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A review of practices in leasing Outer Continental Shelf (OCS) lands for oil and gas development concentrated on tract selection and methods for estimating revenues. The Department of the Interior has leased a total of about 12.5 million acres in 21 years through competitive offerings, with resulting revenues to the Federal Government of nearly \$16 billion. Findings/Conclusions: After the oil embargo, accelerated leasing led to speculation and jeopardized the Government's role in protecting the public interest. For OCS Sale #35, tracts were selected for leasing without adequately assessing their resource potential. Prelease tract evaluations were made using inadequate data. Revenues to be received were overestimated because of inadequate information and overoptimistic estimates. Recommendations: The Secretary of the Interior should: (1) direct a geological program to appraise OCS oil and gas resources; (2) encourage industry to share information on explorations with the Department; and (3) offer for lease only areas analyzed through sufficient information. Congress should act favorably on proposed legislation providing for a leasing program to meet national goals and assure receipt of fair market value for oil and gas. (HTW)

# REPORT TO THE CONGRESS

BY THE COMPTROLLER GENERAL  
OF THE UNITED STATES

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## Outer Continental Shelf Sale #35--Problems Selecting And Evaluating Land To Lease

### Department of the Interior

Outer Continental Shelf oil and gas tracts were selected for leasing by the Interior Department without obtaining adequate information to determine their potential resources. This, coupled with pressure to lease a predetermined number of acres resulted in:

- selecting tracts which the Department believed had little potential for development,
- deriving unreliable tract values based on inadequate data, and
- overestimating revenues for budget purposes by 5 times the actual revenues received, because of inadequate information and overly optimistic estimates.

GAO recommends that the Department direct an exploration program to develop and implement a plan for appraising Outer Continental Shelf oil and gas resources. GAO believes pending legislation would alleviate problems discussed in this report.



COMPTROLLER GENERAL OF THE UNITED STATES  
WASHINGTON, D.C. 20548

IN REPLY  
REFER TO:

B-118678

To the President of the Senate and the  
Speaker of the House of Representatives

This report describes how the United States leases Outer Continental Shelf lands for the domestic development of oil and natural gas resources and suggests ways to improve this Federal program.

This review was initiated at the requests of Senator Alan Cranston and former Senator John Tunney and under the authority of the Budget and Accounting Act, 1921 (31 U.S.C. 53), and the Accounting and Auditing Act of 1950 (31 U.S.C. 67).

We are sending copies of this report to the the Director, Office of Management and Budget; the Secretary of the Interior; Senator Cranston; former Senator Tunney; and the House and Senate committees and subcommittees having oversight responsibilities for the matters discussed in this report.

Sincerely yours,

  
ACTING Comptroller General  
of the United States

COMPTROLLER GENERAL'S  
REPORT TO THE CONGRESS

OUTER CONTINENTAL SHELF  
SALE #35--PROBLEMS SELECTING  
AND EVALUATING LAND TO LEASE  
Department of the Interior

D I G E S T

More and more the Nation is relying on the Outer Continental Shelf leasing program for increasing our domestic oil and gas production to meet our near term energy needs. Decisions on where to lease and at what rate will greatly affect whether we attain our goal of decreasing our reliance on foreign energy supplies.

The Department's policy of leasing the maximum resource in minimum time could adversely affect our domestic energy production. This policy encourages speculation in the Outer Continental Shelf lands and can tie-up industry capital in lands with no or minimal resources and infringe on the public's right to receive fair market value for the resources. The Department of the Interior offered 231 oil and gas tracts for lease (about 1.3 million acres) on the Outer Continental Shelf off southern California on December 11, 1975. The tracts were offered to the highest industry bidders, who are required to develop the tracts for oil and gas.

Actual tracts leased fell far short of the Department's presale estimates that two-thirds would be leased for about \$2.3 billion. (Only 24 percent of the tracts were leased and for \$417 million.) Interior leased the tracts without reliable knowledge of the resources they contained, which compounded problems, as the report shows.

The report examines (1) the tract selection and prelease evaluation procedures and (2) how various estimates of revenue were derived.

## ADEQUACY OF TRACT SELECTION

The Department selected tracts for lease after reviewing only minimal and inadequate data and before assessing the true resource development potential of the land. (See pp. 20 and 24.)

The Department's presale value indicated that 195 (84.4 percent) of the tracts offered for lease contained either no resources or insufficient resources to make a profit. (See p. 24.) The tracts offered for lease included

--128 (55.4 percent) in water too deep for production, based on present technology, (See p. 22.) and

--50 (21.6 percent) selected solely for meeting an acreage goal, even though the Department believed there was little resource development potential. (See p. 22.)

## ADEQUACY OF TRACT EVALUATION

Beforehand, each tract being offered for lease is assigned an independent evaluation of its worth to (1) determine the acceptability of industry bids and (2) assure that the Government receives a fair market value return for the lease of public resources.

The Department's prelease tract evaluations for Sale #35 were made using inadequate data. As a result, estimates of tract values were not reliable and could not reasonably assure that the public received a fair market value return from the leases.

The results of this sale also indicated a lack of competition; of the 231 tracts offered only 70 received bids. The majority of the tracts bid on (70 percent) received only one or two bids. (See p. 30.)

## ADEQUACY OF REVENUE ESTIMATES

Revenues received from Outer Continental Shelf leases are deposited in the U.S. Treasury; consequently, the Government must predict how these sales will affect the Federal budget, so the budget for the next fiscal year can be properly prepared. The Department provides these revenue estimates to the Office of Management and Budget.

The Department's current revenue estimating process for Outer Continental Shelf sales is based on inadequate information and overly optimistic estimates and relies on various errors cancelling each other out. (See p. 6.) In Sale #35, for example, the Department based its revenue prediction on a broad-brush, undetailed resource estimate for the sale area and an anticipated two-thirds leasing rate, which is nearly three times the percentage of acres actually leased. This resulted in over-estimating the results of Sale #35 by 5 times the actual bonus revenues received. (See p. 6.)

## RECOMMENDATIONS TO THE SECRETARY OF THE INTERIOR

The Secretary of the Interior should direct a geological exploration program which would implement a systematic plan for appraising Outer Continental Shelf oil and gas resources, including selected stratigraphic test drilling. The plan should identify the level of stratigraphic drilling necessary to provide a minimal level of data on major shelf areas.

After the plan has been developed, the Secretary should encourage private industry to explore areas identified in the plan and confidentially share with Interior the information developed. Exploration permits issued by the Department for private drilling should provide the opportunity for any bonafied potential bidders to "buy-in" on the exploration by equally sharing the cost of the drilling.

After Interior knows what land industry has explored and how thoroughly it was explored, if any data is still needed, the Department of the Interior should take necessary actions, including public financing of stratigraphic drilling, to obtain it.

In addition, after the tract selection process is completed, the process outlined above should be repeated to obtain more reliable data for prelease evaluation purposes.

The Geological Survey and the Bureau of Land Management should be required to consider all necessary information and make final corrections to tract values before lease. Then, the Department should offer for lease only those areas for which it has collected and analyzed sufficient information to adequately identify where the resources are, their estimated value, and potential for development in the near future.

The Department questioned whether GAO's recommendation would yield benefits in excess of costs for such a program. However, it has never chosen over the past several years to undertake any cost-benefit analysis to support its position. By separate letter to the Secretary, GAO has encouraged the Department to initiate such an analysis. In the meantime, GAO believes there is compelling evidence, as demonstrated in this report, that the present system is wholly inadequate to protect the public interest and its resources and accordingly recommends proceeding with the program outlined in its report. Such a cost-benefit analysis may be helpful in evaluating the usefulness of such a program. However, GAO believes that no cost-benefit study can substitute for actual experience from a Government financed drilling program.

#### RECOMMENDATION TO THE CONGRESS

Selecting tracts with the best potential for resource development and valuing them reliably to assure that the public receives a fair

market value return can only be done well if enough geotechnical data exists when decisions are made. The 94th Congress considered a bill (S. 521) which directed the Secretary to conduct a survey program of Outer Continental Shelf oil and gas resources. As part of the survey program the Secretary was authorized to either contract for, or purchase, required geotechnical information (including stratigraphic drilling) which is not available from commercial sources. At the close of the 94th Congress this bill was with the Conference Committee to work out differences between House and Senate versions.

In April 1975 GAO testified before the Senate Committees on Interior and Insular Affairs and Commerce regarding the need for improved policies and procedures for the rational exploration and development of Outer Continental Shelf fossil fuel resources. At that time GAO endorsed the overall thrust of legislation designed to improve the Government's ability to deal with Outer Continental Shelf exploration and development problems.

Bills (S. 9 and H.R. 1614) identical to S. 521 have been introduced into the 95th Congress.

The recommendation in this report is in line with the thrust of provisions in the proposed legislation to provide for an Outer Continental Shelf leasing program that will identify size, timing, and location of leasing to meet national goals and to assure receipt of a fair market value for the oil and gas owned by the Federal Government. GAO recommends the Congress favorably consider this legislation.

#### AGENCY ACTIONS AND UNRESOLVED ISSUES

The Secretary of the Interior reserved judgment on issues discussed in this report until he had time to formulate his position on many items relating to Outer Continental Shelf

lease sales. (See app. VII.) The Secretary and the Director, Office of Management and Budget, (see app. VI) expressed concern with the cost of obtaining additional data and believed GAO has not presented the cost effectiveness of a systematic exploration program.

Because of items pointed out by the Secretary and the Director, GAO revised the report where applicable. Basic differences remain and are discussed in chapter 4.

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## ABBREVIATIONS

Bureau	Bureau of Land Management
Department	Department of the Interior
GAO	General Accounting Office
MROV	Mean Range of Values
OCS	Outer Continental Shelf
OMB	Office of Management and Budget
Survey	Geological Survey

## GLOSSARY

Frontier areas	Geographic areas of the United States that have experienced little or no history of offshore oil and gas operations.
Geological structure	Term pertaining to the physical results of folding, faulting, and displacement of rock layers due to movement of the earth's crust. Some structures may trap oil or gas.
Geological	Technical data associated with earth processes which identifies the arrangements and composition of subsurface rocks.
Geophysical	Technical data which identifies the structure, composition, and development of subsurface rocks.
Paleontology	A branch of geology dealing with the life of past geological ages based upon the study of fossil remains of organisms.
Reservoir	A natural underground rock formation in which the pore space is sufficient to contain a liquid such as oil or water and gas.

**Seismic**

Geophysical data pertaining to the speed with which induced sound waves pass through different types of rock. The result is the detection and analysis by means of reflection or refraction techniques of elastic waves generated in the earth.

**Stratigraphic test**

A hole drilled to determine the nature of rock layers and their physical and chemical properties; specifically, the ability of the rocks to transmit and retain oil and gas.

## CHAPTER 1

### INTRODUCTION AND SCOPE

At the request of Senator Cranston and former Senator Tunney, we reviewed the Department of the Interior's December 11, 1975, Sale #35 of 231 oil and gas tracts on the Outer Continental Shelf (OCS) off southern California (See app. I and II.) Pursuant to the Senators' requests and agreements reached with their staff, we examined the facts contributing to the disparity between the Department's presale revenue estimate of \$2 billion, the Department's tract evaluation of \$290 million, and the actual industry bonus bids of \$417 million. We also agreed to indicate what implications these disparities would have on the results of future lease sales.

In addition, former Senator Tunney requested that we relate our review results to the conclusions and recommendations made in two prior reports 1/ on Federal leasing policies and practices. Those reports conclude among other things, that the Federal evaluation of OCS resources

--is hindered by inadequate data and analysis,

--does not reasonably assure that a fair market value return is received on lease offers of OCS oil and gas reserves, and

--is being jeopardized by an accelerated leasing schedule.

The review (1) evaluated the adequacy of the tract selection and presale evaluation procedures used, (2) evaluated the method by which various estimates of revenue were derived, and (3) determined the status of these various estimates for Sale #48 scheduled off southern California in March 1978.

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1/"Outlook for Federal Goals to Accelerate Leasing of Oil and Gas Resources on the Outer Continental Shelf," (RED-75-343, Mar. 19, 1975) and "Outer Continental Shelf Oil and Gas Development--Improvements Needed in Determining Where to Lease and at What Dollar Value," (RED-75-359, June 30, 1975).

In conducting the review, we

- Interviewed officials at the Department's Geological Survey (Survey) headquarters in Reston, Virginia; and its district office in Los Angeles, California; the Bureau of Land Management (Bureau), Washington, D.C.; and various petroleum industries.
- Reviewed pertinent records on Sale #35 at the Department's headquarters and district office in Los Angeles.
- Examined applicable regulations, policies, procedures, and practices pertaining to Federal leasing of the OCS.

### ROLE OF THE DEPARTMENT OF THE INTERIOR

The Outer Continental Shelf Lands Act (43 U.S.C. 1331) provides for U.S. jurisdiction over OCS submerged lands--all submerged lands seaward and outside State waters. Federal jurisdiction of OCS lands generally begins about three miles from the coastline of each State. The act authorizes the Department to lease such lands for certain purposes, including production of oil and gas, and to regulate OCS oil and gas operations to prevent waste and conserve natural resources. The act requires that oil and gas leases be issued only on a competitive bidding basis. Leases are awarded through sealed bids on the basis of the highest (1) cash bonus bid with a fixed royalty or (2) percentage royalty bid with a fixed cash basis. Except for one sale where 10 leases were offered on the basis of a royalty bid, all of the Department's leasing has been on the basis of bonus bids.

The Bureau executes the leases of OCS lands with the stated leasing and management goals of (1) providing orderly and timely resource development, (2) protecting the environment, and (3) receiving a fair market value return for leased resources.

The Survey is responsible for valuing tracts before leasing on the basis of engineering and other technical evidence and economic analysis. Its valuation data is used as the basis for judging the acceptability of industry bids. The Survey is also responsible for assisting the Bureau in its leasing objectives by (1) providing technical and administrative assistance, (2) providing services for managing and disposing of OCS areas, and (3) supervising and regulating exploration, development, and production activities on tracts after they are leased.

The Department's system of selecting areas of lease has a direct impact on the ultimate discovery of oil and gas. Selecting the most promising areas will encourage rapid development. Historically, OCS lease offers have been scheduled on an irregular basis. Industry interests and the desire to obtain money for the U.S. Treasury through bonuses generally determined when and where to lease OCS lands.

#### ACCELERATED LEASING PROGRAM

The Department through 1975, leased in the 21 years of the program about 12.5 million acres through competitive lease offerings. Cumulatively this acreage has produced bonus bid revenues of nearly \$16 billion for the Federal Government.

The Arab oil embargo, imposed in October 1973, made the American public conscious of the widening gap between energy consumption and domestic production and our unaccustomed but growing dependence on foreign supplies. The economic, political, and national security impact of the embargo led to a decision to more than triple the acreage annually leased on the OCS. However, long before the embargo, President Nixon, in his April 1973 message to the Congress, directed the Secretary of the Interior to triple (from 1 million acres a year to 3 million acres a year) OCS acreage leased.

