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Costs and Indices for Domestic Oil and Gas Field Equipment and Production Operations 1990 through 1993

July 1994

Energy Information Administration
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Preface

This is the Energy Information Administration's (EIA) twelfth report in the series of oil and gas field equipment and operating costs and indices for the domestic oil and gas producing industry. The purpose of this series is to provide a continuing means of gauging the changes in the oil and gas producing industry's costs of equipment and production operations. The cost data presented in this report are used for analysis and forecasting of U.S. oil and gas supplies by government agencies, the academic community, and the oil and gas industry. This study would not be possible without the cooperation of personnel from service, supply, and oil and gas companies throughout the United States. More information regarding the preparation or contents of this publication may be obtained from Ralph Russell (214/767-2906) or Velton Funk (214/767-0884), both of whom are petroleum engineers in EIA's Dallas Field Office.

All of the tables which appear in this report are available in machine - readable formats (i.e., ASCII or Lotus 1-2-3 ver 2.2). Call Ralph Russell at 214/767-2200.

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Executive Summary

This report presents estimated costs and indices for domestic oil and gas field equipment and production operations for 1990, 1991, 1992, and 1993. The costs of all equipment and services were those in effect during June of each year. The sums (aggregates) of the costs for representative leases by region, depth, and production rate were averaged and indexed. This provides a general measure of the increased or decreased costs from year to year for lease equipment and operations. These general measures do not capture changes in industry-wide costs exactly because of annual variations in the ratio of oil wells to gas wells. The body of the report contains summary tables, and the appendices contain detailed tables.

Price changes for oil and gas, changes in taxes on oil and gas revenues, and environmental factors (costs and lease availability) have significant impact on the number and cost of oil and gas wells drilled. These changes also impact the cost of oil and gas production equipment and operations.

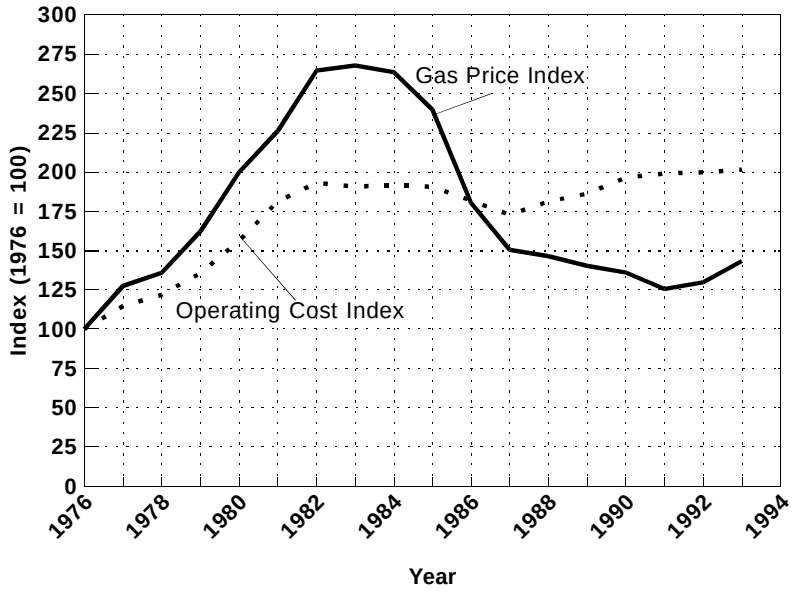
Oil and gas prices rose rapidly from 1976 to 1981, when deflated oil prices peaked at an index of nearly 260. In 1976, the average price of oil was $8.19 per barrel and the average price of gas was $0.58 per Mcf. Deflated gas prices, which also rose to an index of about 260, were at a plateau from 1982 through 1984, before following oil prices downward. The 1993 oil price, following drops since 1990, represented the ninth year since 1976 that deflated oil prices were below those of 1976. By contrast, deflated gas prices have remained above 1976 prices, and have been headed upward since 1991. Clearly, the gas price trends reflect fundamental changes between the markets for oil and gas.

Figure E1, with gas prices and costs indexed to 1976, shows differences from 1976 values of deflated gas prices and deflated operating costs for gas wells. While the period of greatest difference was during 1982 - 1984, the current upward trend in product prices, coupled with stable operating costs, may bring improvements in the potential for producer profitability in future years.

Gas activity has been spurred in recent years by favorable tax treatment (including tax credits for tight formation gas and coalbed methane). Environmental pressures, related to gas production operations are generally less than for oil operations. However, environmental pressures for coalbed leases may equal those for oil, because substantial amounts of water are produced with the gas.

Costs for gas activities were investigated by determining equipping and operating costs for representative gas leases, producing from depths of 2,000, 4,000, 8,000, 12,000, and 16,000 feet in 6 onshore regions of the lower 48 States (see Figure

Figure E1. Deflated Natural Gas Price and Operation Cost Indices



Source: Energy Information Administration, Office of Oil and Gas.

2). The summary tables contain composite costs and indices for flow rates of 50, 250, 500, 1,000, 5,000, and 10,000 thousand cubic feet of gas per day by depth and region.

Current-dollar price changes in gas equipment rose by about 9 percent from 1990 to 1993. This upward price trend seems to signal the end of substantial inventories of equipment which were developed during the early 1980's. Global changes in supplier sources may have mitigated inflationary trends in domestic manufacturing costs, but the path for prices in equipment is upward.

Figure E2, with oil prices and costs indexed to 1976, depicts a difference from the graph of deflated gas prices and operating costs. In approaching peaks in the early 1980's, the rate of increase for oil well operating costs was substantially less than that for oil prices. In contrast to the trends for gas activities, oil prices were much more variable, with a drop from the peak index of 260 to about 80, followed by increases to about 100 and 115. The 1991 to 1993 operating cost trend for oil wells is upward, although at a gradual rate. The trends of Figures E1 and E2 make clear that there are two distinct production domains: gas activities enjoy improving product prices and flat operating costs since 1991; oil activities face dropping product prices and increasing operating costs.

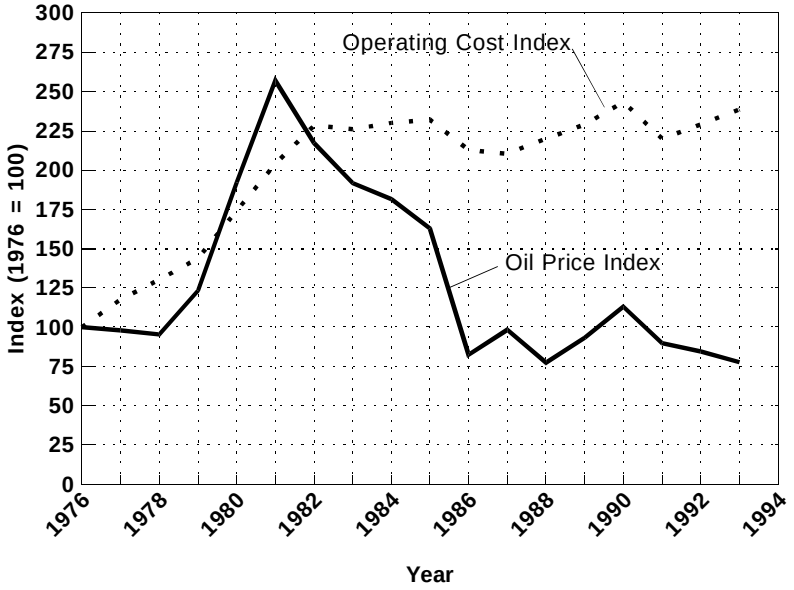
Oil operating costs were estimated by obtaining equipment and operating costs for representative oil leases for 6 onshore regions of the lower 48 States (see Figure 1). Each lease consists of 10 wells producing by primary means (natural depletion) from depths of 2,000, 4,000, 8,000, and 12,000 feet. The aggregate average lease equipment costs for the six regions and four depths increased about 1 percent from 1990 to 1993. Wide fluctuations in tubing prices in the years prior to 1990 masked the trend of other costs. Since 1990, non-tubing costs have risen more than tubing prices.

Costs and indices for additional waterflood oil recovery equipment and its operation were calculated for leases with well depths of 2,000, 4,000, and 8,000 feet in west Texas. Assumptions regarding conversion of primary oil producing leases to secondary recovery (waterflood or water injection) involve:

- the drilling and equipping of 11 water injection wells
- the installation of water supply, storage, treatment, high pressure injection equipment and related piping
- replacement of production facilities with larger equipment.

The Appendices contain detailed information that serves as the basis for analysis of the data. Chapter 3, Discussion of Results, contains summary tables and pertinent graphs which provide the basis for examination of trends.

Figure E2. Deflated Oil Price and Operation Cost Indices



Source: Energy Information Administration, Office of Oil and Gas.

1. Introduction

The Energy Information Administration (EIA) provides interpretive statistics that pertain to the domestic energy industries. The data reported are used to assess the economic effects of specific plans and policies relating to the petroleum industry. This report marks the continuation of the series of equipment and operating costs and indices for oil and gas fields.

Many publications contain data relating to costs in the petroleum industry. For several years, the American Petroleum Institute (API), the Independent Petroleum Association of America, (IPAA), and the Mid-Continent Oil and Gas Association have published annual pertinent cost statistics in their *Joint Association Survey (JAS) of the U.S. Oil and Gas Producing Industry* [1,2]. Section I of that publication pertains to Drilling Costs and Section II (discontinued) presented total U.S. expenditures for exploration, development, and production.

The U.S. Bureau of the Census surveyed a group of companies classified by size and published a report titled *Annual Survey of Oil and Gas*[3] in its Current Industrial Report series. These reports contained oil and gas operating cost data for both direct and indirect expenses but were discontinued.

Other than EIA's, no series of non-aggregated oil and gas field equipment and operating costs and subsequent indices have been published on a regional basis. Equipment and operating costs vary from region to region because of differences in fuel, labor rates, and other related variables. Therefore, equipment and operating costs and indices are estimated by EIA on a regional basis for oil and gas fields.

The costs and indices provided in this report are for representative lease operations with equipment and operating procedures designed by EIA staff engineers for 10 oil wells or 1 gas well per lease. The design criteria took into account the predominant methods of operation in each area. The individual items of equipment were priced by using price lists and by communication with the manufacturer or supplier of the item in each region. Except as mentioned in the Executive Summary and treated in Appendix N, all costs exhibited in this report are current to their year and not adjusted for inflation.

Freight costs and installation costs were determined based on regional rates. These costs were summed for each category of equipment. For example, the category listed as "pumping equipment" for a rod pump system includes:

1. A pumping unit
2. Additional counterweights
3. Crank guards
4. Belt guards, V-belts, and sheaves
5. An electric motor or gas engine

Equipment costs were totaled by region, depth, and/or production rate and presented in summary tables. Operating costs were determined in a similar fashion. Indices were calculated using 1976 as the base year and are also presented in the summary and appendix tables.

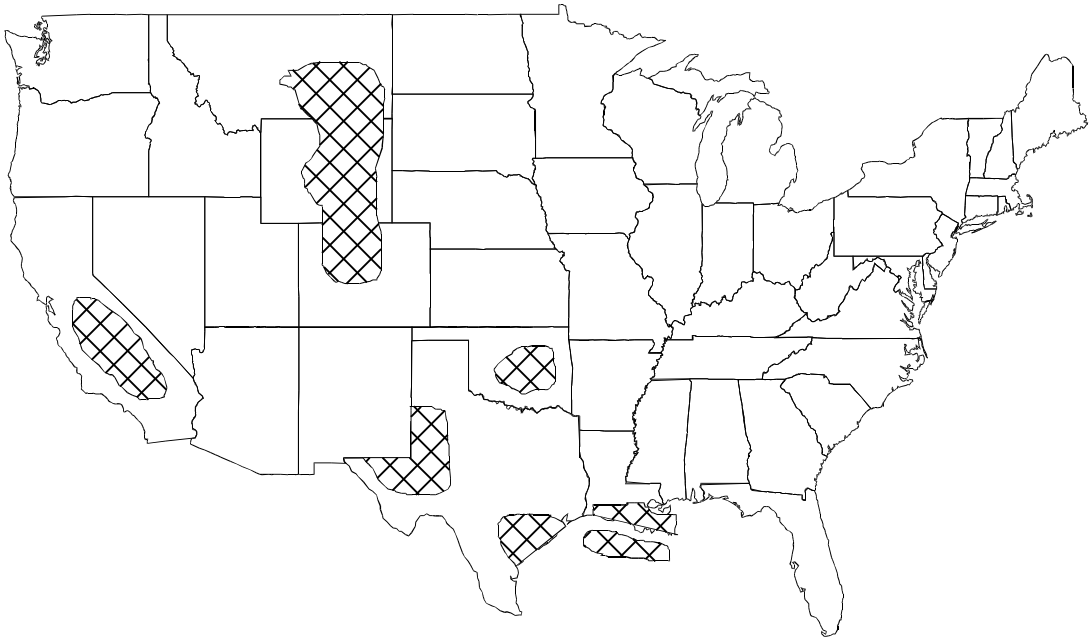
Selected geographical regions are shown in Figures 1 and 2 for oil and gas production, respectively. Each was selected because the operating characteristics were similar and had common major supply centers. Most of the major oil and gas producing regions of the lower 48 States are represented.

[1]American Petroleum Institute, Independent Petroleum Association of America, Mid-Continent Oil and Gas Association, *1992 Joint Association Survey on Drilling Costs.* (Washington, DC, November 1993), American Petroleum Institute.

[2]American Petroleum Institute, Independent Petroleum Association of America, Mid-Continent Oil and Gas Association, *Joint Association Survey of the U.S. Oil and Gas Producing Industry, 1974, Section II: Expenditures for Exploration, Development and Production*, (Washington, DC, May 1976), American Petroleum Institute.

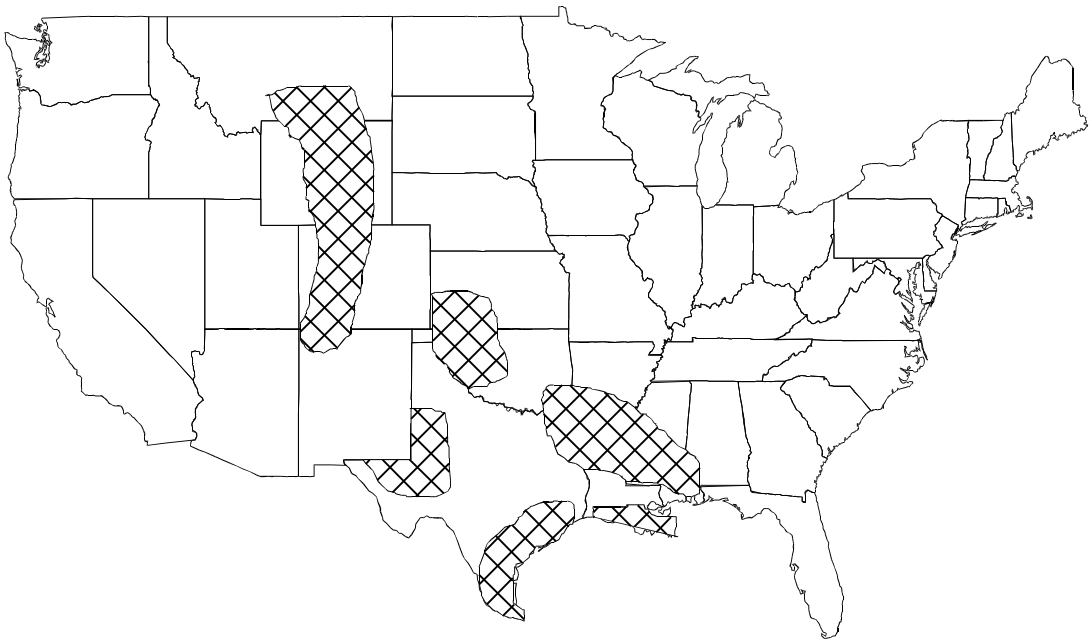
[3]U.S. Bureau of the Census, *Annual Survey of Oil and Gas, 1981*, Current Industrial Reports pub. MA-13K (81)-1, (Washington, DC, March 1983).

Figure 1. Geographical Regions for Oil Producing Leases



Source: Energy Information Administration, Office of Oil and Gas.

Figure 2. Geographical Regions for Gas Producing Leases



Source: Energy Information Administration, Office of Oil and Gas.

2. Indexing Procedure

The leading supply, service, and contracting companies (active in one or more of the regions) were contacted every year (1976 through 1993) for local region (June) prices for their assumed component of equipment or operating function. The objective of this process was to acquire prices that were representative for each region. Total component costs were determined from these prices and summed to permit indexing.

The index numbers of this report are pure cost indices and/or composite indices. A pure cost index measures the change in cost of a fixed quantity of goods and/or services. Pure cost indices are applied to the individual line items presented in the appendix tables. The subtotal and total indices are composite indices. A composite index measures the change in cost of an aggregate of goods and/or services under changing conditions. Any equipment changes that may be made due to technological advances will be reflected in the composite indices. The indices reflect the changes in the costs of the items, their transportation charges and their installation costs on representative leases.

The annual operating cost indices measure the change in direct costs incident to the production of oil and gas and exclude changes in indirect costs such as depreciation, and *ad valorem* and severance taxes.

The indices are calculated with 1976 as the base year as follows:

1993 index = (1993 costs/1976 costs) x 100.

Percent changes can be determined from any year contained in the indices by dividing the last year's index by the first year's index, subtracting one (1.0), and multiplying by 100. For example, to find the percent change from 1992 to 1993, divide the 1993 index by the 1992 index, subtract one (1.0), and multiply by 100.

The estimated region equipment costs for the hypothetical oil leases were summed, averaged, and indexed by depth. This provided a general measure of equipment expenditures relative to depth. The aggregate average cost for all regions and depths were indexed to allow general trend analyses by year. This same procedure was applied to the annual operating costs for the formulated oil leases.

The estimated region equipment costs for the hypothetical gas leases were summed, averaged, and indexed by depth and producing rate to provide a general measure of equipment expenditures by production rate and depth. The aggregate average costs for all the regions, depths, and producing rates were also indexed to allow general trend analyses from year to year. This procedure was also applied to the annual operating costs for the formulated gas leases.

3. Discussion of Results

The summary of composite data and the detailed appendix tables permit analysis of equipment and operating costs for each region, depth, method, and type of production. Some revisions which appear in this report affected equipment costs for the entire series, beginning in 1976. However, these full-history revisions were small. In some cases, the equipment cost revisions reflected a minor change in operating costs. There were no major revisions. The data in this report should be considered as revised, except for the 1993 data, which are preliminary. The following is a discussion of the composite costs and indices.

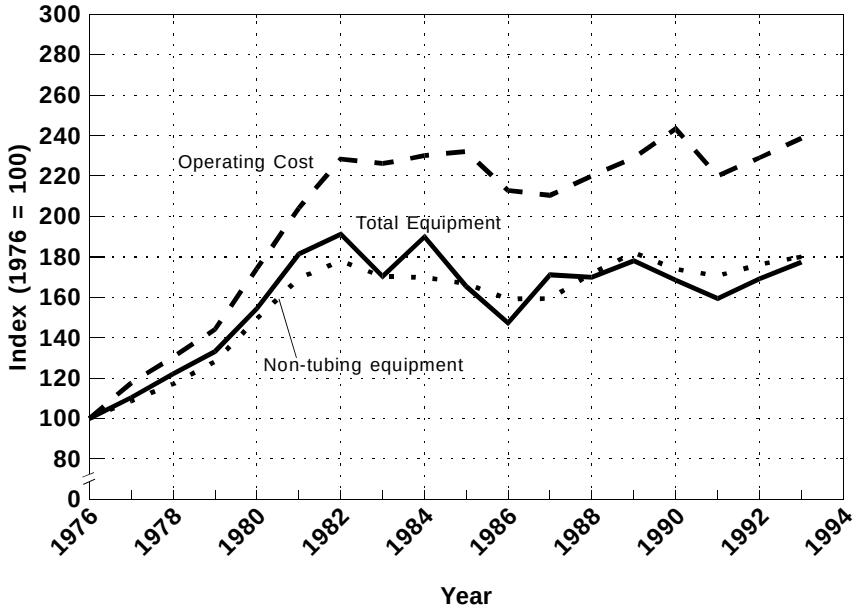
Overview

This report continues a data series which starts in 1976. Combining the data gives a history of equipment and operating costs for oil and gas leases from 1976 to 1993. (See Appendix N for more detailed information). Small revisions were necessary to account for discontinuities in supplier data series, primarily tubulars. The primary result of the changes is focused on the equipment costs for 8,000- and 12,000-foot oil wells. The other notable revisions were the costs of drilling, a component of secondary oil production injection wells.

Figure 3 contains indices of the aggregate average costs for oil well equipment and operations. The data indicate general upward pressure on costs prior to 1982 and relatively stable prices since. The period of rapid cost increases which began before 1976 changed in 1982. The peak year for equipment costs was 1982, followed by prices rising and falling within a range somewhat near the 1982 level. Equipment cost indices for 1993 are still below the 1982 peak, although the upward 1991-1993 trend could lead to a new peak. Operating costs follow a different path. The post-1982 drop was minimal, and the trend break in 1982 has been exceeded six times. The 1993 costs are very near the all-time peak set in 1990. Operating costs have been largely influenced by energy costs (natural gas and electric power) and the costs of oil field services (well servicing units, chemicals etc.).

Figure 4 is a plot of tubing costs for 10-well oil leases. The type of tubing used for deeper wells not only costs more than that used for shallower wells, but price variations have been more extreme. Prices for 12,000-foot wells rose sharply in 1992 and 1993. A more modest increase affected costs for shallower wells.

Figure 3. Aggregate Average Cost Indices for Primary Oil Recovery, 1976-1993 (Operation and Equipment, With and Without Tubing Costs)



Source: Energy Information Administration, Office of Oil and Gas.

Figure 5 is a plot of oil well equipment costs excluding tubing. Contrasting Figures 4 and 5, the non-tubing equipment costs vary much less than those for tubing. However, the 1982 non-tubing equipment costs were nearly double the 1976 costs. Non-tubing equipment costs gradually declined from 1982 through 1987 and have increased since. The 1993 index of non-tubing equipment cost is 181, which is 81 percent higher than the 1976 cost. The non-tubing cost for 8,000-foot wells exceeds that for 12,000-foot wells in a few interim years, an anomaly related to the mixture of pumping equipment types used for 8,000-foot wells.

The availability of well service units (WSUs) is widely used as an indicator of price pressures on operating costs. When the utilization is high, prices of other operating cost items are usually firm. The active WSU count rose from about 2,600 in 1976 to 4,850 in 1981, when activity levels peaked (see Figure 6). Although the 1992 active WSU count was near 1976 levels, the 1993 count showed a substantial increase. Pressure on the well service industry was the result of overbuilding in the early 1980's. With an 8,000 total WSU availability, the portion of WSUs at work in 1985 represented less than 60 percent. In 1986, working WSUs were only 40 percent of those available, and 1993 surveys reflect that 60 percent of the WSUs were working.

Figure 7 contains the equipping and operating cost indices for gas wells (note that gas well equipment costs do not include tubing costs). The index for gas equipment costs increased steadily from 1976 to a peak of 183 in 1982. Lower levels of activity forced the index to a low of 153 in 1986, from which time costs increased, to set new highs each year beginning with 1990. The 1990-1993 annual rate of increase for equipment costs is 2.8 percent. Operating costs have set new highs beginning with 1990. The primary reason for the increase in equipment prices is that the large inventory of gas well equipment that existed in the early 1980's has apparently been depleted. Operating costs rose at a lower rate than equipment costs because of competitive pressures on providers of field services, which are a major influence on overall costs of gas well operation. Furthermore, the use of gas for fuel on gas leases is relatively insignificant, so increasing gas prices had little effect.

Equipment Costs for Oil Leases

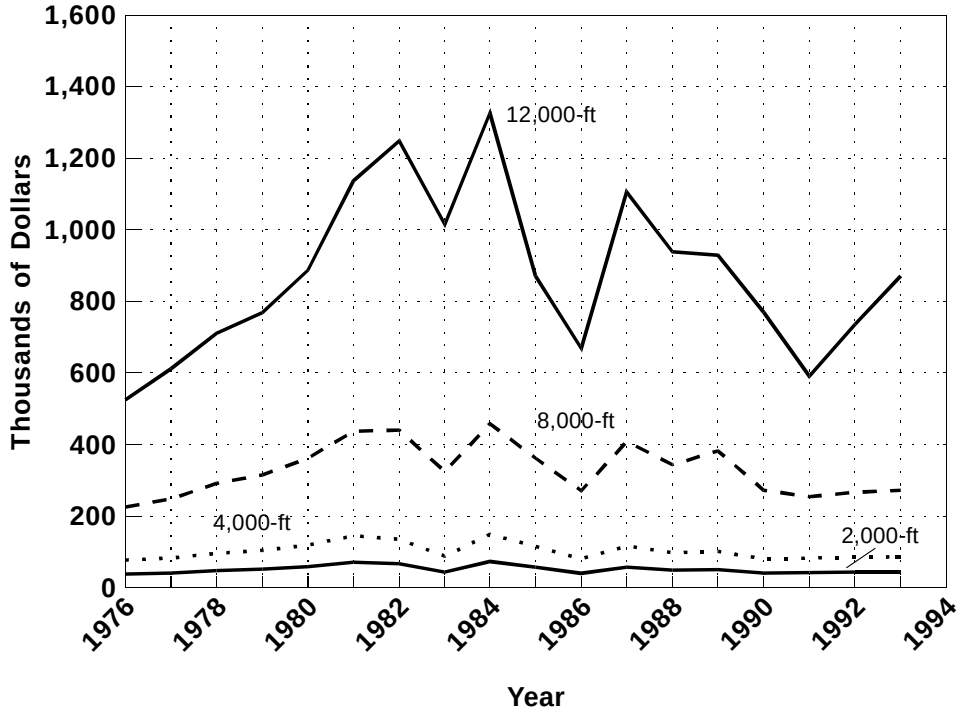
Primary Recovery

Table 1 is a summary of the composite lease equipment costs and indices for primary oil recovery in six onshore producing regions by depth. The trends in costs varied by depth and region. The aggregate (or sum) of the 10-well oil lease equipment costs for the six regions and 4 depths increased by less than 1 percent in the period from 1990 to 1993. Table 1 also presents the average costs and indices of the 6 regions by depth. As shown in Figure 8, the average equipment costs increase with depth. In this figure, the variations by depth by year present slightly dissimilar patterns, as, for example, in the 12,000-foot wells, where the 1991 drop in costs was primarily due to lower costs for tubular goods (see Figure 4). Although there are regional differences in costs for each depth of wells, the range of indexed values is smaller than for operating costs. This is due to smaller regional cost differences for commonly-used materials. For the 3-year period, 1990 to 1993, Rocky Mountain costs rose about 2 percent overall, while west Texas costs rose 7.6 percent.

Secondary Recovery

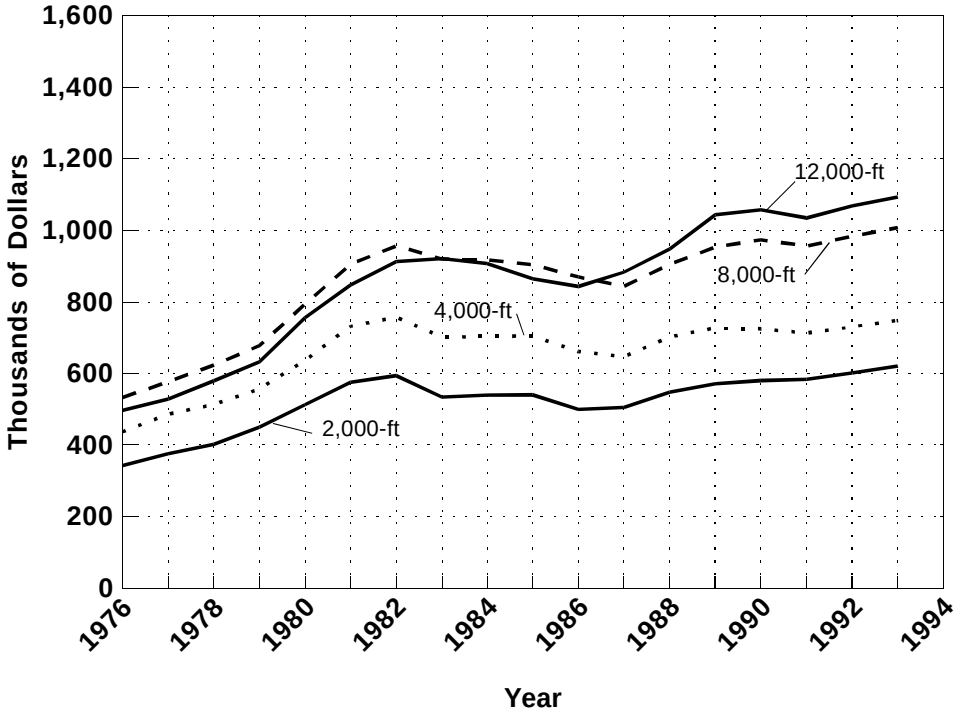
Table 2 summarizes the additional lease equipment costs and indices for secondary oil recovery (waterflood) from depths of 2,000, 4,000, and 8,000 feet in west Texas. The additional lease equipment is the equipment needed to convert from a primary recovery operation to a secondary recovery operation. The aggregate increase in additional equipment costs was about 1 percent for the 1990-1993 period. As noted before, drilling cost estimates are subject to major annual revisions and, as drilling costs can account for more than one-half of the additional equipment costs, revisions to drilling costs may hide the changes in other costs. During the 1990-1993 period, however, changes in drilling costs approximated those of non-drilling costs, with an increase of about 1 percent. Figure 9 shows the additional costs of waterflood equipment for depths of 2,000, 4,000, and 8,000 feet for 1990 through 1993.

