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Accounting for Geological and Geophysical Costs

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of Women Accountants, Tulsa — June 1957*

In order that we may intelligently approach the subject of accounting for geological and geophysical costs, let us first define what is meant by the term "geological and geophysical."

In the final analysis, oil is where you find it, and the drilling of a well is the only method by which to prove whether or not oil or gas occur beneath any given portion of the earth's surface. Yet, scientists in the ninety-eight years since the drilling of the Drake well have devised a variety of methods by which to predict the probable occurrence or non-occurrence of oil or gas and thereby reduce the great financial risks attendant upon the drilling of wells. Among these methods are the following:

1. Geological methods

- (1) Location of surface oil or gas seeps — the original method for the discovery of oil.
- (2) Surface geology — the location through the study of surface outcroppings of rock formations or stratigraphic features which are favorable to the occurrence of oil or gas.
- (3) Sub-surface geology — the study of oil-bearing strata as revealed in existing wells with a view to predicting the occurrence of the same formations and favorable geologic structures in other areas, through the correlation of the record of the rocks as it is revealed in the sedimentary beds laid down in the long course of earth history.
- (4) Core drilling — the drilling of relatively shallow wells of small diameter for the purposes of obtaining core samples of the rock strata occurring beneath the surface in an area where wells have not been drilled and of obtaining information as to the structure of the sub-surface rocks.

2. Geophysical methods

- (1) Magnetic survey — the use of a magnetometer to measure variations in the intensity of the earth's magnetic field in an area and, on the basis of these measurements, to map sub-surface structures resulting from the intrusion of igneous rocks which contain magnetic ferrous materials.

- (2) Gravity method – the use of a gravimeter to measure variations in the relative force of gravity in an area and to map sub-surface features such as salt domes which have less density and, therefore, less gravitational force than do the surrounding rocks.
- (3) Seismic method – the use of a seismograph to measure variations in the time required for an earth tremor induced by a shot-hole explosion to reach the formation to be mapped and to return to the surface, which measurements are used to produce a sub-surface contour map which will indicate structures favorable to the occurrence of oil or gas.

The foregoing list of geological and geophysical methods is by no means complete. It is my impression, moreover, that the principal methods of exploration in use at the present time are based on sub-surface geology and seismic surveys.

HISTORY OF GEOLOGICAL AND GEOPHYSICAL COSTS UNDER FEDERAL INCOME TAX LAWS

Developments under the federal income tax law have had a marked influence on accounting practices with respect to geological and geophysical costs. Accordingly, it seems appropriate to briefly trace the history of these developments up to the present time.

From 1913 until 1941 the Treasury Department appears to have accepted the position taken by oil companies generally that geological and geophysical costs were ordinary and necessary business expenses deductible in the taxable year in which paid or incurred. In June 1941, however, it issued G.C.M. 22689 (1941-1 Cumulative Bulletin 225) which recognized that these costs were expenses but that they were to be considered as direct or indirect expenses in computing net income from the property for percentage depletion purposes. In October 1941 this ruling was superseded by G.C.M. 22956 (1941-2 Cumulative Bulletin 103) which recognized that geological and geophysical costs could be allocated among all properties, producing and non-producing, and that only costs allocable to producing properties would enter into the percentage depletion limitation.

FIELD PROCEDURE MEMORANDUM NUMBER 241

These rulings were a prelude to the Treasury Department's first effort to establish that geological and geophysical costs are capital expenditures, which came in the year 1942 with the issuance of Field Procedure Memo-

randum Number 241 (unpublished). This memorandum laid down four general principles with respect to the capitalization or expensing of geological and geophysical costs:

1. Amounts expended in the evaluation of unleased acreage which result in the acquisition of leases must be capitalized.
2. Amounts expended in the evaluation of existing leases which result in the retention of leases must be capitalized.
3. Amounts expended for work which does not result in the acquisition or retention of leases are to be expensed.
4. Amounts expended to pinpoint a well location or to aid in supervising the drilling of a well are to be classed as intangible drilling and development costs and capitalized or expensed in accordance with the taxpayer's election.

The foregoing principles, which require the capitalization of geological and geophysical costs applicable to acreage acquired or retained and which permit the recovery of such costs only through depletion or upon the surrender or other disposition of the acreage, remain valid today. Most of our problems relate to the method of determining the costs allocable to acreage acquired or retained.

In the 1940's a method which is known as the "shot-point" method came into general use. Under this method the shot points on a seismic map were counted and the total number of shot points was divided into the total cost of the survey to arrive at an average cost per shot-point. The number of points lying on a tract acquired or retained were multiplied by this cost per shot-point to determine the amount to be capitalized. As a general rule, the shot-point method resulted in the expensing of a substantial portion of the cost of surveys, except where there was a heavy concentration of the shot points on the acquired or retained acreage.