In January 1974 President Nixon instructed the Department to accelerate the OCS leasing program from 3 million acres to 10 million acres in 1975, another tripling of the goal in less than 1 year. Under this Presidential mandate, the Department proceeded with plans to lease 10 million acres in 1975. This was almost as much acreage as was leased in the 20 year history of OCS leasing.

At a November 1974 conference of Coastal States Governors, the Secretary of the Interior said the Administration was not wedded to leasing 10 million acres in 1975, but was wedded to the idea of beginning leasing in the frontier areas, in addition to the Gulf of Mexico. Despite this renunciation of specific acreage goals, plans and preparations for OCS Sale #35 were made during the policy's existence and, therefore, had an impact on this sale.

The Secretary believed that starting in 1975 the Department must expedite the preparatory steps for six proposed lease offers annually. He noted that while there were advantages to setting an acre figure to facilitate planning, the real objective was to find and produce oil and

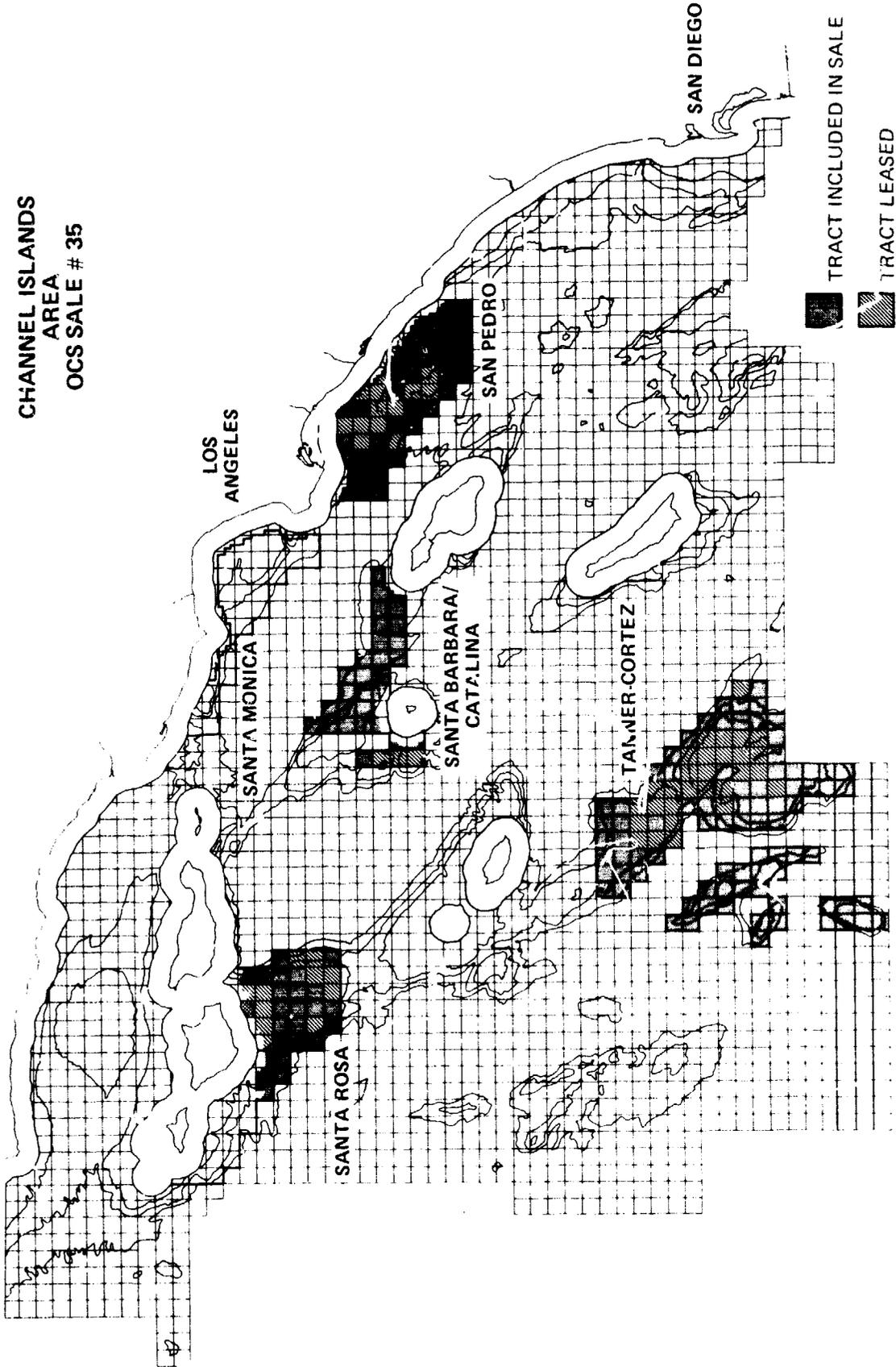
gas safely. The Department is continuing to use acreage as a basis for budget estimates. October 1976 estimates show between 4 and 5 million acres will be offered in each of the next three fiscal years.

In March 1975 we reported that inadequacies in the Government's tract selection and evaluation practices existed even at the 3 million acre leasing rate. Proceeding with an accelerated leasing schedule would mean that the Government's role for protecting the public's interest in OCS lease offers would potentially be jeopardized. Lower quality and/or the lack of evaluation caused by such an accelerated schedule would mean increased reliance on bid competition as the only means to assure that a fair market value return is received for leased resources.

#### OCS SALE #35

The December 11, 1975, sale off southern California--one of four sales for the year--was the first frontier area sale held under the accelerated program. The Department offered 231 tracts for sale covering 1,258,189 acres from Point Mugu south to Dana Point and extending seaward beyond the Santa Barbara and San Clemente Channel Islands. (See map p. 5.) Many Government problems with tract selection and evaluation identified in our prior reports were in existence during this sale.

CHANNEL ISLANDS  
AREA  
OCS SALE # 35



## CHAPTER 2

### IMPROVEMENTS NEEDED IN METHOD

#### OF ESTIMATING BONUS REVENUE

Estimates of anticipated revenue inflows to the Treasury are necessary for the Federal Government to properly budget for the fiscal year; however, it is hard to achieve accurate results. We found that the Department's current revenue estimating process for OCS sales is based on prior sales information and overly optimistic estimates and relies on various errors cancelling each other out.

In Sale #35, for example, the Department based its revenue prediction on a broad-brush, volumetric resource estimate. It anticipated that two-thirds of the tracts would be leased which was nearly three times the percentage of acres actually leased. This resulted in OMB over-estimating the results of Sale #35 by 5 times the actual bonus revenues received.

Since revenues received from OCS lease sales are deposited in the U.S. Treasury, the Government must predict the revenue impact these sales will have on the Federal budget. During the period 1954 through 1972, when sale sizes were usually small and lease offerings were scheduled irregularly, the problem of accurately predicting these expected revenues was less important. During this 19 year period, revenues received from lease sales consisting of lease bonuses, royalties, rentals, and minimum royalties, amounted to \$9 billion.

Since 1973, however, when the accelerated leasing schedule produced larger sized offerings at a more frequent pace, the total revenues received from the sales during the 3 year period ending in 1975 amounted to over \$11 billion. This increased revenue inflow to the Treasury required an accurate method of predicting expected receipts from OCS sales.

The Department's method for estimating OCS sale revenues is not adequate. Estimates are made far in advance of the sale and are based on inadequate data and insufficient information about the proposed tracts to be leased, oftentimes, resulting in over-estimations of revenues actually received. For fiscal year 1976, for example, the Department estimated total bonus revenues from all sales

at \$12.9 billion. This figure was subsequently reduced for budget use by the Office of Management and Budget (OMB) to \$6.6 billion because they felt there was a good chance some of the scheduled sales would not take place. Actual bonus revenues received from all sales amounted to \$1.3 billion, only 10 percent of the original estimate by the Department.

Included in the fiscal year 1976 estimate was the expected results of Sale #35. Only \$417 million of the Department's \$3 billion bonus revenue estimate was actually received.

CHRONOLOGY OF REVENUE  
ESTIMATES FOR SALE #35

Before presenting the chronology of revenue estimates for Sale #35, a clarification of the difference between Survey's tract valuation estimate and the Department's revenue estimate should be made. In order to determine the fair market value return of a tract offered for sale, Survey assigns it a dollar value. This value represents the tract's worth and is used as the basis for determining the acceptability of industry's bid. The total value of all tracts included in the sale represents the worth of those tracts being offered. For the tracts leased in Sale #35, Survey's postsale estimates of their worth was \$160 million.

The revenue estimate represents the total revenues expected from the lease offering. For Sale #35, the Department made various estimates of revenues during the course of the presale period. A chronology of the various estimates and the more important parameters used in deriving these estimates are presented in the following table.

<u>Parameters Considered</u>	<u>4/18/74</u>	<u>7/12/74</u>	<u>11/7/74</u>	<u>10/14/75</u>	<u>12/8/75</u>
Estimated Oil Reserves (in billions of barrels)	--	--	2.7	2.7	2.2
Estimated Gas Reserves (in trillion cubic feet)	--	--	4.8	4.8	4.0
Acreage Offered (in millions)	0.93	1.5	1.5	1.5	1.2
Estimated Percentage of Acres Leased to Acres Offered	58%	50%	67%	67%	67%
Bonus Revenue Estimate (in billions of dollars)	\$1.2	\$3.0	\$3.0	\$2.3	\$1.5- \$2.0

The Department's Assistant Secretary of Program Development and Budget is responsible for the initial revenue estimate. Under his direction, the Policy Analysis staff received its initial revenue estimate from the Bureau. Although specific sale tracts had not been selected, available geologic information had not been determined or analyzed, and resource estimates for the sale area had not been made, the Bureau used the results of a March 1974 lease sale off the coast of Louisiana to estimate that 58 percent of the proposed 930,000 acres offered would be leased at a rate of \$4,150 an acre. This resulted in the April 18, 1974, revenue estimate of \$1.2 billion.

On July 12, 1974, after reviewing the results of a previous sale conducted off the Texas coast in May 1974, the Department revised its computation of expected Sale #35 bonus revenues to \$3 billion. This estimate was based on a revised proposed sale size of 1.5 million acres and a Bureau estimate that 50 percent of the acreage offered would be leased at a rate of \$4,000 an acre.

Before submitting the final bonus revenue estimate to OMB for inclusion in the fiscal year 1976 budget, the Department revised its revenue estimation procedure by incorporating the use of a discounted cash flow model for predicting the

sale results. The model considered many parameters, most of which were estimated using past experience and knowledge. Parameters for expected gas and oil reserves contained in the sale area were also incorporated. These resource estimates were provided by Survey and represented only volumetric estimates of sale areas based on limited specific tract information.

Using this new revenue estimating technique, on November 7, 1974, the Department estimated that bonus revenues from Sale #35 would amount to \$3 billion. This estimate was forwarded to OMB on November 25, 1974, for its review. Using a probability analysis of expected revenues, OMB estimated that \$2 billion of the revenues would actually be received by Treasury in fiscal year 1976 from this sale. In deriving the November 1974 estimate, the Department assumed that instead of the normal 50 percent, two-thirds of the 1.5 million acres offered would be leased because Survey had indicated that Sale #35 appeared particularly promising.

By October 1975, approximately two months before the sale, the Department's estimate of bonus revenue was estimated at \$2.3 billion. Although this estimate continued to use a leasing rate of 67 percent, the previously used oil price (net of royalties) of \$7.00 a barrel was reduced to \$6.40 a barrel, which resulted in an expected revenue decrease of \$700 million. The change was made to represent an adjustment for the removal of the oil depletion allowance in the Bureau's analysis of revenue estimates.

The \$7.00 a barrel figure represented the marginal costs of production on the OCS, including a normal rate of return. It was considered to be the most probable price over the long run.

We believe the value of OCS resources should reflect its anticipated price as well as costs and other factors. It has been a long time since the cost and price of oil bore a direct relation to each other. Under these circumstances, the use of the \$7.00 and \$6.40 a barrel figure did not accurately reflect the actual market conditions. The domestic oil price at well head for new oil in October 1975 was about \$13 a barrel. While the use of a higher rate would have made the budget estimate less accurate, we believe it reflects another problem associated with the estimates developed for this sale.

On December 8, 1975, 3 days before the sale, the Secretary announced that bonus revenues from Sale #35 were expected to amount from \$1.5 to \$2.0 billion. Although all parameters used in deriving the October 1975 estimate remained constant, the reduction in expected revenues resulted from the sale size

being reduced from 1.5 to 1.2 million acres. The majority of tracts eliminated were from the resource-rich acreage of the Santa Monica prospect area where high bonus bids were expected. The high resource expectations were based primarily from good onshore knowledge of existing and productive oil fields.

On December 11, 1975, the Department conducted the sale; actual bonus revenues amounted to only \$417 million.

FACTORS CONTRIBUTING TO  
OVER-ESTIMATES OF REVENUE

The most significant bonus revenue estimate for Sale #35 --\$3 billion--was made in November 1974. OMB reduced this estimate to \$2 billion and included it in the fiscal year 1976 Federal budget. OMB's estimate was based on the results of its probability analysis of the estimated funds the Government will receive in a given year. Since the actual sale results yielded only \$417 million in bonus revenues, the net effect of the over-estimation resulted in an approximately \$1.6 billion understatement in the estimated budget deficit. This difference can be attributed to the acreage reduction offered before the sale and the Department's overly optimistic estimates.

Although predicting revenues 13 months before a sale is not easy, the accuracy of the Department's estimating model should yield better results than those achieved in Sale #35, which resulted in OMB over-estimating revenues by 5 times the actual sale results. According to the Director, Office of Policy Analysis,

"It is doubtful that these bonus estimation models could ever be made very reliable because they are based on only general data, but what we could hope for is that various errors would tend to cancel each other, and on average we wouldn't be too far off."

We agree with the Director that the cause for the model's over-estimate of revenue was a result of using general data in deriving the input parameters to the model. The various inputs were derived by Departmental personnel using volumetric data and assumptions based on past experience instead of detailed geological and geophysical data. We believe, however, estimate accuracy could be greatly enhanced if the Department would take action on the following areas relating to revenue estimating.

The estimate of resources appears to be the most significant factor causing the over-estimate. According to

the Director, Office of Policy Analysis, the Department's estimate of resources substantially overstates the estimates used by the oil companies. In addition, these volumetric estimates, as opposed to tract by tract estimates, were supplied to the Department by Survey personnel. According to the Director, "this appears to be a case where volumetric (broad-brush) estimates badly overstate the possibilities compared to what you see when you actually look, tract by tract, for resources, reservoirs, and traps."