Figure 4. Tubing Costs for Oil Leases, 1976-1993 (10 Producing Wells)



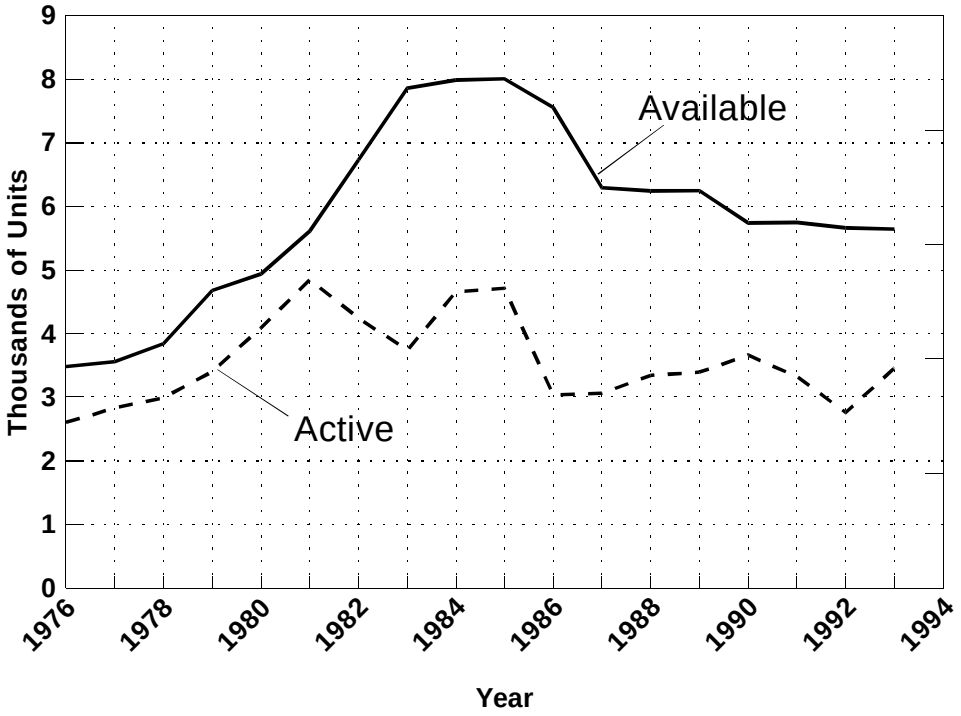
Source: Energy Information Administration, Office of Oil and Gas.

Figure 5. Non-tubing Costs for Oil Leases, 1976-1993 (10 Producing Wells)



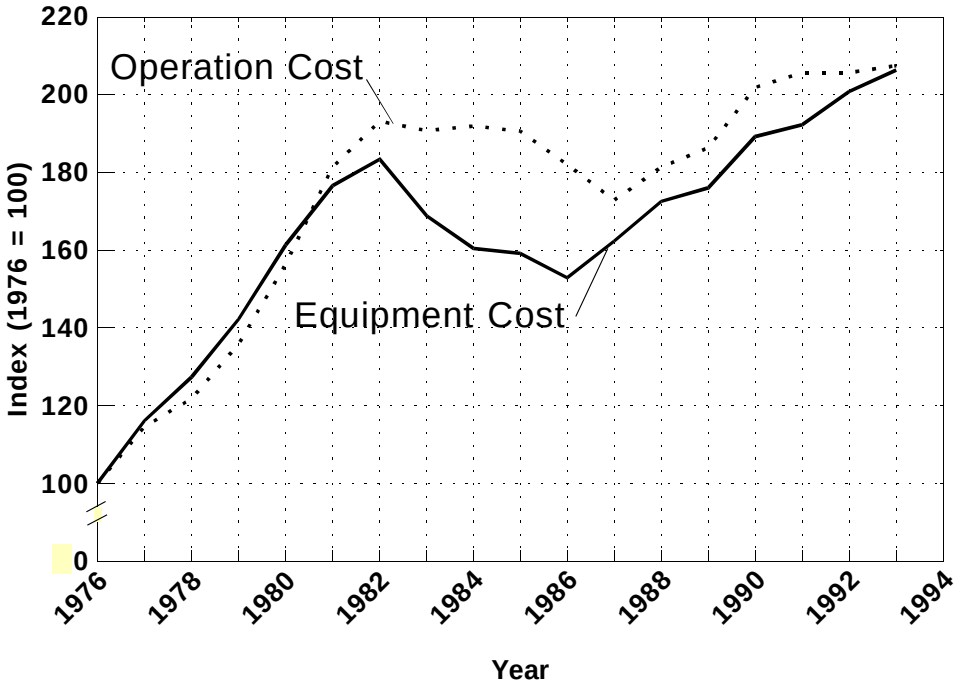
Source: Energy Information Administration, Office of Oil and Gas.

Figure 6. Well Service Units, 1976-1993



Source: Energy Information Administration, Office of Oil and Gas.

Figure 7. Aggregate Average Cost Indices for Gas Recovery, 1976-1993 (Operation and Non-tubing Equipment Costs)



Source: Tables N1 and N2.

Table 1. Summary of Lease Equipment Costs and Composite Indices for Primary Oil Recovery Operations (10 Producing Wells)

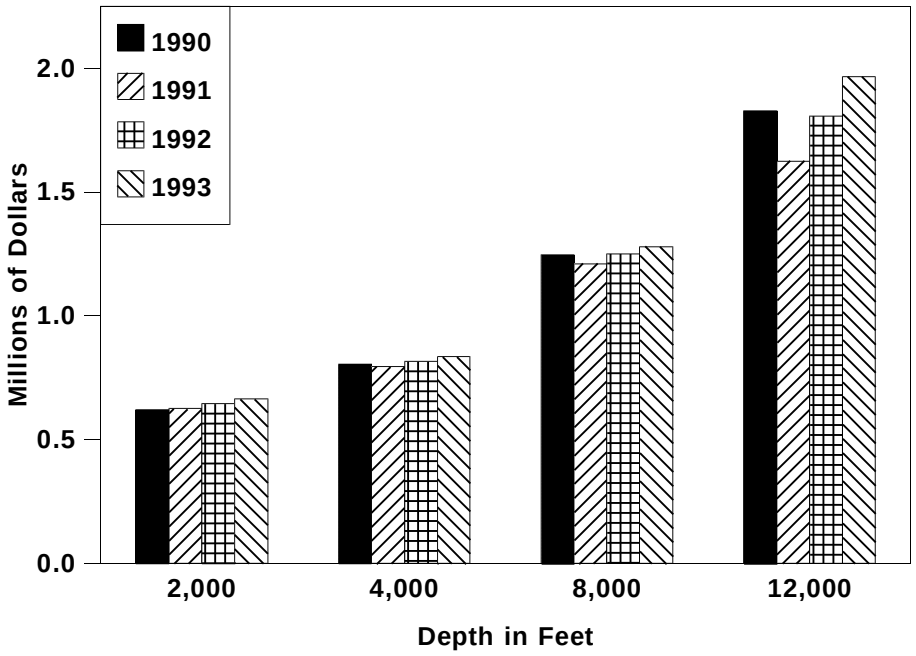
Area	Index (1976=100) 1990	1991	1992	1993	1993 Cost (dollars)*
			2,000-Foot Wells		
California	171.5	162.0	165.7	171.2	859,500
Oklahoma	158.7	163.3	168.9	174.3	609,700
South Louisiana	161.8	167.6	173.7	179.2	663,400
South Texas	159.2	164.8	170.3	175.6	624,000
West Texas	159.1	164.2	169.9	175.0	617,500
Wyoming	164.8	164.1	168.5	172.3	607,100
Average	**163.1**	**164.2**	**169.3**	**174.4**	**663,500**
			4,000-Foot Wells		
California	151.9	142.0	145.5	150.5	1,057,600
Oklahoma	148.9	146.6	152.4	158.2	796,300
South Louisiana	176.8	186.3	188.6	189.4	806,700
South Texas	163.4	172.3	174.1	174.8	761,400
West Texas	150.1	147.6	153.6	159.1	808,900
Wyoming	153.7	145.8	149.6	152.8	775,500
Average	**156.5**	**154.7**	**158.6**	**162.4**	**834,400**
			8,000-Foot Wells		
California	176.2	177.3	181.8	182.7	1,668,100
Oklahoma	189.1	163.3	174.8	185.9	1,362,100
South Louisiana	178.3	182.3	184.4	185.2	1,020,300
South Texas	156.6	165.7	167.4	168.1	949,300
West Texas	146.4	143.2	149.7	155.6	1,380,400
Wyoming	146.5	137.9	141.6	144.4	1,296,500
Average	**164.4**	**159.8**	**165.0**	**168.8**	**1,279,500**
			12,000-Foot Wells		
California	176.2	179.7	190.7	198.0	2,229,200
Oklahoma	180.4	154.7	174.3	193.2	1,876,900
South Louisiana	182.4	158.8	178.0	195.1	2,014,600
South Texas	177.9	153.9	170.9	186.1	1,889,600
West Texas	176.7	152.8	173.1	190.9	1,897,100
Wyoming	181.3	152.9	173.4	192.2	1,889,300
Average	**179.1**	**159.3**	**177.0**	**192.7**	**1,966,100**
Aggregate Average	**168.3**	**159.2**	**169.0**	**177.5**	**1,185,900**

*Preliminary.

Note: Reported average or aggregate average indices are indices of the average costs. They are not an average of the index values.

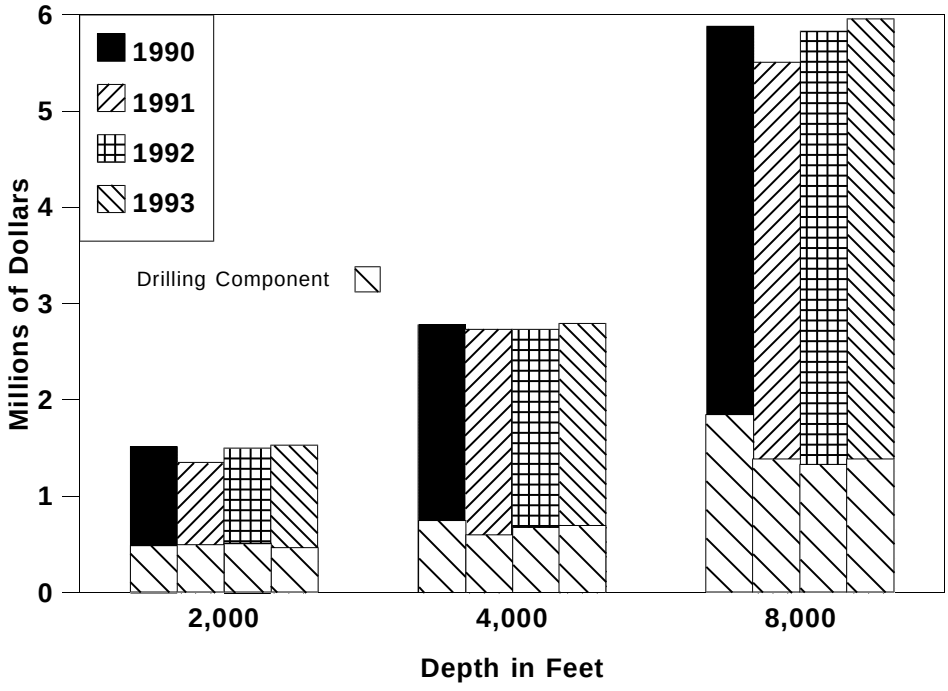
Sources: Energy Information Administration, Office of Oil and Gas.

Figure 8. Aggregate Average Lease Equipment Costs for Primary Oil Recovery, 1990-1993 (10 Producing Wells)



Source: Table 1.

Figure 9. Additional Cost of Lease Equipment for Secondary Oil Recovery in West Texas, 1990-1993 (10 Producing and 11 Injection Wells)



Source: Table 2.

Table 2. Summary of Additional Costs and Composite Indices for Lease Equipment and Injection Wells in West Texas for Secondary Oil Recovery (10 Producing Wells and 11 Injection Wells)

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
	2,000-Foot Wells				
Injection Equipment	219.2	217.0	219.6	222.4	436,300
Producing Equipment	125.2	128.6	135.6	138.7	112,100
Injection Wells**	185.9	155.1	180.9	185.0	980,100
Total or Index	**187.9**	**167.5**	**185.8**	**189.5**	**1,528,500**
	4,000-Foot Wells				
Injection Equipment	208.2	206.1	208.6	211.2	436,300
Producing Equipment	137.7	118.6	123.5	127.1	419,200
Injection Wells**	167.0	168.8	166.9	170.7	1,937,800
Total or Index	**166.3**	**163.5**	**163.5**	**167.1**	**2,793,300**
	8,000-Foot Wells				
Injection Equipment	213.3	211.5	213.6	215.7	732,100
Producing Equipment	129.0	120.0	124.5	128.1	880,600
Injection Wells**	143.3	133.0	142.5	145.8	4,345,900
Total or Index	**146.8**	**137.4**	**145.5**	**148.7**	**5,958,600**
Aggregate Average	**156.9**	**147.9**	**155.1**	**158.5**	**3,426,800**

*Preliminary.
**Costs projected from JAS data.
Note: Reported average or aggregate average indices are indices of the average costs. They are not an average of the index values.
Source: Energy Information Administration, Office of Oil and Gas.

Operating Costs for Oil Leases

Primary Recovery

Table 3 is a summary of the composite operating costs and indices for primary oil recovery operations which are shown in Figure 10. The average for the aggregate of the operating costs for the 6 regions and 4 depths was $194,500 for the 10-well lease in 1993. This represents less than a 3 percent increase for the 1990-1993 period.

Examination of Table 3 shows that cost trends for oil operations varied widely from 1990 to 1993. West Texas costs were flat or negative for all depths except 12,000 feet. On the other extreme, California experienced price increases ranging from 11 percent for 2,000-foot wells to 18 percent for 8,000-foot wells. The 1976 to 1993 history of the aggregate operating costs is shown in Figure 3. The trend is upward, with a possibility that the 1994 index will replace 1990 as the peak year. A more detailed analysis can be made by use of the Appendix tables.

Secondary Recovery

Table 4 and Figure 12 provide a summary of the composite secondary oil recovery operating costs for west Texas. The average aggregated lease (10 producing and 11 injection wells) costs for all depths decreased about 12 percent from 1990 to 1993. Subsurface repairs rose from 6 percent for 8,000-foot wells to 11 percent for 2,000-foot wells over the period. Fuel, power, and water costs for secondary recovery operations decreased by more than 5 percent for the 1990-1993 period. Fuel, power, and water costs for primary recovery operations in this region increased nearly 17 percent during this time. The differences in the changes for fuel, power, and water costs occurred because engines powered by natural gas were the prime movers for primary recovery operations in this region, and electric motors were used for secondary recovery operations. Figure 13 shows fuel, power, and water cost indices for primary and secondary oil recovery in west Texas for 4,000-foot wells. Peaks for both of these indices occurred in the 1984-1985 period.

Table 3. Summary of Direct Annual Operating Costs and Composite Indices for Primary Oil Recovery Operations (10 Producing Wells)

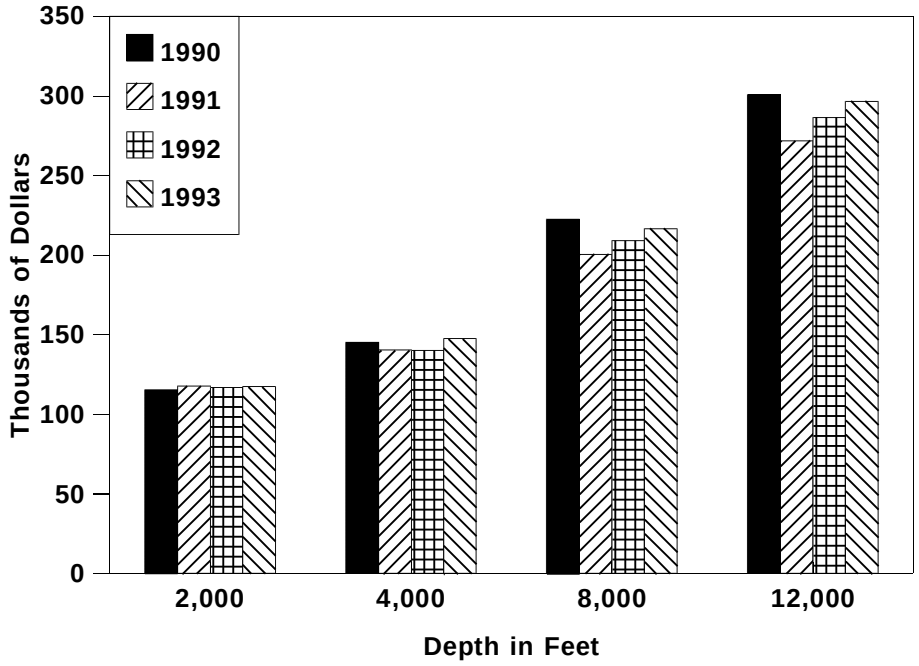
Area	Index (1976 = 100) 1990	1991	1992	1993	1993 Cost (dollars)*
			2,000-Foot Wells		
California	251.4	260.3	260.7	262.9	143,800
Oklahoma	213.0	213.5	213.7	213.3	94,900
South Louisiana	226.8	230.1	230.0	233.1	126,800
South Texas	218.9	230.1	220.4	222.6	122,200
West Texas	229.4	225.2	225.2	222.8	101,600
Wyoming	199.8	204.1	204.7	205.4	114,400
Average	**223.4**	**227.9**	**226.4**	**227.3**	**117,300**
			4,000-Foot Wells		
California	266.4	275.1	276.8	279.4	192,800
Oklahoma	216.8	214.3	217.4	216.2	110,700
South Louisiana	193.0	193.6	193.9	197.2	154,200
South Texas	218.2	225.9	221.2	223.8	176,100
West Texas.	227.4	224.9	224.9	223.2	118,300
Wyoming	200.6	204.4	205.3	206.4	132,300
Average	**219.8**	**223.0**	**223.0**	**224.4**	**147,400**
			8,000-Foot Wells		
California	339.7	348.3	352.8	357.5	331,000
Oklahoma	253.1	251.9	255.8	256.2	193,400
South Louisiana	226.2	234.5	230.0	233.7	212,400
South Texas	212.1	225.1	217.2	220.5	204,600
West Texas	225.4	222.6	218.4	225.3	166,500
Wyoming	208.9	218.7	216.2	217.8	192,500
Average	**244.9**	**251.3**	**249.5**	**252.9**	**216,700**
			12,000-Foot Wells		
California	353.2	360.5	365.2	370.3	482,500
Oklahoma	255.8	255.4	259.4	260.1	232,800
South Louisiana	244.1	246.0	246.8	250.0	287,000
South Texas	232.6	239.4	238.1	241.6	288,500
West Texas	250.7	248.8	251.2	251.4	237,300
Wyoming	243.6	247.5	248.4	250.0	251,500
Average	**266.3**	**269.6**	**271.5**	**274.1**	**296,600**
Aggregate Average	**243.4**	**247.8**	**247.7**	**250.0**	**194,500**

*Preliminary.

Note: Reported average or aggregate average indices are indices of the average costs. They are not an average of the index values.

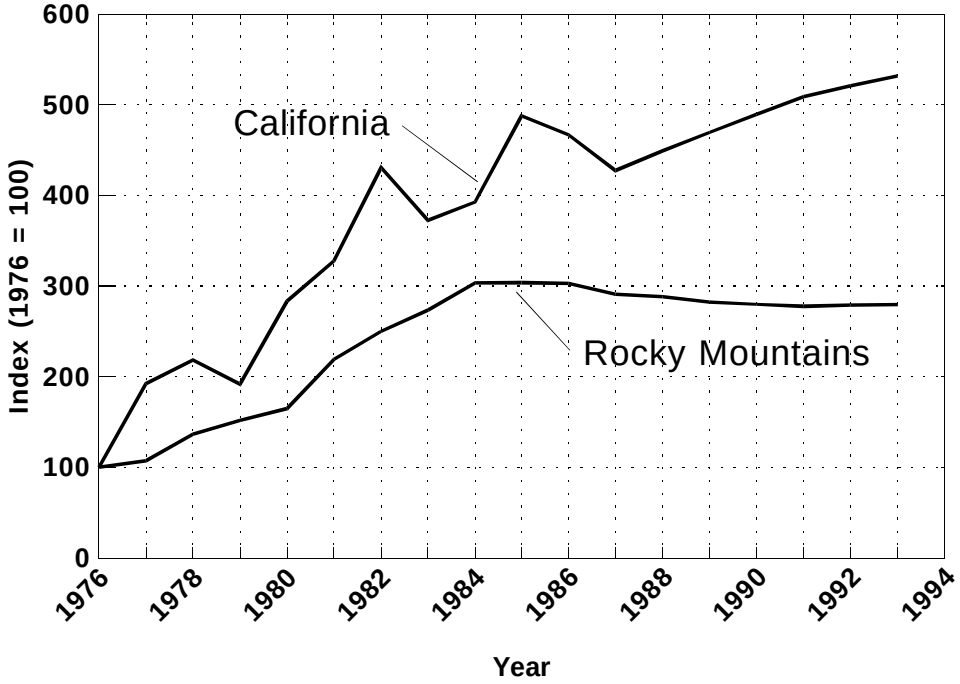
Source: Energy Information Administration, Office of Oil and Gas.

Figure 10. Average Operating Costs for Primary Oil Recovery Operations, 1990-1993



Source: Table 3.

Figure 11. Fuel, Power, and Water Cost Indices for 12,000-Foot Oil Wells in California and Rocky Mountains



Source: Energy Information Administration, Office of Oil and Gas.

Offshore Operations

Table 5 presents a summary of annual operating costs and composite indices for offshore production operations in the Gulf of Mexico. Production from offshore installations has a very large gas component compared to the average onshore lease. The aggregate average of costs at all water depths increased by 3.5 percent from 1990 to $3,367,200 per platform in 1993.

Equipment Costs for Gas Leases

Equipment and operating costs for gas leases producing from depths of 2,000, 4,000, 8,000, 12,000, and 16,000 feet, were determined for 6 onshore regions of the lower 48 States (Figure 2). For each region and depth, costs and indices for equipment for a one-well lease were determined for representative or average gas production rates. Costs and indices were also calculated for a higher and, where possible, for a lower production rate. Composite indices and costs for equipment are presented for a one-well lease with production rates of 50, 250, 500, 1,000, 5,000, and 10,000 thousand cubic feet of gas per day by depth and region. Figure 14 displays the average equipment costs by rate of production and well depth for 1993. There is a large difference between the equipment costs for some production rates and depths. This difference is the result of variations in the type and size of equipment needed in different regions and for different production rates. For example, dehydrators and line heaters are needed in cold climates but may not be needed in more temperate climates.

The indices for the aggregate costs of gas lease equipment for all depths and regions continued on an upward trend throughout the 1990-1993 period. The 9 percent increase from 1990 to 1993 resulted in an overall aggregate average gas lease equipment cost of $49,100, shown in Table 6.

Tables 7 through 12 present summaries of composite gas lease equipment costs and indices for a given production rate by depth and region. For each production rate, the costs are summed and averaged for the selected regions and depths. These average costs and the corresponding indices are presented in each table. The annual change in equipment costs from 1990 to 1993 ranged from an increase of 4 percent for wells producing 50 thousand cubic feet of gas per day to an increase of 14 percent for wells flowing 1 million cubic feet of gas per day.

Table 13 contains gas lease equipment costs aggregated by depth. Changes in gas equipment costs from 1990 to 1993 were small for shallow wells, where costs rose about 5 percent. Costs for 12,000- and 16,000-foot gas wells rose about 11 percent. The dominant factor in determining gas well equipment costs is the production capacity of the equipment. Figure 15 illustrates the aggregate average gas well equipment costs for 1990 through 1993 by production rate. An analysis of the costs presented in Tables 7 through 12 suggests that the excessive inventories of gas well equipment were expended in 1986. There were annual increases in cost for each depth from 1990 through the period ending June 1993. These tables show changes ranging from 4 to 14 per cent.

Operating Costs for Gas Leases

Operating costs for gas leases aggregated for all depths, regions and production rates are shown in Table 14. There was an increase of 2.6 percent from 1990 to 1993, to $22,000 (See Table 14).

Tables 15 through 20 are summaries of composite costs and indices for operating a gas lease. Each table is a summary for one production rate for the same depth and region used for lease equipment costs. For each depth and production rate, the individual operating costs by region were averaged and indices were calculated. From 1990 to 1993, wells producing 50 thousand cubic feet per day exhibited an operating cost increase of about 2 percent, while costs for wells producing at a rate of 1 million cubic feet per day rose at about 8 percent.

Depth has more effect on gas well operating costs than on equipment costs. Depth is a major factor on the cost of down-hole repairs, the amount of chemicals used, and other maintenance cost components. The changes in operating costs aggregated by depth from 1990 through 1993 show little variation with depth. The changes ranged from zero to almost 4 percent from 1990 to 1993. The annual gas well operating costs aggregated by depth are shown in Table 21.

Figure 17 depicts the aggregate average annual gas well operating costs by depth and producing rate for 1993. Operating costs decreased as the producing rate increased from 250 to 500 thousand cubic feet of gas per day in many regions. This is a result of the well design and the completion techniques used. Wells producing at 500 thousand cubic feet of gas per day, or more, were completed with packers. Packers protect the casing-tubing annulus and the casing wellhead from the bottom-hole pressure and any corrosive properties of the well's fluids. With these flow rates, the tubing flow velocity is sufficient to

Table 4. Summary of Direct Annual Operating Costs and Composite Indices for Secondary Oil Recovery Operations in West Texas (10 Producing and 11 Injection Wells)

Component	Index (1976 = 100) 1990	1991	1992	1993	1993 Cost (dollars)*
			2,000-Foot Wells		
Normal Daily	234.8	227.1	217.5	212.3	131,000
Surface Repair.	239.6	236.9	233.6	229.0	49,700
Subsurface Repair	182.7	181.3	192.3	193.8	52,700
Total or Index	**223.0**	**217.7**	**214.5**	**211.0**	**233,400**
			4,000-Foot Wells		
Normal Daily	241.8	233.3	222.9	217.5	164,400
Surface Repair	244.6	240.5	237.3	232.1	79,600
Subsurface Repair	181.4	180.4	190.0	191.4	78,100
Total or Index	**226.1**	**220.6**	**217.3**	**213.7**	**322,100**
			8,000-Foot Wells		
Normal Daily.	251.0	242.6	230.9	226.5	237,800
Surface Repair	245.0	242.4	240.0	236.3	89,800
Subsurface Repair	189.0	187.9	195.4	195.5	147,400
Total or Index	**228.5**	**223.7**	**220.2**	**217.5**	**475,000**
Aggregate Average	**226.5**	**221.3**	**217.9**	**214.8**	**343,500**

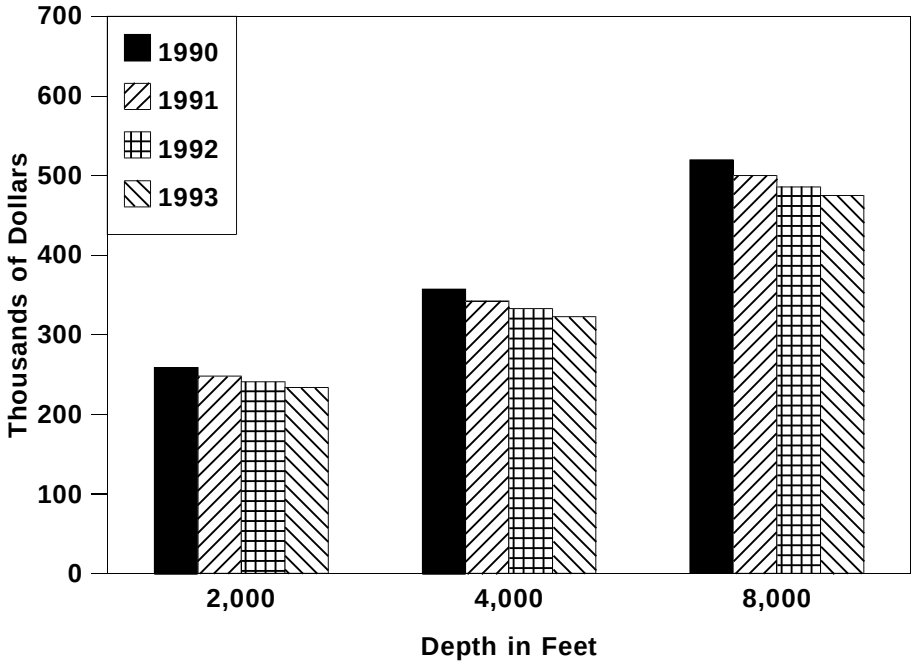
*Preliminary.
Note: Reported average or aggregate average indices are indices of the average costs. They are not an average of the index values.
Source: Energy Information Administration, Office of Oil and Gas.

