	456120.	507600.	559080.	610560.	662040.	713520.
7	219488.	264825.	310163.	355500.	400837.	446175.	491512.	536850.	582187.	627525.
8	192187.	232065.	271942.	311820.	351697.	391575.	431452.	471330.	511207.	551085.
9	168300.	203400.	238500.	273600.	308700.	343800.	378900.	414000.	449100.	484200.
10	147337.	178245.	209153.	240060.	270967.	301875.	332782.	363690.	394597.	425505.
11	128813.	156015.	183217.	210420.	237622.	264825.	292027.	319230.	346432.	373635.
12	112237.	136125.	160012.	183900.	207787.	231675.	255562.	279450.	303337.	327225.
13	98100.	119160.	140220.	161280.	182340.	203400.	224460.	245520.	266580.	287640.
14	85425.	103950.	122475.	141000.	159525.	178050.	196575.	215100.	233625.	252150.
15	74212.	90495.	106778.	123060.	139342.	155625.	171907.	188190.	204472.	220755.
16	64462.	78795.	93127.	107460.	121792.	136125.	150457.	164790.	179122.	193455.
17	55688.	68265.	80842.	93420.	105997.	118575.	131152.	143730.	156307.	168885.
18	48375.	59490.	70605.	81720.	92835.	103950.	115065.	126180.	137295.	148410.
19	41550.	51300.	61050.	70800.	80550.	90300.	100050.	109800.	119550.	129300.
20	35700.	44280.	52860.	61440.	70020.	78600.	87180.	95760.	104340.	112920.

* Annual production rates follow a decreasing geometric law of behavior with a ratio $q = 0.88$

TABLE 17

ASSUMPTION 1* - EXPECTED FUTURE NET REVENUE FOR 150 BCF OF GAS IN PLACE
(in dollars)

YEAR	TOTAL RECOVERY RATES									
	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70
1	724050.	870300.	1016550.	1162800.	1309050.	1455300.	1601550.	1747800.	1894050.	2040300.
2	636300.	765000.	893700.	1022400.	1151100.	1279800.	1408500.	1537200.	1665900.	1794600.
3	558787.	671985.	785183.	898330.	1011577.	1124775.	1237972.	1351170.	1464367.	1577565.
4	490781.	590377.	689974.	789570.	889166.	988763.	1088359.	1187955.	1287551.	1387148.
5	431550.	519300.	607050.	694800.	782550.	870300.	958050.	1045800.	1133550.	1221300.
6	378900.	456120.	533340.	610560.	687780.	765000.	842220.	919440.	996660.	1073880.
7	332831.	400837.	468844.	536850.	604856.	672862.	740869.	808875.	876881.	944888.
8	291881.	351697.	411514.	471330.	531146.	590962.	650779.	710595.	770411.	830227.
9	256050.	308700.	361350.	414000.	466650.	519300.	571950.	624600.	677250.	729900.
10	224606.	270967.	317329.	363690.	410051.	456412.	502774.	549135.	595496.	641857.
11	196819.	237622.	278426.	319230.	360034.	400837.	441641.	482445.	523249.	564052.
12	171956.	207787.	243619.	279450.	315281.	351112.	386944.	422775.	458606.	494437.
13	150750.	182340.	213930.	245520.	277110.	308700.	340290.	371880.	403470.	435060.
14	131737.	159525.	187312.	215100.	242887.	270675.	298462.	326250.	354037.	381825.
15	114919.	139342.	163766.	188190.	212614.	237037.	261461.	285885.	310309.	334732.
16	100294.	121792.	143291.	164790.	186289.	207787.	229286.	250785.	272284.	293782.
17	87131.	105997.	124864.	143730.	162596.	181462.	200329.	219195.	238061.	256927.
18	76162.	92835.	109507.	126180.	142852.	159525.	176197.	192870.	209542.	226215.
19	65925.	80550.	95175.	109800.	124425.	139050.	153675.	168300.	182925.	197550.
20	57150.	70020.	82890.	95760.	108630.	121500.	134370.	147240.	160110.	172980.

* Annual production rates follow a decreasing geometric law of behavior with a ratio $q = 0.88$

TABLE 18

ASSUMPTION 1* - EXPECTED FUTURE NET REVENUE FOR 200 BCF OF GAS IN PLACE
(in dollars)

YEAR	TOTAL RECOVERY RATES									
	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70
1	967800.	1162800.	1357800.	1552800.	1747800.	1942800.	2137800.	2332800.	2527800.	2722800.
2	850800.	1022400.	1194000.	1365600.	1537200.	1708800.	1880400.	2052000.	2223600.	2395200.
3	747450.	898380.	1049310.	1200240.	1351170.	1502100.	1653030.	1803960.	1954890.	2105820.
4	656775.	789570.	922365.	1055160.	1187955.	1320750.	1453545.	1586340.	1719135.	1851930.
5	577800.	694800.	811800.	928800.	1045800.	1162800.	1279800.	1396800.	1513800.	1630800.
6	507600.	610560.	713520.	816480.	919440.	1022400.	1125360.	1228320.	1331280.	1434240.
7	446175.	536850.	627525.	718200.	808875.	899550.	990225.	1080900.	1171575.	1262250.
8	391575.	471330.	551085.	630840.	710595.	790350.	870105.	949860.	1029615.	1109370.
9	343800.	414000.	484200.	554400.	624600.	694800.	765000.	835200.	905400.	975600.
10	301875.	363690.	425505.	487320.	549135.	610950.	672765.	734580.	796395.	858210.
11	264825.	319230.	373635.	428040.	482445.	536850.	591255.	645660.	700065.	754470.
12	231675.	279450.	327225.	375000.	422775.	470550.	518325.	566100.	613875.	661650.
13	203400.	245520.	287640.	329760.	371880.	414000.	456120.	498240.	540360.	582480.
14	178050.	215100.	252150.	289200.	326250.	363300.	400350.	437400.	474450.	511500.
15	155625.	188190.	220755.	253320.	285885.	318450.	351015.	383580.	416145.	448710.
16	136125.	164790.	193455.	222120.	250785.	279450.	308115.	336780.	365445.	394110.
17	118575.	143730.	168885.	194040.	219195.	244350.	269505.	294660.	319815.	344970.
18	103950.	126180.	148410.	170640.	192870.	215100.	237330.	259560.	281790.	304020.
19	90300.	109800.	129300.	148800.	168300.	187800.	207300.	226800.	246300.	265800.
20	78600.	95760.	112920.	130080.	147240.	164400.	181560.	198720.	215880.	233040.

* Amual production rates follow a decreasing geometric law of behavior with a ration q = 0.88

TABLES 19 AND 20

PRESENT VALUE OF EXPECTED FUTURE NET REVENUE

These tables indicate the discounted present value of the total future net revenues, obtained from Tables 13 to 18 for the following rates: 6%, 8%, 10%, 12%, 14%, 16%, 18%, 20%, 22% and 24%.

TABLE 19
ASSUMPTION 1* - PRESENT VALUES OF EXPECTED FUTURE NET REVENUES
(IN DOLLARS)