The originator of the revenue model used for the estimate cautioned against using volumetric resource estimates by stating,

"Due to the sensitivity of bonus value to resources per acre, one of the fundamental problems in bonus estimation is that of specifying the appropriate distribution of resources over acreage. Moreover, given only a resource estimate and a proposed acreage offering, there is no obvious way to determine an appropriate distribution."

The OCS Tract Selection Agreement of August 1971, requires the Survey to provide a preliminary resource estimate on a tract by tract basis. The tract selection recommendation report, submitted in April 1974 for Sale #35, contained tract resource estimates based on volumetric estimates that were extrapolated from rather limited existing data and not on a tract by tract basis. We believe the accuracy of the November 1974 revenue estimate would have been greatly enhanced if the tract by tract resource estimates had been based on more solid data which provided more information on rock porosity, and potential for hydrocarbons.

Another contributing factor to the over-estimate was the percent of acres expected to be leased. The Department believed that two-thirds of the acres would be leased compared to the actual 24.7 percent. The two-thirds leasing rate estimated for budget purposes was overly optimistic in our opinion. It failed to recognize that (1) past OCS leasing experience indicated about a 50 percent leasing rate and was in shallower waters, (2) the data available to Survey when the tracts were selected was minimal, and (3) this was the first frontier sale in the Pacific.

Industry officials also told us that the bids for this sale were low because the lack of information made this a high-risk investment. Industry capital flows to investments of the greatest return and least risk.

According to the Director, Office of Policy Analysis, other factors which affected the accuracy of the revenue estimation included:

- A substantial under-statement of development costs since not enough allowance was made for deep water, and no allowance was made for the low porosity of most reservoir rocks in the region.
- An under-estimate of the number of years to achieve production because of deep water and well spacing.
- A chilling effect on the bids from the likelihood of continued oil and gas controls and from the difficulty developers may anticipate in getting State approval for on-shore facilities.

The adverse effects of the first two factors, we believe, could be alleviated by collecting sufficient information on the tracts offered early in the leasing process. The recommendations presented in Chapter 3, dealing with conducting a systematic exploration program to improve the reliability of data used to select and value tracts, if implemented, could strengthen the input data used to derive the revenue estimate and could result in more accurate estimates.

In response to the third factor, new oil was not controlled before February 1976. Also the Department should play a more active role in coordinating and consulting with developers and State and local officials before a lease sale. Such efforts, in conjunction with better data on each sale's potential, would help alleviate these difficulties.

#### REVENUE ESTIMATES FOR SALE #48--SOUTHERN CALIFORNIA

According to the current leasing schedule, another sale off the southern California coast (Sale #48) is scheduled for March 1978. The sale was originally scheduled to offer approximately 1.5 million acres, but this proposed acreage has now been reduced to 1.0 million.

In attempting to obtain preliminary revenue estimates for the sale, a Department official informed us that providing estimates on a sale by sale basis is no longer consistent with Departmental policy. It is the current policy to provide estimates only on the total sales scheduled for that fiscal year.

The Bureau had made estimates for Sale #48, however, as early as June 1975, when they believed that \$1.4 billion in

bonus revenues would be received from a sale including 1.5 million acres. This estimate was later reduced to \$1.0 billion when the proposed sale size was reduced to 1.0 million acres. In making these estimates, the Bureau assumed that 50 percent of the proposed acreage offered would be sold at a bonus rate of \$2,000 per acre.

Since the December 1975 sale, the Bureau reduced its estimate for Sale #48 to \$400 million. A breakdown of the percent of acres expected to be sold and the bonus rate per acre were not available since the reduction in expected revenue resulted from the poor revenue results of Sale #35.

### CONCLUSIONS

Although revenue estimation is a difficult process in which to achieve accurate results, it is a necessary process. Estimates of anticipated revenue inflows to the Treasury are needed so the Federal Government can properly budget for the fiscal year. This planning process cannot adequately function with a system that relies on various errors cancelling each other out.

The Department's current revenue estimating process is based on poor information and overly optimistic estimates using past sale results. This led to over-estimating the results of Sale #35 by 5 times the actual bonus revenues received. We believe the system can be strengthened if the Department would design and implement a systematic exploration program, particularly in frontier areas, designed toward gathering the geological and geophysical information needed to select and value tracts as well as aid in making more accurate estimates of expected revenues.

## CHAPTER 3

### IMPROVEMENTS NEEDED IN

#### SELECTING AND VALUING TRACTS FOR OCS SALES

Large acreage offerings and an increased sale frequency sometimes produces conditions in which a highly competitive market does not exist. Under these circumstances, the need for a reliable tract selection and evaluation system becomes extremely important if the Government is to assure the public of an adequate supply of domestic resources and a fair market value return for the lease of their resources.

For OCS Sale #35, we found that the Department's tract selection and evaluation process was not very reliable and that bidding was not highly competitive. Tracts were selected for leasing without obtaining adequate information to assess their resource potential. To meet the Department's acreage goal, tracts believed to have little or no resource potential were added to the sale proposal. Additionally, 70 percent of the tracts that received bids got only one or two bids.

In our two prior reports, we noted that the increased leasing activity, both in terms of acreage sizes and number of sale offerings, was causing workload problems. This resulted in the resource valuation program and supervision of industry operations on existing leases being given lower priority. These factors contributed to the following sales results. 1/

- 50 (21.6%) contingency tracts were selected to meet an acreage goal. The Department offered these tracts for lease despite its belief that these tracts had little resource development potential.
- 128 (55.4%) tracts were at depths exceeding present technical capabilities (365 meters) to produce from platforms. Bureau officials, however, have pointed out that deepwater technology is advancing rapidly. They estimated that drilling in areas as deep as 750 meters are within the range of technical feasibility, although this is still several years into the future. We noted however, that industry's

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1/ The categories used in the following description are not mutually exclusive. Thus the percentages shown do not add to 100.

interest still appears to lie in the more shallow waters. Of the 56 tracts leased through this sale, 42 (75 percent) were in waters with depths of 365 meters or less. Of the 14 leased in depths of greater than 365 meters, 12 were in waters with depths of 500 meters or less and 2 tracts had depths of 750 meters.

--211 (91.3%) tracts had a Survey reliability rating of "D," defined as fair to good knowledge of structure with questionable stratigraphic data on gross sand conditions and depth. The knowledge of geologic risk is considered fair to poor. Additionally, the Bureau defines a "D" rating as weak to fair regarding Survey's estimate of the tracts' value. Even though the information was weak to fair for estimating tract values, 195 (84.4%) tracts were estimated to contain either no resource or an insufficient amount of resource to make an economic profit and were subsequently valued at the minimum worth of \$25 an acre.

#### RESOURCE DEVELOPMENT POTENTIAL OF SELECTED TRACTS

Since about one-third of all remaining domestic oil and gas resources are thought to be in the OCS, tremendous reliance has been placed in the OCS program for meeting our near term development needs. In managing these publicly-owned resources, the Government is responsible for (1) the public's interest in receiving the benefit from these energy resources at reasonable prices, (2) safeguarding the human environment to the fullest extent possible, and (3) extending the capability of the non-renewable resource base as fully as possible, both for this and future generations.

A major policy consideration of the resource program is the rate at which resources are sold out of public ownership for private development. Leasing the Federal domain to developers faster than is practicable makes it difficult to plan for environmental protection, assess the value of the resources, and promote competition. This situation can contribute to the uncertainty of the value of Federal resources, encourage private speculation in these resources, and cause industry to tie-up capital on lands with no or minimal resource potential. Leasing too slow on the other hand could lead to scarcity of these resources and increased prices.

The decision to increase the OCS acreage leased annually was based on the overall policy goal of decreasing the Nation's reliance on foreign energy supplies. The apparent guiding philosophy behind this decision was to release as much of the resource as could be sold, with little concern for the revenue impact of flooding the market with tract offerings and with no assurance about when oil and gas would be produced, or what price the consumer would eventually pay.

The results of the OCS Sale #35 demonstrates the effects of operating a leasing program under this type of philosophy. The Department's desire to lease maximum acreage in minimum time resulted in selecting frontier acreage for sale before assessing the true resource development potential of these lands. As a result, Survey thought the majority of OCS sale tracts had no or low resource development potential.

### Tract Selection Procedure

The OCS Tract Selection Agreement of August 19, 1971, specifies the procedure by which the Bureau and Survey jointly select specific tracts for possible lease offering. Under this procedure, the Department gathers and reviews detailed geophysical, geological, engineering, economic, and resource information, and nominations on areas proposed for sale. Based on this review, an estimate of the potential supply of hydrocarbons is made and the size of the sale (in acreage) is modified, as necessary, to maintain the most adequate rate of production possible to meet the demand for these resources.

The Bureau and Survey headquarters offices are responsible for implementing Departmental objectives through specific guidance to their respective field offices for use in the actual tract selection process. This guidance must be consistent with the Department's leasing objectives and include, but not be limited to, such considerations as: (1) recommended sale size; (2) tracts or areas for special consideration; and (3) information relative to Administration or Department policy. According to the procedures, acreage is selected in sufficient amounts to attract industry interest and promote a fair market value return.

In the tract selection process, the Bureau and Survey field offices independently recommend tracts for inclusion in the sale. Before tract selection, the Bureau requests industry to nominate OCS lands on which it would like to bid if a sale is held. The number of nominations each tract receives is the predominant factor influencing the Bureau's tract selection. Survey recommends specific tracts based

on technical information, including geological, geophysical, engineering, and paleontological information. Once the tentative selection lists are compiled, Survey and the Bureau meet to discuss tract selection differences and agree to a joint Bureau-Survey list. This list is forwarded to headquarters for review and a final list of tracts for the offer is determined. Before the offer, changes in the tract selection list are occasionally made by both headquarters and field offices.

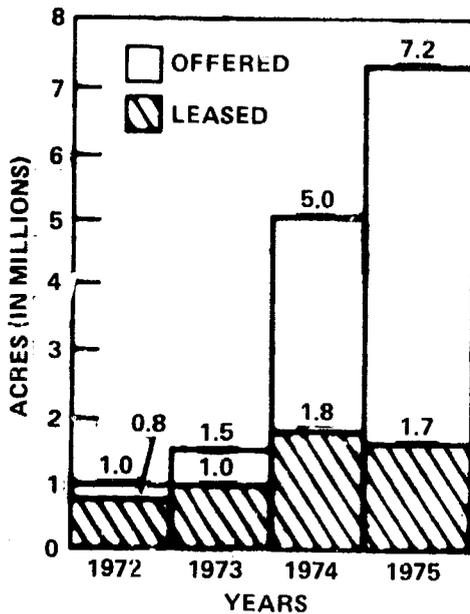
Because of pressures within the Department to increase the sale size to meet acreage goals, tracts were selected for OCS Sale #35 without obtaining sufficient information to determine their resource potential. This lack of information resulted in offering a large number of tracts for sale that the Department believed had no or low resource development potential.

#### Quality of Tracts Offered Adversely Affected by Departmental Acreage Goals

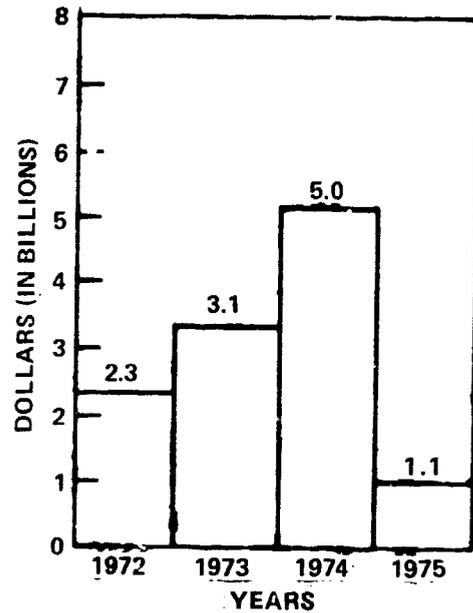
In our March 19, 1975, report to the Congress, we questioned the Department's intent to proceed with the projected leasing schedule. The real issue in defining leasing goals should concern the production of oil and natural gas from the leasing program and not necessarily the number of acres offered for sale. Glutting the market with large acreage offerings could tend to reduce the price paid to the Government and encourage private speculation in these resources at the public expense.

The following charts summarize OCS leasing activity since inception of the accelerated leasing schedule. Although the number of acres offered for lease has increased sevenfold from 1972 to 1975, the number of acres leased has only doubled. Also, the bonus bid per acre has decreased from a high of \$2,985 in 1973 to \$648 in 1975.

ACRES OFFERED VS. ACRES LEASED



BONUS REVENUE RECEIPTS



From the start of the tract selection process on Sale #35, it appears that the Department's primary concern was to meet its acreage goal established under the accelerated leasing program. The March 14, 1974, tract selection guidelines specifically instructed the Bureau Manager of the Pacific OCS Office to include the largest acreage possible in the joint tract recommendation report to comply with the Department's policy at that time of leasing approximately 10 million acres in 1975. Concern for selection of acreage having high resource development potential was not paramount. The guidelines instructed the Bureau personnel that,

"Those areas within the 200 meter water depth are limited, therefore, based upon nominations and other factors, it may be necessary to select substantial acreage out to and possibly even beyond the 600 meter water depth."

The Bureau initially selected nearly 1.7 million acres from the 6.8 million acres nominated by industry and forwarded its recommended tract list to Survey in late March 1974. In an April 10, 1974, memorandum, Survey generally concurred in the Bureau's tract selection but qualified its concurrence by recognizing that pressure might be placed on the Bureau to include maximum acreage for the proposed sale to accomplish the National objective of leasing 10 million

acres in 1975. Survey's opposition to the amount of sale acreage proposed was more definitively expressed later in this memo.

"\* \* \* a sale including in excess of a million acres will place considerable pressure on the anticipated manpower of the Survey assigned to resources evaluation during the presale period, and supervision of industry operations on the issued leases. There is also concern as to whether industry will be prepared with either trained manpower or adequate exploration and production equipment and facilities to effectively assimilate a 1.7 million acre sale."

The memorandum concluded with the recommendation that,

"Two or more sales covering a total in excess of 1.7 million acres would allow us to better meter the pace of industry development and allow us to tailor future sales to be consonant with industry's demonstrated ability to explore and develop the California OCS."

In spite of opposition to the expanded sale size from both Survey and Bureau personnel, work continued to include as large a sale size as possible. On April 29, 1974, Survey and Bureau field offices submitted their joint tract selection recommendation report to headquarters. Approximately 2,621,000 acres of OCS lands from 19 priority areas were identified in the joint report and broken down into the following categories.

	<u>Acres</u>
Primary	1,690,000
Contingency #1	753,000
Contingency #2	<u>178,000</u>
TOTAL	<u>2,621,000</u>

The report stated that, "contingency #1 or #2 do not have high potential and are not recommended for lease offer unless large acreage commitments are required from this tentative sale." The report also pointed out potential problems which might have an impact on the Department's ability to offer tracts from all the recommended areas. These problems included conflicts existing with State sanctuary areas and certain tracts which conflicted with Department of Defense operations. In

August 1974, 297 tracts were announced as being available for further environmental studies. The Secretary subsequently eliminated 66 of these from the sale.

