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ECONOMIC ASPECTS OF THE GULF COAST

OFFSHORE OIL CONTROVERSY

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ECONOMIC ASPECTS OF THE GULF COAST OFFSHORE OIL CONTROVERSY

CHAPTER I

INTRODUCTION

The submerged lands controversy has been one of the most important legal, political and economic problems to come before the American Congress and public in many years.[1] Foremost among the many facets of the marginal sea issue was oil, for the lands immediately involved were called "the richest drilling prize in the history of the oil business."[2] Valuable deposits of minerals other than petroleum may also

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[1]A considerable amount of confusion and misunderstanding has resulted from the misuse of the term "tidelands" when applied to the marginal seas. In a technical sense, "tidelands" are the relatively narrow strips between the mean high and low water marks that are alternately covered and uncovered by the ebb and flow of the tide. Pollard's Lessee v. Hagen, 3 How. 212 (1845). It was agreed by all parties to the controversy that the "tidelands," thus defined, have always belonged to the adjacent States. Supreme Court of the United States, October Term, 1946, Brief for the United States in Support of Motion for Judgment, p. 2.

[2]Oil and Gas Journal, October 11, 1954, p. 167. This authoritative trade magazine estimated that reserves of six billion barrels of oil would be found in the Gulf of Mexico submerged lands in the first six years of intensive drilling.

be found in the submerged lands. It is not surprising that a stake of this magnitude would whet the acquisitive instincts of many different groups.

However, the basic controversy was whether the National Government or the coastal States owned the resources in the submerged lands of the Continental Shelf and which of these public bodies should administer and control the resource development in these offshore areas. Stemming directly from the basic issue is the larger question of the proper position of the Federal Government as a proprietary and regulatory agency for the American people. The submerged lands problem is but a phase of a conflict between the centrifugal and centripetal forces in society, in whose vortex the oil industry, and all industry, has become increasingly involved.

The relationship between State and National Government has undergone many changes since 1789. Changing philosophies of government and changing economic circumstances have cast new roles for governmental units. The rise of a national economy, the growth of the modern international corporation, and the creation of powerful economic pressure groups have created new problems to be solved and new responsibilities for the governments to discharge. Whether these problems and responsibilities should be solved and discharged by the State or Federal governmental bodies is a matter to be decided by democratic processes.

While fundamentally a dispute between the States and the Federal Government, the issue has been of major concern to many groups and organizations not normally associated with either level of government. Among these have been conservation groups, real estate boards, port authorities, educational organizations and oil companies. The States' officials and congressional sponsors of legislation to gain clear title for the States attempted to play down oil as the principal consideration in the controversy. Governor Caldwell of Florida said that the issue was simply that of property rights and that the question of oil lands had been "unhappily" brought into the dispute.[3]

In spite of this disclaimer, for over sixteen years the controversy raged in and out of Congress, the courts, the newspapers, and the public mind. To the normal romance and monetary glitter of oil operations was added the glamour of the sea, a new combination that challenged the public imagination. Few issues in recent times have drawn forth so many words. Since 1937, when the matter first came before Congress, there have been seventeen formal hearings, lasting a total of eighty-eight days and recorded in more than eight thousand printed pages of testimony and exhibits. In the

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[3] New York Times, July 20, 1946, Sec. 26, P. 1. Senator Douglas noted that some of the quitclaim sponsors were as squeamish about mentioning the words "oil and gas" in their discussions as Victorians were in ever mentioning the lower limbs of women. Congressional Record, April 9, 1953, p. 2986.

1953 debate on the Senate floor over a million words were expended. The Supreme Court of the United States has handed down four separate decisions on the matter but even so, the issue is not definitely settled.

The traditional positions of the major political parties have been completely reversed since World War I and the reversal is most clearly shown in this controversy. The Republican Party, historically the party favoring strong central authority, has backed the States' claims against the Federal Government, while the Democratic Party, the traditional party of States' rights, has opposed the claims of the States.

The roots of the traditional stands of the major political parties go back many generations. The Republican Party wanted the real power of government to be removed from the local political arena, where it might be subject to hasty and ill-advised local pressures; the Democrats wanted the power close to the people. Paradoxically the Democratic Party has completely taken over the former Republican position of fearing local political pressures, albeit modernized to apply to the pressure of powerful national and international corporations on local governments, while the Republicans now sing the praises of Thomas Jefferson's states' rights.

It must be noted that in the submerged lands issue, the sectional interests often outweighed the party interests.

Many Congressional Democrats, especially those from the one-party States of Louisiana and Texas, left the fold to back the claims of the coastal oil States. Many of the Republicans in Congress, feeling that the best interests of their particular constituency would not be served by quit-claiming the offshore oil lands to the coastal States, supported the Federal ownership position.

In a large sense, the offshore oil controversy has been a clash of the Harding-Coolidge philosophy of limited Federal power and activity against the New Deal-Fair Deal philosophy of greater Federal responsibility and authority. It is impossible otherwise to account for the support given by the Congressional representatives of the inland States to the claims of the littoral States.

Some persons believe that the individual States, being closer to the problems, could administer the submerged lands with greater efficiency and less expense than a distant government in Washington. Others believe that the lands which lie along the Nation's shore could be more efficiently and economically administered by one government in Washington than by several in Tallahassee, Florida; Baton Rouge, Louisiana; Austin, Texas; Sacramento, California; and the capital cities of the other seventeen coastal States. Senator O'Mahoney, a supporter of the later idea, maintained that the greatest present day problem of political economy is trying to gear government to the modern world; that it is

uneconomic, if not impossible, to govern a national or international economy on local levels; and that chaos would result if modern America attempted to return to the governmental authorities of Thomas Jefferson's day.[4]

The 1953 legislation by Congress, confirming and establishing in the several States titles to the submerged lands within their "historic" boundaries[5] and providing for Federal ownership, control and jurisdiction of the submerged lands beyond the State boundaries and out to the edge of the Continental Shelf,[6] climaxed the controversy. Until this legislation brought some degree of order out of a chaotic situation, offshore oil drilling had been virtually suspended. A legal vacuum had prevented the orderly development of the offshore resources after 1948, the year of the Supreme Court decision in the submerged lands suit against California. Regardless of its merit, the legislation served

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[4]Personal conversation of author with Senator O'Mahoney, May 28, 1953. Senator O'Mahoney, then out of office, noted that, at the time Senator Daniels was fighting for local rule in the submerged lands, he was asking the Civil Aeronautics Board for a large subsidy for a Texas airline. The author has noted another similar inconsistency. Representative Poague (Texas) introduced a bill providing for an upstream flood control program to be administered by the United States Department of Agriculture at the same time that he was trying to prevent Federal administration of the offshore lands. Dallas Morning News, January 2, 1953.

[5]Public Law 31, 83d Cong., 1st Sess., approved May 22, 1953.

[6]Public Law 212, 83d Cong., 1st Sess., approved August 7, 1953.

to fill this legal void and open up the entire Continental Shelf for development.

The issue was settled largely on a political basis. For the most part, economists were not called into the discussion. This was to be expected as, in the words of Frank H. Knight:

> The more vital problems are not problems of economy, but of maintaining social unity in the face of economic interests. And the foundations of unity lie not in intelligence, but in habit, emotion, and ideals of value.[7]

This is not to say that there were no economic considerations in the issue, for the economic ramifications of such a precedent setting action were many, but only that the economic considerations were little used among the bases for the settlement.

The submerged lands issue is complex, having many and varied aspects in the fields of international law, American constitutional law, politics, government, history and economics. The elements of tradition, prejudice and chauvinism have been introduced into the picture by the partisans of both sides and these have not contributed to a temperate discussion and solution.[8] During the heat of the

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[7]Frank H. Knight, Risk, Uncertainty and Profit (Boston: Houghton Mifflin Company, 1921), Introduction, p. xxx.

[8]Texas Land Commissioner Bascom Giles declared that he favored secession from the United States before surrender of the submerged lands. "Muddy Waters," Time, July 7, 1947, p. 84.

controversy, it was difficult for the lay public to separate fact from fiction, so great was the propensity to add false and irrelevant charges.

In the interests of temperate discussion this study will attempt to sketch the background of the controversy, to separate the economic from the primarily political and legal issues, and then to proceed with consideration of the economic factors affecting development of the oil resources of the submerged lands area. The first requisite to understanding the problem is a clear grasp of the area involved in the controversy.

Geographical Description of the Gulf Coast Continental Shelf

The term "Continental Shelf" is applied to that portion of the sea bottom and subsoil surrounding a continent that is covered by water up to a depth of 600 feet; that is, the area that would become dry if the sea level were lowered by 600 feet.[9] It extends seaward from the mean low water line or from the mouths of rivers and bays to the point where the continental land mass descends steeply into the ocean depths.[10] While the actual drop off, or geologic edge,

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[9]M. W. Mouton, The Continental Shelf (The Hague: Martinus Nijhoff, 1952), p. 45.

[10]A. L. Shalowitz, "Cartography in the Submerged Lands Oil Cases," The Journal of the Coast and Geodetic Survey, December, 1951, p. 68.

varies over the world from 360 feet to 1200 feet, cartographers have accepted 600 feet as a convenient definition of the edge.[11]

The continental shelves of the world extend out under about one-twelfth of the oceanic areas and comprise the equivalent of one-quarter of the land areas of the world. Approximately one-tenth of the world's continental shelf area lies adjacent to the United States and Alaska.[12]

The area of that portion of the Continental Shelf contiguous to the United States proper is estimated at 277,500 square miles, which is equal to the area of the States of New York, New Jersey, Pennsylvania, Ohio, Indiana, Illinois, and Kentucky combined, or slightly more than the State of Texas (Figure 1). In addition, the Shelf adjoining Alaska is roughly 600,000 square miles in extent, almost as large as Alaska itself.[13] Altogether, the Continental Shelves of the United States and Alaska exceed the area contained in the Louisiana Purchase.

The Gulf Coast Continental Shelf, extending from the Florida Keys to the Rio Grande River, covers 132,000 square

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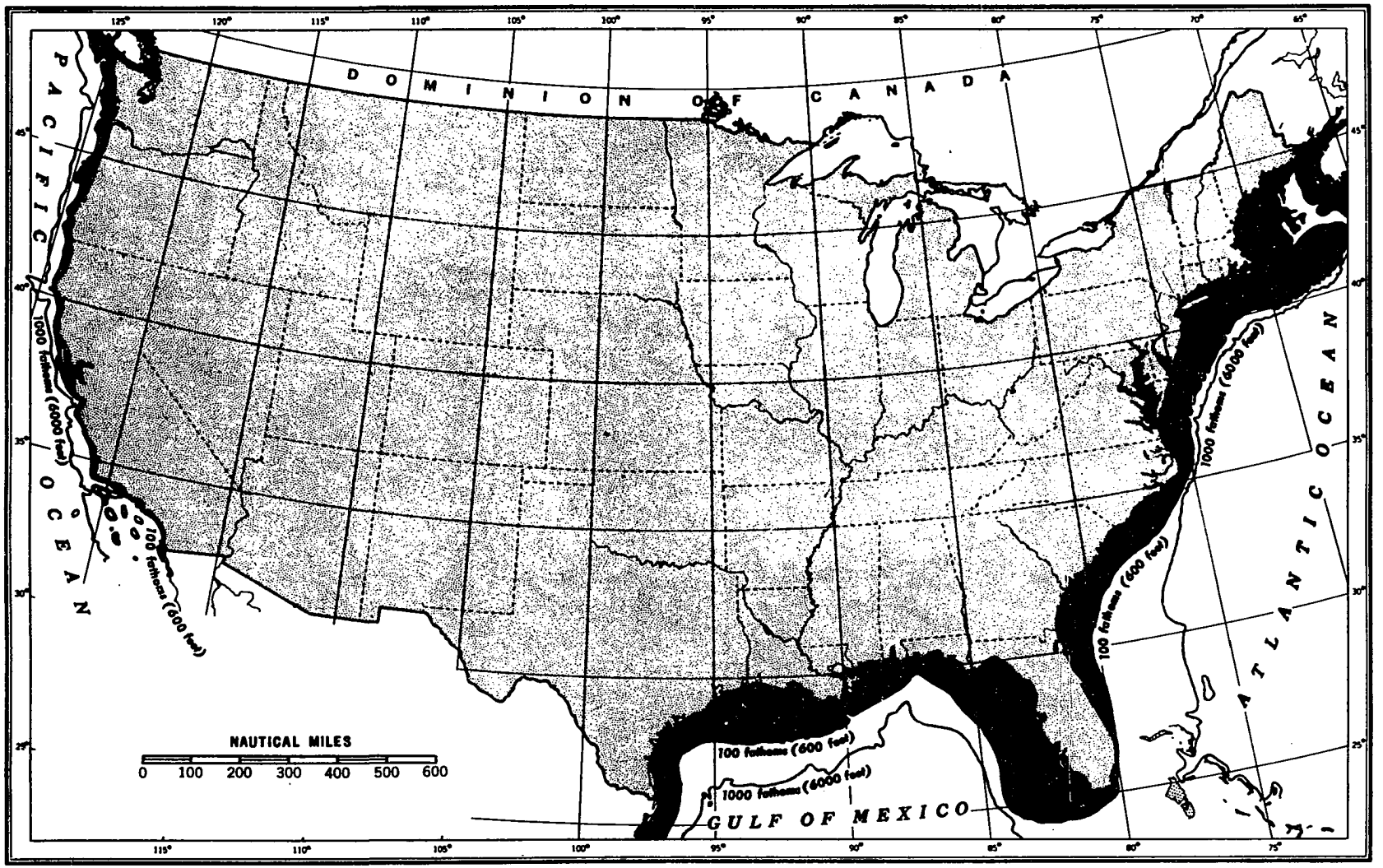
[11]Statement by A. L. Shalowitz, Director of Technical Services, United States Coast and Geodetic Survey, personal interview, May 22, 1953.

[12]Ibid.

[13]J. Ben Carsey, "Geology of the Gulf Coast Area and Continental Shelf," Bulletin of the American Association of Petroleum Geologists, Vol. 34, No. 3, March, 1950, p. 371.

FIGURE 1

THE 100-FATHOM AND THE 1000-FATHOM DEPTH CURVES ALONG THE COASTS OF THE UNITED STATES



miles.[14] That portion seaward of Louisiana and Texas, the most promising for oil, gas, and sulphur production, amounts to 60,000 square miles, an area about one-fifth as large as the combined land areas of these two States. Approximately thirty thousand square miles of Continental Shelf lie seaward of each State.

The area of primary concern is the ten and one-half mile strip immediately seaward of Texas and the three mile strip adjoining Louisiana.[15] A total of 5,468 square miles lies within these two strips. This is one-tenth of the total Continental Shelf seaward of Texas and Louisiana. Fifty-four thousand square miles lie in the area between the "historic State boundaries" and the edge of the Continental Shelf (Table 1).

The Gulf of Mexico Continental Shelf is a continuation of the great coastal plain that slopes down gradually at approximately five feet per mile to the coast. In large areas of the Continental Shelf, this gradient continues far out into the Gulf, resulting in relatively shallow waters

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[14]National Petroleum Council, Submerged Land Productive Capacity (Washington: National Petroleum Council, 1953), Exhibit C, Part 1, p. 1. Hereafter cited as Submerged Lands.

[15]The boundary claims of Louisiana vary from three to fifty miles from dry land. Until the matter is settled, the development of the submerged lands beyond three miles will be retarded. In the absence of a definite boundary, the three mile belt will be used in this discussion.

TABLE 1

ESTIMATES OF THE AREA IN THE CONTINENTAL SHELF SEAWARD OF TEXAS AND LOUISIANA

	Within Alleged "Historic State Boundaries"[1]	Outside Alleged "Historic State Boundaries"	Total
	(Estimate in square miles)		
Seaward of Texas	4062	25,470	29,532
Seaward of Louisiana	1406	28,906	30,312
Total	5468	54,376	59,844

Source: Testimony of Walter S. Halliman, Chairman, National Petroleum Council, before the Senate Interior and Insular affairs Committee, Hearings on S. J. Res. 20, 82d Cong., 1st Sess. (Washington: Government Printing Office, 1951), p. 86.

[1] Ten and one-half statute miles for Texas and three nautical miles for Louisiana.

many miles from shore.[16] Off Texas the average depth at one mile from shore is eighteen feet; at nine miles, forty-two feet; at twenty-seven miles, fifty-two feet; and at seventy miles, one hundred feet.[17]

The Shelf width varies along the Gulf from five miles off parts of the Mississippi River Delta to one hundred and seventy-five miles off Florida. The average width is fifty-nine miles. The maximum width of the Shelf seaward of Texas and Louisiana is one hundred and forty miles off the mouth of the Sabine River, the dividing line between the States. In short, the real estate with which this study is concerned is the subsoil of the vast plain that stretches out under a relatively thin veneer of water along the Gulf of Mexico Coast.

Issues

The submerged lands controversy has been fought on many issues, some real and some that appear to be far afield. In order to grasp the real issue, the false ones must first be disclosed.

False Issues

An extraneous issue used mainly for propaganda pur-

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[16] Carsey, op. cit., p. 398.

[17] Supreme Court of the United States, October Term, 1949, No. 13, Original. Brief for the State of Texas in opposition to Motion for Judgment, p. 4.

poses may best be seen in quotations. For instance, one Texas newspaper commented:

> Federal ownership of the tidelands fits exactly into the scene of creeping socialism. Success of the efforts to grab the tidelands for the Federal Government would give the trend towards socialism its biggest forward "creep" in American history.[18]

There are no grounds to this claim that the issue is one of "socialization" or "nationalization" of the offshore section of the petroleum industry on the one hand, as against free private enterprise in the oil industry on the other. There is no question about public or private ownership of these offshore land and resources. All parties to the controversy agree that they are publicly owned, either by the adjacent States or by the Federal Government. Whatever the governmental authority involved, under every plan of development thus far considered private oil companies would produce, refine, and distribute the offshore oil.

Solicitor General Philip B. Perlman said that this

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[18] The Dallas Morning News, April 19, 1953. A month later (May 20, 1953) the same paper went even farther: "There has been no issue in recent years that has divided the public between left and right as precisely as has the tidelands issue. Beginning with the Daily Worker in New York, staunch federal ownership advocate, and coming all the way from deep red to light pink, one finds editorial opinion, congressional opinion and public opinion on the side of federal ownership almost unanimously. The right has been solidly for state ownership. So has the majority of the middle ground. Apply the tidelands issue to political ideologies throughout the world today or to political ideologies historically through the years and you will get the same result. Today Malenkov and Peron would be on the side of federal ownership. Yesterday, Jefferson would have sided with the claim of the states."

argument boiled down to calling Federal ownership and leasing nationalization, socialization, or other objectionable names, while State ownership and leasing would be an enterprise more private than public in character.[19] Senator Paul H. Douglas pointed out that the followers of this line of reasoning would be forced to call State ownership "state socialism," if they insist that National ownership is "national socialism," as there is no difference in theory on this point between one level of government and another.[20]

Equally there are no valid grounds for the charge by the less temperate Federal ownership advocates that the oil companies are trying to "steal" the offshore oil deposits. The implication is made that State title would amount to oil company title to these resources. Former Secretary of the Interior Harold L. Ickes voiced this charge in rather blunt language:

> The Walters Bill (H.R. 4484) would surrender to the oil interests, without compensation, rich offshore lands that the Supreme Court has said belong to all of the people. A more descriptive name would be "The Big Steal Bill."[21]

Another statement serving to point out the degree of

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[19]U.S. Congress, Senate, Committee on Interior and Insular Affairs, The Submerged Lands Controversy, Committee Print, 82d Cong., 2d Sess. (Washington: Government Printing Office, 1951), p. 18.

[20]Congressional Record, April 10, 1953, p. 3036.

[21]Harold L. Ickes, "The Big Steal in Oil," New Republic, August 27, 1951, p. 17.

emotion that was reached, was made by Representative John D. Dingell (Dem) of Michigan:

> This move on the part of the allied forces of the plunderbund and the administration to rob the people of the United States of the wealth of submerged minerals . . . is the dirtiest and most sinful move ever uncovered in this land.
>
> The plunderbund, the arch conspirators which are connected with a rapacious group within the oil industry will reap the prime benefits and through them a political party supported by excessive outlays of ill-gotten gains will attempt to advance further over the prostrate body politic of the American people.[22]

Answer to such charges is best summed up in the words of the president of Sun Oil Company:

> /This controversy/ has been between the Federal Government and various state governments over title to the tidelands areas. Regardless of the outcome, the oil industry expects to lease and develop the underwater lands there and to pay for the privilege of doing so. . . . Oil companies are concerned that the authority of the landlord, whether Federal or State government agencies, be clearly established so that the tremendous investments required to develop these areas will not be jeopardized by future legislation and court decisions.[23]

As this statement makes clear, the position of the oil companies, under any suggested settlement, would be as lessees of State or Federal offshore lands. The bonuses, rentals, and royalties involved would be paid either to the Treasury of the State concerned or to the United States Treasury. As the record has shown, the States have extracted

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[22] Congressional Record, May 13, 1953, pp. 5067-5068.

[23] Robert G. Dunlap, The Challenge of Free Markets, address before the Petroleum Club of the Cleveland Chamber of Commerce, Cleveland, Ohio, October 15, 1953. Printed as pamphlet, November, 1953, pp. 3-4.

leasing and royalty payments from their lessees that appear to be in line with similar payments made to private landlords. The companies participating in the Gulf Coast offshore development have secured their leases by effective competitive bidding.

These charges and countercharges, in which each side accused the other of trying to "steal" the offshore resources served only to embitter the controversy and to conceal the real issues. In this as in any controversy, each side had valid claims supported by honest differences of opinion.

Stripped of all charges of moral turpitude, there were three views that could be taken by reasonable, sincere and intelligent men. The submerged lands of the Continental Shelf were owned wholly by the Federal Government, or by the adjacent States, or they were owned jointly by both levels of government. In a more reasonable atmosphere, it would have been seen that there was nothing immoral or dishonest about any of these views.

Claims of the Participants

The States of Texas, Louisiana, and California, backed by officials of many other States, have for many years claimed ownership for all coastal States of the strip of submerged lands contiguous to their seacoasts out to the alleged "historic boundaries" of the various States. At the

minimum this limit was held to be three nautical miles from the mean low-water mark for all coastal areas except for the Gulf Coast of Florida and Texas, where the minimum was held to be three leagues.[24]

In addition to the minimum claims, further claims to additional areas of the Continental Shelf have been made from time to time by the States. In 1938, the State of Louisiana unilaterally asserted ownership of the maritime belt to a distance of twenty-seven nautical miles or thirty-one and one-half statute miles from shore.[25] Texas followed suit in 1941 and fixed the boundary of the State at twenty-seven nautical miles from shore.[26] In 1947 the Texas Legislature extended the State boundaries to the edge of the Continental Shelf.[27]

The "cartographic chauvinism" practiced by the Legislatures of Louisiana and Texas furnished much ammunition for the opposition claim that this was a land "grab." It is apparent that the Texas claim to the lands clearly beyond its "historic boundary" was made for bargaining purposes.

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[24]One nautical (marine) mile, representing a one minute arc on the great circle of the earth, is equal to 6080.27 feet. One league is three nautical miles. Three leagues would approximate ten and one-half statute (land) miles.

[25]Louisiana General Statutes, 1938, No. 55.

[26]General Laws of Texas, 47th Legis., 454.

[27]General Laws of Texas, 50th Legis., 451.

This claim was not pressed by the State officials, who made serious demand only for the ten and one-half mile belt.

The situation was somewhat different in Louisiana. There the State officials were never content to limit their claim to three miles from dry land, especially when most of the major offshore petroleum discoveries were located beyond the three mile strip. As late as the 1953 Senate Hearings on the Submerged Lands Act and the Outer Continental Shelf Act, the Louisiana Governor, the Attorney General, the Secretary of the State Mineral Board, and one of the United States Senators from Louisiana denied knowing how many miles the Louisiana boundary extended into the Gulf.[28] The Submerged Lands Act of 1953, confirming and establishing the title of Louisiana to the submerged lands within State boundaries, was passed with no clear idea of what Louisiana's claim would be.

Early in 1954 the Louisiana Legislature officially established the boundary of the State at ten and one-half miles from the "coast line," which in turn was defined as the point in the Gulf of Mexico where the Coast Guard said that high sea navigation began.[29] In some cases this

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[28]U.S. Congress, Senate, Committee on Interior and Insular Affairs, 83d Cong., 1st Sess. Hearings on S. J. Res. 13, p. 264, and Hearings on S. 1901, pp. 250, 293, 315, and 451. Hereafter referred to as Hearings on S. J. Res. 13 and Hearings on S. 1901, respectively.

[29]Oil and Gas Journal, August 2, 1954, p. 54.

legislatively devised boundary would be up to fifty miles from dry land.[30] It is agreed by all that the dividing line between land and water is difficult to draw for the greater part of the Louisiana tidelands, the term "tidelands" here being correctly used. From the Sabine River on, the Louisiana shore is a series of shoals, reefs, marshes, bays, inlets, peninsulas, and islands. Mud islands are known to rise or disappear from time to time along the coast. This confusing coastal configuration lends support to the quest of Louisiana for a definite line of demarcation, though not necessarily the generous one the State has selected.

Since 1945 the Federal Government has contested the claims of the States to the Continental Shelf lands seaward of the mean low-water line.[31] It was acknowledged that the States, and not the Federal Government, owned the true "tidelands," submerged lands beneath inland navigable waters and certain "historic bays," of which Chesapeake Bay is an example.

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[30] Houston Post, November 21, 1954.

[31] The Federal Government was not the only body contesting State title to the marginal seas. In an interesting and amusing side suit, twenty-one bands of California Indians asked the United States Supreme Court to return the submerged lands to them, the rightful heirs of the "aboriginal occupants." The petition of these Campo Mission Indians claimed title to vast stretches of the California coastline by virtue of original occupancy and ownership for over 500 years. New York Times, April 20, 1948. The Supreme Court did not see fit to give the land back to the Indians. United States of America v. the State of California, 334 U.S. 825, October Term, 1947.

There is no need to go into the exhaustive legal arguments, pro and con, that were presented by the States and the Federal Government to back their claims. These matters are well documented in the various briefs presented in the three Supreme Court cases dealing with the submerged lands. However, a brief summary of the various claims will show that each side had strong points in its favor.

The Louisiana Claim

Louisiana and all other littoral States except Texas had roughly the same bases for claiming ownership of the marginal sea areas contiguous to their respective shores.

The simplest claim was that they had controlled and utilized these areas for up to 150 years without objection from the Federal Government. The States had regulated the taking of sponges, oysters, shrimp and kelp from the floor of the marginal seas and on many occasions had leased or granted portions of the marginal sea, including the sea-bed, to individuals and organizations, including the Federal Government. During this long period the States and all Federal officials concerned with such matters thought that the States did own the marginal seas out to three miles from shore. Hence, the legal rules of adverse possession, estoppel, laches or ratification should bar the Federal claim to these areas.

The States claimed a proper and legal chain of title

by virtue of a number of historical events. With the Declaration of Independence in 1776, the thirteen original States succeeded to all rights theretofore held by the British Crown. Following the successful revolution, the British Crown relinquished all proprietary and territorial rights to the original Colonies which were named separately in the peace treaty.

Under the Articles of Confederation the central government owned no land except that ceded by the respective States. The Federal Constitution made provision for the national government to acquire land but, in itself, did not transfer any land to the Federal Government.

The States admitted into the Union at a later date came in on an equal footing with the thirteen original States. The new States automatically acceded to and became vested with the lands out to three miles from shore. Or so was the reasoning of the Louisiana claim.[32]

The Texas Claim

The title claims of Texas to the marginal seas adjacent to the State are generally conceded by all parties familiar with the ownership controversy to be stronger than those of the other States, including the original thirteen.

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[32]Fred S. LeBlanc, Plain Facts and Fundamental Principles in Regard to the Tidelands Controversy (State of Louisiana, Department of Justice, Office of the Attorney General, n.d.).

Texas alone existed as an independent nation, recognized by the United States and many major powers. The Texas Boundary Act of December 19, 1836, described the seaward boundary of the new nation as: "Beginning at the mouth of the Sabine River, and running west along the Gulf of Mexico three leagues from land, to the mouth of the Rio Grande. . . ."

In 1845 Texas worked out an annexation agreement with the United States. Texas had offered to cede all of its public lands to the Union if the United States would take over the $10,000,000 Texas debt. The United States Congress refused to assume the debt in exchange for the "worthless land." An acceptable agreement was finally made whereby Texas would cede to the Union all property pertaining to the public defense, but would retain the public debt and all vacant and unappropriated land lying within its limits. A careful listing of all defense property to be transferred was prepared, checked and signed for by the receiving officers. Although many properties were transferred, including decks and naval yards, the three league strip of marginal seas and the lands beneath were not included. The State of Texas has steadfastly maintained that, since the United States refused to assume the liabilities of the Republic, it should have no claim to the assets of the Republic, excepting only the properties expressly ceded.[33]

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[33] Supreme Court of the United States, October Term, 1949, No. 13, Original, Brief for the State of Texas in Opposition to Motion for Judgment.

The Federal Claim

The Federal Government maintained that after the American Revolution the thirteen original colonies never acquired ownership of the three mile marginal seas belt as the three mile concept was not established in international custom and understanding at that time. The acquisition was accomplished later by the national government as a function of national external sovereignty. The exercise of protection and control of the three mile belt gave the Federal Government paramount rights in and power over the area.

Furthermore, these paramount rights in the marginal sea were not lost by reason of any errors of omission or commission made by the agents of the United States. Laches, estoppel or adverse possession do not hold against the Federal Government.[34]

The special claim of Texas was contested with the argument that, when Texas came into the Union, it was under the equal footing clause. Texas had to relinquish the marginal seas in order to be on an equal footing with the other States. The assumption of the national responsibilities of defense and regulation in the marginal sea off Texas gave the Federal Government paramount rights in this area.[35]

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[34] United States v. California, 332 U.S. 19, and United States v. Louisiana, 339 U.S. 699.

[35] United States v. Texas, 339 U.S. 787.

Method of Approach

Scope of Study

Since a complete investigation of all the competing claims would have necessitated compiling an unwieldy mass of data, certain limitations on the study seemed advisable. Only that portion of the controversy relating to the Gulf Coast Continental Shelf was undertaken. References to the California offshore dispute occur only where there is a relevant tie-in with the Gulf Coast controversy.

The sea, the earth's greatest storehouse of minerals, has been called man's newest frontier.[36] Oceanographers predict that the human race will become increasingly dependent on the sea as a source of foodstuffs, light metals, and chemical elements. Many of these resources can be excluded from the Continental Shelf issue. Both the Federal and State advocates have limited the scope of the controversy to the resources on or in the sub-surface and sub-soil of the shelf. The free swimming fishes and crustaceans, the drifting organisms, and the chemically suspended elements in the waters above the ocean floor have not been a significant part in the controversy.

Certain organic and inorganic resources resting on or attached to the sub-surface of the ocean may also be

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[36] Rachel L. Carson, The Sea Around Us (New York: Oxford University Press, 1951), p. 190.

excluded from the discussion. The Federal government disclaimed any interest in the kelp, sponges, oysters, and clams of the marginal seas.[37] The position of sand, gravel, and mudshell in the controversy is not clear. In the absence of any disclaimer on the part of the Federal government, it must be assumed that these resources are considered a part of the sub-surface and sub-soil. As such, they would be subject to lease by the fee-owner of the underwater lands. Whatever the position of the sand, gravel, and mudshell in the dispute, the emphasis has been small because of the relatively insignificant value of these resources as compared to the oil, gas, and sulphur.

Sources of Information

During the preparation of the dissertation the author spent six weeks in Washington, D. C., while the Senate was debating the Holland Bill, later to become the Submerged Lands Act. As a result the author was able to hear several days of the debate, to attend hearings on the Outer Continental Shelf Act, and to talk with many of the principals on the submerged lands issue--notably Senators Paul Douglas, Joseph P. O'Mahoney, Price Daniel, Earl Long, and Guy Condon. The author spent the remainder of the

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[37] S.107 (83d Cong., 1st Sess.) proposed to allow State regulation, management and administration of the taking, conservation and development of these oceanic resources.

period in Washington gathering data from the pertinent governmental documents in the Library of Congress and in collecting available bulletins from various interested bureaus and departments.

Several days were spent in Austin, Texas, in the libraries of the Attorney General and the Land Commissioner, gathering information on the Texas claim, and the method of offshore leasing. A complete file from the Dallas Morning News on the subject of the submerged lands happenings was kept, starting from the early spring of 1952.

Technical information on cost of geophysical and drilling operations was obtained in personal talks with Otis Danielson, Chief Drilling Engineer of the Kerr-McGee Oil Industries, Incorporated, in their Oklahoma City office and with Jim Savage, Vice-President of Kerr-McGee in their Houston office. Conservation data were furnished by Lawrence R. Alley, Assistant Executive Secretary of the Interstate Oil Compact Commission, headquarters, Oklahoma City. An inspection of an offshore mobile drilling platform ("Mr. Gus") was arranged through the courtesy of the manager of Bethlehem Steel Corporation's Beaumont yards.

Overview of Contents

After a summary of the political and legal history of the submerged lands controversy, an analysis of the estimates of offshore resources is made to establish the

probable values that may occur to the governmental owner. Next a study is made of the cost of recovering offshore oil and gas. This is followed by a discussion of the physical and market risks that might retard offshore oil developments and of the factors which offset these risks. Comparison of the State and Federal leasing methods and practices is detailed in order to show the income actually received by the owner under each system since the passage of the Submerged Lands Act.

Because of the germinal importance of this act, a careful review of the precedents it sets is made, for these precedents might well be assumed to control future interpretation on disposal of public lands and of Federal proprietary activities.

CHAPTER II

POLITICAL AND LEGAL HISTORY OF THE CONTROVERSY

Although development of offshore oil resources began at the close of the 19th Century, the real contest over which governmental unit should be the controlling agency did not become politically important until 1945. From that date until 1952 the scene is one of a stand-off between legislative proponents of quit-claim measures and executive opposition to such. After the Republican victory of 1952, however, Congress passed two acts which were sustained by Supreme Court decision the following year. Yet, obvious areas of disagreement may cause future controversy.

Chronology of Events Prior to the 1952 Election

The first offshore oil deposits were discovered near Santa Barbara, California, in 1894 when it was determined that the Summerland Field extended out under the Pacific Ocean.[1] Between 1921 and 1936, five other offshore pools were discovered in the narrow strip of the Continental Shelf adjoining the California Coast. The latter developments

[1]Buel W. Patch, "Offshore Oil," Editorial Research Reports, Vol. I, January 22, 1946, p. 63.

were made under lease from California, for in 1921 that State had enacted a general leasing statute that applied to the marginal sea.[2]

With the development of oil production under State leases, a number of persons began to file applications with the Department of the Interior for Federal oil and gas leases on submerged lands situated in or near the California offshore producing areas. Several hundred such applications were made between 1924 and 1937. The Department of the Interior consistently rejected all such applications on the grounds that the lands applied for belonged to the State of California.[3] Secretary of the Interior Harold Ickes, in one letter of rejection, wrote: "Title to the soil under the ocean within the three mile limit is in the State of California, and the land may not be appropriated except by authority of the State."[4] Later, Secretary Ickes began to

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[2]This statute was amended in 1929, at the instigation of groups disturbed by the tendency of escaping oil to gum up the beaches, to prohibit the drilling through the water. It was still possible to reach a portion of the underwater deposits by directional drilling from well locations on land. Congressional Digest, October, 1948, p. 233.

[3]United States Department of the Interior, Years of Progress 1945-1952 (Washington: Government Printing Office, 1953), p. 192.

[4]Letter of Harold L. Ickes to Olin S. Proctor, dated December 22, 1933. Complete text in Senate Committee on Interior and Insular Affairs, Jurisdiction over Submerged Lands of the Open Sea, Committee Print, 82d Cong., 1st Sess. (Washington: Government Printing Office, 1951), p. 7.

doubt his decision in this matter, largely as a result of the persistence of several of the Federal lease applicants, and discontinued the rejection of applications received after April 19, 1937.[5]

About this time the Congress became interested in the offshore lands. On August 14, 1937 Senator Gerald Nye (Rep.) of North Dakota introduced a resolution declaring all lands below low water to be the property of the United States and directing the Attorney General to take the necessary action to establish possession.[6] The resolution passed the Senate five days later without debate or recorded dissent. The House Judiciary Committee held hearings on the Nye bill in February, 1938, and favorably reported the resolution to the House, but Congress adjourned before further action was taken. Similar resolutions asserting Federal title and directing the creation of an offshore Naval Petroleum Reserve were offered in 1939 and hearings were held, but none passed.[7]

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[5]Department of the Interior, op. cit., pp. 192-193. In 1940 and again in 1944, certain Federal lease applicants filed suit to compel Secretary Ickes to act on the applications that were being held in suspense. The suits were not successful. Dun v. Ickes, 115 Fed. (2nd) 36 (1940) and Jordan v. Ickes, 143 Fed. (2nd) 152 (1944).

[6]S. J. Res. 208, 75th Cong., 1st Sess.

[7]H. J. Res. 176 was introduced by Congressman Hobbs; H. J. Res. 181, by Congressman O'Connor; and S. J. Res. 83 and S. J. Res. 92, by Senators Walsh and Nye.

Meanwhile oil activity was getting under way in the Gulf of Mexico. On March 11, 1938 the first successful well was completed in the open waters of the Gulf under a lease from the State of Louisiana.[8] In June 1938 the Louisiana Legislature acted to extend the boundary of that State to twenty-seven miles from shore.[9]

In July 1939 at the suggestion of Secretary Ickes, President Roosevelt appointed an interdepartmental committee to study the submerged land ownership matter. The committee recommended that the Attorney General assert a claim to the California offshore and this report was approved by President Roosevelt but because of the war situation, no action was taken by the Attorney General until 1945.[10]

The war caused a virtual suspension of both the drilling activities in the offshore and the ownership dispute.[11] However, even before the end of hostilities in the Pacific Theater, both sides were prepared to resume the domestic battle. The opening blow was struck sixteen days after the capitulation of Germany. On May 29, 1945 Attorney

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[8]The Oil Weekly, March 28, 1938, p. 200.

[9]Louisiana General Statutes, 1938, No. 55.

[10]Department of the Interior, op. cit., p. 192.

[11]Three State ownership bills were introduced during the war by Representative Angell, but these proposals received no attention by Congress. Patch, op. cit., p. 65.

General Biddle filed a test suit in the Federal District Court against the Pacific Western Oil Corporation to recover a small plot of submerged land seaward of California.[12] Retaliation came one month later in the form of a quitclaim resolution, introduced by Representative Hatton Sumners (Dem.) of Texas, which declared that the United States "renounces and disclaims any right, title, interest or claim" to the submerged lands.[13] The Judiciary Committee, of which Rep. Sumners was Chairman, reported H. J. Res. 225 to the House with what some called tumultuous haste.[14] The House passed the measure by a vote of 108-11 on September 20, 1945, after a single afternoon of debate. Senate action was deferred until the next Session of Congress.

On September 28, 1945 President Truman issued Proclamation Number 2668 which asserted that the mineral resources to the edge of the Continental Shelf "appertain to"

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[12] New York Times, May 30, 1945, I., 1.

[13] H. J. Res. 225, 79th Cong., 1st Sess. was introduced on June 28, 1945. Numerous other quitclaim bills had been introduced earlier in the session and hearings had been held, but H. J. Res. 225 was the only bill reported out of the Judiciary Committee.

[14] The Judiciary Committee was criticized for their failure to hear a single representative of the Interior, Justice, or Navy Departments. Alan Barth, "Oil Beneath the Waters," Nation, November 3, 1945, p. 458. However, Chairman Sumners maintained that these administration departments had been invited to contribute anything they desired. U. S. Congress, House Judiciary Committee and Special Subcommittee of the Senate Judiciary Committee, Joint Hearings on H. J. Res. 118 et al, 1945, p. 121.

the United States and are subject to its jurisdiction and control. The Proclamation was most carefully worded so as to reaffirm the traditional three mile limit of jurisdiction over the sea itself. The freedom of the seas was in no way affected by the Proclamation, which dealt only with the seabed and subsoil.[15] Executive Order Number 9633, issued the same day, placed such mineral deposits under the administrative custody of the Secretary of the Interior, pending legislative or judicial determination of the State vs. Federal ownership question.[16]

To secure a more expeditious determination of the ownership question, Attorney General Clark on October 19, 1945 brought suit against the State of California in the Supreme Court of the United States. The complaint against California alleged that the United States was "owner in fee simple of, or possessed of paramount rights in and powers over, the lands, minerals and other things of value" underlying the marginal seas.[17] The suit against the Pacific Western Oil Corporation, a lessee of California, was dropped by the Justice Department.

While the Supreme Court case was pending, Congress

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[15] 10 F.R. 12305.

[16] Ibid.

[17] Supreme Court of the United States, No. 12 Original, 1945 Term, Motion for Leave to Tide Complaint, p. 1.

went ahead with the processing of H. J. Res. 225. After a three day hearing, the Senate Judiciary Committee favorably reported this resolution that had passed the House during the previous Session. On July 22, 1946 the Senate adopted the measure with some slight changes by a vote of 44 to 34. The House quickly approved the Senate version by 188 to 67 and sent it to the White House.[18] President Truman vetoed H. J. Res. 225 on August 1, 1946 on the grounds that the Supreme Court, then considering the case against California, was the appropriate tribunal to determine the legal issue of ownership. He maintained that if the Supreme Court found no Federal title to the land, no quitclaim from Congress would be necessary; if the Court found that the submerged lands belonged to the United States, "they should not be given away."[19]

On August 2, the House fell seventeen ballots short of the two-thirds majority required to enact the measure into law over the Presidential objection. The first quitclaim bill was dead.

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[18] Commercial and Financial Chronicle, August 8, 1946, p. 807. Representative Hobbs proposed an amendment that would reserve the mineral rights in the submerged lands to the United States. The purpose of the amendment was to point out that the controversy was over offshore oil and not over inland waters, reclaimed lands, ports and harbors as the State participants claimed. Congressional Record, July 24, 1946, p. 8865.

[19] House Document Number 765, 79th Cong., 2d Sess. (Washington: Government Printing Office, 1946), p. 3.