RATE OF RETURN	GAS IN PLACE (IN BCF)	TOTAL RECOVERY RATES									
		0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70
0.06	10	-12758.	37661.	88081.	138500.	188920.	239339.	289759.	340178.	390598.	441017.
0.06	30	491437.	642695.	793954.	945213.	1096471.	1247730.	1398988.	1550247.	1701506.	1852764.
0.06	50	995632.	1247730.	1499828.	1751925.	2004023.	2256120.	2508218.	2760316.	3012413.	3264511.
0.06	100	2256120.	2760316.	3264511.	3768706.	4272902.	4777097.	5281292.	5785488.	6289683.	6793878.
0.06	150	3516609.	4272902.	5029195.	5785488.	6541781.	7298074.	8054367.	8810660.	9566953.	10323245.
0.06	200	4777097.	5785488.	6793878.	7802269.	8810660.	9819050.	10827441.	11835831.	12844222.	13852613.
0.08	10	-104599.	-59622.	-14645.	30333.	75310.	120287.	165264.	210242.	255219.	300196.
0.08	30	345174.	480106.	615038.	749970.	884902.	1019834.	1154766.	1289698.	1424629.	1559561.
0.08	50	794947.	1019834.	1244720.	1469607.	1694493.	1919380.	2144267.	2369153.	2594040.	2818926.
0.08	100	1919380.	2369153.	2818926.	3268700.	3718473.	4168246.	4618019.	5067793.	5517566.	5967339.
0.08	150	3043813.	3718473.	4393133.	5067793.	5742452.	6417112.	7091772.	7766432.	8441092.	9115751.
0.08	200	4168246.	5067793.	5967339.	6866885.	7766432.	8665978.	9565525.	10465071.	11364618.	12264164.
0.10	10	-209890.	-169392.	-128894.	-88396.	-47898.	-7400.	33098.	73596.	114094.	154592.
0.10	30	195090.	316584.	438078.	559572.	681066.	802560.	924054.	1045548.	1167042.	1288536.
0.10	50	600070.	802560.	1005050.	1207540.	1410030.	1612520.	1815010.	2017500.	2219990.	2422480.
0.10	100	1612520.	2017500.	2422480.	2827460.	3232440.	3637420.	4042400.	4447380.	4852360.	5257340.
0.10	150	2624970.	3232440.	3839910.	4447380.	5054850.	5662320.	6269790.	6877260.	7484730.	8092200.
0.10	200	3637420.	4447380.	5257340.	6067300.	6877260.	7687220.	8497180.	9307140.	10117100.	10927060.
0.12	10	-334945.	-298179.	-261412.	-224646.	-187879.	-151113.	-114346.	-77580.	-40814.	-4047.
0.12	30	32719.	143019.	253318.	363618.	473917.	584216.	694516.	804815.	915114.	1025414.
0.12	50	400384.	584216.	768049.	951881.	1135713.	1319545.	1503378.	1687210.	1871042.	2054874.
0.12	100	1319545.	1687210.	2054874.	2422539.	2790204.	3157868.	3525533.	3893197.	4260862.	4628526.
0.12	150	2238707.	2790204.	3341700.	3893197.	4444694.	4996191.	5547688.	6099185.	6650681.	7202178.
0.12	200	3157868.	3893197.	4628526.	5363855.	6099185.	6834514.	7569843.	8305172.	9040501.	9775830.
0.14	10	-487265.	-453642.	-420019.	-386396.	-352774.	-319151.	-285528.	-251905.	-218282.	-184659.
0.14	30	-151036.	-50168.	50701.	151569.	252438.	353306.	454175.	555044.	655912.	756781.
0.14	50	185192.	353306.	521421.	689535.	857649.	1025764.	1193878.	1361992.	1530106.	1698221.
0.14	100	1025764.	1361992.	1698221.	2034449.	2370678.	2706906.	3043135.	3379363.	3715592.	4051820.
0.14	150	1866335.	2370678.	2875020.	3379363.	3883706.	4388049.	4892392.	5396735.	5901077.	6405420.
0.14	200	2706906.	3379363.	4051820.	4724278.	5396735.	6069192.	6741649.	7414106.	8086563.	8759020.

* Annual production rates follow a decreasing geometric law of behavior with a ratio q = 0.88

TABLE 20
ASSUMPTION 1* - PRESENT VALUES OF EXPECTED FUTURE NET REVENUES
(IN DOLLARS)

RATE OF RETURN	GAS IN PLACE (IN BCF)	TOTAL RECOVERY RATES 0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70
0.16	10	-675999.	-645052.	-614105.	-583158.	-552211.	-521264.	-490317.	-459370.	-428423.	-397476.
0.16	30	-366529.	-273688.	-180847.	-88006.	4835.	97676.	190517.	283358.	376199.	469040.
0.16	50	-57059.	97676.	252411.	407146.	561881.	716616.	871351.	1026086.	1180821.	1335556.
0.16	100	716616.	1026086.	1335556.	1645026.	1954496.	2263966.	2573436.	2882906.	3192376.	3501846.
0.16	150	1490291.	1954496.	2418701.	2882906.	3347111.	3811316.	4275521.	4739726.	5203931.	5668135.
0.16	200	2263966.	2882906.	3501846.	4120786.	4739726.	5358665.	5977605.	6596545.	7215485.	7834425.
0.18	10	-912484.	-883836.	-855189.	-826542.	-797894.	-769247.	-740599.	-711952.	-683304.	-654657.
0.18	30	-626009.	-540067.	-454125.	-368182.	-282240.	-196298.	-110355.	-24413.	61529.	147472.
0.18	50	-339535.	-196298.	-53060.	90177.	233414.	376651.	519889.	663126.	806363.	949600.
0.18	100	376651.	663126.	949600.	1236075.	1522549.	1809024.	2095499.	2381973.	2668448.	2954922.
0.18	150	1092838.	1522549.	1952261.	2381973.	2811685.	3241397.	3671108.	4100820.	4530532.	4960244.
0.18	200	1809024.	2381973.	2954922.	3527871.	4100820.	4673769.	5246718.	5819667.	6392616.	6965565.
0.20	10	-1210884.	-1184230.	-1157576.	-1130922.	-1104268.	-1077614.	-1050961.	-1024307.	-997653.	-970999.
0.20	30	-944345.	-864383.	-784422.	-704460.	-624499.	-544537.	-464575.	-384614.	-304652.	-224690.
0.20	50	-677806.	-544537.	-411267.	-277998.	-144729.	-11459.	121810.	255080.	388349.	521618.
0.20	100	-11459.	255080.	521618.	788157.	1054696.	1321235.	1587773.	1854312.	2120851.	2387390.
0.20	150	654888.	1054696.	1454504.	1854312.	2254120.	2653929.	3053737.	3453545.	3853353.	4253161.
0.20	200	1321235.	1854312.	2387390.	2920467.	3453545.	3986623.	4519700.	5052778.	5585855.	6118933.
0.22	10	-1588965.	-1564053.	-1539141.	-1514230.	-1489318.	-1464407.	-1439495.	-1414583.	-1389672.	-1364760.
0.22	30	-1339849.	-1265114.	-1190379.	-1115644.	-1040910.	-966175.	-891440.	-816705.	-741970.	-667236.
0.22	50	-1090733.	-966175.	-841617.	-717059.	-592501.	-467943.	-343385.	-218827.	-94269.	30289.
0.22	100	-467943.	-218827.	30289.	279405.	528521.	777637.	1026752.	1275868.	1524984.	1774100.
0.22	150	154847.	528521.	902195.	1275868.	1649542.	2023216.	2396890.	2770564.	3144238.	3517912.
0.22	200	777637.	1275868.	1774100.	2272332.	2770564.	3268796.	3767027.	4265259.	4763491.	5261723.
0.24	10	-2069036.	-2045658.	-2022281.	-1998903.	-1975525.	-1952148.	-1928770.	-1905393.	-1882015.	-1858637.
0.24	30	-1835260.	-1765127.	-1694994.	-1624861.	-1554728.	-1484595.	-1414462.	-1344329.	-1274197.	-1204064.
0.24	50	-1601483.	-1484595.	-1367707.	-1250819.	-1133931.	-1017043.	-900155.	-783266.	-666378.	-549490.
0.24	100	-1017043.	-783266.	-549490.	-315714.	-81938.	151839.	385615.	619391.	853167.	1086944.
0.24	150	-432602.	-81938.	268727.	619391.	970056.	1320720.	1671384.	2022049.	2372713.	2723378.
0.24	200	151839.	619391.	1086944.	1554496.	2022049.	2489601.	2957154.	3424706.	3892259.	4359811.

* Annual production rates follow a decreasing geometric law of behavior with a ratio q = 0.88

ASSUMPTION 2* INCLUDES TABLES FROM 21 TO 40.

* Calculations of the annual production rates are based on a geometric law of behavior with a first year production equal to 10 percent of the total recovery and a ratio q = 0.92.

TABLES 21 TO 26

EXPECTED FUTURE ANNUAL PRODUCTION

These tables indicate the expected future annual production, in a 20-year period for each entry of Table I, page 9. Each entry of Table I is the total amount of gas recovered for each combination of gas in place and expected recovery rate.

TABLE 21

ASSUMPTION 2* - EXPECTED FUTURE ANNUAL PRODUCTION FOR 10 BCF OF GAS IN PLACE
(in BCF)

YEAR	TOTAL RECOVERY RATES									
	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70
1	0.2500	0.3000	0.3500	0.4000	0.4500	0.5000	0.5500	0.6000	0.6500	0.7000
2	0.2300	0.2760	0.3220	0.3680	0.4140	0.4600	0.5060	0.5520	0.5980	0.6440
3	0.2116	0.2539	0.2962	0.3386	0.3809	0.4232	0.4655	0.5078	0.5502	0.5925
4	0.1947	0.2337	0.2726	0.3115	0.3505	0.3894	0.4284	0.4673	0.5063	0.5452
5	0.1791	0.2149	0.2507	0.2866	0.3224	0.3582	0.3940	0.4298	0.4657	0.5015
6	0.1648	0.1977	0.2307	0.2636	0.2966	0.3295	0.3625	0.3954	0.4284	0.4614
7	0.1516	0.1819	0.2122	0.2425	0.2729	0.3032	0.3335	0.3638	0.3941	0.4244
8	0.1395	0.1674	0.1952	0.2231	0.2510	0.2789	0.3068	0.3347	0.3626	0.3905
9	0.1283	0.1540	0.1796	0.2053	0.2309	0.2566	0.2823	0.3079	0.3336	0.3593
10	0.1180	0.1416	0.1653	0.1889	0.2125	0.2361	0.2597	0.2833	0.3069	0.3305
11	0.1086	0.1303	0.1520	0.1738	0.1955	0.2172	0.2389	0.2606	0.2824	0.3041
12	0.0999	0.1199	0.1399	0.1599	0.1798	0.1998	0.2198	0.2398	0.2598	0.2797
13	0.0919	0.1103	0.1287	0.1471	0.1655	0.1838	0.2022	0.2206	0.2390	0.2574
14	0.0846	0.1015	0.1184	0.1353	0.1522	0.1691	0.1860	0.2029	0.2199	0.2368
15	0.0778	0.0934	0.1089	0.1245	0.1400	0.1556	0.1712	0.1867	0.2023	0.2178
16	0.0716	0.0859	0.1002	0.1145	0.1288	0.1431	0.1575	0.1718	0.1861	0.2004
17	0.0658	0.0790	0.0922	0.1054	0.1185	0.1317	0.1449	0.1580	0.1712	0.1844
18	0.0606	0.0727	0.0848	0.0969	0.1090	0.1212	0.1333	0.1454	0.1575	0.1696
19	0.0557	0.0669	0.0780	0.0892	0.1003	0.1115	0.1226	0.1338	0.1449	0.1561
20	0.0513	0.0615	0.0718	0.0820	0.0923	0.1025	0.1128	0.1231	0.1333	0.1436