Inadequate data available  
for tract selection

In June 1975, we reported that although Survey and Bureau headquarters and field offices participate to some degree in various phases of tract selection, the Federal Government has relied primarily on industry interest in deciding where to lease. Determinations to lease specific tracts are based on industry nominations, geological inference, and speculation as to whether oil and gas exist. We also reported, however, that neither Government nor industry had the geological data essential for adequately determining if geological characteristics necessary for petroleum accumulation exist in the wildcat tracts or the frontier OCS areas. Although OCS areas have potentially attractive geological structures, as identified by geophysical data and by extrapolation of geological trends, the geological characteristics and specific potentials for oil and gas are not known until holes have been drilled.

Even though the information received from stratigraphic test drilling would be valuable in identifying areas favorable for oil and gas accumulation, particularly in the previously undrilled areas of the OCS, the Department has been reluctant to take the lead in developing and implementing a systematic exploration plan for resource appraisal. This policy, we believe, is preventing exploration and resource appraisal from proceeding as systematically and efficiently as would otherwise be possible.

The effect of selecting sale tracts before obtaining sufficient geological information can be demonstrated by analyzing the OCS Sale #35 results, where Survey believed a majority of tracts selected had little potential for resource development in the near future.

The August 1974 tract selection procedure requires Survey to include a preliminary resource estimate on a tract by tract basis in the joint tract selection recommendation report when submitted to headquarters. According to Survey officials, this type of information has never been provided for any OCS sale. They believe collecting sufficient information to make such an estimate this early in the leasing process was not worth the benefit derived.

In the March 14, 1974, tract selection guidelines, however, Bureau headquarters instructed its field offices to attempt to obtain from Survey a tract by tract estimate for

production potential of oil and gas before making its recommended tract selection for Sale #35. According to the guidelines, "The possession of this type of data would greatly facilitate the tract selection process."

On March 22, 1974, the Bureau's Pacific OCS Office Manager requested that Survey identify the total barrels or million cubic feet of resource per acre for each tract under consideration.

Although sufficient geological information did not exist for making such an estimate, either in the Government or industry, Survey did not attempt to obtain the data on its own. Instead, it conducted an extensive review of existing data on California onshore basins and oilfields to determine the geological characteristics of the various onshore areas and their respective reserves. Survey then analyzed approximately 6,000 line miles of existing seismic data which it obtained for all the prospect areas and data from numerous shallow coreholes drilled over the years in the San Pedro Bay area. Based on this available lease sale area data and knowledge of the developed onshore areas, the most appropriate developed area was selected. Its resource parameters were applied to a geologically analogous unexplored area to obtain a best estimate of the hypothetical resources of the new area. This inference resulted in a volumetric resource estimate for the various sale areas and was used as the basis for the priority listing of 19 areas considered for inclusion in the sale.

The problem with such an estimate, however, is that it represents a best guess of the total potential resources of an area which can be comprised of many tracts. It will not indicate whether the resource is concentrated in a few tracts or distributed evenly among all tracts.

Based upon these best volumetric resource estimates and acreage goals, Survey and the Bureau made their final tract selection recommendation. On August 7, 1974, the Bureau's Director submitted the final tentative tract selection report for consideration to the Assistant Secretary, Land and Water Resources. The report recommended 297 tracts comprising about 1.6 million acres for inclusion in Sale #35.

The 297 tracts represented acreage from 14 of the 19 priority areas recommended in the joint Survey-Bureau report of April 1974. One problem mentioned in that report (Defense Department conflicts) resulted in elimination of some proposed areas for Sale #35. The call for areas to be nominated in January 1974 included several Defense warning zones around San Clemente Island and on the Santa Rosa-San

Nicholas Ridge area. These areas were considered to have a high potential for oil. This interest presumably existed because industry had previously drilled some coreholes when this area was under state jurisdiction. These tracts had received the highest number of nomination bids per tract from industry. Negotiations between Interior and Defense over this matter concluded in early May 1974. The tracts conflicting with Defense operations were eliminated.

The 297 tracts included 74 contingency #1 tracts which were previously identified as not having high resource potential and were not to be selected unless required by acreage commitments. In addition, although Survey noted in April 1974 that actual OCS platform production had been limited in the past to approximately 110 meter water depths and that existing technical capabilities for platform production was limited to about 365 meter water depths, 159 (53.5%) tracts were in water depths ranging from 375 to 750 meters.

The Secretary, in October 1975, eliminated 62 of the tracts for environmental reasons and on December 9, 1975, eliminated an additional 4 tracts because of potential geological hazards. This reduced the final sale size to 231 tracts comprising about 1.3 million acres. Included in the sale tracts selected were 50 (21.6%) contingency #1 tracts and 128 (55.4%) tracts in water depths exceeding 365 meters.

#### RELIABILITY OF TRACT VALUATIONS HINDERED BY INADEQUATE DATA AND ANALYSIS

Before a sale, each tract offered for lease is assigned an independent evaluation of its worth. This estimated value is a primary factor in determining the acceptability of industry bids and for assuring that the Government receives a fair market value return for the lease of public resources.

In our June 30, 1975, report to the Congress, we stated that the effectiveness of the Department's OCS evaluation program was being hampered by inadequate data and analysis. Because of poor or missing geological data the Department was conservatively estimating tract dollar values in undeveloped areas. The results of Sale #35 show that the Department is continuing to make tract evaluation decisions without sufficient data or analysis. Tract value estimates were not reliable and could not reasonably assure that the public received a fair market value return for lease offerings.

## Tract Evaluation Procedures

Before each OCS lease sale, Survey calculates the presale values of tracts offered for lease and the Bureau audits and reviews Survey's evaluation procedure. During the evaluation process, Survey is responsible for providing the specific geological, geophysical, and engineering inputs obtained through in-house analysis of industry data submitted to the Department and through the purchase of seismic data. The Bureau provides certain economic inputs, such as estimates of oil and gas prices, discount rates, and tax considerations. This information is obtained through review of industry publications, Department guidelines, and independent research.

Survey's field office also furnishes the Bureau reliability categories for each tract, which indicates the adequacy of available geological, geophysical, paleontological, and engineering data, as well as other factors that will be used in the resource evaluation. It then gathers the data on all tracts and uses a scientific technique--the Monte Carlo Method of simulation--to develop a Range of Values, Mean Range of Values (MROV), and Discounted MROV, normally calculated using a discounted cash flow for each sale tract.

The simulation method is useful in analyzing problems where there are many uncertainties and data is often poor and based on subjective judgments. It can consider an unlimited number of variables to arrive at the MROV. Some variables considered in the evaluation are porosity, gas-oil ratios, recovery factors, production rates, rate of return on investment, and over 20 other geologic, engineering, and economic parameters and variables. Because many variables used in this analysis are subjective, the experience of the technical people making the evaluation will have an impact on the analyses results.

At least one week before the sale, a Bureau evaluation team reviews Survey's presale tract evaluation review package which consists of the tract values, reserve estimates, and all pertinent data used in the evaluation process. On the day before the sale, the review team submits to the responsible Survey and Bureau officials a report indicating the results of its review and discussing any area of possible concern regarding selected evaluation inputs.

Immediately after the sale, Survey and the Bureau jointly recommend to the Secretary whether specific bids on tracts should be accepted or rejected for lease. The primary emphasis in this decision is the receipt of fair market value. Factors

considered in making this determination include Survey's reliability category rating and the high bid as a percent of the MROV, discounted MROV, and the average evaluation. The final acceptance or rejection decision is made by the Secretary.

Survey's presale valuation of the 231 tracts included in Sale #35 totaled \$365 million. This valuation was reduced during the postsale analysis to \$290 million. According to Survey, this occurred because errors were made in the original valuation of five tracts. These errors related to the use of inconsistent factors for pay thickness, recovery, production rates, and overstated development costs. An additional factor in their devaluation was that several tracts had a "D" rating. This rating indicates that the data used to develop tract values had a low degree of reliability.

Of the 231 tracts, 195 (84.4%) were valued at \$25 per acre, which is the minimum bonus offer the Department would consider for lease acceptance. According to Survey officials, these tracts were valued at minimum because they either contained no resource or an insufficient amount of resource to make an economic profit. None of the tracts were valued at \$25 because of a lack of information. Seismic data was available for all tracts; certain tracts had other types of data as well (corehole, bottom samples, etc.). Nevertheless, we feel that such data was not adequate to properly judge the resource content of these tracts. Survey's own data reliability rating for these tracts supports our belief.

#### Data Reliability Weak to Fair For Estimating Tract Values

The Monte Carlo simulation model incorporates over 30 factors of geotechnical, engineering, and economic variables in deriving specific tract values. Deriving these variables requires many judgments and involves many uncertainties which must be weighed and evaluated on the basis of individual experience, knowledge, and choice. The quality and quantity of data from which these judgments are based affects the reliability of the final value assigned to any tract.

There are no standards in existence to determine the quantity and quality of data needed to make a reliable tract evaluation. Survey personnel, however, stated that three questions must be answered in order to determine the presence of producible hydrocarbons: (1) Does a structure exist? (2) What is the porosity of the rock? (3) Are hydrocarbons present?

The existence of structures is usually determined by seismic tests; rock porosity by electric logs, shallow

coreholes, and deep stratigraphic tests; and the presence of hydrocarbons only by actual exploratory drilling.

If sufficient information exists for identifying the structure and determining the rock porosity and existence of hydrocarbons, the risk associated with exploring a tract and finding the producible hydrocarbons would be low. Conversely, as the ability to answer any one or more of these conditions decreases, the risk associated with successfully exploring a tract increases. As a result, the value of a tract increases or decreases as the quantity and quality of the data increases.

To reflect the extent and adequacy of available technical data on each tract, Survey assigns a reliability category rating to each tract. As the reliability category decreases from A to E, the risk factor increases because the technical data used are less precise. Survey officials said there are no specific guidelines, criteria, or parameters to spell out how a tract should be rated, therefore, the rating is subjective based on the definition of each category and the experience of the technical people making the rating. (See app. IV for Survey definitions of reliability categories.)

Even though no specific guidelines exist that spell out how a tract should be rated, knowledge of an area and reliability ratings improve with increasing numbers of coreholes. For example, the knowledge of the Tanner Cortez area was sufficient to answer only the first question to determine if producible hydrocarbons are present. Seismic coverage revealed that a structure was present. A deep stratigraphic test near the tract area indicated reservoir rocks were present. This minimal information available for Tanner Cortez resulted in a "D" reliability rating for all tracts in this area. A Survey official estimated that if six other wells had been drilled, the reliability rating would have possibly moved to a "C" or above. The estimated cost of these additional wells would have been about \$27 million. The knowledge obtained from these additional wells would have provided Survey with the ability to better correlate seismic and stratigraphic data; this information would have reduced the risk associated with the estimated resource values for these tracts and better assured the public's chance of receiving the fair market value. Additionally, if industry had access to this data, it would have reduced bidding risks and better focused industry dollars to OCS lands with the best potential for development. However, these wells were not drilled.

Although Survey officials were confident that structure knowledge was good due to adequate seismic coverage on all four prospect areas, they generally agreed that some sale areas

could have used more shallow corehole and deep stratigraphic information to adequately assess the porosity of rock and presence of producible hydrocarbons. According to one Survey official, more drilling would have been performed by industry in preparation for Sale #35, but the drilling vessels were not in the area. After the Santa Barbara oil spill in 1969, a drilling moratorium resulted in the larger, better equipped vessels going to more profitable areas such as Alaska and Indochina. Since the moratorium is over, these ships are expected to return to the California area in the near future.

For Sale #35, 211 of 231 (91.3%) tracts valued and offered for lease were assigned a reliability category rating of "D". This is defined by Survey as fair to good knowledge of structure configuration and size. Well control <sup>1/</sup> is poor at best. Stratigraphic data may not be adequate to predict gross sand conditions and depth. The knowledge of geologic risk is considered fair to poor. Additionally, the Bureau defines a "D" rating as weak to fair in regard to estimating value. According to a Survey official, the "D" rating generally indicates that no stratigraphic drilling was done on tract and that only geophysical data from seismic readings is available.

Sale #35--offering about 1.3 million acres--was conducted on December 11, 1975. Actual sales results fell far short of the Department's presale estimates that 67 percent of the tracts would be leased for about \$2.3 billion. Only 24 percent of the tracts were leased and only \$417 million in revenues were obtained from the sale. Tracts from four prospect areas were offered for lease (see p. 5). The following table provides some general information about the results of Sale #35.

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<sup>1/</sup> Either no wells have been drilled in the area or information available from nearby drilled wells cannot be projected to the area.

Results of Sale #35  
by Prospect Area

	<u>San Pedro</u>		<u>Tanner-Cortez</u>		<u>Santa Rosa</u>		<u>Santa Barbara/Catalina</u>		<u>Total</u>	
	<u>No.</u>	<u>%</u>	<u>No.</u>	<u>%</u>	<u>No.</u>	<u>%</u>	<u>No.</u>	<u>%</u>	<u>No.</u>	<u>%</u>
Tracts in Sale	53	100.0	109	100.0	36	100.0	33	100.0	231	100.0
Tracts Valued at Minimum	38	71.7	89	82.5	35	97.2	33	100.0	195	84.4
Tracts Receiving Bids	20	37.7	35	32.1	12	33.3	3	9.1	70	30.3
Tracts Leased	13	24.5	29	26.6	11	30.5	3	9.1	56	24.2
Average Water Depth of Tracts Leased (Meters)	338	-	332	-	259	-	425	-	324	-

Relevance of data to sale results

The best stratigraphic coverage for Sale #35 was for the San Pedro area. Survey obtained other information--including extensive numbers of shallow coreholes, numerous deep stratigraphic tests, and information from nearby producing wells --through contracts and purchases and requests of existing industry data. This gave Survey sufficient data to analyze rock porosity and, on one tract, identify the existence of hydrocarbons. Seven of the 13 tracts leased in the prospect area received a "C" reliability rating and one additional tract was rated "B". Ten deep stratigraphic tests were performed on these eight tracts by industry, six of which were done on the tract receiving the only "B" rating of the sale.

In comparison to the San Pedro area, the information available in three other prospect areas was not sufficient to adequately determine rock porosity or the existence of producible hydrocarbons. Although numerous bottom samples were done to help in the analysis, there were no deep stratigraphic tests performed on any of the tracts. For example, only one deep stratigraphic test was performed in the Tanner-Cortez area and this was done outside the sale tracts with the data being extrapolated to the sale areas. All tracts located in these three prospect areas were given a reliability rating of "D" by Survey.