The Supreme Court rendered its decision in the case of the United States v. California on June 23, 1947. The Court ruled 6 to 2 that the United States had "paramount rights in and power over" the marginal seas, "an incident to which is full dominion over the resources of the soil under that water area, including oil."[20] Although the Supreme Court held that title rested in the Federal Government, the Attorney General ruled that the Federal Mineral Leasing Act of 1920, as amended, was not applicable to the submerged lands.[21] This ruling completed the stalemate. The United States was without a law under which it could operate the submerged lands and the State ownership supporters had sufficient strength in Congress to prevent the passage of an applicable Federal leasing law. Furthermore, as long as a President hostile to State ownership remained in the White House, they could not pass their quitclaim bill. This impasse in Congress continued through 1951.[22]

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[20] United States v. California, 332 U.S. 19. As the Court did not undertake to fix the landward boundary of the marginal belt, an escrow agreement was made between the Attorney Generals involved for continued operation under State authority until the matter was definitely decided. Congressional Digest, October, 1948, p. 241.

[21] Letter of the Attorney General to the Secretary of the Interior, dated August 29, 1947; text found in Senate Report Number 1143, 82d Cong., 2d Sess. (Washington: Government Printing Office, 1952), p. 30.

[22] Numerous quitclaim and Federal ownership bills were introduced during these years. The quitclaim bills in 1947 were S. J. Res. 14 and H. J. Res. 51; in 1948, S. 1988, H. R. 5992 and thirty-seven identical House bills; in 1949,

Meanwhile geophysical and drilling operations in the Gulf of Mexico were virtually at a standstill because of the indecision in Congress concerning ownership.[23] In an effort to revive offshore activity, Senator O'Mahoney introduced S. J. Res. 195 in 1950 and S. J. Res. 20 in 1951, similar bills that would vest control in the Interior Department, provide for granting new leases, give 37 1/2 per cent of the royalties to the adjacent States, and place the remaining royalties in escrow until final settlement could be made by Congress.[24] The Federal interim control feature prevented passage as the State ownership proponents feared that the interim legislation might turn out to be dangerously permanent.

On the judicial front Attorney General Clark had initiated separate suits in the United States Supreme Court against Louisiana and Texas, seeking determination of the rights of the United States in the twenty-seven nautical mile strip claimed by Louisiana and in the entire Continental

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S.1545, S.1700, S.155 and twenty-five House bills; in 1950, H.R.5991 and H.R. 8137; and in 1951, S.940, H.R.58 and H.R. 4484. The Federal ownership bills in 1948 were S.2222, introduced by Senator Barkley and H.R.5529, by Representative Lemke. In 1949, S.923 duplicated S.222 of 1948 and S.2153, sponsored by Senator O'Mahoney, was designed to quitclaim lands beneath inland navigable waters to the States, leaving the way clear for a Federal ownership bill dealing with the offshore lands at a later date.

[23] Senate Report Number 1143, 82d Cong., 2d Sess. (1952), p. 4.

[24] Other interim bills introduced in 1948 and 1949 had received little serious consideration.

Shelf seaward of Texas claimed by that State. The Federal argument in both cases was similar to that presented in United States v. California. Texas offered a defense based upon its unique history as an independent nation prior to annexation into the United States.[25] The Supreme Court handed down its decisions on June 5, 1950, awarding judgment in both cases to the United States. The case of United States v. Louisiana was decided by a five to two decision and United States v. Texas by four to three.[26]

When the 82d Congress reconvened in 1952, two important submerged land measures carried over from the First Session. One was Representative Walter's House Bill 4484, a quitclaim bill that had passed the house by a vote of 265 to 109 on July 30, 1951. The other was S.J. Res. 20, the Administration's interim operation bill that had been introduced by Senators O'Mahoney and Anderson but not acted on in 1951. There was considerable doubt that H.4484 would get out of the Senate Interior and Insular Affairs Committee, so in January, 1952, S.J. Res. 20 was reported favorably to the Senate. On the floor, Senator Hill submitted an amendment that would earmark the income from the lands in question for

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[25]Supreme Court of the United States, October Term, 1949, No. 13, original, Brief for the State of Texas in Opposition to Motion for Judgment.

[26]United States v. Louisiana, 339 U.S. 699, and United States v. Texas, 339 U.S. 707.

education throughout the nation, but this was promptly tabled.[27] Later, Senator Holland introduced a substitute amendment that was substantially House Bill 4484, a quitclaim measure. The Holland substitute version of S.J. Res. 20 was passed on April 2 with a vote of 50 to 35.[28] A conference committee version of S.J. Res. 20 was accepted by a vote of 247 to 89 in the House on May 15 and by a voice vote in the Senate on May 16.

Two weeks later President Truman vetoed this quitclaim bill. His reasoning was that the Supreme Court had already settled the matter of submerged land ownership and that he did not believe that the people of the country should "turn over to certain States, as a free gift, very valuable lands and mineral resources of the United States as a whole . . ."[29] When the quitclaim advocates did not attempt a vote to override the veto, the second quitclaim measure was dead.

Political Action in 1952

Supporters on both sides took hope from the fact

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[27] Congressional Record, March 26, 1952, p. 3391.

[28] Ibid., April 2, 1952, p. 4416.

[29] Senate Document Number 139, 82d Cong., 2d Sess. (1952), p. 1. In the veto message, the President indicated that he would be willing to accept the original version of S.J. Res. 20 and that he would look favorably on Senator Hill's oil-for-education amendment. Ibid., p. 7.

that 1952 was a general election year. Each expected that the voters would send to Congress and to the Executive mansion representatives favoring its side. After the Republican victory at the polls but before the new President was inaugurated, the outgoing Executive attempted to forestall any legislative solution of the submerged lands problem by executive order.

Political Role of the Oil Industry

The ostensible participants in the offshore lands struggle were the Federal Government on the one side and several State Governments on the other. The States' officials denied the charge that the major oil companies were allied with them in the controversy.[30] Such belief, however, was widely held by people with a knowledge of the situation, for the testimony of oil company officials and the tenor of the editorials in the leading petroleum periodicals indicated that the industry favored State ownership of the submerged lands.[31] For the most part, any help that the oil

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[30] Senator Daniel, in answering such a charge, said: "I have been in this fight about six years, and I will tell you, sir, that everybody I saw helping anybody /further the quitclaim legislation/ was connected with State governments." Hearings on S.J. Res. 13, p. 503.

[31] Testimony of Hines Baker, Walter Hallanan, and others, U.S. Congress, Senate, Committee on Interior and Insular Affairs, 81st Cong., 1st Sess., Hearings on S.155, et al (Washington: Government Printing Office, 1949), pp. 320, 354, 387 and 401. In 1952, when it appeared that President Truman would veto any quitclaim bill that was passed by

industry gave the States' officials in securing the quitclaim was from behind the stage.[32]

The reason the oil companies refrained from open political support is obvious. In the early days of the controversy certain California offshore operators made a serious mistake in taking an active part in lobbying for the first quitclaim bill. In 1945 Edwin W. Pauley, former treasurer of the Democratic National Committee and president of Petrol Oil Corporation, one of the larger California offshore producing companies, and William C. Clary, a special Assistant Attorney General of California, part of whose salary was paid by private oil interests, had joined with California Attorney General Robert W. Kenny in gathering Congressional support for H. J. Res. 225.[33] That measure passed the House in a single afternoon.

The reaction to this outstanding lobbying job was quick and violent. The St. Louis Post Dispatch, uncovering the facts concerning Clary's pay status with the offshore operators, raised such a furor of publicity that the next

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Congress, the oil companies backed the O'Mahoney-Anderson Federal interim operation bill. They thought this bill better than no legislation at all. Philip Geyslin, "U.S. vs. State Struggle for Control Nears Showdown," Wall Street Journal, February 14, 1952, p. 4.

[32]The American Petroleum Institute never took an official stand on the submerged lands question. Letter from William B. Harper, American Petroleum Institute, to the author, dated June 3, 1953.

[33]Alan Barth, "Oil Beneath the Waters," Nation, November 3, 1945, p. 458.

Congressional submerged lands hearing was devoted to checking the extent of the lobbying on this measure by the oil companies.[34] The finding of oilmen in company with and in the ranks of the States' officials aroused the rancor of many Congressmen and Federal officials against the oil companies and the quitclaim bill. Senator Tobey (Rep.) of New Hampshire said that a "sordid picture had been created by the oil company lobbyists" who had been "cajoling" votes for the measure.[35]

Mr. Pauley's connection with the submerged lands issue had some far-reaching repercussions. Early in 1946 Secretary Ickes accused Mr. Pauley, then President Truman's nominee for Under Secretary of the Navy, of offering, in April, 1945, a $300,000 gift from California oilmen to the Democratic Party if the government could be persuaded to refrain from filing suit for title to the submerged lands.[36] Mr. Pauley emphatically denied the charge. When the President stood by his nominee, Mr. Ickes resigned. Opposition to Pauley, largely engendered by the Ickes' charge, later resulted in the withdrawal of the nomination.[37]

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[34]U.S. Congress, Senate, Committee on the Judiciary, Hearings Relating to S.J. Res. 48 and H.J. Res. 225 (Washington: Government Printing Office, 1946), passim.

[35]New York Times, July 23, 1946, I, 2.

[36]New York Times, February 6, 1946, I, 5.

[37]Ibid., August 2, 1946, XII, 1.

Following their unfortunate experiences in attempting to mix politics and offshore oil in 1945 and 1946, the oil companies kept in the background during the rest of the submerged lands controversy. The offshore oil companies set up the Offshore Lessees Committee to speak for the group. Individual oil company officials would appear from time to time during Congressional hearings, but only as expert witnesses.

Inland Support of the Quitclaim Legislation

Although on the surface the position of the inland supporters of the quitclaim legislation is difficult to understand, a quick glance at the facts will explain it.[38] The various organizations of States' officials early lined up inland support through the contention that the Supreme Court decisions in the California, Louisiana and Texas cases clouded the titles to the waters and submerged lands of every State. In a widely distributed pamphlet entitled Every State Has Submerged Lands, the National Association of Attorneys General contended that: "/quitclaim/ legislation is necessary for each of the 48 States in order to restore and confirm their ownership of navigable waters and

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[38] Secretary of the Interior Ickes took great delight in speaking about the "interest of such seafaring States as Tennessee, Nevada, Iowa and Kentucky in preserving their tidal lands impinging on the ocean." New York Times, October 28, 1945, I, 16.

submerged lands within their respective boundaries."[39]

The opponents of the quitclaim legislation on several occasions sought to wean the inland supporters away from the legislation to grant the coastal States offshore lands by offering to confirm State title to all lands beneath navigable inland waters, including the Great Lakes.[40] In each of the Federal ownership and interim operation bills submitted to Congress, the United States specifically disclaimed title to these lands.[41] Senator Anderson (Dem.) of New Mexico, sponsor of several of the Federal bills, asserted: "There is no need for those wishing to protect the legitimate interests of all the States (in the lands beneath inland waters and the actual tidelands) to get into the offshore oil question. . . ."[42]

The Federal ownership and interim operation bills also attempted to quiet the fears of Coastal States and

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[39]National Association of Attorneys General, Every State Has Submerged Lands (Washington: National Association of Attorneys General, n.d.), p. 1.

[40]The Federal Government had never claimed ownership of these lands and was willing to put this in writing.

[41]S.222(1948), S.2153(1949), S.1540(1951), S.107 (1953) and numerous other Senate and House bills. S.107, Sec. 9, stated: "The United States hereby asserts that it has no right, title, or interest in or to the lands beneath navigable inland waters within the boundaries of the respective States, but that all such right, title, and interest are vested in the several States . . ."

[42]New York Times, March 8, 1953, I, 8.

municipalities concerning the ownership of wharfs, decks, piers, jetties or other structures in the open ocean and the ownership of filled in or reclaimed lands in such areas. Individuals and local governments have many millions of dollars invested in such improvements along the coastal belt. The various Federal bills recognized and confirmed the titles of any State or political subdivision thereof, municipality, agency, or person to existing and future improvements of this nature.[43]

The quitclaim sponsors, fearing a division of their forces, were successful either in blocking such legislation in committee or, when one Federal interim control bill was reported out, in amending it on the floor to resemble the offshore quitclaim bill.[44] In most cases, however, they had no cause to worry about losing their inland supporters, for many inland Congressmen had good reason to back the offshore quitclaim. A case in point, Representative Stringfellow (Rep.) of Utah gave as one reason for his support:

> The settlement of the offshore submerged lands dispute in favor of State ownership is only one phase of the revaluation of the entire Federal land ownership problem. . . . For the sake of consistency I could not argue for Federal ownership of these offshore lands and still try to achieve our objective of returning at least part of the public domain in Utah to control of the State and private citizens thereof.[45]

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[43] S.107, 83d Cong., 1st Sess., Sec. 11 (1953).

[44] S.J. Res. 20, 82d Cong., 2d Sess. (1952).

[45] Congressional Record, April 1, 1953, p. A1845.

Other inland Congressmen also saw in the offshore quitclaim legislation a precedent for later attempts to get Federal assets for their constituencies and constituents.

Political Alignment

When it became evident that no quitclaim measure could be passed against the wishes of a Chief Executive hostile to such legislation, the State ownership forces sought a candidate for the 1952 election in sympathy with their position. In General Eisenhower they had such a man, for the General early had declared his support of the States' claims.[46] In New Orleans during the campaign the General said: "I favor the recognition of clear title to these lands (the submerged lands within historic boundaries) in each of the forty-eight States."[47] This was in keeping with the official Republican platform position on the issue, which stated: "We favor restoration to the States of their rights to all lands and resources beneath navigable inland and offshore waters within their historic boundaries."[48]

Governor Stevenson, the Democratic candidate for President, adopted the stand taken by President Truman and

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[46]General Eisenhower put himself on record as favoring State title while still in Europe. This was developed in a letter to Jack Porter of Houston, a personal friend and a staunch quitclaim supporter. Dallas Morning News, June 4, 1952.

[47]New York Times, October 14, 1952, I, 6.

[48]Ibid., July 11, 1952, I, 2.

declared himself against any "blanket cession" of the submerged lands to the States. However, the Governor did express a desire and willingness to work on a compromise solution to break the stalemate. In New Orleans the Democratic candidate said:

> If the submerged lands, by virtue of the ruling of the United States Supreme Court, are a national, and not a State asset . . . I do not think it a wise policy for the Congress to institute the practice of giving away such assets to individual States.[49]

In an attempt to keep peace within the Democratic family, the offshore question was played down in the party platform to appease the Southern State-ownership faction. Still, State party leaders like Governor Shivers of Texas and Governor Kennon of Louisiana announced they were displeased with Stevenson's stand. In fact, Texas voters gave Eisenhower a majority.

The 1952 Election--a Mandate?

During the 1952 political campaign, the submerged lands issue received sufficient coverage by both candidates to acquaint the voters with the different positions. The opposing candidates were frank in disclosing their stands on the issue.

There is no way to assess the exact influence of the submerged lands issue on the outcome of the 1952 election.

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[49] Major Campaign Speeches of Adlai E. Stevenson, 1952 (New York: Random House, 1953), p. 237.

Bartley believes that the support of the quitclaim by General Eisenhower and the opposition to this measure by Governor Stevenson had at least a nominal effect in Texas, a lesser effect in Louisiana, and little or no effect in California.[50]

The press hailed the Republican victory as a mandate from the people favoring a quitclaim of the submerged lands.[51] Obviously such a conclusion goes far beyond the facts. To this writer, it seems unlikely that the submerged lands issue by itself was of sufficient national importance to sway the voters in every State. The causes of the Republican victory must be sought in a wider complex of political, economic, and personal reasons.

Naval Petroleum Reserve Inheritance

President Truman fired a parting shot at the quitclaim plans of the incoming Republican Administration on January 16, 1953 by issuing an executive order setting aside the submerged lands of the Continental Shelf as a naval

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[50]Ernest R. Bartley, The Tidelands Oil Controversy; A Legal and Historical Analysis (Austin: The University of Texas Press, 1953), p. 229. This thorough study of the legal and historical aspects of the marginal seas issue was published while the present study was in preparation. For an interesting and scholarly discussion of the legal intricacies of this complex issue, the reader is recommended to consult this work.

[51]See, for example, Dallas Morning News, March 6, 1953.

petroleum reserve.[52] Senator Daniels said that the President was acting "in pure and simple personal spite and political revenge."[53] Representative Lucas (Dem.) of Texas stated bitterly that the federal ownership advocates were trying to do what they could not get the Congress to do, "like a bunch of thieves who have been caught in the act and are trying to find a legal hole in which they can hide the swag.[54] In a statement accompanying the order, President Truman stated that it was of utmost importance that the vast oil deposits in the Continental Shelf be conserved and utilized for the national security and that it would be "the height of folly for the United States to give away . . . the oil . . . in the Continental Shelf, and then buy back this same oil at stiff prices" for the armed forces.[55]

Few doubted the authority of President Truman to establish a new naval petroleum reserve and few doubted the authority of President Eisenhower to countermand the order or of Congress to pass a law nullifying the order, but in either of the latter cases the Republicans would have to accept the political onus of taking oil out of the Navy's

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[52]Executive Order 10426, F.R. Doc.53-734, January 16, 1953.

[53]Dallas Morning News, January 16, 1953.

[54]Congressional Record, January 16, 1953, p. 439.

[55]Statement by the President Regarding Executive Order 10426, January 16, 1953.

hands.[56] This could provide strong ammunition for the Democrats who presumably would not hesitate to remind the voters that the Republican Teapot Dome scandals in the 1920's involved naval oil reserves.

Unfortunately, the objective used as a justification for the establishment of a new naval petroleum reserve, the promotion of national security, was hampered by President Truman's order if the experience with naval oil reserves in the past is used as a criterion. Oil from the existing naval petroleum reserves contributed little during World War II. Oil fields must be developed before they contribute to national defense. All of the oil resources in the nation constitute the petroleum reserve for defense and all are available not only for the Navy, but for the entire defense establishment, which includes the Army, the Air Force, the Merchant Marine, as well as war production plants, the cars of defense workers, the railroads, and a host of other related petroleum users, when needed for national security. So tremendous are the quantities of petroleum demanded by modern war that anything less than the entire production of all oil fields within the control of the United States would be inadequate. The available petroleum reserve is not augmented when a portion of the potential oil land is set aside in an undeveloped state.

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[56] New York Times, January 18, 1953, IV, 1.

The formula for assuring adequate petroleum for defense is not found in hoarding oil deposits underground but in furthering the development of a dynamic and inventive domestic oil industry. Furthermore, in time of war the government can and does control the prices which it pays for petroleum products as well as other supplies. It would be absurd for the government to permit itself to be charged "stiff prices" for these necessary war supplies.

The offshore naval oil reserve was not slated for a long life as the incoming Administration quickly set about nullifying the order of President Truman. Attorney General Brownell ruled that Executive Order 10426 did not succeed in creating a naval petroleum reserve within the meaning of the statute relating to other petroleum reserves (34 U.S.C. 524). The general effect of the order was to transfer the authority over these lands from the Secretary of the Interior to the Secretary of the Navy.[57] The 1953 version of the quitclaim bill was altered to include a section revoking President Truman's order.[58]

The 1953 Legislation

Early in 1953 the path to victory for the State ownership cause looked clear. General Eisenhower, pledged

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[57]Letter of Herbert Brownell, Jr., to the Secretary of Defense, dated February 13, 1953, reproduced in Hearings on S.J. Res. 13, p. 4.

[58]S.J. Res. 13, Sec. 10.

to back the quitclaim, was in the White House, the Republicans had gained control of both houses of Congress, and one of the leading enemies of State ownership, Senator O'Mahoney (Dem.) of Wyoming, chairman of the Senate committee handling submerged lands legislation, had been defeated. Replacing Senator O'Mahoney as head of the Senate Interior and Insular Affairs Committee was Senator Hugh Butler (Rep.) of Nebraska, a strong quitclaim advocate.

In the first two weeks of the 83d Congress, five separate Senate and thirty-seven House measures dealing with the submerged lands were introduced. The most important of these were:

S.J. Res. 13. This was a quitclaim bill, almost identical to the 1952 S.J. Res. 13 that was vetoed by President Truman. Introduced by Senator Holland and thirty-nine others, this bill would confirm and establish title of the States to the submerged lands within historic boundaries.

H.R. 4198. This was the principal House quitclaim bill that, in addition to assigning the submerged lands within historic boundaries to the States, made provision for the Federal development of the remainder of the Continental Shelf.

S. 294. Senator Daniel introduced this bill that would give the States full ownership within historic boundaries and a share of the control and 37 1/2 per cent of the revenues of the remainder of the Continental Shelf.

S. 107. This bill, introduced by Senator Anderson, provided for joint Federal and State control within three miles from shore, payment to the States of 37 1/2 per cent of the revenues earned within this area, Federal control of the remainder of the Continental Shelf, and the escrow of

all other revenues until the matter could be decided permanently by Congress. This interim operation measure, designed to accomplish resumption of exploration and development activities offshore, would be binding for five years.

S. 107 Amendment. Under this amendment, fathered by Senator Hill, the 67 1/2 per cent of the revenues from the first three miles offshore and the 100 per cent of the revenues from the remainder of the Continental Shelf going to the Federal Government under the provisions of S. 107, would be placed in a special fund in the United States Treasury to be used, after the defense emergency was over, for grants-in-aid of primary, secondary and higher education.

S.J. Res. 18. This was Senator Kefauver's bill that would defer all action on the submerged lands pending a complete study of the ownership problem by a commission to be established by the bill.

The Federal Control Bill

With three United States Supreme Court decisions declaring the "paramount rights" of the United States in the marginal seas seaward of the low water mark, the title of the United States in the submerged lands appeared reasonably well grounded. But the legal victory in the matter of ownership was of little value unless Congress would give concurrent authority for leasing these lands. So great was the power of the State ownership forces that, in 1953, no attempt was made to obtain Congressional approval of a permanent Federal leasing statute. It was conceded that no such bill could get out of committee, much less receive the Congressional blessings.

In an attempt to preserve the interest of the United

States in the marginal sea lands and to break the deadlock that had been delaying the development of the offshore petroleum resources, the Federal ownership supporters, led by Senator Anderson, resubmitted the 1952 O'Mahoney-Anderson interim operation bill to Congress.[59] Their only hope was that, should the quitclaim measure fail, Congress in desperation might accept the interim operation bill. This temporary measure was far from perfect, even in the eyes of its sponsors, but it was the only Federal control bill that appeared to have a chance of success in the Eighty-third Congress.

A compromise measure, the Anderson bill would settle nothing in the long run. For five years the Secretary of the Interior would administer the leasing of the Continental Shelf lands,[60] the States would get 37 1/2 per cent of the revenues from the submerged lands within State boundaries, and the remainder of the revenues from the entire Continental Shelf would be held in a special Treasury account until Congress decided on a permanent settlement. The question of ownership was not raised or solved. Five years later the entire matter would have to be settled or the interim working arrangement extended for another term. The bill was not reported out of committee.

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[59]S. 107, 83d Cong., 1st Sess.

[60]The States would have the power to veto new leases within State boundaries.

The Oil for Education Amendment

The Hill Amendment to the 1953 Federal control bill[61] would use all of the revenues from the Continental Shelf, except the 37 1/2 per cent from within three miles scheduled to go to the adjoining States, as grants-in-aid of education.[62] The method to be used for the allocation of the educational grants was not covered in the amendment, but provision was made to get an accounting from each of the States or political subdivisions which had issued any mineral leases on the Continental Shelf, with a view to subtracting the proceeds previously received from such leases from the amounts scheduled to go to the particular State or municipality.[63]

The opponents of Federal control denounced the Hill Amendment. Senator Potter (Rep.) of Michigan railed at what he called "demagogues who are using education in general and teachers in particular, as tools" to get support for Federal control of the offshore lands.[64] The Hill Amendment sponsors did stress opinions of educational authorities to

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[61]S. 107 Amendment, 83d Cong., 1st Sess.

[62]During the defense emergency, at the discretion of Congress, the monies could be used for national defense expenditures.

[63]Congressional Record, January 16, 1953, p. 407.

[64]Congressional Quarterly Almanac, 1953, Vol. IX, p. 393.

outline the crying needs of the nation's schools.[65] There was an implied accusation that anyone opposing the oil for education amendment was against improving educational standards in the nation, or tantamount to being for poor education.

The oil for education amendment was not popular even with several of the Federal control advocates. Voicing the feeling of this group, Senator Anderson, sponsor of the bill to which the oil for education amendment was attached, said that the amendment weakened the chances of any Federal ownership bill being passed by Congress. He believed that the Hill Amendment, which brought the controversial subject of Federal aid to education into the offshore oil picture, did disservice both to Federal aid to education and to Federal ownership of the submerged lands.[66] The Hill Amendment was defeated in the Senate by a vote of 56 to 33 on April 27, 1953.[67]

State Ownership Bills

For the third time the Congressional quitclaim

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[65] Hearings on S.J. Res. 13, pp. 382, 428, 490, and 594.

[66] Dallas Morning News, March 29, 1953.

[67] In a surprise move, the Senate adopted, 45 to 37, the oil for education amendment to go with the Outer Continental Shelf Bill. It was stripped off in conference to make the bill acceptable to the House. Editorial Research Reports, 1953, Vol. II, p. 535.

advocates attempted to secure clear title to the submerged lands for the States. The assertion was made that this property justly belonged to the States and that the Federal claims to these lands, as well as the three Supreme Court decisions regarding these lands, constituted clouds upon the title. To the opposition argument that, according to the Supreme Court, title was never vested in the States, hence Congress could not grant a return of title, the quitclaim forces pointed out that the Constitution of the United States specifically gave Congress the power to dispose of the territory and other property belonging to the United States.[68] In any event, a quitclaim would return to or give to the States the submerged lands that they thought rightfully belonged to them.

The leading backers of State ownership decided to settle for title out to the historic boundaries lest the quitclaim attempt meet complete defeat. Senator Ellender (Dem.) of Louisiana warned that unless President Eisenhower had a bill that he could sign in 1953, the State ownership "cause has been perhaps permanently lost."[69]

Thirty-one quitclaim bills were introduced in the House in 1953, but the House Judiciary Committee could not agree on any of them. The Committee drafted a new bill,

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[68] Constitution of the United States, Article IV, Sec. 3, Cl. 2.

[69] New York Times, March 22, 1953, I, 56.

known as H.R. 4198, and reported this bill out on March 27, 1953. Titles I and II of the House bill were almost identical with the same titles of the Walters bill that had been passed in 1952. These sections provided for State ownership and development of the lands and resources beneath navigable waters within historic boundaries, but protected the Federal rights to control the flow of inland waters in the interest of flood control, navigation, irrigation, reclamation and power generation. Title III of H.R. 4198 provided for Federal ownership and development of the areas of the Continental Shelf beyond the historic boundaries of the States.[70]

The 1953 Senate quitclaim bill, S.J. Res. 13, sponsored by Senator Spessard Holland (Dem.) of Florida, was similar to Titles I and II of the House bill. However, it left the disposition of the outer Continental Shelf to later determination by Congress. The Senate bill revoked the January 16, 1953 executive order by President Truman, which set aside all offshore deposits as naval petroleum reserves. The Holland bill was reported out of the Senate Interior and Insular Affairs Committee, after a long and not entirely favorable hearing, on March 27, 1953.[71]

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[70]U.S. Congress, House Report No. 215, 83d Cong., 1st Sess. (Washington: Government Printing Office, 1953).

[71]U.S. Congress, Senate Report No. 133, 83d Cong., 1st Sess. (Washington: Government Printing Office, 1953).

Troubles with the Administration

As it developed, the road to quitclaim victory was rocky. The sponsors of the legislation encountered more difficulty on Capitol Hill in 1953 than they had during the Truman era. An extremely vocal group in the Senate fought the bill with every weapon at their disposal. Also, some Eisenhower Administration officials, who would be supposed to reflect the views of the President, placed some unexpected boulders in the path. An Under Secretary of State and the Attorney General of the United States expressed some doubt about the wisdom of certain strategic provisions of the Holland bill.[72]

A spokesman for the State Department warned against extending the State boundaries out more than three miles because of international complications. In the view of the State Department, recognition of State claims beyond this point would force abandonment of the international position the United States had maintained for 150 years. In no case could the claims of the States exceed those of the Nation and the Department of State did not believe it in the national interest to change this traditional three mile position.[73]

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[72]A shocked Dallas Morning News editorially rationalized that "Brownell and Dulles . . . . popped off without knowing what they were talking about." Dallas Morning News, March 14, 1953.

[73]Testimony of Thruston Morton, Under Secretary of State, Hearings on S.J. Res. 13, pp. 1087-88.

This placed the 10 1/2 mile Gulf Coast claims of Florida and Texas in considerable danger of not being acceptable to President Eisenhower, if he believed his State Department advisors. Quitclaim opponent Representative Celler (Dem.) of New York gleefully proclaimed that "this fuzzy duzzy is the result of improvident and extravagant campaign promises that the Eisenhower Administration now finds it can't fulfill."[74]

To the great surprise of the State ownership supporters, Attorney General Brownell recommended to the Senate Interior and Insular Affairs Committee and the House Committee on the Judiciary that Congress grant to the coastal States only the authority to administer and develop the petroleum and other natural resources in the marginal seas within their historic boundaries. He was not in favor of granting a blanket quitclaim because of the constitutional questions that might arise.[75]

This proposal for "use without ownership" was not at all to the liking of the quitclaim forces. They had expected better treatment from President Eisenhower's legal chief. Senator Long said that the Truman Administration had offered a formula more favorable to the coastal States than

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[74] Dallas Morning News, March 12, 1953.

[75] Hearings on S.J. Res. 13, p. 926, and U.S. Congress, House, Subcommittee No. 1 of the House Judiciary Committee, Hearings on H.R. 2948 et al, 83d Cong., 1st Sess. (Washington: Government Printing Office, 1953), p. 218.

the Brownell license without title proposal. Senator Holland told Mr. Brownell that his "statement had little if anything to do . . . with the [campaign] commitment."[76] Clearly, the Administration's signals had become crossed.

Shortly after this damaging testimony had been registered, President Eisenhower, setting aside the recommendations of his Attorney General and Secretary of State, reassured Senator Daniel that the Administration had not changed its campaign position. It was still willing to give the States clear title to the marginal seas within historic boundaries.[77]

Congressional Action on the Quitclaim Bill

Passage of the House bill took only two and one-half days. On April 1, 1953, H.R. 4198 passed by a vote of 285 to 108.[78] In the Senate the quitclaim measure remained under almost continuous debate for twenty-seven sittings, with one of the sittings extending for over twenty-two hours. There was never serious doubt about the eventual success of S.J. Res. 13, the Senate version of the State ownership bill. Similar bills had been passed by substantial margins on two

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[76] Newsweek, March 16, 1953, p. 41.

[77] Dallas Morning News, March 17, 1953.

[78] Congressional Quarterly Almanac, Vol. IX, 1953, p. 394.

earlier occasions.

The backers of the Holland bill, confident of their victory in the final vote, were willing to let the opposition talk themselves out. They wanted no later criticism that the issue had been railroaded through Congress.[79] Damning the bill as a "giveaway" of Federal lands, twenty-six Senators launched an attack to postpone the vote and publicize the measure. The "hardy band of liberals," as they styled themselves, knew that they were waging a war for a lost cause, but they planned to gain one important end in their defeat. They hoped that their demonstration against the Administration-backed submerged land program would have a psychological effect on President Eisenhower. It would not cause the President to back down on the quitclaim commitment, but it could make him extremely sensitive to the charge of running a "giveaway" Administration. This sensitivity could make the President shy away from later proposals for the disposal of other Federal property to the States and to private interests.[80] In what many termed a filibuster[81] Senator Douglas talked five hours, Senator

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[79]Personal conversation with Dow Heard, Assistant Attorney General of Texas, in Washington, D.C., during the debate on the Senate floor.

[80]Personal interview with Senator Paul Douglas in Washington, D.C., on May 18, 1953.

[81]New York Times, May 6, 1953, Sec. 1, p. 3. Senator Morse had the distinction of beating Senator Huey Long's non-stop speaking record in the Senate. Whatever the

Kefauver six hours, Senators Hill, Fulbright, and Humphrey seven hours each, and Senator Morse twenty-two hours and twenty-six minutes.

In a last minute attempt to hold up the bill and to cause embarrassment to the Administration, the opponents proposed a series of amendments. Senator Neely offered an amendment that would use ten per cent of the offshore income for each of the following purposes: reduction of the national debt, aid to education, research in cancer, research in heart disease, research in muscular dystrophy, research in multiple sclerosis, research in infantile paralysis, aid to the blind, aid to disabled veterans, and financial assistance to the American Red Cross in the alleviation of human suffering.[82] Sehator Douglas proposed quitclaiming everything but the moneral rights in the offshore to the States.[83] In another amendment, he suggested that the coastal States, in return for the transfer of the rights of ownership in the submerged lands, should be obligated to

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motives, the wordfest was not a true filibuster. A filibuster usually has but one purpose, the prevention of a vote, and can only be successful when undertaken with a fixed date of adjournment approaching. This necessary condition was lacking and the speakers of the quitclaim opposition never had any notion that a vote could be prevented.

[82] Congressional Record, May 5, 1953, p. 4642.

[83] Ibid., p. 4644. Senator Douglas called this the "turpentine and gasoline amendment" because it would help the Holland bill sponsors, who resembled Lady Macbeth, get the oil spots off their hands.

assume the duties of maintaining the Coast Guard vessels and lighthouses in these areas.[84] All these amendments were quickly rejected.

The Holland Bill, S.J. Res. 13, was passed by the Senate on May 5, 1953, by a vote of 56 to 35.[85] The Senate substitute bill was accepted by the House on May 13 by a 278 to 116 vote.[86] President Eisenhower signed the bill on May 22, saying that he was pleased to do so because "recognizing the states' claims to these lands is in keeping with the basic principles of honesty and fair play." He further stated that he deplored and would always resist Federal encroachment upon the rights and affairs of the States.[87]

Sixteen years after Secretary Ickes had entertained doubts about the ownership of the Continental Shelf, the coastal States won their victory with the Submerged Lands Act. A review of the voting on the three quitclaim bills, 1946, 1952 and 1953, indicates the degree of party support given by the Congressional Republicans on this issue (Table 2).

Table 2 not only shows the significant increase in

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[84] Ibid.

[85] Ibid., p. 4646.

[86] Congressional Quarterly Almanac, Vol. IX, 1953, p. 397.

[87] Editorial Research Reports-1953, Vol. II, p. 533.

TABLE 2

SENATE AND HOUSE VOTING RECORDS ON QUITCLAIM BILLS, BY PARTY AFFILIATION, 1946, 1952, AND 1953

Quitclaim Bill		Republicans		Democrats		Independents		Totals	
		For	Against	For	Against	For	Against	For	Against
1946	Senate	25	8	19	25	-	1	44	34
	House	123	5	65	61	-	1	188	67
1952	Senate	26	11	24	24	-	-	50	35
	House	153	18	94	70	-	1	247	89
1953	Senate	35	9	21	25	-	1	56	35
	House	184	17	94	98	-	1	278	116

Source: Congressional Quarterly Almanac, Vol. II, 1946, p. 579 (H.J. Res. 225); Ibid., Vol. VIII, 1952, p. 334 (S.J. Res. 20); and Ibid., Vol. IX, 1953, pp. 396 and 458 (S.J. Res. 13).

Republican support of the quitclaim measure between 1946 and 1953, it also indicates that the total vote on each bill gave a substantial majority to each one. However, this majority was unable to override President Truman's veto in 1946, and did not try in 1952. Unless the majority in 1953 had managed to gain some extra votes other than those recorded on the bill, a veto would have once again halted passage of a quitclaim measure. Thus the table also shows how vital was the need for a Chief Executive favorable to the bill.

The Outer Continental Shelf Act

The Continental Shelf outside of State boundaries, an area of approximately 261,000 square miles, or about ten times the area within State boundaries, was not affected by the Holland Act. The House version of the quitclaim bill had contained a section providing for Federal jurisdiction over and leasing of the outer shelf, but this portion of the bill was stripped off by a conference committee before the measure received final approval.

It was agreed by all that permanent legislation to provide for the leasing of the outer Continental Shelf should be expedited in order that petroleum developmental activities in this area could proceed. Accordingly, hearings were held by the Senate Interior and Insular Affairs Committee even before the Submerged Lands Act was passed by

the Senate.

There were few areas of disagreement in the proposed legislation. The purposes of S. 1901, as the Outer Continental Shelf Bill was known, were to assert the exclusive jurisdiction and control of the United States Government over the seabed and subsoil of the outer shelf, and to provide for the orderly development of its vast mineral resources. In keeping with the latter purpose and with the approval of all interested parties, leases issued in good faith by the coastal States in the outer shelf prior to the Supreme Court decisions were to be validated and the holders authorized to conduct operations under them. The rules, regulations, and operating orders of the Secretary of the Interior, the Constitution and the laws of the Federal Government, and, in the absence of applicable Federal law or adequate Secretarial regulations, the civil and criminal laws of the adjacent States, were to be extended to the outer shelf area.

The primary policy question facing Congress was not one of State versus Federal rights, but whether, and how far, and at what price, the Federal Government should make use of the existing State laws and facilities in the administration of the outer Continental Shelf.

The views of the Administration were clear on this question. Secretary of the Interior McKay officially advised Congress that the Administration favored preserving

for "the nation as a whole" revenues derived from the outer shelf.[88] In signing the Submerged Lands Act, President Eisenhower was adamant in his insistence that the outer shelf lands "should be administered by the Federal Government and the income therefrom should go into the Federal Treasury."[89] This firm stand went far to mollify many in Congress who opposed the claims of the States to rights in the outer shelf.

The arguments were made that the States already had the administrative system to handle the offshore leasing and regulation, that it would cause duplication of effort if a new Federal system of operation was established, and that, in keeping with the historic system under which all of the area of the continental United States was geographically a part of a State, the State boundaries should be extended to the edge of the Continental Shelf.[90] The idea, of course, was that, in return for the administration and regulation of the Federal lands within State boundaries, the States would be permitted to share in the revenues of and extend their taxing power over the outer shelf. The Texas School Land Board wanted 37 1/2 per cent of the revenues and the power

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[88] New York Times, February 25, 1953, I, 13.

[89] Editorial Research Reports, Vol. II, 1953, p. 534.

[90] U.S. Congress, 83d Cong., 1st Sess., Senate Report No. 411 (Washington: Government Printing Office, 1953), p. 6.

to levy taxes in the Federal area.[91] Louisiana wanted to extend its severance tax, which in recent years has been 10 per cent of the gross production, into the promising area beyond its boundaries. If the taxing power was withheld, Senator Long envisioned the State of Louisiana furnishing without compensation many services, such as roads, schools and hospitals, for the individuals and companies engaged in the development of the outer shelf.[92]

The Senate Interior and Insular Affairs Committee denied the right of taxation to the States in very certain terms:

> The provisions . . . for adoption of State law as the law of the United States shall never be interpreted as a basis for claiming any interest in or jurisdiction on behalf of any State for any purpose over the seabed and subsoil of the outer Continental Shelf, or the property and natural resources thereof or the revenues therefrom.[93]

The Hill oil-for-education amendment was not adopted with the bill as reported out of committee, but this amendment was later added on the Senate floor and passed with little criticism. Because of the controversial nature of the Federal aid-to-education provision, it was removed from the bill by a conference committee before final passage in the House.

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[91] Hearings on S. 1901, p. 188.

[92] Senate Report No. 411, p. 66.

[93] S. 1901, 83d Cong., 1st Sess., Sec. 4(3)(a).

In the final version of the outer Continental Shelf bill, all rentals, royalties and other sums received from the outer shelf would be credited to miscellaneous receipts in the Treasury of the United States.[94] No part of these revenues were to go to any coastal State for any purpose whatever nor would these funds be dedicated to any specific purpose.[95] The bill was passed by voice votes in the Senate and House and was signed into law by President Eisenhower on August 7, 1953.

The Supreme Court Test of the Submerged Lands Act

The States of Arkansas, Rhode Island and West Virginia announced, even before the Submerged Lands Act was passed, that they would challenge the law in the Supreme Court. They questioned whether the Federal Government had the legal right to give actual ownership of the submerged lands, as opposed to developmental rights, to the coastal States.[96] This point caused Attorney General Brownell to entertain doubts concerning the constitutionality of the measure when he testified during the hearings on the Holland Bill. Mr. Brownell recommended the granting of developmental

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[94] S. 1901, 83d Cong., 1st Sess., Sec. 9.

[95] Ibid., Sec. 4(3)(a).

[96] Washington Sunday Star, May 10, 1953.

rights rather than a blanket quitclaim title.[97]

Slightly over a month after President Eisenhower signed the Submerged Lands Act, Arkansas filed a suit in the United States District Court for the District of Columbia seeking to enjoin the United States Treasury from delivering to the coastal States some $70 million in offshore revenues being held in escrow. Calling the Submerged Lands Act unconstitutional, the Arkansas brief said that it was "an unwarranted and invalid attempt to abdicate the sovereignty of the United States to a few of the States."[98]

Separate suits against Texas, Louisiana, and California were filed directly with the Supreme Court by Alabama and Rhode Island later in the year. The complaining States argued that "Congress repudiated the public national interest and violated the principle of equality among the States" when it relinquished Federal ownership of the offshore oil lands to the defendant States.[99]

On March 15, 1954, by a decision of 6 to 2, the Supreme Court denied Alabama and Rhode Island permission to test the validity of the Submerged Lands Act and affirmed the right of Congress to dispose of the lands. In the

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[97]Hearings on S.J. Res. 13, p. 926.

[98]Houston Post, September 27, 1953. The Arkansas suit was filed on July 8, 1953.

[99]Dallas Morning News, February 5, 1954.

words of the majority opinion: "The powers of Congress to dispose of any kind of property belonging to the United States is vested in Congress without limitation."[100] The Arkansas suit in the Federal District Court became a lost cause after this Supreme Court decision, and was dropped. Senator Daniels called the decision in the Alabama and Rhode Island cases "the end of a long and difficult fight."[101]

Areas of Conflict Still Remaining

The Submerged Lands Act of 1953 established title in the States to the contiguous belt of marginal seas extending from the mean low water line to the "boundaries . . . at the time such State became a member of the Union, or as heretofore approved by Congress."[102] Congress limited the boundaries of the States bordering the Atlantic and Pacific to three geographical miles and the States on the Gulf of Mexico to "in no event . . . more than three marine leagues" from the coast line.[103] However, the term "coast line" was

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[100] State of Alabama v. State of Texas et al, 347 U.S. 272, and State of Rhode Island v. State of Louisiana et al, 74 S.Ct. 481.