Table 5. Summary of Direct Annual Operating Costs and Composite Indices per Platform--Gulf of Mexico (10,500-Foot True Vertical Depth Wells)

Water Depth	Index (1976 = 100) 1990	1991	1992	1993	1993 Cost (dollars)*
			12-Slot		
100-Foot	214.3	213.4	219.1	223.2	2,740,600
300-Foot	224.4	223.5	228.8	232.8	3,023,400
Average	**219.4**	**218.5**	**224.0**	**228.1**	**2,882,000**
			18-Slot		
100-Foot	208.7	207.5	212.0	216.5	3,314,300
300-Foot	217.6	216.4	220.8	225.0	3,609,900
600-Foot	220.7	219.7	223.4	227.3	4,147,900
Average	**216.0**	**214.8**	**219.0**	**223.2**	**3,690,700**
Aggregate Average	**217.2**	**216.2**	**220.8**	**224.9**	**3,367,200**

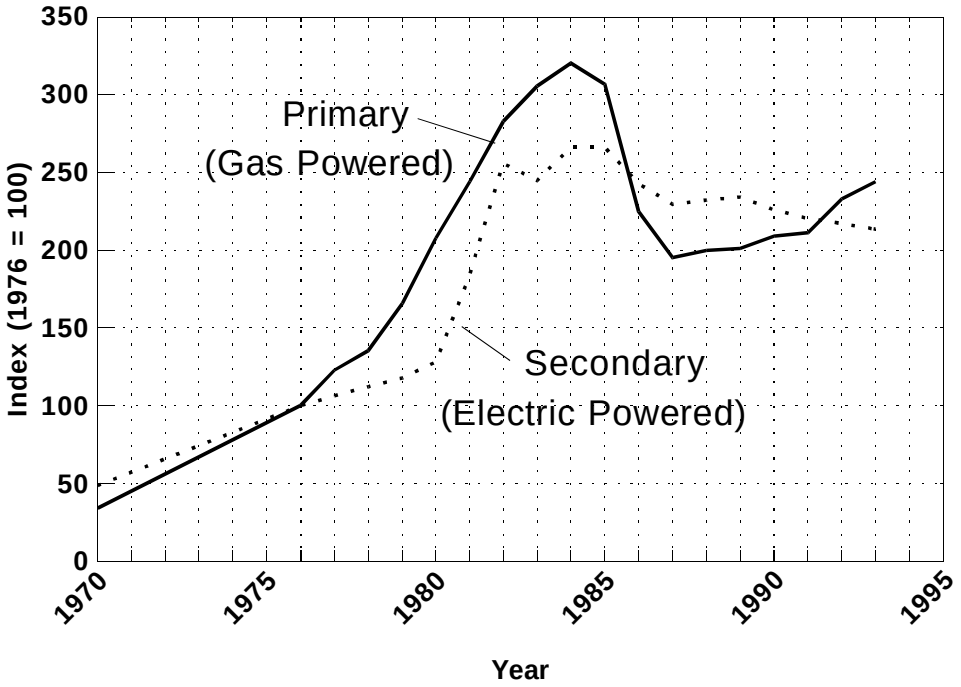
*Preliminary.
Note: Reported average or aggregate average indices are indices of the average costs. They are not an average of the index values.
Source: Energy Information Administration, Office of Oil and Gas.

Figure 12. Annual Operating Costs for Secondary Oil Recovery in West Texas, 1990-1993 (10 Producing and 11 Injection Wells)



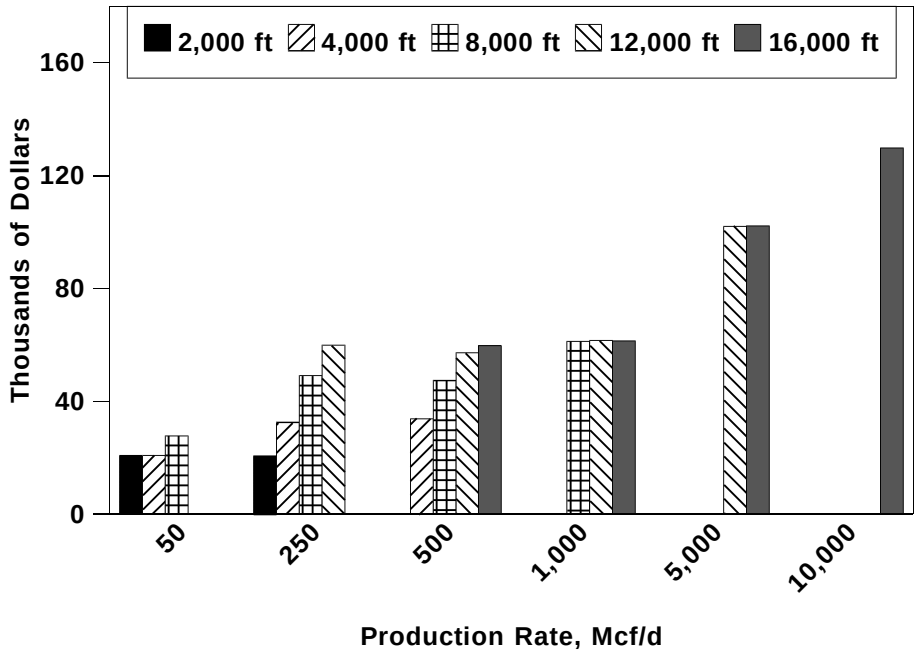
Source: Table 4.

Figure 13. Fuel, Power, and Water Cost Indices for Primary and Secondary Operating Costs for 4,000-foot Wells in West Texas



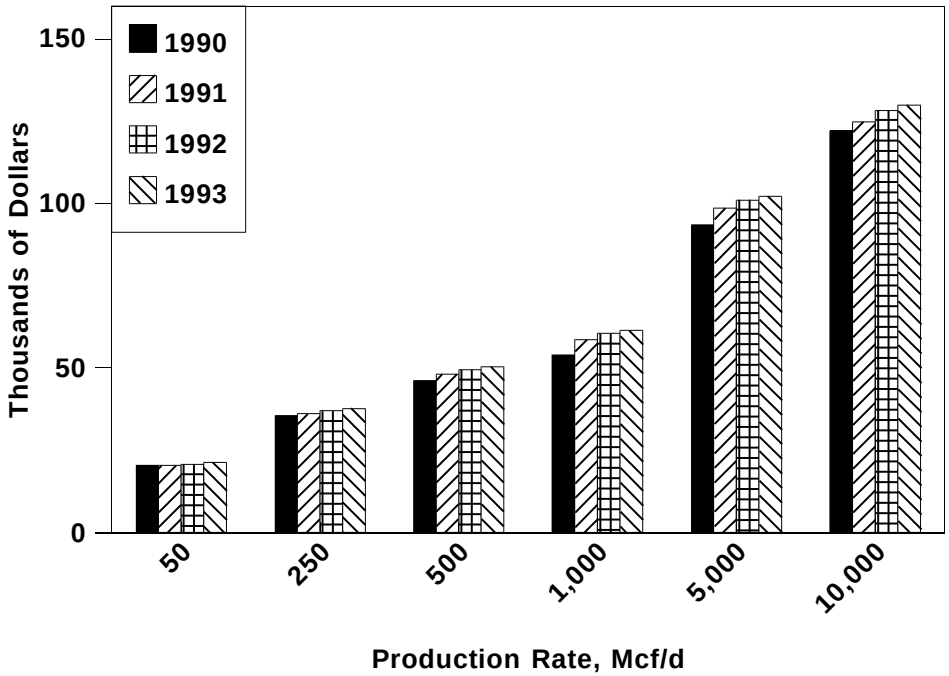
Source: Energy Information Administration, Office of Oil and Gas.

Figure 14. Annual Gas Well Equipment Costs by Depth and Production Rate (1993)



Source: Tables 7 through 12.

Figure 15. Aggregate Average Equipment Costs for a One-Well Gas Lease by Production Rate, 1990-1993



Source: Tables 7 through 12.

Table 6. Average Equipment Costs and Indices for Gas Leases Aggregated for All Depths, Areas and Production Rates (One Producing Well)

	Index (1976 = 100)				1993
	1990	1991	1992	1993	Cost (dollars)*
Aggregate average for all Production Rates	**192.3**	**200.9**	**206.4**	**209.8**	**49,100**

*Preliminary.
Note: •Reported average or aggregate average indices are indices of the average costs. They are not an average of the index values.
Source: Energy Information Administration, Office of Oil and Gas.

Table 7. Summary of Gas Lease Equipment Costs and Composite Indices for One Well Producing 50 Thousand Cubic Feet per Day

	Index (1976 = 100)				1993
Area	1990	1991	1992	1993	Cost (dollars)*
			2,000-Foot Wells		
Mid-Continent	201.0	194.1	198.0	205.9	20,800
North Louisiana	181.9	181.9	187.6	193.3	20,300
South Louisiana	181.9	181.9	187.6	193.3	20,300
Rocky Mountains	194.6	196.4	202.7	206.3	23,100
South Texas	184.5	189.3	189.3	194.2	20,000
West Texas	193.1	188.1	193.1	198.0	20,000
Average	**188.6**	**187.6**	**192.4**	**198.1**	**20,800**
			4,000-Foot Wells		
Mid-Continent	201.0	194.1	198.0	205.9	20,800
South Louisiana	181.9	181.9	187.6	193.3	20,300
Rocky Mountains.	194.6	196.4	202.7	206.3	23,100
South Texas	184.5	189.3	189.3	194.2	20,000
West Texas	192.1	188.1	193.1	198.0	20,000
Average	**191.3**	**190.4**	**195.2**	**200.0**	**20,800**
			8,00-Foot Wells		
West Texas	206.1	203.8	208.4	211.5	27,700
Average forProduction Rate	**191.6**	**190.7**	**194.4**	**200.0**	**21,400**

*Preliminary.
Note: Reported average or aggregate average indices are indices of the average costs. They are not an average of the index values.
Source: Energy Information Administration, Office of Oil and Gas.

remove the well liquids which accumulate in the tubing. Either tubing displacement or inhibitor squeeze jobs can be used to protect the production string from corrosion or scale deposition.

Wells producing at rates of 250 thousand cubic feet of gas per day or less have lower tubing flow velocities. These lower velocities are not always adequate to remove accumulated liquids from the well. Increasing liquid levels usually cause reduced gas production. Therefore, these wells were designed to be completed without packers to permit fluids to be forced up the tubing by expansion of the compressed gas in the casing-tubing annulus.

Because these gas wells which produce at lower flow rates have no packers, the casing-tubing annulus is exposed to the corrosive properties of the well fluids and often needs chemical protection. Tubing displacement and inhibitor squeeze jobs are not effective without a packer, or making them effective would be cost prohibitive. Therefore, continuous chemical injection down the casing-tubing annulus is a common practice. This involves surface chemical injection pumps, maintenance, and larger volumes of chemicals. Therefore, wells which produce less than 250 thousand cubic feet of gas per day have higher fuel, chemical and disposal costs, and higher surface maintenance costs.

Table 8. Summary of Gas Lease Equipment Costs and Composite Indices for One Well Producing 250 Thousand Cubic Feet per Day

Area	Index (1976 = 100) 1990	1991	1992	1993	1993 Cost (dollars)*
			2,000-Foot Wells		
Mid-Continent	206.5	199.1	203.7	210.3	22,500
North Louisiana	181.9	181.9	187.6	193.3	20,300
South Louisiana	181.9	181.9	187.6	193.3	20,300
Rocky Mountains	194.6	196.4	202.7	206.3	23,100
South Texas	184.5	189.3	189.3	194.2	20,000
West Texas	167.3	162.4	166.3	170.3	17,200
Average	**185.8**	**184.9**	**188.7**	**194.3**	**20,600**
			4,000-Foot Wells		
Mid-Continent	215.7	211.9	217.9	223.1	29,900
North Louisiana	199.3	200.0	207.2	211.5	29,400
South Louisiana	200.0	202.2	207.9	212.2	29,500
Rocky Mountains	195.7	197.4	203.4	206.0	48,400
South Texas	200.0	206.5	207.2	210.1	29,000
West Texas	209.7	208.2	213.4	216.4	29,000
Average	**202.6**	**203.9**	**209.2**	**212.4**	**32,500**
			8,000-Foot Wells		
Mid-Continent	203.0	201.7	205.7	210.4	48,400
North Louisiana	190.3	192.0	197.1	201.3	47,900
South Louisiana	190.8	192.9	197.5	201.7	48,000
Rocky Mountains	171.6	179.4	183.4	185.8	55,000
South Texas	190.7	197.5	197.0	200.0	47,200
West Texas	199.1	199.1	202.2	205.2	47,200
Average	**189.8**	**193.1**	**196.3**	**200.0**	**49,000**
			12,000-Foot Wells		
Mid-Continent	209.0	216.0	223.8	228.5	58,500
Rocky Mountains	181.4	195.5	202.6	204.8	63,900
West Texas	205.1	212.1	219.5	222.3	56,900
Average	**197.1**	**206.9**	**214.2**	**217.5**	**59,800**
Average for Production Rate	**194.0**	**197.3**	**202.2**	**206.0**	**37,700**

*Preliminary.

Note: •Reported average or aggregate average indices are indices of the average costs. They are not an average of the index values.

Source: Energy Information Administration, Office of Oil and Gas.

Table 9. Summary of Gas Lease Equipment Costs and Composite Indices for One Well Producing 500 Thousand Cubic Feet per Day

Area	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
	4,000-Foot Wells				
Mid-Continent	213.4	210.2	215.7	221.3	28,100
North Louisiana	184.6	183.7	190.4	195.2	20,300
Rocky Mountains	169.9	178.3	182.9	185.3	53,000
Average	**183.7**	**187.8**	**193.0**	**196.5**	**33,800**
	8,000-Foot Wells				
Mid-Continent	197.4	196.1	200.4	204.8	46,700
North Louisiana	186.0	188.1	193.2	197.0	46,300
South Louisiana	186.0	188.1	193.2	197.0	46,300
Rocky Mountains	170.1	178.5	182.3	184.7	53,200
South Texas	186.3	192.7	192.7	195.7	45,600
West Texas	189.9	193.4	196.9	200.0	45,600
Average	**185.5**	**189.2**	**192.9**	**196.3**	**47,300**
	12,000-Foot Wells				
Mid-Continent	207.6	215.3	223.3	227.7	56,700
North Louisiana	196.9	207.4	216.0	219.9	56,300
South Louisiana	196.9	207.4	216.0	219.9	56,300
Rocky Mountains	180.3	195.1	202.0	204.3	62,100
South Texas	197.2	211.8	215.7	218.9	55,600
West Texas	204.0	212.9	220.1	223.3	55,600
Average	**196.9**	**208.0**	**215.3**	**218.8**	**57,100**
	16,000-Foot Wells				
Mid-Continent	183.9	197.3	203.7	207.7	61,900
South Louisiana	196.9	207.4	216.0	219.9	56,300
West Texas	181.2	195.3	201.7	204.0	60,800
Average	**187.0**	**199.6**	**206.7**	**210.2**	**59,700**
Average for Production Rate	**188.9**	**197.1**	**202.9**	**206.6**	**50,400**

*Preliminary.
Note: Reported average or aggregate average indices are indices of the average costs. They are not an average of the index values.
Source: Energy Information Administration, Office of Oil and Gas.

Table 10. Summary of Gas Lease Equipment Costs and Composite Indices for One Well Producing 1 Million Cubic Feet per Day

Area	Index (1976 = 100) 1990	1991	1992	1993	1993 Cost (dollars)*
8,000-Foot Wells					
South Louisiana	176.3	191.8	199.0	202.3	61,500
South Texas	176.8	195.4	199.0	201.7	60,900
Average	**176.6**	**193.7**	**199.0**	**202.0**	**61,200**
12,000-Foot Wells					
Mid-Continent	183.9	197.3	203.7	207.7	61,900
North Louisiana	176.3	191.8	199.0	202.3	61,500
South Louisiana	176.3	191.8	199.0	202.3	61,500
Rocky Mountains	180.3	195.1	202.0	204.3	62,100
South Texas	176.8	195.4	199.0	201.7	60,900
West Texas	181.2	195.3	201.7	204.0	60,800
Average	**178.8**	**194.4**	**200.7**	**203.6**	**61,500**
16,000-Foot Wells					
Mid-Continent	183.9	197.3	203.7	207.7	61,900
North Louisiana	176.3	191.8	199.0	202.3	61,500
South Louisiana	176.3	191.8	199.0	202.3	61,500
West Texas	181.2	195.3	201.7	204.0	60,800
Average	**179.4**	**194.0**	**201.0**	**204.0**	**61,400**
Average for Production Rate	**178.5**	**194.0**	**200.3**	**203.3**	**61,400**

See footnotes for Table 11.

Table 11. Summary of Gas Lease Equipment Costs and Composite Indices for One Well Producing 5 Million Cubic Feet per Day

Area	Index (1976 = 100) 1990	1991	1992	1993	1993 Cost (dollars)*
12,000-Foot Wells					
South Louisiana	209.2	220.6	226.9	229.6	102,400
South Texas	209.5	223.4	227.0	229.1	101,700
Average	**209.4**	**222.0**	**227.0**	**229.4**	**102,100**
16,000-Foot Wells					
Mid-Continent	215.3	225.3	231.0	234.2	102,800
North Louisiana	209.2	220.6	227.1	229.6	102,400
South Louisiana	209.2	220.6	226.9	229.6	102,400
West Texas	213.4	223.9	229.6	231.4	101,600
Average	**211.5**	**222.3**	**228.4**	**230.9**	**44,300**
Average for Production Rate	**211.1**	**222.6**	**228.2**	**230.7**	**102,200**

*Preliminary.

Note: •Reported average or aggregate average indices are indices of the average costs. They are not an average of the index values.

Source: Energy Information Administration, Office of Oil and Gas.

Table 12. Summary of Gas Lease Equipment Costs and Composite Indices for One Well Producing 10 Million Cubic Feet per Day

Area	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
	12,000-Foot Wells				
South Louisiana	209.2	220.6	226.9	229.6	102,400
North Louisiana	205.7	210.5	216.4	219.1	129,900
Average	**209.4**	**222.0**	**227.0**	**229.4**	**102,100**
	16,000-Foot Wells				
Mid-Continent	215.3	225.3	231.0	234.2	102,800
North Louisiana	209.2	220.6	227.1	229.6	102,400
South Louisiana	209.2	220.6	226.9	229.6	102,400
West Texas	213.4	223.9	229.6	231.4	101,600
Average	**211.5**	**222.3**	**228.4**	**230.9**	**44,300**
Average for Production Rate	**211.1**	**222.6**	**228.2**	**230.7**	**102,200**

*Preliminary.
Note: •Reported average or aggregate average indices are indices of the average costs. They are not an average of the index values.
Source: Energy Information Administration, Office of Oil and Gas.

Table 13. Summary of Aggregate Average Gas Lease Equipment Costs by Depth (1990-1993)

Depth (feet)	Average Costs (dollars)			
	1990	1991	1992	1993
2,000	19,700	19,600	20,100	20,700
4,000	27,200	27,400	28,100	28,600
8,000	45,400	46,700	47,700	48,500
12,000	57,700	61,500	63,500	64,400
16,000	72,700	76,900	79,200	80,300

*Preliminary.
Source: Energy Information Administration, Office of Oil and Gas.

Table 14. Average Operating Costs and Indices for Gas Leases Aggregated for All Depths, Areas and Production Rates (One Producing Well)

	Index (1976 = 100)				1993
	1990	1991	1992	1993	Cost (dollars)*
Aggregate Average for all Production Rates	**201.9**	**205.7**	**205.7**	**207.5**	**22,000**

*Preliminary.
Note: •Reported average or aggregate average indices are indices of the average costs. They are not an average of the index values.
Source: Energy Information Administration, Office of Oil and Gas.

Table 15. Summary of Gas Lease Operating Costs and Composite Indices for One Well Producing 50 Thousand Cubic Feet per Day

	Index (1976 = 100)				1993
Area	1990	1991	1992	1993	Cost (dollars)*
			2,000-Foot Wells		
Mid-Continent	238.2	238.2	238.2	238.2	8,100
North Louisiana	224.4	226.8	234.1	239.0	9,800
South Louisiana	195.1	226.8	234.1	239.0	9,800
Rocky Mountains	189.6	197.9	197.9	197.9	9,500
South Texas	207.7	241.0	220.5	220.5	8,600
West Texas	252.9	247.1	241.2	235.3	8,000
Average	**212.5**	**225.0**	**222.5**	**225.0**	**9,000**
			4,000-Foot Wells		
Mid-Continent	223.8	221.4	219.0	221.4	9,300
South Louisiana	197.9	229.8	234.0	238.3	11,200
Rocky Mountains	219.6	198.2	198.2	200.0	11,200
South Texas	211.1	240.0	224.4	220.0	9,900
West Texas	246.3	251.2	246.3	239.0	9,800
Average	**219.6**	**228.3**	**223.9**	**223.9**	**10,300**
			8,000-Foot Wells		
West Texas	237.9	217.2	210.3	205.2	11,900
Average for Production Rate	**218.2**	**225.0**	**222.7**	**222.7**	**9,800**

*Preliminary.
Note: •Reported average or aggregate average indices are indices of the average costs. They are not an average of the index values.
Source: Energy Information Administration, Office of Oil and Gas.

Table 16. Summary of Gas Lease Operating Costs and Composite Indices for One Well Producing 250 Thousand Cubic Feet per Day

Area	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
	2,000-Foot Wells				
Mid-Continent	231.9	229.8	229.8	231.9	10,900
North Louisiana	222.4	222.4	228.6	232.7	11,400
South Louisiana	195.9	222.4	228.6	232.7	11,400
Rocky Mountains	219.6	198.2	198.2	198.2	11,100
South Texas	206.4	234.0	217.0	217.0	10,200
West Texas	242.9	238.1	233.3	228.6	9,600
Average	**220.8**	**225.0**	**222.9**	**225.0**	**10,800**
	4,000-Foot Wells				
Mid-Continent	222.7	221.2	221.2	224.2	14,800
North Louisiana	223.9	226.9	229.9	232.8	15,600
South Louisiana	200.0	226.9	229.9	232.8	15,600
Rocky Mountains	219.4	168.8	169.9	171.0	15,900
South Texas	209.2	233.8	221.5	218.5	14,200
West Texas	234.4	232.8	227.9	223.0	13,600
Average	**217.1**	**214.3**	**212.9**	**214.3**	**15,000**
	8,000-Foot Wells				
Mid-Continent	221.7	221.7	220.8	223.6	23,700
North Louisiana	211.9	216.9	219.5	222.9	26,300
South Louisiana	195.8	216.1	219.5	222.0	26,200
Rocky Mountains	214.4	200.8	201.6	202.4	25,300
South Texas	203.5	222.6	210.4	209.6	24,100
West Texas	230.2	229.2	224.5	220.8	23,400
Average	**212.2**	**216.5**	**214.8**	**215.7**	**24,800**
	12,000-Foot Wells				
Mid-Continent	217.3	218.0	218.8	221.1	29,400
Rocky Mountains	211.0	201.3	203.9	204.5	31,500
West Texas	223.7	218.5	215.6	212.6	28,700
Average	**216.3**	**211.3**	**212.1**	**212.1**	**29,900**
Average for Production Rate	**214.9**	**216.1**	**214.9**	**214.9**	**18,700**

*Preliminary.

Note: •Reported average or aggregate average indices are indices of the average costs. They are not an average of the index values.

Source: Energy Information Administration, Office of Oil and Gas.

Table 17. Summary of Gas Lease Operating Costs and Composite Indices for One Well Producing 500 Thousand Cubic Feet per Day

Area	Index (1976 = 100) 1990	1991	1992	1993	1993 Cost (dollars)*
			4,000-Foot Wells		
Mid-Continent	253.3	251.7	250.0	255.0	15,300
North Louisiana	208.5	212.7	218.3	222.5	15,800
Rocky Mountains	208.4	182.1	183.2	184.2	17,500
Average	**221.3**	**210.7**	**213.3**	**216.0**	**16,200**
			8,000-Foot Wells		
Mid-Continent	221.7	222.9	220.5	225.3	18,700
North Louisiana	201.9	207.7	213.5	219.2	22,800
South Louisiana	187.5	208.7	213.5	219.2	22,800
Rocky Mountains	208.6	190.5	192.4	193.3	20,300
South Texas	169.1	190.0	174.5	173.6	19,100
West Texas	241.0	232.5	225.3	221.7	18,400
Average	**203.1**	**207.1**	**205.1**	**208.2**	**20,400**
			12,000-Foot Wells		
Mid-Continent	216.5	217.5	217.5	221.4	22,800
North Louisiana	204.2	209.3	215.3	218.6	25,800
South Louisiana	189.0	210.2	215.3	219.5	25,900
Rocky Mountains	205.5	192.1	195.3	196.1	24,900
South Texas	193.9	217.4	207.0	206.1	23,700
West Texas	230.5	218.1	213.3	209.5	22,000
Average	**207.0**	**210.5**	**210.5**	**212.3**	**24,200**
			16,000-Foot Wells		
Mid-Continent	209.3	211.0	211.9	215.3	25,400
South Louisiana	185.6	207.6	213.6	217.4	28,700
West Texas	222.5	217.5	215.0	210.8	25,300
Average	**205.7**	**212.2**	**213.8**	**215.4**	**26,500**
Average for Production Rate	**206.1**	**209.1**	**208.1**	**210.1**	**20,800**

*Preliminary.

Note: Reported average or aggregate average indices are indices of the average costs. They are not an average of the index values.

Source: Energy Information Administration, Office of Oil and Gas.

Table 18. Summary of Gas Lease Operating Costs and Composite Indices for One Well Producing 1 Million Cubic Feet per Day

Area	Index (1976 = 100) 1990	1991	1992	1993	1993 Cost (dollars)*
			8,000-Foot Wells		
South Louisiana	185.5	205.3	210.7	216.8	28,400
South Texas	192.1	245.7	228.3	228.3	29,000
Average	**189.1**	**225.6**	**219.4**	**222.5**	**28,700**
			12,000-Foot Wells		
Mid-Continent	215.8	216.5	217.3	222.6	29,600
North Louisiana	200.0	204.6	210.5	215.0	32,900
South Louisiana	185.6	204.6	209.8	215.0	32,900
Rocky Mountains	203.8	192.9	195.5	196.2	30,600
South Texas	190.6	218.1	204.0	203.4	30,300
West Texas	226.5	217.6	214.0	210.3	28,600
Average	**202.7**	**208.2**	**207.5**	**209.5**	**30,800**
			16,000-Foot Wells		
Mid-Continent	211.5	212.8	213.5	217.6	32,200
North Louisiana	196.5	208.1	212.8	217.4	37,400
South Louisiana	183.7	200.0	205.8	209.9	36,100
West Texas	222.7	218.7	216.7	212.0	31,800
Average	**201.9**	**208.7**	**211.2**	**213.7**	**34,400**
Average for Production Rate	**201.4**	**212.2**	**211.5**	**214.2**	**31,700**

See footnotes for Table 19.

Table 19. Summary of Gas Lease Operating Costs and Composite Indices for One Well Producing 5 Million Cubic Feet per Day

Area	Index (1976 = 100) 1990	1991	1992	1993	1993 Cost (dollars)*
			12,000-Foot Wells		
South Louisiana	185.4	197.2	201.4	204.9	29,500
South Texas	171.1	163.9	165.7	168.7	28,000
Average	**178.1**	**179.4**	**182.6**	**185.8**	**28,800**
			16,000-Foot Wells		
Mid-Continent	173.5	170.9	173.5	176.5	34,600
North Louisiana	171.9	177.1	181.9	185.2	38,900
South Louisiana	170.8	171.3	175.1	178.5	37,300
West Texas	186.5	173.5	174.5	174.5	34,900
Average	**175.5**	**173.0**	**176.0**	**178.4**	**36,400**
Average for Production Rate	**175.5**	**174.5**	**177.7**	**180.3**	**33,900**

*Preliminary.

Note: •Reported average or aggregate average indices are indices of the average costs. They are not an average of the index values.

Source: Energy Information Administration, Office of Oil and Gas.

Table 20. Summary of Gas Lease Operating Costs and Composite Indices for One Well Producing 10 Million Cubic Feet per Day

Area	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
	16,000-Foot Wells				
North Louisiana	165.2	162.7	166.6	169.7	48,700

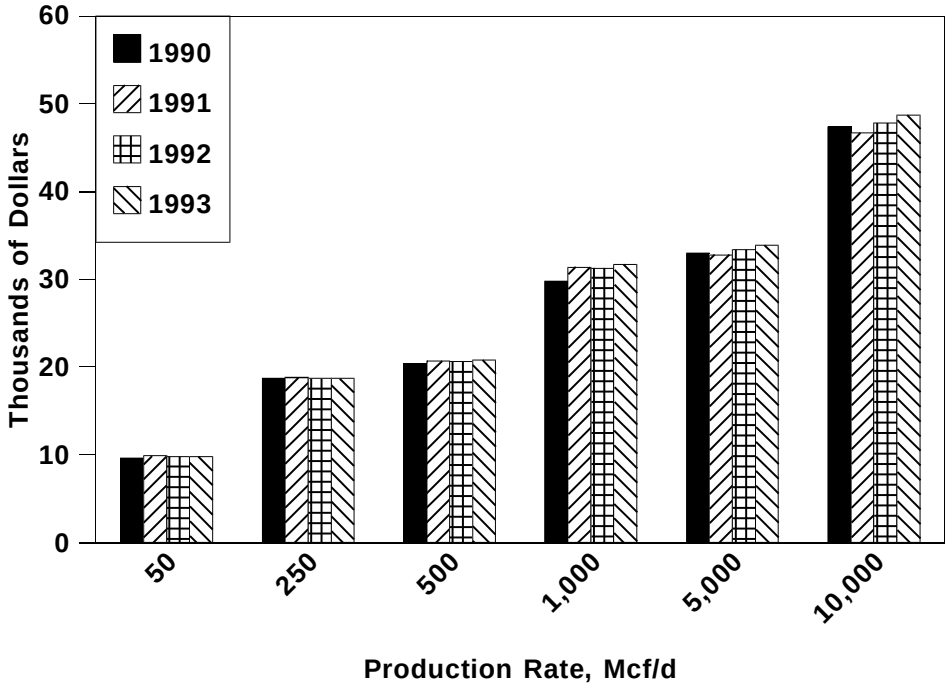
*Preliminary.
Note: Reported average or aggregate average indices are indices of the average costs. They are not an average of the index values.
Source: Energy Information Administration, Office of Oil and Gas.