A better understanding of how the inadequate data affected Survey's value and revenues received from leases can be demonstrated by comparing the results of tracts leased. As shown on the following schedule, the bonus bids received per acre leased are higher for San Pedro than the other three areas even though Survey estimates showed more than 2 1/4 times more oil reserves per tract for the Tanner Cortez area. In addition, the bonus revenues received from the sale of the seven "C" rated and one "B" rated tract at San Pedro accounted for \$222 million or 53 percent of all revenues received in the sale. This is quite high considering (1) Survey estimated these tracts to contain only 12 percent of all oil reserves leased in the sale, and (2) three of the eight tracts were leased at a 33-1/3 percent royalty rate compared to 16-2/3 percent for all others. This higher royalty rate reduces the bonus bid offered by industry on these tracts.

	<u>San Pedro</u>	<u>Tanner- Cortez</u>	<u>Santa Rosa</u>	<u>Santa Barbara/ Catalina</u>	<u>Total</u>
<b>Estimated Oil Reserves (in barrels) Per Acre Leased</b>	1,984	4,490	130	657	2,906
<b>Tract Value Per Acre Leased</b>	\$857	\$592	\$25	\$25	\$514
<b>Bonus Bid Received Per Acre Leased</b>	\$3,330*	\$1,040	\$118	\$352	\$1,346

\*Includes three tracts leased at a 33-1/3% royalty rate.

The inadequacy of data and its impact on presale values is further demonstrated by comparing Survey's presale values for "D" rated minimum value tracts leased with the bonus bids that were received for these tracts. The table below shows that Survey concluded that many tracts either had no or low resource potential. Industry, however, in evaluating these same tracts frequently drew different conclusions. This uncertainty over the fair market value of tracts encourages speculation by industry. The results of this speculation are that industry either ties up capital in lands with minimal or no resource potential or buys very good lands for less than the fair market value. Until these tracts are further explored and potential resources are developed, no one knows whether the industry capital applied to these tracts was wasted or will provide a sizeable return for their investment.

Comparison of Industry Bids with  
Presale Tract Values for Leased "D"  
Rated, Minimally Valued Tracts

<u>Prospect area</u>	<u>Number of tracts</u>	<u>Federal value \$ per acre</u>	<u>Average accepted bids \$ per acre</u>
Santa Rosa	11	\$25	\$115.68
Tanner Cortez	20	25	452.88
Santa Barbara/ Catalina	3	25	351.76
San Pedro	5	25	299.83

The inadequacy of data can also be seen by examining Survey's postsale review of bids. During the postsale bid analysis eight tracts had their values recomputed (see table below).

<u>Tract number</u>	<u>GS Presale value \$ per acre</u>	<u>GS Postsale value \$ per acre</u>	<u>High bid accepted \$ per acre</u>	<u>High bid rejected \$ per acre</u>
74	\$1,877.00	\$ 535.00	\$ --	\$ 44.06
75	6,047.00	1,813.00	1,761.00	--
76	4,261.00	25.00	916.00	--
103	6,102.00	4,449.00	2,119.79	--
104	7,473.00	5,939.00	5,791.00	--
114	2,099.00	1,195.00	1,609.03	--
116	1,185.00	612.00	--	264.08
126	4,530.00	<u>1/</u> 530.00	--	529.54

1/Survey recommended that this tract be leased for the high bid (\$530 per acre), however, the Secretary, who has the final decision, rejected this bid.

According to Survey the above tract values were reviewed because of errors--relating to the use of inconsistent factors for pay thickness, recovery, production rates, and overstated development costs--in certain parameters used in the original Monte Carlo simulation analysis. An additional factor in deciding to accept the lower industry bids for three of the five above tracts leased was that the presale tract value had a "D" reliability rating.

For example, tract 103 had a presale value of about \$6,100 an acre and a high bid of \$2,120 an acre. During the post-sale review of bids, it was determined that a greater recovery factor had been applied to this tract than adjoining tracts and there was no basis for the difference. The value for this tract was recomputed at \$4,449 an acre. It was felt that the difference between the bid and postsale value (about \$2,300 an acre) was not inconsistent with range of error expected from a "D" category tract. The tract was therefore recommended for acceptance and eventually leased despite a difference of over 100 percent between the postsale value and the high bid.

In our opinion, comparison of presale values to high bids is a more objective way to assess Survey's evaluation capabilities. Values developed after industry bids are known are subject to other than geologic influences. The above example shows the Department's lack of confidence in their own valuation of tracts. With adequate data on resource potential, the Department could have had greater reliability and confidence in its estimate of tract values. Consequently, decisions to lease tracts are not reliable and cannot assure the receipt of a fair market value for the tracts.

#### Lack of competition

Competitive leasing programs are based on the premise that competition will provide a fair market value for the product sold. This is only true, however, when highly competitive market conditions exist. When competitive market conditions do not exist, it is necessary to value the product being sold independently and base accept/reject decisions on these valuations. We believe that the goal of a valuation program should be to develop estimates which represent what a competitive market would yield. However, Survey's presale evaluation was based on inadequate data (91 percent of tracts offered had a "D" reliability rating).

Sale #35's results show a lack of competition. Of the 231 tracts offered only 70 (about 33 percent) received bids and 56 (24 percent) were eventually leased. Additionally, the majority (70 percent) of the tracts bid on received only one or two bids each; of the 56 tracts leased, 36 tracts received only 1 or 2 bids (30 of these tracts had one bid). The table below shows the frequency of bids per tract.

**Analysis of Tracts by Prospect Area Showing  
the Number of Tracts Bid on and the  
Frequency of Bids Each Tract Received**

<u>Prospect Area</u>	<u>Tracts bid on</u>	<u>Frequency of Bids per Tract</u>									
		<u>1 Bid</u>	<u>2 Bids</u>	<u>3 Bids</u>	<u>4 Bids</u>	<u>5 Bids</u>	<u>6 Bids</u>	<u>7 Bids</u>	<u>8 Bids</u>	<u>9 Bids</u>	<u>10 Bids</u>
Santa Rosa	<u>1/ 12</u>	11	1	--	--	--	--	--	--	--	--
Tanner-Cortez	35	13	7	2	5	2	2	--	3	--	1
Santa Barbara/ Catalina	3	3	--	--	--	--	--	--	--	--	--
San Pedro	<u>20</u>	<u>13</u>	<u>1</u>	<u>2</u>	<u>1</u>	<u>2</u>	<u>1</u>	--	--	--	--
<b>Total</b>	<u>70</u>	<u>40</u>	<u>9</u>	<u>4</u>	<u>6</u>	<u>4</u>	<u>3</u>	<u>0</u>	<u>3</u>	<u>0</u>	<u>1</u>

1/Note: one bid was disqualified because it was not from a qualified bidder.

Since market conditions were not perfectly competitive the only way to assure the public receives the fair market value for the sale of national resources is to improve the reliability of the valuations by obtaining and using better information.

**Lack of time to review  
presale valuation data**

According to the presale evaluation procedures, approximately one week prior to the sale, Survey is to provide an evaluation review package of information to a Bureau evaluation review team. This material is to include tract values and all relevant input data used for the valuations. The team does not have the expertise to do an in-depth analysis of the evaluations, but they do check the input data and tract data summary sheets to find any glaring differences in the inputs of adjacent tracts. If the input data and tract data summary is considered inadequate, the team can recommend to the OCS Manager that the tract be deleted from the sale.

Survey was unable to provide the evaluation package until the afternoon before the sale and all the information was not contained in the package. Comments made by the review team in

its postsale analysis of the tract evaluation procedures for Sale #35 included,

"The team did not have all the tract evaluations made available to it and could do only a cursory examination\* \* \*. Additionally, the review team was not provided with a list of tracts and their data reliability ratings as specified in the agreement."

The team report also stated that due to the time element, there was no opportunity for the review team and Survey staff to discuss the effects of late information and corrections.

This presale cursory review of tract values resulted in some postsale problems during the bid acceptance/rejection process. Tract values for 31 of the 70 tracts receiving bids were reviewed by Survey and the Bureau before making its final acceptance/rejection recommendation to the Secretary. Factual and/or procedural errors were detected in 8 of the 31 (26 %) values. These errors dealt with assigning improper development costs to tract values, assigning inconsistent recovery factors, pay thickness, oil rates, and risk factors (factors included in Monte Carlo Method of simulation).

#### Need for a systematic exploration plan

The need for sufficient data is critical to (1) identify where to lease so that domestic oil and gas production can be increased in the near future and (2) determine the fair market value for leased lands. In spite of this need, the Department has been reluctant to undertake a systematic exploration program to collect data on previously unexplored frontier land.

For Sale #35, the Department has maintained its policy of relying on industry to perform the necessary geophysical and geological tests. The Department does not contract for exploration drilling information but may contract for other types of data, such as seismic. In collecting data for the sale, the Department did not conduct any surveys of its own, but obtained much of the raw data from industry and firms who specialize in data collection. As a result, since the survey locations are determined by industry interest, an over-abundance of data for some areas existed while other areas remain relatively unexplored.

The position that Survey maintains, with respect to adequacy of data for tract evaluations, is one of parity with industry. It believes that the amount of data collected for

a sale area is adequate when the Department has at least the same amount of data as industry. This policy, however, fails to recognize that industry and Department objectives are not similar. The Department's objective should be to obtain the best data possible for valuing tracts being offered in a sale. Industry, however, can focus their exploration activities on fewer tracts. The results of this policy are very evident in Sale #35. One area (San Pedro) had much more information available for reliable tract evaluation than the other three prospect areas.

Another problem with industry's data collection efforts deals with the leasing process itself. According to Survey officials, the time interval between tract selection and the sale does not permit industry to adequately survey the entire sale area. This results in conducting surveys in the areas of greatest interest, leaving other areas with relatively small amounts of data for both industry and the Department.

Survey has been reluctant to sponsor data collection surveys in these areas where adequate information does not exist since the law does not provide funds for such studies and Departmental policies and procedures do not require it.

#### CONCLUSIONS

The Nation greatly relies on the OCS leasing program for increasing our domestic oil and gas production to meet our near term domestic energy needs. Decisions regarding where to lease and at what rate to lease will have significant impact on whether our goal--decreasing our reliance on foreign energy supplies--is attained. The Department's policy of leasing maximum resource in minimum time could have adverse effects on our domestic energy production. This policy encourages speculation in OCS lands. It can result in tying up industry capital in lands with no or minimal resource potential or infringing on the public's right to receive fair market value from the sale of publicly-owned resources.

We believe the Department should schedule lease offerings in geographical areas and adequate acreage amounts to extend the capability of the non-renewable resource as fully as possible and still meet our near term domestic energy needs. Before scheduling lease sales, however, the Department should conduct a systematic program to identify the specific amounts of resource available for production on the OCS. Such information gathered across the OCS would provide

--the Nation with a better knowledge of the total OCS resource potential for the purposes of formulating broad energy policy;

--Interior with a basis for prioritizing the areas for leasing purposes;

--a better basis than now exists for evaluating resource development potential and potential environmental impacts (both within and between geologic areas) if used in conjunction with the results of available environmental information involving the same geologic areas; and

--more reliable valuing of tracts to assure that the public receives a fair market value return for the lease offerings.

The results of OCS Sale #35, however, indicate that the Department does not have sufficient geological information to identify the amounts of resources available for production. Instead of developing and implementing a systematic exploration plan for resource appraisal, the Department relies on tract nominations made by industry, which also does not have sufficient geological information to decide where to lease.

This lack of geological information, compounded by the Department's unrealistic attempt at meeting its leasing acreage goal, resulted in sale tract selection that the Department believed (1) contained either no resource or an insufficient amount of resource to make an economic profit and (2) in water depths that exceed the current technical production capabilities.

In addition, the tract values assigned by the Department were not reliable. The public was not assured a fair market value return for lease offerings because data reliability was weak and competition was poor. In addition, the Bureau review team was not provided with all tract values and necessary information before the sale and did not consider late information or corrections to computations.

#### RECOMMENDATIONS TO THE SECRETARY OF THE INTERIOR

The Secretary of Interior should take the following actions.

--Direct a geological exploration program which would provide for the development and implementation of a systematic plan for appraising Outer Continental Shelf oil and gas resources, including selected stratigraphic test drilling. The plan should identify the level of stratigraphic drilling necessary to provide a minimal level of data coverage for major OCS areas.

--After the plan has been developed, encourage private industry to conduct the drilling identified in the plan subject to the developed information being shared with Interior on a confidential basis. Exploration permits issued by the Department for private drilling should provide the opportunity for any bonafied potential bidder to "buy-in" on the exploration by paying a pro-rata cost of the drilling.

After the extent of industry participation is known, if any data gaps still exist, take the necessary actions, including public financing of stratigraphic drilling, to obtain the needed data.

--In addition, after obtaining and evaluating the above information, should take the necessary steps to encourage industry to obtain further information after the tract selection process is completed. These additional activities should focus on the specific tracts selected and help develop reasonably sound information for presale evaluation purposes. The results again should be shared with Interior on a confidential basis. Exploration permits issued by the Department for private drilling should provide the opportunity for any bonafied potential bidder to "buy-in" on the exploration by paying a pro-rata cost of the drilling.

After the extent of industry participation has been reviewed and evaluated by Interior, if any significant data gaps exist, take the necessary actions, including publicly financed stratigraphic drilling, to obtain data.

--Offer for lease sale only those areas for which the Department has collected and analyzed sufficient information to adequately identify where the resource is, its estimated value, and its potential for development in the near future.

--Require Survey and the Bureau to consider all necessary information and make final corrections to tract values prior to the sale being conducted.

The Department questioned whether our recommendation would yield benefits in excess of costs for such a program. However, it has never chosen over the past several years to undertake any cost-benefit analysis to support its position. By separate letter to the Secretary we have encouraged the Department to initiate such an analysis. In the meantime, we believe there is compelling evidence, as demonstrated in this report, that the present system is wholly inadequate to protect

the public interest and its resources and accordingly recommend proceeding with the program outlined in our report. Such a cost-benefit analysis may be helpful in evaluating the usefulness of such a program. However, we believe that no cost-benefit study can substitute for actual experience from a Government financed drilling program.

#### RECOMMENDATION TO THE CONGRESS

Selecting high resource development potential tracts for sale and valuing them reliably to assure that the public receives a fair market value return can only be accomplished effectively if sufficient geotechnical data exists at the time decisions are made. The 94th Congress considered a bill (S. 521) which directed the Secretary to conduct a survey program of OCS oil and gas resources. As part of the survey program the Secretary was authorized to either contract for, or purchase, required geotechnical information (including stratigraphic drilling) which is not available from commercial sources. At the close of the 94th Congress this bill was with the Conference Committee to work out differences between House and Senate versions.

In April 1975 we testified before the Senate Committees on Interior and Insular Affairs and Commerce regarding the need for improved policies and procedures for the rational exploration and development of OCS fossil fuel resources. At that time we endorsed the overall thrust of the legislation designed to improve the Government's ability to deal with OCS exploration and development problems.