[101] Houston Post, March 16, 1954. Within a month Senator Douglas and fourteen other Senators introduced a resolution to repeal the Submerged Lands Act and to make the Outer Continental Shelf Act apply to the entire offshore area (Oil and Gas Journel, April 12, 1954, p. 52). Though this resolution did not pass, its introduction indicated the issue was not dead.

[102] Public Law 31, 83d Cong., 1st Sess., Sec. 2(b).

[103] Ibid.

defined so vaguely that any number of meanings could be assigned. Congress failed to heed the advice of Attorney General Brownell who urged that a definite line be drawn around the coast of the United States that would show precisely where the boundaries were being fixed.[104] As a result, the territorial claims of the States were left open for future determination. The possibility of such additional claims is not excluded in the Act, which expressly provides that nothing shall be construed as "prejudicing the existence of any State's seaward boundary beyond three geographical miles if it is so provided by its constitution or laws prior to or at the time such State became a member of the Union."[105]

Because of the failure to establish a definite line of demarcation between State and Federal jurisdictions, there has been continuing disagreement in at least one instance over where the boundaries lie. At present Texas and Florida appear to be satisfied with their rather well defined three leagues out into the Gulf of Mexico. The Federal leasing authorities have recognized the historic claims of these two States and have not objected to State leasing activities carried on within the ten and one-half

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[104] Testimony of Herbert Brownell, Jr., Hearings on S.J. Res. 13, p. 926.

[105] Public Law 13, 83d Cong., 1st Sess., Sec. 4.

mile strips. With one exception, the other States have made no claim to more than three miles but there is no assurance that further claims will not be made. The discovery of a large petroleum pool under the Gulf of Mexico, say, seven miles off the coasts of Alabama and Mississippi, could motivate these States into a frenzied search for historical "proof" that their boundaries extended three leagues into the Gulf. Louisiana alone at the present time (1956) is contesting the limitation to three miles implied in the Submerged Lands Act.

In addition to the boundary dispute between Louisiana and the Federal Government, there has existed for many years a private feud over the seaward boundary between the States of Louisiana and Texas. Texas claims that the line should extend southeast from the mouth of the Sabine River, the direction the river takes in the last few miles before it empties into the Gulf of Mexico. Louisiana maintains that the line should extend south into the Gulf, the direction taken by the Sabine along most of its course between the two States. Because of the conflicting views, a sizable pie-shaped wedge of submerged land is claimed by both States.[106]

As provided in the Outer Continental Shelf Act, title to the areas extending from the "historic State bound-

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[106] New York Times, June 7, 1953, IV, 12.

aries" to the edge of the Continental Shelf is clearly in the Federal Government. But there is room for the later claim that State boundaries are co-extensive with the boundaries of the United States. One school of thought believes that, with the exception of the District of Columbia, there can be no Federal land in the continental United States that is not included within State boundaries.[107] Further credence to this belief is found in the provision in the Outer Continental Shelf Act that extends the police powers of the States to the edge of the Continental Shelf in the absence of Federal regulation.[108] This is not an empty provision as the States are actually exercising their police powers in the Outer Shelf. The extension was made to carry the proration powers of the Interstate Oil Compact States out into the ocean.[109]

While the Outer Continental Shelf Act specifically states that the exercise of police power in the Outer Shelf in no way would give the States any ownership rights or taxing power over these lands,[110] the act of performing these regulatory functions at the behest of the Federal

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[107] Statement of Governor Frank Vennon of Louisiana, Hearings on S.J. Res. 13, p. 1097.

[108] Public Law 212, 83d Cong., Sec. 4(2).

[109] Personal letter from E. W. Henderson, Gulf Coast Oil and Gas Supervisor, United States Geological Survey, New Orleans, Louisiana, dated May 6, 1955.

[110] Public Law 212, 83d Cong., Sec. 4(3).

Government gives the States a claim to some interest in the income from the lands regulated. Without some shadow of interest or title to these lands, the States could not be expected to perform the police functions.

What will the future bring? A change of administration might bring an attempt to regain for the Federal Government theownership and control of the three to ten and one-half mile strips quitclaimed to the littoral States by the Submerged Lands Act of 1953. When asked how this could be done, Senator Douglas offered the ambiguous reply, "What the Lord giveth, the Lord taketh away."[111]

The Federal ownership partisans have been mollified to a large extent by the unqualified reservation to the Federal Government of the resources in the Continental Shelf beyond the strips quitclaimed to the States. A further salve to ease the pain of losing the marginal strip has been found in the great success of the developmental activities thus far undertaken in the Outer Continental Shelf. The Federal Government has done very well indeed in the leasing of the Gulf of Mexico Outer Continental Shelf, an area ten times larger than the areas awarded to the States.

Summary

For years the coastal States assumed that they owned

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[111]Personal interview with Senator Douglas, Washington, D. C., February 18, 1953.

the seas adjacent to their shores and the resources in and under these seas. During those years, most of the States had occasion to exercise the perquisites and duties of ownership in the leasing of the submerged lands and the regulation of the resource exploitation. The assumption that the States owned the resources of the marginal sea was shared by all Federal officials dealing with such matters until 1938, when Secretary of the Interior Ickes, at the instigation of persons seeking Federal leases on these lands, changed his mind on the matter of ownership. An attempt was soon made to claim these lands for the Federal Government and create from them a naval petroleum reserve, but the Ickes inspired measure died in Congress.

After World War II, the Federal Government sued the State of California to determine ownership of the lands off the coast of that State. California, with the aid of other interested States, fought back in Congress and in 1946 secured passage of a bill quitclaiming the disputed lands to the coastal States. President Truman vetoed the measure.

In 1947 the Supreme Court handed down a decision that California had no title to or property interest in the offshore lands but that the United States Government had "paramount rights" in these lands. In 1950 similar cases involving Texas and Louisiana were settled in the same way. A second quitclaim bill was passed by Congress and promptly vetoed by President Truman. Congress refused to pass a

leasing law under which the Federal Government could operate the submerged lands. In the stalemate that resulted, offshore oil developmental operations virtually ceased.

In the 1952 election General Eisenhower and the Republican Party favored the quitclaim, while Governor Stevenson and the loyal fractions of the Democratic Party were opposed to giving title to the States. The victory of the Republicans could not be attributed to the party stand on the submerged land issue, but the victory opened the road for a successful quitclaim bill.

In 1953, after comprehensive hearings and lengthy debate, Congress passed a bill giving title to the submerged lands within historic State boundaries to the coastal States. President Eisenhower, true to his campaign commitment, approved the bill. A militant minority in the Senate had been unable to secure passage of a compromise Federal control bill that would have divided the revenues from the offshore lands with the coastal States. An amendment that would have devoted the revenues received by the Federal Government to education also failed.

Soon after the quitclaim of the disputed three mile and three league strips to the coastal States, Congress passed a bill that authorized Federal leasing in the Continental Shelf beyond State boundaries. All revenues from this area were reserved for the United States Government.

The quitclaim was unsuccessfully contested in the

United States Supreme Court by two States. Even so, the dispute is not resolved. Several areas of conflict still remain. The boundaries between State and Federal submerged lands and even between the submerged lands of neighboring States have not been definitely established. The special three league claims of Texas and Florida continue to cause trouble for the Department of State in international negotiations. Most important, a substantial minority in Congress has not become reconciled to the quitclaim. This vociferous minority could become a majority and take steps to recover the ceded lands.

CHAPTER III

RESOURCES OF THE MARGINAL SEA

The so-called "tidelands" controversy has centered mainly around the question of the ownership of the oil, gas, and sulphur in the sub-surface and sub-soil of the Continental Shelf beyond the ordinary low-water mark of the ocean. This chapter is concerned with a brief description of the geologic nature of the Gulf Continental Shelf and an examination of four estimates of the petroleum and sulphur resources. The estimates were prepared by expert geologists and were stated in terms of physical quantities. These physical quantity estimates have been converted into dollar value estimates by numerous persons and groups, with such estimates ranging from zero to $1 trillion, depending mainly on the assumptions made in the conversion process. Examination of these assumptions makes it possible to discard some of them as being unrealistic. In the final part of the chapter an effort is made to suggest a more reasonable middle ground.

Geologic Nature of the Gulf Continental Shelf

The great stores of petroleum in the earth are known

to be contained in the stratified sedimentary rocks laid down in the 550 million years since the beginning of the Cambrian time period. In the United States oil is known to occur throughout the geologic column in a sequence of remarkable continuity and universality extending from the Cambrian to the Pleistocene periods.[1]

Oil may occur in commercial quantities only when four conditions are present. First, there must be a source rock, generally of marine origin, containing carbonaceous materials. Second, there must be heat and pressure under which hydrocarbons are formed. Third, since most of the source rocks are too fine-grained and compact to yield their oil freely for commercial production, the oil must migrate to and be collected in suitable reservoir rocks, where it fills the interspaces in the pores of the rock or fissures within the rock. Fourth, the petroleum must be imprisoned in the reservoir rock by a layer or trap of some impervious substance.[2]

These necessary conditions are most prevalent in the great mediterranean regions of the world, within which lie more than half of the eleven million square miles of the

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[1]Eugene Stebinger, "Petroleum in the Ground," The World Geology of Petroleum, ed. by Wallace E. Pratt & Dorothy Good (Philadelphia: American Geographical Society, 1950), p. 3.

[2]Institute of Petroleum, Modern Petroleum Technology (London: Institute of Petroleum, 1946), p. 18.

total continental area of the world. The bulk of the petroleum found in the world to date has been located in the land areas fringing these mediterranean basins.[3] The Gulf of Mexico and the Caribbean Sea comprise one such basin.

The oil producing sands located in the land areas of the Gulf Coastal Plain of the United States occur within a series of sedimentary wedges that incline gradually southward and outward toward the Gulf of Mexico. Usually, as these wedges incline toward the coast, they become thicker and contain a greater proportion of sand and shale of marine origin.[4] Geologists believe that the sediments laid down along the coast of Louisiana during the two most recent geologic eras are at least 30,000 feet thick.[5]

In general the zones of greatest production in the Gulf Coastal areas are found in the younger and stratigraphically higher wedges of sediment lying seaward of and above the older formations. Because of this seaward migration of the more prolific zones in the younger strata, there is reason to believe that conditions favorable to oil occurrence

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[3]Wallace E. Pratt, "Petroleum in the Continental Shelves," Bulletin of the American Association of Petroleum Geologists, April, 1947, p. 661.

[4]United States Geological Survey, Potential Oil and Gas Reserves of the Continental Shelf Off the Coasts of Louisiana, Texas, and California (Washington: Government Printing Office, 1946), p. 2.

[5]J. Ben Carsey, "Geology of the Gulf Coast Area and the Continental Shelf," Bulletin of the American Association of Petroleum Geologists, March, 1950, p. 361.

continue far out in the continental platform. Experts in the United States Geological Survey believe that the oil bearing strata extend to the edge of the Continental Shelf (100 fathoms), and possibly farther out into the Continental Slope.[6] The geologic picture is in no way changed by the relatively thin sheet of water covering the submerged lands.

The larger part of the Continental Shelf from the Rio Grande to the Mississippi delta is underlain by a wide and potentially productive belt of Miocene sands. A large number of oil fields have been discovered in this formation in Coastal Louisiana, suggesting that the Miocene can be quite prolific. In the 9 1/2 million acres of land underlain by Miocene, over one hundred "interesting" structures have been found, with eleven oil fields that will produce in excess of 100 million barrels each in ultimate recovery, twenty-nine fields of over 50 million barrels each, and sixty-two fields of over 20 million barrels of oil apiece. In the offshore regions this formation lies at accessible drilling depths,[7] so that the evidence given by land development in Miocene sands promises rich reward in offshore drilling.

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[6]U. S. Department of the Interior, Geological Survey, Oil and Mineral Possibilities on the Continental Shelves of the United States and Alaska (Washington: Government Printing Office, 1946), p. 7.

[7]Oil and Gas Journal, June 21, 1954, p. 108. Statement of Ben C. Belt, Vice-president of Gulf Oil Corporation.

Most of the oil fields in the coastal region of Texas and Louisiana are thought to be closely related to and controlled by salt domes or plugs.[8] Salt plugs are cylindrical masses of rock salt, one to five miles in diameter, that have been thrust thousands of feet upward through weak points in the overlying sedimentary formations.[9] The salt, originally lying in stratified beds formed by the evaporation of inland seas in prior geologic times, is plastic under sufficient pressure and flows slowly but inexorably along the lines of least resistance, usually upward. The bullet-shaped salt plugs puncture the covering strata of rock or arch them upward into a domal shape. The uparching and uptilting of the sedimentary strata create reservoir conditions which trap the oil above and on the flanks of the dome. Because the salt plug is relatively impervious to oil movement, it forms an effective seal.[10] Already more than 190 salt plugs have been encountered by drilling in the Gulf Coast and many more structures thought to have salt cores have been located by geophysical methods.[11] Carsey has counted 164 sea mounds on the Continental Shelf and slopes

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[8]Wrather, op. cit., p. 8.

[9]W. A. Van Wiebe, North American Petroleum (Wichita, Kansas: W. A. Van Wiebe, 1952), p. 248.

[10]The Institute of Petroleum, op. cit., pp. 24-25.

[11]Carsey, op. cit., p. 363.

off the coast of Texas and Louisiana,[12] some of which are underlain by salt, as recent geophysical survey and drilling have proved.

Due to the steep dips of the beds uptilted by salt plugs, the salt dome formations offer a very narrow horizontal target for the drilling bit. However, the vertical oil columns are often quite thick and may contain multiple sands which yield very large recovery per-acre-foot.[13] For example, the Spindletop field, though only 500 acres in expanse, has produced over fifty-three years a total of 130 million barrels of oil and has been estimated to contain an additional 6 million barrels.[14] Ten miles off the coast of Louisiana, three Oklahoma companies found 100 million barrels of oil in a 600 acre plot surrounding a salt dome. The initial flow from the discovery well was 935 barrels per day from the very shallow depth of 1700 feet.[15] In another well

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[12] Ibid., p. 376.

[13] G. Frederick Shepherd, "Developments in the Louisiana Gulf Coast in 1946," Bulletin of the American Association of Petroleum Geologists, June, 1947, p. 1054.

[14] Lester C. Uren, Petroleum Production Engineering (New York: McGraw-Hill, 1950), p. 87. The famous Lucas gusher, the first successful salt dome well ever drilled, came in for an estimated production of 75,000 to 100,000 barrels per day.

[15] Christian Science Monitor, May 15, 1948. The three companies were Kerr-McGee Oil Industries, Incorporated, Stanolind Oil and Gas, and Phillips Petroleum Company.

eighteen miles offshore from Cameron Parish, Louisiana, oil sands totaling 700 feet in thickness were discovered in a domal structure.[16]

While geologists at present believe that most of the offshore producing zones will be closely related to salt plug intrusions, this does not preclude the possibility of finding other types of producing formations. The Houston Post quoted an undisclosed geophysicist as saying: "Just name a type of structure and you'll find it in the Gulf of Mexico." Another geophysicist was quoted as saying: "In all probability I have seen more favorable looking oil structures in the Gulf of Mexico than any 100 men have ever seen on land."[17]

The technicians, geologists and geophysicists, seem in agreement that the submerged lands of the Gulf of Mexico offer great promise as a new oil province. These specialists feel confident that large areas of the Continental Shelf are underlain by petroleum and sulphur deposits.[18] The question then becomes one of attempting to estimate how much oil, gas and sulphur lie in the submerged lands.

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[16] Houston Post, May 17, 1954.

[17] Houston Post, May 7, 1954.

[18] Of 365 wells drilled in the Gulf of Mexico through May of 1954, 230, or 62.8 per cent proved productive. Letter from William B. Harper, American Petroleum Institute, July 19, 1954.

The Meaning of Reserve

Unfortunately the term "reserve" has been subjected to a considerable amount of use and abuse in Congress and in the public press. Few users of the word have attempted to qualify or define exactly what they mean. The same word does not always carry a single meaning, and when that imprecise term is used in a quantitative valuation, only confusion can result. In the welter of meanings for the term, five distinctly different ones emerge: static reserves, ultimate reserves, proved reserves, recoverable reserves, and basic reserves.

"Static reserves," or the common usage of the term, denote a fixed quantity of something that is withheld, kept back and stored for future use. It implies that mineral reserves are a fund which can be depleted but not augmented. Apparently this was the meaning President Truman had in mind when he attempted to set up the Naval Petroleum Reserve in 1953. As a matter of fact, our mineral reserves are dynamically tied in with the state of technological development. They are not a fixed fund but expand and contract in response to man's ability to discover, recover and utilize them.[19] Thus, this meaning must be discarded.

"Ultimate reserves" carry the meaning of totality.

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[19]This is the thesis of a recent pamphlet, Eugene Holman: Our Inexhaustible Resources (New York: Standard Oil Company, 1952).

That is to say, the term signifies an attempt to measure the last and smallest particle of any mineral. Analogy will make clear the absurdity of using such a term for other than propaganda purposes. The scientific analysis of sea-water, for instance, reveals that each square mile of the ocean contains a quantity of gold worth $93,000,000 at the present gold price of $35 per fine troy ounce.[20] This is interesting to know, but of no practical value to mankind. The computation of the size and value of a mineral reserve is dependent upon the geologic distribution of the material in the earth, the engineering techniques of recovery and utilization, and the economics of price. The total quantity of gold in the ocean, or any part of it, fails to be a mineral reserve at the present time on three counts: it is minutely distributed through the sea-water; the techniques of efficient recovery are lacking; and the economic cost of recovery would far exceed the value of the gold recovered. By the same tokens, it is of little practical value to compute the ultimate reserves in the deepest, least accessible, least productive of the geologically inferred offshore oil fields. Such use of the term "reserve" precludes its acceptance.

"Proved reserves" is a term developed by the American Petroleum Institute and the American Gas Association to indicate only those quantities of oil and gas recoverable

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[20]Carson, op. cit., p. 191.

under existing economic and operating conditions.[21]

The proved reserves of the American Petroleum Institute specifically exclude oil under untested portions of partially developed fields, oil that may be present in unknown prospects in regions believed to be generally favorable, oil that may become recoverable through new secondary recovery methods not yet applied, and, in brief, any oil that has not been proved to be physically present in the reservoir.[22] Proved reserves thus represent the minimum expected recoveries. Certainly in a dynamic economy such a concept undervalues enterprise, perseverance, and technology.

"Recoverable reserves" is a term of fundamental economic importance for with it an attempt is made to consider the incentives and the efficiencies that govern production. What the term actually does is to describe the state of any mineral at any particular time in a certain economy. In short, the recoverable reserve is the total quantity of any mineral estimated originally to have been present multiplied by the percentage of recovery that can be accomplished at the existing price levels with known

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[21]American Petroleum Institute and American Gas Association, Proved Reserves of Crude Oil, Natural Gas Liquids and Natural Gas (New York: American Petroleum Institute and American Gas Association, 1954), Vol. 8, pp. 5, 15.

[22]Ibid., p. 6.

methods of extraction.[23] Certainly this term is far more realistic than the highly conservative "proved reserves" and the visionary "ultimate reserves." Yet, because the concept implies description under particular circumstances, and because the circumstances of resources in the submerged lands are often hypothetical, the term recoverable reserves is not adequate.

"Basic reserves" in the words of the United States Geological Survey denote: "Those quantities of a substance for which some evidence is available to indicate concentrations of potential economic value, at depths in the earth's crust believed to be accessible for exploration. . . ."[24] On the surface there would appear to be no difference between "basic reserves" and "recoverable reserves." However, certain key words in the above definition indicate the nature of the difference. Note "some evidence," "potential economic value," and "believed to be accessible." It is these words which show that the concept of "basic reserves" tends to be functionally predictive instead of merely descriptive. The quantity of a "basic reserve" differs from the quantity assigned under the idea of "recoverable

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[23]Frederick H. Lahee, "Our Oil and Gas Reserves, Their Meaning and Limitations," Bulletin of the American Association of Petroleum Geologists, Vol. 34, No. 6 (June, 1950), p. 1283.

[24]United States Geological Survey, Fuel Reserves of the United States (Washington: Government Printing Office, 1951), p. 2.

reserves" because the former figure is arrived at on the basis of all known geologic, engineering and economic data plus certain assumptions about the size and thickness of the deposits and their grade.

The mathematical estimates of the oil resources in the marginal sea lands are based upon many assumptions, since the amount of pertinent data on such areas is relatively meager. Probably the best guide under such circumstances is the projection into the future of what has been done in the past under somewhat similar conditions. Because estimates of "basic reserves" are usually arrived at on the basis of such projection, this use of the concept would appear to be most useful in discussing valuation of the offshore oil, gas, and sulphur resources. Here is a concept that, unlike the other four, does not assume a fixed fund which can only be depleted, that does not envision that all traces of a mineral can be classed as usable, that does not reject any but current proved developments, that does not tend to be primarily descriptive. Here is a concept that is based on intelligent conjecture and thus constitutes a mean between over-caution and fantasy.

"Political Valuation" of Offshore Resources

In the heat of the political controversy over Continental Shelf ownership, the lay public received a barrage of estimates on the value of the offshore resources. Ten

of these estimates are shown below:

1) $1,000 billion. Stated by F. M. McCormick, secretary-treasurer of the C.I.O. Oil Workers Union. As this estimate stands so far above all others, it may be that Mr. McCormick was referring to the precedents set by the "tidelands" legislation rather than placing a value on the offshore resources alone. His statement was unqualified.[25]

2) $50 billion to $300 billion. Used by Senators Douglas and Morse. Includes oil, gas and sulphur in the entire Continental Shelf, including Alaska.[26]

3) $250 billion. Used by President Truman. Includes only oil in the entire Continental Shelf, including Alaska.[27]

4) $186 billion. Used by Senator Murray. Includes oil, gas and sulphur in the entire Continental Shelf, including Alaska.[28]

5) $80 billion. Findings of eighteen Texas geologists and engineers. Includes oil, gas and sulphur in Texas Continental Shelf only.[29]

6) $67.5 billion. Used by the Public Affairs Institute. Includes oil and gas in the entire Continental Shelf, excluding Alaska.[30]

7) $1.5 billion. Used by Senator Long. Includes royalty interest to accrue over fifty years from oil and gas within 3 mile and 10 1/2 mile belts

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[25] The Dallas Morning News, September 30, 1953.

[26] Congressional Record, April 9, 1953, p. 2990, and May 1, 1953, p. 4439.

[27] New York Times, January 17, 1953, I, 8.

[28] Congressional Record, April 8, 1953, p. 2946.

[29] Houston Post, October 26, 1952, p. 1.

[30] Washington Window, February 20, 1953, p. 2.

immediately offshore.[31]

8) $0.92 billion. Used by Senator Holland. Includes royalty interest for all time from oil and gas within 3 mile and 10 1/2 mile belts.[32]

9) $0.2 to $0.25 billion. Estimate of Texas Land Commissioner Bascom Giles. Includes lease and bonus payments on oil, gas and sulphur leases, excluding all royalty from production, from the Texas Continental Shelf.[33]

10) $0.00 billion. This figure is inferred from a statement made by H. R. Cullen, prominent oil operator of Houston, Texas, in a telegram to President Eisenhower. Mr. Cullen actually said ". . .Oil cannot be produced under the tidelands economically at the present prices of oil . . ."[34] A logical inference is that the net value of the offshore resources at the time may be zero.

In general the Federal ownership advocates favored the higher valuations, while the State ownership advocates favored the lower ones. With the exception of the two extreme estimates, each of the political valuations of the wealth to be found in the submerged lands used one or another of the four principal geological estimates as a point of departure.[35] These technical estimates of physical quantities of petroleum and sulphur, independently prepared

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[31] Congressional Record, May 5, 1953, p. 4617.

[32] Congressional Record, May 4, 1953, p. 4513.

[33] Dallas Morning News, August 29, 1952, p. 1.

[34] The Dallas Morning News, April 8, 1953.

[35] To be discussed in the next section of this chapter.

by competent geologists, would hardly be recognized by their creators in the form offered for political debate.

The reasons for the great differences in the various estimates of value and the cause of the difficulty in reconciling the estimates can be attributed to five principal factors:

1. The geographical areas described in the estimates are not uniform. Some of the estimates include only the area out to 3 and 10 1/2 miles; others include the entire Continental Shelf of the United States proper; still others include the Continental Shelf of Alaska along with the Shelf of the United States proper.
2. The resources included in the estimates are not consistent. Some include only oil, others oil and gas, and still others oil, gas, and sulphur.
3. The basis of value means different things to different people. In some cases the value considered is the "net" value of the resources after the deduction of the costs of production. In other cases only the royalty interest of the landowner is considered. In other estimates all receipts of the landowner, including royalties, lease bonuses, delay rentals, and severance taxes, are included. In still other estimates the value sought has been the gross value of the

resources in place.

4. Different meanings for the physical volume of the resources have been employed. Many of the estimates are of the maximum ultimate resources, while others have been of the minimum expected resources imputed to the offshore areas by comparing them to the proved reserves of comparable onshore areas.

5. Uniform monetary values have not been assigned to the resources. Present prices have been assigned to the resources in some of the estimates, while increased prices have been assigned in others.

Numerous values can be derived from the use of different combinations of the factors listed above. Certainly an estimate of the royalty eighth of the oil within "historic State boundaries" should differ greatly from an estimate of the gross value of all of the oil, gas, and sulphur existing in place in the entire Continental Shelf of the United States and Alaska.

If order is to be made out of this chaotic set of valuations, it is necessary that comparable areas, quantities, and measurements be used. There is no reason to believe that the price of oil will remain at $2.50 per barrel, or $2.75, or whatever prices were used in the various estimates; or that natural gas will remain at $0.09 per

thousand cubic feet, or $0.15; or that sulphur will remain at $25 per long ton. Hence, to be consistent, all measurements should be in physical quantities, such as barrels of oil, thousands of cubic feet of natural gas, and long tons of sulphur, rather than in dollars.[36] This procedure will be followed wherever possible in this discussion. Whenever the physical quantities of the resources must be valued, constant prices of $2.50 per barrel of oil, $0.10 per thousand cubic feet of natural gas, and $25 per long ton of sulphur will be used in order to maintain consistency.

The relationship of the cost of production and the current valuation (price) of the product will determine whether production will be effected at a particular time. Thus, it will be economical for the operators to engage in production only as long as price promises to cover cost. The royalty owner, however, receives a fixed payment as a fixed percentage of the gross physical production,[37] regardless of the cost-price relationship. Since the owning governmental unit will receive royalty payments based on the gross production, the gross physical reserve is the

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[36]As petroleum and sulphur royalties may be demanded either in kind or in money, the royalty payments may be stated in physical units of oil, gas, or sulphur as easily as they may be stated in money. Such is not the case in the matter of lease bonus and delay rental payments, where payment is based on fixed dollars per acre rather than a portion of the physical production.

[37]In the absence of production the landlord receives an annual delay rental payment.

significant and meaningful measure for determining the amounts to accrue to the landlord.

Technical Estimates of the Offshore Resources

At present there is no certain way to measure the gross physical reserves of the Continental Shelf. In the absence of a method of taking a direct reading on the quantities of resources the "best" estimates of trained technicians are usually used. Since the technicians do not agree even within wide limits, conclusions based on these estimates must allow for wide margins of error and must permit later revision as additional information becomes available. Even the best "basic reserves" estimate must ultimately meet the test of "recoverable reserves," for one hundred per cent recovery of oil, gas, or sulphur from a reservoir is at present an impossible goal.[38]

The four most frequently quoted geological estimates of the offshore resources are the independently prepared studies made by Wallace E. Pratt, L. G. Weeks, eighteen Texas geologists and engineers, and the United States Geological Survey.

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[38] Lahee, "Our Oil and Gas Reserves: Their Meaning and Limitations," pp. 1284-85.

Pratt Estimate[39]

In 1947 Wallace E. Pratt, vice-president of the Standard Oil Company of New Jersey, attempted to approximate the oil content of the submerged lands. In doing so he began with one assumption: that the sedimentary rocks of the continental shelves and slopes of the world contained approximately the same amount of oil as the sedimentary rocks in the land areas of the United States. By comparing the relatively well-proven land area with the area of unproven oceanic sedimentary basins, Pratt hoped to achieve a conservative, reasonable estimate.

About ten per cent of the estimated 2.5 to 3.0 million cubic miles of sedimentary rock in the United States had been explored at that date. That partial search discovered 53 billion barrels of oil[40] and little doubt exists that large volumes of oil await future discovery in unexplored areas.

As the continental shelves of the world are thought to contain 50 to 60 million cubic miles of sediments, or twenty times the total sedimentary area of the United States, Pratt reasoned that they should contain about twenty times

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[39]Wallace E. Pratt, "Petroleum in the Continental Shelves," Bulletin of the American Association of Petroleum Geologists, Vol. 31, No. 4 (April, 1947), pp. 669-670.

[40]This includes both oil produced (32 billion barrels) and oil remaining as proved reserves (21 billion barrels) at the end of 1945.

the total sedimentary area of the United States, Pratt reasoned that they should contain about twenty times as much oil. On the basis of past discoveries in the United States, with only ten per cent of the sedimentary rocks explored, the continental shelves and slopes of the world should contain more than 1,000 billion barrels of oil. Pratt pointed out that this was a minimum estimate and that if additional oil is discovered in the United States land areas or if the offshore areas turn out to be better suited for petroleum occurrence than the land areas used for comparison, the estimates for the oil in the continental shelves and slopes should be correspondingly greater. Since the continental shelves and slopes contiguous to the United States and Alaska are believed to constitute approximately one-tenth of the total underwater sedimentary basin of the world, it can be inferred from the Pratt estimate of underwater oil in the world that the continental shelves and slopes adjacent to the United States and Alaska may be expected to contain a minimum of 100 billion barrels of oil.

At this point many followers of the Pratt estimate seem to go astray. The $270 billion valuation placed on the "give away" to or "theft" by the States of California, Texas, and Louisiana by some opponents of the various quitclaim bills was derived from this 100 billion barrel estimate.[41]

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[41] 100 billion barrels of oil @ $2.70/bbl = $270 billion.

Two serious errors in the use of Pratt's estimate were made by Federal ownership partisans. First, Pratt included the continental slopes in his calculations and one-half of the total offshore sediments on which Pratt based his estimate are thought to be in the area classified as continental slope. Many authorities at present believe that the edge of the Continental Shelf (600 feet) will be the limit of possible development.[42] If this is correct, the oil in the shelves alone bordering the United States and Alaska would amount to 50 billion barrels.

The second error arises from the application of Pratt's estimate, which refers to the entire Continental Shelf of the United States proper and Alaska, to the shelf area of the three States of California, Texas, and Louisiana. In all fairness to both the estimate and the States, it is improper to say that Pratt was speaking of the sedimentary formations in just these three States. If Pratt's estimate is to be used to value the oil offshore from these states, the oil credited to California, Texas, and Louisiana should be on a ratio of the quantity of sedimentary rock found in the entire Continental Shelf of the United States and Alaska. Unfortunately, measurements of the cubic volume of sediments in these areas are not available.

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[42]United States Geological Survey, Fuel Reserves of the United States, p. 32.

Weeks Estimate[43]

L. G. Weeks, chief geologist for the Standard Oil Company of New Jersey, using almost the same method as Pratt, arrived at a somewhat smaller estimate for the oil in the Continental Shelves. Weeks predicted from the limited exploration thus far accomplished in the sedimentary land basin of the world that a total production of 610 billion barrels of oil could be expected from the land areas. If so, the ten million square miles of offshore sedimentary basins, which are approximately two-thirds as large as the sedimentary areas on land, should contain some 400 billion barrels of oil. Hence, the submerged lands of the United States and Alaska, should contain 40 billion barrels.

Of the 880,000 square miles in the Continental Shelves of the United States and Alaska, approximately 590,000 square miles lie seaward of Alaska and 290,000 square miles seaward of the United States proper. With uniform distribution of the 40 billion barrels of oil, 26.8 billion barrels should lie off of Alaska, and the continental shelves of the United States should contain approximately 13.2 billion barrels.

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[43]L. G. Weeks, "Concerning Estimates of Potential Petroleum Reserves," Bulletin of the American Association of Petroleum Geologists, Vol. 34, No. 10 (October, 1950), pp. 1947-1953.

Estimate of Eighteen Texas Geologists and Engineers[44]

One of the most controversial estimates appeared during the presidential election campaign of 1952. This report, signed by eighteen prominent oil technicians, and admittedly released to point out to the voting citizens of Texas the true values at stake in the offshore controversy, was limited to the submerged lands seaward of Texas only. Although the report was designed to sway the voters of Texas into the camp of the candidate supporting State ownership of the submerged lands and can clearly be labeled as political in nature, the scientific data on which the report is based does not appear to be biased.[45]

The Texas group assumed the submerged lands to have potentialities at least equivalent to the unsubmerged lands adjacent to the Texas Coast. Geologically the areas were found similar in faulting, in folding and in uplift through earth structural changes, and in piercement by salt masses. In a belt one-hundred miles wide onshore along the Gulf of Mexico, the group found that cumulative production and

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[44]Released to the public in The Houston Post, October 26, 1952, p. 1.

[45]Senator Lehman pointed out that Texans are sometimes prone to exaggerate just a little when talking to outsiders, but that this tendency does not ordinarily assert itself when Texans are talking to Texans. This report was for home consumption. Congressional Record, April 13, 1953, p. 3084.

proved reserves, as of January 1, 1952, amounted to 11 billion barrels of oil, 62 trillion cubic feet of gas, and 121 million long tons of sulphur. Potential resources of about this magnitude should lie offshore in the belt of sediments averaging one hundred miles in width.

Actually, the report stated, the potential production from the offshore lands should be much greater than that of the onshore belt because of better reservoir conditions, the full use of modern methods of recovery, and the greater mass or thickness of sediments in the Gulf.[46] The report also noted that the proved reserve estimate for the land area was very conservative and covered only the resources absolutely proved by the drilling bit. Revisions of the estimates on proved reserves, which because of their conservative methods of calculation have always been upward, and additional new discoveries should greatly increase the amount of petroleum and sulphur found and to be found in the area used for comparison. Accordingly, the report roughly doubled the estimate of expected reserves to recognize the probability of future discovery and to allow for the greater production expected offshore.[47]

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[46]This last point overlooked in the estimates by Pratt and Weeks.

[47]The report converted the physical estimates of oil, gas, and sulphur into dollars at the current market prices and arrived at a gross valuation of $41,492,650,000.00. The report doubled the monetary estimate, rather than the

The United States Geological Survey Estimate[48]

The Geological Survey report of the potential oil and gas resources in the Continental Shelf areas of the United States is the most exhaustive and comprehensive study made on this subject to date. This report, like the report of the Texas group, assumes that the Continental Shelves are underlain by sediments that are similar to and potentially as productive as those under the adjacent land areas.

The Geological Survey utilized two different methods of estimating the potential offshore oil in the Gulf of Mexico seaward of Texas and Louisiana. First, the Survey estimated the quantity of oil and gas that has been discovered in an onshore strip adjoining the coast comparable in width to the Continental Shelf. Assuming the density and productivity of the geological structures to be the same in both areas, the oil in the entire Continental Shelf off Texas and Louisiana would approximate 13 billion barrels.

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physical estimate, stating that "a more realistic forecast is $80 billion." If it can be assumed that the Texas group meant that their physical estimates should be doubled, the submerged lands seaward of Texas should produce, over time, almost 22 billion barrels of oil, 124 trillion cubic feet of gas, and 242 million long tons of sulphur.

[48]U.S. Department of the Interior, Geological Survey, Potential Oil and Gas Reserves of the Continental Shelf Off the Coast of Louisiana, Texas, and California, February 16, 1953.

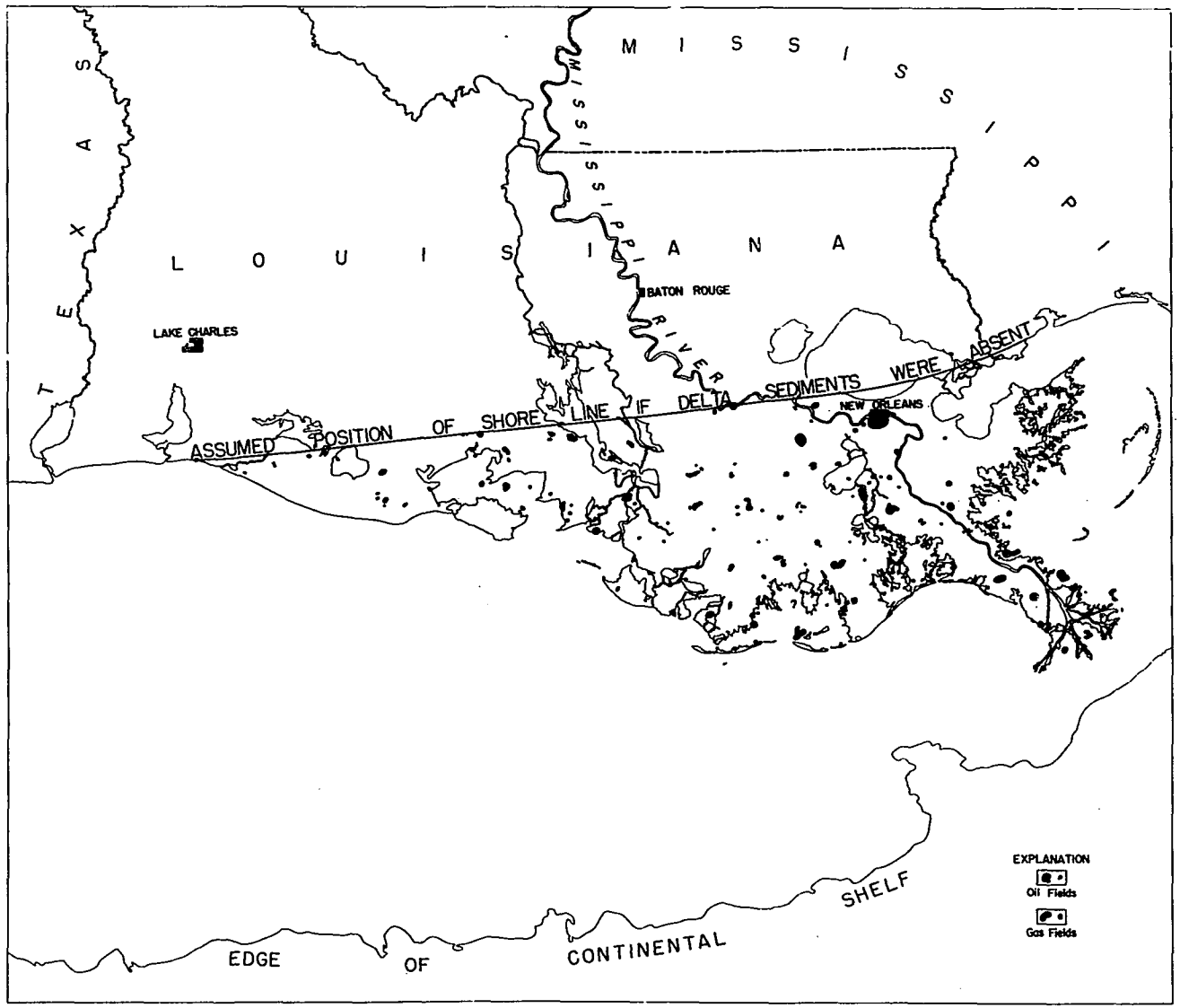
The 10 1/2 mile strip offshore from Texas should contain 1.2 billion barrels of oil; the 3 mile strip offshore from Louisiana, 0.25 billion barrels.

Second, the Geological Survey used the Mississippi delta as a sample of the oil occurrence in the Gulf Continental Shelf. In relatively recent geologic times the Mississippi River has built a delta seaward for nearly one hundred miles from a line connecting the shore lines of the Gulf on the two sides of the delta (See Figure 2). The delta extends a river-made platform to within ten or twelve miles of the edge of the Continental Shelf.

The Geological Survey thought it reasonable to assume that oil occurrence in this sample area would indicate results to be expected from nearby portions of the shelf. On this delta area of about 10,000 square miles, or slightly less than 20 per cent of the Continental Shelf bordering Louisiana and Texas, more than 100 oil and gas fields with somewhere around two billion barrels of oil have been discovered thus far. Ultimate petroleum discoveries of at least 2 1/2 billion barrels can reasonably be expected in the delta. Therefore the Continental Shelf should contain approximately 13 billion barrels of oil. While the Survey did not assert that the known delta reserves provided a reliable yardstick for the entire shelf area, they did find it significant that the total reserves estimated by using this yardstick were roughly equivalent to the

FIGURE 2

PETROLEUM DEVELOPMENT ON THE MISSISSIPPI RIVER DELTA



UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

estimate of 13 billion barrels obtained by using the shoreward belt of equal width as a yardstick.

The Geological Survey found that natural gas has been associated with oil in the Gulf Coast region at approximately 5,000 cubic feet of gas for each barrel of oil. The same ratio is expected in the Continental Shelf. Since petroleum reserves of 13 billion barrels are estimated, a total of 65 trillion cubic feet of gas can be inferred for the entire Continental Shelf off Texas and Louisiana. The 10 1/2 statute mile strip seaward of Texas should contain 6 trillion cubic feet and the entire shelf off Texas about 45 trillion cubic feet. The 3 1/2 statute mile belt off Louisiana should contain 1 1/4 trillion cubic feet and the entire Louisiana shelf about 20 trillion cubic feet of gas. (Table 3).

These estimates of the Geological Survey admittedly ignore the effect of future discoveries in the yardstick land areas. Should additional discoveries be made there, the estimates for the offshore areas should be correspondingly increased. Nor do the estimates consider the possibility of future technical improvements that may substantially increase the percentage of oil recovered from producing fields. In addition, the Geological Survey report does not attempt to estimate the effect of such presently unpredictable geological factors as possible changes of character and thickness in the sedimentary rock

TABLE 3

ESTIMATED POTENTIAL OIL AND GAS RESERVES OF THE CONTINENTAL SHELF LANDWARD OF "TRADITIONAL STATE BOUNDARIES" OF TEXAS AND LOUISIANA AND FOR THE ENTIRE GULF CONTINENTAL SHELF

	Oil (billions of barrels)		Gas (trillions of cubic feet)	
Texas:				
Within 10 1/2 statute miles of the coast	1.2		6.0	
Total Continental Shelf off Texas		9.0		45.0
Louisiana:				
Within 3 1/2 statute miles of the coast	0.25		1.25	
Total Continental Shelf off Louisiana		4.0		20.0
Total:				
Within "traditional state boundaries"	1.45		7.25	
Total Gulf Continental Shelf[1]		13.0		65.0

Source: United States Geological Survey, Potential Oil and Gas Reserves of the Continental Shelf Off the Coasts of Louisiana, Texas and California, February 16, 1953.