Table 21. Summary of Aggregate Average Gas Lease Operating Cost, by Depth (1990-93)

Depth (feet)	Average Cost (Dollars)			
	1990	1991	1992	1993
2,000	9,600	9,900	9,800	9,900
4,000	13,700	13,600	13,500	13,600
8,000	21,900	22,800	22,500	22,700
12,000	27,500	27,800	27,900	28,100
16,000	33,000	33,400	33,900	34,300

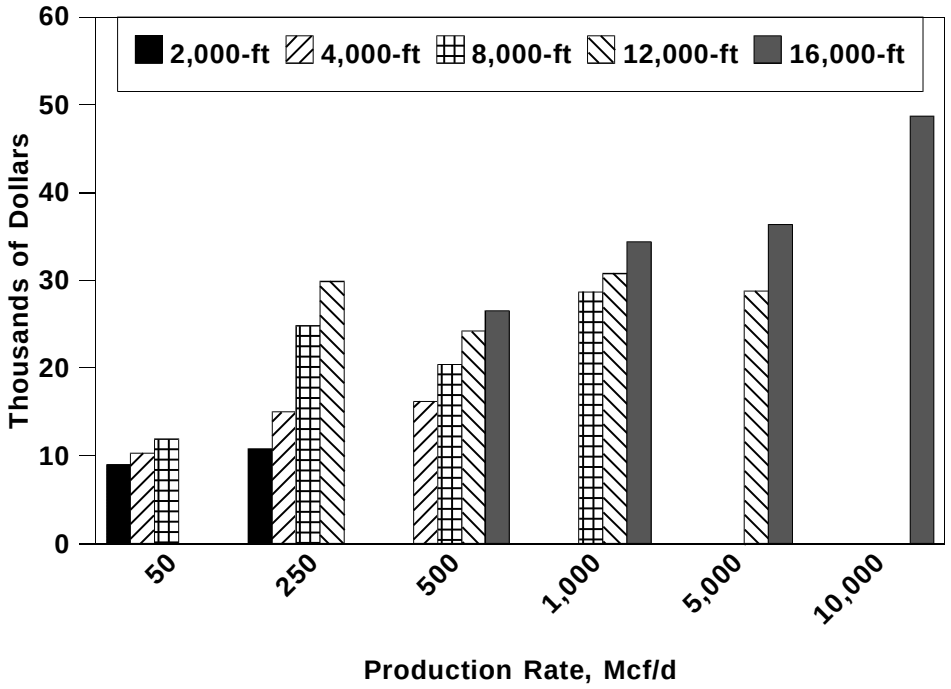
*Preliminary.
Source: Energy Information Administration, Office of Oil and Gas.

Figure 16. Aggregate Average Annual Gas Well Operating Costs for a One Well Gas Lease by Production Rate, 1990-1993



Source: Tables 14 through 19.

Figure 17. Annual Gas Well Operating Costs by Depth and Production Rate, 1993



Source: Tables 14 through 19.

4. Indexing Review

Technological and Data Changes

The uniform oil lease equipment design adopted in 1976 was the basic criterion for oil lease equipment cost estimates. Revisions have been made to stay current with engineering and competitive practices. Individual component prices were combined into one price for a group of equipment, as necessary, to assure confidentiality of prices. Appendix Tables A15 through A18 contain detailed equipment lists of representative wells in west Texas for each depth. These equipment lists reflect any changes made to date.

Standardization of the data used has evolved during the past 18 years. Improved methods for measuring various contractor costs were used and applied to previous estimates. The gas lease equipment designs were made in 1980 and the equipment and operating components were priced back through 1976. There have been no recent design changes for gas equipment. A typical design is shown in Appendix Table H11 which contains a list of equipment for a 12,000-foot gas well producing 1 million cubic feet per day in west Texas.

Estimated preliminary costs were revised to reflect more accurate data. Some of these changes and factors were:

- New projections of *Joint Association Survey* (JAS) data for west Texas were made to estimate 1993 drilling costs.
- Independent Petroleum Association of America data were used to project 1993 drilling costs.
- Region gas prices were revised to the final prices.

Primary Oil Recovery

Leases for oil wells were assumed to consist of 10 wells producing by artificial lift into a centrally located tank battery. The depths of all wells on the leases were 2,000, 4,000, 8,000, or 12,000 feet.

Costs were determined for new equipment capable of producing 200 barrels of fluid per day per well for onshore primary operations. Tubing costs were included for information only. Care must be exercised when combining these equipment costs with drilling costs to obtain total lease development and equipment costs, because most drilling cost estimates include tubing costs. The artificial lift selected was dependent upon the type of lift found to be dominant for each depth in each region. The two types of prime movers considered were electric motor and gas engine. Table 22 details the type of lift and prime mover used in each region and depth.

Annual operating costs were estimated for daily production rates of 100 barrels of fluid per day per well for each depth in each region of operation.

Table 22. Type of Artificial Lift and Prime Mover Used for Each Depth and Area

Area	Type of Lift	Prime Mover	Type of Lift	Prime Mover
	2,000-foot Wells		4,000-foot Wells	
California	Rod	Motor	Rod	Motor
Oklahoma	Rod	Engine	Rod	Engine
South Louisiana	Rod	Engine	Gas	Engine
South Texas	Rod	Engine	Gas	Engine
West Texas	Rod	Engine	Rod	Engine
Wyoming	Rod	Motor	Rod	Motor
	8,000-foot Wells		12,000-foot Wells	
California	Hydraulic	Motor	Hydraulic	Motor
Oklahoma	Hydraulic	Engine	Hydraulic	Engine
South Louisiana	Gas	Engine	Hydraulic	Engine
South Texas	Gas	Engine	Hydraulic	Engine
West Texas	Rod	Engine	Hydraulic	Engine
Wyoming	Rod	Motor	Hydraulic	Motor

Source: Energy Information Administration, Office of Oil and Gas.

Secondary Oil Recovery

Costs for secondary oil recovery in west Texas were calculated for wells producing from depths of 2,000, 4,000, and 8,000 feet. Each lease had 10 producing wells, 11 injection wells, and 1 disposal well. Additional costs included those for water supply wells, water storage tanks, injection plant, filtering systems, and injection lines. Equipment was designed to handle 350 barrels of fluid per day per producing well. Gas engines used in primary operations were replaced by electric motors for secondary oil recovery. Some equipment for primary oil production was replaced with larger equipment to accommodate the increased fluid volumes assumed for secondary recovery production. Increases in operational costs for secondary oil recovery are indicated for the increased fluid lift of 290 barrels of fluid per day per producing well and the water injection system. Additional equipment costs are presented in Appendix Tables A9, A10, and A11, and direct annual operating costs are presented in Tables A12, A13, and A14.

Offshore Gas and Primary Oil Recovery

Equipment and operating costs for the offshore Gulf of Mexico were estimated for 12- and 18-slot platforms containing one dually completed well for each slot. Maximum crude oil production was assumed to total 11,000 barrels of oil per day from wells on each platform. Maximum associated gas production was assumed to be 40 million cubic feet of gas per day per platform. This balance between gas and oil is weighted more heavily toward gas in offshore operations than in onshore leases. Operating costs were derived for platforms assumed to be 50, 100, and 125 miles from shore corresponding to water depths of 100, 300, and 600 feet, respectively. Meals, platform maintenance, helicopter, and boat transportation of personnel and supplies, and communication costs are included in normal production expenses. Insurance costs for platform and production equipment are included, as well as administrative expenses. Crude oil and natural gas transportation costs to shore are excluded.

Gas Recovery

Leases for gas wells were assumed to consist of one well producing into an onsite separator and two storage tanks (a lease condensate sales tank and a water storage tank). Line heaters, dehydration units, and methanol injectors were included where needed. It was assumed that any compression or gas treatment would be provided by the first purchaser. The cost data presented were based on the installation of new equipment and included items needed from the wellhead to the inlet on the meter run for the gas stream and through the tank for the liquid streams. Downhole tubing costs were not included.

Gas production rates of 50, 250, 500, 1,000, 5,000, and 10,000 thousand cubic feet of gas per day and well depths of 2,000, 4,000, 8,000, 12,000, and 16,000 feet were the assumed volume and depth divisions for the cost determinations. These volumes were selected because of different processing equipment requirements for each of these flow rates. Production records were used to determine the average production rates for each depth in each region. The equipment and operating costs for each of these average production rates were calculated. For a broader view of each flow rate in each region at each depth, the equipment and operating costs of the next higher and/or lower rates are shown. Costs were calculated for equipping gas wells at producing rates of 50 thousand cubic feet per day even though a new well coming onstream at this rate may never reach payout. This low rate of flow was selected to identify costs of production from stripper gas wells. Flow rates above 10 million cubic feet per day usually require custom designing of equipment and are not priced in this report.

The depths of 2,000, 4,000, 8,000, and 12,000 feet were chosen to be compatible with data provided for oil production. An additional depth of 16,000 feet was added for gas equipment and operations because there was significant gas production from this depth in some regions studied.

Section I

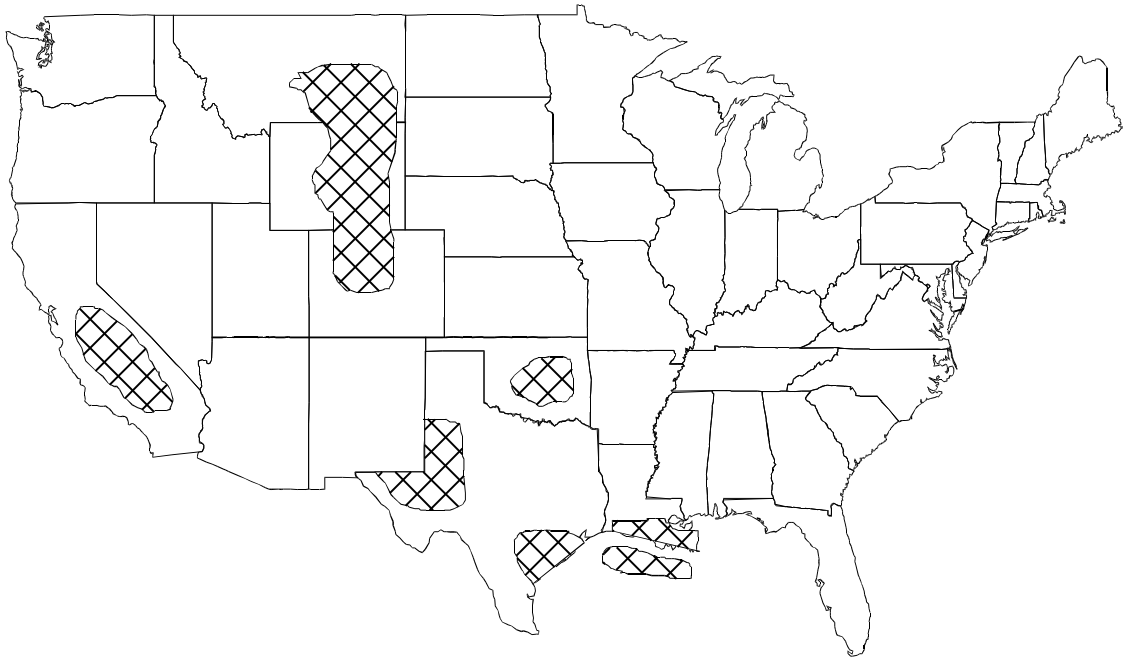
Appendices A Through G

Costs and Indices for Domestic Oil Field Equipment and Production Operations

Appendices A Through G

Costs and Indices for Domestic Oil Field Equipment and Production Operations

Figure 1. Geographical Regions for Oil Producing Leases



Source: Energy Information Administration, Office of Oil and Gas.

A detailed breakdown of 1993 costs and indices for 1990 through 1993 is shown in each of the oil lease appendix tables. These tables include both lease equipment costs and direct annual operating costs with their appropriate index numbers. Appendices A through G present the costs and indices for each region and type of operation for oil production.

The tables are arranged by region with each region identified by an alpha character. For example, Tables A1 through A18 are for west Texas. Tables A1 through A4 contain equipment costs and indices for primary production for four depths, beginning with the shallowest depth. Tables A5 through A8 are the annual operating costs and indices by depth for primary operations. Tables A9, A10, and A11 present additional equipment costs required for secondary operations for three depths. Tables A12, A13, and A14 contain annual operating costs by depth for secondary production. Tables A15 through A18 are sample detailed equipment listings by depth for the region.

The remaining Tables containing costs and indices for oil leases by region are arranged in similar order. These appendices are: Appendix B--South Texas, Appendix C--South Louisiana, Appendix D--Oklahoma, Appendix E--Rocky Mountains, Appendix F--California, and Appendix G--Gulf of Mexico.

Notes: 1993 data are preliminary and are marked with a single asterisk (*). All prior data were revised. Indices marked with a double asterisk (**) are composite indices. Other indices are pure cost. Data with (***) are estimated from *Joint Association Survey on Drilling Costs* data.

Table A1. Lease Equipment Costs and Indices for Primary Oil Production in West Texas
(10 Wells Producing from 2,000 Feet by Rod Lift)

Component	Index (1976 = 100)				1993 Cost
	1990	1991	1992	1993	(dollars)*
Producing Equipment:					
Tubing	108.1	110.6	114.5	115.6	41,400
Rods	102.6	103.7	107.9	107.9	20,600
Pumps	127.4	127.4	131.0	133.3	11,200
Pumping Equipment.	148.9	154.1	163.9	173.8	227,300
Subtotal or Index**	**135.9**	**139.9**	**147.9**	**154.8**	**300,500**
Gathering System:					
Flowlines	249.7	253.8	250.3	246.9	35,800
Manifold	239.4	264.4	261.4	258.3	34,100
Subtotal or Index**	**244.8**	**258.8**	**255.6**	**252.3**	**69,900**
Lease Equipment:					
Producing Separator	146.9	170.3	175.0	181.3	11,600
Test Separator	179.2	187.1	191.1	196.0	19,800
Heater Treater	140.0	145.2	148.4	151.6	23,500
Storage Tanks	179.2	186.0	188.1	190.2	63,900
Accessory Equipment	198.6	204.8	210.2	215.6	31,700
Disposal System	183.6	182.4	188.9	193.7	80,400
LACT Unit	163.4	166.7	169.9	174.2	16,200
Subtotal or Index**	**175.4**	**180.1**	**184.4**	**188.5**	**247,100**
Total or Index**	**159.1**	**164.2**	**169.9**	**175.0**	**617,500**

Table A2. Lease Equipment Costs and Indices for Primary Oil Production in West Texas
(10 Wells Producing from 4,000 Feet by Rod Lift)

Component	Index (1976 = 100)				1993 Cost
	1990	1991	1992	1993	(dollars)*
Producing Equipment:					
Tubing.	102.6	109.0	112.8	114.2	82,900
Rods	97.7	98.7	101.5	101.5	39,700
Pumps	126.8	130.5	132.9	136.6	11,200
Pumping Equipment	147.6	135.4	145.0	154.9	347,300
Subtotal or Index**	**132.0**	**125.5**	**133.0**	**139.8**	**481,100**
Gathering System:					
Flowlines	239.9	242.6	238.8	235.6	44,300
Manifold.	239.4	264.4	261.4	258.3	34,100
Subtotal or Index**	**239.7**	**251.6**	**248.1**	**245.0**	**78,400**
Lease Equipment:					
Producing Separator	146.9	170.3	175.0	181.3	11,600
Test Separator	179.2	187.1	191.1	196.0	19,800
Heater Treater	140.0	145.2	148.4	151.6	23,500
Storage Tanks	179.2	186.0	188.1	190.2	63,900
Accessory Equipment	198.6	204.8	210.2	215.6	31,700
Disposal System	183.4	181.5	188.3	193.2	82,700
LACT Unit	163.4	166.7	169.9	174.2	16,200
Subtotal or Index**	**175.5**	**179.8**	**184.3**	**188.4**	**249,400**
Total or Index**	**150.1**	**147.6**	**153.6**	**159.1**	**808,900**

Table A3. Lease Equipment Costs and Indices for Primary Oil Production in West Texas
(10 Wells Producing from 8,000 Feet by Rod Lift)

Component	Index (1976 = 100)				1993 Cost
	1990	1991	1992	1993	(dollars)*
Producing Equipment:					
Tubing	98.9	113.8	114.7	113.6	212,800
Rods	94.3	88.5	89.7	89.8	89,700
Pumps	128.9	132.2	136.7	136.7	12,300
Pumping Equipment	162.0	148.0	159.7	171.6	729,100
Subtotal or Index**	**135.8**	**130.7**	**138.0**	**144.7**	**1,043,900**
Gathering System:					
Flowlines	230.5	231.7	228.2	224.3	58,100
Manifold	239.4	264.4	261.4	258.3	34,100
Subtotal or Index..**	**233.5**	**242.7**	**239.4**	**235.8**	**92,200**
Lease Equipment:					
Producing Separator	146.9	170.3	175.0	181.3	11,600
Test Separator	179.2	187.1	191.1	196.0	19,800
Heater Treater	140.0	145.2	148.4	151.6	23,500
Storage Tanks	179.2	186.0	188.1	190.2	63,900
Accessory Equipment.	198.6	204.8	210.2	215.6	31,700
Disposal System	197.6	194.9	202.4	208.0	77,600
LACT Unit	163.4	166.7	169.9	174.2	16,200
Subtotal or Index..**	**179.3**	**183.7**	**188.3**	**192.5**	**244,300**
Total or Index**	**146.4**	**143.2**	**149.7**	**155.6**	**1,380,400**

Table A4. Lease Equipment Costs and Indices for Primary Oil Production in West Texas
(10 Wells Producing from 12,000 Feet by Hydraulic Lift)

Component	Index (1976 = 100)				1993 Cost
	1990	1991	1992	1993	(dollars)*
Producing Equipment:					
Tubing	149.7	106.4	138.0	167.3	854,300
Pumps	257.7	260.3	261.7	261.7	196,000
Pumping Equipment	213.4	213.0	219.9	219.9	391,000
Subtotal or Index**	**175.2**	**146.4**	**169.2**	**188.8**	**1,441,300**
Gathering System:					
Flowlines	177.3	147.6	172.3	195.8	177,400
Manifold	239.4	264.4	261.4	258.3	34,100
Subtotal or Index..**	**185.2**	**162.4**	**183.6**	**203.8**	**211,500**
Lease Equipment:					
Producing Separator	146.9	170.3	175.0	181.3	11,600
Test Separator	179.2	187.1	191.1	196.0	19,800
Heater Treater	140.0	145.2	148.4	151.6	23,500
Storage Tanks	179.2	186.0	188.1	190.2	63,900
Accessory Equipment	198.6	204.8	210.2	215.6	31,700
Disposal System	197.6	194.9	202.4	208.0	77,600
LACT Unit	163.4	166.7	169.9	174.2	16,200
Subtotal or Index**	**179.3**	**183.7**	**188.3**	**192.5**	**244,300**
Total or Index**	**176.7**	**152.8**	**173.1**	**190.9**	**1,897,100**

Table A5. Direct Annual Operating Costs and Indices for Primary Oil Production in West Texas
(10 Wells Producing from 2,000 Feet by Rod Lift)

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
Normal Daily Expense:					
Supervision and Overhead	291.7	273.3	253.3	233.3	14,000
Labor (pumper)	278.4	270.3	262.2	254.1	18,800
Auto Usage	226.9	250.0	257.7	257.7	6,700
Chemicals	225.9	207.4	203.7	203.7	5,500
Fuel, Power & Water	205.6	206.9	227.8	238.9	17,200
Operative Supplies	266.7	250.0	250.0	250.0	1,500
Subtotal or Index**	**250.9**	**244.9**	**244.2**	**240.4**	**63,700**
Surface Maintenance, Repair & Services:					
Labor (roustabout)	262.1	255.2	244.8	248.3	7,200
Supplies & Services	259.4	250.0	243.8	234.4	7,500
Equipment Usage	230.8	238.5	246.2	246.2	3,200
Other	180.0	180.0	180.0	180.0	2,700
Subtotal or Index**	**242.7**	**238.2**	**233.7**	**231.5**	**20,600**
Subsurface Maintenance, Repair & Services:					
Workover Rig Services	212.8	212.8	225.6	225.6	8,800
Remedial Services	143.8	143.8	143.8	143.8	2,300
Equipment Repair	124.4	126.7	128.9	131.1	5,900
Other	150.0	150.0	150.0	150.0	300
Subtotal or Index**	**161.8**	**162.7**	**168.6**	**169.6**	**17,300**
Total or Index**	**229.4**	**225.2**	**225.2**	**222.8**	**101,600**

Table A6. Direct Annual Operating Costs and Indices for Primary Oil Production in West Texas
(10 Wells Producing from 4,000 Feet by Rod Lift)

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
Normal Daily Expense:					
Supervision and Overhead	291.2	273.5	252.9	230.9	15,700
Labo r(pumper)	278.4	270.3	262.2	254.1	18,800
Auto Usage	226.9	250.0	257.7	257.7	6,700
Chemicals	237.0	218.5	218.5	218.5	5,900
Fuel, Power & Water	209.1	211.4	233.0	244.3	21,500
Operative Supplies	266.7	266.7	250.0	250.0	1,500
Subtotal or Index**	**251.6**	**246.4**	**246.4**	**242.6**	**70,100**
Surface Maintenance, Repair & Services:					
Labor (roustabout)	262.1	255.2	244.8	248.3	7,200
Supplies & Services	261.8	252.9	244.1	238.2	8,100
Equipment Usage	246.2	292.3	253.8	261.5	3,400
Other	187.5	187.5	187.5	187.5	4,500
Subtotal or Index**	**242.0**	**243.0**	**232.0**	**232.0**	**23,200**
Subsurface Maintenance Repair & Services:					
Workover Rig Services	204.5	204.5	219.7	219.7	14,500
Remedial Services	160.9	156.5	156.5	160.9	3,700
Equipment Repair	120.4	124.5	126.5	128.6	6,300
Other.	166.7	166.7	166.7	166.7	500
Subtotal or Index.**	**167.4**	**168.1**	**175.9**	**177.3**	**25,000**
Total or Index**	**227.4**	**224.9**	**224.9**	**223.2**	**118,300**

Table A7. Direct Annual Operating Costs and Indices for Primary Oil Production in West Texas
(10 Wells Producing from 8,000 Feet by Hydraulic Lift)

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
Normal Daily Expense:					
Supervision and Overhead	294.9	275.9	254.4	231.6	18,300
Labor (pumper)	278.4	270.3	262.2	254.1	18,800
Auto Usage	226.9	250.0	257.7	257.7	6,700
Chemicals	217.2	200.0	200.0	196.6	5,700
Fuel, Power & Water	213.3	214.8	237.5	250.0	32,000
Operative Supplies	257.1	242.9	228.6	228.6	1,600
Subtotal or Index**	**248.4**	**242.9**	**227.4**	**242.3**	**83,100**
Surface Maintenance, Repair & Services:					
Labor (roustabout)	262.1	255.2	244.8	248.3	7,200
Supplies & Services	253.8	246.2	238.5	233.3	9,100
Equipment Usage	240.0	273.3	246.7	246.7	3,700
Other	180.0	180.0	180.0	180.0	5,400
Subtotal or Index**	**234.5**	**234.5**	**225.7**	**224.8**	**25,400**
Subsurface Maintenance, Repair & Services:					
Workover Rig Services	222.9	222.9	241.7	241.7	34,800
Remedial Services	191.4	185.7	188.6	190.0	13,300
Equipment Repair	131.7	136.7	140.0	140.0	8,400
Other	166.7	155.6	166.7	166.7	1,500
Subtotal or Index.**	**194.0**	**193.3**	**204.6**	**204.9**	**58,000**
Total or Index**	**225.4**	**222.6**	**218.4**	**225.3**	**166,500**

Table A8. Direct Annual Operating Costs and Indices for Primary Oil Production in West Texas
(10 Wells Producing from 12,000 Feet by Hydraulic Lift)

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
Normal Daily Expense:					
Supervision and Overhead	298.0	276.5	254.1	231.6	22,700
Labor (pumper)	278.4	270.3	262.2	254.1	18,800
Auto Usage	226.9	250.0	257.7	257.7	6,700
Chemicals	212.1	190.9	190.9	190.9	6,300
Fuel, Power & Water	213.6	215.9	2386	251.7	44,300
Operative Supplies	310.0	310.0	3100	320.0	3,200
Subtotal or Index**	**248.0**	**242.2**	**2456**	**244.6**	**102,000**
Surface Maintenance, Repair & Services:					
Labor (roustabout)	262.1	255.2	244.8	248.3	7,200
Supplies & Services	233.7	236.6	239.6	242.6	24,500
Equipment Usage	240.0	273.3	246.7	246.7	3,700
Other	200.0	200.0	200.0	200.0	1,200
Subtotal or Index**	**238.4**	**242.4**	**239.7**	**242.4**	**36,600**
Subsurface Maintenance, Repair & Services:					
Workover Rig Services	201.5	201.5	206.1	206.1	13,600
Remedial Services	197.5	192.4	195.0	195.8	23,300
Equipment Repair	326.8	330.7	333.5	334.1	59,800
Other	166.7	158.3	166.7	166.7	2,000
Subtotal or Index**	**258.8**	**258.8**	**262.0**	**262.5**	**98,700**
Total or Index**	**250.7**	**248.8**	**251.2**	**251.4**	**237,300**

Table A9. Additional Lease Equipment Costs and Indices for Secondary Oil Production in West Texas
(10 Wells Producing from 2,000 Feet by Rod Lift and 11 Water Injection Wells)

Component	Index (1976 = 100)				1993 Cost
	1990	1991	1992	1993	(dollars)*
Injection Equipment:					
Supply Wells	175.6	173.3	169.2	166.1	121,400
Plant	275.4	284.9	291.4	296.4	99,900
Distribution Lines	173.9	156.6	171.8	185.5	78,300
Header	235.7	240.6	240.1	240.1	49,700
Electrical Service	327.2	328.7	327.5	328.3	87,000
Subtotal or Index**	**219.2**	**217.0**	**219.6**	**222.4**	**436,300**
Producing Equipment:					
Tubing Replacement	115.1	117.1	123.7	125.0	49,000
Rods & Pumps	105.3	106.3	110.1	110.7	35,200
Pumping Equipment	230.2	246.9	266.3	284.7	27,900
Subtotal or Index**	125.2	128.6	135.6	138.7	112,100
Injection Wells:* **					
Subtotal or Index**	**185.9**	**155.1**	**180.9**	**185.0**	**980,100**
Total or Index**	**187.9**	**167.5**	**185.8**	**189.5**	**1,528,500**

Table A10. Additional Lease Equipment Costs and Indices for Secondary Oil Production in West Texas
(10 Wells Producing from 4,000 Feet by Rod Lift and 11 Water Injection Wells)

Component	Index (1976 = 100)				1993 Cost
	1990	1991	1992	1993	(dollars)*
Injection Equipment:					
Supply Wells	175.6	173.3	169.2	166.1	121,400
Plant	274.6	284.0	29.05	295.6	99,900
Distribution Lines	173.9	156.6	171.8	185.5	78,300
Header	235.7	240.6	240.1	240.1	49,700
Electrical Service	235.6	236.7	235.9	236.4	87,000
Subtotal or Index**	**208.2**	**206.1**	**208.6**	**211.2**	**436,300**
Producing Equipment:					
Tubing Replacement	112.6	114.8	120.6	121.8	92,900
Rods & Pumps	99.8	101.1	103.6	104.0	54,700
Pumping Equipment	157.2	124.6	129.8	135.3	271,600
Subtotal or Index**	**137.7**	**118.6**	**123.5**	**127.1**	**419,200**
Injection Wells:* **					
Subtotal or Index**	**167.0**	**168.8**	**166.9**	**170.7**	**1,937,800**
Total or Index**	**166.3**	**163.5**	**163.5**	**167.1**	**2,793,300**

Table A11. Additional Lease Equipment Costs and Indices for Secondary Oil Production in West Texas
(10 Wells Producing from 8,000 Feet by Rod Lift and 11 Water Injection Wells)

Component	Index (1976 = 100)				1993 Cost
	1990	1991	1992	1993	(dollars)*
Injection Equipment:					
Supply Wells	177.7	174.9	169.6	165.6	215,000
Plant	283.0	293.5	300.8	306.4	202,200
Distribution Lines	175.4	158.0	173.3	187.2	118,700
Header	221.3	225.5	225.5	225.1	60,100
Electrical Service	254.6	255.9	254.6	254.4	136,100
Subtotal or Index**	**213.3**	**2115**	**213.6**	**215.7**	**732,100**
Producing Equipment:					
Tubing Replacement	102.6	117.1	119.2	118.1	227,900
Rods & Pumps	95.0	97.1	97.8	97.8	115,900
Pumping Equipment	153.3	128.7	135.5	142.7	536,800
Subtotal or Index**	**129.0**	**120.0**	**124.5**	**128.1**	**880,600**
Injection Wells:***					
Subtotal or Index**	**143.3**	**133.0**	**142.5**	**145.8**	**4,345,900**
Total or Index**	**146.8**	**137.4**	**145.5**	**148.7**	**5,958,600**

Table A12. Direct Annual Operating Costs and Indices for Secondary Oil Production in West Texas
(10 Wells Producing from 2,000 Feet by Rod Lift and 11 Water Injection Wells)

Component	Index (1976 = 100)				1993 Cost
	1990	1991	1992	1993	(dollars)*
Normal Daily Expense:					
Supervision and Overhead	254.5	239.3	222.1	203.4	29,500
Labor (pumper).	235.0	228.3	221.7	215.0	25,800
Chemicals	208.6	200.0	200.0	200.0	7,000
Fuel, Power & Water..	225.8	221.2	212.6	214.2	64,700
Operative Supplies	286.7	280.0	280.0	266.7	4,000
Subtotal or Index**	**234.8**	**227.1**	**217.5**	**212.3**	**131,000**
Surface Maintenance, Repair & Services:					
Labor (roustabout)	253.6	246.4	239.1	231.9	16,000
Supplies & Services.	232.7	230.0	227.3	221.8	24,400
Equipment Usage	260.9	269.6	273.9	278.3	6,400
Other..	193.3	193.3	193.3	193.3	2,900
Subtotal or Index**	**239.6**	**236.9**	**233.6**	**229.0**	**49,700**
Subsurface Maintenance, Repair & Services:					
Workover Rig Services...	204.9	204.9	222.4	222.4	31,800
Remedial Services.	180.5	175.6	180.5	182.9	7,500
Equipment Repair.	120.8	122.6	126.4	128.3	6,800
Other..	188.6	180.0	182.9	188.6	6,600
Subtotal or Index**	**182.7**	**181.3**	**192.3**	**193.8**	**52,700**
Total or Index..**	**223.0**	**217.7**	**214.5**	**211.0**	**233,400**