Bills S. 9 and H.R. 1614, identical to S. 521, have been introduced into the 95th Congress. The recommendation in this report is in line with the thrust of provisions in the proposed legislation to provide for an OCS leasing program that will identify size, timing, and location of leasing to meet national goals and to assure receipt of a fair market value for the oil and gas owned by the Federal Government. We recommend the Congress favorably consider this legislation.

## CHAPTER 4

### AGENCY COMMENTS

#### DEPARTMENT OF THE INTERIOR

The Department, in commenting on this report on February 24, 1977, (see app. VII), stated that Secretary Andrus has not had time to formulate his position on many items relating to OCS lease sales which are discussed in the report and reserves judgment on these issues. The Department did not agree with our findings that inadequate information about resource potential, coupled with pressure to meet acreage goals, resulted in selecting tracts which the Department believed had little resource development potential and consequently derived unreliable tract values. An analysis of specific Department comments follow.

#### Bonus estimates

The Department pointed out the difficulty of accurately estimating bonuses for budget purposes as far as 18 months in advance of a proposed sale and that the estimating model used for Sale #35 was not appropriate and is no longer used. The Department also stated they no longer make bonus estimates for an individual sale. Instead, a single revenue estimate is prepared for total acreage to be offered for an entire year. They stated that this procedure tends to average significant sale by sale differences which are likely in frontier areas, and thereby provide a more accurate overall budget estimate.

The Department pointed out that the bonus estimating procedures are not related in any manner to Survey's presale tract-by-tract estimate and thus the difference between the bonus estimates and the total high bids received proves nothing concerning whether or not the public received fair market value. Additionally, the Department agreed that the accuracy of bonus estimates could be improved by acquiring additional data, but they questioned whether the improved accuracy is worth the cost to the public and private sector of acquiring the additional data.

We are aware that the bonus estimates and presale tract-by-tract estimate are not related as we discussed on page 7 of our report. We also made no comparison of the bonus revenue estimate for budget purposes with the actual bids to imply that less than fair market value was received. We do believe, however, that the Department needs to obtain

more reliable data to meet the Nation's goal of increasing domestic energy production and to achieve its goal of orderly and timely resource development. By obtaining more reliable data, the Department would have a better basis for selecting the best areas for lease and development and for tract valuations. We believe that an additional benefit that would accrue from obtaining more reliable data is improved accuracy of estimating bonus revenues for budget estimating purposes.

### Tract selection

The Department commented that acreage selected for Sale #35 was not based on a desire to lease as much as possible and that the Department does not have acreage goals. The Department said its leasing strategy for Sale #35 was to offer a sufficient number of tracts in each area to give maximum opportunity to discover oil and gas consistent with environmental safety. They felt that this would insure that major structures containing oil and gas would be rapidly explored to provide knowledge of the OCS' actual potential in meeting domestic energy needs.

As discussed in the report, despite the renouncement of specific acreage goals, plans and preparations for OCS Sale #35 were made during the policy's existence and consequently impacted on this sale. Also, if acreage selected was not based on a desire to lease as much as possible why were 50 contingency #1 tracts included in the sale despite the Survey and Bureau field offices statement that, "contingency #1 or #2 do not have high potential and are not recommended for lease offer unless large acreage commitments are required."

While the Department stated they have no acreage leasing goals, we point out that acreage is used for budget estimates. The latest estimates show between 4 and 5 million acres will be offered in each of the next three fiscal years.

We believe the Department's strategy used for Sale #35 results in private industry obtaining and developing information of OCS resource potential after the tracts are leased. Consequently, the Department, which is charged with managing these resources to assure that national energy goals are accomplished, is not in an adequate position to select the optimum area for lease and assess the true value of the potential resources.

## Tract evaluation and fair market value

The Department believed it had enough information to make reliable estimates of resource potential and tract values. It pointed out that at the time of the sale, Survey had obtained over 14,000 line miles of seismic data covering all tracts and studied 414 oil and gas fields in California. Data on field size, net pay thickness, recoverable hydrocarbons, and structure success ratios were developed. These analogs plus other available data allowed Survey to estimate the presence or absence of resources, the quality and quantity of reservoirs, including porosity, location and size of structure. Data from 239 coreholes and a deep stratigraphic test were also used. The Department believed that it did determine that the necessary characteristics for petroleum accumulation existed.

We maintain our view that the Department did not have adequate information on resource potential for selecting and valuing tracts. The Department comments do not address that the majority of the tracts offered for lease (91 percent) were "D" rated which is defined as:

- questionable data on gross sand conditions and depth,
- fair to poor knowledge of geologic risk,
- fair to good knowledge of structure, and
- weak to fair regarding Survey's estimate of tract values.

In addition, about 85 percent of the tracts offered were valued at the minimum worth of \$25 an acre, which means that the tracts were estimated to contain either no resource or an insufficient amount of resources to make an economic profit. If the Department believed adequate information existed to evaluate these tracts, why were the minimum valued tracts offered for sale? Offering tracts estimated to contain limited resources does not meet the Nation's goal of increasing domestic energy production or the Department's goal of orderly and timely resource development.

Regarding the adequacy of data, at a hearing before the Senate Subcommittee on Minerals, Materials and Fuels, Committee on Interior and Insular Affairs, on October 21, 1975, the Department stated that about 20,000 line miles of marine

seismic data are required to evaluate 1,000,000 acres offered for sale. For Sale #35 about 1.3 million acres were offered for sale, but the Department states they had about 14,000 line miles of seismic information. According to their own criteria about 26,000 line miles of the data would have been required for adequate seismic evaluation.

The data for the 239 coreholes were primarily from the San Pedro area. As stated in the report, this area had the highest reliability ratings and consequently the lowest investment risks; the eight highly rated tracts leased in this area (14 percent of all the tracts leased) accounted for 53 percent of the total sale revenues.

The Department disagreed with our analysis linking data availability and revenues received from tracts leased. They stated the reasons the San Pedro area received higher bids than the Tanner Cortez area, which was estimated to contain 2-1/4 times more oil reserves per tract, was not due to lack of data but to other factors such as shallower water depths and shorter distance to shore.

This comment does not consider the fact that industry capital flows to investments with potential low risk and high returns. Of the four areas offered for lease, the San Pedro area most fulfilled this requirement. It had the only tracts rated higher than "D" and on one tract hydrocarbons had been identified.

We agreed that other factors impact upon the bids per area. However, as shown on p. 27 the average water depths for tracts leased in the Tanner Cortez area are about the same depth of the tracts leased in the San Pedro area.

The Department disagrees that the present OCS leasing procedures encourages speculation. They state that the report offers no proof that companies have bid and won tracts for the purpose of speculating. They point out that the reason for low bids on OCS sales in 1975 was that three of the four sales involved the Gulf of Mexico where the best potential acreage has already been leased and the fourth sale was Sale #35--a frontier area. Secondly, the Department states that a 1976 sale (#40) had average bids three times greater than the 1975 average bids.

However, it is a basic principle of economics that flooding the market place with a commodity tends to reduce its market value. This decrease in value may make it more

attractive to take speculative risks. Further the future domestic energy outlook for oil and gas resources is limited, enhancing the climate conducive for speculation, particularly if producers hold back production waiting for prices to rise. Since the leases can frequently be purchased at extremely low prices, holding costs are minimal.

Recent news stories about the Department's preliminary investigation of natural gas withholding may be providing an example of speculation. An analysis by the Department of production and reserves data for five offshore fields in the Gulf of Mexico indicated that natural gas was not being produced to its capabilities at a time when parts of the Nation were suffering a severe winter and a natural gas shortage. The Department intends to further investigate this matter.

As for the higher results of Sale #40, the Department has stated and we acknowledge that many factors influence bidding results. Sale #40 involved leasing tracts in a frontier area that holds great industry interest. These lands are easily accessible to existing refineries and to the ultimate market for the developed products.

The Department stated that the report offers no proof that the public does not receive fair market value for its resources. The Department's presale evaluation is conducted to determine what it believes to be each tract's resource value. The Department commented the Government goal is not to see how close it comes to the highest bid. Industry bids are determined by many factors in addition to resource evaluation such as its assessment of competition, need for reserves and its aversion to risk. These items cannot be quantified by Survey. Therefore, the Department feels a comparison of the high bid to Survey's presale value is not by itself the measure of whether or not the public received fair market value.

In our opinion the leasing procedures described for Sale #35 does not provide an adequate level of assurance that fair market value is received. We believe this because:

--91 percent of the tracts values developed for this sale had a "D" reliability rating and were based primarily on seismic data, which according to previously discussed Department criteria was about half the amount of seismic coverage needed; and

--the present system results in the real evaluation of resource potential after the lease sale, a situation we consider contrary to normal business practices of knowing the value of products and services sold.

The table presented on page 29 highlighting the difference between industry bids for certain tracts which the Government nor industry really has any idea of resources being sold or purchased. The range of industry bids above the Government values is from over 400 percent to over 1,800 percent. While it will not be known for years whose overall evaluation of resources was the better, this system has resulted in industry spending capital speculatively for assets of unknown value. It is conceivable this capital could be applied to exploration and better data would become available on where OCS energy resources exist before leasing. The Government would then have a better basis for judging the value of OCS areas, industry competition for energy resources should improve because less risk would be associated with the investment, less industry capital will be applied to unproductive leasing rights, and the chances for receiving fair market value would increase.

#### Government financed exploration

The Department questions whether securing additional data prior to a lease sale will increase revenue and states that to determine whether oil and gas actually exist would require a massive and extremely expensive drilling program. They felt that we did not adequately discuss the benefits and cost of such a program. In addition, the Department believed such an exploration program could cause possible delays.

We are not advocating as the Department infers a totally financed Federal drilling program designed to actually prove the existence of oil and gas. We are proposing that a plan for systematic appraisal of OCS resource potential be developed which would identify, among other things, those specific areas where the Department of the Interior determined that stratigraphic drilling should be performed. We believe that private industry should then be encouraged to perform the planned stratigraphic testing to the extent it is willing to do so. However, we believe that the Government should finance any additional drilling needed to fully carry out the resource appraisal plan. Such an approach will provide better information to realistically assess the oil and gas potential of OCS areas.

Concerning the cost effectiveness of such a program, the cost to the Federal Government cannot be determined until the Department of the Interior develops a resource appraisal plan, identifies the levels of stratigraphic drilling needed to assess major OCS areas, and determines the extent to which private industry is willing to perform such drilling. The benefits of stratigraphic drilling, although difficult to quantify, could be measured, to some extent, by industry's willingness to undertake such efforts under a positive comprehensive program developed by the Department of the Interior. In any case, it should be the business of the Department to make such assessments including a cost-benefit analysis. The fact that it has not chosen to do so in no way negates our argument that such a program might not be beneficial to the public interest. By separate letter report, we encouraged the Department to undertake such an analysis.

One way to initiate a drilling program could be through a notice in the Federal Register encouraging industry to conduct the needed drilling to the greatest possible extent, subject to the developed information being shared with Interior on a confidential basis. We believe there is industry interest in OCS exploration as indicated by participation in recent exploration activities. Cost of a recent stratigraphic test off the Atlantic Coast are being shared by 31 companies. After the extent of industry participation was known, if any gaps then existed, Interior should take the necessary actions, including public financing of stratigraphic drilling, to obtain the needed data.

Benefits will also accrue by having a systematic exploration program other than revenue benefits to the Treasury. Such a program will provide for the timely and orderly development of OCS resources to meet the national goal of increased domestic energy resource production and can aid significantly in decisions regarding tradeoffs between development and potential environmental and social impacts accompanying a leasing and drilling program.

Although we agree that exploration activities could delay leasing somewhat, we are aware of no evidence to indicate development would be similarly delayed, and Interior does not offer any supportive evidence. Interior's argument does not take into account the fact that exploration is a prerequisite to development in any event whether or not the timing of this activity is before or after leasing.

OFFICE OF MANAGEMENT  
AND BUDGET (OMB)

OMB commented in a letter dated February 23, 1977.  
(See app. VI.) A discussion of their comments follows.

Budget estimates

OMB believes that significant improvements in OCS revenue estimates for budget purposes would be quite costly. They stated that sales receipt estimates are subject to multiple sources of uncertainty (see Appendix VI for a detailed list as discussed by OMB), most of which are not affected by changes in the degree of geological knowledge about the tracts to be offered. OMB questions whether obtaining significantly better geological knowledge at the early stages of the leasing process to serve budget estimating purposes would be justified.

As stated previously, we are not advocating obtaining the additional geological information for the primary purpose of improving OCS revenue estimates for budget purposes. We consider this only to be a secondary benefit. While we recognize that the factors cited do indeed affect OCS sales revenue, improved knowledge of energy resources is still an important element that affects these estimates. We believe the Department needs to obtain more reliable geological information to have a better basis for selecting the best areas for lease and development and valuing the national resources being sold. Under the present method these key decisions are being made based on unreliable data as rated by the Survey. With increasing domestic energy needs it is now more important in our opinion to increase the reliability of national efforts to find and produce OCS resources.

Fair market value

OMB does not agree that the use of uncertain tract values results in the Government receiving less than fair market value. They state that tract values are always uncertain until all of the oil is extracted. OMB feels that as long as competition is adequate and the Government knows as much as industry about the values of the tracts, fair market value will be received. OMB also states that the expected benefits resulting from a publicly financed drilling program are uncertain, however, it is certain that such a program would cost the Government significantly more to do such drilling.

We believe that OMB's characterization of the tract values as "uncertain" is somewhat improper. In our view the data used

to develop these tracts is not only "uncertain," but also unreliable. We recognize, as OMB states, that the total value of a tract will always be "uncertain" until all oil is extracted. The key question, however, is the reliability of the values developed under the present method. As Sale #35 demonstrates, this reliability is very low at best.

Secondly, OMB appears to believe that competition in OCS bidding is presently adequate and thus assures the receipt of fair market value. Our analysis of Sale #35 indicates that competition was inadequate. The table on page 30 shows that the majority (70 percent) of the tracts bid on received only one or two bids each. Additionally of the 56 tracts leased, 36 received only one or two bids (30 of these tracts had only one bid). We believe this does not indicate adequate competition.

Also related to the question of competition, OMB discusses in their comments that publicly financed drilling would not eliminate risk, but merely transfer it, along with the cost of producing this information to the Government. They state their belief that such a system is unlikely to significantly affect a major oil company's evaluation of risk. They point out, however, that the risk may have great significance to smaller bidders. They conclude that transferring risk to the Government by improving prelease information might simply increase the competitiveness of smaller bidders without significantly increasing winning bids.

As we and OMB have previously stated, competition is a key factor necessary to assure the receipt of fair market value. We believe that Sale #35 demonstrates a lack of competition. If increased competition from smaller bidders results from the attainment of additional prelease geological information we believe this would enhance the chances of receiving fair market value for leased Federal resources.