[1]The Geological Survey assumes no oil and gas in the Continental Shelf seaward of Mississippi, Alabama, and Florida.

from land to subsea areas and changes in the prevalence and size of structural traps. These factors in the aggregate might serve either to increase or decrease the estimates substantially. The Geological Survey did not feel that an attempt to consider these factors with the present state of knowledge would improve the quality of the estimates.

In the matter of oil reserve estimates, the Geological Survey has generally preferred to be on the conservative side.[49] In the case at hand, the estimates would seem to be of the minimum reserves expected, with no attempt to predict the maximum quantities possible.

Potential Income of the Leasing Governmental Body

In the submerged lands controversy, one of the principal questions concerned which governmental unit, Federal or State, would get the sums accruing to the underwater landowner from the private industry development of the resources located therein.[50] As this phase of the controversy boils down to the question of who gets the money, the problem arises of determining the amount at stake.

In an effort to indicate the general order of magnitude of the values involved, three illustrative calculations

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[49]Personal interview with Mr. Ralph Miller, Fuels Division, United States Geological Survey, May 28, 1953.

[50]The author knows of no plans for drilling by the Federal or State Governments.

have been made by the author. These calculations are not intended as forecasts; they are merely for purposes of illustration. The calculations are based first of all on the best estimates of physical quantity made by geological experts; furthermore, certain assumptions concerning the expected levels of royalty, price, lease bonus, delay rental and severance tax are made, based upon existing average prices and percentages. The answers derived are no more accurate than the estimates and assumptions used. Developments in the near or remote future may make these calculations unrealistic.

If royalty payments were the only amount involved, the problem would be relatively simple. The royalty owner would receive an agreed-on percentage[51] of the oil, gas, and sulphur produced, delivered in kind at the expense of the operator to the tanks, pipelines, or storage bins of the landowner located on the leases involved. If the landowner, or lessor, so elected, delivery of the royalty oil, gas, and sulphur would be made in money at the highest established field prices. Whether in kind or in cash, the royalty payment would be an established portion of the gross production,

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[51]The customary royalty on oil and gas has been 12 1/2 per cent of the gross production. For sulphur the amount has generally been 5 per cent of the gross production. These royalty percentages can vary and have been as high as 90.5 per cent on oil and gas. Houston Post, April 7, 1954.

free of all costs to the royalty owner.

Royalty payments will not be the only income going to the owning government. The Federal or State governments asserting ownership over the submerged lands will be able to collect not only lease bonus payments and annual delay rental payments, in addition to the royalty payments, but will also collect taxes. The amounts involved will vary according to the contractual agreements made with the lessees and the tax laws of the governmental body concerned. Since the royalties, bonuses, delay rentals, and severance taxes are not fixed amounts, and, since the physical quantities of oil, gas, and sulphur to be found in the submerged lands are largely unknown, it will not be possible to arrive at a fixed sum that would accrue to the owning governmental body. The present division of ownership between the Federal and State governments requires a further division of expected incomes.

In order to reduce the number of variable factors in the equation, certain minimum assumptions will be made. First, it will be assumed that the royalty payments for oil and gas will amount to 12 1/2 per cent and for sulphur to 5 per cent. These percentages are customarily in use at the present time. Second, the lease bonuses will be assumed to average $15 per acre. While the average lease bonus payments for submerged lands leased for oil and gas to date have been much higher, averaging $83 per

acre,[52] these leases have been on selected acreage on and around promising formations. It is doubtful that payments for all submerged lands will continue this high.[53] Third, the delay rentals will be assumed to average $5 per acre per year with the rental being paid for one year only.[54] A last assumption will place the severance and gross production taxes on gas, oil, and sulphur at 5 per cent. The severance taxes in effect at the present time average around 5 per cent in Texas and 10 per cent in Louisiana.[55] It is anticipated that the Federal government will establish a levy in lieu of state severance taxes that will approximately equal the State taxes.[56]

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[52]The total acreage leased to the end of 1954, both Federal and State, amounted to approximately 2.65 million acres, on which lease bonus payments of close to $220 million have been made, an average of $83 per acre. World Oil, August 1, 1954, and Houston Post, November 14, 1954.

[53]On the other hand, the owning government may be able to lease the same areas for oil and gas more than once. In addition, sulphur leases may be made on top of oil leases. A bonus can be extracted from the lessee on each transaction, thereby substantially increasing the bonus income of the lessor.

[54]Delay rentals, also called minimum royalty payments, are annual payments made during the life of a lease on non-producing properties. Once production is accomplished and as long as it continues, delay rental payments are not required.

[55]Hearings on S.1901, p. 280, 301.

[56]Public law 212, 83d Cong., 1st Sess., Sec. 6(9). The outer Continental Shelf Act contains a "windfall" provision in the handling of State leases found to be located

In no cases thus far, in the leasing by Texas and Louisiana, have the leasing provisions brought a smaller amount to the leasing authority than would be forthcoming with the assumed provisions. In many cases the royalty and rental schedules and the tax rates have been much greater. The United States Department of the Interior has stipulated a royalty of 16.67 per cent, a minimum lease bonus of $15 per acre, and an annual rental of $3 per acre for Federal leases off Louisiana.[57]

Applying these assumptions concerning the expected levels of royalty payments, lease bonuses, delay rentals, and severance taxes, to the most conservative estimates of the offshore oil and gas, the report of the United States Geological Survey, and the only estimate of offshore sulphur, that of the eighteen Texas geologists and engineers,[58] we derive a total income to the owning government over the years from the entire Continental Shelf of the Gulf of

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on Federal property. The lessees are required to pay an amount equivalent to any State severance tax imposed by the State issuing the lease.

[57] Houston Post, August 15, 1954.

[58] Actually, this report could be called two separate estimates. The Texas group made a formal prediction of 121 million long tons of sulphur and then stated that the estimate was much too low and should be doubled. Here, the more conservative estimate has been used. The Texas group included only the sulphur located offshore of Texas. Mr. Fred M. Nelson, president of the Texas Gulf Sulphur Company, told the Senate Interior and Insular Affairs Committee that the Texas geologists and engineers really were speaking of the entire Gulf Continental Shelf in the estimate. Hearings on S.1901, p. 118.

Mexico seaward of Texas and Louisiana of $7.89 billion. (Table 4).

For the belts 10 1/2 miles wide offshore from Texas and 3 miles offshore from Louisiana, using the same assumptions and estimates, the total income to the level of government exercising ownership would amount to a minimum of $859 million over the years (Table 5).

If Pratt's seemingly more generous estimate of the offshore oil is used to ascertain the amounts likely to accrue to the owning governments, the Texas and Louisiana submerged lands would contribute less to the owners than is found to be the case when the Geological Survey estimate is used. This incongruous situation can be explained by the lack of strict comparability of the estimates. Pratt stated only that the Continental Shelves and Slopes of the United States and Alaska should contain 100 billion barrels of oil. If one took liberties with Dr. Pratt's estimate and inferred that one half of this oil would be found in the Continental Shelves[59] and that the oil would be found evenly distributed throughout the Continental Shelves of the United States and Alaska, the Continental Shelf seaward of Texas and Louisiana, which comprises approximately 6.8 per cent of the total Continental Shelf area, would contain only 3.4 billion barrels of oil. This inferred estimate is so much lower

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[59]The other half would be in the Continental Slopes.

TABLE 4

MINIMUM EXPECTED AMOUNTS TO ACCRUE TO THE LEASING AND TAXING AUTHORITY FROM THE ENTIRE CONTINENTAL SHELF SEAWARD OF TEXAS AND LOUISIANA

Royalty:	
Oil- 13 billion barrels @ $2.50/bbl. X 12 1/2% royalty	$ 4.062 billion
Gas- 65 trillion cubic feet @ $.10/mcf X 12 1/2% royalty ...	0.813 billion
Sulphur- 121 million long tons @ $25/ton X 5% royalty	0.151 billion
Lease Bonus and Delay Rental:	
38,300,000 acres @ $20/acre[1]	0.766 billion
Severance Tax:	
Oil- 13 billion barrels @ $2.50/bbl. X 5% tax	1.625 billion
Gas- 65 trillion cubic feet @ $.10/mcf X 5% tax	0.325 billion
Sulphur- 121 million long tons @ $25/ton X 5% tax	0.151 billion
Total	$ 7.893 billion

Source: United States Geological Survey, Potential Oil and Gas Reserves of the Continental Shelf Off the Coasts of Louisiana, Texas and California (Oil and Gas). Eighteen Texas Geologists and Engineers, Houston Post, October 26, 1952 (Sulphur).

[1]The total acreage of the submerged lands is not definitely known. However, the area seaward of Louisiana approximates 19,400,000 acres and the area offshore from Texas is close to 18,900,000 acres. The assumption is made that the delay rentals will be paid for one year only for the average acre of submerged lands. $15 lease bonus plus $5 delay rental is equal to $20.

TABLE 5

MINIMUM EXPECTED AMOUNTS TO ACCRUE TO THE LEASING AND TAXING AUTHORITY FROM THE CONTINENTAL SHELF LOCATED WITHIN "HISTORIC STATE BOUNDARIES" OF TEXAS AND LOUISIANA[1]

Royalty:	
Oil- 1.45 billion barrels @ $2.50/bbl. X 12 1/2% royalty	$ 0.453 billion
Gas- 7.25 trillion cubic feet @ $.10/mcf X 12 1/2% royalty ...	0.091 billion
Sulphur- 11.1 million long tons @ $25/ton X 5% royalty	0.014 billion
Lease Bonus and Delay Rental:	
3,500,000 acres[2] @ $20/acre	0.070 billion
Severance Tax:	
Oil- 1.45 billion barrels @ $2.50/bbl. X 5% tax	0.181 billion
Gas- 7.25 trillion cubic feet @ $.10/mcf X 5% tax	0.036 billion
Sulphur- 11.1 million long tons @ $25/ton X 5% tax	0.014 billion
Total	$ 0.859 billion

Source: United States Geological Survey, Potential Oil and Gas Reserves of the Continental Shelf Off the Coasts of Louisiana, Texas and California (Oil and Gas). Eighteen Texas Geologists and Engineers, Houston Post, October 26, 1952 (Sulphur).

[1]The "Historic State Boundaries" of Texas are rather well established at 10 1/2 statute miles, or three leagues from shore. For Louisiana, the matter is somewhat less settled with the so-called "Historic State Boundaries" being located somewhere between 3 miles and 31 1/2 miles from the Louisiana shores. For this table, the Louisiana boundary has been assumed at 3 miles from shore.

[2]The area within the 10 1/2 mile strip off Texas approximates 2,600,000 acres. The 3 mile strip off Louisiana comprises an area of about 900,000 acres.

than any other estimate that it may be discarded. In addition since Pratt made no attempt to estimate the potential gas and sulphur, the data are lacking to determine the potential income to the royalty owning government.

For the same reasons, Weeks' estimate of the physical quantity of offshore oil is of little value in finding the income to the owning government. This leaves only the estimate of the eighteen Texas geologists and engineers. If the basic assumptions concerning royalties, bonuses, rentals, and taxes are applied to the admittedly conservative 11 billion barrels of oil, 62 trillion cubic feet of gas, and 121 million long tons of sulphur predicted by the Texas group in the submerged lands seaward of Texas, the income to go to the government owning these submerged lands would be approximately $6.575 billion (Table 6).

Following the qualifying statement in the report of the Texas group that the estimate of physical quantities was too low, the physical amounts involved should be doubled. This would produce a total income to the owner of the lands offshore from Texas of over $13 billion.

Each of the geological estimates of the physical volume of expected resources that was used in determining the royalty and leasing income, as well as the two estimates that were not used, were labeled by their authors as being on the conservative side. By any estimate the amount at stake in the dispute is large. The three tables in this

TABLE 6

EXPECTED AMOUNTS TO ACCRUE TO THE LEASING AND TAXING AUTHORITY FROM THE CONTINENTAL SHELF LOCATED SEAWARD OF TEXAS, USING PHYSICAL QUANTITIES ESTIMATED BY EIGHTEEN TEXAS GEOLOGISTS AND ENGINEERS

Royalty:	
Oil - 11 billion barrels @ $2.50/bbl. X 12 1/2% royalty	$ 3.438 billion
Gas - 62 trillion cubic feet @ $.10/mcf X 12 1/2% royalty ...	0.813 billion
Sulphur - 121 million long tons @ $25/ton x 5% royalty	0.151 billion
Lease Bonus and Delay Rental:	
18,900,000 acres @ $20/acre	0.766 billion
Severance Tax:	
Oil - 11 billion barrels @ $2.50/bbl. X 5%	1.375 billion
Gas - 62 trillion cubic feet @ $.0/mcf X 5%	0.310 billion
Sulphur - 121 million long tons @ $25/ton X 5%	0.151 billion
Total	$ 6.575 billion

Source: Eighteen Texas Geologists and Engineers, Houston Post, October 26, 1952.

section show the minimum amounts that the leasing governmental authorities might be expected to derive from development of submerged lands oil, gas, and sulphur resources, other things being equal. Since it was impossible to determine an annual income, the figures are given to show what the lessor may minimally expect from the "basic reserves" as they are developed, no matter when, so long as development proceeds under the outlined assumptions.

Summary

Even among experts there is disagreement concerning the size and value of the resource deposits in the Continental Shelf seaward of Texas and Louisiana, but at least two salient points of agreement can be recognized. First, geological evidence indicates that large quantities of oil, gas, and sulphur exist in the submerged lands. This has been proved empirically by the drilling bit in a limited portion of the offshore area. Little doubt exists in the minds of the technicians, geologists and geophysicists most familiar with the Gulf Coastal region, that other large areas of the Continental Shelf will prove highly productive. Second, the royalties and perquisites incident to the ownership of the submerged lands will amount to a large sum of money, although the amount is unknown.

CHAPTER IV

METHODS AND COSTS OF RECOVERING PETROLEUM FROM THE GULF COAST SUBMERGED LANDS

In this chapter an examination will be made of the methods in use and proposed for developing and producing the offshore petroleum. Then an attempt will be made to compare the costs offshore and onshore.

Man's ability to recover a portion of the oil and gas locked in the floor of the Continental Shelf is an established fact. Pioneering operations have demonstrated that production from these offshore reserves is technically feasible, for the problems of offshore drilling alone are not greatly different from the problems of comparable onshore drilling. Geologically the Gulf Continental Shelf is part of the Gulf Coastal Plain covered by a veneer of water, so the offshore operator can capitalize on the experience gained from drilling on structures in the immediately adjacent land areas.

Offshore operators have discovered that geophysical costs can be reduced below the current costs of such work on land. Geophysical operations conducted thus far have

disclosed the presence of about 250 structures in the submerged lands seaward of Texas and Louisiana that can be labelled first class.[1] Of the sixty-four structures drilled up to March 1955, thirty-six proved to be oil or gas fields and twenty-eight fields were discovered with the first well. Of all wildcat wells drilled, about 40 per cent have been successful.[2]

Although offshore drilling operations are relatively expensive compared to comparable dry land operations, most of the operators believe that technological developments in drilling, producing, and transporting of offshore oil and gas will permit them to realize a competitive cost per barrel in a large part of the Continental Shelf area.[3]

The cost of Continental Shelf petroleum development may be expressed in two ways: (1) the cost per well and (2) the cost per barrel of oil or 1,000 cubic feet of gas. Although the latter cost is the more significant figure for use in comparing the cost of onshore and offshore petroleum,[4]

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[1]Ira H. Cram, "Review and Appraisal of Offshore Operations," an address before the Southwest District Meeting, Production Division, American Petroleum Institute, New Orleans, Louisiana, March 11, 1955, p. 3 (mimeographed).

[2]Ibid., p. 4.

[3]National Petroleum Council, Submerged Lands, p. vii.

[4]The cost per barrel of oil or per thousand cubic feet of natural gas can be found by dividing the total cost of field exploitation, including all costs of exploration, development and operation, by the total volume of production

such data are unavailable. Literature on the subject fails to reveal any unit cost experience and the writers even hesitate to make estimates. Under the circumstances analysis must be based on cost per well figures, but an attempt will be made to point out its inherent shortcomings.

Such costs will vary from well to well, from area to area, and from time to time. Variables like depth of the water, distance from land, type of strata below the ocean bottom, depth of the productive zone, size of the reservoir, pattern of well spacing, rate of production, and number of operations being carried on in the area, will cause great differences in cost. Accordingly, cost data, if available, could be applied accurately only to limited areas thus far explored.

Offshore Developmental Methods and Costs

In order to attempt a determination of the cost of recovering oil from the submerged lands of the Gulf, it is necessary to go step by step through the field development operation. First is the search, then acquiring the lease, and then setting up the drilling rigs. After that the offshore drilling procedure is similar to that onshore. Each

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over all time. The true cost per unit of production cannot be calculated accurately until all of the petroleum is produced by both primary and secondary recovery methods and the physical plant scrapped. However, by the use of accounting artifices the approximate unit cost can be derived for any given volume of production in a given time period.

step needs clarification and eventual synthesis so that one can see the particular problems of offshore development, how they are met, and what prospects the future shows.

Geophysical Operations

The first step in the development of the Continental Shelf petroleum resources is the obtaining of a permit to engage in geological and geophysical operations. These permits convey no property right, interest, or reservation to the lands involved, and are issued by the State or Federal agencies charged with the administration of the area of interest, namely, the Texas Land Commission, the Louisiana Department of Conservation, and the Bureau of Land Management, Department of the Interior. In general, the permits are given freely to persons and organizations agreeing to abide by the rules and regulations of the issuing jurisdiction, governing such matters as the safe use of dynamite in the interest of property and wildlife preservation. The cost of obtaining such permits is very low.[5]

Next the area for survey must be located. Ordinary land methods for locating positions cannot be used but

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[5]The State of Texas charges $50 per active day of scientific sounding and requires that the company conducting the geophysical operations provide free transportation, lodging, and meals to the representatives of the Land Commission and the Fish and Game Commission. General Land Office, Rules and Regulations Governing Geological, Geophysical and Other Surveys and Investigations in the Areas Within Tidewater Limits Within Jurisdiction of the State of Texas, December 1, 1953, p. 2.

several methods are available that give acceptably accurate positional surveys. Triangulation by the shoran, lorac, and raydist methods, each a specialized type of radar, can plot a position up to one hundred miles with a tolerance of one hundred feet.[6] These systems require two or more transmitters on shore and a receiver on the survey ship. A specialized firm usually owns and operates the transmission systems, charging offshore clients a service fee of about $6,000 per month for each geophysical party using the service.[7] A fourth system, the sonobuoy method, utilizes our knowledge of the speed of sound in water to plot locations.[8] Sonobuoy equipment is generally owned and operated by the exploring company.

The principal methods used in locating and mapping structures in the Gulf of Mexico favorable for the accumulation of petroleum are magnetic, gravimetric, and seismic surveys. It is unfortunate that two relatively inexpensive exploration methods, aerial photography interpretation and surface mapping, are of little use in the submerged lands.[9]

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[6]National Petroleum Council, Submerged Lands, p. C18.

[7]Ibid.

[8]Sonobuoys, or small sound wave detectors with radio transmitters attached, are anchored at known positions. The exploring party plots its position by setting off dynamite discharges and then recording the time it takes the radio wave from the sonobuoy to reach the ship.

[9]There has been a limited amount of "surface" geology carried on by skin-diving geologists in the shallower

The structures most sought after in the Gulf of Mexico are the buried salt domes. The magnetometer, gravimeter, and seismograph have proved excellent tools for finding and outlining these salt domes. All three instruments have been used on land for many years and after some alteration of equipment and techniques for marine geophysical exploration, it was found that some marine operations could be carried out faster and with less expense than comparable operations on land.[10]

The magnetometer, which registers continuously while being towed behind a boat or suspended from an airplane, measures the variations of magnetic intensity brought about by salt domes. The cost of marine magnetic surveying is not found to be greater than land surveying with this instrument.[11]

The gravimeter, a sensitive weighing device, helps to locate and define salt domes by recording variations of gravity around the dome. Salt has a specific gravity that is somewhat less than the gravity of surrounding formations.

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waters of the Gulf of Mexico. In most cases, however, the outcroppings are covered by thick deposits of silt, making such methods difficult if not impossible.

[10]To show the speed of modern geophysical methods, twenty salt domes were located in twenty weeks by two gravimeter parties operating on land. W. A. Ver Wiebe, North American Petroleum (Wichita, Kansas, W. A. Ver Wiebe, 1952), p. 248.

[11]National Petroleum Council, Submerged Lands, p. E18.

Marine gravimeters may be lowered to the ocean floor, then leveled and read by remote control. Due to the difficulty of leveling in rough water or on a soft sea bottom, marine gravimetric surveying cannot match the speed of land operation. It is reported that surveying costs approach $120 per marine station as compared to $20 per land station.[12]

Reflection and refraction seismic surveying trace the inclination of rock strata and their depth below the surface by recording and timing reverberations of artificially generated sound waves.[13] As sound waves travel at different speeds through different strata, it is possible to outline salt domes with considerable accuracy. Reflection seismic surveys, most used in marine operations to date, are less expensive and generally more precise than refraction surveys, though they often do not give as much information about the underground formations. In its most recent development, all of the shooting and recording equipment can be operated from one ship and continuous recordings made while the vessel is underway.[14]

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[12] Ibid., p. E13.

[13] The reflection seismograph times the echo of an explosion going straight down and bouncing back. The refraction seismograph times the refracted reverberations of an explosion some distance away from the instrument.

[14] In the one ship, continuous system developed by one geophysical firm, the seismic detectors are placed at intervals in a long, oil filled plastic hose, or streamer, that is attached to a reel at the stern of the ship. Just

The total monthly cost of operating a marine seismic party is three or four times that of a land crew, but because of the speed and continuity of the marine operation, the productivity is five to seven times that of a normal land crew, even counting in the days of unfavorable weather offshore.[15] With proper scheduling of surveys so that long and continuous lines can be run without interruption, the exploration cost per acre should be considerably less than that for land surveys.[16]

Lease Acquisition Costs

Once a promising structure is located the interested company or joint venture must acquire a lease from the governmental body concerned. The offshore leasing procedures used by Louisiana, Texas and the Federal Government, while

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before the shot is fired from a separate shooting cable, the reel is released and the streamer permitted to become motionless in the water. After the shot is recorded, the streamer is reeled back to its original position. The ship never decreases its forward speed. John W. Wilson, "Single Ship Takes the Place of a Fleet," World Oil, June, 1954, p. 162.

[15]R. A. Boulware and E. D. Alcock, "Offshore Seismographic Survey," World Petroleum, March, 1948, p. 61. An important advantage in marine seismic work is the ability to use explosives in water without having to drill shot holes, a time-consuming operation in land seismic surveying.

[16]One of the larger offshore operators has found the cost per profile obtained by water-borne parties to be 75 per cent of the coastal land belt profile cost. Dean A. McGee, "Economics of Offshore Drilling in the Gulf of Mexico," Reprint of paper presented to the Division of Production, American Petroleum Institute, Chicago, Illinois, November 9, 1954, p. 2.

differing in detail, and similar in practice. From time to time these governmental units entertain nominations to make certain parcels of underwater land available for lease. Interested parties request that parcels containing their finds be included in the sale. So as not to show their hands, the prospective bidders commonly nominate a larger area than they expect to bid on. They are not committed to bid on these camouflage parcels, known as "scenery" or "whale pasture" in the industry, but only to guarantee that they will make a substantial bid in the general area.[17]

When all nominations are in, the owning government works out the conditions of the sale and places the suggested parcels up for competitive sealed bidding. The present practice is to leave the bid open at one end only, i.e., to fix the minimum royalty and accept bids on the cash bonus. The leasing governments prefer this method whereby they will get some cash, even if the lease is dry.[18]

The amounts bid in cash bonuses for offshore leases have mounted steadily since 1945, when Louisiana sold leases

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[17]Information on Texas leasing procedure obtained from the General Land Office, Austin, Texas; on Louisiana from State Land Office, Baton Rouge, Louisiana.

[18]It must be noted that this procedure works in favor of the bidder with a plentiful supply of cash as against one who does not, but is perfectly willing to gamble with a heavier percentage of the product, in case he finds oil. However, any company with the financial ability to operate in the offshore area should have no difficulty in finding cash bonus money. The little operators stay on dry land.

on 89,000 acres for an average of $5.13 per acre. Texas and Louisiana averaged $36 per acre on the 1,839,932 acres sold up to August 1, 1954.[19] In two sales held in late 1954 by the Federal Government, 461,870 acres located in the outer Continental Shelf brought $139,405 in bonus money, or $302 per acre.[20] As of November 9, 1954, a total of 2,301,802 acres of State and Federal submerged lands had been leased for $205,888,873. The average lease acquisition cost over the nine years has been $89 per acre.

While the lease acquisition cost per acre and the totals paid to the leasing governments appear large, these figures have little meaning unless compared with the cost of acquiring nearby onshore leases. No accurate data and few estimates are available on the sums that have been spent in acquiring onshore leases. It is known, however, that, in addition to the usually substantial lease bonuses, very large sums have been spent searching and securing titles, defending title suits, assembling and pooling small tracts, handling damage and drainage claims, and other costs that are not experienced when one lessor owns the entire area. Over the years these additional costs may exceed the cost of leasing and maintaining offshore acreage.

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[19] World Oil, August 1, 1954, p. 98.

[20] Personal letter from Sidney M. Groom, Jr., Manager, Outer Continental Shelf Office, Bureau of Land Management, Department of the Interior, March 11, 1955.

The successful bidder for an offshore lease receives a clean original title to a relatively large parcel of land. Texas lease blocks are of 640 acres each up to three miles from shore and 1440 acres each from there to the Outer Continental Shelf. Louisiana leases up to 5000 acres in one parcel.[21] Federal lease blocks are of 5760 acres each.[22] No lessor has established a limit as to the number of blocks that may be purchased by any one bidder.

Lease costs will probably continue to increase as more companies seek acreage in the offshore areas. Three factors that would attract them there are:

1) The relatively large size of the lease block.
2) The freedom from title defenses and block assembling.
3) The probable right to set their own well pattern instead of having to conform to offset competitive drilling as on land.

Granted certain necessary technological changes and probable incentives, the larger companies may well move out to sea. The long range costs of acquiring and maintaining offshore leases should not deviate greatly from those associated with onshore leases.

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[21] Hearings on S. 1901, p. 75.

[22] 43 C.F.R. 201.3 (c).

Marine Drilling Operations

The only way to discover oil and gas on a lease, under present technology, is to drill a hole in the ground with a bit. In offshore drilling the main problem has been cost. Economical methods had to be developed whereby cumbersome rotary drilling rigs could be supported out of the open waters of the ocean. The sea is a hard taskmaster and demands sturdy construction. Although the much publicized Gulf Coast hurricanes do not cause as much lost drilling time as do the frequent line squalls and "northers," offshore installations must be designed to withstand any problem hurricane force.[23]

While drilling over water is not an entirely new venture,[24] previous experience could not be applied directly to open water drilling in the waves of the Gulf. For drilling into promising submerged areas close to shore, methods developed many years ago in the California coastal oil fields can be adopted. Using directional drilling, in

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[23]McGee, op. cit., p. 5, points out that offshore drilling time lost due to weather compares favorably with lost rig time on land. Mud, the constant enemy of onshore rig operators, is no problem in offshore drilling and moving.

[24]As early as 1894, extension wells from California coastal fields were drilled from piers built out in the open ocean. The great Lake Maracaibo, Venezuela, oil fields were developed by drilling from fixed platforms in water up to one hundred feet in depth. Operations have been successfully conducted from drilling barges for a number of years in the Louisiana bayou and marsh country. All these operations were accomplished in relatively protected waters.

which the bit is slanted out under the ocean from rigs located on the land, operators have hit the object target with remarkable accuracy, even with drift angles up to seventy-five degrees.[25]

Directional drilling has been incorporated into the offshore drilling procedure, allowing several wells to be drilled and produced from one installation. Even so, the economies of multiple well operations from one platform are partially offset by the higher cost of directional drilling. While costs vary with the angle of drift required, the formations encountered, and the degree of accuracy required, the per foot cost of directional drilling is reported to be, on the average, half again as expensive as vertical drilling.[26] More footage of drilling is required in a directional well than in a straight well and directionally drilled wells are somewhat more expensive to maintain.[27] However, the additional cost of drilling and producing wells by the directional method is small compared with the savings on platform construction.

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[25]H. John Eastman, "Producing Directionally Drilled Wells," World Oil, April, 1954, p. 234.

[26]Personal interview with Otis Danielson, Chief Drilling Engineer, Kerr-McGee Oil Industries, Inc., Oklahoma City, Oklahoma, July 5, 1954.

[27]Eastman, op. cit., p. 243. Operating expenses are reported to be about ten per cent more on directional wells than on straight wells.

Often shore bases must be established to supply the offshore platforms and barges. In remote areas where port facilities are not available, this involves constructing supply depots and docks with cranes for handling the relatively heavy oil field equipment. These facilities must be duplicated in part at the well site. The general experience has been that a shore base, once established, can supply many drilling operations in the adjacent ocean area. Under these circumstances, only a portion of the shore base cost can be charged to any one well. If drilling is successful, the shore base may be used for years to service the producing wells.

Regardless of the type of drilling installation, any offshore operation must be supported by a small fleet of crew and cargo vessels to transport the drilling crews, supervisory personnel, and supplies between the shore base and the drilling location. One crewboat is required to stand by the scene of operations at all times to evacuate personnel in case of emergency.

Several operators have utilized helicopters to transport personnel and light supplies on regular schedules between land and specially built heliports on the drilling installation. This has resulted in savings on portal-to-portal pay, less overtime pay, better supervision, and less down time for the rig while waiting for parts. If helicopter transportation is proved capable of operating in all

kinds of weather, possibly smaller and less expensive platforms and barges can be used.[28]

Drilling Installations

Three general methods of supporting the drilling rig have been used in submerged land operations: 1) the self-contained platform, 2) the small platform combined with a drilling tender, and 3) the mobile, self-contained unit, either submersible barge or elevated platform.

Both from cost and operational standpoints, none of the three drilling devices are completely competitive in all water depths.[29] The submersible barge appears to be the most economical method of drilling in waters up to forty feet in depth. The mobile elevated barges and platforms, because of their high initial cost, cannot compete with the submersible barge in waters of less than forty feet. The large, self-contained, fixed platform can be used in water up to 150 feet, but operations from these permanent structures would probably exceed the cost of and lack the

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[28]The S-55 helicopter is claimed to be capable of operating in winds of 60 miles per hour, with ceilings of 300 feet and visibility of one mile. The S-55 helicopter can transport an entire drilling crew in one load. J. C. Craig, "Auxiliary Floating Equipment and Helicopters," paper presented at Spring Meeting of the Southwestern District, Division of Production, American Petroleum Institute, Houston, Texas, March 5, 1954 (mimeographed).

[29]Personal interview with Ray Lacy, Shipbuilding Division, Bethlehem Steel Company, Beaumont, Texas, on March 6, 1955. He pointed out the platform methods could theoretically be used in waters 200 feet deep.

flexibility of similar operations from mobile devices in any depth of water. The closest approach to a method competitive in all depths of water is found in the small platform combined with a drilling tender.[30]

Self-Contained platform. At first, operators mounted all drilling machinery, supplies, and crew quarters necessary to sustain extended drilling operations on one massive platform. The advantages in such a procedure are structural safety through size and the ability to continue operations in all but hurricane weather. The obvious disadvantages are great original cost and the expense of moving or salvaging the platform should the location prove nonproductive.[31]

The largest structure of this type, the Humble Grande Isle platform, located in forty-five feet of water seaward of Louisiana, is 206 feet long, 110 feet wide, and the lowest deck is 35 feet above the mean low water mark; it has facilities for drilling one straight hole and six slanting holes and cost $1,250,000.[32]

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[30]McGee, op. cit., p. 5.

[31]The cost of moving a self-contained platform to another location has been estimated at 50 per cent of the original cost of the platform. National Petroleum Council, Submerged Lands, p. C22.

[32]Testimony of Mercer Parks, Humble Oil and Refining Company, before the Senate Committee on Interior and Insular Affairs, Hearings on S. 1901, p. 82.

Small platform with floating drilling tender. One method of reducing platform costs in offshore drilling is the use of a small platform, fifty feet by one hundred feet, to support the derrick and a minimum of drilling equipment, and a barge or ship to contain auxiliary supplies and equipment and to house the crews. The drilling tender is snubbed up to the platform and the auxiliary equipment interconnected with the drilling rig by hoses, cables, and ramps. Such a platform can be erected for around $300,000; if operations are unsuccessful, it can be moved and relocated for approximately sixty per cent of its original cost.[33] It is reported that this general method has been used in 90 per cent of the offshore wells drilled to 1954.[34]

The vessels used as drilling tenders have been either converted war-surplus LSTs and YF barges or custom constructed craft.[35] In bad weather these vessels are moved to sheltered locations.[36] Drilling operations must

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[33]National Petroleum Council, Submerged Lands, p. C24.

[34]McGee, op. cit., p. 3.

[35]In service or near completion on March 4, 1955, were fifteen converted L.S.T.s, ten converted YF barges, and six new tenders. Personal interview, Jim Savage, Assistant Vice-President, Kerr-McGee Oil Industries, Inc., Houston, Texas, March 4, 1955.

[36]Self propelled tenders may head for deeper waters to ride out any storm. Most tenders, especially the war-surplus craft, do not have propulsion equipment that is operational.

cease when the tender is not attached to the platform.[37]

The operators who bought surplus YF barges and LSTs were able to convert these craft to drilling tenders at a total cost of from $700,000 to $1,500,000 each. New drilling tenders of comparable size cost about $2,700,000 now and are much more satisfactory operationally than the converted tenders.[38] As these special purpose ships may be used in the drilling of many wells during their working lives, only a portion of the acquisition cost need be charged to any one well.

This method of offshore drilling is generally less expensive than the large self-contained platform method.[39] The continuing popularity of the platform-tender combination is attested by the orders being placed with shipyards for new drilling tenders. Still, this drilling method suffers from two inherent disadvantages. Operations cannot proceed in rough weather and there is also the substantial cost of erecting the fixed platform before the operator is certain

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[37]As much as ten per cent of the drilling time may be lost due to unfavorable weather conditions. John M. Payne, "Mobile Units for Offshore Drilling," a paper presented at the Spring Meeting of the Southwestern District, Division of Production, American Petroleum Institute, Houston, Texas, March 6, 1954, p. 29.

[38]National Petroleum Council, Submerged Lands, p. C26.

[39]To further reduce costs, one company has mounted two rigs on one platform. Both drilling rigs can be served by one tender. Oil and Gas Journal, January 18, 1954, p. 81.

of successful exploratory wells. These disadvantages led to the development of methods in which a fixed platform is not needed until production is accomplished and in which operations are not appreciably affected by weather.

Mobile drilling units. To cope with these two disadvantages mobile drilling units have been developed. These units can be grouped into three main categories: 1) submersible barges, 2) mobile platforms, and 3) elevated barges.[40]

Submersible drilling barges have a floating hull which, when flooded, rests on the bottom. In open water models, first used in 1952, fixed legs keep the drilling platform well out of the water. Drilling operations carried on to date have been highly successful in waters less than 40 feet deep.[41] One submersible barge drilled 132,000 feet of hole in a five month period, an average of 26,500 feet per month.[42] The complete cost of one barge capable of drilling in forty feet of water was $1,750,000.[43]

A mobile platform differs from a submersible barge in that the drilling platform is mounted above the

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[40]Classification from Payne, op. cit., p. 30.

[41]McGee, op. cit., p. 5.

[42]Payne, op. cit., p. 30.

[43]Houston Post, April 25, 1954. This barge was built for the Ocean Drilling and Exploration Company by the Alexander Shipyard, New Orleans, Louisiana.

submergible hull on extendable legs. The one mobile platform so far completed can operate in waters up to one hundred feet deep,[44] but plans have been completed for a model usable in two hundred feet of water. The one hundred foot model was built and equipped at a contract price of $4,250,000.[45]

Elevated barges differ from the other two mobile drilling craft in that the floating hull containing the drilling equipment is lifted out of the water on extendable legs. One barge, capable of drilling in one hundred feet of water, is now in use off the Louisiana coast.[46]

Mobile drilling units do not answer all the problems of offshore drilling, but they may contribute to offshore development by lowering costs in shallow waters and providing economically feasible means for drilling in the deeper waters.[47]

Proposed methods of offshore drilling. The great potentialities of offshore oil development have stimulated

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[44]This mobile platform, named "Mr. Gus," was built by Bethlehem Steel Company for the C. G. Glasscock Drilling Company. The author was privileged to inspect this piece of equipment in the Beaumont, Texas, yard of the Bethlehem Steel Company.

[45]Personal interview with Ray Lacy, Bethlehem Steel Company, Beaumont, Texas, on March 5, 1955.

[46]Personal interview, Jim Savage, Kerr-McGee Oil Industries, Inc., March 4, 1955. He indicated several more such barges are nearing completion.

[47]Personal interview with Ray Lacy, March 5, 1955.

much engineering thought in the past decade. A few of the plans will indicate trends of thought in attempts at solution of these new problems.

One plan envisions a giant sphere containing all the drilling equipment to be submerged on the Gulf floor. If drilling were successful, a submarine gathering system or a gathering platform would be erected. Servicing would be carried out by personnel and equipment in portable diving bells.[48] Presumably such a unit could operate in waters out to the edge of the Continental Shelf. The cost is unknown.

Another plan calls for a recoverable tripod drilling platform with legs 724 feet long firmly grounded in the sea bottom. Such a rig, if feasible, could drill out to the edge of the Continental Shelf.[49]

In another plan the drilling rig and production equipment are placed on a floating foundation. The conductor pipe from the surface of the water to the ocean floor would be moderately flexible to permit some lateral movement of the floating platform. The greatest difficulty would be experienced in anchoring the platform to prevent undulation

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[48] Houston Post, May 17, 1954.

[49] Anthony Gibbon, "New Techniques Await Resumption of Offshore Drilling," World Oil, November, 1952, p. 166.

under changing wave and load conditions.[50]

Nearer fruition is a project of the Gulf Oil Corporation for drilling in 300 feet of water. While no details have been released, speculations report that the unit will be a combination fixed platform and elevated barge. A platform 150 feet high would be erected on the ocean floor with a giant elevated barge placed on top of the platform.[51]

Future methods may bear no resemblance to current practice.[52]

The Cost of Marine Drilling

In the nine years of drilling in a limited portion of the Gulf submerged lands, cost studies have been made, but they have been inconclusive.[53] Some operators hesitate

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[50]Henry E. Gross, "Possibilities and Problems of Drilling Beyond the Continental Shelves," Transactions of the American Institute of Mechanical Engineers, Vol. 170, 1947, p. 180.

[51]Houston Post, May 17, 1954.

[52]An interesting case in point is a proposal, suggested for the California submerged lands, of sinking vertical shafts into the earth on land and driving tunnels laterally out under the ocean. The network of tunnels would end in caissons large enough to hold electric drilling rigs. Each caisson rig, by directional drilling, could tap a fairly wide area. Such a plan, because of the great expense, would only seem feasible where the petroleum deposits were clearly delineated. The techniques involved are familiar to mining engineers, however, and the bomb-proof aspects of such a plan cannot be ignored. Ed Lundburg, "Oil City Under the Sea," Popular Mechanics, August, 1951, p. 86.

[53]Ira H. Cram, Senior Vice-President, Continental Oil Company, had this to say: ". . . I have worked up a

to give out any cost information.[54]

Offshore drilling costs vary widely, depending on such factors as the method of drilling used, the number of wells drilled from each location or platform, the depth of the well, and many other considerations. In drilling undertaken to date in the shallower waters of the Gulf, total costs per well are reported, to cite extremes, as equal to costs for land wells[55] or as being five times greater than the cost of counterpart land wells.[56]

Before comparing offshore to land drilling, it will be well to make a cost comparison of the various offshore drilling methods in use. McGee has provided data showing that an 11,000 foot dry hole in thirty-five feet of water would cost in 1954 an estimated $372,000 if drilled from a mobile device, $536,000 from a small platform and drilling tender, and $788,000 from a self-contained platform. Platform costs account almost entirely for these cost

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lot of data on costs and decided that none of these figures were worth putting out." Letter to the author, dated March 17, 1955. Dean A. McGee, President, Kerr-McGee Oil Industries, Inc., says, ". . . it is impossible to arrive at a reasonable figure which would represent an overall offshore producing cost." Letter to the author, dated March 31, 1955.

[54]One company official, refusing to let the author see a cost study on his desk, frankly stated that his company was embarrassed to let others see how much money they had spent on so few wells.

[55]McGee, op. cit., p. 9.

[56]National Petroleum Council, Submerged Lands, p. C37.

differentials. The cost of a single completed well of 11,000 feet in thirty-five feet of water is estimated to be $536,000 with a mobile device, $768,000 for the platform and tender combination, and $1,256,000 for the self-contained platform (Table 7).[57]

A cost comparison has been made for six completed wells of 11,000 feet in thirty-five feet of water by the three drilling methods (Table 8). The assumption is made that the mobile devices would be moved from location to location to drill vertical holes, rather than drilling directional holes from one location.[58] The average cost per well would be $535,600 if drilled by a mobile unit, $658,700 from a small platform and tender, and $672,300 if a self-contained platform were used.

It can be seen that, for a development program of several wells within the reach of one platform, there is little cost differential between the three drilling methods in current use. For exploratory drilling, however, the

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[57]McGee, op. cit., p. 5. Account must be taken of the fact that the entire cost of the platforms in the last two drilling methods was borne by the one well drilled from each. In practice, several wells would be drilled from each platform, thereby reducing the platform cost per well. The additional cost of directional drilling would be more than offset by the savings on platform construction.

[58]It would be a point of indifference, costwise, whether directional wells were drilled from one location or vertical wells from several locations. The additional cost of directional drilling would about equal the cost of erecting separate caissons, piling, and production platforms for vertical wells drilled by mobile units.