Table A13. Direct Annual Operating Costs and Indices for Secondary Oil Production in West Texas
(10 Wells Producing from 4,000 Feet by Rod Lift and 11 Water Injection Wells)

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
Normal Daily Expense:					
Supervision and Overhead	287.6	269.7	250.3	229.0	33,200
Labor (pumper)	235.0	227.8	220.6	213.3	38,400
Chemicals	221.9	209.4	209.4	209.4	6,700
Fuel, Power & Water	227.6	222.5	212.6	213.9	79,800
Operative Supplies	261.5	253.8	250.0	242.3	6,300
Subtotal or Index**	**241.8**	**233.3**	**222.9**	**2175**	**164,400**
Surface Maintenance, Repair & Services:					
Labor (roustabout)	255.3	248.2	241.2	234.2	26,700
Supplies & Services	227.5	222.8	219.3	212.3	36,300
Equipment Usage	293.5	297.8	304.3	308.7	14,200
Other	200.0	200.0	200.0	200.0	2,400
Subtotal or Index**	**244.6**	**240.5**	**237.3**	**232.1**	**79,600**
Subsurface Maintenance, Repair & Services:					
Workover Rig Services	202.4	202.4	218.4	218.4	45,200
Remedial Services	192.6	188.2	191.2	192.6	13,100
Equipment Repair	120.2	123.8	126.2	129.8	10,900
Other	181.6	173.5	177.6	181.6	8,900
Subtotal or Index**	**181.4**	**180.4**	**190.0**	**191.4**	**78,100**
Total or Index**	**226.1**	**220.6**	**217.3**	**213.7**	**322,100**

Table A14. Direct Annual Operating Costs and Indices for Secondary Oil Production in West Texas
(10 Wells Producing from 8,000 Feet by Rod Lift and 11 Water Injection Wells)

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
Normal Daily Expense:					
Supervision and Overhead	282.8	264.5	244.4	223.7	37,800
Labor (pumper)	235.0	227.8	220.6	213.3	38,400
Chemicals	221.9	209.4	209.4	209.4	6,700
Fuel, Power & Water	247.9	242.0	230.3	230.9	148,500
Operative Supplies	265.4	257.7	253.8	246.2	6,400
Subtotal or Index**	**251.0**	**242.6**	**230.9**	**226.5**	**237,800**
Surface Maintenance, Repair & Services:					
Labor (roustabout)	255.3	248.2	241.2	234.2	26,700
Supplies & Services	238.9	234.1	229.9	222.8	37,200
Equipment Usage	249.4	256.2	262.9	269.7	24,000
Other	190.0	190.0	190.0	190.0	1,900
Subtotal or Index**	**245.0**	**242.4**	**240.0**	**236.3**	**89,800**
Subsurface Maintenance, Repair & Services:					
Workover Rig Services	199.0	199.0	212.8	212.8	86,400
Remedial Services	249.3	242.5	236.6	234.3	31,400
Equipment Repair	108.6	112.9	116.5	117.3	16,300
Other	176.0	169.3	173.3	177.3	13,300
Subtotal or Index**	**189.0**	**187.9**	**195.4**	**195.5**	**147,400**
Total or Index**	**228.5**	**223.7**	**220.2**	**217.5**	**475,000**

Table A15. Detailed Lease Equipment List for 2,000-Foot Wells in West Texas (10 Producing Wells)

Tubing (20,000 feet)

Size: 2-3/8 inches
Weight: 4.7 pounds per foot
Grade: H-40

Sucker Rods (20,000 feet)

Size: 5/8 inches
API class: K

Rod Pump (10)

API type: TH
Size: 2 by 1-3/4 inches by 9 feet

Pumping Unit (10)

API size: C57D-76-54
Engine: 9 horsepower single cylinder

Oil Flowline (11,500 feet)

Size: 2-3/8 inches
Material: polyvinyl chloride 1120
Weight: 0.43 pounds per foot
Pressure rating: 160 pounds per square inch

Manifold (1)

Valves: 2-inch, 3-way, 2-position, electric operated (10)

Production Separator (1)

Type: Vertical
Size: 30 inches by 10 feet
Capacity: 2,700 barrels of fluid per day and 5.7 million cubic feet of gas per day

Vapor Recovery Unit (1)

Capacity: 40 thousand cubic feet of gas per day

Test Separator (1)

Type: Vertical
Size: 24 inches by 7-1/2 feet
Capacity: 1,290 barrels of fluid per day
Working pressure: 125 pounds per square inch
Net oil computer: Electronic

Heater Treater (1)

Working pressure: 50 pounds per square inch
Size: 4 feet by 27-1/2 feet

Oil Storage Tanks (2)

Storage capacity: 2,000 barrels
Type: 10 gauge, bolted steel
Construction: Gas tight
Size: 30 feet by 16 feet

Water Disposal Pump (1)

Type: Quintuplex
Plungers: 1-1/2 inches
Working Pressure: 1,000 pounds per square inch
Electric motor: 20 horsepower

Water Disposal Line (2,000 feet)

Size: 2-3/8 inches
Weight: 3.75 pounds per foot
Grade: B
Mill test: 2,500 pounds per square inch

LACT Unit (1)

Capacity: 2,000 barrels of oil per day
Working Pressure: 125 pounds per square inch.

Source: Energy Information Administration, Office of Oil and Gas.

Table A16. Detailed Lease Equipment List for 4,000-Foot Wells in West Texas (10 Producing Wells)

Tubing (40,000 feet)

Size: 2-3/8 inches
Weight: 4.7 pounds per foot
Grade: J--55

Sucker Rods (40,000 feet)

Size: 5/8 inches (24,000 feet)
Size: 3/4 inches (16,000 feet)
API class: K

Rod Pump (10)

Size: 2 by 1-1/2 inches by 9 feet
API type: RWBC

Pumping Unit (10)

API size: M160D-173-74
Engine: 12 horsepower single cylinder

Oil Flowline (16,000 feet)

Size: 2-3/8 inches
Material: polyvinyl chloride 1120
Weight: 0.43 pounds per foot
Pressure rating: 160 pounds per square inch

Manifold (1)

Valves: 2 inch, 3-way, 2-position, electric operated (10)

Production Separator (1)

Type: Vertical
Size: 30 inches by 10 feet
Capacity: 2,700 barrels of fluid per day and 5.7 million cubic feet of gas per day

Vapor Recovery Unit (1)

Capacity: 40 thousand cubic feet of gas per day

Test Separator (1)

Type: Vertical
Size: 24 inches by 7-1/2 feet
Capacity: 1,290 barrels of fluid per day
Working pressure: 125 pounds per square inch
Net oil computer: electronic

Heater Treater (1)

Working pressure: 50 pounds per square inch
Size: 4 feet by 27-1/2 feet

Oil Storage Tanks (2)

Storage capacity: 2,000 barrels
Type: 10 gauge, bolted steel
Construction: Gas tight
Size: 30 feet by 16 feet

Water Disposal Pump (1)

Type: Quintuplex
Plungers: 1-1/2 inches
Working pressure: 1,000 pounds per square inch
Electric motor: 20 horsepower

Water Disposal Line (2,400 feet)

Size: 2-3/8 inches
Weight: 3.75 pounds per foot
Grade: B
Mill test: 2,500 pounds per square inch

LACT Unit (1)

Capacity: 2,000 barrels of oil per day
Working pressure: 125 pounds per square inch

Source: Energy Information Administration, Office of Oil and Gas.

Table A17. Detailed Lease Equipment List for 8,00- Foot Wells in West Texas (10 Producing Wells)

Tubing (80,000 feet)

Size: 2-7/8 inches
Weight: 6.5 pounds per foot
Grade: J-55

Sucker Rods (80,000 feet)

Size: 1 inch (15,250 feet)
Size: 7/8 inches (17,500 feet)
Size: 3/4 inches (47,250 feet)
API class: K

Rod Pump (10)

Size: 2-1/2 by 1-1/4 inches by 20 feet
API type: RWBC

Pumping Unit (10)

API size: M456D-305-144
Engine: 32 horsepower single cylinder

Oil Flowline (23,200 feet)

Size: 2-3/8 inches
Material: polyvinyl chloride 1120
Weight: 0.43 pounds per foot
Pressure rating: 160 pounds per square inch

Manifold (1)

Valves: 2 inch, 3-way, 2-position, electric operated (10)

Production Separator (1)

Type: Vertical
Size: 30 inches by 10 feet
Capacity: 2,700 barrels of fluid per day and 5.7 million cubic feet of gas per day

Vapor Recovery Unit (1)

Capacity: 40 thousand cubic feet of gas per day

Test Separator (1)

Type: Vertical
Size: 24 inches by 7-1/2 feet
Capacity: 1,290 barrels of fluid per day
Working pressure: 125 pounds per square inch
Net oil computer: electronic

Heater Treater (1)

Working pressure: 50 pounds per square inch
Size: 4 feet by 27-1/2 feet

Oil Storage Tanks (2)

Storage capacity: 2,000 barrels
Type: 10 gauge, bolted steel
Construction: Gas tight
Size: 30 feet by 16 feet

Water Disposal Pump (1)

Type: Quintuplex
Plungers: 1-1/2 inches
Working pressure: 1,000 pounds per square inch
Electric motor: 20 horsepower

Water Disposal Line (3,400 feet)

Size: 2-3/8 inches
Weight: 3.75 pounds per foot
Grade: B
Mill test: 2,500 pounds per square inch

LACT Unit (1)

Capacity: 2,000 barrels of oil per day
Working pressure: 125 pounds per square inch

Source: Energy Information Administration, Office of Oil and Gas.

Table A18. Detailed Lease Equipment List for 12,000-Foot Wells in West Texas (10 Producing Wells)

Tubing (240,000 feet)

Size: 2-7/8 inches (120,000 feet)
Weight: 6.5 pounds per foot
Grade: N80
Size: 1.66 inches (120,000 feet)
Weight: 2.4 pounds per foot
Grade: J-55

Hydraulic Bottom Hole Pump (10)

Size: 2 by 1-3/8 by 1-3/16 inches

Surface Pumping Equipment (4)

Type: Triplex
Engine: 6 cylinder, 100 horsepower

Power Oil Flowlines (23,200 feet)

Size: 1-1/2 inches
Grade: J-55

Power Oil Tank (1)

Storage capacity: 750 barrels
Type: 10 gauge, bolted steel
Construction: Gas tight
Size: 15-1/2 feet by 24 feet

Oil Flowlines (23,200 feet)

Size: 2-3/8 inches
Weight: 0.4 pounds per foot
Material: Fiberglass epoxy

Manifold (1)

Valves: 2 inch, 3-way, 2-position, electric operated (10)

Production Separator (1)

Type: Vertical
Size: 30 inches by 10 feet
Capacity: 2,700 barrels of fluid per day and
5.7 million cubic feetof gas per day

Test Separator (1)

Type: Vertical
Size: 24 inches by 7-1/2 feet
Capacity: 1,290 barrels of fluid per day
Working pressure: 125 pounds per square inch
Net oil computer: electronic

Heater Treater (1)

Working pressure: 50 pounds per square inch
Size: 4 feet by 27-1/2 feet

Oil Storage Tanks (2)

Storage capacity: 2,000 barrels
Type: 10 gauge, bolted steel
Construction: Gas tight
Size: 30 feet by 16 feet

Water Disposal Pump (1)

Type: Quintuplex
Plungers: 1-1/2 inches
Working pressure: 1,000 pounds per square inch
Electric motor: 20 horsepower

Water Disposal Line (3,400 feet)

Size: 2-3/8 inches
Weight: 3.75 pounds per foot
Grade: B
Mill test: 2,500 pounds per square inch

LACT Unit (1)

Capacity: 2,000 barrels of oil per day
Working pressure: 125 pounds per square inch

Vapor Recovery Unit (1)

Capacity: 40 thousand cubic feet of gas per day

Source: Energy Information Administration, Office of Oil and Gas.

Table B1. Lease Equipment Costs and Indices for Primary Oil Production in South Texas
(10 Wells Producing from 2,000 Feet by Rod Lift)

Component	Index (1976 = 100)				1993 Cost
	1990	1991	1992	1993	(dollars)*
Producing Equipment:					
Tubing	107.8	109.8	112.6	113.7	40,600
Rods	101.5	103.0	104.0	105.5	21,200
Pumps	127.4	127.4	131.0	133.3	11,200
Pumping Equipment	149.1	154.4	164.3	174.2	227,300
Subtotal or Index**	**135.7**	**139.8**	**147.1**	**154.2**	**300,300**
Gathering System:					
Flowlines	255.0	263.1	263.1	263.8	39,300
Manifold	238.8	263.4	260.4	257.5	34,500
Subtotal or Index**	**247.3**	**263.3**	**261.8**	**260.8**	**73,800**
Lease Equipment:					
Producing Separator	146.9	170.3	171.9	173.4	11,100
Test Separator.	179.2	187.1	191.1	194.1	19,600
Heater Treater	140.0	145.2	147.7	150.3	23,300
Storage Tanks.	182.4	193.1	195.8	198.8	66,600
Accessory Equipment	198.6	204.8	210.2	215.6	31,700
Disposal System.	179.3	178.6	184.1	189.7	81,400
LACT Unit	163.4	166.7	169.9	174.2	16,200
Subtotal or Index**	**174.9**	**180.7**	**184.7**	**188.7**	**249,900**
Total or Index**	**159.2**	**164.8**	**170.3**	**175.6**	**624,000**

Table B2. Lease Equipment Costs and Indices for Primary Oil Production in South Texas
(10 Wells Producing from 4,000 Feet by Gas Lift)

Component	Index (1976 = 100)				1993 Cost
	1990	1991	1992	1993	(dollars)*
Producing Equipment:					
Tubing	100.3	106.2	108.8	110.1	79,700
Valves and Mandrels	321.3	420.2	428.5	437.5	110,700
Pumping Equipment.	150.0	151.1	151.1	147.3	153,800
Subtotal or Index**	**153.6**	**168.7**	**170.7**	**170.3**	**344,200**
Gathering System:					
Flowlines	157.0	154.2	152.5	151.1	130,400
Manifold	238.8	263.4	260.4	257.5	34,500
Subtotal or Index**	**168.0**	**168.9**	**167.0**	**165.4**	**164,900**
Lease Equipment:					
Producing Separator	146.9	170.3	171.9	173.4	11,100
Test Separator	179.2	187.1	191.1	194.1	19,600
Heater Treater.	140.0	145.2	147.7	150.3	23,300
Storage Tanks	182.4	193.1	195.8	198.8	66,600
Accessory Equipment.	198.6	204.8	210.2	215.6	31,700
Disposal System.	178.6	177.4	183.5	189.2	83,800
LACT Unit	163.4	166.7	169.9	174.2	16,200
Subtotal or Index**	**174.7**	**180.3**	**184.5**	**188.6**	**252,300**
Total or Index**	**163.4**	**172.3**	**174.1**	**174.8**	**761,400**

Table B3. Lease Equipment Costs and Indices for Primary Oil Production in South Texas
(10 Wells Producing from 8,000 Feet by Gas Lift)

Component	(1976 = 100)				1993 Cost
	1990	1991	1992	1993	(dollars)*
Producing Equipment:					
Valves and Mandrels	321.5	420.3	428.8	437.6	154,900
Pumping Equipment	148.4	149.6	149.6	145.8	153,800
Subtotal or Index**	**145.5**	**161.3**	**163.7**	**164.0**	**468,200**
Gathering System:					
Flowlines	153.2	150.2	148.4	147.0	199,100
Manifold	238.8	263.4	260.4	257.5	34,500
Subtotal or Index**	**161.0**	**160.4**	**158.5**	**157.0**	**233,600**
Lease Equipment:					
Producing Separator	146.9	170.3	171.9	173.4	11,100
Test Separator	179.2	187.1	191.1	194.1	19,600
Heater Treater	140.0	145.2	147.7	150.3	23,300
Storage Tanks	182.4	193.1	195.8	198.8	66,600
Accessory Equipment	198.6	204.8	210.2	215.6	31,700
Disposal System	182.6	180.4	186.8	193.2	79,000
LACT Unit	163.4	166.7	169.9	174.2	16,200
Subtotal or Index**	**175.9**	**181.3**	**185.5**	**189.8**	**247,500**
Total or Index**	**156.6**	**165.7**	**167.4**	**168.1**	**949,300**

Table B4. Lease Equipment Costs and Indices for Primary Oil Production in South Texas
(10 Wells Producing from 12,000 Feet by Gas Lift)

Component	Index (1976 = 100)				1993 Cost
	1990	1991	1992	1993	(dollars)*
Producing Equipment:					
Tubing	149.8	105.8	136.4	165.8	843,800
Pumps	257.7	260.3	261.7	261.7	196,000
Pumping Equipment	213.4	213.0	219.9	219.9	391,000
Subtotal or Index..**	**175.2**	**146.0**	**168.2**	**187.9**	**1,430,800**
Gathering System:					
Flowlines	192.1	164.0	162.7	161.8	176,900
Manifold	238.8	263.4	260.4	257.5	34,500
Subtotal or Index**..	197.2	174.8	173.3	172.3	211,400
Lease Equipment:					
Producing Separator	146.9	170.3	171.9	173.4	11,100
Test Separator	179.2	187.1	191.1	194.1	19,600
Heater Treater	140.0	145.2	147.7	150.3	23,300
Storage Tanks	182.4	193.1	195.8	198.8	66,600
Accessory Equipment	198.6	204.8	210.2	215.6	31,700
Disposal System	181.2	177.8	184.3	190.6	78,900
LACT Unit	163.4	166.7	169.9	174.2	16,200
Subtotal or Index..**	**175.5**	**180.4**	**184.7**	**189.0**	**247,400**
Total or Index**	**177.9**	**153.9**	**170.9**	**186.1**	**1,889,600**

Table B5. Direct Annual Operating Costs and Indices for Primary Oil Production in South Texas
(10 Wells Producing from 2,000 Feet by Rod Lift)

Component	(1976 = 100)				1993 Cost
	1990	1991	1992	1993	(dollars)*
Daily Expense:					
Supervision and Overhead	291.7	273.3	253.3	243.3	14,600
Labor (pumper)	253.5	315.1	275.6	275.6	23,700
Auto Usage	232.0	260.0	268.0	268.0	6,700
Chemicals	225.9	211.1	207.4	207.4	5,600
Fuel, Power & Water	223.3	202.7	223.3	234.2	17,100
Operative Supplies	227.3	245.5	227.3	236.4	2,600
Total or Index**	**248.2**	**259.6**	**248.2**	**249.3**	**70,300**
Surface Maintenance, Repair & Services:					
Labor (roustabout)	225.4	218.3	211.3	212.7	15,100
Supplies & Services	172.7	216.4	189.1	192.7	10,600
Equipment Usage	230.4	265.2	243.5	243.5	5,600
Other	333.3	325.0	316.7	316.7	3,800
Total or Index**	**216.1**	**232.3**	**216.1**	**218.0**	**35,100**
Subsurface Maintenance, Repair & Services:					
Workover Rig Services	156.6	162.3	167.9	173.6	9,200
Remedial Services	146.2	142.3	150.0	157.7	4,100
Equipment Repair	120.0	124.0	124.0	128.0	3,200
Other	150.0	150.0	150.0	150.0	300
Subtotal or Index**	**145.3**	**148.1**	**152.8**	**158.5**	**16,800**
Total or Index**	**218.9**	**230.1**	**220.4**	**222.6**	**122,200**

Table B6. Direct Annual Operating Costs and Indices for Primary Oil Production in South Texas
(10 Wells Producing from 4,000 Feet by Gas Lift)

Component	Index (1976 = 100)				1993 Cost
	1990	1991	1992	1993	(dollars)*
Normal Daily Expense:					
Supervision and Overhead	291.2	277.9	261.8	244.1	16,600
Labor (pumper)	253.5	315.1	275.6	275.6	23,700
Auto Usage	232.0	260.0	268.0	268.0	6,700
Chemicals	237.0	225.9	222.2	222.2	6,000
Fuel, Power & Water	234.2	222.2	246.2	259.8	30,400
Operative Supplies	187.5	193.8	187.5	190.6	6,100
Subtotal or Index**	**245.6**	**255.8**	**250.7**	**252.1**	**89,500**
Surface Maintenance, Repair & Services:					
Labor (roustabout)	225.4	218.3	211.3	212.7	15,100
Supplies & Services	175.5	183.0	179.1	181.8	46,000
Equipment Usage	229.2	266.7	245.8	245.8	5,900
Other	362.5	350.0	337.5	343.8	5,500
Subtotal or Index**	**197.0**	**202.7**	**196.7**	**199.2**	**72,500**
Subsurface Maintenance, Repair & Services:					
Workover Rig Services	223.8	228.6	233.3	242.9	5,100
Remedial Services	180.0	177.1	182.9	191.4	6,700
Equipment Repair	144.4	188.9	188.9	200.0	1,800
Other	166.7	166.7	166.7	166.7	500
Subtotal or Index**	**188.2**	**194.1**	**198.5**	**207.4**	**14,100**
Total or Index**	**218.2**	**225.9**	**221.2**	**223.8**	**176,100**

Table B7. Direct Annual Operating Costs and Indices for Primary Oil Production in South Texas
(10 Wells Producing from 8,000 Feet by Gas Lift)

Component	Index (1976 = 100)				1993 Cost
	1990	1991	1992	1993	(dollars)*
Normal Daily Expense:					
Supervision and Overhead	253.8	237.2	220.5	201.3	15,700
Labor (pumper)	253.5	315.1	275.6	275.6	23,700
Auto Usage	232.0	260.0	268.0	268.0	6,700
Chemicals	233.3	218.5	214.8	214.8	5,800
Fuel, Power & Water	230.8	221.1	245.1	257.9	34,300
Operative Supplies	200.0	220.0	202.9	208.6	7,300
Subtotal or Index**	**238.0**	**247.7**	**242.4**	**243.5**	**93,500**
Surface Maintenance, Repair & Services:					
Labor (roustabout)	225.4	218.3	211.3	212.7	15,100
Supplies & Services	190.7	218.1	201.1	204.6	57,500
Equipment Usage	236.0	276.0	252.0	252.0	6,300
Other	335.0	325.0	315.0	320.0	6,400
Subtotal or Index**	**207.1**	**227.2**	**211.8**	**214.9**	**85,300**
Subsurface Maintenance, Repair & Services:					
Workover Rig Services	215.2	218.2	224.2	230.3	7,600
Remedial Services	141.1	141.1	146.7	158.9	14,300
Equipment Repair	126.7	153.3	153.3	160.0	2,400
Other	166.7	155.6	166.7	166.7	1,500
Subtotal or Index**	**157.8**	**160.5**	**166.0**	**175.5**	**25,800**
Total or Index**	**212.1**	**225.1**	**217.2**	**220.5**	**204,600**

Table B8. Direct Annual Operating Costs and Indices for Primary Oil Production in South Texas
(10 Wells Producing from 12,000 Feet by Hydraulic Lift)

Component	Index (1976 = 100)				1993 Cost
	1990	1991	1992	1993	(dollars)*
Normal Daily Expense:					
Supervision and Overhead	296.9	279.6	260.2	240.8	23,600
Labor (pumper)	253.5	315.1	275.6	275.6	23,700
Auto Usage	232.0	260.0	268.0	268.0	6,700
Chemicals	225.8	209.7	206.5	206.5	6,400
Fuel, Power & Water	208.6	202.1	224.1	236.4	44,200
Operative Supplies	278.6	307.1	292.9	300.0	4,200
Subtotal or Index**	**241.7**	**248.5**	**245.6**	**246.7**	**108,800**
Surface Maintenance, Repair & Services:					
Labor (roustabout)	225.4	218.3	211.3	212.7	15,100
Supplies & Services	194.2	230.0	217.5	225.8	27,100
Equipment Usage	236.0	276.0	252.0	252.0	6,300
Other	200.0	200.0	200.0	200.0	1,200
Subtotal or Index**	**209.0**	**230.6**	**218.9**	**223.9**	**49,700**
Subsurface Maintenance, Repair & Services:					
Workover Rig Services	190.0	192.9	195.7	198.6	13,900
Remedial Services	203.3	201.9	208.2	216.4	58,200
Equipment Repair	305.6	308.9	311.2	312.3	55,900
Other	153.8	146.2	153.8	153.8	2,000
Subtotal or Index**	**234.8**	**235.4**	**239.9**	**244.8**	**130,000**
Total or Index**	**232.6**	**239.4**	**238.1**	**241.6**	**288,500**

Table C1. Lease Equipment Costs and Indices for Primary Oil Production in South Louisiana
(10 Wells Producing from 2,000 Feet by Rod Lift)

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
Producing Equipment:					
Tubing	104.8	108.2	111.0	112.2	39,600
Rods	96.6	98.5	100.5	102.0	20,800
Pumps	127.4	127.4	131.0	133.3	11,200
Pumping Equipment	146.8	153.5	165.2	176.9	227,300
Subtotal or Index**	**133.0**	**138.2**	**146.9**	**155.2**	**298,900**
Gathering System:					
Flowlines	243.3	244.8	244.8	244.2	80,600
Manifold	239.8	263.9	261.7	258.6	34,400
Subtotal or Index**	**242.3**	**250.3**	**249.7**	**248.4**	**115,000**
Lease Equipment:					
Producing Separator	146.9	170.3	175.0	181.3	11,600
Test Separator	179.2	187.1	191.1	196.0	19,800
Heater Treater	140.0	145.2	148.4	151.6	23,500
Storage Tanks	179.7	188.4	191.6	194.9	65,300
Accessory Equipment	198.6	204.8	210.2	215.6	31,700
Disposal System	183.5	184.7	191.9	194.7	81,400
LACT Unit	163.4	166.7	169.9	174.2	16,200
Subtotal or Index**	**175.6**	**181.4**	**186.3**	**190.0**	**249,500**
Total or Index**	**161.8**	**167.6**	**173.7**	**179.2**	**663,400**

Table C2. Lease Equipment Costs and Indices for Primary Oil Production in South Louisiana
(10 Wells Producing from 4,000 Feet by Gas Lift)

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
Producing Equipment:					
Tubing	102.1	105.6	108.2	109.5	78,500
Valves and Mandrels	321.3	420.2	428.5	437.5	110,700
Pumping Equipment	150.0	151.1	151.1	147.3	153,800
Subtotal or Index**	**154.5**	**168.7**	**170.7**	**170.3**	**343,000**
Gathering System:					
Flowlines	225.4	226.0	226.0	225.5	177,500
Manifold	239.8	263.9	261.7	258.6	34,400
Subtotal or Index**	**227.5**	**231.5**	**231.2**	**230.3**	**211,900**
Lease Equipment:					
Producing Separator	146.9	170.3	175.0	181.3	11,600
Test Separator	179.2	187.1	191.1	196.0	19,800
Heater Treater	140.0	145.2	148.4	151.6	23,500
Storage Tanks	179.7	188.4	191.6	194.9	65,300
Accessory Equipment	198.6	204.8	210.2	215.6	31,700
Disposal System	183.7	184.9	191.9	194.7	83,700
LACT Unit	163.4	166.7	169.9	174.2	16,200
Subtotal or Index**	**175.7**	**181.5**	**186.3**	**190.0**	**251,800**
Total or Index**	**176.8**	**186.3**	**188.6**	**189.4**	**806,700**

Table C3. Lease Equipment Costs and Indices for Primary Oil Production in South Louisiana
(10 Wells Producing from 8,000 Feet by Gas Lift)

Component	Index (1976 = 100)				1993 Cost
	1990	1991	1992	1993	(dollars)*
Producing Equipment:					
Tubing	123.7	105.7	108.3	109.6	156,900
Valves and Mandrels	321.5	420.3	428.8	437.6	154,900
Pumping Equipment	148.4	149.6	149.6	145.8	153,800
Subtotal or Index**	**157.6**	**161.2**	**163.6**	**163.9**	**465,600**
Gathering System:					
Flowlines	221.9	222.3	222.3	221.8	273,900
Manifold	239.8	263.9	261.7	258.6	34,400
Subtotal or Index**	**223.6**	**226.3**	**226.1**	**225.4**	**308,300**
Lease Equipment:					
Producing Separator	146.9	170.3	175.0	181.3	11,600
Test Separator	179.2	187.1	191.1	196.0	19,800
Heater Treater	140.0	145.2	148.4	151.6	23,500
Storage Tanks	179.7	188.4	191.6	194.9	65,300
Accessory Equipment	198.6	204.8	210.2	215.6	31,700
Disposal System	185.0	187.4	190.9	192.9	78,300
LACT Unit	163.4	166.7	169.9	174.2	16,200
Subtotal or Index**	**175.9**	**182.2**	**185.9**	**189.4**	**246,400**
Total or Index**	**178.3**	**182.3**	**184.4**	**185.2**	**1,020,300**

Table C4. Lease Equipment Costs and Indices for Primary Oil Production in South Louisiana
(10 Wells Producing from 12,000 Feet by Hydraulic Lift)

Component	Index (1976 = 100)				1993 Cost
	1990	1991	1992	1993	(dollars)*
Producing Equipment:					
Tubing	148.5	105.2	136.1	165.8	836,700
Pumps	257.7	260.3	261.7	261.7	196,000
Pumping Equipment	213.4	220.2	227.7	227.7	404,900
Subtotal or Index**	**174.5**	**147.6**	**170.0**	**189.8**	**1,437,600**
Gathering System:					
Flowlines	216.5	179.3	197.0	214.4	283,800
Manifold	239.8	263.9	261.7	258.6	34,400
Subtotal or Index**	**218.6**	**187.0**	**202.9**	**218.4**	**318,200**
Lease Equipment:					
Producing Separator	146.9	170.3	175.0	181.3	11,600
Test Separator	179.2	187.1	191.1	196.0	19,800
Heater Treater	140.0	145.2	148.4	151.6	23,500
Storage Tanks	179.7	188.4	191.6	194.9	65,300
Accessory Equipment	198.6	204.8	210.2	215.6	31,700
Disposal System	223.6	222.1	225.9	227.9	90,700
LACT Unit	163.4	166.7	169.9	174.2	16,200
Subtotal or Index**	**187.8**	**192.9**	**196.7**	**200.2**	**258,800**
Total or Index**	**182.4**	**158.8**	**178.0**	**195.1**	**2,014,600**