Sale #35 also demonstrates the importance of the presale value as a decision tool. The Department has never rejected a bid that exceeds the presale value of a tract. It is thus necessary in our opinion to improve the reliability of these values to assure the receipt of fair market value.

Improving the chances of obtaining fair market value for the national resources being sold, however, is not the only reason for increased exploration. We believe such data is necessary to obtain a better understanding of the OCS's potential and identify resource location. Such data would enable the Department to select areas for leasing bearing the best potential.

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 CHIEF COUNSEL AND STAFF DIRECTOR

## United States Senate

COMMITTEE ON THE JUDICIARY  
 WASHINGTON, D.C. 20510

December 16, 1975

Mr. Elmer Staats  
 Comptroller General of the United States  
 General Accounting Office  
 441 G St. N.W.  
 Washington, D.C. 20548

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Dear Mr. Staats:

As you know, there has been much confusion surrounding the results of the December 11, 1975 lease sale of Outer Continental Shelf oil and gas tracts of the Southern California coast. Therefore, I respectfully request that the United States General Accounting Office conduct a tract-by-tract survey to determine why the oil industry's bonus bids of \$438 million were far below the Federal Government's presale estimate of between \$1.5 and \$2 billion. A survey by G.A.O., an independent agency, could provide critical information concerning the disparity between the actual bids received and the presale estimates.

It would be beneficial if the G.A.O. could relate the results of this survey to results and recommendations of their studies on Federal leasing policies and practices which concludes that the Federal Government's Shelf evaluation program:

- - is hindered by inadequate data and analysis
- - does not reasonably insure that a fair market value return is received on lease offers of shelf oil and gas reserves, and
- - is being jeopardized by an accelerated leasing schedule.

The Senate has recently passed S. 521, The Outer Continental Shelf Management Act of 1975, which substantially revises the terms under which OCS areas are leased and developed. The House Ad Hoc Select Committee, which has held extensive hearings on this subject, will consider a final

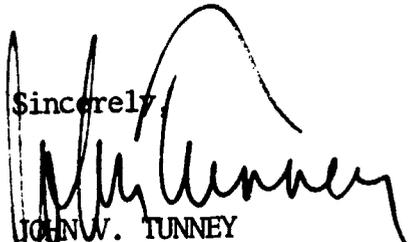
Page Two

House version in the very near future. The Congress recognizes the need to develop OCS oil and gas as swiftly as is practicable, but the Congress is initiating a major restructuring of the leasing procedure. Clearly, the results of the December 11, 1975 lease sale provides compelling evidence that the existing leasing procedure must be changed.

Because of the disappointing lease sale in Southern California, I am requesting Secretary Kleppe to reject all the bids that were received last week. I believe that Secretary Kleppe could take such action under the provisions of the OCS Lands Act of 1953 which requires that the Secretary secure a fair market value for the oil and gas produced on public lands. Given the urgency of this matter I would urge that this study be completed in two months and during that time no new leases be granted.

Because of the urgent nature of this request, your timely cooperation will be appreciated.

Sincerely,



JOHN W. TUNNEY  
United States Senator

JVT/ppp

ALAN CRANSTON  
CALIFORNIA

United States Senate

WASHINGTON, D.C. 20510

December 19, 1975

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1975 DEC 24 11 51

Honorable Elmer B. Staats  
Comptroller General of the United States  
General Accounting Office  
441 G Street, N.W.  
Washington, D.C. 20548

Dear Mr. Staats:

On December 11, 1975, the Bureau of Land Management of the U.S. Department of the Interior held an oil lease sale for 231 tracts on the outer continental shelf off Southern California. The resulting high bids were so far below the Department's pre-sale estimates that serious questions remain about the wisdom of the Administration's decision to push forward with this sale at this time.

I am aware of the fact that the General Accounting Office, as a general policy, does not intervene in an on-going administrative decision-making process. I am also aware that there may be legal constraints on GAO if I were to request an audit of the Department of Interior's evaluation of the high bids received at the December 11th sale, prior to a final decision. Nevertheless, these low bids will have impact on the federal budget. They are \$1 billion less than the estimate in the Budget Resolution adopted by Congress and \$1.5 billion less than the Interior Department estimate made this month. Therefore, I wish to advise you of my intention to request that GAO undertake an audit of the Department's sale if and when any of the high bids are accepted.

Prior to the sale, the Department of Interior publicly stated that estimated high bids would total between \$1.5 billion and \$2 billion. The great disparity between this pre-sale estimate and the actual result of only \$438 million bid on only 70 of the 231 tracts, raises serious question about whether these high bids are sufficient compensation for the private exploitation of this publicly-owned resource. By comparison, a sale of 71 tracts in the Santa Barbara Channel in 1968 -- when the price of oil was about one-fourth of what it is now -- yielded high bids totalling more than \$600 million.

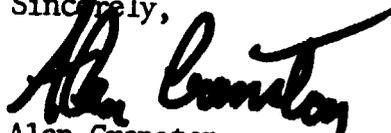
Because the GAO has previously studied many aspects of the Administration's accelerated leasing program, I believe it would be appropriate and enlightening for GAO to conduct a thorough post-sale audit. A request for

Honorable Elmer B. Staats  
December 19, 1975  
Page Two

such an analysis was made to me by the Honorable Tom Bradley, Mayor of Los Angeles, in a letter dated December 15. A copy of his letter to me is enclosed for your review.

Any comments you may have at this time will be appreciated.

Sincerely,



Alan Cranston

Enclosure

cc: Honorable Thomas Kleppe

SUMMARY OF OCS LEASE SALES  
CONDUCTED SINCE DECEMBER 11, 1975

	Southern California (Sale #35) December 11, 1975	Gulf of Mexico (Sale #41) February 18, 1976	Gulf of Alaska (Sale #39) April 13, 1976	Mid-Atlantic (Sale #40) August 17, 1976
Date Sale Conducted				
Tracts Offered	231	132	189	154
Tracts Leased	56	34	76	93
Percent Tracts Leased to Offered	24.2%	25.7%	40.2%	60.4%
Tracts Minimally Valued Offered	195	110	161	108
Percent Tracts Minimally Valued to Total Tracts Offered	84.4%	83.3%	85.2%	70.1%
Tracts Minimally Valued Leased	39	23	53	58
Percent Tracts Minimally Valued Leased to Minimally Valued Offered	20.0%	20.9%	32.9%	53.7%
Total Tracts with "D" Reliability Rating	211	61	189	154 *
Percent Total Tracts with "D" Reliability Rating	91.3%	46.2%	100.0%	100.0%
Acres Offered	1,257,593	687,604	1,008,499	876,750
Acres Leased	310,049	161,286	409,057	529,466
Percent Acres Leased to Offered	24.7%	23.4%	40.6%	60.4%
Bonus Bid Revenue Received	\$417,312,141	\$175,976,493	\$559,836,587	\$1,127,936,425
Bonus Bid Per Acre Received	\$1,346	\$1,091	\$1,369	\$2,130

\* Reliability rating definition revision resulted in "D" rating being reclassified as "E" rating, so that all the tracts listed for Sale #40 were rated as "E".

SURVEY DEFINITIONS OF  
EVALUATION RELIABILITY CATEGORIES

- A. Drainage and has excellent control, good data, with little (relative) uncertainty with regard to exploratory value.
- B. Good knowledge and good well or geophysical control, may have some production data; part of evaluation has some doubt, especially if the exploratory portion is large.
- C. Good knowledge of structure configuration and size; well control may be interpolated into tract to predict sand conditions, depth, and hydrocarbon potential; good knowledge of geologic risk.
- D. Fair to good knowledge of structure configuration and size. Poor to no well control. Stratigraphic data may or may not be adequate to predict gross sand conditions and depth; fair to poor knowledge of geologic risk.
- E. Poor to very poor well control, useful geophysical data sparse to non-existent, stratigraphic data poor. Poor knowledge of geologic risk.

BUREAU EXPLANATION OF POSTSALE ANALYSIS CHARTPROVIDED TO GAO

- A. Actual drainage is taking place or would be taking place when production facilities are established. Production data and/or test data available on offsetting wells. Good well control to establish reservoir limits. Good idea of reserves. Seismic may be available, but not necessarily required.
- B. Possible drainage and/or development. Less well control than (A). Structure may be confirmed by seismic to some extent. Some idea of reserves.
- C. No drainage involved. Sufficient well control and/or seismic data to identify structure. Good evidence of trend and conditions under the prospect.
- D. Either stratigraphic or structural information is poor. Both may be weak to fair in regard to estimating value. Some idea of structure should be known.
- D. Insufficient well control and/or seismic to show structure. Trend may be unknown. Very little opinion as to actual value.



EXECUTIVE OFFICE OF THE PRESIDENT  
OFFICE OF MANAGEMENT AND BUDGET  
WASHINGTON, D.C. 20503

February 23, 1977

Mr. Victor L. Lowe  
Director  
General Government Division  
General Accounting Office  
Washington, D. C. 20548

Dear Mr. Lowe:

Thank you for the opportunity to comment on the draft General Accounting Office report on outer continental shelf sale #35.

I have enclosed the comments on the draft prepared by my staff. I hope these are helpful to you.

Sincerely,

A handwritten signature in black ink, appearing to read "Bert Lance".

Bert Lance  
Director

Enclosure

**Comments on Draft General Accounting Office Report  
Assessing Outer Continental Shelf  
Sale #35**

[See GAO note, p. 57.]

Information and Budget Receipts Estimation

The draft report implies that better geological information would substantially improve budget receipts estimates. We believe that significant gains in estimate quality would be quite costly to obtain because:

- receipts estimates must be made as much as 22 months before the sale date.
- tracts may not yet have been tentatively selected for the sale. This means that neither the industry nor the government has completed the collection of detailed geophysical data, much less the analysis of it. Collection and analysis of detailed geophysical data for the whole nominations area (for sale #35 this was 7.7 million acres compared with 1.5 million acres tentatively selected) could be done early enough to impact the initial budget receipts estimates. Stratigraphic tests to cover the whole area open for nominations could also be drilled. Whether this five-fold or more increase

in cost would be justified by the resulting improvement in budget receipts estimates is not clear. (The data acquisition cost increase is likely to be much greater than five-fold since tract by tract information currently used to evaluate tracts for bid acceptance or retention now frequently includes much information collected by industry, and obtained by the Geological Survey at no cost to the government, subsequent to tentative tract selection.)

- In frontier areas neither costs, time periods required to explore and develop, nor industry discounts for risk are known until substantial leasing and operating experience has been gained. Since bids are very sensitive to these factors, merely knowing somewhat more about the geological promise of the area may not significantly reduce the uncertainties in receipts estimates.
- When rates of leasing are significantly changed, industry bidding behavior will be changed since future opportunities will be different. The expectation is for more selectivity in bidding, but it is impossible to determine in advance, exactly how and to what extent industry will respond.
- Price/cost relationships for finding new oil change over time. Current data on these economic factors are not complete and comprehensive. More importantly bidding behavior is actually based on industry anticipations about future price/cost relationships, for which no data is available.
- At the time initial budget receipts estimates must be made, the Secretary of Interior has not yet determined whether tracts will be deleted from the sale for environmental or other reasons. Since candidates for deletion may be valuable, high-bonus tracts, the receipts estimates are subject to additional uncertainties because environmental information is not complete until late in the sale process.
- Sales included in the budget estimates may be later delayed, indefinitely deferred, or reduced in size because of:
  - secretarial decisions to do so after all of the relevant information is made available, or
  - litigation.

In short, sale receipts estimates are subject to multiple sources of uncertainty, most of which are not affected by changes in the degree of geological knowledge about the tracts to be offered. Whether the substantial costs of obtaining significantly better geological knowledge at early stages of the leasing process to serve budget estimating purposes would be justified by the improvement in budget estimates is questionable.

### Information and Fair Market Value

The draft also suggests that the receipt of fair market value for outer continental shelf tracts can not be assured as long as their values are uncertain. Unfortunately, the value of such tracts are always uncertain until actual production is finally completed.

The degree of uncertainty depends upon the level of geological knowledge about the tracts and upon many other things. For any given state of geological knowledge about a particular tract, each potential bidder will have a maximum value which he thinks the tract is worth. Because of the uncertainties there will be great variation in the values that potential bidders will put on the tract. Given sufficient competition, the bidders will have incentives to bid their full estimates of the tract's value. The high bid will then be a fair representation of the value which a competitive market places on the profit opportunities and uncertainties represented by the tract. This is our understanding of the meaning of "fair market value."

The question of whether it would be more advantageous to the government to sell the tract when a different state of geological knowledge about the tract is available is a different question than whether fair market value is achieved.

The discussion in the section "Data reliability weak to fair for estimating tract values" seems to assume that having more tract information available prior to leasing would increase receipts from leasing by more than the costs of obtaining the information and would increase exploration efficiency. The cost of this better information in the example on page 40 would have been \$27 million for six additional stratigraphic tests. The implication conveyed is that without those six tests, the public is not likely to receive fair market value. On page 39 an example is provided, to buttress the argument, in which a tract containing economically productive hydrocarbons has its value increased by better information.

[See GAO note, p. 57.]

If bidders were indifferent to risk and their value estimates were unbiased, improved information would have no effect on total receipts. Gains in receipts on good tracts due to better information would be exactly balanced by losses in receipts on bad tracts. However, bidders are likely to be averse to risk and therefore the gains from better information are likely to exceed the losses. Government production of that better information does not eliminate the risk, it merely transfers it, along with the costs of producing the information, to the government.

Whether or not the government will be better off for having accepted the risk and the costs of producing the information, depends on the following:

- How much if any, the "cost" of risk is lower to the government than to the bidders, and
- how much, if any, the information produced by the government replaces investments in information that would have been made by the bidders.

If the bidders put a higher value on the risk than the government's valuation of that same risk, there will be a net gain in bonus receipts to set against the costs of producing the information. The risk evaluation of a major oil company is not likely to be much different from that of the government. For smaller bidders, on the other hand, the risk may have great significance. For this reason, transferring risk to the government by improving pre-lease information might simply increase the competitiveness of smaller bidders without significantly increasing the winning bids.

If the information produced by the government replaces information investments that would have been made by the bidders, the costs of those investments should be credited against the costs of the government's pre-leasing information collection. However, it seems unlikely that such credits would amount to much. The industry is now free to drill as many off-structure stratigraphic tests before leasing as they wish. They generally choose to drill only a very few.

In short, it is not self-evident that increasing the amount of pre-leasing information would be advantageous from a government point of view. It is possible that the government would gain from more information, but it is also possible that it would lose. It is certain that it would cost the government significantly more to develop the information.

GAO note: The deleted comments relate to matters which were discussed in the draft report but omitted from this final report. Page references refer to the previous draft report and are not applicable to this report.