TABLE 7

COST COMPARISON OF DRY HOLE AND COMPLETED WELL OF 11,000 FEET USING VARIOUS METHODS OF OFFSHORE DRILLING[1]

Item	Deep Water Barge or Mobile Platform	Minimum Platform and Drilling Tender	Self Contained Platform
Platform	---	250,000	800,000
Caisson and guide piling	25,000	---	---
Rotary Drilling to 11,000 feet	201,000	236,800	199,300
Day work - ten days	57,500	47,500	35,000
Drilling casing, cementing, mud, logging, rental tools, and use of shore base facilities	114,000	114,000	114,000
Total dry hole cost, including platform	397,500	648,300	1,148,300
Less platform drilling salvage	25,000	112,500	360,000
Net dry hole cost for single well	372,500	535,800	788,300
Total dry hole cost, including platform	397,500	648,300	1,148,300
Day work in completion-ten days	57,500	47,500	35,000
Oil string, casing, cementing, perforating, tubing, well head, packers, and miscellaneous equipment	72,600	72,600	72,600
Production platform	8,000	---	---
Total completed single well cost	535,600	768,400	1,255,900

Source: Dean A. McGee, "Economics of Offshore Drilling in the Gulf of Mexico," pp. 11, 12.

[1]Assumes water depth of thirty-five feet and 1954 costs.

TABLE 8

COST COMPARISON OF SIX COMPLETED WELLS OF 11,000 FEET USING VARIOUS METHODS OF OFFSHORE DRILLING[1]

Item	Deep Water Barge or Mobile Platform	Minimum Platform and Drilling Tender	Self-Contained Platform
Completed cost of single well (from Table 7)	535,600	768,400	1,255,900
Additional costs of drilling and completing five other wells:			
Caissons, guide pilings, and production platforms	165,000	---	---
Rotary drilling:			
Vertical	1,005,000	---	---
Directional (150% of vertical)	---	1,776,000	1,495,000
Day work-twenty days per well in drilling and completing	575,000	475,000	350,000
Casing, cementing, logging, mud, rental tools, well heads, share of shore base costs, and miscellaneous equipment	933,000	933,000	933,000
Total cost of six wells	3,213,600	3,952,400	4,003,900
Average cost of each well	535,600	658,700	672,300

Source: Dean A. McGee, "Economics of Offshore Drilling in the Gulf of Mexico," p. 14.

[1]Assumes water depth of thirty-five feet and 1954 costs.

mobile unit appears to have a decided cost advantage.

In comparing the cost per well offshore with comparable wells onshore, McGee has assembled representative data from thirty-five offshore wells in waters up to forty-three feet and twenty-eight inland wells.[59] From these data, McGee constructed the cost curves reproduced in Figure 3. Admittedly, the curves are not completely dependable; still, they roughly reflect the comparative costs experienced.

Two significant points appear from the McGee cost study. First, at depths greater than 10,000 feet, the difference in offshore and onshore costs remain approximately constant. Thus, below 10,000 feet, the deeper the well, the less becomes the cost disadvantage of offshore drilling. Secondly, at depths of 5,000 feet and less, wells can be drilled from submersible barges at total costs not appreciably greater than comparable wells on land. While the capital and operating costs are higher on the submersible barge rigs than on land rigs, much less preparatory expense is needed in rigging up the marine unit.[60]

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[59]Of the thirty-five offshore wells, fifteen were drilled from a small platform and tender and twenty from a submersible barge. To enlarge the sample, a method was used that added the average completion costs to the dry holes in order that they might be included. Personal letter from William N. Mosley, Production Engineer, Kerr-McGee Oil Industries, Inc., April 18, 1955.

[60]A land rig often cannot be moved into location until roads are built, the ground leveled, and the pits

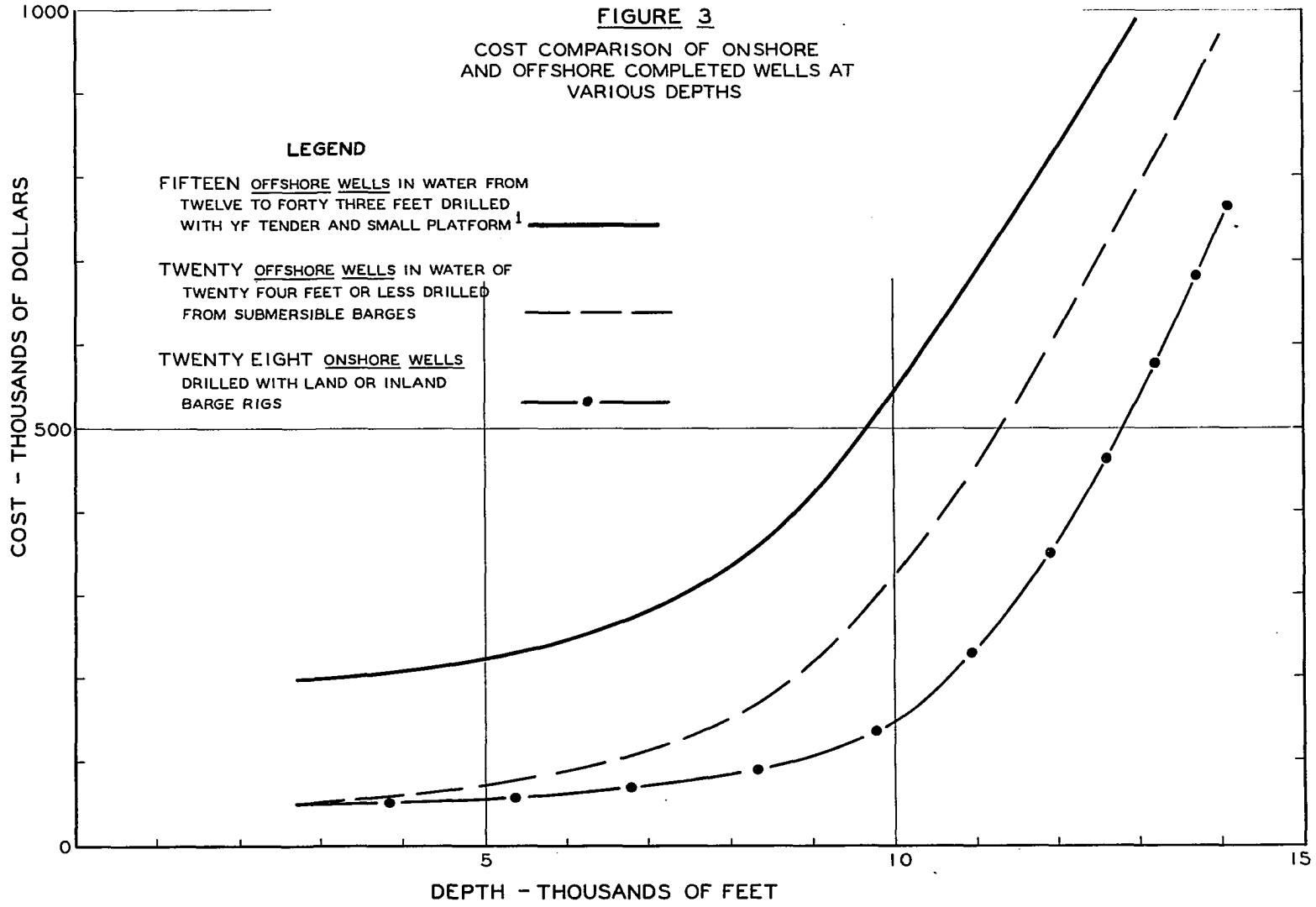


FIGURE 3

COST COMPARISON OF ONSHORE AND OFFSHORE COMPLETED WELLS AT VARIOUS DEPTHS

SOURCE : DEAN A. MCGEE, "ECONOMICS OF OFFSHORE DRILLING IN THE GULF OF MEXICO"

[1] USING ONE THIRD OF PLATFORM COST

The National Petroleum Council, in a study completed in 1953, found that offshore wells, both exploratory and developmental, cost from two to five times as much as the same type wells would cost on land.[61] The study shows that ten offshore exploratory wells, averaging 11,000 feet, drilled from fixed platforms in sixty feet of water to test one large structure, would cost $8,200,000, while ten onshore exploratory wells drilled to the same depth would cost $3,200,000.[62] Under these circumstances, the offshore costs per well were 2.6 times the cost of the onshore. A twenty well development program in sixty feet of water to depths averaging 11,000 feet would cost $14,045,000, as compared to an estimated $4,980,000 for twenty similar wells drilled on land.[63] Here, the offshore cost would be 2.8 times the land cost.

Although the industry is trying to evaluate the effect of water depth on cost of drilling, there is no agreement on the expected cost of drilling in waters of over one hundred feet. One authority expects that the platform cost

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dug. Except where the rig can be skidded, it must be torn down and reassembled between each well.

[61] National Petroleum Council, Submerged Lands, p. C37.

[62] Ibid., p. C38. It is assumed that five platforms would be used to drill the ten wells and that there would be at least one productive well on each platform.

[63] Ibid., p. C43. The offshore cost includes four platforms.

will increase as a square of the depth of the water and that transportation costs will run directly in proportion to the distance from the shore base to the well location. Other drilling costs will not be affected by the depth of the water or the distance from land.[64] Another authority says that drilling between 120 feet and 200 feet will be quite as feasible as, and only slightly more expensive than, drilling in waters shallower than 120 feet.[65]

Since there has been no breakdown of onshore costs, exact comparison between the various aspects of onshore and offshore drilling activities can only be conjectura. In spite of the general agreement that the drilling cost per well offshore is higher than the per well cost onshore, many industry spokesmen hesitate to accept those estimates as definitive. Certain mitigating factors may counteract the disadvantage shown by acceptance of the cost per well approximations.

This incongruous cost picture of higher absolute costs per well, yet comparable net costs per unit of production, can be explained by taking into account the state of development in adjoining land areas and certain

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[64]Statement of Mercer H. Parks, Petroleum Engineer, Humble Oil and Refining Company, before the Interior and Insular Affairs Committee, United States Senate, Hearings on S.1901, p. 84.

[65]Statement attributed to Ben C. Belt, Vice President, Gulf Oil Company, Oil and Gas Journal, June 21, 1954, p. 108.

institutional features peculiar to large scale offshore operations. The simple and easily drilled structures on land have already been discovered and tested for petroleum. To find additional deposits on shore now requires deeper and more expensive drilling. The gloomier prospects of more expensive deeper drilling on land was one of the major factors that led the operators to turn their attention to the large virgin territory offshore. The Committee on Submerged Lands Productive Capacity of the National Petroleum Council pointed this fact out in their statement:

> Their [the operators] decision to explore on the Continental Shelf is based on the conviction that onshore exploratory work along the Gulf Coast is reaching the point of diminishing returns and that offshore costs will be reduced materially by utilizing the technical "know how" gained from large scale operations particularly in the developmental phases of offshore operations.[66]

The institutional features that partially offset the greater cost per well for marine as compared to land development are the result of the unique offshore ownership pattern. Larger leasing blocks with the virtual absence of offset drilling commitments, greater freedom for geological exploration, greater ease of establishing unit operations, among other factors, make development work more efficient and reduce the net cost per barrel of petroleum produced to a price somewhat lower than the absolute cost per well

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[66]National Petroleum Council, Submerged Lands, pp. C4, 5.

figures would indicate.

Offshore Production Methods and Costs

Regardless of how efficient the drilling techniques become, unless the offshore petroleum can be lifted and transported to shore at a reasonable cost, the Continental Shelf fields will be priced out of the market. Production and transportation costs appear to be somewhat higher than the costs experienced in adjacent land areas. However, certain economies, such as the elimination of small leases and the concentration of operations from several wells on one platform, serve to effect savings in offshore production.

The per well and per day operating costs tend to approach constancy, regardless of the producing rates. Depending on the area, until the daily production in any field reaches a daily volume of 1,500 to 4,000 barrels, the production costs are reported to be in excess of those on land.[67]

A problem encountered after drilling any oil well is that of deciding whether to complete the well for production or abandon it. Drill stem tests may show a well to be good, bad, or indifferent. Many operators prefer that a well be very good or very bad, as the worst possible outcome of any exploratory venture is the indifferent well,

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[67]McGee, op. cit., p. 7.

known in the industry as a "teaser." The operator hesitates to abandon the well uncompleted because it may be more productive than drill stem tests indicate; he hestiates to incur the additional expense of completing the well as it may not pay out the cost of the completion, much less the drilling costs.

Because of the higher costs of marine oil production a well is not completed for production in the offshore unless it is very, very good. Exactly what constitutes a "good" or "commercial" well is relative. One offshore operator recommends plugging and walking away from the smaller discoveries, i.e., wells that locate fields with an ultimate recovery of less than twenty-five million barrels.[68]

Too, the productive life of each offshore well is shorter. Stripper wells making ten to fifteen barrels a day will rarely pay their way. The operating head of one large company recently bemoaned the fact that he was forced to abandon some fifty to one hundred barrel a day offshore wells making water, because it would cost $100,000 to work over each well.[69]

Production and Storage

After a drilling program is successfully completed,

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[68]Statement of Ben C. Belt, Oil and Gas Journal, June 21, 1954, p. 109.

[69]Cram, op. cit., p. 7.

facilities for handling the petroleum must be provided. Flow lines must be laid from the wells to gathering stations. Automatic safety equipment must be installed to protect life and property from the hazards of blowout, fire, storm, and collision. The production personnel must be provided with living quarters, boats, and supplies.

Production costs, as this term is narrowly used in the oil industry, consist of the direct lifting costs,[70] depreciation, taxes, interest, and overhead. McGee has found these costs to run from fifty cents to eighty cents per barrel in one fairly representative offshore area in its early stages of production while comparable costs onshore run from thirty to forty cents per barrel.[71]

Three basic methods of handling and storing the offshore production are now being used. In the first, all production facilities are mounted on the production platform. The petroleum is stored on the platform until it can be barged to shore. In the second, the oil flows or is pumped from the production platforms to centrally located gathering barges. Submersible tank battery barges have been developed that can be left on location in all but hurricane weather.

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[70]Direct lifting costs, in turn, consist of labor, maintenance, supplies, fuel, and lubricants necessary to lift the petroleum to the surface.

[71]McGee, op. cit., p. 8. As these wells become older, less productive, and require more working over, the production costs are expected to rise.

The third method consists of connecting the well to shore with an underwater pipeline. Commingled oil and gas can be sent through the pipeline for separation, treatment, and storage on land. If the distances involved are not too great and the volume of oil and gas sufficient to justify the construction of a pipeline, the last method is reported to be the most economical of the three.[72]

Transportation

Oil produced from most of the offshore wells is now being carried to storage onshore in barges. This method is relatively slow, difficult, and expensive. The necessity of loading the oil at the offshore storage platform or barge and rehandling it when the barge reaches shore serves to increase the transportation cost from fifteen to twenty-five cents per barrel.[73] This compares roughly with the cost of gathering oil by truck for short hauls on land, where pipeline connections are not available.

Natural gas does not lend itself to easy transport by surface craft. Special barges containing high-pressure containers for the gas have been developed, but this equipment is relatively expensive. It is generally conceded that the laying of oil and gas pipelines is the ideal solution to the transportation problem in the offshore, where

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[72] Ibid., p. 6.

[73] Ibid.

circumstances permit.

From an engineering point of view, the construction of pipelines in the open waters of the Gulf does not appear to be much more difficult than in the swamplands of Louisiana or the mountainous terrain of Wyoming.[74] The longest line laid in the Gulf taps production twenty-five miles from shore. Forty-eight miles of gathering line collected the oil and gas from the scattered wells.[75] The cost of a properly laid and protected pipeline is reported to be from two to four times the cost of a similar line on land.[76]

Summary

The consensus of opinion among authorities on the Continental Shelf development is that it costs more to drill a well in the Gulf offshore than in the nearby coastal land areas. Geophysical operations may be less expensive offshore because of the greater productivity of relatively unimpeded seismic surveying. Present offshore lease costs would seem to compare favorably with onshore ones. However, even with the best marine mobile drilling installation, the cost of drilling a well 10,000 feet deep is approximately

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[74]An elaborate gathering system in waters that average ninety feet has been in operation for some time in the Tia Juana Field, Lake Maracaibo, Venezuela.

[75]Oil and Gas Journal, September 13, 1954, p. 97.

[76]Martinus W. Mouton, The Continental Shelf, p. 298.

twice as much offshore as onshore. Added to that are the necessary expenses of transportation and storage for offshore production beyond the usual expenses incurred by land operators. The total cost of offshore production per well might be five times as much as the onshore total.

Granted that the costs per well are higher, it does not follow that the costs per unit of production will necessarily be higher. Several economies unique to Continental Shelf operations serve to counter the higher costs per well.

To begin with, the offshore is a virgin territory. First rate structures that are relatively easy to find and test exist in great number. By use of highly efficient marine geophysical procedures, these promising formations can be located at a lower cost per structure than is possible on land. Next, the leases can be acquired and maintained at what appears to be a relatively low cost. Because of the nature of the submerged land ownership and the large size of the leasing blocks, fewer wells are required to develop the structures found to be productive. The competitive offset drilling often associated with land operations need not be present in the offshore.

While data are not available to show the effect of these special offshore economies on the cost per barrel of oil and per thousand cubic feet of gas, it can be inferred from the interest of many major companies in the submerged lands that the total costs per unit of production are not

expected to exceed those on land. McGee optimistically states that offshore operations are very attractive at current costs and that these costs are comparable now with those in some areas of the United States where exploration and development are being aggressively pursued. Furthermore, McGee unequivocally contends that, "Drilling and operating costs [in the offshore] can and will be reduced materially as experience is accumulated by the industry."[77]

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[77]McGee, op. cit., p. 9.

CHAPTER V

RISKS AND INCENTIVES IN OFFSHORE OPERATIONS

Spokesmen for the petroleum industry have long publicized the "risks" inherent in the search for oil and gas. Trade associations have pointed out that the searchers in eight out of nine exploratory attempts find no oil.[1] Lay readers are led to believe that this is the success record for all oil wells drilled. Fortunately, it is not. While the petroleum trade associations make no attempt to publicize the over-all success record, the industry has averaged approximately two successful wells out of each three wells drilled.[2]

In 1953 the chairman of the National Petroleum Council Committee on Submerged Lands Productive Capacity foresaw the possibility of a net loss for the oil industry in the offshore development. He pointed out that great amounts of capital would have to be risked in exploration

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[1]American Petroleum Institute, Searching For Oil: The Gamble That Pays Off For You (New York: American Petroleum Institute, 1953), p. 5.

[2]American Petroleum Institute, Petroleum Facts and Figures (11th ed.; New York: American Petroleum Institute, 1954), p. 99.

and drilling, and these expenditures, with production, royalty and lease bonus costs added, might exceed the value of the oil and gas produced over the entire operation.[3]

Oilmen apparently use the word "risk" in different ways at different times, such uses being acceptable in turn to the statistician, the actuary, and the economist. Such an observation suggests a convenient classification of risks for the purpose of analysis in this study.

The first class, the exploration and development risks, might be called "probabilities" by the statistician. They are concerned with degree of success or failure in finding and producing offshore oil. The second group are the physical risks. These are the pure risks familiar to the actuary in which there is a chance of loss but no possible chance of gain. They include unforseen and fortuitous occurrences such as accidents, war damage and those commonly referred to as "Acts of God." The last class, the economic risks, refers to the potential profits or losses that may accrue to the offshore oil and gas producers under the established institutional framework. These economic risks are primarily concerned with the institution of the market. Granted that profits or losses will be influenced by the previously defined development and physical risks, the

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[3]Report of L. S. Wescoat in National Petroleum Council, Submerged Lands Productive Capacity (Washington: National Petroleum Council, 1953), pp. 6-7.

market risks could have the greatest effect on the profitability of the offshore development.

In light of the risks as defined, it is the purpose of this chapter to examine and analyze the nature and the severity of these different risks and to ascertain what factors, including incentives, tend to offset or minimize them. An attempt will be made to show that, for the large established producing oil companies with diversified operations, the likelihood of financial loss may be negligible.

The Nature of Risk

Risk has been defined as "uncertainty in regard to cost, loss, or damage"[4] and includes both "the occurrence of results entirely unforseen as well as those imperfectly allowed for. . ."[5] Knight found the term "risk," as used in everyday speech, to mean two categorically different things. The first type of "risk" is capable of quantitative measurement and is not in effect an uncertainty at all.[6] While a single situation might be regarded as uncertain, it may be converted into an effective certainty by adding

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[4]Charles O. Hardy, Risk and Risk Bearing (Chicago: University of Chicago Press, 1923), p. 1.

[5]Frank H. Knight, "Risk," Encyclopaedia of the Social Sciences (New York: The MacMillan Company, 1934), p. 392.

[6]Knight, Risk, Uncertainty, and Profit (Boston: Houghton Mifflin Company, 1921), pp. 19-20.

together a sufficient number of cases. The greater the number of cases that are added, following the statistical "law of large numbers," the less the uncertainty becomes.[7] If an accurate quantitative knowledge of the probability of every possible outcome is available, the losses from these combined ventures may be converted into fixed costs.[8] This is the principle of insurance.

The chance of success of a large number of offshore drilling ventures cannot be measured with the degree of accuracy experienced, say, in the repeated flipping of a coin or the insuring of ten thousand lives. In each of these cases, the frequency distribution of the two possible outcomes of heads or tails and life or death can be ascertained in advance within close limits. In the drilling of an oil well many shadings of success or failure are possible. The well may discover a highly productive oil field, paying out its costs many times, or it may be a completely dry hole. Most of the instances will fall between these two extremes.

Although the degree of success of an extended oil development program is not capable of exact quantitative measurement, the drilling experience of the past has shown that a direct and surprisingly stable correlation exists

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[7] Ibid., p. 46.

[8] Ibid., pp. 198-199.

between the number of wells drilled and the quantity of oil discovered. The correlation is close enough so that, assuming a sufficient number of cases, a diversified oil company should be able to ascertain within relatively close limits the amount of oil they could reasonably expect to discover from a given amount of drilling, onshore, or offshore. Such a company, in effect, self-insures against the dry holes that are sure to be a part of any extended drilling program.

The other form of "risk," or true uncertainty, does not lend itself to quantitative measurement. As it is not possible to predict the outcome of an individual case or even a group of cases with any degree of certainty, this type of risk is much more difficult to offset than the measurable risks.[9] Knight suggests several possible ways in which these business uncertainties may be reduced.[10] First, they may be reduced by grouping or consolidation. This method relies on the assumption that uncertainties should be less in groups of cases than in single instances. In offshore oil operations, this would consist of combining many drilling ventures into one operational program with a reasonable assurance that at least some of the ventures would be successful. Second, by geographical and operational diversification the consequences of unfavorable

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[9] Ibid., p. 20.

[10] Ibid., p. 239.

contingencies may be diffused. In the offshore development the normal dispersion of operations used in the search for oil should reduce considerably the chance of a random ill-wind of fortune smiting all of the installations. Third, some of the risks may be passed on to specialists in the form of hedging contracts. For example, offshore operators may be able to hedge part of the dry hole risk by giving shares in the wells to drilling contractors in payment for their services. Last, true uncertainty may be reduced by gaining a better knowledge of and securing some control over the future contingencies. New developments in the fields of meteorology, oceanography, geology, and engineering may serve to help make the uncertainties more certain and more subject to human control.[11]

Exploration and Development Risks

The first risks to be examined deal with the uncertainties of the productive process. Included in this category are the possibilities that the petroleum deposits do not exist offshore in commercial quantities, that the geologists and geophysicists will be unable to locate the

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[11]Hardy, largely agreeing with Knight, maintains that, although it may not be possible to eliminate the loss or damage itself, much can be done to eliminate the uncertainty concerning its time, place, or extent. The uncertainties can be reduced or eliminated by preventing the harmful effects, where possible, and accumulating reserves to meet the risks when it is impossible to prevent the loss or damage. Hardy, op. cit., p. 10.

deposits if they exist, and that the petroleum engineers will not be able physically to recover these deposits with a degree of success conducive to commercial development, should they be located. It can be immediately noted that no risk of loss exists in the offshore area until funds are expended on the development of the petroleum resources expected to exist therein. A frustrated hope or expectation is not by itself a loss.

The drilling of an individual oil well is a highly speculative operation.[12] However, the only assured way of finding new reserves is to bore holes in the earth. This worthwhile procedure, called "wildcatting," is the assumption of a speculative risk that must be shouldered by some persons or organizations within the economy if the new reserves are to be forthcoming.

Because drilling an individual oil well is a highly speculative venture, it does not follow that the production end of the petroleum industry constitutes a financially hazardous operation. The same relationship or, more correctly, lack of relationship can hold true for the individual from within the oil industry. Frank H. Knight said: ". . . Risks which would be dangerous to producers on a

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[12]Hardy, op. cit., p. 125. Technically, oil exploration cannot be called "gambling," as true gambling involves the creation of an unnecessary risk and, by its nature, represents an economic loss to the community.

small scale may lose their serious character for large scale enterprises. . . ."[13]

For a new firm with no established production, the drilling of an exploratory well or a series of such wells would be very risky indeed. This firm could drill a dry hole, or series of dry holes, and go bankrupt. On the other hand, for a large oil company with established production and widely diversified exploratory operations, the tax laws and the law of averages turn the speculative risk of "wild-catting" into a relatively safe investment. Larger companies do not stake their fortunes on the outcome of one well, but rely on the probability of obtaining a reasonable ratio of success in many scattered wells.

It is maintained that the major producing companies, using scientific geological and geophysical methods, modern drilling and production methods, the depletion allowance, and the ability to expense certain drilling and development costs, take little if any risk.

Geology and Geophysics

It has been established that oil, gas, and sulphur exist in considerable quantity in the submerged land areas seaward of the Gulf States. From the limited and widely

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[13]Frank H. Knight, "Risk," Encyclopaedia of the Social Sciences (New York: The Macmillan Company, 1934), p. 393.

scattered geophysical exploration that has been accomplished to date, empirical proof is forthcoming that the offshore areas have about the same number of potential oil, gas, and sulphur structures per square mile as the adjacent onshore areas have. Exploratory drilling has proved that about the same number produce oil and gas as the structures located under land areas.

While the sciences of geology and geophysics cannot definitely locate where those resources are sure to be found, they can greatly increase the chances of success in the search. By methods outlined in Chapter IV, the geologists and geophysicists locate underground structures that may contain petroleum and/or sulphur. Unfortunately these technicians cannot take a direct reading on the structure and report either the presence or absence of the resources. It remains the prerogative of the lowly drill bit to actually discover the deposit.

The fact that the earth scientists cannot detect the absence or presence of valuable resources trapped in the structures does not detract from their useful function of reducing risk. By the use of technical advice, the exploratory operator can substantially reduce the number of dry holes, or, stated another way, reduce the risk that any particular hole will be dry. Dr. Frederic Lahee, in a study of exploratory wells drilled in 1953, found that wells located on technical advice were 2.5 times as

successful as those located without such advice. Dr. Lahee's study shows that 11.9 per cent of the technically located exploratory wells were successful as compared to 4.7 per cent success for the exploratory wells located without the help of geology and geophysics.[14] Since the end of World War II, or from 1946 through 1953, the technically located wells have had 3.8 times the success of non-technically located wells.[15]

Because of the expense and complexity of offshore operations, the development can be undertaken only by companies of considerable absolute size. The larger companies have learned over the years to advance into virgin oil country behind a vanguard of geologists and geophysicists. The Continental Shelf is not a good province for the "doodlebugger," the operator who relies on intuition or on a witch-hazel fork. The companies developing the submerged lands have relied on the most advanced technical advice obtainable.

Drilling Technology

As was developed in Chapter IV, competent and experienced petroleum engineers state that a sizeable portion

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[14]Frederic H. Lahee, "Exploratory Drilling in 1953," Bulletin of the American Association of Petroleum Geologists, XXXVIII (June, 1954), p. 1231.

[15]Lahee, Bulletin of the American Association of Petroleum Geologists, June issues, 1947-1954.

of the offshore petroleum can be recovered with known and proven drilling methods. They do not anticipate that technical problems will hold up the development of the deeper water areas. Cost, rather than the physical inability to locate and produce the petroleum, will be the main factor. However, relative costs should tend to go down as the industry finds short-cuts and new methods in offshore drilling.[16]

In the drilling of any oil well, there are certain drilling hazards to plague the operator. Machinery failure, lost circulation, obstructions in the hole, and other familiar mishaps of drilling can require expensive shut-downs, fishing jobs, and even the loss of the hole. These drilling hazards are not unique to offshore operations and on both land and sea they can often be insured against by the process of contracting out the drilling. In the Continental Shelf area, several competent drilling contractors are ready, willing, and able to deliver "turnkey" jobs for a fixed price per foot of drilling.[17]

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[16]Testimony of Mercer Parks in Hearings on S. 1901, p. 97.

[17]The largest and most experienced of the offshore drilling contractors seem to be Kerr-McGee Oil Industries, Inc., of Oklahoma City, Loffland Brothers Co., of Tulsa, and Noble Drilling Corp., of Tulsa. The contractors prefer day work where the risk of delay or mishap is carried by the operator. Personal interview with Mr. Otis Danielson, Chief Drilling Engineer, Kerr-McGee Oil Industries, Inc., July 5, 1954.

The Probability of Success in Drilling

The probability of success in the drilling of oil wells cannot be based upon a priori probability, but must be analyzed from the standpoint of empirical probability. A priori probability deals with the occurrence pattern of chance phenomena. Since offshore drillings cannot be classified as chance happenings, as defined by statisticians, oilmen must rely empirically on past experience to get the range of future probability. With empirical probability as a starting point, the oilmen can then use a priori reasoning to predict the future tolerance limits of expectation.

The petroleum industry has accumulated over the years a large body of knowledge on the relationship of successful wells to dry holes. That this relationship has been a relatively stable figure indicates that technological improvements in finding new oil are almost offsetting the increasing difficulty of finding suitable exploration areas because of the increasing maturity of the American petroleum industry.[18]

One of the leading oil consultants in the United States, Max W. Ball, has pointed out that the more oil the

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[18]David D. Moore, "Role of Technology in the Future of Petroleum," (Unpublished report to the President's Material Policy Commission, September 15, 1951), p. 3. This report is now located in the files of the National Security Resources Board, Washington, D. C.

oil industry finds, the less there remains to be found; but that the more that the industry finds, the more it learns to find more.[19]

Experience has taught that certain things happen with a degree of certainty that can be depended on. In the absence of factors that would change the chances of occurrence, a reasonable assumption can be made that, given a large number of cases of physically similar phenomena, the future occurrence will not be much different from the past. This assumption has been made and used with a considerable degree of success in the search for oil by the petroleum industry. In 1952 the National Petroleum Council, using American Petroleum Institute statistics, stated:

> The best evidence of the continued discovery of oil is the experience that discovery is in proportion to the exploratory effort and in the current high level of exploration. In the states in which extensive drilling was carried on during 1950, the number of oil and gas discoveries was directly proportional to the number of exploratory wells.[20]

That this relationship is not an isolated case is suggested by another statement of the National Petroleum Council: ". . . The rate of development of /petroleum/ reserves has been in proportion to drilling during the past

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[19]Hearings on S. Res. 239, p. 69.

[20]National Petroleum Council, Petroleum Productive Capacity (Washington: National Petroleum Council, 1952), p. 58.

quarter century of scientific exploration, without any downward trend."[21]

In the ninety five years that have intervened between the completion of the first oil well in Titusville, Pennsylvania, and the end of 1953, 1,481,844 wells have been drilled in the United States. Of this number, 979,637 were oil wells, 103,768 were gas wells, 368,177 were dry holes, and 30,263 were service wells drilled for the purpose of injecting water or gas into underground formations.[22] Of all wells drilled in the United States since 1859, omitting service wells, 73.1 per cent have been successful, i.e., completed as producing wells.[23]

During the eight years from 1946 through 1953, a total of 310,545 oil and gas wells were drilled in the United States, excluding service wells. Of this number 200,206, or 64.5 per cent, were successful. During the most successful year, 1946, 70.2 per cent of the wells were producers. In the least successful year, 1952, 60.1 per cent of the wells were completed as producing wells. This

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[21] Ibid., p. 52.

[22] American Petroleum Institute, Facts About Oil (New York: American Petroleum Institute, 1954), pp. 4-5.

[23] The degree of success, of course, is another matter. Undoubtedly, many of these "successful" wells never paid out the investment made in them. Suffice to say that the well owners considered the prospects of potential production good enough to complete the wells for production.

decline can be accounted for partially by noting that the number of exploratory wells[24] as compared to developmental wells[25] increased during the period (Table 9). In 1946, 21.5 per cent of the total wells drilled were exploratory wells; in 1953, 27.7 per cent. As the exploratory wells generally experience a lesser degree of success than the developmental wells, the increase in exploratory drilling over the eight year period is reflected in the decreased success of the total wells drilled.

The relative success of the exploratory wells drilled in the eight year period remained about constant. The average of success for the period was 19.4 per cent, with a range from 18.3 per cent in 1948 to 20.3 per cent in 1947. The success of the developmental wells drilled from 1946 through 1953 averaged 79.5 per cent. A slight decline trend can be detected in the success of these wells over the period. However, in spite of this decline, over three-fourths of the developmental wells drilled in any year found petroleum (Table 9).

The statistics given thus far have been for the

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[24]Exploratory wells include new field wildcats on structures never before productive, deeper and shallower pool tests on structures already productive, and outpost tests drilled to extend partially developed pools.

[25]Field or developmental wells are wells drilled to productive zones already roughly established by exploratory drilling.

TABLE 9

RELATIVE SUCCESS OF EXPLORATORY, DEVE
DRILLED IN THE UNITED STATES,

Year	Exploratory Wells			Develop	
	Number Drilled (Thousands)	Number Successful	Per cent Successful	Number Drilled (Thousand	Nu Suc
1946	5.8	1.1	19.8	21.2	
1947	6.8	1.4	20.3	24.1	
1948	8.0	1.5	18.3	29.3	
1949	9.1	1.8	20.2	28.6	
1950	10.3	2.0	19.5	31.7	
1951	11.8	2.2	18.9	31.4	
1952	12.4	2.3	18.8	32.0	
1953	13.3	2.7	20.1	34.7	
Total	77.5	15.0	19.4	233.0	18

Source: Compiled from data in Frederic H. Lahee, Bulleti
June issues, 1947-1954, and American Petroleum I
11th editions; New York: American Petroleum Inst

ABLE 9

RY, DEVELOPMENTAL AND TOTAL WELLS
STATES, ANNUALLY, 1946-1953

Developmental Wells			Total Wells		
ed (Thousands)	Number Successful	Per cent Successful	Number Drilled (Thousands)	Number Successful	Per cent Successful
	17.8	83.9	27.0	18.9	70.2
	19.9	82.5	30.9	21.3	68.8
	23.8	81.1	37.3	25.2	67.6
	23.0	80.4	37.6	24.8	65.9
	25.2	79.5	42.0	27.3	64.8
	24.2	77.2	43.2	26.5	61.3
	24.4	76.2	44.4	26.7	60.1
	26.9	77.3	48.1	29.5	61.6
	185.2	79.5	310.5	200.2	64.5

Bulletin of the American Association of Petroleum Geologists,
oleum Institute, Petroleum Facts and Figures (9th, 10th and
eum Institute, n.d.).

entire United States. They may or may not be representative of the degree of success that can be expected in the Gulf of Mexico submerged lands. Fortunately, some statistical data are available on the relative success of exploratory wells, developmental wells, and total wells in the area adjacent to the submerged lands in the Gulf of Mexico. The oil provinces known as the Texas Upper Gulf Coast and the Louisiana Gulf Coast are admirably suited as examples of what could be expected in the offshore area. As a matter of fact, statistics on the Louisiana Gulf Coast include the offshore lands contiguous to Louisiana.

Table 10 combines the statistics on the Texas Upper Gulf Coast and Louisiana Gulf Coast provinces gathered from year to year by the Committee on Statistics of Exploratory Drilling of the American Association of Petroleum Geologists. The percentage of success on exploratory wells and total wells along the Gulf Coast of Texas and Louisiana is roughly comparable to the national average. For the eight years from 1946 through 1953, the Gulf Coast exploratory wells have been 26.7 per cent successful and all wells have been 63.9 per cent successful.

Offshore drilling has not proceeded far enough to draw any conclusions as to the ratio of producing wells to dry holes. World War II and the Federal-State ownership controversy held drilling activity in the offshore area to a virtual standstill for several years. From the limited

TABLE 10

RELATIVE SUCCESS OF EXPLORATORY, DEVELOPMENTAL AN
IN UPPER GULF COAST OF TEXAS[1] AND LOUISIAN
ANNUALLY, 1946-1953

Year	Exploratory Wells			Developmental We	
	Number Drilled	Number Successful	Per cent Successful	Number Drilled	Number Successful
1946	217	30	13.8	1,148	846
1947	353	80	22.7	1,167	919
1948	341	50	14.7	1,576	1,181
1949	620	180	29.0	1,642	1,283
1950	654	189	28.9	2,093	1,692
1951	755	221	29.3	1,804	1,432
1952	862	231	26.8	2,052	1,535
1953	1,047	315	30.1	2,314	1,744
Total	4,849	1,296	26.7	13,796	10,632

Source: Compiled from data in Bulletin of the American Associati
1947-1954.

[1]The Texas Upper Gulf Coast area consists of twenty-nine counties
Gulf of Mexico.

[2]The Louisiana Gulf Coast area consists of the southmost thirty-e
contiguous waters of the Gulf of Mexico.

TABLE 10

RATORY, DEVELOPMENTAL AND TOTAL WELLS DRILLED
T OF TEXAS[1] AND LOUISIANA GULF COAST,[2]
ANNUALLY, 1946-1953

Developmental Wells			Total Wells		
Number Drilled	Number Successful	Per cent Successful	Number Drilled	Number Successful	Per cent Successful
1,148	846	73.7	1,365	876	64.2
1,167	919	78.7	1,520	999	65.7
1,576	1,181	74.9	1,917	1,231	64.2
1,642	1,283	78.1	2,262	1,463	64.7
2,093	1,692	84.1	2,747	1,881	68.5
1,804	1,432	79.4	2,559	1,653	64.6
2,052	1,535	74.8	2,914	1,766	60.6
2,314	1,744	75.4	3,361	2,059	61.3
13,796	10,632	77.1	18,645	11,928	63.9

f the American Association of Petroleum Geologists, June issues,

of twenty-nine counties which partially adjoin Louisiana and the

f the southmost thirty-eight parishes of Louisiana and the

storms exceed these limits, for example, the October 1949 hurricane,[30] but to build structures able to withstand the greatest possible storms would be uneconomical. The realistic solution worked out by operators has been to build the operational platform sufficiently high to clear all but freak waves and to let insurance take care of damage caused by extraordinary occurrences.[31]

Blow-out and Fire

The risks of blow-out, the forcing of the drill pipe, casing, or drilling mud out of the hole by high gas pressure, followed by rapid expulsion of oil and gas from the hole and by possible consequent fire, are not unique to offshore operations. Fortunately blow-outs can rather safely be controlled with a combination of heavy drilling muds and blow-out preventers.[32] Further, storm choke valves can be located below the ocean floor to shut in the well in case the platform is knocked down. A differential pressure drop

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[30]R. C. Farley and J. S. Leonard, "Gulf Hurricane," Oil and Gas Journal, February 23, 1950, p. 141. A drilling platform twenty-seven feet above the mean water level received damage amounting to $205,600.

[31]Personal interview with Otis Danielson, chief drilling engineer of Kerr-McGee Oil Industries, Inc., June 29, 1954.

[32]Lester C. Uren, Petroleum Production Engineering (New York: McGraw-Hill, 1946), p. 602. Blow-out preventers are pressure rams that can be closed on the drill pipe or casing.

will actuate the valve.[33]

To combat fire risk, all equipment considered as sources of ignition are placed on platforms separate from the drilling and production platform.[34] However, operators usually rely on the added protection of insurance to cope with these particular risks.

Collision

Although permission to erect platforms will be granted only when such structures in no serious way interfere with navigation, and even then, strict rules govern the placing of lights and fog horns,[35] the risks of collision during a storm cannot be avoided. With a crippled steamer in the grip of unpredictable winds and sea, the master can only pray for "lots of water under the keel, miles to the nearest shoal, no ships about, and . . . no unwatched immobile drilling structures."[36] In case electronic

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[33]Statement by Otis Danielson to author, June 29, 1954.

[34]John N. Donhaiser, "What's Being Done About Offshore Safety," World Oil, June, 1954, p. 218.

[35]The State of Texas has rules on this matter. Rule N, Rules and Regulations Governing Drilling and Producing Operations in Coastal Waters, General Land Office, State of Texas, November 17, 1951, states: "In order to provide ample safeguards against collisions, proper signal lights or buoys shall be installed at, or in immediate vicinity of well and structures erected in the water. Signal lights shall be kept burning except during daylight hours." The U.S. Coast Guard has similar rules.

[36]J. J. Tucker, "Those who Go Down to the Sea in Drilling Rigs," World Oil, November, 1948, p. 116.

navigational aids fail to avert a collision, the damage caused by collision can be covered by insurance. Usually liability would fall on the shipowner rather than on the platform owner, for responsibility for avoiding collision goes to the party having mobility and control.

Enemy Action

Offshore platforms, storage tanks, and underwater pipelines would be extremely vulnerable to enemy action in time of war. Bomb, torpedo, shell, and depth charge attack could do great damage to persons and property.[37] Unfortunately the hazards of an exposed physical position can not be remedied, although naval and air protection might minimize the risk. Financial protection from war damage would probably become an obligation of the Federal government.[38] Precedent for such action was established in both World Wars by the creation of the Bureau of War Risk in 1914 and by the War Shipping Administration and the War Damage Corporation during World War II.[39]

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[37]Such damage would go much further than the installation itself as overflowing oil would damage fisheries, beaches, and harbors. See Mouton, op. cit., p. 307.

[38]Standard marine insurance contracts include war risk in the perils clause, but when war threatens or is declared the marine companies hasten to cancel this section. War risk coverage by private concerns is usually at prohibitive premiums.

[39]Some authorities on insurance recommend that the government provide automatic indemnification for war damage, with costs shared on a nation-wide basis. John H. Magee,

The Insuring of Offshore Operations

Insurance is a stop-gap by which the offshore operator can purchase the difference between successful operation and possible failure due to physical hazards and can convert the possibility of property and liability losses into fixed costs.[40] Although the insurance industry hesitated at first to write policies for offshore petroleum operators, commitments through liability, compensation, and floater policies drew them into fairly complete coverage. However, there is no standard form for offshore insurance contracts, each being essentially the result of operator-underwriter negotiations.[41]

The combined marine policies are commonly written with deductible clauses. The usual deduction in use on policies of this type is $10,000, or 2 1/2 per cent of the value at risk, whichever is greater.[42] The annual premium

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General Insurance (Homewood, Illinois: Richard D. Irwin, Inc., 1953), p. 166.