* Annual production rates follow a decreasing geometric law of behavior with a ratio $q = 0.92$

TABLE 22

ASSUMPTION 2* - EXPECTED FUTURE ANNUAL PRODUCTION FOR 30 BCF OF GAS IN PLACE
(in BCF)

YEAR	TOTAL RECOVERY RATES									
	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70
1	0.7500	0.9000	1.0500	1.2000	1.3500	1.5000	1.6500	1.8000	1.9500	2.1000
2	0.6900	0.8280	0.9660	1.1040	1.2420	1.3800	1.5180	1.6560	1.7940	1.9320
3	0.6348	0.7618	0.8887	1.0157	1.1426	1.2696	1.3966	1.5235	1.6505	1.7774
4	0.5842	0.7010	0.8178	0.9346	1.0515	1.1683	1.2851	1.4020	1.5188	1.6356
5	0.5373	0.6448	0.7522	0.8597	0.9671	1.0746	1.1821	1.2895	1.3970	1.5044
6	0.4943	0.5932	0.6920	0.7909	0.8898	0.9886	1.0875	1.1863	1.2852	1.3841
7	0.4548	0.5457	0.6367	0.7276	0.8186	0.9095	1.0005	1.0914	1.1824	1.2733
8	0.4184	0.5021	0.5857	0.6694	0.7531	0.8368	0.9205	1.0041	1.0878	1.1715
9	0.3849	0.4619	0.5389	0.6159	0.6928	0.7698	0.8468	0.9238	1.0008	1.0778
10	0.3541	0.4249	0.4958	0.5666	0.6374	0.7082	0.7791	0.8499	0.9207	0.9915
11	0.3258	0.3910	0.4561	0.5213	0.5864	0.6516	0.7167	0.7819	0.8471	0.9122
12	0.2997	0.3597	0.4196	0.4796	0.5395	0.5995	0.6594	0.7194	0.7793	0.8392
13	0.2758	0.3309	0.3861	0.4412	0.4964	0.5515	0.6067	0.6618	0.7170	0.7721
14	0.2537	0.3044	0.3552	0.4059	0.4566	0.5074	0.5581	0.6088	0.6596	0.7103
15	0.2334	0.2801	0.3268	0.3734	0.4201	0.4668	0.5135	0.5602	0.6068	0.6535
16	0.2147	0.2577	0.3006	0.3436	0.3865	0.4294	0.4724	0.5153	0.5583	0.6012
17	0.1975	0.2371	0.2766	0.3161	0.3556	0.3951	0.4346	0.4741	0.5136	0.5531
18	0.1817	0.2181	0.2544	0.2908	0.3271	0.3635	0.3998	0.4362	0.4725	0.5089
19	0.1672	0.2006	0.2341	0.2675	0.3010	0.3344	0.3679	0.4013	0.4347	0.4682
20	0.1538	0.1846	0.2154	0.2461	0.2769	0.3076	0.3384	0.3692	0.3999	0.4307

* Annual production rates follow a decreasing geometric law of behavior with a ratio $q = 0.92$

TABLE 23

ASSUMPTION 2* - EXPECTED FUTURE ANNUAL PRODUCTION FOR 50 BCF OF GAS IN PLACE
(in BCF)

YEAR	TOTAL RECOVERY RATES									
	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70
1	1.2500	1.5000	1.7500	2.0000	2.2500	2.5000	2.7500	3.0000	3.2500	3.5000
2	1.1500	1.3800	1.6100	1.8400	2.0700	2.3000	2.5300	2.7600	2.9900	3.2200
3	1.0580	1.2696	1.4812	1.6928	1.9044	2.1160	2.3276	2.5392	2.7508	2.9624
4	0.9736	1.1683	1.3630	1.5577	1.7525	1.9472	2.1419	2.3366	2.5313	2.7260
5	0.8955	1.0746	1.2537	1.4328	1.6119	1.7910	1.9701	2.1492	2.3283	2.5074
6	0.8238	0.9886	1.1534	1.3182	1.4829	1.6477	1.8125	1.9772	2.1420	2.3068
7	0.7579	0.9095	1.0611	1.2127	1.3643	1.5159	1.6675	1.8190	1.9706	2.1222
8	0.6973	0.8368	0.9762	1.1157	1.2552	1.3946	1.5341	1.6735	1.8130	1.9525
9	0.6415	0.7698	0.8981	1.0264	1.1547	1.2830	1.4114	1.5397	1.6680	1.7963
10	0.5902	0.7082	0.8263	0.9443	1.0624	1.1804	1.2984	1.4165	1.5345	1.6526
11	0.5430	0.6516	0.7602	0.8688	0.9774	1.0860	1.1946	1.3032	1.4118	1.5204
12	0.4995	0.5995	0.6994	0.7993	0.8992	0.9991	1.0990	1.1989	1.2988	1.3987
13	0.4596	0.5515	0.6434	0.7353	0.8273	0.9192	1.0111	1.1030	1.1949	1.2868
14	0.4228	0.5074	0.5919	0.6765	0.7611	0.8456	0.9302	1.0147	1.0993	1.1839
15	0.3890	0.4668	0.5446	0.6224	0.7002	0.7780	0.8558	0.9336	1.0114	1.0892
16	0.3579	0.4294	0.5010	0.5726	0.6442	0.7157	0.7873	0.8589	0.9305	1.0020
17	0.3292	0.3951	0.4609	0.5268	0.5926	0.6585	0.7243	0.7902	0.8560	0.9219
18	0.3029	0.3635	0.4241	0.4846	0.5452	0.6058	0.6664	0.7270	0.7875	0.8481
19	0.2787	0.3344	0.3901	0.4459	0.5016	0.5573	0.6131	0.6688	0.7246	0.7803
20	0.2564	0.3076	0.3589	0.4102	0.4615	0.5127	0.5640	0.6153	0.6666	0.7178

*Annual production rates follow a decreasing geometric law of behavior with a ratio $q = 0.92$

TABLE 24

ASSUMPTION 2* - EXPECTED FUTURE ANNUAL PRODUCTION FOR 100 BCF OF GAS IN PLACE
(in BCF)

YEAR	TOTAL RECOVERY RATES									
	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70
1	2.5000	3.0000	3.5000	4.0000	4.5000	5.0000	5.5000	6.0000	6.5000	7.0000
2	2.3000	2.7600	3.2200	3.6800	4.1400	4.6000	5.0600	5.5200	5.9800	6.4400
3	2.1160	2.5392	2.9624	3.3856	3.8088	4.2320	4.6552	5.0784	5.5016	5.9248
4	1.9472	2.3366	2.7260	3.1155	3.5049	3.8943	4.2838	4.6732	5.0627	5.4521
5	1.7910	2.1492	2.5074	2.8656	3.2238	3.5820	3.9402	4.2984	4.6566	5.0148
6	1.6477	1.9772	2.3068	2.6363	2.9659	3.2954	3.6249	3.9545	4.2840	4.6136
7	1.5159	1.8190	2.1222	2.4254	2.7286	3.0317	3.3349	3.6381	3.9413	4.2444
8	1.3946	1.6735	1.9525	2.2314	2.5103	2.7892	3.0682	3.3471	3.6260	3.9049
9	1.2830	1.5397	1.7963	2.0529	2.3095	2.5661	2.8227	3.0793	3.3359	3.5925
10	1.1804	1.4165	1.6526	1.8886	2.1247	2.3608	2.5969	2.8330	3.0690	3.3051
11	1.0860	1.3032	1.5204	1.7376	1.9548	2.1719	2.3891	2.6063	2.8235	3.0407
12	0.9991	1.1989	1.3987	1.5986	1.7984	1.9982	2.1980	2.3978	2.5977	2.7975
13	0.9192	1.1030	1.2868	1.4707	1.6545	1.8383	2.0222	2.2060	2.3899	2.5737
14	0.8456	1.0147	1.1839	1.3530	1.5221	1.6912	1.8604	2.0295	2.1986	2.3677
15	0.7780	0.9336	1.0892	1.2448	1.4004	1.5560	1.7116	1.8672	2.0228	2.1784
16	0.7157	0.8589	1.0020	1.1452	1.2883	1.4315	1.5746	1.7178	1.8609	2.0041
17	0.6585	0.7902	0.9219	1.0536	1.1853	1.3170	1.4487	1.5804	1.7121	1.8438
18	0.6058	0.7270	0.8481	0.9693	1.0904	1.2116	1.3328	1.4539	1.5751	1.6962
19	0.5573	0.6688	0.7803	0.8918	1.0032	1.1147	1.2262	1.3376	1.4491	1.5606
20	0.5127	0.6153	0.7178	0.8204	0.9229	1.0255	1.1280	1.2306	1.3331	1.4357