# United States Department of the Interior

OFFICE OF THE SECRETARY  
WASHINGTON, D.C. 20240

FEB 24 1977

Dear Mr. Canfield:

In response to your January 28, 1977, letter we submit the following comments on GAO Draft Report, "Assessment of Outer Continental Shelf Sale #35-Southern California."

First, Secretary Andrus has not yet had time to formulate his position on many of the items relating to OCS lease sales which are addressed in your report. He reserves judgment on those issues until he has had an opportunity to thoroughly review and study the OCS program. Second, there are errors of fact and a number of incorrect or incomplete arguments included in the draft report as presented to the Department. For instance, while the draft report argues strenuously for having the Department secure substantial amounts of additional data prior to a lease sale, it does not present a benefit-cost analysis concerning this recommendation. As is commented on later in this letter, securing added data would be costly and might not lead to the results claimed by the report.

We do not agree with GAO's contentions that inadequate information about resource potential coupled with pressure to meet acreage goals resulted in selecting tracts which the Department believed had little resource development potential, nor do we agree that the Department derived unreliable tract values based on inadequate data interpreted by inexperienced personnel.

The remainder of this letter presents our comments, first on some broad areas of concern and later on some specific points we consider to be in error.

## Bonus Estimates

Estimating under the best of circumstances is fraught with uncertainty. Bonus estimates are sometimes prepared as much as 18 months before a sale for budget purposes. The bonus estimating model used for OCS lease sale #35 was based solely on the Department's experience in the Gulf of Mexico, as there were no data on frontier experiences. A review of the model after the California sale indicated that it was not appropriate for estimating revenues for OCS lease sale #35, or any sale in a frontier area. As a result, the Department discontinued using the model for estimating revenues in frontier areas. Instead, the revenues received and percent of acreage sold for recent frontier sales are used to make estimates for the entire fiscal year.



Furthermore, bonus estimates are no longer made for an individual sale by the Department of the Interior when preparing revenue estimates for the budget. The total acreage to be offered in frontier areas and the Gulf of Mexico for an entire fiscal year is estimated and a single revenue estimate for the entire year is prepared. We believe that this is superior to making individual sale estimates around which the range of estimated error is necessarily larger.

It should be pointed out that the bonus estimating procedures are not related in any manner to USGS's pre-sale tract-by-tract analysis. The difference between the bonus estimates and the total of high bids received indicates nothing concerning whether or not the public received fair market values for its resources. This point is discussed later in this letter. In addition, although we agree that the accuracy of bonus estimates can be improved by acquiring additional data, we question whether the improved accuracy is worth the costs to the public and private sectors of acquiring the additional data.

#### Tract Selection

The draft report attributes to the Department acreage leasing goals, even though we have repeatedly explained to your staff that we do not have such goals (for example, in the April 8, 1975, letter from then Secretary Morton to Mr. Staats).

The fact that acreage was selected "prior to assessing the true resource development potential" was not because the Department had a desire to lease as much acreage as possible (page 23 of the draft). The Department's leasing strategy was to offer a sufficient number of tracts in each area to give maximum opportunity to discover and develop oil and gas consistent with environmental safety. This was done to ensure that if major structures containing oil and gas are present, they will be fully explored and developed. The Department thought that this was the proper way to utilize the capability of industry to explore and discover OCS oil and gas reservoirs.

The statement of the Secretary of the Interior on November 14, 1974, before the OCS Governor's Conference explained the leasing strategy of the Department at that time; that is, the Department was not committed to leasing 10 million acres in 1975, but was committed to beginning to lease in the frontier areas. The goal of opening up all frontier areas by the end of 1978 was established in order to better determine the location and magnitude of oil and gas prospects in areas other than the Gulf of Mexico, where the best prospects already have been leased. As you may know, the goal of opening up all frontier areas by 1978 has been substantially modified as a result of experience and knowledge gained over the past year. The OCS planning schedule approved in January 1977 indicates potential lease sales in frontier areas through 1980, and two potential sales offshore Alaska will not be considered until after 1980. Moving into major regions of the OCS would, if leasing is found to be environmentally acceptable, increase the probability that the best oil and gas reservoirs will be found and production brought on line over

the next 5 to 15 years. Rapid and safe exploration is essential to provide knowledge of the actual potential of the OCS in meeting our domestic energy needs. A southern California sale appeared early in the lease schedule because of its proximity to nearshore and onshore development with associated support facilities and indication of significant resource potential.

#### Tract Evaluation and Fair Market Value

The report states that the tract values were not reliable because they were derived by inexperienced personnel who used inadequate data. The Department believed it had enough information to make reliable estimates of tract value. There are three questions which must be answered in order to determine whether or not conditions exist for petroleum accumulation (they are incorrectly stated in the report on page 38 of the draft report): (1) Are there source rocks? (2) Are there reservoir rocks? and (3) Is there a trapping mechanism?

[See GAO note, p. 63.]

More specifically, at the time of tentative tract selection, GS has some knowledge as to where the major structures are, based on geophysics, which covers the area with a fairly broad grid. By sale time, GS has acquired more geophysics and has studied the results of any stratigraphic tests and any other drilling which has occurred nearby. By the time sale #35 was held, GS had 14,000 line miles of geophysics covering all tracts with a 1 1/2 x 1 1/2 mile grid. Four hundred fourteen oil and gas fields in California were studied on a stratigraphic-unit basis and on a geomorphic region-basis. Data on field size, net pay thickness, recoverable hydrocarbons and structure success ratios were developed. These analogs along with the available data allowed GS to estimate the presence or absence of stratigraphic units and the quality and quantity of reservoirs, including porosity, permeability, location and size of structure. Data from approximately 239 core holes and a deep stratigraphic test on the OCS were used. The point is that GS can, and did for sale #35, determine if the three characteristics necessary for petroleum accumulation were present; however, to determine whether oil and gas accumulations actually exist would require a drilling program. This would almost inevitably be a very large expensive process, a fact not adequately set forth or analyzed in the draft report.

[See GAO note, p. 63.]

A further comment attempting to link data availability and revenue generation is set forth on page 43 of the draft report, as follows: "The bonus bids received per acre leased is higher for San Pedro than the other three areas. This occurred even though Survey estimates showed more than 2 1/4 times more oil reserves per tract for the Tanner Cortez area than the San Pedro area." The authors conclude that the reason the bids were higher is that GS had more information on San Pedro tracts. This is not the case. Exploration and development costs and production costs are less for the San Pedro tracts because of shallower water depth and shorter distance to shore. These factors substantially influence bids since the net value of a barrel of oil will be higher where production and transportation costs are lower. Thus, we believe that the report's attempt to link data availability and revenue generation is wanting in hard evidence.

We further believe the report offers no proof that the public does not receive fair market value for its resources (see draft pages 45 and 46). The Department conducts a pre-sale evaluation to determine what it believes to represent resource value for each tract using a methodology unrelated to that used for estimating bonuses for budget purposes. The Government's goal is not to see how close it comes to the highest bid. A company's bid is determined by many factors in addition to resource evaluation such as its assessment of competition, need for reserves and its aversion to risk. These items cannot be quantified by GS. Therefore, a comparison of the high bid to GS's evaluation is not by itself the measure of whether or not the public received fair market value.

Because the draft report concludes that we have large acreage leasing goals, it also concludes that large acreage sales lead to speculation and reduce the price to the Government. Page 25 of the draft report states: "As previously mentioned, glutting the market with large acreage offerings would tend to reduce the price paid to the Government and to encourage private speculation in these resources at the public expense."

We believe this is another example of error in the analysis presented in the draft. To support our position we present several points. First, the GAO conclusion rests on the fact that bonus receipts were less for 1975 than for preceding years. Four sales were held in 1975, three in the Gulf of Mexico and one in southern California. We know the best acreage in the Gulf of Mexico has been sold; this is one of the reasons

for entering frontier areas. Because the best potential acreage has been leased, it is obvious that the remainder will not attract high bids. Second, the experience of sale #40 in the mid-Atlantic, held in August 1976, does not fit into this analysis. The average per acre bid was more than three times the 1975 average bids. This points out the fallacy in limiting an analysis of the success of the program to one sale. Further, the report offers no proof that companies have bid and won tracts for the purpose of speculating.

[See GAO note, p. 63.]

#### Government Financed Exploration

As stated at the beginning of this letter, Secretary Andrus has not had time to thoroughly examine the OCS program and suggested alternatives, such as a government financed exploration program. Therefore, we will not comment on the recommendation. However, we believe more study of this issue is required. We do not feel that the report provides any basis for determining the merits of such a program; that is, we do not feel it has provided facts to determine that the public does not get fair market value and that securing more information at significantly added costs will increase revenue.

A key unanswered question is whether the cost of Government financed exploration would increase the return to the Treasury in at least equal amounts. There are no estimates of either total costs or benefits. On page 40, it is suggested that six additional wells drilled (at a cost of \$27 million) in one area would have better assured the public's chance of receiving fair market value. We know that on the average, one productive hole is found for every ten drilled in a wildcat area. The expense of drilling six wells would be large; the social benefits must be measured carefully to see if such an expenditure is appropriately incurred by the public or should be left to the industry. In addition, the draft report fails to discuss the time consumed and the potential resulting costs of delay from carrying out such a program.

Comments of a more specific nature on errors in the draft report are set forth in the enclosure. We hope that both the comments in the letter and in the enclosure will be given careful consideration in revising your draft.

Since this is such a highly technical area, we are willing to assist in your draft revision process should you so desire.

Sincerely,



Richard R. Hite  
Acting Assistant Secretary--  
Administration and Management

Mr. Monte Canfield, Jr.  
Director, Energy and  
Minerals Division  
General Accounting Office  
Washington, D.C. 20548

Enclosure

GAO note: The deleted comments relate to matters which were discussed in the draft report but omitted from this final report. Page references refer to a previous draft report and are not applicable to this report.

## Comments on Specific Points

[See GAO note, p. 63.]

Page 16 - "As for the third factor mentioned we note that prior to February 1976 new oil was not controlled." It is not the present that is important here but rather the future as perceived by the companies. The price of oil 5-25 years from the sale is what must be estimated. Although there were no price controls in December 1975, the companies could have expected the controls to be imposed.

[See GAO note, p. 63.]

Page 20 - The report implies that bidding was not highly competitive because 70 percent of the tracts that received bids got only one or two bids. However, there were 40 individuals or groups who bid in 30 different combinations, and although only one bidder may have bid on a tract, that bidder did not know whether there were other potential bidders until the bids were opened.

Page 26 - The BLM OCS Manager was instructed to include the largest acreage possible considering nominations, environmental considerations, current technology and other criteria. It is not true that concern for selection of acreage having high resource development potential was not paramount. Although the guidelines do say it may be necessary to select substantial acreage out to and possibly even beyond the 600 meter water depth, the guidelines continue to say such selection should be sufficient to encourage development of technology for deep water.

[See GAO note, p. 63.]

Page 29 - The Department and industry know whether geological characteristics necessary for petroleum accumulation exist. All the necessary conditions can exist without accumulations of oil and gas. Whether oil and gas actually exist can in economic quantities only be determined by a drilling program.

Page 35 - "Because many of the variables used in this analysis are subjective, the experience of the technical people making the evaluation will impact on the analyses results." We already have shown that the estimates were made by very experienced persons. In addition, the authors do not appear to understand the Monte Carlo simulation model; this model is designed to minimize the subjective judgment effect. The program runs 500 discounted cash flows after randomly selecting values (between a minimum and maximum established by the experienced staff) for the different variables and calculates 500 values with a histogram and curve showing the probability of each value being the true value.

Page 38 - To determine if the geologic characteristics are proper for the accumulation of hydrocarbons, it is necessary to know if there are source rocks, reservoir rocks and a trapping mechanism. To produce the hydrocarbons economically, a porosity, viscosity and energy source are the important factors.

[See GAO note, p. 63,]

Page 41 - The "D" reliability rating is taken care of in the Monte Carlo program by the risk factor. Consequently, the mean range of values reflects the rating.

Page 45 - Errors in calculating certain tract evaluations were not related to the adequacy of information.

[See GAO note, p. 63.]

PRINCIPAL OFFICIALS  
RESPONSIBLE FOR THE ADMINISTRATION OF  
ACTIVITIES DISCUSSED IN THIS REPORT

	<u>Tenure of office</u>	
	<u>From</u>	<u>To</u>
<u>DEPARTMENT OF THE INTERIOR</u>		
SECRETARY OF THE INTERIOR:		
Cecil D. Andrus	Jan. 1977	Present
Thomas S. Kleppe	Oct. 1975	Jan. 1977
Kent Frizzell (acting)	July 1975	Oct. 1975
Stanley K. Hathaway	June 1975	July 1975
Kent Frizzell (acting)	May 1975	June 1975
Rogers C. B. Morton	Jan. 1971	May 1975
ASSISTANT SECRETARY OF THE INTERIOR--		
ENERGY AND MINERALS:		
William D. Bettenberg (acting)	Jan. 1977	Present
William G. Fischer (acting)	Jan. 1976	Jan. 1977
Jack W. Carlson	Aug. 1974	Jan. 1976
King Mallory (acting)	May 1974	July 1974
Stephen A. Wakefield	Mar. 1973	Apr. 1974
John B. Rigg (note a)	Jan. 1973	Mar. 1973
Hollis M. Dole	Mar. 1969	Jan. 1973
ASSISTANT SECRETARY OF THE INTERIOR--		
LAND AND WATER RESOURCES:		
Christopher G. Farrand (acting)	Jan. 1977	Present
Jack O. Horton	Mar. 1973	Jan. 1977
ASSISTANT SECRETARY OF THE INTERIOR--		
PUBLIC LAND MANAGEMENT (note b)		
Harrison B. Leosch	Apr. 1969	Jan. 1973
ASSISTANT SECRETARY OF THE INTERIOR--		
PROGRAM DEVELOPMENT AND BUDGET:		
Heather L. Ross (acting)	Jan. 1977	Present
Ronald G. Coleman	May 1976	Jan. 1977
Stanley D. Doremus (acting)	Feb. 1976	May 1976
Ryston C. Hughes	Feb. 1974	Feb. 1976
Laurence E. Lynn	Apr. 1973	Feb. 1974
ASSISTANT SECRETARY OF THE INTERIOR--		
PROGRAM POLICY (note c)		
John W. Larson	Apr. 1969	Apr. 1973

	<u>Tenure of office</u>	
	<u>From</u>	<u>To</u>
DIRECTOR GEOLOGICAL SURVEY:		
Vincent E. McKelvey	Dec. 1971	Present
William A. Radlinski (acting)	May 1971	Dec. 1971
DIRECTOR BUREAU OF LAND MANAGEMENT:		
Curt Berklund	July 1973	Present
Burton W. Silcock	June 1971	July 1973

- 
- a/ Deputy Assistant Secretary in charge.
  - b/ Became office of Assistant Secretary--Land and Water Resources in March 1973 reorganization.
  - c/ Became office of Assistant Secretary--Program Development and Budget in April 1973 reorganization.