Table C5. Direct Annual Operating Costs and Indices for Primary Oil Production in South Louisiana
(10 Wells Producing from 2,000 Feet by Rod Lift)

Component	Index (1976 = 100)				1993 Cost
	1990	1991	1992	1993	(dollars)*
Normal Daily Expense:					
Supervision and Overhead	273.3	261.7	251.7	241.7	14,500
Labor (pumper)	215.1	222.1	229.1	236.6	40,700
Auto Usage	232.0	260.0	268.0	268.0	6,700
Chemicals	222.2	203.7	203.7	207.4	5,600
Fuel, Power & Water	360.0	348.0	348.0	358.0	17,900
Operative Supplies	228.6	242.9	228.6	228.6	1,600
Subtotal or Index**	**248.7**	**249.3**	**251.3**	**255.1**	**87,000**
Surface Maintenance, Repair & Services:					
Labor (roustabout)	231.6	223.7	215.8	218.4	8,300
Supplies & Services	186.1	233.3	205.6	208.3	7,500
Equipment Usage	268.8	287.5	293.8	306.3	4,900
Subtotal or Index**	**220.0**	**238.9**	**225.6**	**230.0**	**20,700**
Subsurface Maintenance, Repair & Services:					
Workover Rig Services	195.0	195.0	198.3	196.7	11,800
Remedial Services	146.2	138.5	146.2	146.2	3,800
Equipment Repair	120.0	124.0	124.0	128.0	3,200
Other	150.0	150.0	150.0	150.0	300
Subtotal or Index**	**166.4**	**165.5**	**169.0**	**169.0**	**19,100**
Total or Index**	**226.8**	**230.1**	**230.0**	**233.1**	**126,800**

Table C6. Direct Annual Operating Costs and Indices for Primary Oil Production in South Louisiana
(10 Wells Producing from 4,000 Feet by Gas Lift)

Component	Index (1976 = 100)				1993 Cost
	1990	1991	1992	1993	(dollars)*
Normal Daily Expense:					
Supervision and Overhead	272.1	258.8	250.0	239.7	16,300
Labor (pumper)	215.1	222.1	229.1	236.6	40,700
Auto Usage	232.0	260.0	268.0	268.0	6,700
Chemicals	237.0	218.5	218.5	218.5	5,900
Fuel, Power & Water	391.1	374.7	374.7	388.6	30,700
Operative Supplies	110.3	113.8	110.3	113.8	3,300
Subtotal or Index**	**254.5**	**252.8**	**254.5**	**259.0**	**103,600**
Surface Maintenance, Repair & Services:					
Labor (roustabout)	231.6	223.7	215.8	218.4	8,300
Supplies & Services	92.5	96.8	94.5	95.7	24,200
Equipment Usage	264.7	282.4	294.1	300.0	5,100
Subtotal or Index**	**119.2**	**122.7**	**120.5**	**122.1**	**37,600**
Subsurface Maintenance, Repair & Services:					
Workover Rig Services	192.6	192.6	196.3	196.3	5,300
Remedial Services	154.3	148.6	151.4	154.3	5,400
Equipment Repair	144.4	188.9	188.9	200.0	1,800
Other	166.7	133.3	133.3	166.7	500
Subtotal or Index**	**167.6**	**168.9**	**171.6**	**175.7**	**13,000**
Total or Index**	**193.0**	**193.6**	**193.9**	**197.2**	**154,200**

Table C7. Direct Annual Operating Costs and Indices for Primary Oil Production in South Louisiana
(10 Wells Producing from 8,000 Feet by Gas Lift)

Component	Index (1976 = 100)				1993 Cost
	1990	1991	1992	1993	(dollars)*
Normal Daily Expense:					
Supervision and Overhead	273.4	260.8	250.6	240.5	19,000
Labor (pumper)	215.1	222.1	229.1	236.6	40,700
Auto Usage.	232.0	260.0	268.0	268.0	6,700
Chemicals	281.8	259.1	263.6	263.6	5,800
Fuel, Power & Water.	387.8	370.0	371.1	384.4	34,600
Operative Supplies	200.0	225.0	209.4	212.5	6,800
Subtotal or Index**	**266.4**	**265.5**	**266.2**	**270.5**	**113,600**
Surface Maintenance, Repair & Services:					
Labor (roustabout)	231.6	223.7	215.8	218.4	8,300
Supplies & Services.	197.2	224.9	207.5	211.4	59,400
Equipment Usage.	272.2	294.4	305.6	316.7	5,700
Subtotal or Index**	**205.0**	**228.5**	**213.6**	**217.8**	**73,400**
Subsurface Maintenance, Repair & Services:					
Workover Rig Services.	200.0	200.0	202.6	202.6	7,900
Remedial Services.	150.0	148.9	152.2	153.3	13,800
quipment Repair	135.7	157.1	164.3	164.3	2,300
Other.	155.6	144.4	155.6	155.6	1,400
Subtotal or Index.**	**161.8**	**162.5**	**166.4**	**167.1**	**25,400**
Total or Index.**	**226.2**	**234.5**	**230.0**	**233.7**	**212,400**

Table C8. Direct Annual Operating Costs and Indices for Primary Oil Production in South Louisiana
(10 Wells Producing from 12,000 Feet by Hydraulic Lift)

Component	Index (1976 = 100)				1993 Cost
	1990	1991	1992	1993	(dollars)*
Normal Daily Expense:					
Supervision and Overhead	273.5	260.2	250.0	238.8	23,400
Labor (pumper)	215.1	222.1	229.1	236.6	40,700
Auto Usage.	232.0	260.0	268.0	268.0	6,700
Chemicals	246.4	225.0	225.0	225.0	6,300
Fuel, Power & Water.	377.1	359.3	360.2	373.7	44,100
Operative Supplies	207.1	235.7	221.4	228.6	3,200
Subtotal or Index**	**272.3**	**268.6**	**269.2**	**273.4**	**124,400**
Surface Maintenance, Repair & Services:					
Labor (roustabout)	231.6	223.7	215.8	218.4	8,300
Supplies & Services.	193.4	227.4	217.9	226.4	24,000
Equipment Usage.	272.2	294.4	305.6	316.7	5,700
Subtotal or Index.**	**211.1**	**234.0**	**227.2**	**234.6**	**38,000**
Subsurface Maintenance, Repair & Services:					
Workover Rig Services.	186.8	186.8	188.2	188.2	14,300
Remedial Services.	176.6	175.1	179.2	180.7	48,600
Equipment Repair	336.2	340.2	343.1	343.7	59,800
Other.	158.3	150.0	150.0	158.3	1,900
Subtotal or Index.**	**229.9**	**230.3**	**233.5**	**234.7**	**124,600**
Total or Index.**	**244.1**	**246.0**	**246.8**	**250.0**	**287,000**

Table D1. Lease Equipment Costs and Indices for Primary Oil Production in Oklahoma
(10 Wells Producing from 2,000 Feet by Rod Lift)

Component	Index (1976 = 100)				1993 Cost
	1990	1991	1992	1993	(dollars)*
Producing Equipment:					
Tubing	104.5	107.9	110.7	111.9	39,600
Rods	96.6	98.5	100.0	100.5	20,500
Pumps	127.4	127.4	131.0	133.3	11,200
PumpinEquipment	150.9	154.5	164.4	174.3	227,300
Subtotal or Index..**	**135.8**	**139.0**	**146.5**	**153.4**	**298,600**
Gathering System:					
Flowlines	243.7	252.4	253.2	254.0	32,000
Manifold	240.2	265.2	262.1	259.1	34,200
Subtotal or Index..**	**241.9**	**258.9**	**257.8**	**256.6**	**66,200**
Lease Equipment:					
Producing Separator	146.9	170.3	175.0	181.3	11,600
Test Separator	179.2	187.1	191.1	196.0	19,800
Heater Treater	140.0	145.2	148.4	151.6	23,500
Storage Tanks	182.4	189.9	192.5	194.9	65,300
Accessory Equipment	198.6	204.8	210.2	215.6	31,700
Disposal System	185.5	181.2	187.2	192.5	76,800
LACT Unit	163.4	166.7	169.9	174.2	16,200
Subtotal or Index**	**176.7**	**180.7**	**185.0**	**189.3**	**244,900**
Total or Index**	**158.7**	**163.3**	**168.9**	**174.3**	**609,700**

Table D2. Lease Equipment Costs and Indices for Primary Oil Production in Oklahoma
(10 Wells Producing from 4,000 Feet by Rod Lift)

Component	Index (1976 = 100)				1993 Cost
	1990	1991	1992	1993	(dollars)*
Producing Equipment:					
Tubing.	102.2	105.6	108.2	109.5	78,600
Rods	94.6	95.6	96.8	96.8	39,200
Pumps	126.8	130.5	132.9	136.6	11,200
Pumping Equipment	147.1	136.1	145.8	155.7	347,300
Subtotal or Index**	**131.1**	**124.8**	**131.8**	**138.7**	**476,300**
Gathering System:					
Flowlines	230.1	237.4	238.0	239.3	39,000
Manifold	240.2	265.2	262.1	259.1	34,200
Subtotal or Index..**	**234.6**	**249.8**	**248.8**	**248.1**	**73,200**
Lease Equipment:					
Producing Separator	146.9	170.3	175.0	181.3	11,600
Test Separator	179.2	187.1	191.1	196.0	19,800
Heater Treater	140.0	145.2	148.4	151.6	23,500
Storage Tanks	182.4	189.9	192.5	194.9	65,300
Accessory Equipment	198.6	204.8	210.2	215.6	31,700
Disposal System	185.1	180.4	186.8	192.4	78,700
LACT Unit	163.4	166.7	169.9	174.2	16,200
Subtotal or Index..**	**176.7**	**180.4**	**184.9**	**189.3**	**246,800**
Total or Index**	**148.9**	**146.6**	**152.4**	**158.2**	**796,300**

Table D3. Lease Equipment Costs and Indices for Primary Oil Production in Oklahoma
(10 Wells Producing from 8,000 Feet by Hydraulic Lift)

Component	Index (1976 = 100)				1993 Cost
	1990	1991	1992	1993	(dollars)*
Producing Equipment:					
Tubing	156.4	100.7	118.4	134.7	383,700
Pumps	257.7	260.3	261.7	261.7	196,000
Pumping Equipment	201.5	208.5	216.6	216.6	331,000
Subtotal or Index**	**184.7**	**156.1**	**168.6**	**177.7**	**910,700**
Gathering System:					
Flowlines	233.1	164.9	184.5	223.6	165,700
Manifold	240.2	265.2	262.1	259.1	34,200
Subtotal or Index**	**234.1**	**180.1**	**196.2**	**229.0**	**199,900**
Lease Equipment:					
Producing Separator	146.9	170.3	175.0	181.3	11,600
Test Separator	179.2	187.1	191.1	196.0	19,800
Heater Treater	140.0	145.2	148.4	151.6	23,500
Storage Tanks	182.4	189.9	192.5	194.9	65,300
Accessory Equipment	198.6	204.8	210.2	215.6	31,700
Disposal System	183.9	178.3	185.7	192.2	83,400
LACT Unit	163.4	166.7	169.9	174.2	16,200
Subtotal or Index**	**176.4**	**179.8**	**184.6**	**189.2**	**251,500**
Total or Index**	**189.1**	**163.3**	**174.8**	**185.9**	**1,362,100**

Table D4. Lease Equipment Costs and Indices for Primary Oil Production in Oklahoma
(10 Wells Producing from 12,000 Feet by Hydraulic Lift)

Component	Index (1976 = 100)				1993 Cost
	1990	1991	1992	1993	(dollars)*
Producing Equipment:					
Tubing	148.7	105.1	135.9	165.5	837,300
Pumps	257.7	260.3	261.7	261.7	196,000
Equipment	213.4	220.2	227.7	227.7	404,900
Subtotal or Index**	**174.6**	**147.4**	**169.8**	**189.6**	**1,438,200**
Gathering System:					
Flowlines	233.1	164.9	184.5	223.6	165,700
Manifold	240.2	265.2	262.1	259.1	34,200
Subtotal or Index..**	**234.1**	**180.1**	**196.2**	**229.0**	**199,900**
Lease Equipment:					
Separator	146.9	170.3	175.0	181.3	11,600
Test Separator	179.2	187.1	191.1	196.0	19,800
Heater Treater	140.0	145.2	148.4	151.6	23,500
Storage Tanks	182.4	189.9	192.5	194.9	65,300
Accessory Equipment	198.6	204.8	210.2	215.6	31,700
Disposal System	189.4	183.1	190.0	196.4	70,700
LACT Unit	163.4	166.7	169.9	174.2	16,200
Subtotal or Index..**	**177.6**	**181.2**	**185.7**	**190.3**	**238,800**
Total or Index**	**180.4**	**154.7**	**174.3**	**193.2**	**1,876,900**

Table D5. Direct Annual Operating Costs and Indices for Primary Oil Production in Oklahoma
(10 Wells Producing from 2,000 Feet by Rod Lift)

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
Normal Daily Expense:					
Supervision and Overhead	268.3	256.7	243.3	228.3	13,700
Labor (pumper)	252.7	245.9	237.8	229.7	17,000
Auto Usage	232.0	260.0	268.0	268.0	6,700
Chemicals	225.9	207.4	207.4	207.4	5,600
Fuel, Power & Water	266.7	244.4	279.6	285.2	15,400
Operative Supplies	233.3	266.7	250.0	250.0	1,500
Subtotal or Index**	**254.1**	**245.9**	**248.4**	**243.5**	**59,900**
Surface Maintenance, Repair & Services:					
Labor (roustabout)	206.9	206.9	206.9	220.7	6,400
Supplies & Services	209.4	262.5	228.1	234.4	7,500
Equipment Usage	300.0	307.7	307.7	323.1	4,200
Subtotal or Index**	**224.3**	**248.6**	**233.8**	**244.6**	**18,100**
Subsurface Maintenance, Repair & Services:					
Workover Rig Services	125.8	130.6	138.7	138.7	8,600
Remedial Services	143.8	143.8	143.8	150.0	2,400
Equipment Repair	117.8	120.0	122.2	124.4	5,600
Other	150.0	150.0	150.0	150.0	300
Subtotal or Index**	**125.6**	**128.8**	**133.6**	**135.2**	**16,900**
Total or Index**	**213.0**	**213.5**	**213.7**	**213.3**	**94,900**

Table D6. Direct Annual Operating Costs and Indices for Primary Oil Production in Oklahoma
(10 Wells Producing from 4,000 Feet by Rod Lift)

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
Normal Daily Expense:					
Supervision and Overhead	269.1	254.4	241.2	225.0	15,300
Labor (pumper)	252.7	245.9	237.8	229.7	17,000
Auto Usage	232.0	260.0	268.0	268.0	6,700
Chemicals	266.7	248.1	248.1	248.1	6,700
Fuel, Power & Water	278.8	254.5	290.9	295.5	19,500
Operative Supplies	250.0	266.7	250.0	250.0	1,500
Subtotal or Index**	**262.8**	**252.3**	**256.0**	**250.8**	**66,700**
Surface Maintenance, Repair & Services:					
Labor (roustabout)	206.9	206.9	206.9	220.7	6,400
Supplies & Services	211.8	238.2	223.5	226.5	7,700
Equipment Usage	307.7	315.4	315.4	330.8	4,300
Subtotal or Index**	**226.3**	**239.5**	**232.9**	**242.1**	**18,400**
Subsurface Maintenance, Repair & Services:					
Workover Rig Services	146.8	152.1	160.6	160.6	15,100
Remedial Services	154.2	150.0	154.2	154.2	3,700
Equipment Repair	118.0	122.0	124.0	126.0	6,300
Other	250.0	200.0	250.0	250.0	500
Subtotal or Index**	**140.6**	**143.5**	**150.0**	**150.6**	**25,600**
Total or Index**	**216.8**	**214.3**	**217.4**	**216.2**	**110,700**

Table D7. Direct Annual Operating Costs and Indices for Primary Oil Production in Oklahoma
(10 Wells Producing from 8,000 Feet by Hydraulic Lift)

Component	Index (1976 = 100)				1993 Cost
	1990	1991	1992	1993	(dollars)*
Normal Daily Expense:					
Supervision and Overhead..	269.6	255.7	241.8	225.3	17,800
Labor (pumper)	252.7	245.9	237.8	229.7	17,000
Auto Usage	232.0	260.0	268.0	268.0	6,700
Chemicals	200.0	182.8	182.8	182.8	5,300
Fuel, Power & Water	290.4	263.8	304.3	309.6	29,100
Operative Supplies	300.0	325.0	325.0	337.5	2,700
Subtotal or Index**	**263.1**	**251.1**	**258.6**	**254.4**	**78,600**
Surface Maintenance, Repair & Services:					
Labor (roustabout)	206.9	206.9	206.9	220.7	6,400
Supplies & Services	206.5	233.8	229.9	240.3	18,500
Equipment Usage	293.3	300.0	300.0	306.7	4,600
Subtotal or Index**	**217.4**	**235.5**	**233.1**	**243.8**	**29,500**
Subsurface Maintenance, Repair & Services:					
Workover Rig Services	172.1	173.8	178.7	178.7	10,900
Remedial Services	165.8	165.8	169.6	172.2	13,600
Equipment Repair	328.1	331.5	333.1	333.1	59,300
Other	214.3	200.0	200.0	214.3	1,500
Subtotal or Index**	**256.9**	**258.8**	**261.5**	**262.5**	**85,300**
Total or Index**	**253.1**	**251.9**	**255.8**	**256.2**	**193,400**

Table D8. Direct Annual Operating Costs and Indices for Primary Oil Production in Oklahoma
(10 Wells Producing from 12,000 Feet by Hydraulic Lift)

Component	Index (1976 = 100)				1993 Cost
	1990	1991	1992	1993	(dollars)*
Normal Daily Expense:					
Supervision and Overhead..	269.4	255.1	239.8	224.5	22,000
Labor (pumper	252.7	245.9	237.8	229.7	17,000
Auto Usage.	232.0	260.0	268.0	268.0	6,700
Chemicals	215.2	193.9	193.9	193.9	6,400
Fuel, Power & Water	298.4	271.7	312.6	318.1	40,400
Operative Supplies	322.2	366.7	355.6	366.7	3,300
Subtotal or Index**	**269.9**	**256.6**	**265.3**	**261.7**	**95,800**
Surface Maintenance, Repair & Services:					
Labor (roustabout).	206.9	206.9	206.9	220.7	6,400
Supplies & Services	197.1	232.0	222.3	232.0	23,900
Equipment Usage	293.3	300.0	300.0	306.7	4,600
Subtotal or Index*	**208.8**	**234.0**	**227.2**	**237.4**	**34,900**
Subsurface Maintenance, Repair & Services:					
Workover Rig Services	174.7	178.0	182.4	182.4	16,600
Remedial Services	223.3	223.3	228.2	230.1	23,700
Equipment Repair	326.8	330.7	333.5	334.1	59,800
Other	222.2	211.1	211.1	222.2	2,000
Subtotal or Index**	**260.2**	**262.6**	**266.2**	**267.3**	**102,100**
Total or Index**	**255.8**	**255.4**	**259.4**	**260.1**	**232,800**

Table E1. Lease Equipment Costs and Indices for Primary Oil Production in the Rocky Mountains
(10 Wells Producing from 2,000 Feet by Rod Lift)

Component	Index (1976 = 100)				1993 Cost
	1990	1991	1992	1993	(dollars)*
Producing Equipment:					
Tubing	109.9	105.6	110.7	112.0	42,000
Rods	78.0	79.1	79.9	80.3	20,400
Pumps	127.4	127.4	131.0	133.3	11,200
Pumping Equipment	154.5	142.1	149.0	155.8	153,000
Subtotal or Index**	**131.8**	**123.8**	**129.3**	**133.7**	**226,600**
Gathering System:					
Flowlines	245.4	255.3	256.6	257.2	39,100
Manifold	239.1	263.9	260.9	257.9	34,300
Subtotal or Index**	**242.5**	**259.3**	**258.6**	**257.5**	**73,400**
Lease Equipment:					
Producing Separator	148.4	170.3	176.6	182.8	11,700
Test Separator	179.2	187.1	192.1	196.0	19,800
Heater Treater	103.7	107.8	109.7	112.0	24,300
Storage Tanks	176.7	184.2	187.2	189.6	63,500
Accessory Equipment	198.6	204.8	210.2	215.6	31,700
Disposal System	219.7	217.3	226.6	233.5	80,800
LACT Unit	163.4	166.7	169.9	174.2	16,200
Electrification	242.3	244.0	244.0	245.2	59,100
Subtotal or Index**	**186.6**	**190.7**	**195.0**	**198.9**	**307,100**
Total or Index**	**164.8**	**164.1**	**168.5**	**172.3**	**607,100**

Table E2. Lease Equipment Costs and Indices for Primary Oil Production in the Rocky Mountains
(10 Wells Producing from 4,000 Feet by Rod Lift)

Component	Index (1976 = 100)				1993 Cost
	1990	1991	1992	1993	(dollars)*
Producing Equipment:					
Tubing	107.4	103.4	108.4	109.6	83,300
Rods	85.5	87.1	87.8	87.8	39,400
Pumps	126.8	130.5	132.9	136.6	11,200
Pumping Equipment	150.0	123.4	128.0	132.9	247,000
Subtotal or Index**	**129.9**	**113.6**	**117.7**	**121.0**	**380,900**
Gathering System:					
Flowlines	192.9	200.0	201.5	201.0	39,800
Manifold	239.1	263.9	260.9	257.9	34,300
Subtotal or Index**	**211.5**	**225.7**	**225.4**	**223.9**	**74,100**
Lease Equipment:					
Producing Separator	148.4	170.3	176.6	182.8	11,700
Test Separator	179.2	187.1	192.1	196.0	19,800
Heater Treater	103.7	107.8	109.7	112.0	24,300
Storage Tanks	176.7	184.2	187.2	189.6	63,500
Accessory Equipment	198.6	204.8	210.2	215.6	31,700
Disposal System	222.2	219.4	229.1	236.5	83,000
LACT Unit	163.4	166.7	169.9	174.2	16,200
Electrification	241.1	243.2	243.6	244.9	70,300
Subtotal or Index**	**188.7**	**192.7**	**197.0**	**200.9**	**320,500**
Total or Index**	**153.7**	**145.8**	**149.6**	**152.8**	**775,500**

Table E3. Lease Equipment Costs and Indices for Primary Oil Production in the Rocky Mountains
(10 Wells Producing from 8,000 Feet by Rod Lift)

Component	Index (1976 = 100)				1993 Cost
	1990	1991	1992	1993	(dollars)*
Producing Equipment:					
Tubing	102.0	110.2	113.3	112.3	220,500
Rods	90.7	92.5	92.8	92.9	101,600
Pumps	128.9	132.2	136.7	136.7	12,300
Pumping Equipment	156.1	127.3	132.4	137.8	509,900
Subtotal or Index**	**129.8**	**116.9**	**120.7**	**123.3**	**844,300**
Gathering System:					
Flowlines	227.1	234.4	236.3	236.6	64,600
Manifold	239.1	263.9	260.9	257.9	34,300
Subtotal or Index**	**231.0**	**244.1**	**244.3**	**243.6**	**98,900**
Lease Equipment:					
Producing Separator	148.4	170.3	176.6	182.8	11,700
Test Separator	179.2	187.1	192.1	196.0	19,800
Heater Treater	103.7	107.8	109.7	112.0	24,300
Storage Tanks	176.7	184.2	187.2	189.6	63,500
Accessory Equipment	198.6	204.8	210.2	215.6	31,700
Disposal System	219.9	215.6	226.5	234.7	88,500
LACT Unit	163.4	166.7	169.9	174.2	16,200
Electrification	245.7	248.0	248.0	249.0	97,600
Subtotal or Index**	**192.9**	**196.4**	**200.8**	**204.7**	**353,300**
Total or Index**	**146.5**	**137.9**	**141.6**	**144.4**	**1,296,500**

Table E4. Lease Equipment Costs and Indices for Primary Oil Production in the Rocky Mountains
(10 Wells Producing from 12,000 Feet by Hydraulic Lift)

Component	Index (1976 = 100)				1993 Cost
	1990	1991	1992	1993	(dollars)*
Producing Equipment:					
Tubing	150.3	103.3	134.7	163.0	862,700
Pumps	257.7	260.3	261.7	261.7	196,000
Pumping Equipment	215.3	222.9	231.2	231.2	319,100
Subtotal or Index**	**173.3**	**141.4**	**165.4**	**185.7**	**1,377,800**
Gathering System:					
Flowlines	226.4	161.8	182.0	218.1	171,200
Manifold	239.1	263.9	260.9	257.9	34,300
Subtotal or Index**	**228.2**	**176.6**	**193.5**	**223.9**	**205,500**
Lease Equipment:					
Producing Separator	148.4	170.3	176.6	182.8	11,700
Test Separator	179.2	187.1	192.1	196.0	19,800
Heater Treater	103.7	107.8	109.7	112.0	24,300
Storage Tanks	176.7	184.2	187.2	189.6	63,500
Accessory Equipment	198.6	204.8	210.2	215.6	31,700
Disposal System	239.5	235.3	247.2	256.2	96,600
LACT Unit	163.4	166.7	169.9	174.2	16,200
Electrification	270.9	270.9	268.4	267.1	42,200
Subtotal or Index**	**192.2**	**195.7**	**200.7**	**205.1**	**306,000**
Total or Index**	**181.3**	**152.9**	**173.4**	**192.2**	**1,889,300**

Table E5. Direct Annual Operating Costs and Indices for Primary Oil Production in the Rocky Mountains
(10 Wells Producing from 2,000 Feet by Rod Lift)

Component	Index (1976 = 100)				1993 Cost
	1990	1991	1992	1993	(dollars)*
Normal Daily Expense:					
Supervision and Overhead	244.3	250.0	255.7	258.6	18,100
Labor (pumper)	265.5	262.1	257.5	257.5	22,400
Auto Usage	232.0	256.0	268.0	268.0	6,700
Chemicals	251.9	240.7	237.0	237.0	6,400
Fuel, Power & Water	255.1	249.3	253.6	253.6	17,500
Operative Supplies	228.6	242.9	228.6	228.6	1,600
Subtotal or Index**	**252.6**	**253.0**	**254.4**	**255.1**	**72,700**
Surface Maintenance, Repair & Services:					
Labor (roustabout)	200.0	202.4	202.4	202.4	8,300
Supplies & Services	190.3	238.7	206.5	212.9	6,600
Equipment Usage	205.9	217.6	229.4	223.5	3,800
Subtotal or Index**	**197.8**	**218.0**	**209.0**	**210.1**	**18,700**
Subsurface Maintenance, Repair & Services:					
Workover Rig Services	114.8	120.0	124.3	124.3	14,300
Remedial Services	119.0	114.3	119.0	119.0	2,500
Equipment Repair	126.7	126.7	128.9	131.1	5,900
Other	150.0	150.0	150.0	150.0	300
Subtotal or Index**	**118.6**	**121.3**	**125.1**	**125.7**	**23,000**
Total or Index**	**199.8**	**204.1**	**204.7**	**205.4**	**114,400**

Table E6. Direct Annual Operating Costs and Indices for Primary Oil Production in the Rocky Mountains
(10 Wells Producing from 4,000 Feet by Rod Lift)

Component	Index (1976 = 100)				1993 Cost
	1990	1991	1992	1993	(dollars)*
Normal Daily Expense:					
Supervision and Overhead	250.6	257.1	261.0	264.9	20,400
Labor (pumper)	265.5	262.1	257.5	257.5	22,400
Auto Usage	232.0	256.0	268.0	268.0	6,700
Chemicals	266.7	255.6	251.9	251.9	6,800
Fuel, Power & Water	251.1	246.8	250.0	250.0	23,500
Operative Supplies	228.6	242.9	228.6	242.9	1,700
Subtotal or Index**	**254.3**	**254.9**	**255.8**	**257.1**	**81,500**
Surface Maintenance, Repair & Services:					
Labor (roustabout)	200.0	202.4	202.4	202.4	8,300
Supplies & Services	193.8	228.1	206.3	209.4	6,700
Equipment Usage	205.6	216.7	222.2	222.2	4,000
Subtotal or Index**	198.9	214.3	207.7	208.8	19,000
Subsurface Maintenance, Repair & Services:					
Workover Rig Services	129.1	134.4	139.1	139.1	21,000
Remedial Services	137.9	134.5	137.9	141.4	4,100
Equipment Repair	120.0	122.0	124.0	126.0	6,300
Other	133.3	133.3	133.3	133.3	400
Subtotal or Index**	**128.3**	**131.8**	**135.6**	**136.5**	**31,800**
Total or Index**	**200.6**	**204.4**	**205.3**	**206.4**	**132,300**

Table E7. Direct Annual Operating Costs and Indices for Primary Oil Production in the Rocky Mountains
(10 Wells Producing from 8,000 Feet by Rod Lift)

Component	Index (1976 = 100)				1993 Cost
	1990	1991	1992	1993	(dollars)*
Normal Daily Expense:					
Supervision and Overhead	251.1	256.7	261.1	264.4	23,800
Labor (pumper)	265.5	262.1	257.5	257.5	22,400
Auto Usage	232.0	256.0	268.0	268.0	6,700
Chemicals	241.4	231.0	231.0	231.0	6,700
Fuel, Power & Water	255.2	252.4	254.5	254.5	36,900
Operative Supplies	385.7	428.6	414.3	428.6	3,000
Subtotal or Index**	**256.4**	**257.4**	**258.7**	**259.8**	**99,500**
Surface Maintenance, Repair & Services:					
Labor (roustabout)	200.0	202.4	202.4	202.4	8,300
Supplies & Services	500.0	566.7	554.5	578.8	19,100
Equipment Usage	215.8	226.3	236.8	231.6	4,400
Subtotal or Index**	**309.7**	**336.6**	**334.4**	**341.9**	**31,800**
Subsurface Maintenance, Repair & Services:					
Workover Rig Services	126.4	147.3	135.3	135.3	34,900
Remedial Services	190.0	190.0	195.0	198.8	15,900
Equipment Repair	141.7	148.3	151.7	150.0	9,000
Other	140.0	130.0	130.0	140.0	1,400
Subtotal or Index**	**141.4**	**155.4**	**149.3**	**150.0**	**61,200**
Total or Index**	**208.9**	**218.7**	**216.2**	**217.8**	**192,500**