* Annual production rates follow a decreasing geometric law of behavior with a ratio $q = 0.92$

TABLE 25

ASSUMPTION 2* - EXPECTED FUTURE ANNUAL PRODUCTION FOR 150 BCF OF GAS IN PLACE
(in BCF)

YEAR	TOTAL RECOVERY RATES									
	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70
1	3.7500	4.5000	5.2500	6.0000	6.7500	7.5000	8.2500	9.0000	9.7500	10.5000
2	3.4500	4.1400	4.8300	5.5200	6.2100	6.9000	7.5900	8.2800	8.9700	9.6600
3	3.1740	3.8088	4.4436	5.0784	5.7132	6.3480	6.9828	7.6176	8.2524	8.8872
4	2.9208	3.5049	4.0891	4.6732	5.2574	5.8415	6.4257	7.0098	7.5940	8.1781
5	2.6865	3.2238	3.7611	4.2984	4.8357	5.3730	5.9103	6.4476	6.9849	7.5222
6	2.4715	2.9659	3.4602	3.9545	4.4488	4.9431	5.4374	5.9317	6.4260	6.9203
7	2.2738	2.7286	3.1833	3.6381	4.0929	4.5476	5.0024	5.4571	5.9119	6.3667
8	2.0919	2.5103	2.9287	3.3471	3.7655	4.1839	4.6023	5.0206	5.4390	5.8574
9	1.9246	2.3095	2.6944	3.0793	3.4642	3.8491	4.2341	4.6190	5.0039	5.3888
10	1.7706	2.1247	2.4788	2.8330	3.1871	3.5412	3.8953	4.2494	4.6036	4.9577
11	1.6290	1.9548	2.2805	2.6063	2.9321	3.2579	3.5837	3.9095	4.2353	4.5611
12	1.4986	1.7984	2.0981	2.3978	2.6976	2.9973	3.2970	3.5968	3.8965	4.1962
13	1.3788	1.6545	1.9303	2.2060	2.4818	2.7575	3.0333	3.3090	3.5848	3.8605
14	1.2684	1.5221	1.7758	2.0295	2.2832	2.5369	2.7906	3.0442	3.2979	3.5516
15	1.1670	1.4004	1.6338	1.8672	2.1006	2.3340	2.5674	2.8008	3.0342	3.2676
16	1.0736	1.2883	1.5031	1.7178	1.9325	2.1472	2.3620	2.5767	2.7914	3.0061
17	0.9877	1.1853	1.3828	1.5804	1.7779	1.9755	2.1730	2.3706	2.5681	2.7657
18	0.9087	1.0904	1.2722	1.4539	1.6357	1.8174	1.9991	2.1809	2.3626	2.5444
19	0.8360	1.0032	1.1704	1.3376	1.5048	1.6720	1.8393	2.0065	2.1737	2.3409
20	0.7691	0.9229	1.0768	1.2306	1.3844	1.5382	1.6921	1.8459	1.9997	2.1535

* Annual production rates follow a decreasing geometric law of behavior with a ratio $q = 0.92$

TABLE 26

ASSUMPTION 2* - EXPECTED FUTURE ANNUAL PRODUCTION FOR 200 BCF OF GAS IN PLACE
(in BCF)

YEAR	TOTAL RECOVERY RATES									
	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70
1	5.0000	6.0000	7.0000	8.0000	9.0000	10.0000	11.0000	12.0000	13.0000	14.0000
2	4.6000	5.5200	6.4400	7.3600	8.2800	9.2000	10.1200	11.0400	11.9600	12.8800
3	4.2320	5.0784	5.9248	6.7712	7.6176	8.4640	9.3104	10.1568	11.0032	11.8496
4	3.8943	4.6732	5.4521	6.2310	7.0098	7.7887	8.5676	9.3464	10.1253	10.9042
5	3.5820	4.2984	5.0148	5.7312	6.4476	7.1640	7.8804	8.5968	9.3132	10.0296
6	3.2954	3.9545	4.6136	5.2726	5.9317	6.5908	7.2499	7.9090	8.5680	9.2271
7	3.0317	3.6381	4.2444	4.8508	5.4571	6.0635	6.6698	7.2762	7.8825	8.4889
8	2.7892	3.3471	3.9049	4.4628	5.0206	5.5785	6.1363	6.6942	7.2520	7.8099
9	2.5661	3.0793	3.5925	4.1058	4.6190	5.1322	5.6454	6.1586	6.6719	7.1851
10	2.3608	2.8330	3.3051	3.7773	4.2494	4.7216	5.1938	5.6659	6.1381	6.6102
11	2.1719	2.6063	3.0407	3.4751	3.9095	4.3439	4.7783	5.2127	5.6471	6.0815
12	1.9982	2.3978	2.7975	3.1971	3.5968	3.9964	4.3960	4.7957	5.1953	5.5950
13	1.8383	2.2060	2.5737	2.9414	3.3090	3.6767	4.0444	4.4120	4.7797	5.1474
14	1.6912	2.0295	2.3677	2.7060	3.0442	3.3825	3.7207	4.0590	4.3972	4.7355
15	1.5560	1.8672	2.1784	2.4896	2.8008	3.1120	3.4232	3.7344	4.0456	4.3568
16	1.4315	1.7178	2.0041	2.2904	2.5767	2.8630	3.1493	3.4356	3.7219	4.0082
17	1.3170	1.5804	1.8438	2.1072	2.3706	2.6340	2.8974	3.1608	3.4242	3.6876
18	1.2116	1.4539	1.6962	1.9386	2.1809	2.4232	2.6655	2.9078	3.1502	3.3925
19	1.1147	1.3376	1.5605	1.7835	2.0065	2.2294	2.4523	2.6753	2.8982	3.1212
20	1.0255	1.2306	1.4357	1.6408	1.8459	2.0510	2.2561	2.4612	2.6663	2.8714

* Annual production rates follow a decreasing geometric law of behavior with a ratio q = 0.92

TABLES 27 TO 32

EXPECTED ANNUAL FUTURE GROSS REVENUE

Each entry of these tables, i.e., gross revenue per year, is equal to the price times the corresponding expected annual production as given in Tables 21 to 26. The price chosen is $0.15 per thousand cubic feet of gas produced.

TABLE 27

ASSUMPTION 2* - EXPECTED FUTURE GROSS REVENUE FOR 10 BCF OF GAS IN PLACE
(in dollars)

YEAR	TOTAL RECOVERY RATES									
	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70
1	37500.	45000.	52500.	60000.	67500.	75000.	82500.	90000.	97500.	105000.
2	34500.	41400.	48300.	55200.	62100.	69000.	75900.	82800.	89700.	96600.
3	31740.	38088.	44436.	50784.	57132.	63480.	69828.	76176.	82524.	88872.
4	29208.	35049.	40891.	46732.	52574.	58415.	64257.	70098.	75940.	81781.
5	26865.	32238.	37611.	42984.	48357.	53730.	59103.	64476.	69849.	75222.
6	24715.	29659.	34602.	39545.	44488.	49431.	54374.	59317.	64260.	69203.
7	22738.	27286.	31833.	36381.	40929.	45476.	50024.	54571.	59119.	63667.
8	20919.	25103.	29287.	33471.	37655.	41839.	46023.	50206.	54390.	58574.
9	19246.	23095.	26944.	30793.	34642.	38491.	42341.	46190.	50039.	53888.
10	17706.	21247.	24788.	28330.	31871.	35412.	38953.	42494.	46036.	49577.
11	16290.	19548.	22805.	26063.	29321.	32579.	35837.	39095.	42353.	45611.
12	14986.	17984.	20981.	23978.	26976.	29973.	32970.	35968.	38965.	41962.
13	13788.	16545.	19303.	22060.	24818.	27575.	30333.	33090.	35848.	38605.
14	12684.	15221.	17758.	20295.	22832.	25369.	27906.	30442.	32979.	35516.
15	11670.	14004.	16338.	18672.	21006.	23340.	25674.	28008.	30342.	32676.
16	10736.	12883.	15031.	17178.	19325.	21472.	23620.	25767.	27914.	30061.
17	9877.	11853.	13828.	15804.	17779.	19755.	21730.	23706.	25681.	27657.
18	9087.	10904.	12722.	14539.	16357.	18174.	19991.	21809.	23626.	25444.
19	8360.	10032.	11704.	13376.	15048.	16720.	18393.	20065.	21737.	23409.
20	7691.	9229.	10768.	12306.	13844.	15382.	16921.	18459.	19997.	21535.