[40] J. E. Pike, "Off-Shore Drilling Coverage Reviewed by the Underwriter," Journal of Commerce, June 5, 1950, p. 56.

[41] Richard McKiddy, Director, Insurance Department, Kerr-McGee Oil Industries, Inc., in personal interview with author, June 29, 1954, outlined how Kerr-McGee and Southern Marine and Aviation Underwriters, Inc., of New Orleans, hammered out one marine policy to cover vessels, cargoes, platforms, drilling rigs, well completion equipment, and submersible barges.

[42] Nary Schiflett, "Tidelands Oil-Big Values, Unknown Risk-A Challenge in Specialty Insurance," The National Underwriter, March 4, 1954, p. 31.

is around 5 per cent of the amount at risk for drilling platforms and barges and 3 1/2 per cent for production platforms.[43]

Since physical risks may assume disaster proportions and since the Federal Government has acted under the concept of the public welfare in aiding individuals, companies, and local governmental units in other areas of the economy by insurance, loans, grants, and subsidies to alleviate disaster distress, it may be that offshore petroleum operators will also receive Federal relief if disaster occurs.

A review of the special physical hazards of offshore operations reveals that most of the risks can be either reduced by technological advances in petroleum, structural, and safety engineering or passed on to others by means of insurance, public and private. Further technological advances and more experienced underwriting of the risks may bring future reductions.

Market Risks

In a dynamic industrial society, the greatest risks are not those concerned with the technological processes of physical production, but are those that have to do with the

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[43] L. K. Griffin, president of the Southern Marine and Aviation Underwriters, Inc., in personal letter dated July 15, 1954, stated that rates are expected to decline as operators gain more experience in marine operations and insurance carriers acquire familiarity with coverages involved.

institution of the market. Long chaotic, the market situation of petroleum has been stabilized in recent years to a degree found in few other industries.

The Demand for Petroleum Products

Most responsible authorities agree that demands for energy are on the increase. World Oil recently made a prediction of 1975 crude oil demand. If domestic consumption increases by 300,000 barrels daily per year, its present increase rate, the United States will need 15 million barrels daily in 1975.[44] The President's Material Policy Commission report in 1952 estimated domestic demand in 1975 at 13.7 million barrels daily.[45]

The sources for such demand may be found in a complex of factors. Population experts suggest that by 1975 the population of the United States may reach 206 million persons,[46] a 28 per cent increase over 1953. The increasing mechanization of agriculture and the increasing use of roads and highways by a growing population indicate a greater quantity of petroleum to fuel the larger number of tractors,

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[44]Warren L. Baker, "Higher Oil and Gas Producing Rates Lie Ahead of the U.S., World Oil, July, 1954, p. 58. This increase would amount to three per cent per year.

[45]President's Materials Policy Commission, Resources for Freedom, "The Outlook for Key Commodities," Vol. II (Washington: Government Printing Office, 1952), p. 129. The 1953 domestic demand was 8.0 million barrels daily.

[46]U.S. Bureau of the Census, Current Population Reports: Population Estimates No. 78, August 21, 1953, p. 2.

automobiles, trucks, and busses. The emphasis on the airplane and on diesel fuels for railroads, the growth of the petrochemical industry,[47] the probable doubling of consumption of natural gas as a consequence of new pipeline connections with hitherto untapped population centers[48]--these among many support the estimates.

The Supply of Petroleum

If these estimates are correct, the question arises: where will the oil come from? In 1948 Secretary of Defense James Forrestal stated "It now appears that the United States military and civilian needs for a major war effort would exceed by at least 2,000,000 barrels a day the foreseeable production from the continental United States."[49] Another authority recently stated that even if imports are three times as high in 1975 as in 1953, or up to 3 million barrels a day, the United States will still need to produce domestically at least 10.9 million barrels of crude oil and one million barrels of natural gasoline per day in 1975 to

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[47]American Petroleum Institute, Facts About Oil, p. 24, predicts that over 50 per cent of the nation's chemicals will be produced from petroleum within the next decade.

[48]World Oil, July, 1954, p. 59.

[49]U.S. Congress, Senate and House, Committees on the Judiciary, Joint Hearings on S. 1988 and Similar House Bills, 80th Cong., 2d Sess. (Washington: Government Printing Office, 1948), p. 605.

meet the anticipated demand.[50] One consultant to the Atomic Energy Commission has predicted that the peak for the domestic production of oil will be reached by 1960.[51] The offshore oil fields are expected to supply a large part of the increased demand.[52]

The Competition of Foreign Oil

At present, certain elements of the petroleum industry seem alarmed at the flow of foreign oil into the domestic market. They maintain that the foreign oil is supplanting rather than supplementing the domestic supply.

The basic problem is brought on by the difference in production costs between the United States oil fields and the newer foreign oil regions. In Venezuela and the Middle East some institutional and geological factors have combined to permit low production costs. In both areas the single ownership of the minerals by the sovereign governments has permitted well spacing to be dictated by engineering considerations alone. The relatively large size of several of

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[50]Warren L. Baker, op. cit., p. 59. The 1953 domestic oil production was 6.5 million barrels daily.

[51]Palmer C. Putnam, Energy in the Future (New York: D. van Nostrand, 1953), p. 169. A decline in domestic production after 1960 will be caused, not by any lowering of demand, but by the exhaustion of economically recoverable reserves.

[52]National Petroleum Council, Submerged Lands, p. 5.

the principal foreign fields,[53] the thickness of the oil producing zones,[54] and the unique fissured nature of some of the reservoir formations[55] have permitted a high volume of production from a small number of wells.

The average well in Kuwait and Arabia is reported to produce better than 6,000 barrels per day, while the Venezuelan wells average around 200 barrels per day.[56] This far surpasses the daily production of 13 barrels for the average well in the United States.[57]

While the costs of production in these foreign fields are closely guarded business secrets, it is known that Persian Gulf oil enjoys a price advantage of approximately one dollar per barrel over East Texas oil delivered

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[53]The recently developed Ghawar field of Saudi Arabia is 72 miles long and 15 miles wide and has a pay sand 100 feet thick. This field is believed to extend another 58 miles in length. World Oil, May, 1954, p. 90.

[54]The Burgan field of Kuwait, second only to Ghawar in potential production, has a producing zone 1000 feet thick. Ibid., p. 91.

[55]The Massid-el-Suleman field of Iran has been efficiently produced with an average well spacing of two miles, or one well for each 2560 acres. U.S. Congress, Senate and House, Selected Committees on Small Business, The Third World Petroleum Congress, Joint Committee Print, 82d Cong., 2d Sess. (Washington: Government Printing Office, 1952), p. 19.

[56]Hines H. Baker, Oil Alert! (Houston: Humble Oil and Refining Company, 1954), p. 8.

[57]American Petroleum Institute, Petroleum Facts and Figures, 11th ed., p. 100.

in the Port of New York.[58] One authority has estimated the actual cost of producing Middle East crude oil to be less than one-half of the average United States crude oil costs, with the Venezuelan crude costs being not much higher than those in the Persian Gulf.[59]

It is obvious that the South American and Middle East oil could undersell domestic oil if the owners of the foreign oil chose to compete on a price basis. Thus far, they have not so chosen.

Should the importing companies fail to restrict voluntarily the flow of imports, it is possible the United States Government would intervene. Military, political, and economic considerations could require that the "law of comparative advantage" be ignored. Under present laws, petroleum and petroleum products are free of duty, but are subject to an import tax up to 10.5 cents per barrel.[60] There are no import quotas in effect at this time.[61] However,

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[58]U.S. Congress, Senate, Committee on Interior and Insular Affairs, 83d Cong., 2d Sess., Report of the Minerals, Materials, and Fuel Economic Subcommittee on the Assessibility of Strategic and Critical Materials to the United States in Time of War or for Our Expanding Economy (Washington: Government Printing Office, 1954), p. 241.

[59]P. H. Frankel, Essentials of Petroleum: A Key to Oil Economics (London: Chapman and Hall, Ltd., 1946), pp. 114-115.

[60]Internal Revenue Code, Section 3422.

[61]Personal letter from Donn N. Bent, Secretary, United States Tariff Commission, July 29, 1954.

should the imports threaten to injure the domestic industry, the President of the United States is empowered to restrict imports under the "escape clause" written into all trade agreements concluded since 1942.[62] Should the President fail to act, the Congress could step in and raise tariff barriers or establish import quotas.[63]

On the other hand, for diplomatic purposes, the United States may be forced to open its domestic market to Middle East oil. Should this course of action become imperative to keep the Middle East out of the Soviet clutches, the high cost domestic producers, onshore and offshore, could find themselves priced out of the market.

The Competition of Other Energy Sources

Until recent years the natural petroleum industry has had only one important rival for the energy markets, the coal industry. This battle for markets has been notably one-sided, with oil and gas holding coal to no gain since 1913, while petroleum use increased elevenfold.[64] Unless new technological developments in the field of coal

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[62]Trade Agreements Act of June 12, 1934, as amended in 1951.

[63]Congress can regain direct control over tariff matters by allowing the Trade Agreements Act of 1934, which empowered the President to handle such matters, to expire when it comes up for renewal yearly.

[64]American Petroleum Institute, Petroleum Facts and Figures, 9th Edition, p. 117, and 11th Edition, p. 81.

mining[65] or utilization substantially reduce the relative cost of coal or unless the relative costs of petroleum increase materially, the petroleum industry does not have much to fear from competition with bulk coal and manufactured gas.

In recent years, new threats to the supremacy of natural petroleum as an energy source have come from atomic energy, solar energy, and synthetic liquid fuels. It is conceivable that rapid technological developments in these new sources of energy could enable them to supplant petroleum in most of its uses long before the reserves of petroleum are exhausted.

The Atomic Energy Commission expects nuclear power to be supplying electricity in the industrial field by 1960.[66] However, due to the extremely high present cost of the fixed plant needed to utilize nuclear fuels, some authorities believe that power from atomic fission will not be cheap power.[67] At least for the immediate future, it appears that fixed nuclear power plants will be utilized

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[65]Experiments in coal gasification, in which coal is fired underground and the gases brought to the surface, may eliminate the need to mine coal. The Bureau of Mines in conjunction with the Alabama Power Company is working on a gasification project at Gorgas, Alabama. U.S. Department of the Interior, Bureau of Mines, Report of Investigations 4942 (Washington: Government Printing Office, 1953), p. 73.

[66]World Oil, June, 1954, p. 57.

[67]Gordon Dean, Report on the Atom (New York: Alfred A. Knopf, 1953), p. 153.

principally in areas where other fuels are unavailable or very costly.[68] However, rapid and radical technological developments may change the cost picture for nuclear energy at any time.

Because of the lack of continuity and reliability of the sunshine and the low recovery from known methods of gathering the heat energy, the present use of solar energy is limited to the occasional space heating of buildings.[69] Solar energy does not loom as a serious competitor of natural petroleum at this time.

Until recently gasoline and lubricating oil from crude petroleum have been in sole demand for road transportation use because there were no equivalent products to energize and lubricate the internal combustion engine. This situation no longer exists.[70] Rapid progress in the development of synthetic liquid fuels and lubricants has provided substitutes that are mechanically on par with the natural

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[68]Putnam, op. cit., p. 214.

[69]Eugene Ayres and Charles A. Scarlott, Energy Sources-The Wealth of the World (New York: McGraw-Hill, 1952, pp. 198-199. The maximum power recovery from an acre of optical solar collectors in Arizona on an average annual basis would be fifty horsepower. To supply the present power needs of the United States would require the erection of optical collectors over an area of 50,000 square miles in Arizona.

[70]Synthetic liquid fuels made from coal supplied almost half of the aircraft and motor fuels used in Germany in 1944.

petroleum products.[71] From information gained in the operation of certain demonstration plants, the Bureau of Mines has established that certain types of motor fuels may be produced from oil shale at costs nearly competitive with the similar products from natural petroleum and from coal at somewhat higher costs.[72]

Although this threat of potential competition from synthetic liquid fuels will face the petroleum industry from now on, the opinion is widely held that the synthetic fuels, if not subsidized by government, will remain as high cost supplementary energy supplies, to be utilized only when the crude natural petroleum supply will not fill the demands of the nation.[73]

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[71]U.S. Congress, House, Committee on Interstate & Foreign Commerce, Hearings on Fuel Investigation, 80th Cong., 2d Sess. (Washington: Government Printing Office, 1948), p. 912. The synthetic liquid fuel processes presently involved are the hydrogenation of coal, known as the Bergius process, which is best suited for the production of high octane aviation and motor gasoline; the gas-synthesis of coal, known as the Fischer-Tropsch process, best suited for lower grade gasoline and distillate fuels; and the retorting of oil shale, a process that turns out heavy oil, usable almost as recovered for fuel oil and, after processing, as distillate fuel and diesel oil, but not well suited for conversion into higher-octane fuels.

[72]U.S. Department of the Interior, Bureau of Mines, Report of Investigations 4942, pp. 31-39.

[73]President's Materials Policy Commission, Resources for Freedom, "The Outlook for Energy Sources," Vol. III (Washington: Government Printing Office, 1952), p. 8. The National Petroleum Council found that "all methods of manufacturing synthetic liquid fuels proposed by the Bureau of Mines are definitely uneconomical under present conditions,"

Incentives to the Offshore Oil Development

The petroleum industry has been aided greatly by the actions of government, both Federal and State. The benefits of tax incentives offered by the Federal Government and the price stability incident to the regulation of production by the governments of the oil producing States are enjoyed by all oil producers, onshore and offshore. In the matter of production allowables, however, offshore operators have an advantage over their counterparts on land. The prorationing authorities have seen fit in certain instances to permit greater production quotas for the offshore wells.

The combination of these favorable features in the tax and regulatory laws relating to oil production has done much to reduce the financial risk of such operations.

Tax Incentives

The Federal income tax structure includes two provisions that greatly reduce the financial hazards in petroleum production. These are the percentage depletion allowance[74] and the ability to "expense," or deduct from current income, the "intangible drilling and development costs."[75]

National Petroleum Council, Final Report of the Committee on Synthetic Liquid Fuels Production Costs (Washington: National Petroleum Council, 1953), p. 10.

[74]Internal Revenue Code, Reg. 111, Sec. 29.23 (m)-2, and Sec. 29.23 (m)-4.

[75]Internal Revenue Code, Reg. 111, Sec. 29.23 (m) -16(b).

The depletion allowance is an income tax deduction given to wasting asset industries in an attempt to make up for the gradual exhaustion of the resource. The cost or "discovery value" of a property which decreases in direct relation to the rate of extraction of the asset is returned through depletion either at a statutory percentage of the gross income from the property or at a rate based on the ratio of the value of the asset used up to the total asset value.[76] The statutory percentage depletion allowance for petroleum has been established by Congress at 27 1/2 per cent. Each year the property owner may deduct from taxable income this percentage of the gross income from the property, with the limitation that the allowance cannot exceed 50 per cent of the net income from the property.[77]

The percentage depletion allowance has no necessary relationship to the cost of developing the property. As the owner can deduct from the Federal income tax base every year 27 1/2 per cent of the gross income from the petroleum produced, it is possible under certain circumstances to take in total depletion allowances, over the years, several times the cost of the property. Congress designed the

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[76]Arthur Anderson and Company, Oil and Gas Federal Income Tax Manual, Sixth Edition, January 1, 1950, p. 47.

[77]Internal Revenue Code, Reg. 111, Sec. 2923 (m)-4. Periodic attacks on percentage depletion in Congress have been unsuccessful in eliminating or reducing the allowance.

percentage depletion allowance as an incentive to the wildcatter. The allowance was granted to help make up for the dry holes that are a part of any oil operator's lot in life.

An intangible drilling and development cost, generally speaking, is an expenditure that has in itself no salvage value. This would include the cost of drilling the hole, mud, wages, fuel, and hauling. The operator has the option of capitalizing these items or charging them to expense during the year they are incurred.[78] As capitalized intangible drilling and development costs are recoverable only through depletion and may not be depreciated, it is generally considered poor business practice to capitalize these items.[79] All of the unrecovered costs of a dry hole may be expensed if the operator retains no interest in the property.

With the aid of these two special income tax provisions, the operator with established production and undrilled leases need not pay any income taxes. The operator, individual or corporate, can "live" on the 27 1/2 per cent depletion allowance on the gross income from the property and expend the rest of the gross income remaining after operating expenses on new holes. The latter procedure is known in the trade as "tax drilling." If the operator is

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[78]Arthur Anderson and Company, op. cit., p. 29.

[79]Ibid., p. 50.

reasonably successful in finding new production, he will have new depletable assets and the process can go on indefinitely.[80]

Conservation and Price Stability

At the request of a substantial portion of the petroleum industry and with the blessings of the national government, the Interstate Oil Compact was formed in 1935. The Compact now includes most of the important oil producing states.

Spokesmen for the Compact and the industry contend that it was designed to prevent physical waste and can point to many achievements such as the reduction of gas flaring, the limitation of production to the maximum efficient withdrawal rate, the elimination of much unnecessary offset drilling by the wider spacing of wells, and the prevention of premature abandonment of stripper wells.[81] They uniformly insist that no price fixing is intended in the conservation measures, although frequently, as they point out, price stability is an incidental and fortuitous by-product

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[80]The depletion allowance and the right to expense intangibles was called "the sweetest combination in U.S. business" in "The Depletion Uproar," Fortune, April, 1950, p. 76.

[81]Hines H. Baker, Achievements and Unsolved Problems in Oil and Gas Conservation, reprint of address delivered at meeting of Interstate Oil Company Commission, March 10, 1949 at Galveston, Texas, pp. 9-14.

of proration of supply.[82] In a reversal of the dictum of Adam Smith, by conscientiously endeavoring to promote the public welfare, the petroleum industry has furthered its own "selfish interests."[83]

For the purpose of this study, it is not necessary to review this long controversy. A number of students of the subject have pointed out that, as the permissible supply is based on estimated demand at the prevailing price, the workings of the Interstate Oil Compact can be understood only in terms of a method of avoiding price fluctuations, especially downward. Instead of permitting prices to fall, the Compact member states have cut production.[84] The proration of oil supply to the estimated market demand, whatever the motive, has the effect of stabilizing the price. If the price is stabilized, the most severe risk in business is eliminated. In the words of Frank Knight: ". . . . In a highly changeable or 'dynamic' society, the most unpredictable element in the situation, or the greatest risk, has to do with price changes rather than with the physical

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[82]H. B. Fell, "Excess Oil Production Causes Waste," Oil For Today . . . And For Tomorrow (Oklahoma City: Interstate Oil Compact Commission, 1953), p. 67.

[83]George W. Stocking, "Stabilization of the Oil Industry; Its Economic and Legal Effect," American Economic Review, Supp., March, 1933, p. 55.

[84]Myron W. Watkins, Oil: Stabilization or Conservation (New York: Harper and Brothers, 1937), p. 247.

volume of production."[85]

Under existing regulations, all of the petroleum producers in the Gulf of Mexico seaward of the shores of Texas and Louisiana receive the blessings of price stabilization. The leases granted by Texas and Louisiana are prorated to market demand by the Railroad Commission of Texas and the Louisiana Department of Conservation, respectively. The leases in the Outer Continental Shelf granted by the Federal Government are prorated to market demand as directed by the Secretary of the Interior.[86] Federal regulations specifically define the "waste of oil and gas" as, among other things, "the production of oil or gas in excess of transportation or marketing facilities or in excess of reasonable market demand."[87]

Special Production Allowables

The offshore wells in the area under the jurisdiction of the Louisiana Department of Conservation, because

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[85]Frank H. Knight, "Risk," Encyclopaedia of the Social Sciences, p. 392.

[86]To prevent duplication of proration authorities, the Department of the Interior has authorized the States of Texas and Louisiana to establish the allowable production for all wells drilled on Federal leases seaward of those States. Letter from Sidney M. Groom, Jr., Manager, Outer Continental Shelf Office, Bureau of Land Management, New Orleans, Louisiana, dated May 6, 1955.

[87]U.S. Department of the Interior, Leasing and Operating Regulations for the Submerged Lands of the Continental Shelf, May 8, 1954, 30 C.F.R. 250.2 (h)(4).

of the increased cost incident to offshore drilling operations, have received special consideration on allowable production. The Department of Conservation gave all wells not otherwise prorated by special order the following allowables:

Depth	Daily Well Allowable(BPD) Offshore	Daily Well Allowable(BPD) Onshore
0-2,000	151	46
2-3,000	162	54
3-4,000	174	65
4-5,000	185	76
5-6,000	202	91
6-7,000	219	106
7-8,000	242	122
8-9,000	265	136
9-10,000	288	156
10-11,000	311	177
11-12,000	333	198
12-13,000	356	218
Below 13,000	385	246

The Department of Conservation found that, due to the nature of the offshore development, where fewer wells are needed to produce from a reservoir of given size and characteristics than would be the case in comparable land operations, a larger allowable per well could be assigned to each offshore well without causing underground waste or inequity.[88]

The President of Standard Oil Company of California

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[88]Department of Conservation, State of Louisiana, Order No. 151: Order Concerning the Per Well Allowable for Wells Completed in Offshore Reservoirs, September 24, 1948, as amended by Production and Proration Order No. 7, Effective July 1, 1954, Dated June 23, 1954.

had this to say about the production allowables:

> . . . In order that the return from the sale of . . . oil might be counted on to pay out the large investment required to bring them /new fields/ into production . . . it is necessary . . . that State and Federal regulatory bodies continue to recognize this economic reality, as the State of Louisiana has done, and set allowables for the offshore fields which are high enough.[89]

The State of Texas, at the present time, does not have a fixed special allowable for offshore wells. The Railroad Commission of Texas has a scale of allowables for discovery wells, both onshore and offshore.[90] After the completion of the sixth well in a field or the expiration of eighteen months, whichever comes sooner, the wells are assigned a yardstick allowable based on twenty acre increments until such time as a hearing can be held to establish the most efficient rate of production for the wells in the field.[91] At this hearing, the Railroad Commission is able to make special dispensation for offshore wells in order to help make up for the additional cost of offshore operations, if such action seems appropriate.

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[89]T. S. Peterson, "New Horizons," a paper presented before the joint session of the American Association of Petroleum Geologists, the Society of Exploratory Geophysicists, and the Society of Economic Paleontologists and Minerologists, St. Louis, Missouri, April 13, 1954. Reprinted as a pamphlet.

[90]Railroad Commission of Texas, Special Order No. 20-17,849, dated March 20, 1950.

[91]Personal letter from Harry M. Batis, Chief Supervisor, Oil and Gas Division, Railroad Commission of Texas, July 9, 1954.

The wells on Federal leases are prorated by the adjacent States. Therefore, Outer Continental Shelf wells seaward of Louisiana receive the special allowable offered by that State; those off Texas may receive special consideration by the Texas Railroad Commission.

Such action by the regulating authorities seems reasonable and equitable. As fewer wells are needed to efficiently produce a given structure than would be required on land, a larger allowable per well offshore may result in roughly the same production from the reservoir as would be permitted from an onshore reservoir. The higher production allowables serve to help the offshore operator recover his initial investment more rapidly, thereby greatly decreasing the financial risk.

Summary

There are three kinds of risk involved in offshore oil operations. The first type is concerned with the probabilities of locating oil in any development program undertaken. Geologists and petroleum engineers feel assured that oil exists in the submerged lands and can be recovered by known methods. Diversification of drilling operations and the law of averages in an extensive development program greatly lessen the dry hole risk. The second group of risks involves the physical hazards of wind, wave, fire, blow-out, collision, and enemy action. These hazards for

the most part can be offset by marine and casualty insurance. Lastly, there are the institutional risks of the market reception of the offshore oil and gas and the actions of government.

The market demand for oil and gas has increased steadily in the past and there is reason to believe that the demand will continue to grow in the future. Petroleum products, it is believed, will play an increasingly larger part in the needs of the larger economy of the future. Offshore operations should supply a substantial portion of the oil and gas to fill the increasing needs. While imported petroleum products, synthetic petroleum substitutes, and nuclear energy will possibly supply at least a portion of the energy market in the future, it is presently believed that these products will be used to supplement, rather than supplant, the domestic natural petroleum. However, should Middle East oil be imported into the domestic market in great quantity or should rapid technical developments in nuclear power radically lower the production cost of nuclear energy, the domestic petroleum industry would be forced to make an agonizing reappraisal.

For the most part, government action has been directed at stimulating and protecting the petroleum industry. Tax incentives, proration of production with the resultant stabilization of prices, and, in the case of offshore operations, increased production quotas, have tempered

many of the winds of adversity on the offshore operators.

It appears that the favorable factors combine to offset the three categories of risk to a degree sufficient to permit successful offshore operations. At least, it seems that the operators believe that this possibility exists, or they would not be so industriously engaged in the waters of the Gulf of Mexico. If the overall "risk" picture looked bleak, i.e., the profit expectations poor or non-existent, the operators would certainly be conducting their search for oil in drier and more promising areas. As Senator George W. Malone has noted, they are not turning in their offshore leases.[92]

Certainly, with the outcome of a large number of drilling ventures known, with the aid of insurance to ward off physical catastrophe, with an ever-expanding home market, with the help of tax incentives, and with prices stabilized by proration, the large oil companies engaged in the offshore development are in a less "risky" situation than are many of their counterparts in other lines of endeavor.

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[92] Hearings on S.1901, p. 108.

CHAPTER VI

LEASING METHODS AND GOVERNMENTAL CONTROLS

Oil development in the upland areas of the United States has been characterized by economic waste arising from the atomized landownership pattern. As a result there have been many squabbles over land ownership and many needless wells drilled, merely to comply with offset drilling requirements. This situation can be remedied if the attractive aspects of oil development abroad are adopted in the Continental Shelf development. In many areas of the Middle East and South America it has been possible for a single operator to acquire oil rights covering extensive tracts.[1] Here petroleum engineers have had a chance to show what can be done in efficiently draining large oil reservoirs. In a few land areas in the United States, notably on large ranches in the Western States and in the marsh lands of Louisiana, the ownership patterns have permitted development with little regard for boundary lines. The Continental Shelf offers the opportunity to develop oil pools as natural

[1]The Kirkuk Field in the Middle East is located in a concession covering 32,000 square miles. Concessions in Colombia are as large as 494,000 acres.

units, if only the institutional rigidities that have prevailed in most upland operations are not extended into the Gulf.

As was pointed out in Chapter II, the greater part of the oil industry seemed to favor State ownership of the submerged lands. Proponents of Federal ownership contended that oil companies figured they could acquire more favorable terms from the States;[2] proponents of State ownership vowed that the States extracted much harsher terms from the lessees than did the Federal Government.[3] The latter could only guess at the cost and restrictiveness of Federal leases in the offshore for, until August 1953, no applicable leasing statute covered this area. If they used the Federal statute dealing with oil and gas leases on the public domain as their guide, they found support for their claim that Federal leases were less costly than State leases. Because most of the attacks on the oil industry in the past had

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[2]Testimony of O. A. Knight, C.I.O., Hearings on S.J. Res. 13, p. 446. Also Marion Clawson, Uncle Sam's Acres (New York: Dodd, Mead and Company, 1951), p. 334. Clawson averred: "Most people who have raised the state vs. federal claim have really had in mind . . . . a desire to obtain from state administration a more favorable deal for themselves than they can get from the federal administration."

[3]Statement of Price Daniel, United States Senator, Hearings on S.J. Res. 13, pp. 209-210. Senator Daniel maintained that the entire Federal-State controversy was started when certain persons, colorfully called "claim jumpers," filed for Federal leases at fifty cents per acre under the Federal Mineral Leasing Act of 1920 on producing properties located in the California offshore.

emanated from Washington, not from Austin or Baton Rouge, and because of the lack of knowledge of how harsh the new Federal offshore leasing statute would be, the larger oil companies sought to perpetuate State leasing of the submerged lands.

In order to gain a picture of the conditions in 1952-1953 as well as those today in leasing and supervisory control, comparison will be made of the leasing laws of Texas and Louisiana in 1953 with the Federal Mineral Leasing Act of 1920; then comparison will be made of present regulation, both State and Federal.

Leasing Procedure

Oil and Gas Leases

An oil and gas lease conveys certain rights in realty to the lessee. In the leasing of both private and public lands, the lessee has the exclusive right to prospect for, produce, and take the petroleum from the area under lease for a stated period of time and as long thereafter as oil and/or gas can be produced in commercial quantities. In consideration for this lease the lessee contracts to pay, in the absence of production, a periodic delay rental, and if production is accomplished, a stated percentage of the petroleum produced, known as royalty. All the expenses of operation are borne by the lessee. As additional consideration, the lessee may also pay the landowner an initial cash

bonus. Furthermore, oil and gas leases generally contain express or implied covenants, whereby the lessee is required to drill and produce such wells as are necessary to protect the lessor from loss by reason of production on adjacent properties and to drill and produce such other wells as may reasonably be required to develop the property in an orderly and timely manner.

Within this general lease framework, there is much room for variation. Differences can be found in the royalty percentage, the annual delay rental, the cash bonus payment, and the drilling requirements. In the case at hand, the landowner is also the sovereign government of the area involved with the taxing and regulatory powers incident to the exercise of sovereignty. The degree and severity of the taxation and regulation enforced by the owning governmental unit can also vary within wide limits.

With these variables, it is difficult to compare two leases under different leasing provisions or under different governmental jurisdictions. It cannot be stated definitely that a high royalty and low cash bonus on the leases of one governmental owner will bring a greater total income over the years than a low royalty and high cash bonus will bring to another owning government. The total income to each landowner will be known only when the last unit of oil and gas is produced. The various claims of the landowners cannot be reduced to the common denominator of money

until the final tabulation.

The Federal Mineral Leasing Act of 1920

The leasing of public lands in America is a relatively recent innovation.[4] The big problem until almost the close of the 19th Century[5] was one of securing settlers to bring the unclaimed lands into useful production. Accordingly, to encourage settlement and development, land was given away or sold at nominal prices (largely by the Federal Government), with no proprietary rights reserved in the alienated lands.[6]

The Mining Law of 1872, known as the Placer Act, originally passed with metallic minerals in mind, was applied to the development of petroleum when that mineral was discovered on public lands near the turn of the century. Under certain conditions the discoverer of a mineral lode could get clear title to the property. In the case of oil it was necessary for the wildcatter to drill and discover petroleum deposits on each claim before valid title to the

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[4]One exception, an act passed in 1807, provided for the leasing of federally owned lead miles in Indiana. The leasing operations were not successful and this act was repealed in 1847. Marion Clawson, op. cit., p. 75.

[5]Frederick Jackson Turner placed the close of the frontier at 1893.

[6]Texas, alone among the western states, retained all of the unpatented lands within its boundaries when entering the United States.

property could be obtained.[7] During the expensive and time-consuming drilling operations the interest of the petroleum prospector in the property was indefinite and insecure. As a result, the development of petroleum in the public domain was anything but orderly and economical.

In an attempt to remedy the many deficiencies in the Placer Act, Congress passed the Federal Mineral Leasing Act in 1920. It was a compromise measure, attempting to reconcile the various regional and economic interests concerned with the utilization of the public lands. Here, for the first time, the Federal Government made large scale provision for leasing public land, rather than selling it or giving it away.

As applied to petroleum, the Act provided for the issuance of prospecting permits that granted the exclusive right to explore for oil and gas on specific areas up to 2,560 acres for a period of two years. If the permittee was successful in producing petroleum in commercial quantities, the law rewarded him with a lease on one-fourth of the area included in the permit, or one square mile, with a royalty of five per cent. The discoverer also received preferential right to lease the remainder of the area contained in the prospecting permit at a royalty rate and cash

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[7]After discovery, the land could be patented for $5 per acre. However, no claim could exceed 1500 feet by 600 feet in dimensions.

bonus payment to be established by competitive bidding. The principal disadvantage of the permit system, from the point of view of the permittee, was that it required that drilling operations be started within six months after the permit was issued. To maintain the permit in good standing, the permittee had to pursue a stipulated developmental schedule during subsequent periods.

Later amendments to the Leasing Act had the effect of abandoning the permit system and substituting a form of lease.[8] The "competitive lease," available on lands within known geologic structures, remained about as before, but the "non-competitive lease," applicable to lands not within known geologic structures, enabled the first qualified applicant to secure five year leases on all of the land in any lease blocks desired, up to an established statutory acreage limitation. The non-competitive lease had no drilling requirements and could be extended at the option of the leaseholder for an additional five years. The only payment called for in this type of lease was an advance rental of fifty cents per acre for the first year and smaller rental payments in subsequent years. The royalty was established at 12 1/2 per cent.

The Secretary of the Interior had no discretion in the issuance of the non-competitive leases. The law

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[8]Public Law 297½, 74th Cong. (1935) and Public Law 696, 79th Cong. (1946). This is the procedure in use today.

specifically stated that the first qualified person making application for a lease "shall be entitled to a lease of such lands without competitive bidding."[9] While the Secretary was required to lease any lands applied for, he did have the authority to raise the rental payments above the minimum in the issuance of new leases.

For the operator the non-competitive lease method had three main advantages over the permit system in use from 1920 to 1935, and for that matter over most private leases:

1. The leases were inexpensive. An operator could carry a large inventory of prospective oil land at nominal cost.
2. There were no drilling requirements.
3. The lessee had a preferential right to renew the lease to a total of ten years.

This is not to say that members of the oil industry have had no criticism of the Federal Mineral Leasing Act. As a matter of fact, the Act has been under fire from the industry most of its career. The first major revision of the Act was accomplished in 1946[10] with the blessings of the industry and officials of the Department of the Interior. This amendment removed many of the inequities and

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[9]Public Law 696, 79th Cong. (1946), Sec. 3.

[10]60 Stat 950, 30 U.S.C., Sec. 181, et seq.

brought the law up to date in certain respects, but it failed to remove the sources of three major objections on the part of the oil industry:

1. The limitation on acreage.
2. The reservation of authority by the Secretary of the Interior in respect to methods of operation, conservation practices, restriction of assignments, and rate of development.
3. The difficulty of dealing with an administrative agency located so far from the field of operations.

In general it was suggested that the law was too restrictive and too inflexible.

As these objections were heard again and again during the course of the offshore oil debates, they will be studied in some detail later. Suffice here to say that the objections that seem to have merit were corrected for offshore leasing in the Outer Continental Shelf Act.[11]

State Leases

The states of Texas and Louisiana have followed the procedure of leasing all state lands by sealed competitive bid after block nominations by prospective bidders. Either

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[11]Congress in in the process of again amending the Federal Mineral Leasing Act. It is believed that many of the objectionable features will be eliminated in the leasing of onshore public lands.

the royalty or the cash bonus is left open for bidding. Because of the difficulty experienced in selecting the highest bid when both the royalty and cash bonus are left open, it has been found advisable to fix one and accept bids on the other. In most cases, the royalty, the delay rental, and the minimum cash bid per acre have been established by administrative decision with the cash bonus being established by competition.[12]

Public officials of these two states maintain that this system permits the highest possible return from State lands.[13] Should the land prove unproductive, the lessor state has benefitted by the amount of the cash bonus and the rentals collected. On productive leases the state not only obtains the initial cash bonus but also receives the royalty from production.

It is to be noted that Congress substantially adopted this State leasing procedure when it passed the legislation to govern the leasing of the Outer Continental Shelf.

Minerals Included in the Lease

Since other minerals besides oil and gas may be found in the subfloor of the Continental Shelf, it is of

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[12]Testimony of Bascom Giles, Texas Land Commissioner, Hearings on S. 1901, p. 77.

[13]Ibid. Also, see testimony of C. J. Bonnecarrere, Secretary, State Mineral Board of Louisiana, Hearings on S. 1901, p. 269.

interest to determine the mineral rights granted in the leases of the various proprietary governments.

Louisiana includes sulphur, potash, and "other minerals" with oil and gas under one lease.[14] The Louisiana Attorney General has rendered an opinion to the effect that the "other minerals" exclude those on the surface of the land, of which sand, gravel, and mudshell are examples, but cover and apply to all minerals which are found and produced by drilling and mining.[15] This is the usual practice in leases made by private lessors. The widely used and well standardized "Form 88" lease form includes "gas, oil, and other minerals." The purchaser of a lease gets the benefit of other minerals that he may find while drilling for petroleum.

The State of Texas for many years has followed the policy of issuing leases for oil and gas only. Separate leases must be acquired for the exploitation of sulphur and other minerals on State lands. In scattered instances Texas has leased the same geographic areas for both purposes, but always under separate leases.

The Federal Mineral Leasing Act of 1920, as amended, also called for separate leases for each mineral. This

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[14]Personal letter from Max A. Gianelloni, Jr., State Mineral Board of Louisiana, dated July 8, 1954.

[15]Testimony of Fred S. LeBlanc, Attorney General, State of Louisiana, Hearings on S. 1901, p. 263.

procedure has been followed in the leasing of the Federal offshore lands under the Outer Continental Shelf Act.[16]

In the Federal oil and gas leases, all uranium, thorium, and other minerals determined to be peculiarly essential to the production of fissionable materials, are specifically reserved to the lessor.[17] Also, the United States reserves and retains the ownership of and the right to extract all helium contained in the gas produced from any Federal lands.[18] Such reservations do not appear in the leases issued by the States of Louisiana and Texas.

There is no way of determining which method of leasing will bring the largest return to the lessor. Even assuming that a lease including all minerals can be sold for somewhat more than a lease for petroleum alone, it seems doubtful that an oil company would pay much of a premium for the additional mineral rights in an oil and gas lease. However, sulphur companies are interested in obtaining leases on the Continental Shelf and, it is believed, would pay sizable amounts for such leases. They prefer to lease the sulphur rights only and do not want to pay the additional amounts necessary to lease all the mineral

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[16]United States Department of the Interior, Bureau of Land Management, Oil and Gas Lease Form 4-1255, Sec. 3(b).

[17]Public Law 212, Sec. 12(e).

[18]Ibid., Sec. 12(f).

rights.[19]

Fortunately the production of petroleum and sulphur from the same geologic formation is not mutually exclusive. Sulphur is found in the anhydrous cap-rock formations on the top of buried salt domes. Petroleum is generally found along the flanks of the salt domes.[20] If care is taken, the production of one mineral does not interfere with the recovery of the other.[21] Usually, the oil companies consider any sulphur deposits discovered in the course of drilling for petroleum as a gratuitous by-product, to be tagged with a stiff overriding royalty and turned over to a sulphur company for development. They feel that the sulphur industry gets a free ride as a result of the geophysical work and exploratory oil drilling in the areas where sulphur is not included in the oil and gas lease.[22]

With modern geophysics, there is no sound reason why the land cannot be leased more than once for different minerals. The owning governments could benefit financially from the sale of separate leases: the sulphur industry

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[19]Testimony of Fred M. Nelson, President, Texas Gulf Sulphur Company, Hearings on S. 1901, p. 115.

[20]One exception is the Spindletop Field, where a large portion of the petroleum was found directly above the salt dome.

[21]Testimony of Eugene H. Walet, Jr., President, Jefferson Lake Sulphur Company, Hearings on S. 1901, p. 402.

[22]Letter of Jack Porter, oil operator, Hearings on S. 1901, p. 778.

would have access to more potential leases, and the petroleum industry would not be seriously harmed by such an arrangement.[23]

Size of Lease Blocks and Acreage Limitations

One of the most important criticisms directed at the Federal Mineral Leasing Act of 1920 during the submerged lands controversy concerned the provision dealing with acreage limitation. In the original act anti-monopoly sentiments in Congress had ordained that no individual or corporation could hold more than three oil and gas leases in any one State and not more than one 640 acre lease within the geologic structure of the same oil or gas field.[24]

These safeguards against monopoly were imposed to prevent a few large operators from depriving others of a fair participation in the resources available for development. Obviously the solons were not familiar with the nature of the petroleum industry. In their anti-monopoly zeal they made it difficult if not impossible to carry on economical operations, for no efficient oil development can be built on a basis of 640 acre leases. The best possible way to assure waste in the development of an oil pool is to parcel it out to competing operators. This is what the

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[23]Ibid., p. 113.

[24]Public Law 146, 66th Cong. (1920), Sec. 14 and 27.

Congress did in the 1920 Leasing Act.

In 1926 an amendment raised the limits per individual or company to 7680 acres in one State and 2560 acres on one structure.[25] The new, more generous limits did not ease the situation for long. Many operators who held the maximum acreage allowable, much of which was substantially depleted by production, were prevented from further development of the public lands unless they abandoned or sold the older leases. Even more important, the structure limitation often stood in the way of sound conservation practices. From a technical point of view, efficient operation of an oil pool can be accomplished best by producing the pool as one unit. This is difficult to arrange when many operators are involved.

In 1946 Congress increased the acreage allowable to 15,360 acres in one State and abolished the acreage limitation on each structure. Furthermore, any areas included in an approved cooperative or unit plan of development and operation were specifically exempted from the acreage restriction.[26] The benefits derived from unitization were thought to justify the waiver of acreage charges in unitized areas.[27]

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[25]Public Law 159, 69th Cong. (1926), Sec. 27.

[26]Public Law 696, 79th Cong. (1946), Sec. 17 and 27.

[27]Testimony of Julius A Krug, Secretary of the Interior, before the Senate Committee on Public Lands and

It was now possible for a producing company to obtain leases on twenty-four adjoining sections,[28] which should permit control of a substantial portion of any normal structure. Also, if the operating company would undertake to include each well drilled in a unitization agreement, there would be no limit to the amount of public land that could be held in each State. The only effect that the remaining acreage restriction had on the actions of an operator was a limitation on his inventory of undrilled lands blocked up in advance of developmental operations. This was the Federal leasing situation at the time the offshore ownership controversy was being argued.[29]

Whatever the virtues or vices of the amended 1920 Leasing Act, this Act could not be applied to the submerged lands of the Continental Shelf.[30] When the Congress finally passed a leasing law for these offshore lands, the acreage limitation was dropped entirely. The maximum leasing block

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Surveys, 79th Cong., 2d Sess., Hearings on S. 1236 (Washington: Government Printing Office, 1946), p. 237.

[28]One section, or square mile, contains 640 acres.

[29]Under the 1946 amendment to the Federal Mineral Leasing Act, operations proceded with little apparent difficulty. The limitation to 15,360 acres not under unitization plans did not prove to be unduly restrictive. In 1954, however, the acreage limitation was again relaxed to permit the holding of 46,080 acres in each State by an individual or corporation. Public Law 561, 83d Cong. (1954), Sec. 27.