Table E8. Direct Annual Operating Costs and Indices for Primary Oil Production in the Rocky Mountains
(10 Wells Producing from 12,000 Feet by Hydraulic Lift)

Component	Index (1976 = 100)				1993 Cost
	1990	1991	1992	1993	(dollars)*
Normal Daily Expense:					
Supervision and Overhead	250.9	255.4	259.8	263.4	29,500
Labor (pumper)	265.5	262.1	257.5	257.5	22,400
Auto Usage	232.0	256.0	268.0	268.0	6,700
Chemicals	218.2	200.0	200.0	200.0	6,600
Fuel, Power & Water	279.9	277.4	278.9	279.4	55,600
Operative Supplies	250.0	280.0	270.0	280.0	2,800
Subtotal or Index**	**262.7**	**262.7**	**263.9**	**265.2**	**123,600**
Surface Maintenance, Repair & Services:					
Labor (roustabout)	200.0	202.4	202.4	202.4	8,300
Supplies & Services	243.3	291.7	271.7	281.7	16,900
Equipment Usage	215.8	226.3	236.8	231.6	4,400
Subtotal or Index**	**224.2**	**250.8**	**242.5**	**246.7**	**29,600**
Subsurface Maintenance, Repair & Services:					
Workover Rig Services	129.4	131.4	133.3	133.3	13,600
Remedial Services	174.8	174.0	178.7	181.9	23,100
Equipment Repair	327.4	330.7	333.5	334.1	59,800
Other	150.0	150.0	150.0	150.0	1,800
Subtotal or Index**	**228.1**	**229.8**	**232.9**	**234.0**	**98,300**
Total or Index**	**243.6**	**247.5**	**248.4**	**250.0**	**251,500**

Table F1. Lease Equipment Costs and Indices for Primary Oil Production in California
(10 Wells Producing from 2,000 Feet by Rod Lift)

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
Producing Equipment:					
Tubing	110.8	113.7	117.9	116.8	56,200
Rods	103.8	104.9	105.2	105.2	30,100
Pumps	124.4	128.6	128.6	128.6	15,300
Pumping Equipment	149.9	115.0	120.1	125.4	211,000
Subtotal or Index**	**136.2**	**114.3**	**118.4**	**121.7**	**312,600**
Gathering System:					
Flowlines	257.3	248.8	249.8	286.5	80,500
Manifold	237.3	261.9	259.0	256.0	34,300
Subtotal or Index**	**250.8**	**253.0**	**252.8**	**276.6**	**114,800**
Lease Equipment:					
Producing Separator	141.8	162.7	168.7	174.6	11,700
Test Separator	179.2	188.1	192.1	197.0	19,900
Free Water Knockout	141.3	146.7	149.3	152.0	11,400
Heater Treater	223.6	228.6	233.1	237.5	140,100
Storage Tanks	174.6	181.3	183.9	186.5	64,700
Accessory Equipment	198.6	204.8	210.2	215.6	31,700
Disposal System	189.8	185.3	191.5	201.4	71,100
LACT Unit	163.4	166.7	169.9	174.2	16,200
Electrification	246.2	247.7	247.7	249.2	65,300
Subtotal or Index**	**199.8**	**203.7**	**207.6**	**212.3**	**432,100**
Total or Index**.	**171.5**	**162.0**	**165.7**	**171.2**	**859,500**

Table F2. Lease Equipment Costs and Indices for Primary Oil Production in California
(10 Wells Producing from 4,000 Feet by Rod Lift)

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
Producing Equipment:					
Tubing	108.2	111.2	115.4	114.2	111,600
Rods	98.0	99.6	99.6	99.6	55,400
Pumps	124.6	129.2	129.2	129.2	16,800
Pumping Equipment	127.1	97.0	101.5	106.3	289,400
Subtotal or Index**	**119.1**	**101.4**	**105.2**	**107.9**	**473,200**
Gathering System:					
Flowlines	244.8	235.8	236.6	273.5	106,100
Manifold	237.3	261.9	259.0	256.0	34,300
Subtotal or Index**	**242.9**	**242.5**	**242.3**	**269.0**	**140,400**
Lease Equipment:					
Producing Separator	141.8	162.7	168.7	174.6	11,700
Test Separator	179.2	188.1	192.1	197.0	19,900
Free Water Knockout	141.3	146.7	149.3	152.0	11,400
Heater Treater	223.6	228.6	233.1	237.5	140,100
Storage Tanks	174.6	181.3	183.9	186.5	64,700
Accessory Equipment	198.6	204.8	210.2	215.6	31,700
Disposal System	187.3	182.4	188.6	198.9	73,400
LACT Unit	163.4	166.7	169.9	174.2	16,200
Electrification	225.3	226.8	226.8	228.4	74,900
Subtotal or Index**	**197.5**	**201.2**	**205.0**	**209.7**	**444,000**
Total or Index**.	**151.9**	**142.0**	**145.5**	**150.5**	**1,057,600**

Table F3. Lease Equipment Costs and Indices for Primary Oil Production in California
(10 Wells Producing from 8,000 Feet by Hydraulic Lift)

Component	Index (1976 = 100)				1993 Cost
	1990	1991	1992	1993	(dollars)*
Producing Equipment:					
Tubing	122.6	128.5	130.2	127.0	496,900
Rods	257.7	260.3	261.7	261.7	196,000
Pumping Equipment	207.0	213.6	221.2	221.2	305,200
Subtotal or Index**	**158.6**	**164.3**	**167.3**	**165.2**	**998,100**
Gathering System:					
Flowlines	233.3	196.8	213.2	224.9	216,800
Manifold	237.3	261.9	259.0	256.0	34,300
Subtotal or Index**	**233.8**	**204.7**	**218.8**	**228.7**	**251,100**
Lease Equipment:					
Producing Separator	141.8	162.7	168.7	174.6	11,700
Test Separator	179.2	188.1	192.1	197.0	19,900
Free Water Knockout	141.3	146.7	149.3	152.0	11,400
Heater Treater	223.6	228.6	233.1	237.5	140,100
Storage Tanks	174.6	181.3	183.9	186.5	64,700
Accessory Equipment	198.6	204.8	210.2	215.6	31,700
Disposal System	187.8	182.8	188.6	200.5	79,200
LACT Unit	163.4	166.7	169.9	174.2	16,200
Electrification	256.9	256.9	254.0	252.9	44,000
Subtotal or Index**	**198.1**	**201.7**	**205.4**	**210.6**	**418,900**
Total or Index**	**176.2**	**177.3**	**181.8**	**182.7**	**1,668,100**

Table F4. Lease Equipment Costs and Indices for Primary Oil Production in California
(10 Wells Producing from 12,000 Feet by Hydraulic Lift)

Component	Index (1976 = 100)				1993 Cost
	1990	1991	1992	1993	(dollars)*
Producing Equipment:					
Tubing	135.8	144.8	160.1	170.5	999,000
Rods	257.7	260.3	261.7	261.7	196,000
Pumping Equipment	215.4	221.8	228.9	228.9	350,500
Subtotal or Index**	**162.0**	**169.9**	**182.4**	**189.9**	**1,545,500**
Gathering System:					
Flowlines	233.3	196.8	213.2	224.9	216,800
Manifold	237.3	261.9	259.0	256.0	34,300
Subtotal or Index**	**233.8**	**204.7**	**218.8**	**228.7**	**251,100**
Lease Equipment:					
Producing Separator	141.8	162.7	168.7	174.6	11,700
Test Separator	179.2	188.1	192.1	197.0	19,900
Free Water Knockout	141.3	146.7	149.3	152.0	11,400
Heater Treater	223.6	228.6	233.1	237.5	140,100
Storage Tanks	174.6	181.3	183.9	186.5	64,700
Accessory Equipment	198.6	204.8	210.2	215.6	31,700
Disposal System	187.8	182.8	188.6	200.5	79,200
LACT Unit	163.4	166.7	169.9	174.2	16,200
Electrification	286.4	285.4	282.0	280.1	57,700
Subtotal or Index**	**202.0**	**205.5**	**209.1**	**214.1**	**432,600**
Total or Index**	**176.2**	**179.7**	**190.7**	**198.0**	**2,229,200**

Table F5. Direct Annual Operating Costs and Indices for Primary Oil Production in California (10 Wells Producing from 2,000 Feet by Rod Lift)

Component	Index (1976 = 100)				1993 Cost
	1990	1991	1992	1993	(dollars)*
Normal Daily Expense:					
Supervision and Overhead	271.7	266.7	256.7	246.7	14,800
Labor (pumper)	226.0	230.2	235.4	239.6	23,000
Auto Usage	232.0	256.0	268.0	264.0	6,600
Chemicals	236.8	226.3	226.3	226.3	4,300
Fuel, Power & Water	407.1	423.0	428.3	436.3	49,300
Operative Supplies	237.5	262.5	250.0	262.5	2,100
Subtotal or Index**	**299.7**	**307.5**	**309.7**	**311.8**	**100,100**
Surface Maintenance, Repair & Services:					
Labor (roustabout)	201.9	203.7	207.4	209.3	11,300
Supplies & Services	234.5	289.7	255.2	258.6	7,500
Equipment Usage	185.7	214.3	235.7	257.1	3,600
Subtotal or Index**	**209.3**	**230.9**	**225.8**	**230.9**	**22,400**
Subsurface Maintenance, Repair & Services:					
Workover Rig Services	195.1	196.7	196.7	196.7	12,000
Remedial Services	157.1	142.9	142.9	142.9	1,000
Equipment Repair	130.5	135.6	135.6	135.6	8,000
Other	150.0	150.0	150.0	150.0	300
Subtotal or Index**	**162.8**	**165.1**	**165.1**	**165.1**	**21,300**
Total or Index**	**251.4**	**260.3**	**260.7**	**262.9**	**143,800**

Table F6. Direct Annual Operating Costs and Indices for Primary Oil Production in California (10 Wells Producing from 4,000 Feet by Rod Lift)

Component	Index (1976 = 100)				1993 Cost
	1990	1991	1992	1993	(dollars)*
Normal Daily Expense:					
Supervision and Overhead	270.6	263.2	254.4	244.1	16,600
Labor (pumper)	226.0	230.2	235.4	239.6	23,000
Auto Usage	232.0	256.0	268.0	264.0	6,600
Chemicals	233.3	223.8	223.8	223.8	4,700
Fuel, Power & Water	456.0	474.9	483.4	492.6	86,200
Operative Supplies	250.0	275.0	262.5	262.5	2,100
Subtotal or Index**	**337.4**	**347.1**	**351.1**	**354.2**	**139,200**
Surface Maintenance, Repair & Services:					
Labor (roustabout)	201.9	203.7	207.4	209.3	11,300
Supplies & Services	225.8	277.4	245.2	251.6	7,800
Equipment Usage	186.7	206.7	226.7	253.3	3,800
Subtotal or Index**	**207.0**	**227.0**	**222.0**	**229.0**	**22,900**
Subsurface Maintenance, Repair & Services:					
Workover Rig Services	188.0	189.0	189.0	189.0	18,900
Remedial Services	200.0	176.9	176.9	176.9	2,300
Equipment Repair	106.2	111.1	112.3	111.1	9,000
Other	166.7	166.7	166.7	166.7	500
Subtotal or Index**	**154.8**	**155.8**	**156.3**	**155.8**	**30,700**
Total or Index**	**266.4**	**275.1**	**276.8**	**279.4**	**192,800**

Table F7. Direct Annual Operating Costs and Indices for Primary Oil Production in California
(10 Wells Producing from 8,000 Feet by Hydraulic Lift)

Component	Index (1976 = 100)				1993 Cost
	1990	1991	1992	1993	(dollars)*
Normal Daily Expense:					
Supervision and Overhead	273.4	264.6	255.7	244.3	19,300
Labor (pumper)	226.0	230.2	235.4	239.6	23,000
Auto Usage	232.0	256.0	268.0	264.0	6,600
Chemicals	246.7	220.0	220.0	223.3	6,700
Fuel, Power & Water	493.0	511.1	522.8	532.9	191,300
Operative Supplies	272.7	300.0	290.9	300.0	3,300
Subtotal or Index**	**394.2**	**404.7**	**411.7**	**417.0**	**250,200**
Surface Maintenance, Repair & Services:					
Labor (roustabout)	201.9	203.7	207.4	209.3	11,300
Supplies & Services	241.2	279.4	264.7	273.5	18,600
Equipment Usage	200.0	218.8	237.5	262.5	4,200
Subtotal or Index**	**221.0**	**242.8**	**239.1**	**247.1**	**34,100**
Subsurface Maintenance, Repair & Services:					
Workover Rig Services	194.7	194.7	194.7	194.7	3,700
Remedial Services	231.6	201.8	205.3	207.0	11,800
Equipment Repair	285.4	288.3	291.3	290.3	29,900
Other	144.4	144.4	144.4	144.4	1,300
Subtotal or Index**	**253.2**	**245.7**	**248.4**	**248.4**	**46,700**
Total or Index**	**339.7**	**348.3**	**352.8**	**357.5**	**331,000**

Table F8. Direct Annual Operating Costs and Indices for Primary Oil Production in California
(10 Wells Producing from 12,000 Feet by Hydraulic Lift)

Component	Index (1976 = 100)				1993 Cost
	1990	1991	1992	1993	(dollars)*
Normal Daily Expense:					
Supervision and Overhead	274.5	265.3	255.1	243.9	23,900
Labor (pumper)	226.0	230.2	235.4	239.6	23,000
Auto Usage	232.0	256.0	268.0	264.0	6,600
Chemicals	228.6	211.4	211.4	211.4	7,400
Fuel, Power & Water	489.4	509.0	521.2	531.7	295,600
Operative Supplies	283.3	316.7	300.0	308.3	3,700
Subtotal or Index**	**411.1**	**424.2**	**432.0**	**438.2**	**360,200**
Surface Maintenance, Repair & Services:					
Labor (roustabout)	201.9	203.7	207.4	209.3	11,300
Supplies & Services	229.1	273.3	255.8	264.0	22,700
Equipment Usage	200.0	218.8	237.5	262.5	4,200
Subtotal or Index**	**216.7**	**243.6**	**237.2**	**244.9**	**38,200**
Subsurface Maintenance, Repair & Services:					
Workover Rig Services	200.0	200.0	200.0	200.0	5,600
Remedial Services	210.5	182.9	184.8	186.7	19,600
Equipment Repair	329.6	315.6	318.4	319.0	57,100
Other	138.5	130.8	138.5	138.5	1,800
Subtotal or Index**	**272.3**	**255.4**	**257.8**	**258.8**	**84,100**
Total or Index**	**353.2**	**360.5**	**365.2**	**370.3**	**482,500**

Table G1. Annual Operating Costs and Indices for a 12-Slot Platform in the Gulf of Mexico - 100-Foot Depth

Component	Index (1976 = 100)				1993 Cost
	1990	1991	1992	1993	(dollars)*
Labor	242.2	242.2	251.9	251.9	581,800
Supervision	242.5	242.5	252.2	252.2	87,300
Payroll Overhead	322.8	322.8	335.8	335.8	267,600
Food Expense	132.4	139.0	139.0	139.5	55,600
Labor Transportation	201.2	201.2	219.4	228.5	403,900
Surface Equipment	214.7	214.7	214.7	214.7	106,300
Operating Supplies	215.2	215.2	215.2	215.2	21,300
Workover	215.5	219.2	225.0	226.7	619,700
Communications	502.4	497.6	495.2	490.5	21,100
Administrative	236.9	236.9	244.7	244.7	283,800
Insurance	147.7	134.9	121.0	136.3	292,200
Total or Index**	**214.3**	**213.4**	**220.0**	**218.4**	**2,740,600**

Table G2. Annual Operating Costs and Indices for a 12-Slot Platform in the Gulf of Mexico - 300-Foot Depth

Component	Index (1976 = 100)				1993 Cost
	1990	1991	1992	1993	(dollars)*
Labor	242.2	242.2	251.9	251.9	581,800
Supervision	242.5	242.5	252.2	252.2	87,300
Payroll Overhead	322.8	322.8	335.8	335.8	267,600
Food Expense	132.4	139.0	139.0	139.5	55,600
Labor Transportation	281.7	281.7	299.1	307.8	591,100
Surface Equipment	214.8	214.8	214.8	214.8	107,400
Operating Supplies	214.8	214.8	214.8	214.8	21,500
Workover	222.3	226.0	231.5	233.1	666,600
Communications	96.3	95.7	95.3	94.7	28,900
Administrative	236.7	236.7	244.5	244.5	284,300
Insurance	146.1	134.8	122.8	136.1	331,300
Total or Index**	**224.4**	**223.5**	**229.8**	**228.2**	**3,023,400**

Table G3. Annual Operating Costs and Indices for a 18-Slot Platform in the Gulf of Mexico - 100-Foot Depth

Component	Index (1976 = 100)				1993 Cost
	1990	1991	1992	1993	(dollars)*
Labor	234.5	234.5	243.9	243.9	641,300
Supervision	234.6	234.6	244.1	244.1	96,200
Payroll Overhead	312.5	312.5	325.0	325.0	295,000
Food Expense	132.3	139.0	139.0	139.6	63,500
Labor Transportation	201.2	201.2	219.4	228.5	403,900
Surface Equipment	194.0	194.0	194.0	194.0	107,300
Operating Supplies	193.7	193.3	193.3	193.3	21,500
Workover	218.5	222.4	228.2	229.9	928,400
Communications	175.8	174.2	173.3	171.7	21,100
Administrative	226.8	226.8	234.4	234.4	308,000
Insurance	146.7	133.6	119.5	135.0	428,100
Total or Index**	**208.7**	**207.5**	**213.2**	**213.1**	**3,314,300**

Table G4. Annual Operating Costs and Indices for a 18-Slot Platform in the Gulf of Mexico - 300-Foot Depth

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
Labor	234.5	234.5	243.9	243.9	641,300
Supervision	234.6	234.6	244.1	244.1	96,200
Payroll Overhead	312.8	312.8	325.3	325.3	295,000
Food Expense	132.3	139.0	139.0	139.6	63,500
Labor Transportation	281.7	281.7	299.1	307.8	591,100
Surface Equipment.	191.9	191.9	191.9	191.9	107,300
Operating Supplies	191.6	191.6	191.6	191.6	21,500
Workover	225.2	228.9	234.6	236.2	998,700
Communications	96.3	95.7	95.3	94.7	28,900
Administrative	226.1	226.1	233.7	233.7	308,000
Insurance	144.9	132.8	119.8	134.1	458,400
Total or Index**	**217.6**	**216.4**	**221.9**	**221.8**	**3,609,900**

Table G5. Annual Operating Costs and Indices for a 18-Slot Platform in the Gulf of Mexico - 600-Foot Depth

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
Labor	234.5	234.5	243.9	243.9	641,300
Supervision	234.6	234.6	244.1	244.1	96,200
Payroll Overhead.	312.8	312.8	325.3	325.3	295,000
Food Expense.	132.3	139.0	139.0	139.6	63,500
Labor Transportation	355.4	355.4	372.1	380.4	778,300
Surface Equipment.	216.8	216.8	216.8	216.8	122,300
Operating Supplies	216.5	216.5	216.5	216.5	24,500
Workover	219.3	222.8	227.7	229.6	1,029,200
Communications.	91.1	90.8	90.3	89.7	32,800
Administrative.	231.1	231.1	238.6	238.6	315,200
Insurance.	151.7	144.0	135.7	144.9	749,600
Total or Index**	**220.7**	**219.7**	**224.5**	**224.5**	**4,147,900**

Section II

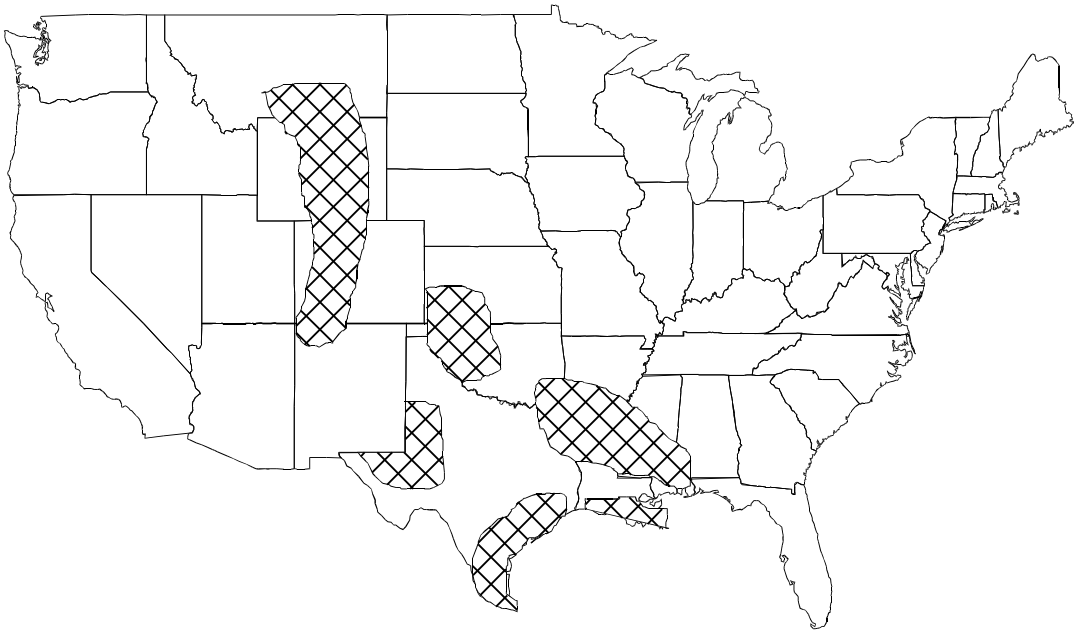
Appendices H Through M

Costs and Indices for Domestic Gas Field Equipment and Production Operations

Appendices H Through M

Costs and Indices for Domestic Gas Field Equipment and Production Operations

Figure 2. Geographical Regions for Gas Producing Leases



Source: Energy Information Administration, Office of Oil and Gas.

Appendices H through M contain details for gas leases. A detailed breakdown of 1993 costs and indices for 1990 through 1993 is shown in each of the gas lease tables. The tables are arranged by region with each region identified by an alpha character. Each table within the appendix is for a different depth. For example, Table H1 contains equipping cost data for west Texas gas leases at 2,000-foot depths; Table H2 contains equipping cost data for gas leases at 4,000-foot depths; Table H5 contains equipping cost data for 16,000-foot wells. Tables H6 through H10 contain operating costs for gas wells at 2,000, 4,000, 8,000, 12,000 and 16,000-foot depths, respectively. Each table is further divided into costs associated with different flow rates. For example, Table H1 has equipping costs for production rates of 50 and 250 thousand cubic feet per day only. Table H11 is a typical equipment list for a 12,000-foot gas well producing 1 million cubic feet per day in west Texas.

The remaining tables of costs and indices for gas leases by region are arranged in similar order. These appendices are: Appendix I--South Texas, Appendix J--South Louisiana, Appendix K--North Louisiana, Appendix L-- Mid-Continent, and Appendix M--Rocky Mountain Region.

Notes: 1993 data are preliminary and are marked with a single asterisk (*). All prior data were revised. Indices marked with a double asterisk (**) are composite indices. Other indices are pure cost.

Table H1. Lease Equipment Costs and Indices for Gas Production in West Texas
(1 Well Producing from 2,000 Feet)

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
	50 Thousand Cubic Feet Per Day				
Flowlines and Connections	223.1	230.8	238.5	253.8	3,300
Production Package.	150.0	150.0	152.9	155.9	5,300
Storage Tanks	213.0	201.9	207.4	211.1	11,400
Total or Index	**193.1**	**188.1**	**193.1**	**198.0**	**20,000**
	250 Thousand Cubic Feet Per Day				
Flowlines and Connections	223.1	230.8	238.5	253.8	3,300
Production Package.	150.0	150.0	152.9	155.9	5,300
Storage Tanks	164.8	153.7	157.4	211.1	11,400
Total or Index	**167.3**	**162.4**	**166.3**	**170.3**	**20,000**

Table H2. Lease Equipment Costs and Indices for Gas Production in West Texas
(1 Well Producing from 4,000 Feet)

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
	50 Thousand Cubic Feet Per Day				
Flowlines and Connections	223.1	230.8	238.5	253.8	3,300
Production Package.	150.0	150.0	152.9	155.9	5,300
Storage Tanks	211.1	201.9	207.4	211.1	11,400
Total or Index	**192.1**	**188.1**	**193.1**	**198.0**	**20,000**
	250 Thousand Cubic Feet Per Day				
Flowlines and Connections	220.0	226.7	235.6	237.8	10,700
Production Package.	194.3	194.3	194.3	197.1	6,900
Storage Tanks	211.1	201.9	207.4	211.1	11,400
Total or Index	**209.7**	**208.2**	**213.4**	**216.4**	**29,000**

Table H3. Lease Equipment Costs and Indices for Gas Production in West Texas
(1 Well Producing from 8,000 Feet)

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
	50 Thousand Cubic Feet Per Day				
Flowlines and Connections	218.8	222.9	227.1	229.2	11,000
Production Package	175.9	175.9	179.3	182.8	5,300
Storage Tanks	211.1	201.9	207.4	211.1	11,400
Total or Index	**206.1**	**203.8**	**208.4**	**211.5**	**27,700**
	250 Thousand Cubic Feet Per Day				
Flowlines and Connections	216.7	222.9	227.1	229.2	11,000
Production Package	194.3	194.3	194.3	197.1	6,900
Dehydrators	184.9	187.1	189.2	192.5	17,900
Storage Tanks	211.1	201.9	207.4	211.1	11,400
Total or Index	**199.1**	**199.1**	**202.2**	**205.2**	**47,200**
	500 Thousand Cubic Feet Per Day				
Flowlines and Connections	212.2	219.5	226.8	229.3	9,400
Production Package	170.0	170.0	170.0	172.5	6,900
Dehydrators	176.3	187.1	189.2	192.5	17,900
Storage Tanks	211.1	201.9	207.4	211.1	11,400
Total or Index	**189.9**	**193.4**	**196.9**	**200.0**	**45,600**

Table H4. Lease Equipment Costs and Indices for Gas Production in West Texas
(1 Well Producing from 12,000 Feet)

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
	250 Thousand Cubic Feet Per Day				
Flowlines and Connections	247.8	282.6	301.4	304.3	21,000
Production Package	170.0	162.5	165.0	165.0	6,600
Dehydrators	184.9	187.1	189.2	192.5	17,900
Storage Tanks	211.1	201.9	207.4	211.1	11,400
Total or Index	**205.1**	**212.1**	**219.5**	**222.3**	**56,900**
	500 Thousand Cubic Feet Per Day				
Flowlines and Connections	248.4	288.7	309.7	312.9	19,400
Production Package	170.0	170.0	170.0	172.5	6,900
Dehydrators	184.9	187.1	189.2	192.5	17,900
Storage Tanks	211.1	201.9	207.4	211.1	11,400
Total or Index	**204.0**	**212.9**	**220.1**	**223.3**	**55,600**
	1 Million Cubic Feet Per Day				
Flowlines and Connections	255.8	300.0	321.2	321.2	16,700
Production Package	122.2	144.4	147.5	149.5	14,800
Dehydrators	184.9	187.1	189.2	192.5	17,900
Storage Tanks	211.1	201.9	207.4	211.1	11,400
Total or Index	**181.2**	**195.3**	**201.7**	**204.0**	**60,800**

Table H5. Lease Equipment Costs and Indices for Gas Production in West Texas
(1 Well Producing from 16,000 Feet)

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
	500 Thousand Cubic Feet Per Day				
Flowlines and Connections	255.8	300.0	321.2	321.2	16,700
Production Package	122.2	144.4	147.5	149.5	14,800
Dehydrators	184.9	187.1	189.2	192.5	17,900
Storage Tanks	211.1	201.9	207.4	211.1	11,400
Total or Index	**181.2**	**195.3**	**201.7**	**204.0**	**60,800**
	1 Million Cubic Feet Per Day				
Flowlines and Connections	255.8	300.0	321.2	321.2	16,700
Production Package	122.2	144.4	147.5	149.5	14,800
Dehydrators	184.9	187.1	189.2	192.5	17,900
Storage Tanks	211.1	201.9	207.4	211.1	11,400
Total or Index	**181.2**	**195.3**	**201.7**	**204.0**	**60,800**
	5 Million Cubic Feet Per Day				
Flowlines and Connections	273.8	293.9	303.7	303.7	49,800
Production Package	130.6	146.3	148.1	150.9	16,300
Dehydrators	206.2	207.1	210.6	213.3	24,100
Storage Tanks	211.1	201.9	207.4	211.1	11,400
Total or Index	**213.4**	**223.9**	**229.6**	**231.4**	**101,600**

Table H6. Direct Annual Operating Costs and Indices for Gas Production in West Texas
(1 Well Producing from 2,000 Feet)

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
	50 Thousand Cubic Feet Per Day				
Direct Labor & Overhead..	283.3	266.7	250.0	241.7	2,900
Fuel, Chemicals & Disposal	250.0	300.0	300.0	300.0	600
Surface Maintenance	253.3	246.7	240.0	233.3	3,500
Subsurface Maintenance	180.0	180.0	200.0	200.0	1,000
Total or Index**	**252.9**	**247.1**	**241.2**	**235.3**	**8,000**
	250 Thousand Cubic Feet Per Day				
Direct Labor & Overhead..	283.3	266.7	250.0	241.7	2,900
Fuel, Chemicals & Disposal	210.0	220.0	220.0	220.0	2,200
Surface Maintenance	253.3	246.7	240.0	233.3	3,500
Subsurface Maintenance	180.0	180.0	200.0	200.0	1,000
Total or Index**	**242.9**	**238.1**	**233.3**	**228.6**	**9,600**