* Annual production rates follow a decreasing geometric law of behavior with a ratio of q = 0.92

TABLE 28

ASSUMPTION 2* - EXPECTED FUTURE GROSS REVENUE FOR 30 BCF OF GAS IN PLACE
(in dollars)

YEAR	TOTAL RECOVERY RATES									
	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70
1	112500.	135000.	157500.	180000.	202500.	225000.	247500.	270000.	292500.	315000.
2	103500.	124200.	144900.	165600.	186300.	207000.	227700.	248400.	269100.	289800.
3	95220.	114264.	133308.	152352.	171396.	190440.	209484.	228528.	247572.	266616.
4	87623.	105147.	122672.	140197.	157721.	175246.	192770.	210295.	227819.	245344.
5	80595.	96714.	112833.	128952.	145071.	161190.	177309.	193428.	209547.	225666.
6	74146.	88976.	103805.	118634.	133464.	148293.	163122.	177952.	192781.	207610.
7	68214.	81857.	95500.	109143.	122786.	136429.	150072.	163714.	177357.	191000.
8	62758.	75310.	87861.	100413.	112965.	125516.	138068.	150619.	163171.	175723.
9	57737.	69285.	80832.	92380.	103927.	115474.	127022.	138569.	150117.	161664.
10	53118.	63742.	74365.	84989.	95612.	106236.	116860.	127483.	138107.	148730.
11	48869.	58643.	68416.	78190.	87964.	97738.	107512.	117285.	127059.	136833.
12	44959.	53951.	62943.	71935.	80927.	89919.	98911.	107903.	116895.	125887.
13	41363.	49635.	57908.	66181.	74453.	82726.	90998.	99271.	107543.	115815.
14	38053.	45664.	53274.	60885.	68496.	76106.	83717.	91327.	98938.	106549.
15	35010.	42012.	49014.	56016.	63018.	70020.	77022.	84024.	91026.	98028.
16	32209.	38650.	45092.	51534.	57976.	64417.	70859.	77301.	83743.	90184.
17	29632.	35559.	41485.	47412.	53338.	59265.	65191.	71118.	77044.	82971.
18	27261.	32713.	38165.	43618.	49070.	54522.	59974.	65426.	70879.	76331.
19	25081.	30097.	35113.	40129.	45145.	50161.	55178.	60194.	65210.	70226.
20	23074.	27688.	32303.	36918.	41533.	46147.	50762.	55377.	59992.	64606.

* Annual production rates follow a decreasing geometric law of behavior with a ratio of $q = 0.92$

TABLE 29

ASSUMPTION 2* - EXPECTED FUTURE GROSS REVENUE FOR 50 BCF OF GAS IN PLACE
(in dollars)

YEAR	TOTAL RECOVERY RATES									
	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70
1	187500.	225000.	262500.	300000.	337500.	375000.	412500.	450000.	487500.	525000.
2	172500.	207000.	241500.	276000.	310500.	345000.	379500.	414000.	448500.	483000.
3	158700.	190440.	222180.	253920.	285660.	317400.	349140.	380880.	412620.	444360.
4	146038.	175246.	204453.	233661.	262869.	292076.	321284.	350491.	379699.	408907.
5	134325.	161190.	188055.	214920.	241785.	268650.	295515.	322380.	349245.	376110.
6	123577.	148293.	173008.	197724.	222439.	247155.	271870.	296586.	321301.	346017.
7	113691.	136429.	159167.	181905.	204643.	227381.	250119.	272857.	295596.	318334.
8	104597.	125516.	146436.	167355.	188274.	209194.	230113.	251032.	271952.	292871.
9	96229.	115474.	134720.	153966.	173212.	192457.	211703.	230949.	250195.	269440.
10	88530.	106236.	123942.	141648.	159354.	177060.	194766.	212472.	230178.	247884.
11	81448.	97738.	114027.	130317.	146607.	162896.	179186.	195476.	211765.	228055.
12	74932.	89919.	104905.	119892.	134878.	149865.	164851.	179838.	194824.	209811.
13	68938.	82726.	96513.	110301.	124089.	137876.	151664.	165451.	179239.	193027.
14	63422.	76106.	88791.	101475.	114159.	126844.	139528.	152212.	164897.	177581.
15	58350.	70020.	81690.	93360.	105030.	116700.	128370.	140040.	151710.	163380.
16	53681.	64418.	75154.	85890.	96626.	107363.	118099.	128835.	139571.	150307.
17	49388.	59265.	69142.	79020.	88897.	98775.	108652.	118530.	128407.	138285.
18	45435.	54522.	63609.	72696.	81783.	90870.	99957.	109044.	118131.	127218.
19	41801.	50161.	58522.	66882.	75242.	83603.	91963.	100323.	108683.	117043.
20	38456.	46147.	53839.	61530.	69221.	76912.	84604.	92295.	99986.	107677.

* Annual production rates follow a decreasing geometric law of behavior with a ratio of $q = 0.92$

TABLE 30

ASSUMPTION 2* - EXPECTED FUTURE GROSS REVENUE FOR 100 BCF OF GAS PLACE
(in dollars)

YEAR	TOTAL RECOVERY RATES									
	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70
1	375000.	450000.	525000.	600000.	675000.	750000.	825000.	900000.	975000.	1050000.
2	345000.	414000.	483000.	552000.	621000.	690000.	759000.	828000.	897000.	966000.
3	317400.	380880.	444360.	507840.	571320.	634800.	698280.	761760.	825240.	888720.
4	292076.	350491.	408907.	467322.	525737.	584152.	642568.	700983.	759398.	817813.
5	268650.	322380.	376110.	429840.	483570.	537300.	591030.	644760.	698490.	752220.
6	247155.	296586.	346017.	395448.	444879.	494310.	543741.	593172.	642603.	692034.
7	227381.	272857.	318334.	363810.	409286.	454762.	500239.	545715.	591191.	636667.
8	209194.	251032.	292871.	334710.	376549.	418387.	460226.	502065.	543904.	585742.
9	192457.	230949.	269440.	307932.	346423.	384915.	423406.	461898.	500389.	538881.
10	177060.	212472.	247884.	283296.	318708.	354120.	389532.	424944.	460356.	495768.
11	162896.	195476.	228055.	260634.	293213.	325793.	358372.	390951.	423530.	456110.
12	149865.	179838.	209811.	239784.	269757.	299730.	329703.	359676.	389649.	419622.
13	137876.	165451.	193027.	220602.	248177.	275752.	303328.	330903.	358478.	386053.
14	126844.	152212.	177581.	202950.	228319.	253687.	279056.	304425.	329794.	355162.
15	116700.	140040.	163380.	186720.	210060.	233400.	256740.	280080.	303420.	326760.
16	107363.	128835.	150307.	171780.	193252.	214725.	236197.	257670.	279142.	300615.
17	98775.	118530.	138285.	158040.	177795.	197550.	217305.	237060.	256815.	276570.
18	90870.	109044.	127218.	145392.	163566.	181740.	199914.	218088.	236262.	254436.
19	83603.	100323.	117043.	133764.	150484.	167205.	183925.	200646.	217366.	234087.
20	76912.	92295.	107677.	123060.	138442.	153825.	169207.	184590.	199972.	215355.

* Annual production rates follow a decreasing geometric law of behavior with a ratio of q = 0.92

TABLE 31

ASSUMPTION 2* - EXPECTED FUTURE GROSS REVENUE FOR 150 BCF OF GAS PLACE
(in dollars)

YEAR	TOTAL RECOVERY RATES									
	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70
1	562500.	675000.	787500.	900000.	1012500.	1125000.	1237500.	1350000.	1462500.	1575000.
2	517500.	621000.	724500.	828000.	931500.	1035000.	1138500.	1242000.	1345500.	1449000.
3	476100.	571320.	666540.	761760.	856980.	952200.	1047420.	1142640.	1237860.	1333080.
4	438114.	525737.	613360.	700983.	788606.	876229.	963852.	1051474.	1139097.	1226720.
5	402975.	483570.	564165.	644760.	725355.	805950.	886545.	967140.	1047735.	1128330.
6	370732.	444879.	519025.	593172.	667318.	741465.	815611.	889758.	963904.	1038051.
7	341072.	409286.	477501.	545715.	613929.	682144.	750358.	818572.	886787.	955001.
8	313791.	376549.	439307.	502065.	564823.	627581.	690339.	753097.	815856.	878614.
9	288686.	346423.	404161.	461898.	519635.	577372.	635110.	692847.	750584.	808321.
10	265590.	318708.	371826.	424944.	478062.	531180.	584298.	637416.	690534.	743652.
11	244344.	293213.	342082.	390951.	439820.	488689.	537558.	586426.	635295.	684164.
12	224798.	269757.	314716.	359676.	404635.	449595.	494554.	539514.	584473.	629433.
13	206814.	248177.	289540.	330903.	372266.	413629.	454992.	496354.	537717.	579080.
14	190266.	228319.	266372.	304425.	342478.	380531.	418584.	456637.	494691.	532744.
15	175050.	210060.	245070.	280080.	315090.	350100.	385110.	420120.	455130.	490140.
16	161044.	193253.	225461.	257670.	289879.	322088.	354296.	386505.	418714.	450922.
17	148162.	177795.	207427.	237060.	266692.	296325.	325957.	355590.	385222.	414855.
18	136305.	163566.	190827.	218088.	245349.	272610.	299871.	327132.	354393.	381654.
19	125404.	150484.	175565.	200646.	225727.	250807.	275888.	300969.	326050.	351130.
20	115369.	138442.	161516.	184590.	207664.	230737.	253811.	276885.	299959.	323032.