TAX COURT DECISIONS

During the 1940's two cases decided by the Board of Tax Appeals or Tax Court, strengthened the Treasury position. In the year 1941 in the case of Schermerhorn Oil Corporation (46 B.T.A. 151) a geologist was given a contractual right to 10 per cent of the net profits after the payout of any properties acquired on the basis of his recommendations. The Board held that the payments to the geologist were expenditures made in connection with the acquisition or preservation of a capital asset and that they were capital in nature. Later, in the year 1946 the Tax Court ruled in the case of The Louisiana Land and Exploration Company (7 T.C. 507) that amounts expended for a geophysical survey of certain leases owned by the

taxpayer to determine if sub-surface structures were favorable to the occurrence of oil or gas were to be capitalized because the expenditure resulted in the retention of a capital asset.

I.T. 4006

In the year 1951 the Treasury Department issued I.T. 4006 (1950-1 Cumulative Bulletin 48), which is the leading pronouncement on the subject of geological and geophysical costs and which goes beyond Field Procedure Memorandum Number 241 in defining the method by which the amount of geological and geophysical costs applicable to acreage acquired or retained is to be determined. The contents of this ruling may be summarized as follows:

1. If an oil or gas property is acquired or retained on the basis of data obtained from geological or geophysical exploration, the costs attributable to the property should be capitalized as a part of the cost thereof.
2. In exploration a distinction is to be drawn between three areas of exploration:
 - (1) The program area — the general geographical region in which exploration is to be conducted;
 - (2) The project area — the area which can be explored advantageously as a single integrated operation, which area is ordinarily covered by a reconnaissance-type survey;
 - (3) The area of interest — each separable non-contiguous portion of the project area which the reconnaissance-type survey indicates is sufficiently favorable in its prospects to justify further exploration through a detail survey.
3. The apportionment of geological and geophysical costs is to be made as follows:
 - (1) If the reconnaissance-type survey of the project area leads to the discovery of no areas of interest, the cost of such survey is to be deducted as a loss.
 - (2) If the reconnaissance-type survey leads to the discovery of one or more areas of interest, the cost of such survey is to be divided equally among the areas of interest located as the result thereof.
 - (3) If the detail survey of an area of interest does not lead to the acquisition or retention of properties, the cost of the detail survey plus the cost of the reconnaissance-type survey allocable to the area of interest are to be deducted as a loss.

- (4) If the detail survey of an area of interest leads to the acquisition or retention of properties, the cost of the detail survey plus the cost of the reconnaissance-type survey allocable to the area of interest are to be capitalized and allocated among the properties so acquired or retained.

SPECIFIC PROBLEMS

With this historical background and statement of general principles in mind, let us now consider some of the specific problems which arise in the application of I.T. 4006. The views expressed on these problems are based on my personal experience and not upon any rulings or cases relating to the subject.

WHAT COSTS ARE INCLUDED IN GEOLOGICAL AND GEOPHYSICAL COSTS?

Costs incurred in the conduct of geological and geophysical work may logically be divided into three classes:

1. Payments to independent contractors for surveys or for geological and geophysical data.
2. Cost of surveys conducted by company employees and with company equipment.
3. Salaries, supplies, and expenses of company-operated geological department.

In my own experience, Internal Revenue Service personnel have concerned themselves only with classes 1 and 2, that is, with the cost of field surveys and have not attempted to add overhead to such costs or to capitalize any portion of expenses incurred in the operation of a geological department.

WHAT IS THE PROJECT AREA?

When I.T. 4006 was promulgated there was widespread feeling among tax practitioners that it would result in the capitalization of most geological and geophysical costs. This feeling was based on the requirement that if a reconnaissance-type survey resulted in the location of even one area of interest, all costs of the reconnaissance-type survey were to be capitalized, so that if a project covered a whole county and only one area of interest were found, the entire cost would be capitalized. In my experience, such a result has not materialized, and this may be attributed to a somewhat different definition of the project area than was visualized at that time.

According to I.T. 4006, the project area is the territory which "can be explored advantageously as a single integrated operation." In planning his exploration the operator considers such factors as the size and topography

of the program area, the existing information with respect to the region, and the quantity of equipment, men, and money available for the project. In general, operators, considering these factors, have restricted surveys of the reconnaissance type to relatively small geographical areas. As a result, a reconnaissance-type survey may result in the location of no areas of interest and the entire cost thereof will be expensed; and, if a survey results in the location of an area of interest, only the costs applicable to a relatively small area are capitalized. It should be recognized also that the phrase "single integrated operation" implies that the project area is not only a contiguous geographical area but has time dimensions as well, which serves to limit the costs applicable to a single project to the cost of work performed in a relatively short period of time.

In some instances, reconnaissance-type surveys are dispensed with altogether and the area of interest is selected on the basis of existing sub-surface geological information which indicates that an area is deserving of a detailed survey.

WHAT IS AN AREA OF INTEREST?

I.T. 4006 defines an area of interest as each "separable, non-contiguous portion of the project area, identified by the reconnaissance-type survey as possessing sufficient mineral-producing potential to merit further exploration."

In my experience, the term "area of interest" is not a land tract of any predetermined size. Rather, it corresponds generally to the outlines of the anomaly, or structural feature, being surveyed. This is rather difficult to express in words, but it is a reasonably simple process if one inspects the sub-surface contour map resulting from the survey. The concentric circles of sub-surface contours (looking much like hills on an ordinary topographic map) mark the structural features and serve to divide any given map into its areas of interest, their geographical size depending on the structural characteristics of the region.