[30]Letter of the Attorney General to the Secretary of the Interior, dated August 29, 1947; text found in Senate Report Number 1143, 82d Cong., 2d Sess., p. 30.

was established in the Outer Continental Shelf Act at 5,760 acres, but no restriction was placed on the number of blocks an individual or company could hold.[31] This Act recognized the need for petroleum operations on a very large scale in the offshore. The justification of the acreage restriction on the grounds that such limitation prevented the "little man" from being shut out did not fit the circumstances found in the submerged lands.

The offshore is the province of the large operator. Any company with capital resources necessary to develop a part of this oil province should be well able to take care of itself in the competition for leases. The public interest would not be served by the atomization of the offshore lease ownership and development.

The maximum size of the leasing blocks sold by Louisiana are set by State law at 5,000 acres.[32] There are no statutory provisions in Texas limiting the size of each lease plat, but the Texas School Land Board, for administrative convenience, has established lease blocks of 640 acres

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[31] Public Law 212, 83d Cong. (1953); 67 Stat. 468 (b)(1). In practice, the leasing blocks in the Outer Continental Shelf generally contain 5,000 acres in the areas adjacent to Louisiana and 5,760 acres in the areas seaward of Texas. Leasing blocks of less than full size are offered for sale if the situation warrants such subdivision. Personal letter from Sidney M. Groom, Jr., Manager, Outer Continental Shelf Office, Bureau of Land Management, New Orleans, dated May 6, 1955.

[32] Statement of Senator Russell B. Long, Hearings on S. 1901, p. 77.

out to three miles from land and 1,440 acres from three miles to ten and one-half miles from shore.[33] Neither state has any limit as to the number of leases or amount of acreage that any individual or company may hold.

Income to the Landowner

The income the landowner receives from leased land is composed of royalty, delay rental, and cash bonus.

Royalty

In private oil and gas leases in the mid-continent oil provinces, a cost free royalty payment to the landowner of one-eighth of the petroleum produced has been customary for many years. Elsewhere, however, such a ratio does not prevail. The most common arrangement in foreign lands is to establish the royalty at one-half of the net profits from operations. In most of the oil producing areas of the world, with the exception of the United States, all minerals are owned by the sovereign government. In order to obtain oil concessions in many of these areas and to ward off expropriation once the oil fields are developed, the international oil companies have been generous with the landowning governments. Lease contracts that split the net profits are the rule in most of the countries of South America and

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[33] Statement of Senator Price Daniel, Hearings on S. 1901, p. 75.

the Middle East.[34]

In Alberta, where about 90 per cent of the mineral rights are reserved to the Crown, the Alberta Government computes the royalty on a sliding scale formula, based on actual production. The basic royalty varies from 5 per cent for less than twenty barrels per day to 16 2/3 per cent for 135 barrels per day and over.[35] The basic royalty applies only to the portions of an exploratory reservation converted to lease form after oil is discovered in commercial quantities.[36] The reservation holder may take under lease, in

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[34] Oil and Gas Journal, February 1, 1954, p. 41. The Saudi Arabian Government received 50 per cent of Aramco's net operating profit since 1950. Arabian American Oil Company, Report of Operations to the Saudi Arab Government, 1953 (New York, Arabian American Oil Company, 1954). Venezuelan royalty (called "exploitation tax") is 16 2/3 per cent, but the income tax law of 1948 provides for an additional tax on operators whose net profits exceed the taxes paid to the government, providing that such companies have earned more than 10 per cent on their invested capital. This additional tax serves to bring the total government take up to half the net profits from operations. Guillermo Zuloaga, "Venezuela," World Geology of Petroleum, p. 79. Trinidad has a royalty of 10 per cent, but the oil operators are assessed an income tax of 40 per cent of chargeable income derived from operations in Trinidad, with no depletion allowable. A. J. Freie, "Trinidad," ibid., pp. 93-94.

[35] Royal Bank of Canada, Royalty Payments to the Crown--Bulletin No. 11 (Calgary, Alberta; Royal Bank of Canada, 1952), p. 1.

[36] Royal Bank of Canada, Alberta-Regulations-Leases and Reservations--Bulletin No. 1 (Calgary, Alberta; Royal Bank of Canada, 1952), pp. 1-3. The Alberta leasing procedure is much like the permit system used by the United States from 1920 to 1935. Exclusive exploratory rights over an area not exceeding 100,000 acres in each tract are

alternate checker-board blocks not exceeding 5,760 acres each, only 50 per cent of the land in each township covered by the reservation. The other 50 per cent of the land remains as Crown property and is sold at public auction. Sealed bids on the cash bonus are accepted under terms which provide for the payment of the basic sliding scale royalty plus an "overriding" royalty of 15 per cent. Thus, for a well of 135 barrels per day, Alberta would receive a royalty of 31 2/3 per cent and any initial cash bonus that might be forthcoming.[37]

Landowning governmental units in the United States have not been uniformly content with the royalty eighth. The City of Long Beach, California, in leasing the prolific oil lands underlying the Long Beach Harbor, extracted a royalty of 94 per cent of the gross production after the expenses of drilling were returned.[38] Texas recently received what is thought to be the world record royalty bid when Humble Oil and Refining Company leased sixty-five acres

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granted on condition that the reservation holder conduct an aggressive developmental program. Hereafter cited as Alberta Regulations.

[37] Ibid., p. 6.

[38] Frank J. Taylor, "The Town With Too Much Money," The Saturday Evening Post, January 12, 1952, p. 72. The wells in this very prolific field paid themselves out in three or four months.

of state land for a flat royalty of 90.5 per cent.[39]

Most of the leases issued by the States of Louisiana and Texas in the offshore have carried the standard royalty of 12 1/2 per cent. In very promising areas, Texas has charged 16 2/3 per cent.[40] Since the Bureau of Land Management successfully sold one-sixth royalty leases in the Gulf in 1954, both States have gone to the 16 2/3 per cent basis.[41]

Under the Federal Mineral Leasing Act of 1920, the holder of a prospecting permit on the discovery of oil could obtain a lease on one-fourth of the land in his 2,560 acre permit at a royalty of 5 per cent. The other three-fourths of the land in the permit was sold at a public auction with the royalty based on a graduated scale from 12 1/2 per cent to 25 per cent. The sliding scale of royalties was based on the production of the wells and the quality of the oil. This plan recognized that wells producing more and better grade oil could afford to carry a higher royalty than would be the case if the wells were small and the oil poor. To further extend the life of the smaller wells and to conserve the oil

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[39] Houston Post, April 7, 1954. This Neches River bed tract was adjoined on both sides by Humble wells. Humble was willing to pay this unusually high royalty to assure that no other operator would outbid them on this lease.

[40] Personal letter from Bascom Giles, Texas Land Commissioner, dated June 19, 1953.

[41] It is of interest to note that California leased 1175 offshore acres to Richfield Oil Corporation in 1954 for an equivalent of 80 per cent royalty on a production of 100 barrels per day. World Oil, August 1, 1954, p. 98.

that would be wasted should they be closed down, the Secretary of the Interior was authorized to reduce the royalty to zero on wells not exceeding ten barrels per day when, in his judgment, the well could not be successfully operated on the royalty fixed in the lease.[42]

When the permit system of leasing was abandoned in 1935, the effect was to raise the minimum royalty on all new Federal leases to 12 1/2 per cent.[43] Because of the carry over of many leases with the 5 per cent royalty, the average Federal royalty in recent years has been somewhat less than 12 1/2 per cent.

The Outer Continental Shelf Act established the minimum royalty payments for all Federally owned offshore lands at 12 1/2 per cent for oil and gas and 5 per cent for sulphur, with the proviso that the Secretary of the Interior could charge more.[44] In the lease sales carried out to date, the Department of the Interior has stipulated a royalty of 16 2/3 per cent on petroleum and 7 1/2 per cent or $1.50 per long ton, whichever is higher, on sulphur.[45] Whether the one-sixth petroleum royalty will be required in the

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[42] Public Law 146, 66th Cong. (1921), Section 17.

[43] Public Law 297½, 74th Cong. (1935), Section 17.

[44] Public Law 212, 83d Cong. (1953), Sec. 8 (b)(3) and (d)(4).

[45] Oil and Gas Journal, September 13, 1954, p. 96.

deeper waters of the Gulf is not known. The third offshore sale, held on July 21, 1955, disposed of lands located as far as 60 miles from shore and as much as 100 feet below the surface of the Gulf at the 16 2/3 royalty rate. As long as the leases continue to sell at the higher rate, there is no reason to believe that the Secretary will return to the 12 1/2 per cent figure.

Delay Rental

One of the conditions generally included in most oil and gas leases is a provision for the payment of a delay rental to the mineral owner. The dual purpose of this provision is to get income to the landowner in the absence of production and to encourage the leaseholder to an aggressive pursuit of production. Delay rentals cease when the royalties from production paid during the year exceed an established minimum. If these delay charges are low, lessees consider the rental as an inexpensive way to maintain undrilled prospects. If they are high, potential lessees are discouraged from taking out leases.

The Federal Mineral Leasing Act of 1920 called for a delay rental on non-competitive leases of fifty cents per acre for the first year, no rental for the second and third years, twenty-five cents for the fourth and fifth years, and fifty cents for the sixth and each succeeding year.[46] For

[46]Department of the Interior, Bureau of Land Management, Circular No. 1773, Part 192.80 (a), November 29, 1950.

leases issued competitively, the annual rental was one dollar per acre.[47] The delay charges on the non-competitive leases were considerably below those generally found in private leases, providing little income to the government and little incentive to timely development. To partially correct the situation, the Leasing Act was amended in 1946 to include a minimum royalty of one dollar per year per acre on all leases issued after that date.[48]

Congress, in passing the Outer Continental Shelf Act, left the delay rental provision to the discretion of the Secretary of the Interior.[49] The Secretary is authorized to raise or lower the delay rentals for each lease sale as conditions dictate. For the 1954 Federal sales in the outer shelf, the yearly delay rental and minimum royalty was established at $3.00 per acre. The enthusiastic bidding for leases on this basis serves as testimony that the $3.00 rate is not considered out of line by the industry.

The State of Louisiana, to tie in the amount of the delay rental with the value placed on each lease by the lessee, established the annual rental at one-half of the initial cash bonus.[50] Under this arrangement a lease drawing

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[47] Ibid., Part 192.80 (b) (3).

[48] Public Law 696, 79th Cong. (1946), Sec. 3.

[49] 67 Stat, 468 (b)(4).

[50] Revised Statutes of Louisiana, Title 30, Chap. 2, Part II (a) 129.

a high bonus bid and presumed to be more valuable will pay a greater delay rental than a lease sold for a lower bonus. The average annual delay rental on undeveloped offshore leases sold by Louisiana through August 1, 1954, would approximate $12 per acre on this basis. On leases thought to be valuable the State is assured that the lessee will attempt to obtain production rapidly and, if not successful, will surrender the property to avoid further rental payments.

The State of Texas has followed the procedure of charging a flat annual delay rental per acre. The amount is established for each lease sale by the General Land Office. Originally one dollar per year in the earlier offshore leases, it was later raised to two dollars and in May, 1955, to three dollars per year.[51] In this matter, Texas has followed the lead of the Bureau of Land Management.

Cash Bonus

In addition to the royalty payment, a cash bonus payment is usually made to the landowner. Such payment varies with the number of parties interested in the property, the bargaining power of the parties involved, and the anticipated value of the lease. The highest per acre cash bonus on record is the $3,000,000 paid to the Province of Alberta for a quarter section of highly desirable land. This bonus

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[51] Personal letter from Bascom Giles, June 19, 1953.

amounted to $18,750 per acre.[52]

The Federal Mineral Leasing Act of 1920 had no provision for bonus payment in the leasing of lands not located on known geologic structures. The applicant needed only to file for a lease on the public domain, pay a token rental of fifty cents per acre, and the Secretary of the Interior was obliged to deliver the lease. Although the Interior Department has repeatedly asked the Congress to change this portion of the law to permit competitive bidding, no alteration has been made. On lands classified as proved the original act called for competitive sales. The foresight of Congress in making these leases competitive has produced some large bonus payments. One oil company paid a cash bonus of $2,500 per acre, in addition to a one-fourth royalty, for some choice land in Elk Hills, California.[53]

The State of Louisiana made the first competitive sale of leases in the Gulf of Mexico in August, 1945, when 89,000 acres were sold for an average lease bonus of $5.13 per acre.[54] Texas, in November, 1947, sold 304,000 acres for an average of $27.36 per acre.[55] By August, 1954,

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[52] Alberta Regulations, p. 7.

[53] Dorsey Hager, Fundamentals of the Petroleum Industry (New York: McGraw-Hill, 1939), p. 194.

[54] McGee, op. cit., p. 3.

[55] Testimony of Bascom Giles, Hearings on S. J. Res. 13, p. 336.

Louisiana had issued leases on 1,188,469 acres at an average bonus of $24.00 per acre. Texas, through the same period, had leased 651,463 acres for an average of $58.00 an acre. Together, these two States had disposed of 1,839,932 acres at an average price per acre of $36.[56]

In view of the much higher bonuses obtained in later sales, it can be seen that Louisiana and Texas practically gave away the earlier leases. However, a retrospective view is hardly fair to the parties involved in the transactions. It must be assumed that an oil lease is worth just what it will bring on the market. In the early days of the offshore leasing, before the interest in this development became widespread, it was to be expected that the bids would be relatively low. The oil industry was not at all sure that offshore operations would be successful and profitable. In addition, before the passage of the Holland Bill, the offshore bidders were taking the chance that their State leases would not be valid, should a hostile Congress decide that title to the offshore rested in the Federal Government.[57]

Slightly over a year after the Outer Continental Shelf Act authorized Federal leasing of the Continental

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[56] World Oil, August 1, 1954, p. 98. All of these leases were on a one-eighth royalty basis.

[57] This possibility seemed remote at all times during the controversy. Every bill calling for Federal ownership recognized the equities of the State lease holders and contained a plan for validating these leases.

Shelf seaward of the "historic State boundaries," the Bureau of Land Management held two lease sales. In the first sale, held on October 13, 1954, the Bureau sold 394,720 acres seaward of Louisiana for an average cash bonus of $295 per acre. In the November 9, 1954, sale of 67,150 acres off Texas, the Bureau received $348 per acre.[58] From both sales the Federal Government realized an average of $303 per acre on the 461,870 acres sold. All of the leases called for a one-sixth royalty. Separate sulphur leases on 25,000 acres off Louisiana were sold for an average of $49 per acre.[59]

Officials of the Department of the Interior were pleased with the results of the sales. Despite the higher royalty involved and the greater distance from shore, some new individual Gulf of Mexico lease bonus records were established. Forest Oil Company paid $1,220 an acre for a 5,000 acre plot located thirty-two miles seaward of Louisiana.[60] Magnolia Petroleum Company bought 1,440 acres off Texas for $2,209 an acre.[61]

It is interesting to note that Texas, prior to the passage of the Submerged Land Act (Holland Bill) in May, 1953, had sold 114,799 acres of leases in areas over ten and

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[59]The sulphur bids ranged from $16.50 to $130.20 per acre with 7 1/2 per cent royalty. Shell Oil Company was the only bidder on the five leases sold.

[60]Oil and Gas Journal, October 15, 1954, p. 71.

[61]World Oil, December, 1954, p. 88.

ore-half miles from shore for $2,863,963, or $19.78 an acre.[62] Subsequently, these leases were ratified by the Outer Continental Shelf Act and Texas was permitted to keep the bonus and delay rental monies. Had Texas refrained from selling these leases that were clearly beyond the "historic state boundaries," it is almost certain that the Federal Government could have made a more advantageous disposition in the sale of November 9, 1954. If it can be assumed that these first choice lands in the outer Continental Shelf would have brought as much as the average in the 1954 sale, they could have been sold for $50,390,052, or 17.5 times as much as Texas realized from the sale. In addition, the Federal Government would have a higher royalty from production over the years.

Since 1954 the States of Texas and Louisiana have been receiving much higher bonus bids than were received in earlier periods. Also, possibly as a result of the success of the Federal sales on a one-sixth royalty basis, both States switched to a 16 2/3 per cent royalty. In February, Louisiana sold 34,777 acres for $608 an acre with a one-sixth royalty.[63] Three months later, Louisiana received $841 per acre for 25,376 acres on the same royalty basis.[64]

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[62]Statement of John Ben Shepperd, Attorney General of Texas, Hearings on S. 1901, p. 185.

[63]Oil, March, 1955, p. 28.

[64]Oil and Gas Journal, May 23, 1955, p. 94. In a

In May 1955, Texas sold one-sixth royalty leases on 48,000 acres for $132 an acre.[65]

No doubt the State officials responsible for the administration of the property in the offshore regret their haste in leasing large blocks of submerged lands during the period when the State ownership claim was up for question. Since the Holland Bill was passed, these State officials or their successors have been more careful in rationing out the remaining lands.[66] A significant decline in the number of lease tracts offered in each sale is noted.

An examination of the bids received in representative sales by the State and Federal governments reveals no uniform competitive pattern in the bidding. The examples selected for detailed examination are the first sales of lands seaward of Texas by the Texas General Land Office and the United States Department of the Interior following the enactment of the Submerged Land Act in 1953. The conditions of these two sales were as follows:

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sale that is being contested by the Department of the Interior, Louisiana sold 4,687 acres at the mouth of the Mississippi River for an average of $1,637 per acre.

[65] Oil and Gas Journal, May 9, 1955, p. 81. One 640 acre lease seaward of Galveston Island sold for $1,687 per acre.

[66] Mr. Bascom Giles, the Texas Land Commissioner responsible for all submerged land sales through 1953, was convicted of fraud in connection with the Texas Veteran's Land Program. An investigation of his administration of the offshore land sales was proposed in the Texas Legislature. Houston Post, May 12, 1955.

Sale	Minimum Bonus Per Acre	Royalty Percent	Delay Rental Per Acre
Texas Sale of December 1, 1953	$ 5.00	12 1/2	$2.00
Federal Sale of November 9, 1954	$15.00	16 2/3	$3.00

Other things being equal, the cash bonus bids should be lower in the Federal sale. However, two factors serve to offset the harsher Federal terms. First, it should be noted that the Federal sale was held almost a year after the Texas sale. A somewhat higher price per acre could be expected in the later sale in keeping with the rising trend of prices in the offshore as the industry gained experience and interest in the submerged land development. Also, while the lands in the Texas sale had been picked over several times before in earlier sales, the Federal lands were almost virgin territory. The qualification on virginity was caused by the previous sale of nearly 145,000 acres in the Outer Continental Shelf by the State of Texas prior to the passage of the Holland Bill. No doubt, some of the most prominent and promising structures in the Texas Outer Shelf were included in these earlier sales, but, we could hazard, the surface was hardly scratched. For these and other reasons unknown, the Federal Government realized 4.4 times as much in cash bonus per acre as did the State of Texas in their first post-Holland Bill sales.

In the December 1, 1953, offering of 442 tracts by

the Texas School Land Board, thirty bidders responded.[67] Twenty-five of these bidders bought 317 tracts, totaling 401,057 acres, for $31,491,649, an average of $79 per acre.[68] A total of 934 bids were received on the land parcels offered, or an average of slightly less than three bids on each tract sought.[69]

A breakdown of the bids received on each lease indicates that the competition for a large number of the leases was somewhat limited (Table 11). One hundred and nine leases, comprising 149,622 acres, or 37.3 per cent of the total land sold, went without contest for an average of $12.22 per acre. In individual cases, however, the sole bidders submitted surprisingly high offers to assure that they would secure the leases. Therein lies the great advantage to the leasing government of using the sealed bid method. In the absence of collusion, each interested party does not know how many others will submit a bid. The Standard Oil Company of Texas badly overestimated the

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[67]The General Land Office normally sends out notices of lease sales to more than 2,000 parties interested enough to have their names on the mailing list. Testimony of Bascom Giles, Hearings on S. 1901, p. 226.

[68]The source of all data on this lease sale is the Texas General Land Office, Tabulation of Bids Received Prior to 10 o'clock a.m., December 1, 1953, by the School Land Board. Hereafter cited as Tabulation of Bids, December 1, 1953.

[69]No bids were received on 125 tracts. It is assumed that the interested bidders requested that these parcels be offered for sale as a cover for their real bidding.

TABLE 11

NUMBER OF BIDS RECEIVED ON EACH LEASE BLOCK IN SALE OF TEXAS OFFSHORE LANDS, DECEMBER 1, 1953

Number of Bids	Number of Leases	Acres Involved	Percent of Land Bought	Total Amount Received (thousands of dollars)	Average Price per Acre[1]
1	109	149,622	37.3	$ 1,829	$ 12.22
2	83	94,464	23.5	2,808	29.72
3	29	30,825	7.7	1,856	60.21
4	29	27,623	6.9	3,740	135.41
5	21	26,611	6.6	2,282	85.76
6	14	24,479	6.1	2,648	108.17
7	10	17,440	4.3	3,699	212.09
8	9	16,000	4.0	6,275	392.18
9	6	3,840	1.0	1,509	393.08
10	6	9,078	2.3	4,068	448.13
11	1	1,075	.3	777	723.00
	317	401,057	100.0	$31,491	$ 78.52

Source: General Land Office, Tabulation of Bids Received Prior to 10 o'clock a.m., December 1, 1953, by the School Land Board.

[1]Computed from unrounded data.

competition in four notable instances. This company bid $179,203, or $280 an acre, on each of four adjoining 640 acre tracts. On two of these parcels there was no other bidder. The other two tracts each had only one other bidder. Placid Oil Company offered only $5.16 an acre for one and the Lamar Hunt Trust bid $5.25 an acre for the other. Shell Oil Company had about the same experience, bidding $277 an acre on two tracts, when opposed solely by Hunt bids of $5.25.

For certain acreage the bidding was highly competitive. The greatest number of bids were submitted on 1075 acres adjoining Kleberg County. A tabulation of the bidding on this lease is given below:

Bids Received on Lease 196-Tract 945[70]

Bidder	Amount of Bid	Bid Per Acre
Standard Oil Company of Texas	$777,227.13	$723.00
Sun Oil Company	538,843.86	501.25
Magnolia Petroleum Company	453,650.00	422.00
Gulf Oil Corporation	362,720.00	337.41
Charles Sapp	160,375.00	149.19
The Texas Company	140,943.25	131.11
Shell Oil Company	30,150.00	38.05
Humble Oil and Refining Company	16,404.00	15.26
Atlantic Refining Company	11,120.00	10.34
Pure Oil Company	6,132.00	5.70
Caroline Hunt Trust	5,643.75	5.25

[70] Tabulation of Bids, December 1, 1953.

It is obvious that the geophysical crews of the top six bidders found this area promising. The Standard Oil Company of Texas was enthusiastic enough about the prospects to bid $723 an acre. It is wise that Texas Standard did, as Sun Oil Company was not far behind with a bid for $501.25 an acre. It is also obvious that the five low bidders were speculating, as they either did not know the geology of the area or did not think much of their seismic pictures if such were available. The Hunt interests submitted a bid of $5.25, only twenty-five cents above the minimum allowed, on this and on a large number of other tracts offered, apparently in the hope of accidentally getting some good ones.

The highest price for one lease was received for 5,760 acres located five miles off Mustang Island in sixty feet of water. The bids were as follows:

Bids Received on Lease 331-Tract 774[71]

Bidder	Amount of Bid	Bid Per Acre
Gulf Oil Corporation	$3,065,880.00	$532.27
Atlantic Refining Company	1,008,000.00	175.00
Charles Sapp	951,212.00	165.14
Shell Oil Company	778,460.00	135.15
Standard Oil Company of Texas	708,489.11	123.00
Sun Oil Company and Seaboard Oil Company	501,120.55	87.00
Humble Oil and Refining Company	290,937.60	50.51
Phillips Petroleum Company	150,000.00	26.04

[71] Tabulation of Bids, December 1, 1953.

Gulf Oil Corporation, a newcomer to offshore operations, jumped in with a per acre bid of $523.27 for this three mile square tract. This indicated that Gulf wanted to get into the offshore business badly and, furthermore, that Gulf had no knowledge of Atlantic Refining Company's plan to offer $175.00 per acre.

Several of the tracts drew bids that were very close. In one 758 acre parcel, Sun Oil Company bid $501.25 per acre, beating Standard Oil Company of Texas's bid of $449.00 by a mere $2.25 an acre. The highest price per acre in the sale was paid by the Standard Oil Company of Texas for one 640 acre lease. Texas Standard beat out nine competitors with a bid of $728.28 per acre.

An examination of the total bids submitted by each company and the degree of success is revealing (Table 12). The H. L. Hunt interests[72] submitted the greatest number of bids and were successful in acquiring the lion's share of the leases. Hunt bought 99,778 acres, or 24.9 per cent of the land sold, for $622,153, an average of $6.24 an acre. In fifty-five out of sixty-two leases, Hunt was unopposed. At first glance, it might be assumed that Hunt bid low only on land of dubious value. New Republic was the first to

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[72]The Hunt Oil Company submitted bids for itself and for H. L. Hunt, the Hassie Hunt Trust, the Nelson Bunker Hunt Trust, the Caroline Hunt Trust, the Lamar Hunt Trust, and the William Herbert Hunt Trust.

TABLE 12

AMOUNTS PAID FOR TEXAS OFFSHORE LEASES, DECEMBER 1, 1953

Company	Number of leases	Amount paid (thousands of dollars)	Acreage	Average price per acre[1]
Hunt et al	62	$ 622	99,778	$ 6.24
Atlantic	36	1,624	38,167	42.54
Shell	32	3,769	37,721	99.92
Sun	31	3,336	20,690	161.22
Humble	26	4,443	47,795	92.96
Charles Sapp	21	201	20,180	9.98
Standard of Texas	19	3,560	17,833	199.63
Sun and Seaboard	14	1,617	9,306	173.72
Stanolind	9	198	7,718	25.71
The Texas Company	9	425	5,690	74.69
Ohio	7	51	4,903	10.46
Continental	6	687	16,320	42.10
Kerr McGee	6	136	12,960	10.46
British American	5	108	3,200	33.78
Arkansas Fuel Oil	5	92	3,200	28.63
Placid	4	18	2,538	7.21
Tidewater	4	540	12,099	44.63
Seaboard	4	67	4,505	14.94
Magnolia	4	6,267	17,920	349.71
Phillips	3	42	1,920	22.00
Gulf	3	3,456	7,040	490.95
Jake L. Harmon	2	7	1,280	5.77
Pure	2	185	6,400	28.94
John W. Mecom	2	22	1,254	17.82
American Liberty	1	17	640	26.26
Total	317	$31,490	401,057	$ 78.53

Source: General Land Office, Tabulation of Bids Received Prior to 10 o'clock a.m., December 1, 1953, by the School Land Board.

[1]Computed from unrounded data.

point out the fallacy of this assumption with the observation that Hunt bid $5.25 per acre on the lease that Texas Standard felt justified in buying for $723 an acre.[73]

A critical examination of this Texas lease sale discloses what seem to be two major errors. First, the authorities in charge placed too much land on the market at one time. Over half a million acres were placed on the block in this one sale. It is believed that more interest would have been generated in each parcel and correspondingly higher lease bonuses would have been received if the land had been offered in smaller quantities. Second, the minimum bonus of five dollars was too low to discourage speculation. The serious purchasers would not have been discouraged by a much higher minimum and the State of Texas, in addition to realizing more money from the sale, could be assured that the purchaser was interested enough in the land to spend the money necessary to develop it. One major oil company executive suggests a minimum bonus of at least $50 per acre.[74] The public interest is not best served by the rapid disposition of these offshore mineral leases in return for token bonuses.

With the exception of the stated objections, the

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[73] New Republic, January 11, 1954, p. 3. This report, however, may have imputed their hindsight to Mr. Hunt's foresight.

[74] Letter of Ben C. Belt, Vice-President, Gulf Oil Corporation, dated May 22, 1953, Hearings on S. 1901, p. 778.

lease sale appears to have been conducted in a manner that does credit to the public administrators responsible for the sale. The event was well publicized in advance to all possible bidders and full disclosure was made of all bids submitted. There is no evidence of any collusion on the part of the companies bidding in this sale and the uninhibited bids submitted on the more desirable properties serve to substantiate this appearance of a competitive sale.

On November 9, 1954, slightly less than one year after the Texas School Land Board sale discussed above, the Bureau of Land Management sold 67,150 acres in the Outer Continental Shelf seaward of Texas for $23,357,030, an average of $347.83 per acre. The land was located in three areas lying from twelve to twenty miles offshore. Fourteen bidding groups, representing seventeen companies, submitted ninety bids on the nineteen tracts offered. Each parcel, on the average, received 4.74 bids. Four of the tracts, containing 34 per cent of the land sold, received only one bid. These parcels went for an average of $17.91 per acre (Table 13).

The tract receiving the greatest number of bids drew the highest price per acre. This 1,440 acre plot, for which there were ten bidders, brought $2,209 an acre. A tabulation of the bids appears below:

Bids Received on Outer Continental Shelf Tract 0511: S W ¼ Block 52, High Island Area[75]

Bidder	Amount of Bid	Bid Per Acre
Magnolia Petroleum Company	$3,180,960.00	$2,209.00
Standard Oil Company of Texas	1,780,000.99	1,236.11
Pure Oil Company Ohio Oil Company Sun Oil Company Seaboard Oil Company	1,501,020.00	1,042.37
Placid Oil Company	556,992.00	386.80
Continental Oil Company Atlantic Refining Company Tidewater Association Oil Company	513,268.00	356.43
Phillips Petroleum Company	500,666.00	347.68
The Texas Company	182,880.00	127.00
Union Producing Company	109,440.00	76.00
Stanolind Oil and Gas Company	103,680.00	72.00
Gulf Oil Corporation	60,850.00	42.25

Magnolia must have found a very promising structure on this tract that extended into the adjoining tract to the North, for it bid only on these two parcels and won both. Standard of Texas had the geology mapped out differently: it also wanted Tract 0511, but bid even more for the adjoining tract to the East. Gulf's bid of $42 on Tract 0511, its

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[75]The source of all data on this lease sale is the tabulation of bids released by the Outer Continental Shelf Office, Bureau of Land Management, entitled Oil and Gas Lease Sale, Outer Continental Shelf Lands, Texas, November 9, 1954. Hereafter cited as Lease Sale, Outer Shelf, Texas, November 9, 1954.

TABLE 13

NUMBER OF BIDS RECEIVED ON EACH LEASE BLOCK IN SALE OF FEDERAL LANDS SEAWARD OF TEXAS, NOVEMBER 9, 1954

Number of Bids	Number of Leases	Acres Involved	Percent of Land Bought	Amount Received (thousands of dollars)	Average Price per Acre[1]
1	4	22,833	34.0	$ 409	$ 17.91
2	2	4,320	6.4	327	75.62
3	0	--	--	--	--
4	3	12,960	19.3	1,230	94.94
5	3	8,494	12.7	3,778	444.75
6	1	5,583	8.3	3,650	653.77
7	2	2,880	4.3	3,635	1,262.11
8	2	2,880	4.3	2,582	896.60
9	1	5,760	8.6	4,565	792.58
10	1	1,440	2.1	3,181	2,209.00
Total	19	67,150	100.0	$23,357	$ 347.83

Source: Bureau of Land Management, Outer Continental Shelf Office, Oil and Gas Lease Sale, Outer Continental Shelf Lands, Texas, November 9, 1954.

[1]Computed from unrounded data.

only bid in this area, seemingly indicates a comparative lack of appreciation of the structure.

The lease selling for the largest amount drew nine bids. The bids on this 5760 acre plot were:

Bids Received on Outer Continental Shelf Tract 0518, Block 140, High Island Area[76]

Bidder	Amount of Bid	Bid Per Acre
Standard Oil Company of Texas	$4,565,251.99	$792.57
Phillips Petroleum Company	4,166,000.00	723.26
Humble Oil and Refining Company	3,602,880.00	625.50
Pure Oil Company Ohio Oil Company Sun Oil Company	3,501,020.00	607.82
Continental Oil Company Atlantic Refining Company Tidewater Associated Oil Company	3,007,000.00	522.04
Shell Oil Company	1,314,432.00	228.20
Stanolind Oil and Gas Company	1,103,731.20	191.62
Union Producing Company	633,600.00	110.00
The Texas Company	305,280.00	53.00

The cash bonus offers from Standard of Texas and Phillips were surprisingly close and they were not ahead of the next three bids by a very safe margin. This lease must contain a large, promising, and easily located structure to draw so much serious interest.

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[76]Lease Sale, Outer Shelf, Texas, November 9, 1954.

The Standard Oil Company of Texas bought six tracts comprising 25.6 per cent of the land offered, for $588 per acre (see Table 14). The joint venture composed of the Tidewater Associated Oil Company and the Atlantic Refining Company was high on five parcels, buying 37.8 per cent of the total offering for $244 an acre. Seven of the fourteen bidding groups, including some of the most illustrious names in offshore oil, were shut out of the sale.

The criticisms leveled at the administration of the Texas sale cannot be repeated for the Federal sale of lands in the Outer Continental Shelf off Texas. A much smaller and more easily digested quantity of land was offered in the Federal sale. This may account, in part, for the higher bonuses received.[77] The higher minimum bonus used in the Federal sale brought in a larger amount of money on the less desirable leases. It is believed that the minimum bonus should be increased on Federal sales to an amount considerably higher than the present $15.00 per acre.

Taxes

In addition to the normal landowner's income accruing to the governmental proprietors of the Continental Shelf, the taxing powers incident to sovereignty also apply

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[77]However, it should be noted that the Federal sale of lands seaward of Louisiana included 395,000 acres. In spite of the large amount of land in one sale, the Bureau of Land management realized $295 per acre.

TABLE 14

AMOUNTS PAID FOR FEDERAL OFFSHORE LEASES, NOVEMBER 9, 1954

Company	Number of Leases	Amount Paid (thousands of dollars)	Acreage	Average Price per Acre[1]
Standard of Texas	6	$10,165	17,280	$ 588.26
Tidewater Atlantic	5	6,188	25,390	243.72
Phillips	2	1,001	2,880	347.68
Gulf	2	247	11,520	21.41
Magnolia	2	4,876	2,880	1,693.00
Continental Tidewater Atlantic	1	103	5,760	17.88
Continental	1	777	1,440	539.59
Total	19	$23,357	67,150	$ 347.83

Source: Bureau of Land Management, Outer Continental Shelf Office, Oil and Gas Lease Sale, Outer Continental Shelf Lands, Texas, November 9, 1954.

[1]Computed from unrounded data.

in the offshore. Do the taxes borne by the Federal lessees differ from those paid by the lessees of Louisiana and Texas? To what extent do the taxes borne by the marine producer differ from those paid by his counterpart on land?

Lands Under State Jurisdiction

The Federal income and excise tax laws are applicable to the waters adjacent to the United States within a three-mile limit.[78] The strip between three miles and ten and one-half miles seaward of Texas is legally in the high seas, but, although the tax laws are not clear on this point, it is assumed that the Bureau of International Revenue will consider all lands within the "historic State boundaries" of Texas to be a part of the United States.

Louisiana levies a severance tax on all oil and gas produced within the State boundaries. This tax will apply to all offshore production seaward of that State out to the point where the boundary is eventually established. The severance tax, based on the gravity of the oil, varies from 18 cents to 26 cents per barrel. With the price of the oil, which varies with the gravity, at $2.50 to $2.85 per barrel, the severance tax amounts to slightly less than 10 per cent of the gross value of the oil.[79]

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[78]Letter from H. Chapman Rose, Acting Secretary of the Treasury, Hearings on S. 1901, p. 695.

[79]Testimony of C. J. Bonnecarrere, Secretary, State Mineral Board of Louisiana, ibid., p. 280.

Texas also levies a severance tax, but the rate is not as high as the Louisiana tax. At present, the Texas tax averages approximately 5 per cent of the gross value of the petroleum produced.[80] Liability for this tax extends to all producers within the ten and one-half mile offshore belt.

Both States have extended their counties out into the Gulf of Mexico. The purpose of this boundary extension was to provide law enforcement by county agencies in the offshore areas within State jurisdiction. These counties have the authority to levy ad valorem property taxes on the improvements made in the offshore. The amount of the tax would depend on the value of the property and the rate assessed. It is unknown how much the county property taxes would add to the total tax load of each barrel of oil, but the amount could be sizable.

Oil operations carried on in the State offshore areas are subject to the same taxes that would be collected if the wells were located on land.

Lands Under Federal Jurisdiction

The applicability of the Federal income and excise taxes to the areas of the Continental Shelf beyond the three-mile limit will depend, in many instances, on whether these areas are adjudicated to be a part of the United States. The touchy question of whether the United States can extend

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[80] Ibid., p. 301.

its taxing authority without extending its sovereignty has not been decided.[81]

There is no question that Federal income taxes are collectible on the income derived by citizens and corporations of the United States in carrying on business or performing services on the entire Continental Shelf. There is some question, however, in respect to the income earned by non-resident alien individuals and corporations in the area beyond the three mile limit. Their income may be held as derived from sources outside the United States, resulting in an exemption from United States income taxes.[82] In addition, if the operations beyond the three mile limit are held to be on the high seas, the Federal excise taxes on products exported to these offshore installations could not be applied. As a matter of equity these taxes should be applied uniformly to all developments on the Continental Shelf, regardless of their location in respect to the three mile line.

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[81]Congress extended the Constitution, laws, and civil and political jurisdiction of the United States to the subsoil and seabed of the Outer Continental Shelf and all fixed structures that may be erected thereon. Public Law 212, 83d Cong., Sec. 4 (a)(1). This action may have solved the tax problem.

[82]It is presumed that the greater part, if not all, of the operations in the Gulf Coast Continental Shelf will be carried on by United States residents or corporations. However, there is the possibility that alien corporations, chartered as a front by United States citizens, might evade the income tax laws. Many ships owned by Americans fly the flag of Panama for tax purposes.

The Federal Government does not collect severance or gross production taxes on oil and gas produced from leases originally issued by the Bureau of Land Management. It collects a sum in lieu of these taxes, however, on the production of leases issued by the States in the Outer Continental Shelf prior to the passage of the Submerged Land Act and ratified by the Outer Continental Shelf Act. To maintain the State leases, the holders must pay to the Secretary of the Interior a sum of money equal to the amount of the severance taxes which would have been payable on such production to the State issuing the lease.[83]

Senator Russell B. Long of Louisiana fought a long losing battle to have the State taxing authority extended out to the edge of the Continental Shelf. In his bitterness after his proposal was defeated, the Senator said:

> . . . But rather than deal fairly with the States, the Federal Government has chosen, through the "windfall" provision in this bill (S. 1901), to extract the last ounce of flesh by adding the amount of the States' tax to the royalty to which the Federal Government is otherwise entitled under the validated States' leases.[84]

The majority of the Senate Interior and Insular Affairs Committee maintained that States' lessees in lands seaward of State Boundaries should be held to their bargain; otherwise,

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[83]Public Law 212, 83d Cong. (1953), Sec. 6(a)(9).

[84]U.S. Congress, Senate, Committee on Interior and Insular Affairs Report No. 411, 83d Cong., 1st Sess. (Washington: Government Printing Office, 1953), p. 67.

they would receive a "windfall" in Federal validation.

No property taxes are levied by the Federal Government in the Outer Continental Shelf. The states are specifically prohibited from extending their taxation laws into the area of Federal jurisdiction.[85] Federal leaseholders get a definite advantage, as far as taxes are concerned. The absence of the severance and property taxes paid by their opposite numbers on land or in the State-owned offshore goes a long way toward making up for the additional costs engendered by the greater distance from shore and the greater depth of the water.

Authority of the Lessor

Offshore property, Federal or State, is public property which should be protected and preserved so that it may best serve the public interest. One of the objections to the Federal Mineral Leasing Act of 1920 was the reservation of much authority in the hands of the Secretary of the Interior. Obviously, a lease which imposes no restrictions in regard to the development and operation would be more desirable to the lessee than one containing limitations in these respects. But, necessarily, leases on public lands should not be unrestrictive in nature.

To quiet the criticism of "bureaucracy" in Federal lease administration and expedite operations in the Outer

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[85] Public Law 212, Sec. 4 (a)(2).

Continental Shelf, the Interior Department has created an autonomous regional office in New Orleans.[86] Administratively, obtaining and maintaining leases in offshore lands should be similar under the aegis of Federal or State authority.

Protective Covenants

All standard oil and gas lease contracts contain express or implied protective covenants that assign certain duties to the lessee. Among them is the provision that requires the lessee to drill and produce such wells as will protect the lessor from adverse drainage from other properties. Since the offshore lands are owned in huge areas by one lessor, the necessity of compulsory competitive drilling is removed, except where private properties onshore adjoin public land offshore, or where the public properties of at least two separate governmental units are contiguous. Unitization laws would prevent wasteful competition even at these points.

Drilling Requirements

The Federal lease form stipulates as one of the obligations of the lessee, that he must undertake "to drill and produce such wells as the Secretary may reasonably

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[86]Personal letter from H. P. Hochmuth, Bureau of Land Management, dated May 12, 1955. All lease files dealing with the Outer Continental Shelf are located in the New Orleans Office.

require in order that the leased area may be properly and timely developed and produced in accordance with good operating practice."[87] The Texas lease form has roughly the same provision.[88] The Louisiana lease says nothing about the matter, but such agreement is implied in the contract.[89]

Approval of Assignment

To expedite the assignment of Federal leases, the Department of the Interior permits leases to be assigned in whole or part to anyone qualified under the law to take and hold a lease,[90] subject to the administrative approval of the Director of the Bureau of Land Management.[91] If the assignees are qualified to hold a lease, the instrument of transfer must be approved within thirty days after filing.

The Louisiana lease contract states that the rights

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[87]Bureau of Land Management, Department of the Interior, Oil and Gas Lease Form 4-1255, Sec. 2(c)(2). In many of the Federal leases issued on land, the Secretary of the Interior specifically requires that a certain number of wells be drilled in accordance with an established schedule. These provisions are found in many private leases.

[88]General Land Office of Texas, Oil and Gas Lease August 6, 1953, par. 7.

[89]Louisiana State Lease Form, Revised October, 1948.

[90]Persons qualified to hold a lease must be citizens of the United States over twenty-one years of age, associations of such citizens, States, political subdivisions of a State, or private, public, or municipal corporations organized under Federal or State charter. 43 C.F.R. 201.2.

[91]43 C.F.R. 201.60.

under the lease may be assigned or transferred on approval of the State Mineral Board.[92] Texas requires no approval of a transfer, but requires that a copy of the assignment be filed with the General Land Office.[93] Under each of the jurisdictions the leasing authorities only desire to know who is responsible for the lease.