* Annual production rates follow a decreasing geometric law of behavior with a ratio of q = 0.92

TABLE 32

ASSUMPTION 2* - EXPECTED FUTURE GROSS REVENUE FOR 200 BCF OF GAS PLACE
(in dollars)

YEAR	TOTAL RECOVERY RATES									
	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70
1	750000.	900000.	1050000.	1200000.	1350000.	1500000.	1650000.	1800000.	1950000.	2100000.
2	690000.	828000.	966000.	1104000.	1242000.	1380000.	1518000.	1656000.	1794000.	1932000.
3	634800.	761760.	888720.	1015680.	1142640.	1269600.	1396560.	1523520.	1650480.	1777440.
4	584152.	700983.	817813.	934644.	1051474.	1168305.	1285135.	1401966.	1518796.	1635627.
5	537300.	644760.	752220.	859680.	967140.	1074600.	1182060.	1289520.	1396980.	1504440.
6	494310.	593172.	692034.	790896.	889758.	988620.	1087482.	1186344.	1285206.	1384068.
7	454762.	545715.	636667.	727620.	818572.	909525.	1000477.	1091430.	1182382.	1273335.
8	418387.	502065.	585742.	669420.	753097.	836775.	920452.	1004130.	1087807.	1171485.
9	384915.	461898.	538881.	615864.	692847.	769830.	846813.	923796.	1000779.	1077762.
10	354120.	424944.	495768.	566592.	637416.	708240.	779064.	849888.	920712.	991536.
11	325793.	390951.	456110.	521268.	586426.	651585.	716743.	781902.	847060.	912219.
12	299730.	359676.	419622.	479568.	539514.	599460.	659406.	719352.	779298.	839244.
13	275752.	330903.	386053.	441204.	496354.	551505.	606655.	661806.	716956.	772107.
14	253687.	304425.	355162.	405900.	456637.	507375.	558112.	608850.	659587.	710325.
15	233400.	280080.	326760.	373440.	420120.	466800.	513480.	560160.	606840.	653520.
16	214725.	257670.	300615.	343560.	386505.	429450.	472395.	515340.	558285.	601230.
17	197550.	237060.	276570.	316080.	355590.	395100.	434610.	474120.	513630.	553140.
18	181740.	218088.	254436.	290784.	327132.	363480.	399828.	436176.	472524.	508872.
19	167205.	200646.	234087.	267528.	300969.	334410.	367851.	401292.	434733.	468174.
20	153825.	184590.	215355.	246120.	276885.	307650.	338415.	369180.	399945.	430710.

* Annual production rates follow a decreasing geometric law of behavior with a ratio of $q = 0.92$

TABLES 33 TO 38

EXPECTED ANNUAL FUTURE NET REVENUE

These tables indicate the expected annual future net revenues, in a 20-year period, defined as the difference between gross revenues and operational costs. Operational costs are fixed at $7,200 per year.

TABLE 33
ASSUMPTION 2* - EXPECTED FUTURE NET REVENUE FOR 10 BCF OF GAS IN PLACE
(in dollars)

YEAR	TOTAL RECOVERY RATES									
	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70
1	30300.	37800.	45300.	52800.	60300.	67800.	75300.	82800.	90300.	97800.
2	27300.	34200.	41100.	48000.	54900.	61800.	68700.	75600.	82500.	89400.
3	24540.	30888.	37236.	43584.	49932.	56280.	62628.	68976.	75324.	81672.
4	22008.	27849.	33691.	39532.	45374.	51215.	57057.	62898.	68740.	74581.
5	19665.	25038.	30411.	35784.	41157.	46530.	51903.	57276.	62649.	68022.
6	17515.	22459.	27402.	32345.	37288.	42231.	47174.	52117.	57060.	62003.
7	15538.	20086.	24633.	29181.	33729.	38276.	42824.	47371.	51919.	56467.
8	13719.	17903.	22087.	26271.	30455.	34639.	38823.	43006.	47190.	51374.
9	12046.	15895.	19744.	23593.	27442.	31291.	35141.	38990.	42839.	46688.
10	10506.	14047.	17588.	21130.	24671.	28212.	31753.	35294.	38836.	42377.
11	9090.	12348.	15605.	18863.	22121.	25379.	28637.	31895.	35153.	38411.
12	7786.	10784.	13781.	16778.	19776.	22773.	25770.	28768.	31765.	34762.
13	6588.	9345.	12103.	14860.	17618.	20375.	23133.	25890.	28648.	31405.
14	5484.	8021.	10558.	13095.	15632.	18169.	20706.	23242.	25779.	28316.
15	4470.	6804.	9138.	11472.	13806.	16140.	18474.	20808.	23142.	25476.
16	3536.	5683.	7831.	9978.	12125.	14272.	16420.	18567.	20714.	22861.
17	2677.	4653.	6628.	8604.	10579.	12555.	14530.	16506.	18481.	20457.
18	1887.	3704.	5522.	7339.	9157.	10974.	12791.	14609.	16426.	18244.
19	1160.	2832.	4504.	6176.	7848.	9520.	11193.	12865.	14537.	16209.
20	491.	2029.	3568.	5106.	6644.	8182.	9721.	11259.	12797.	14335.

* Annual production rates follow a decreasing geometric law of behavior with a ratio of $q = 0.92$

TABLE 34

ASSUMPTION 2* - EXPECTED FUTURE NET REVENUE FOR 30 BCF OF GAS IN PLACE
(in dollars)

YEAR	TOTAL RECOVERY RATES									
	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70
1	105300.	127800.	150300.	172800.	195300.	217800.	240300.	262800.	285300.	307800.
2	96300.	117000.	137700.	158400.	179100.	199800.	220500.	241200.	261900.	282600.
3	88020.	107064.	126108.	145152.	164196.	183240.	202284.	221328.	240372.	259416.
4	80423.	97947.	115472.	132997.	150521.	168046.	185570.	203095.	220619.	238144.
5	73395.	89514.	105633.	121752.	137871.	153990.	170109.	186228.	202347.	218466.
6	66946.	81776.	96605.	111434.	126264.	141093.	155922.	170752.	185581.	200410.
7	61014.	74657.	88300.	101943.	115586.	129229.	142872.	156514.	170157.	183800.
8	55558.	68110.	80661.	93213.	105765.	118316.	130868.	143419.	155971.	168523.
9	50537.	62085.	73632.	85180.	96727.	108274.	119822.	131369.	142917.	154464.
10	45918.	56542.	67165.	77789.	88412.	99036.	109660.	120283.	130907.	141530.
11	41669.	51443.	61216.	70990.	80764.	90538.	100312.	110085.	119859.	129633.
12	37759.	46751.	55743.	64735.	73727.	82719.	91711.	100703.	109695.	118687.
13	34163.	42435.	50708.	58981.	67253.	75526.	83798.	92071.	100343.	108616.
14	30853.	38464.	46074.	53685.	61296.	68906.	76517.	84127.	91738.	99349.
15	27810.	34812.	41814.	48816.	55818.	62820.	69822.	76824.	83826.	90828.
16	25009.	31450.	37892.	44334.	50776.	57217.	63659.	70101.	76543.	82984.
17	22432.	28359.	34285.	40212.	46138.	52065.	57991.	63918.	69844.	75771.
18	20061.	25513.	30965.	36418.	41870.	47322.	52774.	58226.	63679.	69131.
19	17881.	22897.	27913.	32929.	37945.	42961.	47978.	52994.	58010.	63026.
20	15874.	20488.	25103.	29718.	34333.	38947.	43562.	48177.	52792.	57406.