WHAT RECORDS SHOULD BE KEPT WITH RESPECT TO GEOLOGICAL AND GEOPHYSICAL COSTS?

If the books are to be kept on the basis prescribed in I.T. 4006 for federal income tax purposes, the taxpayer should create an account entitled "Geological and Geophysical Exploration in Process," or some similar title. To this account are to be charged all direct costs of exploratory work.

A subledger or sub-analysis should be maintained supporting this

account. A sub-account is required for each project area which management undertakes to survey and for each prospect or area of interest which is found. Because seismograph parties often work on a monthly basis, it is frequently necessary to allocate costs to project areas or to areas of interest based on the number of days worked or the number of shot holes detonated during the period as shown by the reports of the party chief. The names or numbers assigned to projects or areas of interest will correspond to those used on the maps and reports of the survey party. When each reconnaissance-type survey is completed, the costs accumulated thereon are divided and transferred to the areas of interest discovered as the result of such work.

The clearance of the accumulated costs from "Geological and Geophysical Exploration in Progress" must await the completion of the survey. Therefore, if at the year-end the survey is incomplete, the costs are carried over into the succeeding year. If the survey is completed and the results, either on the reconnaissance-type or detailed survey, are negative, the related costs should be cleared to expense. In my judgment, this is the case even if the taxpayer should own some acreage in the area. I.T. 4006 requires that "if property is acquired or retained on the basis of data obtained from exploration, costs of exploration attributable to that property should be capitalized as part of the cost of such property." If the results of exploration indicate that conditions are unfavorable to the occurrence of oil or gas, it could hardly be maintained that acreage owned in the area was acquired or retained on the basis of exploration work.

If, however, the results of the survey are favorable it is recognized that the exploration costs must be capitalized, and an allocation of such costs to the leases in the area of interest must be made at the time the accumulated costs are cleared from "Geological and Geophysical Exploration in Process." There may be an exception to this general rule if during the taxable year a dry hole is drilled on the prospect, thereby indicating that the exploratory work was of no value.

If exploratory costs are to be capitalized, I.T. 4006 specifies that the allocation to individual leases shall be made on an acreage basis. Although it is not mentioned in the ruling, it would appear reasonable in cases where less than the full working interest is acquired to allocate such costs on the basis of net acres rather than gross acres involved.

It should be observed that the clearance of the accumulated cost on an area of interest from "Geological and Geophysical Exploration in Process" to "Undeveloped Leasehold Cost" must await the completion of the leasing program resulting from such work. As a result, it may be necessary to carry the accumulated costs forward into the succeeding year when the

leasing program is completed, at which time the above-described allocation can be made.

WHAT DISPOSITION SHOULD BE MADE OF
PAYMENTS FOR SHOOTING RIGHTS?

Closely related to the problem of accounting for geological and geophysical costs is the matter of accounting for payments to landowners for the privilege of exploring an area which is not under an oil and gas lease.

If the payments to the landowner are only for exploration privileges and damages to the property and are not in part consideration for an option to acquire leases, they are treated like any other type of geological and geophysical cost.

If the contract with the landowner grants the taxpayer an option to lease all or part of the area surveyed, the payments are in the nature of an element of lease acquisition cost and are to be included in the cost of the leases acquired, or charged off upon expiration of the option period if none are acquired.

ACCOUNTING FOR GEOLOGICAL AND GEOPHYSICAL COSTS
FOR PURPOSES OF FINANCIAL REPORTING

The foregoing discussion has related solely to the federal income tax accounting for geological and geophysical costs. One may reasonably ask: Are these same practices generally followed for purposes of financial reporting?

Some light on the answer to this question is to be found in a survey of sixty-one oil producers which was made a few years ago by a graduate student at the University of Texas. This survey showed the following results:

Payments to outside exploration companies for geophysical work

Capitalize cost of work leading to reserves	38
Expense all exploration costs	22
Have conducted no exploration	1

Cost of exploration by own personnel

Capitalize cost of work leading to reserves	14
Expense all costs of own staff	44
Have no such exploration	3

Payments to outside exploration companies for work on existing leases that show favorable indications

Capitalize full cost	36
Expense full cost	24
Have conducted no such work	1

It appears from the preceding summary that a majority of the companies surveyed are seeking to follow the principles of I.T. 4006 in keeping their books. In my opinion, this is a reasonable course of action for the reason that it recognizes the fact that geological and geophysical costs are in the nature of capital expenditures, if related to properties acquired or retained. Also, because such a practice places the books and the tax returns on the same basis in this respect.

Among those companies who expense all exploration costs, I suspect one would find two classes:

1. Those who have consistently done so and because of its simplicity do not desire to change their practice.
2. Those who desire to await the outcome of the Revenue Agent's examination and capitalize no more costs than his findings require.

If a survey were conducted at the present time, it is my opinion that it would show a somewhat larger percentage of companies following the principles of I.T. 4006 for the reason that the industry now has several more years of experience with the ruling and is less fearful of the practical difficulties involved in its application.