Regulation Under the Governmental Police Power

The police powers in the Continental Shelf are exercised by the Federal Government and the States concerned. They can help or hinder the efficient and economic development of the offshore resources. For full utilization of the marginal sea resources, it is essential that each use be controlled in a way that will least interfere with the shore and offshore for other purposes.

Navagation and Communications

Rigid compliance with directives of the Army Corps of Engineers and the United States Coast Guard enables a fairly high degree of navigational safety.[94] Radio communication from drilling platform or ship to shore is controlled

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[92]Louisiana State Lease Form, Revised October, 1948, Par. 8.

[93]General Land Office of Texas, Oil and Gas Lease Form, August 6, 1953, Par. 13.

[94]Structures are not permitted within 2000 feet of any navagational channel and warning devices must be placed on any structures erected.

by the Federal Communications Commission.

Public Health and Safety

Boats used in offshore oil operations must conform to Coast Guard regulations on seaworthiness and the presence of safety equipment. The Coast Guard is particularly strict in the regulation of equipment and mechanisms using explosives.

The Federal Government and the States of Texas and Louisiana are equally strict in requirements for keeping wells under control. Regulations require that wells be properly cased and cemented and that adequate well head equipment and storm chokes be installed to control the gas pressures,[95] thus averting possible catastrophic damage to life and property should blowout and/or fire occur on an offshore installation.

Preservation of Fish and Wild Life

The States have long been concerned about the effect of the explosives used in geophysical exploration and the pollution from drilling and production operations on aquatic life.[96] Louisiana and Texas have established rules and

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[95] 30 C.F.R. 250.40. Also General Land Office of Texas, Rules and Regulations Governing Drilling and Producing Operations in Coastal Waters, dated November 17, 1951.

[96] Continuing studies are being made of ways to prevent damage to marine life. The Department of Oceanography, Texas A & M College, has been engaged on this project for several years.

regulations to govern the use of explosives in public waters and to prevent pollution of these waters by oil seepage and the discharge of drilling chemicals.[97] The Department of the Interior has adopted these statutes and regulations of the adjoining States for application to the Outer Continental Shelf. The Geological Survey is authorized to accept the assistance of the adjoining States in the enforcement of these regulations on Federal property.[98]

Conservation

Conservation is the prevention of physical and economic waste. In onshore petroleum production the "rule of capture" had led operators to drill and produce at the maximum possible rate to forestall drainage of their pool by neighboring wells. Such unnecessary drilling and rapid production contradicted sound conservational knowledge and prevented maximum ultimate recovery. Fortunately the companies of a size necessary to undertake petroleum development in the submerged lands are well aware of the economic rewards that accrue from following sound conservation

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[97] General Land Office of Texas, Rules and Regulations Governing Geological, Geophysical and Other Surveys and Investigations in Areas within Tidewater Limits within the Jurisdiction of the State of Texas, November 17, 1953. Operations in the Louisiana offshore are governed by the Louisiana Department of Wild Life and Fisheries, Rules Governing Seismic Exploration in the State of Louisiana, January, 1952.

[98] 18 F.R. 5667, September 23, 1953.

practices. In the words of the president of one of the largest domestic producing companies:

> . . . Broadly speaking, the interests of the lessees [in conservation] are the same as the interests of the State and that as an operator of an oil field the Humble Company is more interested in conserving that resource and getting the most oil out of the reserve than anybody else, because it has its investment there.[99]

Examination of the conservation principles likely to be applied in the Continental Shelf area may furnish evidence as to the pattern of development to be expected there.

Well Location and Spacing

Although petroleum engineers do not completely agree on how many wells are needed to provide adequate drainage for an oil pool,[100] there is substantial agreement that the volume of recovery from an oil reservoir is normally less dependent on well density than on factors such as the porosity and permeability of the reservoir rock, the viscosity of the gas-oil fluid, and the effectiveness of the gas or water energy drive. Further, authoritative opinion holds that the development of many oil fields on land was economically

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[99]Testimony of Hines H. Baker, President, Humble Oil and Refining Company, before the Senate Committee on Interior and Insular Affairs, 81st Cong., 1st Sess., Hearings on S.155 et al, p. 379.

[100]For an excellent review of both sides of this continuing controversy, see the following report: Research and Coordinating Committee, Interstate Oil Compact Commission, Well Spacing (Oklahoma City: Interstate Oil Compact Commission, 1951).

wasteful, primarily because of too many wells.[101] A better understanding of the factors affecting recovery and the past experience of wasteful drilling may well guide developmental patterns in the offshore lands.

Texas has a minimum spacing rule requiring twenty acres per well, with special rules for special cases.[102] Louisiana has plans for varying the spacing distance according to the depth of the well.[103] The Federal Government leaves approval of well spacing and well location programs to the Geological Survey which will give due consideration to the geological and engineering characteristics of the field.[104] The size of the leases, the fact that search for oil offshore is directed mainly at salt dome formations which usually have little lateral expanse, and the prevalence of large companies as offshore operators--these factors too tend to lessen the likelihood of wasteful well drilling in the Continental Shelf area.

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[101] Personal letter from William J. Murray, Jr., Railroad Commission of Texas, dated July 7, 1954. The East Texas field had approximately 25,000 wells drilled. Under field rules for the late 1930's only 13,300 wells would have been drilled. Were the same field being developed today, 6,650 wells would probably suffice to drain the field.

[102] Ibid.

[103] State of Louisiana Department of Conservation, Statewide Order No. 29E (Proposed).

[104] 30 C.F.R. 250.17.

Restriction of Production to the Maximum Efficient Rate

As conservation engineers have become more familiar with the relationship between pressure maintenance and petroleum recovery, they have developed methods of gauging, with reasonable accuracy, the production rate for each pool and well that will result in the greatest total recovery. This optimum withdrawal factor is known as the "maximum efficient rate." This is a technical factor and has nothing to do with considerations of market demand and price. Good conservation practice and equity call for strict regulation of production to this engineering optimum.

The Railroad Commission of Texas determines a MER for each well drilled in the State, including the offshore, as soon as sufficient reservoir information has been assembled. No well may be produced in excess of the MER, although this factor may be changed as technical conditions warrant.[105] The Louisiana Department of Conservation does not use the MER to allocate production. Louisiana establishes the allowable production for offshore wells on the basis of well depth only.[106] The United States Geological Survey is empowered to determine the potential capacity

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[105]Testimony of William J. Murray, Jr., Railroad Commission of Texas, Hearings on S. 1901, p. 143.

[106]State of Louisiana, Department of Conservation, Order No. 151, September 24, 1948, and Production and Proration Order No. 7, June 23, 1955.

(MER) and to fix the permissible production for each well drilled on the Federal offshore lands when such action is necessary to prevent waste.[107] While no rigid formula is used to determine the optimum production rate, the Oil and Gas Supervisor in charge presumably attempts to apply all applicable engineering factors.[108]

Compulsory Submission of Well Data

A wealth of geological information is turned up by the drilling bit. In the absence of rules to the contrary, the operator doing the drilling could carry this information to his grave, causing subsequent unnecessary drilling to get the underground information already discovered but not revealed. Of course, it is only fair that the information so revealed be considered confidential until public release would not be prejudicial to the interests of the operator supplying the information.

Each of the governmental agencies charged with the leasing of Gulf of Mexico offshore lands requires that driller's logs and/or electric logs be filed on all discovery wells drilled on their leases.[109] As landowners the State

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[107] 30 C.F.R. 250.16.

[108] Personal letter from E. W. Henderson, Oil and Gas Supervisor, Gulf Coast Region, United States Geological Survey, New Orleans, Louisiana, dated May 6, 1955.

[109] The requirements are found in 30 C.F.R. 250.37(c); Texas General Land Office, Oil and Gas Lease Form, August 6, 1953; and Louisiana Department of Conservation, Statewide Order No. 29-B, February 23, 1955, Sec. IV.

and Federal Governments have a direct pecuniary interest in collecting all underground information relating to their leases. It is unfortunate that Texas and Louisiana do not require that well data on wells drilled on private leases be submitted for filing in public geological archives, as does Oklahoma.

Compulsory Unitization

Nearly all students of petroleum economics agree on the desirability of unitization[110] but not on the means.[111] Most believe that some form of compulsion is needed[112] to gain the advantages of unitized operations. Chief among these are:

1. Economies resulting from the abolition of competitive drilling.
2. Reduction of manpower needs and costs in producing the field.
3. Greater production from scientific well spacing and better control of reservoir energy.

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[110]Unitization is the development and operation of an entire pool as a single unit. One operator conducts all operations as specified in the unit agreement, and costs and benefits are allocated among the various interest holders.

[111]Eugene V. Rostow, A National Policy for the Oil Industry (New Haven: Yale University Press, 1948), p. 51.

[112]In 1945 Oklahoma passed a mild form of compulsory unitization. Arkansas followed in 1951. Most observers agree on the success of the program thus far.

The submerged lands are ideally suited for unitized development. In most cases there will be only one royalty owner to satisfy; with the large leasing blocks and the relatively small number of offshore operators, the holdings in each pool will not be widely diversified; the higher costs per well in offshore drilling offer further incentive to reduce the number of wells drilled. Thus far in the submerged land development many of the companies have formed joint ventures on their own for the purpose of buying and developing leases.[113] However, it would be wise to have compulsory unitization laws or lease contract agreements to eliminate the chance of hold-outs.

The Outer Continental Shelf Act provides for compulsory unitization in the submerged lands if the Secretary deems unitization necessary in the interest of conservation.[114] Such agreements may be initiated by lessees or they may be required by the Secretary.[115] The regulations controlling such agreements are the same as those used on land areas owned by the Federal Government.[116]

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[113] One example is the C.A.T.C. Group, composed of the Continental Oil Company, Atlantic Refining Company, Tidewater Associated Oil Company, and Cities (Service) Producing Company. This association has participated in many joint ventures over a period of several years.

[114] Public Law 212, 83d Cong. (1953), Sec. 5 (a)(1).

[115] 43 C.F.R. 201.10.

[116] 30 C.F.R. 226.

The States of Louisiana and Texas do not require compulsory unitization at this time, either on submerged lands owned by the States, upland areas owned by the States, or on private lands regulated by the States. These States permit and encourage unitization, but do not require it. By their failure to pass legislation requiring unitization, where circumstances warrant such consolidation, these States are denied the use of one of the most valuable weapons against physical and economic waste.

Proration

The restriction of petroleum production to the estimates of market demand prepared by the Bureau of Mines, United States Department of the Interior, is a well established exercise of the police power by the member States of the Interstate Oil Compact. Proration to market demand has no necessary relation to the restriction of production to the engineering concept of the maximum efficient rate. As a matter of fact, proration often causes individual wells to be produced considerably below their most efficient rate, or, stated another way, in a technically inefficient manner.

The proration laws were instituted at the request of the petroleum industry and, since the limitation of supply to demand at the existing market price provides a high degree of price stability for the industry, it is believed that these laws, as presently constituted, will remain on

the books until the industry finds it advantageous to have them changed or dropped. It is not the purpose of this study to pass judgment on the virtue of proration to market demand or to weigh its benefits against its shortcomings.

The States of Texas and Louisiana have been members in good standing of the Interstate Oil Compact since that organization was formed in 1935. Accordingly, through the agency of the Railroad Commission of Texas and the Louisiana Department of Conservation, they have enforced and will enforce production allowables for the wells and pools in the Gulf of Mexico.

When the Outer Continental Shelf Act was passed, it carried the provision that, where they were not inconsistent with Federal laws and regulations, the civil and criminal laws of each adjacent State were declared to be the law of the United States for the subsoil, seabed, and structures of the Outer Continental Shelf.[117] The Act also specifically authorized the Secretary of the Interior to cooperate with the conservation agencies of the adjacent States in the enforcement of these laws. Accordingly, the Secretary has accepted the production allowables established by the States of Louisiana and Texas for wells drilled on Federal leases seaward of those States.[118]

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[117]Public Law 212, 83d Cong. (1953), Sec. 4(a)(2).

[118]Personal letter from E. W. Henderson, Gulf Coast Oil and Gas Supervisor, United States Geological Survey, New Orleans, Louisiana, dated May 6, 1955.

Summary

The Governments owning and administering the submerged petroleum lands of the Gulf of Mexico utilize much the same procedures. Lease blocks are offered for sale with interested parties offering sealed bids open only on the amount of the cash bonus per acre. Although this is the present practice, the Federal Government did not follow this plan until 1953 with the passage of the Outer Continental Shelf Act. The land area which may be leased varies in size: the Federal Government permits a maximum single lease of 5,760 acres off Texas; Louisiana's maximum is 5,000 acres; the Texas School Land Board has set maximums of 640 acres out to three miles and 1,440 acres beyond that point. However, none of the governments place a limit on the number of leases that can be purchased.

Included in the bids are provisions for royalty payment, now usually 16 2/3 per cent; for payment of a specified delay rental, lately $3 per acre for Texas and the Federal Government; and for a minimum price on the cash bonus per acre. In the sales thus far conducted the governmental units have received increasingly larger cash payments per acre. The leases have for the most part been only for oil and gas; other mineral resources, notably sulphur, require separate leasing.

Perhaps the most outstanding difference between

State and Federal areas lies in the taxes that are imposed: in the Outer Continental Shelf area the Federal Government imposes neither property nor severance taxes.

Aided by favorable physical and land ownership patterns in the offshore, the operators tend to accept developmental features that have proved advantageous elsewhere. These include efficient well spacing, production not in excess of the maximum efficiency rate, and voluntary unitization. With compulsory unit development the Gulf of Mexico operations may approach the efficiency reached in the Middle East and South American oil provinces.

CHAPTER VII

PRECEDENTS SET BY THE SUBMERGED LANDS ACT

The Submerged Lands Act of 1953 gave to the littoral States title to and control over the belt of marginal sea out to the undetermined State boundaries. The failure to delineate definitely the extent of the States' ownership assured much expensive and unnecessary litigation.[1] In fact, the boundary problem may retard development of a portion of the Continental Shelf.

Congress indisputably had authority to alienate these lands but there was little precedent to guide them in their decision. No nation had undertaken to solve the many new problems encountered in drilling oil wells in the open sea. And no matter what decision Congress made in this intricate, highly complex matter, new precedents would have been established--certainly in domestic affairs, perhaps in

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[1]United States Attorney General Herbert Brownell, Jr., foreseeing a protracted and useless squabble, asked Congress to draw definite boundary lines. Hearings on S. J. Res. 13, p. 926. Texas Attorney General Ben Shepperd, after the Holland Bill was passed, said that it was almost certain that Texas would have to go to court to establish its claim to three leagues into the Gulf of Mexico. Oil and Gas Journal, July 19, 1954, p. 75.

international affairs.

From an economic point of view, the legal question of land ownership, Federal, State, or private, is not so important as the effect that the ownership on these different levels will have on the conservation of the land and water resources and the availability of those resources for multiple use. The protection of the resources of man's physical environment against waste, including misuse, non-use and partial use, is now a major problem of civilization. If State or private ownership will best accomplish this many-faceted goal, resource ownership should be vested in State or in private hands. If the complex problems of conservation and multiple land use can be solved only by co-ordinating and centralized control on a regional or national level, any policy that could result in the permanent alienation of our public lands should be suspect. Once the Federal public lands pass into other hands, it would be difficult if not impossible to reclaim them, however much the economic well-being of the nation might be benefitted by the recovery of such lands.

International Aspects of the Offshore Oil Legislation

The recognition by the Holland Act of State authority beyond the traditional three mile limits of national sovereignty placed the United States in an embarrassing

position in its relations with foreign nations. Though it is in the best economic and military interests of the United States to have the sovereignty of other nations restricted to three miles from land, we cannot expect to restrain others from doing what we do ourselves.

The Development of the Three Mile Concept of the Marginal Seas

Debate over the question as to how far the sea can be subjected to sovereignty began in the Middle Ages and still goes on. Appeals to divine, natural, Roman and "international" law have been made to support or combat claims of particular nations to exclusive sovereignty over greater or lesser stretches of ocean. Legal writers have been inspired primarily by the material interests of their nations in the right to share, control or monopolize commerce and fisheries in the various marine areas of the world.[2]

However, even nations favoring freedom of the seas readily admitted that states had some legitimate interest in the marginal waters immediately adjoining their shores. While not unanimously accepted, a norm of three miles, the limit of a cannon shot in the early Eighteenth Century, won growing support as the outer boundary of sovereignty.[3] The

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[2]P. E. Corbett, Law and Society in the Relation of States (New York: Harcourt, Brace and Company, 1951), p. 120.

[3]Ibid., p.122. The first important departure from the three-mile rule occurred in 1951 when the International

three mile limit became "international law" to the extent that the naval powers of the world found it in their interests to go along with such limitation and enforce it on others.

The Interest of the United States in Preserving the Three Mile Sovereignty Concept

The United States Government has consistently supported the three mile concept and has vigorously objected to claims of other nations to broader limits.[4] This concept of the freedom of the seas also applies to the freedom of the air spaces above the seas. Any policy change which would place the United States in a position of limiting the freedom of the high-seas and air-lanes is believed to be detrimental to the national interests of this country.[5]

National Defense Consideration

The time honored position of the United States Navy is that the greater the freedom and range of its warships

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Court of Justice ruled ten to two in favor of recognizing Norway's jurisdiction over the marginal sea four miles out from a straight line that was drawn from point to point on its irregular fjord-cut shore. International Court of Justice, United Kingdom v. Norway, December 18, 1951.

[4]While a steadfast champion of the three mile limit for territorial waters, the United States has extended its own jurisdiction for specific purposes beyond this limit in many instances, mostly dealing with customs regulation or the protection of aquatic animals or fishes.

[5]Statement of Jack B. Tate, Deputy Legal Advisor, Department of State, Hearings on S. J. Res. 13, p. 1053.

and aircraft, the better protected are the security interests of the United States.[6] It must be noted that the sword cuts both ways, as the fixing of the seaward boundaries of all nations at three miles also determines how near foreign warships and aircraft may lawfully approach the shores and harbor installations of the United States. However, as long as the United States remains a strong naval and air power, the Defense Department believes that it can keep potential enemies well away from the American shores.[7] The maintenance of such defense zones, of course, would be based upon the exercise of power rather than on the workings of international law.

Fisheries

The extension of national sovereignty into the high seas may also constitute a grave threat to the fishing industry of the United States. American fishing fleets range far from domestic waters in search of good fishing grounds.[8] For generations New England fishermen have made their most prolific catches in the waters off Nova Scotia and Newfoundland. The West Coast tuna fleets in recent years have

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[6]Letter of Undersecretary of the Navy Francis P. Whitehair to Rep. Celler, appearing in Hearings on S. J. Res. 13, p. 135. This policy showed its advantages in the United Nations warship patrol of Korea Bay and the Formosa Strait.

[7]Ibid.

[8]The 1951 offshore catch was valued at $345 million. Hearings on S. J. Res. 13, p. 307.

secured the greater portion of their yield from the seas contiguous to the Pacific coasts of Central and South American Countries. Much of the salmon catch by the Puget Sound fishing fleet is made in waters adjacent to the Canadian mainland.[9] Gulf Coast shrimp fishermen have expanded their operations south along the coasts of Mexico, to the great discomfort of our Gulf of Mexico neighbor.[10] American fishing interests have consistently opposed any change in the United States policy that will endanger their access to these fishing grounds.[11]

The Submerged Lands Act as a Justification for Foreign Claims

President Truman in his Proclamation of September, 1945, made a careful distinction between the "natural resources of the subsoil and seabed" and the high seas above

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[9]Statement of W. M. Chapman, U. S. Congress, House, Hearing of the Subcommittee on Fisheries of the House Committee on Merchant Marine and Fisheries, 81st Cong., 2d Sess. (Washington: Government Printing Office, 1950), p. 11.

[10]Christian Science Monitor, March 5, 1953. In early 1953, Mexican naval forces, claiming jurisdiction to three leagues into the Gulf of Mexico, seized United States shrimp boats found fishing in the waters between three statute miles and nine nautical miles seaward of various parts of Mexico. The United States Department of State promptly protested the seizure, holding that citizens of the United States had a right to fish these waters without molestation by the Mexican Government. The matter is still unsettled.

[11]Statement of John J. Real, Fishermen's Cooperative Association, Hearings on S. J. Res. 13, p. 308.

the ocean floor.[12] The Submerged Lands Act, in tacitly recognizing the complete sovereignty of Florida and Texas in the Gulf of Mexico out to three leagues, provides justification for even more extravagant claims by other nations in their adjacent seas and removes any ground for protest by the United States concerning such extension of sovereignty.[13] However, in the Outer Continental Shelf Act, Congress carefully used the wording of the 1945 Proclamation.[14]

The Future of Federal Lands

The consensus of opinion on the effect of the offshore quitclaim measure was that a precedent had been established that would aid the claims of other States to the minerals, timber, and grassland resources of the public domain. One Senatorial supporter of the quitclaim remarked: ". . . The underlying principles and conditions involved in the tidelands issue are identical to those involved in subsurface rights in the public lands. . . ."[15] This stand was

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[12]Presidential Proclamation No. 2667, September 28, 1945.

[13]Letter of Thruston B. Morton, Assistant Secretary of State, to Senator Jackson, dated March 6, 1953, Hearings on S. J. Res. 13, p. 1088. At the time the Act was passed, the United States was protesting a Soviet claim of 12 miles out in the Bering Sea as well as Mexico's claim. Washington Post, March 14, 1953.

[14]Public Law 212, 83d Cong., 1st Sess., Sec. 3(a) and (b).

[15]Statement of Lester C. Hunt, Senator from Wyoming, Hearings on S. J. Res. 13, p. 874.

also affirmed by Senator Butler, chairman of the Senate Interior and Insular Affairs Committee: ". . . When the tidelands question is settled, there are plans for the introduction of a bill which will make the same theory applicable to the public lands now held by the Federal Government within the States."[16]

Even opponents of the quitclaim measure agreed that the Act would set such a precedent: ". . . Quitclaimism, whereby the United States would be persuaded to renounce blindly to States sovereignty over millions of acres of seaward lands, would lead to the ultimate destruction of all Federal conservation, public land, and public power policies. . . ."[17] This trend is climaxed in the statement by Secretary of the Interior McKay to the Western Governors' Conference that the main objective of the Administration's public land policy was to accomplish the transfer of the public domain to private ownership.[18]

The United States still possesses 460 million acres of unreserved and unappropriated public land, 170 million acres in the fourteen public land states and 290 million acres in Alaska.[19] Any estimate of the value of these lands

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[16] Congressional Record, March 30, 1953, p. 2600.

[17] Statement of Representative Peter W. Rodino, Jr., Congressional Digest, December, 1953, p. 297.

[18] New York Times, November 3, 1953, I, 25.

[19] Department of Interior, Years of Progress 1945-

would be in tens of billions of dollars,[20] with changing conditions and technological progress increasing the value in the future. Would it be in the national interest to dispose of these lands?

Many students of the problem agree that Federal ownership is not the ideal solution. Still, local pressures for quick development of the forest and grazing lands would be almost impossible for the States to resist; ultimate results of over-grazing and overcutting might be soil erosion, downstream flooding, and siltation.[21] That such conditions are not figments of imagination may be seen by examination of the conditions that led to the Taylor Grazing Act of 1934:

> . . . On the western slope of Colorado and in nearby States I saw waste, competition, overuse, and abuse of valuable range lands and watersheds. . . . Farms and ranches everywhere in the range country were suffering. . . . Valuable irrigation projects stood in danger of

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1952, p. 89. In 1950 the Federal public domain had 457,600,000 acres in Continental U. S. and 465,000,000 in Alaska. Hearings on S. J. Res. 13, p. 873.

[20]One anti-quitclaim source valued the coal and oil shale deposits in the public lands at $980 billion. At a royalty of ten per cent and after the deduction of 37½ per cent that goes to the State in which the resource is produced in lieu of taxes, over $61 billion would accrue to the Federal Government from coal and oil shale alone. "The Offshore Oil Bill--a Trillion Dollar Principle," New Republic, April 13, 1953, p. 7. See also former Secretary of Interior Chapman's estimates of more than a trillion and a half dollars. Hearings on S. J. Res. 13, p. 976.

[21]Personal conversation of author with Senator Paul Douglas, May 18, 1953.

ultimate deterioration.[22]

One editor, sympathetic to the idea of State or private control of present Federal land, nonetheless remarked: ". . . I have observed that selfish interests are able to make a greater impression on state governments and agencies than on Federal [ones]."[23]

From such evidence it is difficult not to conclude that transfer of the public domain under the precedent set by the Submerged Lands Act would result in greater national harm than immediate local benefit.

Mineral Rights

Attempts to wrest ownership and control for the States of all mineral rights in the Federal public domain were revived in 1953 by the Hunt Bill[24] and the Malone Amendment to the Holland Bill.[25] Although the bill failed to pass and the Malone amendment failed to get out of committee, there was considerable support for the principle.[26]

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[22]Remarks by Congressman Taylor, staunch States' rights advocate. Congressional Record, 76th Cong., 3d Sess. (1940-1941), LXXVI (Appendix), p. 4198.

[23]George L. Petersen, editor of Minneapolis Star, quoted in "Natural Resources--Whose Responsibility," Field and Stream, June, 1954, p. 105.

[24]S. 107, 83d Cong., 1st Sess.

[25]Hearings on S. J. Res. 13, p. 909-10.

[26]The Malone Amendment was defeated in Committee by only three votes. Washington Evening Star, May 5, 1953.

Grazing Lands

Under the Taylor Grazing Act, permits are issued for ten year terms, renewable if the Department of the Interior believes grazing is not damaging the land. Meanwhile the government aids the permit holder in numerous ways.[27] In 1953, at the instigation of a small group of the larger livestock operators, legislation was introduced that would give the permittees a vested right to these leased lands.[28] Under the proposal, grazing permits could have been bought and sold and grazing regulations would have been formulated by stockmen's committees.

Representative D'Ewart[29] argued that a tenant is not likely to improve a property if he does not have the assurance of tenure and some degree of control over the land use.[30] Opponents of the D'Ewart bill pointed out that the

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[27]The government prevents trespass, reseeds denuded areas, controls noxious weeds, and provides fire protection.

[28]H. R. 4023, introduced by Representative D'Ewart (Rep.) of Montana, and S. 1491, introduced by Senator Barrett (Rep.) of Nebraska. These were identical bills.

[29]It is of interest to note that Mr. D'Ewart, in October, 1955, was appointed as Assistant Secretary of the Interior, in charge of public lands, national parks and Indian affairs. The appointment as guardian of the public lands of the man best known to the nation for his attempt to turn control of these very lands over to the cattlemen was condemned by the opposition press as a case of setting the fox to watch the chickens. "Giveaway McKay Hires a Helper," Democratic Digest, November, 1955, p. 85.

[30]Representative Wesley A. D'Ewart, Congressional Digest, December, 1953, p. 298.

primary objective of Federal ownership and control of the Western lands would be defeated by the legislation. The stockmen could overgraze with impunity to the detriment of the entire Western economy.[31] The proposal was defeated.

The Future of Federal Proprietary Activities

In addition to the attempted alienation of the surface and mineral rights in public lands, there has been a concerted drive by interests hostile to Federal proprietary activities to accomplish disposal of Federally owned power generation and transmission facilities and sites, synthetic rubber and petroleum plants, and other assets. Proposals have ranged from exchanging Government bonds "for stock in new companies to spring from presently Government-owned plants,"[32] to the transfer of such Federal activities and facilities to State or local governmental units.[33]

We will not review here the many individual proposals designed to halt the proprietary activities of the

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[31]Robert W. Sawyer, Congressional Digest, December, 1953, p. 299. Mr. Sawyer is the spokesman for the American Forestry Association.

[32]Proposal by Charles E. Wilson, President, General Electric Company, quoted in The Economist, April 11, 1953, p. 87.

[33]The multi-pronged attack on governmental enterprise is adequately presented in the first Hoover Report. U.S. Commission on Organization of the Executive Branch of the Government, Final Report to the Congress (Washington: Government Printing Office, 1949), passim.

Federal Government.[34] They deserve mention only because they spring from the same community of thought that was responsible for the Submerged Lands Act.

Summary

The extension of full sovereignty beyond three miles into the Gulf of Mexico by Texas and Florida has made it difficult for the United States Department of State to oppose the claims of other countries to areas more than three miles from their shores. The military and commercial interests of the United States would be served best by a retention of the traditional "freedom of the seas" beyond three miles.

Support of the quitclaim measure by Congressmen from inland States was based on their expectation that the precedent set by such legislative action would apply to the whole public domain. The entire question of Federal control and administration of grazing and mineral lands and reclamation areas seems to be on the brink of re-examination if not of repeal.

Both domestically and internationally the action taken in the Submerged Lands Act may have bred more problems than it solved.

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[34] Among these are the withdrawal of the Federal Government from the development of the Snake River along the Idaho-Oregon border in favor of the Idaho Power Company (Business Week, August 13, 1955, p. 28), the sale of twenty-five of the twenty-seven government owned synthetic rubber plants to private industry (Ibid., May 7, 1955, p. 184), and the shutting down of the Bureau of Mines pilot plants engaged in research on synthetic petroleum (Congressional Record, May 7, 1953, p. 1193).

CHAPTER VIII

SUMMARY AND CONCLUSIONS

Summary

The controversy over ownership of the marginal sea lands was but one phase of the continuing struggle regarding the activities of the central government in the nation's economy. State ownership advocates contended that familiarity with local conditions, plus experience in leasing and regulation, meant greater efficiency and economy under State procedures. Proponents of Federal ownership argued that uniform administration by one agency less susceptible to local pressures insured the greater protection of the public welfare. Sincere, intelligent men were found on each side.

Prior to 1938 leasing of offshore areas was a State function; in numerous instances the Federal government secured leases in such areas from the States. In that year, however, Secretary Ickes cast doubt on the legitimacy of State ownership by his refusal to deny applications for Federal leases on these lands. His point of view was later vindicated in three separate Supreme Court decisions which denied State ownership of the offshore lands and upheld the

"paramount rights" of the Federal government in such areas. Yet, the Federal government had no statute under which it could operate the submerged lands, and Congress was not disposed to remedy this deficiency. Twice President Truman vetoed bills which would have quitclaimed the disputed lands to the coastal States.

This legislative-executive stalemate was broken by the election of General Eisenhower in 1952. Assured of Presidential support, Congress successfully passed the Submerged Lands Act in May 1953, and the Outer Continental Shelf Act in August 1953. The former made provision for unobstructed State ownership within "historic State boundaries"; the latter affirmed Federal ownership from State boundaries to the edge of the Continental Shelf. The Supreme Court upheld the Submerged Lands Act by stating that the power to dispose of property belonging to the United States "is vested in Congress without limitation." Although State ownership supporters hailed the victory as irrevocable, there are signs that the controversy is not completely settled.

For one thing a later Congress might repeal the Submerged Lands Act. In view of the claims advanced by certain groups in inland States for ownership of Federal lands in their respective States, leaders of the Federal ownership faction could possibly rally enough support to abrogate the precedent set by the Act. Too, impetus from the State

Department because it is embarrassed in international negotiations by our overriding of the traditional three-mile limit might lead to revision of the Submerged Lands Act. Both repeal and revision have been subjects of bills at least once since the passage of the Act.

During the long political controversy, estimates of the value of the resources in the marginal sea area were distorted, often for partisan purposes. Divergent estimates ranged from zero to one trillion dollars. Most were based on one of four resource appraisals made by competent geologists. The variations can be explained by a lack of uniformity (1) in delimiting geographical areas, (2) in selecting what resources would be included, and (3) in setting a standard money value per unit. Two further causes for the variations are (4) that the meaning of the term "reserve" ranged between the extremes of ultimate reserves and proved reserves, and (5) that the valuation varied from the gross value of resources in place to the net value after costs of production.

The geological experts agreed that the bed of the Gulf Coast marginal sea was potentially promising in oil, gas and sulphur, comparing favorably with adjacent onshore strips. A reasonable measure of value, using minimum expectations which are based on current prices, indicates that the entire Continental Shelf area seaward of Texas and Louisiana would bring a return to the owning governments of

approximately $7.9 billion. For the State-owned areas in this region, the return would be approximately $0.9 billion.

The resources of this almost virgin territory are of no practical value unless they can be economically extracted; at least one developmental cost is reported to be significantly less than that on land. The costs of marine seismic survey, the principal method used, are only 50 to 75 per cent as much per profile as comparable land survey. The possible saving on lease acquisition costs is unknown, primarily because land leases may include hidden costs, such as those for title clarification and defense of damage claims. Since the offshore lessee can secure relatively large lease tracts free from these additional costs, it is possible that lease costs offshore may be appreciably less than those on land.

The cost of drilling an offshore well under present technology may be but slightly more than the cost of comparable onshore drilling, or it may be as much as five times more. Factors causing the variation in cost are depth of the water, method of drilling used, depth of the well, and number of wells drilled from each location. There is evidence also that the production costs per well are higher. However, the significant figure which determines whether the offshore oil can be economically produced is not the cost per well but the cost per barrel of oil or per 1,000 cubic feet of gas. Unfortunately, satisfactory data are not

available on the costs per unit of production, either offshore or onshore.

Institutional patterns of oil production afford certain economies peculiar to the offshore development, economies which probably offset the higher cost per well. Normally the lease blocks in the offshore are relatively large with no limit on contiguous purchases, and because of single ownership of the entire area there should be little necessity for competitive offset drilling, a major bane of onshore producers. Fewer wells per field should be needed and these can be spaced as dictated by conditions of optimum production efficiency. The acknowledged high cost of platforms is offset by directional drilling in which several wells can be drilled from one platform, or by the use of mobile units in which no drilling platform is needed.

Offshore operations have the same risks as those onshore, plus some that are unique. In both places the operator runs about equal chances of drilling dry holes, or experiencing a blow-out or fire. The consequences of the latter two onshore and offshore may not be equal. Offshore, however, the operator has to contend with the action of sometimes over-violent waves and wind, the hazards of collision with for-or storm-bound vessels, and the possibilities of wartime attack on his vulnerable installations. The device of casualty insurance, private or public, the latter covering war damage, is available or probably will be

available to offset these unique marine perils. Furthermore, drilling experience onshore and offshore reveals a pattern of success in both exploratory and developmental ventures, the number of successful wells being proportional to the number drilled.

Authorities generally agree that offshore petroleum will find a market. The expected growth in domestic population accompanied by the probable increased utilization of the internal combustion engine and the probable continuing upsurge in the natural gas and petro-chemical industries indicate an ever-increasing demand. It is not known how much of this increased demand will be filled by imported oil and nuclear energy. Many experts maintain that foreign oil and nuclear energy will supplement rather than displace domestic petroleum. Barring any radical changes, the workings of the Interstate Oil Compact Commission will provide a high measure of price stability for the petroleum industry, offshore as well as onshore. The State of Louisiana has allowed greater daily production per well offshore than onshore; Texas treats each case on its merits in separate hearings, and it is believed they often give the same special dispensation. Under present regulations the special allowables set by the States extend into the Federal area.

The lease blocks in the offshore have been of much greater size than the average tracts on land. Louisiana lease blocks are of 5,000 acres; those in Texas territory

are of 640 acres inside the 3-mile limit and 1,440 acres beyond this point; Federal blocks are of 5,760 acres: in none of these jurisdictions is there any limit to the number of blocks owned by a lessee. This last provision, as it applies to Federal areas, is in answer to one of the major objections against Federal leasing practices under the Mineral Leasing Act of 1920. Under that act the government was more fearful of monopoly than eager for the most efficient, economical development.

In the various sales made by the States and the Federal Government since 1953, the general price trend has been upward. The sealed bids offered to the lessor by various interested parties have brought the cash bonus bids from less than $25 per acre in the late 1940's and early 1950's to more than $300 per acre in Federal lands and to more than $800 per acre in one Louisiana sale. At the same time, delay rentals have begun to assume the fixed figure of $3 per acre and royalty payments have increased from 12 1/2 to 16 2/3 per cent.

The income to the governmental landlords is increased beyond these payments by their taxing power. Although there is no severance tax as yet in the Outer Continental Shelf area, the States collect that type of tax in their respective areas. On both State and Federal lands the income tax provisions prevail, but as on land, the combination of the depletion allowance and the right to charge intangible

drilling and development costs to current expense gives a significant tax advantage to the petroleum producer.

Since the offshore oil lands in question have only three owners, protective covenants, which cause much wasteful competitive drilling onshore, are of minor importance. Well aware of this waste, the large oil companies will voluntarily space their wells according to the best available engineering planning and produce no more than the maximum efficient rates. In fact if self-interest does not motivate such practices, the governmental owners can compel well spacing. Indeed the U. S. Geological Survey has the power to force unitization in the outer Shelf. Thus far, Texas and Louisiana do not have compulsory unitization statutes.

The overall effects of the Submerged Lands Act are not limited to the nominally disputed lands. It is believed by the State Department that the Act has ramifications that will work to the detriment of the United States in maintaining freedom of the seas, a heretofore cardinal policy of the State and Defense Departments. States' rights proponents and special interest factions have used the Act as a stepping stone in their bid for the relinquishment of Federal control of public lands and Federal proprietary activities.

Conclusions

It seems likely that the warnings offered by the

State Department and by various Congressmen about the dangerous precedents inherent in the Submerged Lands Act may have merit. This Act, which recognized the sovereignty of Texas and Florida to lands beyond the traditional three-mile limit, offers possible warrant for other nations to assert sovereignty over the high seas contiguous to their coast. The gains made by the Gulf States may eventually cost the nation dearly in loss of military and commercial mobility. Had the Submerged Lands Act clearly limited the Gulf States to the subsoil and subsurface of the Continental Shelf beyond three miles, as was done in the Outer Continental Shelf Act, the State Department would not face the dilemma it now does.

On the domestic scene, Congress may use the Submerged Lands Act as the precedent for disposition of inland unreserved Federal lands and other Federal assets. Certain legislators from the inland States supported the Holland Bill because they wanted such a precedent; without this support and the approval of the President, it is highly improbable that the Coastal States could have secured the passage of the quitclaim.

Although the dollar value estimates of the resources of the marginal sea lands were bandied about carelessly for political purposes, each estimate was founded on an expert appraisal of the physical quantities of the anticipated resource recovery. In their own context the geological

estimates seem reasonable; when used out of context as the bases for dollar valuation, they brought forth strange conclusions. From an examination of what appear to be the most reasonable technical estimates, it is concluded that many billions of dollars will accrue to the governmental owners of the submerged lands.

For a diversified operator with a good backlog of experience and capital, offshore petroleum operations pose no particularly hazardous ventures. Most of the peculiar physical risks are converted to annual fixed costs by casualty insurance; the likely wartime risks would undoubtedly be covered by Federal assumption of damage losses. Because of the "laws" of probability, the diversified operator can predict with reasonable certainty the number of wells that will prove dry holes. While any individual well is a risk, an extensive drilling program will not be a risk for companies large enough to do business offshore. Further, the ability to expense developmental costs and the depletion allowance go far to make up for the losses incurred in drilling dry holes.

From a study of the offshore lease sales conducted thus far, it can be noted in general that the smaller the total area offered in each sale, the higher the average cash bonus bid per acre. With the limited number of oil companies engaged in offshore activities, the offering of too much land at one time has resulted in less competition for

each lease.

It has also been noted that the various leasing governments follow each other's lead on many successful innovations that tend to increase the return to the lessor. When the 16 2/3 per cent royalty fee instituted by the Federal Government proved feasible with no visible reduction in cash bonus payments, Texas and Louisiana were quick to follow. The Federal Government has adopted the States' highly successful leasing procedure in which the royalty is fixed and sealed bids are accepted for cash bonus payment. These bonus payments have a stipulated minimum: $15 per acre by the Federal Government, $5 by Texas and Louisiana. It is believed that the higher minimum price is not high enough, that $15 per acre is insufficient to impede speculative leasing and that a $50 cash bonus would do much to prevent speculation without driving off serious bidders.

Of features which have proved worthwhile although not yet adopted by all three governments, three deserve special mention. First, in order to increase the probable return from resources in its area and to remove the existing inequity between State-owned and Federally-owned lands, it might be advisable for the Federal Government to levy a severance tax in the Outer Continental Shelf. Second, since production not in excess of the MER brings the greatest possible return from a well, Louisiana ought to follow the lead of Texas and the Federal Government and prorate

production per well by this standard. Third, a system of compulsory unitization is needed. At first glance that proposal seems superfluous. Since the oil companies have long clamored for larger lease blocks which could be more economically developed than smaller ones, and since most competent petroleum engineers agree on the greater efficiency of unitized production, it seems likely that the offshore operators will want to adopt voluntary unitization for offshore development. However, there are certain likely areas where disagreement may arise. The boundaries between State and State, or Federal and State, offer one such type area; another is the possible conflict between onshore and offshore development.

An oil field is not circumscribed either by arbitrary property lines or by the shore line itself. For optimum production and efficiency an oil field should be developed as a unit. Even if the offshore operators desire unit development, the provisions in the protective covenants that require competitive offset drilling onshore defeat efficiency. Seemingly the only way to overcome conflicts of this nature is by a State compulsory unitization statute.

Offshore operators seem to agree that the average cost per well offshore at present is more than the cost onshore. However, reliance upon such gross figures tends to obscure the fact that the cost per well is not necessarily the most significant factor. Other factors such as

geophysical costs, lease costs and the proper placing of each well so as to minimize the number of wells needed to drain a reservoir, may be more important from a cost per barrel standpoint. The institutional pattern in the offshore lends itself to maximum efficiency in well spacing, so that five wells offshore may do the work of fifteen onshore. If this were so, and assuming all other costs to be equal, the drilling cost per well offshore could be three times as much as onshore and still have the same cost per barrel. Experience has shown significant differences in geophysical exploration costs in favor of the offshore operator; lease costs may also be less. In this virgin territory, exploratory operations conducted thus far have had an unusually high degree of success.

Although exact statistical data are lacking on the cost per barrel both onshore and offshore, the inference seems sound that the cost must be at least approximately the same in both places. Support is given this inference by the willingness of oilmen to engage in Gulf Coast marine operations. Their eagerness is shown by the surprisingly high cash bonus payments in the offshore sales of 1953 and 1954.

No attempt has been made in this study to decide the justice of the quitclaim to the States of the submerged lands within State boundaries. Regardless of which level of government owns and administers offshore land, the same private companies will conduct the production operations.

The overall availability of petroleum will not be appreciably affected by the ownership pattern.

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