* Annual production rates follow a decreasing geometric law of behavior with a ratio of q = 0.92

TABLE 35

ASSUMPTION 2* - EXPECTED FUTURE NET REVENUE FOR 50 BCF OF GAS IN PLACE
(in dollars)

YEAR	TOTAL RECOVERY RATES									
	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70
1	180300.	217800.	255300.	292800.	330300.	367800.	405300.	442800.	480300.	517800.
2	165300.	199800.	234300.	268800.	303300.	337800.	372300.	406800.	441300.	475800.
3	151500.	183240.	214980.	246720.	278460.	310200.	341940.	373680.	405420.	437160.
4	138838.	168046.	197253.	226461.	255669.	284876.	314084.	343291.	372499.	401707.
5	127125.	153990.	180855.	207720.	234585.	261450.	288315.	315180.	342045.	368910.
6	116377.	141093.	165808.	190524.	215239.	239955.	264670.	289386.	314101.	338817.
7	106491.	129229.	151967.	174705.	197443.	220181.	242919.	265657.	288396.	311134.
8	97397.	118316.	139236.	160155.	181074.	201994.	222913.	243832.	264752.	285671.
9	89029.	108274.	127520.	146766.	166012.	185257.	204503.	223749.	242995.	262240.
10	81330.	99036.	116742.	134448.	152154.	169860.	187566.	205272.	222978.	240684.
11	74248.	90538.	106827.	123117.	139407.	155696.	171986.	188276.	204565.	220855.
12	67732.	82719.	97705.	112692.	127678.	142665.	157651.	172638.	187624.	202611.
13	61738.	75526.	89313.	103101.	116889.	130676.	144464.	158251.	172039.	185827.
14	56222.	68906.	81591.	94275.	106959.	119644.	132328.	145012.	157697.	170381.
15	51150.	62820.	74490.	86160.	97830.	109500.	121170.	132840.	144510.	156180.
16	46481.	57218.	67954.	78690.	89426.	100163.	110899.	121635.	132371.	143107.
17	42188.	52065.	61942.	71820.	81697.	91575.	101452.	111330.	121207.	131085.
18	38235.	47322.	56409.	65496.	74583.	83670.	92757.	101844.	110931.	120018.
19	34601.	42961.	51322.	59682.	68042.	76403.	84763.	93123.	101483.	109843.
20	31256.	38947.	46639.	54330.	62021.	69712.	77404.	85095.	92786.	100477.

* Annual production rates follow a decreasing geometric law of behavior with a ratio of $q = 0.92$

TABLE 36

ASSUMPTION 2* - EXPECTED FUTURE NET REVENUE FOR 100 BCF OF GAS IN PLACE
(in dollars)

YEAR	TOTAL RECOVERY RATES									
	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70
1	367800.	442800.	517800.	592800.	667800.	742800.	817800.	892800.	967800.	1042800.
2	337800.	406800.	475800.	544800.	613800.	682800.	751800.	820800.	889800.	958800.
3	310200.	373680.	437160.	500640.	564120.	627600.	691080.	754560.	818040.	881520.
4	284876.	343291.	401707.	460122.	518537.	576952.	635368.	693783.	752198.	810613.
5	261450.	315180.	368910.	422640.	476370.	530100.	583830.	637560.	691290.	745020.
6	239955.	289386.	338817.	388248.	437679.	487110.	536541.	585972.	635403.	684834.
7	220181.	265657.	311134.	356610.	402086.	447562.	493039.	538515.	583991.	629467.
8	201994.	243832.	285671.	327510.	369349.	411187.	453026.	494865.	536704.	578542.
9	185257.	223749.	262240.	300732.	339223.	377715.	416206.	454698.	493189.	531681.
10	169860.	205272.	240684.	276096.	311508.	346920.	382332.	417744.	453156.	488568.
11	155696.	188276.	220855.	253434.	286013.	318593.	351172.	383751.	416330.	448910.
12	142665.	172638.	202611.	232584.	262557.	292530.	322503.	352476.	382449.	412422.
13	130676.	158251.	185827.	213402.	240977.	268552.	296128.	323703.	351278.	378853.
14	119644.	145012.	170381.	195750.	221119.	246487.	271856.	297225.	322594.	347962.
15	109500.	132840.	156180.	179520.	202860.	226200.	249540.	272880.	296220.	319560.
16	100163.	121635.	143107.	164580.	186052.	207525.	228997.	250470.	271942.	293415.
17	91575.	111330.	131085.	150840.	170595.	190350.	210105.	229860.	249615.	269370.
18	83670.	101844.	120018.	138192.	156366.	174540.	192714.	210888.	229062.	247236.
19	76403.	93123.	109843.	126564.	143284.	160005.	176725.	193446.	210166.	226887.
20	69712.	85095.	100477.	115860.	131242.	146625.	162007.	177390.	192772.	208155.

* Annual production rates follow a decreasing geometric law of behavior with a ratio of $q = 0.92$

TABLE 37

ASSUMPTION 2* - EXPECTED FUTURE NET REVENUE FOR 150 BCF OF GAS IN PLACE
(in dollars)

YEAR	TOTAL RECOVERY RATES									
	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70
1	555300.	667800.	780300.	892800.	1005300.	1117800.	1230300.	1342800.	1455300.	1567800.
2	510300.	613800.	717300.	820800.	924300.	1027800.	1131300.	1234800.	1338300.	1441800.
3	468900.	564120.	659340.	754560.	849780.	945000.	1040220.	1135440.	1230660.	1325880.
4	430914.	518537.	606160.	693783.	781406.	869029.	956652.	1044274.	1131897.	1219520.
5	395775.	476370.	556965.	637560.	718155.	798750.	879345.	959940.	1040535.	1121130.
6	363532.	437679.	511825.	585972.	660118.	734265.	808411.	882558.	956704.	1030851.
7	333872.	402086.	470301.	538515.	606729.	674944.	743158.	811372.	879587.	947801.
8	306591.	369349.	432107.	494865.	557623.	620381.	683139.	745897.	808656.	871414.
9	281486.	339223.	396961.	454698.	512435.	570172.	627910.	685647.	743384.	801121.
10	258390.	311508.	364626.	417744.	470862.	523980.	577098.	630216.	683334.	736452.
11	237144.	286013.	334882.	383751.	432620.	481489.	530358.	579226.	628095.	676964.
12	217598.	262557.	307516.	352476.	397435.	442395.	487354.	532314.	577273.	622233.
13	199614.	240977.	282340.	323703.	365066.	406429.	447792.	489154.	530517.	571880.
14	183066.	221119.	259172.	297225.	335278.	373331.	411384.	449437.	487491.	525544.
15	167850.	202860.	237870.	272880.	307890.	342900.	377910.	412920.	447930.	482940.
16	153844.	186053.	218261.	250470.	282679.	314888.	347096.	379305.	411514.	443722.
17	140962.	170595.	200227.	229860.	259492.	289125.	318757.	348390.	378022.	407655.
18	129105.	156366.	183627.	210888.	238149.	265410.	292671.	319932.	347193.	374454.
19	118204.	143284.	168365.	193446.	218527.	243607.	268688.	293769.	318850.	343930.
20	108169.	131242.	154316.	177390.	200464.	223537.	246611.	269685.	292759.	315832.

* Annual production rates follow a decreasing geometric law of behavior with a ratio of q = 0.92

TABLE 38

ASSUMPTION 2* - EXPECTED FUTURE NET REVENUE FOR 200 BCF OF GAS IN PLACE
(in dollars)

YEAR	TOTAL RECOVERY RATES									
	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70
1	742800.	892800.	1042800.	1192800.	1342800.	1492800.	1642800.	1792800.	1942800.	2092800.
2	682800.	820800.	958800.	1096800.	1234800.	1372800.	1510800.	1648800.	1786800.	1924800.
3	627600.	754560.	881520.	1008480.	1135440.	1262400.	1389360.	1516320.	1643280.	1770240.
4	576952.	693783.	810613.	927444.	1044274.	1161105.	1277935.	1394766.	1511596.	1628427.
5	530100.	637560.	745020.	852480.	959940.	1067400.	1174860.	1282320.	1389780.	1497240.
6	487110.	585972.	684834.	783696.	882558.	981420.	1080282.	1179144.	1278006.	1376868.
7	447562.	538515.	629467.	720420.	811372.	902325.	993277.	1084230.	1175182.	1266135.
8	411187.	494865.	578542.	662220.	745897.	829575.	913252.	996930.	1080607.	1164285.
9	377715.	454698.	531681.	608664.	685647.	762630.	839613.	916596.	993579.	1070562.
10	346920.	417744.	488568.	559392.	630216.	701040.	771864.	842688.	913512.	984336.
11	318593.	383751.	448910.	514068.	579226.	644385.	709543.	774702.	839860.	905019.
12	292530.	352476.	412422.	472368.	532314.	592260.	652206.	712152.	772098.	832044.
13	268552.	323703.	378853.	434004.	489154.	544305.	599455.	654606.	709756.	764907.
14	246487.	297225.	347962.	398700.	449437.	500175.	550912.	601650.	652387.	703125.
15	226200.	272880.	319560.	366240.	412920.	459600.	506280.	552960.	599640.	646320.
16	207525.	250470.	293415.	336360.	379305.	422250.	465195.	508140.	551085.	594030.
17	190350.	229860.	269370.	308880.	348390.	387900.	427410.	466920.	506430.	545940.
18	174540.	210888.	247236.	283584.	319932.	356280.	392628.	428976.	465324.	501672.
19	160005.	193446.	226887.	260328.	293769.	327210.	360651.	394092.	427533.	460974.
20	146625.	177390.	208155.	238920.	269685.	300450.	331215.	361980.	392745.	423510.

* Annual production rates follow a decreasing geometric law of behavior with a ratio of $q = 0.92$

TABLES 39 AND 40

PRESENT VALUE OF EXPECTED FUTURE NET REVENUE

These tables indicate the discounted present value of the total future net revenues, obtained from Tables 33 to 38 for the following rates: 6%, 8%, 10%, 12%, 14%, 16%. 18%, 20%, 22% and 24%.

TABLE 39

ASSUMPTION 2* PRESENT VALUES OF EXPECTED FUTURE NET REVENUES

(IN DOLLARS)

RATE OF RETURN	GAS IN PLACE (IN BCF)	TOTAL RECOVERY RATES									
		0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70
0.06	10	-12758.	37661.	88081.	138500.	188920.	239339.	289759.	340178.	390598.	441017.
0.06	30	491437.	642695.	793954.	945213.	1096471.	1247730.	1398988.	1550247.	1701506.	1852764.
0.06	50	995632.	1247730.	1499828.	1751925.	2004023.	2256120.	2508218.	2760316.	3012413.	3264511.
0.06	100	2256120.	2760316.	3264511.	3768706.	4272902.	4777097.	5281292.	5785488.	6289683.	6793878.
0.06	150	3516609.	4272902.	5029195.	5785488.	6541781.	7298074.	8054367.	8810660.	9566953.	10323245.
0.06	200	4777097.	5785488.	6793878.	7802269.	8810660.	9819050.	10827441.	11835831.	12844222.	13852613.
0.08	10	-104599.	-59622.	-14645.	30333.	75310.	120287.	165264.	210242.	255219.	300196.
0.08	30	345174.	480106.	615038.	749970.	884902.	1019834.	1154766.	1289698.	1424629.	1559561.
0.08	50	794947.	1019834.	1244720.	1469607.	1694493.	1919380.	2144267.	2369153.	2594040.	2818926.
0.08	100	1919380.	2369153.	2818926.	3268700.	3718473.	4168246.	4618019.	5067793.	5517566.	5967339.
0.08	150	3043813.	3718473.	4393133.	5067793.	5742452.	6417112.	7091772.	7766432.	8441092.	9115751.
0.08	200	4168246.	5067793.	5967339.	6866885.	7766432.	8665978.	9565525.	10465071.	11364618.	12264164.
0.10	10	-209890.	-169392.	-128894.	-88396.	-47898.	-7400.	33098.	73596.	114094.	154592.
0.10	30	195090.	316584.	438078.	559572.	681066.	802560.	924054.	1045548.	1167042.	1288536.
0.10	50	600070.	802560.	1005050.	1207540.	1410030.	1612520.	1815010.	2017500.	2219990.	2422480.
0.10	100	1612520.	2017500.	2422480.	2827460.	3232440.	3637420.	4042400.	4447380.	4852360.	5257340.
0.10	150	2624970.	3232440.	3839910.	4447380.	5054850.	5662320.	6269790.	6877260.	7484730.	8092200.
0.10	200	3637420.	4447380.	5257340.	6067300.	6877260.	7687220.	8497180.	9307140.	10117100.	10927060.
0.12	10	-334945.	-298179.	-261412.	-224646.	-187879.	-151113.	-114346.	-77580.	-40814.	-4047.
0.12	30	32719.	143019.	253318.	363618.	473917.	584216.	694516.	804815.	915114.	1025414.
0.12	50	400384.	584216.	768049.	951881.	1135713.	1319545.	1503378.	1687210.	1871042.	2054874.
0.12	100	1319545.	1687210.	2054874.	2422539.	2790204.	3157868.	3525533.	3893197.	4260862.	4628526.
0.12	150	2238707.	2790204.	3341700.	3893197.	4444694.	4996191.	5547688.	6099185.	6650681.	7202178.
0.12	200	3157868.	3893197.	4628526.	5363855.	6099185.	6834514.	7569843.	8305172.	9040501.	9775830.
0.14	10	-487265.	-453642.	-420019.	-386396.	-352774.	-319151.	-285528.	-251905.	-218282.	-184659.
0.14	30	-151036.	-50168.	50701.	151569.	252438.	353306.	454175.	555044.	655912.	756781.
0.14	50	185192.	353306.	521421.	689535.	857649.	1025764.	1193878.	1361992.	1530106.	1698221.
0.14	100	1025764.	1361992.	1698221.	2034449.	2370678.	2706906.	3043135.	3379363.	3715592.	4051820.
0.14	150	1866335.	2370678.	2875020.	3379363.	3883706.	4388049.	4892392.	5396735.	5901077.	6405420.
0.14	200	2706906.	3379363.	4051820.	4724278.	5396735.	6069192.	6741649.	7414106.	8086563.	8759020.

* Annual production rates follow a decreasing geometric law of behavior with a ratio q = 0.92

TABLE 40
ASSUMPTION 2* - PRESENT VALUES OF EXPECTED FUTURE NET REVENUES
(IN DOLLARS)

RATE OF RETURN	GAS IN PLACE (IN BCF)	TOTAL RECOVERY RATES									
		0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70
0.16	10	-675999.	-645052.	-614105.	-583158.	-552211.	-521264.	-490317.	-459370.	-428423.	-397476.
0.16	30	-366529.	-273688.	-180847.	-88006.	4835.	97676.	190517.	283358.	376199.	469040.
0.16	50	-57059.	97676.	252411.	407146.	561881.	716616.	871351.	1026086.	1180821.	1335556.
0.16	100	716616.	1026086.	1335556.	1645026.	1954496.	2263966.	2573436.	2882906.	3192376.	3501846.
0.16	150	1490291.	1954496.	2418701.	2882906.	3347111.	3811316.	4275521.	4739726.	5203931.	5668135.
0.16	200	2263966.	2882906.	3501846.	4120786.	4739726.	5358665.	5977605.	6596545.	7215485.	7834425.
0.18	10	-912484.	-883836.	-855189.	-826542.	-797894.	-769247.	-740599.	-711952.	-683304.	-654657.
0.18	30	-626009.	-540067.	-454125.	-368182.	-282240.	-196298.	-110355.	-24413.	61529.	147472.
0.18	50	-339535.	-196298.	-53060.	90177.	233414.	376651.	519889.	663126.	806363.	949600.
0.18	100	376651.	663126.	949600.	1236075.	1522549.	1809024.	2095499.	2381973.	2668448.	2954922.
0.18	150	1092838.	1522549.	1952261.	2381973.	2811685.	3241397.	3671108.	4100820.	4530532.	4960244.
0.18	200	1809024.	2381973.	2954922.	3527871.	4100820.	4673769.	5246718.	5819667.	6392616.	6965565.
0.20	10	-1210884.	-1184230.	-1157576.	-1130922.	-1104268.	-1077614.	-1050961.	-1024307.	-997653.	-970999.
0.20	30	-944345.	-864383.	-784422.	-704460.	-624499.	-544537.	-464575.	-384614.	-304652.	-224690.
0.20	50	-677806.	-544537.	-411267.	-277998.	-144729.	-11459.	121810.	255080.	388349.	521618.
0.20	100	-11459.	255080.	521618.	788157.	1054696.	1321235.	1587773.	1854312.	2120851.	2387390.
0.20	150	654888.	1054696.	1454504.	1854312.	2254120.	2653929.	3053737.	3453545.	3853353.	4253161.
0.20	200	1321235.	1854312.	2387390.	2920467.	3453545.	3986623.	4519700.	5052778.	5585855.	6118933.
0.22	10	-1588965.	-1564053.	-1539141.	-1514230.	-1489318.	-1464407.	-1439495.	-1414583.	-1389672.	-1364760.
0.22	30	-1339849.	-1265114.	-1190379.	-1115644.	-1040910.	-966175.	-891440.	-816705.	-741970.	-667236.
0.22	50	-1090733.	-966175.	-841617.	-717059.	-592501.	-467943.	-343385.	-218827.	-94269.	30289.
0.22	100	-467943.	-218827.	30289.	279405.	528521.	777637.	1026752.	1275868.	1524984.	1774100.
0.22	150	154847.	528521.	902195.	1275868.	1649542.	2023216.	2396890.	2770564.	3144238.	3517912.
0.22	200	777637.	1275868.	1774100.	2272332.	2770564.	3268796.	3767027.	4265259.	4763491.	5261723.
0.24	10	-2069036.	-2045658.	-2022281.	-1998903.	-1975525.	-1952148.	-1928770.	-1905393.	-1882015.	-1858637.
0.24	30	-1835260.	-1765127.	-1694994.	-1624861.	-1554728.	-1484595.	-1414462.	-1344329.	-1274197.	-1204064.
0.24	50	-1601483.	-1484595.	-1367707.	-1250819.	-1133931.	-1017043.	-900155.	-783266.	-666378.	-549490.
0.24	100	-1017043.	-783266.	-549490.	-315714.	-81938.	151839.	385615.	619391.	853167.	1086944.
0.24	150	-432602.	-81938.	268727.	619391.	970056.	1320720.	1671384.	2022049.	2372713.	2723378.
0.24	200	151839.	619391.	1086944.	1554496.	2022049.	2489601.	2957154.	3424706.	3892259.	4359811.

* Annual production rates follow a decreasing geometric law of behavior with a ratio q= 0.92