Table H7. Direct Annual Operating Costs and Indices for Gas Production in West Texas
(1 Well Producing from 4,000 Feet)

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
	50 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	285.7	257.1	242.9	228.6	3,200
Fuel, Chemicals & Disposal.	200.0	220.0	220.0	220.0	1,100
Surface Maintenance	253.3	280.0	280.0	273.3	4,100
Subsurface Maintenance.	185.7	200.0	200.0	200.0	1,400
Total or Index.**	**246.3**	**251.2**	**246.3**	**239.0**	**9,800**
	250 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	285.7	257.1	242.9	228.6	3,200
Fuel, Chemicals & Disposal.	205.0	220.0	220.0	220.0	4,400
Surface Maintenance	245.0	240.0	235.0	230.0	4,600
Subsurface Maintenance.	185.7	200.0	200.0	200.0	1,400
Total or Index.**	**234.4**	**232.8**	**227.9**	**223.0**	**13,600**

Table H8. Direct Annual Operating Costs and Indices for Gas Production in West Texas
(1 Well Producing from 8,000 Feet)

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
	50 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	287.5	256.3	243.8	231.3	3,700
Fuel, Chemicals & Disposal.	210.0	220.0	220.0	220.0	2,200
Surface Maintenance	245.0	210.0	205.0	200.0	4,000
Subsurface Maintenance.	183.3	175.0	166.7	166.7	2,000
Total or Index**	**237.9**	**217.2**	**210.3**	**205.2**	**11,900**
	250 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	287.5	256.3	243.8	231.3	3,700
Fuel, Chemicals & Disposal.	212.8	228.2	228.2	228.2	8,900
Surface Maintenance	238.5	235.9	230.8	225.6	8,800
Subsurface Maintenance.	183.3	175.0	166.7	166.7	2,000
Total or Index.**	**230.2**	**229.2**	**224.5**	**220.8**	**23,400**
	500 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	287.5	256.3	243.8	231.3	3,700
Fuel, Chemicals & Disposal.	242.9	242.9	238.1	238.1	5,000
Surface Maintenance	238.2	235.3	229.4	226.5	7,700
Subsurface Maintenance.	183.3	175.0	166.7	166.7	2,000
Total or Index.**	**241.0**	**232.5**	**225.3**	**221.7**	**18,400**

Table H9. Direct Annual Operating Costs and Indices for Gas Production in West Texas
(1 Well Producing from 12,000 Feet)

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
	250 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	294.7	236.8	226.3	210.5	4,00
Fuel, Chemicals & Disposal	208.0	222.0	222.0	222.0	11,100
Surface Maintenance	242.5	230.0	225.0	220.0	8,800
Subsurface Maintenance	173.1	180.8	180.8	184.6	4,800
Total or Index**	**223.7**	**218.5**	**215.6**	**212.6**	**28,700**
	500 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	294.7	236.8	226.3	210.5	4,000
Fuel, Chemicals & Disposal	228.0	228.0	224.0	220.0	5,500
Surface Maintenance	240.0	228.6	222.9	220.0	7,700
Subsurface Maintenance	173.1	180.8	180.8	184.6	4,800
Total or Index**	**230.5**	**218.1**	**213.3**	**209.5**	**22,000**
	1 Million Cubic Feet Per Day				
Direct Labor & Overhead	294.7	236.8	226.3	210.5	4,000
Fuel, Chemicals & Disposal	228.8	230.8	226.9	225.0	11,700
Surface Maintenance	225.6	215.4	212.8	207.7	8,100
Subsurface Maintenance	173.1	180.8	180.8	184.6	4,800
Total or Index**	**226.5**	**217.6**	**214.0**	**210.3**	**28,600**

Table H10. Direct Annual Operating Costs and Indices for Gas Production in West Texas
(1 Well Producing from 16,000 Feet)

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
	500 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	294.7	236.8	226.3	210.5	4,000
Fuel, Chemicals &Disposal	222.6	225.8	222.6	222.6	6,900
Surface Maintenance	225.6	228.2	225.6	223.1	8,700
Subsurface Maintenance	174.2	183.9	187.1	183.9	5,700
Total or Index**	**222.5**	**217.5**	**215.0**	**210.8**	**25,300**
	1 Million Cubic Feet Per Day				
Direct Labor & Overhead	294.7	236.8	226.3	210.5	4,000
Fuel, Chemicals & Disposal	223.0	224.6	223.0	219.7	13,400
Surface Maintenance	225.6	228.2	225.6	223.1	8,700
Subsurface Maintenance	174.2	183.9	187.1	183.9	5,700
Total or Index*	**222.7**	**218.7**	**216.7**	**212.0**	**31,800**
	5 Million Cubic Feet Per Day				
Direct Labor & Overhead	294.7	236.8	226.3	210.5	4,000
Fuel, Chemicals & Disposal	143.4	142.4	146.5	150.5	14,900
Surface Maintenance	238.8	240.8	238.8	236.7	11,600
Subsurface Maintenance	175.8	130.3	133.3	133.3	4,400
Total or Index**	**186.5**	**173.5**	**174.5**	**174.5**	**34,900**

Table H11. Detailed Lease Equipment List for 12,000-Foot Gas Wells in West Texas Producing 1 Million Cubic Feet per Day

Safety Valve

Size: 2 inches
Working pressure: 10,000 pounds per square inch
Actuates: High/low pressures

Production Package

Choke: Built in, inlet
Coils: 2 inches XH
Heater Rating: 250,000 BTU per hour
Size: 16 inches by 8 feet
Working pressure: 1,000 pounds per square inch

Dehydrator/Reconcentrator

Type: Glycol Absorption
Size: 12-3/4 inches
Working pressure: 1,440 pounds per square inch

Storage Tanks (2)

Size: 10 feet x 15 feet
Capacity: 210 barrels
Construction: Welded Steel

Source: Energy Information Administration, Office of Oil and Gas.

Table I1. Lease Equipment Costs and Indices for Gas Production in South Texas
(1 Well Producing from 2,000 Feet)

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
	50 Thousand Cubic Feet Per Day				
Flowlines and Connections	215.4	230.8	238.5	253.8	3,300
Production Package	142.9	148.6	148.6	151.4	5,300
Storage Tanks	203.6	205.5	203.6	207.3	11,400
Total or Index	**184.5**	**189.3**	**189.3**	**194.2**	**20,000**
	250 Thousand Cubic Feet Per Day				
Flowlines and Connections	215.4	230.8	238.5	253.8	3,300
Production Package	142.9	148.6	148.6	151.4	5,300
Storage Tanks	203.6	205.5	203.6	207.3	11,400
Total or Index	**184.5**	**189.3**	**189.3**	**194.2**	**20,000**

Table I2. Lease Equipment Costs and Indices for Gas Production in South Texas
(1 Well Producing from 4,000 Feet)

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
	50 Thousand Cubic Feet Per Day				
Flowlines and Connections	215.4	230.8	238.5	253.8	3,300
Production Package	142.9	148.6	148.6	151.4	5,300
Storage Tanks.	203.6	205.5	203.6	207.3	11,400
Total or Index	**184.5**	**189.3**	**189.3**	**194.2**	**20,000**
	250 Thousand Cubic Feet Per Day				
Flowlines and Connections	213.0	223.9	230.4	232.6	10,700
Production Package	178.4	186.5	183.8	186.5	6,900
Storage Tanks	203.6	205.5	203.6	207.3	11,400
Total or Index	**200.0**	**206.5**	**207.2**	**210.1**	**29,000**

Table I3. Lease Equipment Costs and Indices for Gas Production in South Texas
(1 Well Producing from 8,000 Feet)

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
	250 Thousand Cubic Feet Per Day				
Flowlines and Connections	210.2	218.4	222.4	224.5	11,000
Production Package	178.4	186.5	183.8	186.5	6,900
Dehydrators	177.9	186.3	185.3	188.4	17,900
Storage Tanks	203.6	205.5	203.6	207.3	11,400
Total or Index	**190.7**	**197.5**	**197.0**	**200.0**	**47,200**
	500 Thousand Cubic Feet Per Day				
Flowlines and Connections	212.2	219.5	226.8	229.3	9,400
Production Package	157.1	164.3	161.9	164.3	6,900
Dehydrators	177.9	186.3	185.3	188.4	17,900
Storage Tanks	203.6	205.5	203.6	207.3	11,400
Total or Index	**186.3**	**192.7**	**192.7**	**195.7**	**45,600**
	1 Million Cubic Feet Per Day				
Flowlines and Connections	255.8	300.0	321.2	321.2	16,700
Production Package	120.0	144.0	146.0	149.0	14,900
Dehydrators	177.9	186.3	185.3	188.4	17,900
Storage Tanks	203.6	205.5	203.6	207.3	11,400
Total or Index	**176.8**	**195.4**	**199.0**	**201.7**	**60,900**

Table I4. Lease Equipment Costs and Indices for Gas Production in South Texas
(1 Well Producing from 12,000 Feet)

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
	500 Thousand Cubic Feet Per Day				
Flowlines and Connections	248.4	288.7	309.7	312.9	19,400
Production Package	157.1	164.3	161.9	164.3	6,900
Dehydrators	177.9	186.3	185.3	188.4	17,900
Storage Tanks	203.6	205.5	203.6	207.3	11,400
Total or Index	**197.2**	**211.8**	**215.7**	**218.9**	**55,600**
	1 Million Cubic Feet Per Day				
Flowlines and Connections	255.8	300.0	321.2	321.2	16,700
Production Package	120.0	144.0	146.0	149.0	14,900
Dehydrators	177.9	186.3	185.3	188.4	17,900
Storage Tanks	203.6	205.5	203.6	207.3	11,400
Total or Index	**176.8**	**195.4**	**199.0**	**201.7**	**60,900**
	5 Million Cubic Feet Per Day				
Flowlines and Connections	273.8	293.9	303.7	303.7	49,800
Production Package	126.4	145.5	145.5	148.2	16,300
Dehydrators	200.0	206.1	207.0	210.4	24,200
Storage Tanks	203.6	205.5	203.6	207.3	11,400
Total or Index	**209.5**	**223.4**	**227.0**	**229.1**	**101,700**

Table I5. Direct Annual Operating Costs and Indices for Gas Production in South Texas
(1 Well Producing from 2,000 Feet)

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
	50 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	253.8	276.9	253.8	246.2	3,200
Fuel, Chemicals & Disposal	250.0	300.0	300.0	300.0	600
Surface Maintenance	178.9	221.1	194.7	194.7	3,700
Subsurface Maintenance	180.0	200.0	200.0	220.0	1,100
Total or Index**	**207.7**	**241.0**	**220.5**	**220.5**	**8,600**
	250 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	253.8	276.9	253.8	246.2	3,200
Fuel, Chemicals & Disposal	210.0	220.0	220.0	220.0	2,200
Surface Maintenance	178.9	221.1	194.7	194.7	3,700
Subsurface Maintenance	180.0	200.0	200.0	220.0	1,100
Total or Index**	**206.4**	**234.0**	**217.0**	**217.0**	**10,200**

Table I6. Direct Annual Operating Costs and Indices for Gas Production in South Texas
(1 Well Producing from 4,000 Feet)

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
	50 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	264.3	292.9	271.4	257.1	3,600
Fuel, Chemicals & Disposal	200.0	220.0	220.0	220.0	1,100
Surface Maintenance	178.9	221.1	194.7	194.7	3,700
Subsurface Maintenance	200.0	200.0	214.3	214.3	1,500
Total or Index**	**211.1**	**240.0**	**224.4**	**220.0**	**9,900**
	250 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	264.3	292.9	271.4	257.1	3,600
Fuel, Chemicals & Disposal	205.0	220.0	220.0	220.0	4,400
Surface Maintenance	183.3	220.8	195.8	195.8	4,700
Subsurface Maintenance	200.0	200.0	214.3	214.3	1,500
Total or Index..**	**209.2**	**233.8**	**221.5**	**218.5**	**14,200**

Table I7. Direct Annual Operating Costs and Indices for Gas Production in South Texas
(1 Well Producing from 8,000 Feet)

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
	250 Thousand Cubic Feet Per Day				
Direct Labor & Overhead..	252.9	252.9	235.3	223.5	3,800
Fuel, Chemicals & Disposal	212.8	225.6	225.6	225.6	8,800
Surface Maintenance	176.6	214.9	191.5	191.5	9,000
Subsurface Maintenance.	208.3	200.0	200.0	208.3	2,500
Total or Index.**	**203.5**	**222.6**	**210.4**	**209.6**	**24,100**
	500 Thousand Cubic Feet Per Day				
Direct Labor & Overhead..	252.9	252.9	235.3	223.5	3,800
Fuel, Chemicals & Disposal	115.0	137.5	125.0	125.0	5,000
Surface Maintenance	175.6	212.2	190.2	190.2	7,800
Subsurface Maintenance	208.3	200.0	200.0	208.3	2,500
Total or Index**	**169.1**	**190.0**	**174.5**	**173.6**	**19,100**
	1 Million Cubic Feet Per Day				
Direct Labor & Overhead..	252.9	252.9	235.3	223.5	3,800
Fuel, Chemicals & Disposal	186.5	284.6	265.4	267.3	13,900
Surface Maintenance	171.7	210.9	191.3	191.3	8,800
Subsurface Maintenance	208.3	200.0	200.0	208.3	2,500
Total or Index.**	**192.1**	**245.7**	**228.3**	**228.3**	**29,000**

Table I8. Direct Annual Operating Costs and Indices for Gas Production in South Texas
(1 Well Producing from 12,000 Feet)

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
	500 Thousand Cubic Feet Per Day				
Direct Labor & Overhead..	260.0	280.0	260.0	250.0	5,000
Fuel, Chemicals & Disposal.	182.8	200.0	200.0	196.6	5,700
Surface Maintenance.	178.6	219.0	197.6	200.0	8,400
Subsurface Maintenance...	179.2	183.3	187.5	191.7	4,600
Total or Index..**	**193.9**	**217.4**	**207.0**	**206.1**	**23,700**
	1 Million Cubic Feet Per Day				
Direct Labor & Overhead..	260.0	280.0	260.0	250.0	5,000
Fuel, Chemicals & Disposal	186.4	216.9	201.7	201.7	11,900
Surface Maintenance	171.7	210.9	191.3	191.3	8,800
Subsurface Maintenance...	179.2	183.3	187.5	191.7	4,600
Total or Index**	**190.6**	**218.1**	**204.0**	**203.4**	**30,300**
	5 Million Cubic Feet Per Day				
Direct Labor & Overhead..	260.0	280.0	260.0	250.0	5,000
Fuel, Chemicals & Disposal	157.9	150.9	156.1	161.4	9,200
urface Maintenance	142.9	136.5	141.3	146.0	9,200
Subsurface Maintenance.	200.0	169.2	173.1	176.9	4,600
Total or Index**	**171.1**	**163.9**	**165.7**	**168.7**	**28,000**

Table J1. Lease Equipment Costs and Indices for Gas Production in South Louisiana
(1 Well Producing from 2,000 Feet)

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
	50 Thousand Cubic Feet Per Day				
Flowlines and Connections	200.0	214.3	221.4	235.7	3,300
Production Package.	142.9	145.7	148.6	151.4	5,300
Storage Tanks	201.8	196.4	203.6	208.9	11,700
Total or Index	**181.9**	**181.9**	**187.6**	**193.3**	**20,300**
	250 Thousand Cubic Feet Per Day				
Flowlines and Connections	200.0	214.3	221.4	235.7	3,300
Production Package.	142.9	145.7	148.6	151.4	5,300
Storage Tanks	201.8	196.4	203.6	208.9	11,700
Total or Index	**181.9**	**181.9**	**187.6**	**193.3**	**20,300**

Table J2. Lease Equipment Costs and Indices for Gas Production in South Louisiana
(1 Well Producing from 4,000 Feet)

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
	50 Thousand Cubic Feet Per Day				
Flowlines and Connections	200.0	214.3	221.4	235.7	3,300
Production Package.	‘142.9	145.7	148.6	151.4	5,300
Storage Tanks	201.8	196.4	203.6	208.9	11,700
Total or Index	**181.9**	**181.9**	**187.6**	**193.3**	**20,300**
	250 Thousand Cubic Feet Per Day				
Flowlines and Connections	213.0	223.9	230.4	234.8	10,800
Production Package.	181.1	183.8	186.5	189.2	7,000
Storage Tanks	201.8	196.4	203.6	208.9	11,700
Total or Index	**200.0**	**202.2**	**207.9**	**212.2**	**29,500**

Table J3. Lease Equipment Costs and Indices for Gas Production in South Louisiana
(1 Well Producing from 8,000 Feet)

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
	250 Thousand Cubic Feet Per Day				
Flowlines and Connections	212.2	218.4	222.4	226.5	11,100
Production Package	181.1	183.8	186.5	189.2	7,000
Dehydrators	177.1	181.3	185.4	189.6	18,200
Storage Tanks	201.8	196.4	203.6	208.9	11,700
Total or Index	**190.8**	**192.9**	**197.5**	**201.7**	**48,000**
	500 Thousand Cubic Feet Per Day				
Flowlines and Connections	212.2	219.5	226.8	229.3	9,400
Production Package	159.5	161.9	164.3	166.7	7,000
Dehydrators	177.1	181.3	185.4	189.6	18,200
Storage Tanks	201.8	196.4	203.6	208.9	11,700
Total or Index	**186.0**	**188.1**	**193.2**	**197.0**	**46,300**
	1 Million Cubic Feet Per Day				
Flowlines and Connections	255.8	300.0	321.2	321.2	16,700
Production Package	120.0	143.0	146.0	149.0	14,900
Dehydrators	177.1	181.3	185.4	189.6	18,200
Storage Tanks	201.8	196.4	203.6	208.9	11,700
Total or Index	**176.3**	**191.8**	**199.0**	**202.3**	**61,500**

Table J4. Lease Equipment Costs and Indices for Gas Production in South Louisiana
(1 Well Producing from 12,000 Feet)

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
	500 Thousand Cubic Feet Per Day				
Flowlines and Connections	248.4	288.7	309.7	312.9	19,400
Production Package	159.5	161.9	164.3	166.7	7,000
Dehydrators	177.1	181.3	185.4	189.6	18,200
Storage Tanks	201.8	196.4	203.6	208.9	11,700
Total or Index	**196.9**	**207.4**	**216.0**	**219.9**	**56,300**
	1 Million Cubic Feet Per Day				
Flowlines and Connections	255.8	300.0	321.2	321.2	16,700
Production Package	120.0	143.0	146.0	149.0	14,900
Dehydrators	177.1	181.3	185.4	189.6	18,200
Storage Tanks	201.8	196.4	203.6	208.9	11,700
Total or Index	**176.3**	**191.8**	**199.0**	**202.3**	**61,500**
	5 Million Cubic Feet Per Day				
Flowlines and Connections	273.8	293.9	303.7	303.7	49,800
Production Package	127.3	143.6	146.4	150.0	16,500
Dehydrators	199.1	201.7	206.0	210.3	24,400
Storage Tanks	201.8	196.4	203.6	208.9	11,700
Total or Index	**209.2**	**220.6**	**226.9**	**229.6**	**102,400**

Table J5. Lease Equipment Costs and Indices for Gas Production in South Louisiana
(1 Well Producing from 16,000 Feet)

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
	500 Thousand Cubic Feet Per Day				
Flowlines and Connections....	248.4	288.7	309.7	312.9	19,400
Production Package	159.5	161.9	164.3	166.7	7,000
Dehydrators.	177.1	181.3	185.4	189.6	18,200
Storage Tanks.	201.8	196.4	203.6	208.9	11,700
Total or Index	**196.9**	**207.4**	**216.0**	**219.9**	**56,300**
	1 Million Cubic Feet Per Day				
Flowlines and Connections....	255.8	300.0	321.2	321.2	16,700
Production Package.	120.0	143.0	146.0	149.0	14,900
Dehydrators	177.1	181.3	185.4	189.6	18,200
Storage Tanks	201.8	196.4	203.6	208.9	11,700
Total or Index	**176.3**	**191.8**	**199.0**	**202.3**	**61,500**
	5 Million Cubic Feet Per Day				
Flowlines and Connections....	273.8	293.9	303.7	303.7	49,800
Production Package.	127.3	143.6	146.4	150.0	16,500
Dehydrators.	199.1	201.7	206.0	210.3	24,400
Storage Tanks	201.8	196.4	203.6	208.9	11,700
Total or Index.	**209.2**	**220.6**	**226.9**	**229.6**	**102,400**

Table J6. Direct Annual Operating Costs and Indices for Gas Production in South Louisiana
(1 Well Producing from 2,000 Feet)

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
	50 Thousand Cubic Feet Per Day				
Direct Labor & Overhead..	230.8	323.1	323.1	323.1	4,200
Fuel, Chemicals & Disposal.	250.0	300.0	300.0	300.0	600
Surface Maintenance	175.0	180.0	190.0	200.0	4,000
Subsurface Maintenance	166.7	150.0	166.7	166.7	1,000
Total or Index**	**195.1**	**226.8**	**234.1**	**239.0**	**9,800**
	250 Thousand Cubic Feet Per Day				
Direct Labor & Overhead..	230.8	323.1	323.1	323.1	4,200
Fuel, Chemicals & Disposal..	210.0	220.0	220.0	220.0	2,200
Surface Maintenance.	175.0	180.0	190.0	200.0	4,000
Subsurface Maintenance	166.7	150.0	166.7	166.7	1,000
Total or Index.**	**195.9**	**222.4**	**228.6**	**232.7**	**11,400**

Table J7. Direct Annual Operating Costs and Indices for Gas Production in South Louisiana
(1 Well Producing from 4,000 Feet)

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
	50 Thousand Cubic Feet Per Day				
Direct Labor & Overhead..	242.9	335.7	335.7	335.7	4,700
Fuel, Chemicals & Disposal	200.0	220.0	220.0	220.0	1,100
Surface Maintenance	175.0	180.0	190.0	200.0	4,000
Subsurface Maintenance.	175.0	175.0	175.0	175.0	1,400
Total or Index**	**197.9**	**229.8**	**234.0**	**238.3**	**11,200**
	250 Thousand Cubic Feet Per Day				
Direct Labor & Overhead..	242.9	335.7	335.7	335.7	4,700
Fuel, Chemicals & Disposal....	205.0	220.0	220.0	220.0	4,400
Surface Maintenance.	180.0	188.0	196.0	204.0	5,100
Subsurface Maintenance.	175.0	175.0	175.0	175.0	1,400
Total or Index**	**200.0**	**226.9**	**229.9**	**232.8**	**15,600**

Table J8. Direct Annual Operating Costs and Indices for Gas Production inSouth Louisiana
(1 Well Producing from 8,000 Feet)

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
	250 Thousand Cubic Feet Per Day				
Direct Labor & Overhead..	229.4	317.6	317.6	317.6	5,400
Fuel, Chemicals & Disposal..	212.8	225.6	225.6	225.6	8,800
Surface Maintenance.	172.0	180.0	188.0	194.0	9,700
Subsurface Maintenance	191.7	191.7	191.7	191.7	2,300
Total or Index**	**195.8**	**216.1**	**219.5**	**222.0**	**26,200**
	500 Thousand Cubic Feet Per Day				
Direct Labor & Overhead..	229.4	317.6	317.6	317.6	5,400
Fuel, Chemicals & Disposal	184.6	196.2	200.0	207.7	5,400
Surface Maintenance	173.5	181.6	189.8	198.0	9,700
Subsurface Maintenance.	191.7	191.7	191.7	191.7	2,300
Total or Index**	**187.5**	**208.7**	**213.5**	**219.2**	**22,800**
	1 Million Cubic Feet Per Day				
Direct Labor & Overhead..	229.4	317.6	317.6	317.6	5,400
Fuel, Chemicals & Disposal.	185.2	194.4	200.0	207.4	11,200
Surface Maintenance.	168.8	181.3	189.6	197.9	9,500
Subsurface Maintenance	191.7	191.7	191.7	191.7	2,300
Total or Index.**	**185.5**	**205.3**	**210.7**	**216.8**	**28,400**

Table J9. Direct Annual Operating Costs and Indices for Gas Production in South Louisiana
(1 Well Producing from 12,000 Feet)

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
	500 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	235.0	320.0	320.0	320.0	6,400
Fuel, Chemicals & Disposal	183.3	193.3	196.7	203.3	6,100
Surface Maintenance	177.3	188.6	197.7	204.5	9,000
Subsurface Maintenance	179.2	179.2	183.3	183.3	4,400
Total or Index**	**189.0**	**210.2**	**215.3**	**219.5**	**25,900**
	1 Million Cubic Feet Per Day				
Direct Labor & Overhead	235.0	320.0	320.0	320.0	6,400
Fuel, Chemicals & Disposal	185.2	195.1	200.0	206.6	12,600
Surface Maintenance	168.8	181.3	189.6	197.9	9,500
Subsurface Maintenance	179.2	179.2	183.3	183.3	4,400
Total or Index**	**185.6**	**204.6**	**209.8**	**215.0**	**32,900**
	5 Million Cubic Feet Per Day				
Direct Labor & Overhead	235.0	320.0	320.0	320.0	6,400
Fuel, Chemicals & Disposal	168.3	161.0	163.4	168.3	6,900
Surface Maintenance	184.2	194.7	201.8	207.0	11,800
Subsurface Maintenance	176.9	165.4	169.2	169.2	4,400
Total or Index**	**185.4**	**197.2**	**201.4**	**204.9**	**29,500**

Table J10. Direct Annual Operating Costs and Indices for Gas Production in South Louisiana
(1 Well Producing from 16,000 Feet)

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
	500 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	235.0	320.0	320.0	320.0	6,400
Fuel, Chemicals & Disposal	177.1	200.0	205.7	211.4	7,400
Surface Maintenance	177.3	188.6	197.7	204.5	9,000
Subsurface Maintenance	175.8	172.7	178.8	178.8	5,900
Total or Index**	**185.6**	**207.6**	**213.6**	**217.4**	**28,700**
	1 Million Cubic Feet Per Day				
Direct Labor & Overhead	235.0	320.0	320.0	320.0	6,400
Fuel, Chemicals &Disposal	183.1	191.5	197.2	201.4	14,300
Surface Maintenance	168.8	181.3	189.6	197.9	9,500
Subsurface Maintenance	175.8	172.7	178.8	178.8	5,900
Total or Index**	**183.7**	**200.0**	**205.8**	**209.9**	**36,100**
	5 Million Cubic Feet Per Day				
Direct Labor & Overhead	235.0	320.0	320.0	320.0	6,400
Fuel, Chemicals & Disposal	150.5	146.3	149.5	153.7	14,600
Surface Maintenance	178.0	188.1	194.9	200.0	11,800
Subsurface Maintenance	177.1	125.7	128.6	128.6	4,500
Total or Index**	**170.8**	**171.3**	**175.1**	**178.5**	**37,300**

Table K1. Lease Equipment Costs and Indices for Gas Production in North Louisiana
(1 Well Producing from 2,000 Feet)

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
	50 Thousand Cubic Feet Per Day				
Flowlines and Connections	200.0	214.3	221.4	235.7	3,300
Production Package	142.9	145.7	148.6	151.4	5,300
Storage Tanks	201.8	196.4	203.6	208.9	11,700
Total or Index	**181.9**	**181.9**	**187.6**	**193.3**	**20,300**
	250 Thousand Cubic Feet Per Day				
Flowlines and Connections	200.0	214.3	221.4	235.7	3,300
Production Package	142.9	145.7	148.6	151.4	5,300
Storage Tanks	201.8	196.4	203.6	208.9	11,700
Total or Index	**181.9**	**181.9**	**187.6**	**193.3**	**20,300**

Table K2. Lease Equipment Costs and Indices for Gas Production in North Louisiana
(1 Well Producing from 4,000 Feet)

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
	250 Thousand Cubic Feet Per Day				
Flowlines and Connections	213.0	221.7	230.4	234.8	10,800
Production Package	178.4	178.4	183.8	186.5	6,900
Storage Tanks	201.8	196.4	203.6	208.9	11,700
Total or Index	**199.3**	**200.0**	**207.2**	**211.5**	**29,400**
	500 Thousand Cubic Feet Per Day				
Flowlines and Connections	200.0	216.7	250.0	266.7	1,600
Production Package	159.5	161.9	164.3	166.7	7,000
Storage Tanks	201.8	196.4	203.6	208.9	11,700
Total or Index	**184.6**	**183.7**	**190.4**	**195.2**	**20,300**

Table K3. Lease Equipment Costs and Indices for Gas Production in North Louisiana
(1 Well Producing from 8,000 Feet)

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
	250 Thousand Cubic Feet Per Day				
Flowlines and Connections	212.2	218.4	222.4	226.5	11,100
Production Package	178.4	178.4	183.8	186.5	6,900
Dehydrators	177.1	181.3	185.4	189.6	18,200
Storage Tanks	201.8	196.4	203.6	208.9	11,700
Total or Index	**190.3**	**192.0**	**197.1**	**201.3**	**47,900**
	500 Thousand Cubic Feet Per Day				
Flowlines and Connections	212.2	219.5	226.8	229.3	9,400
Production Package	159.5	161.9	164.3	166.7	7,000
Dehydrators	177.1	181.3	185.4	189.6	18,200
Storage Tanks	201.8	196.4	203.6	208.9	11,700
Total or Index.	**186.0**	**188.1**	**193.2**	**197.0**	**46,300**

Table K4. Lease Equipment Costs and Indices for Gas Production in North Louisiana
(1 Well Producing from 12,000 Feet)

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
	500 Thousand Cubic Feet Per Day				
Flowlines and Connections	248.4	288.7	309.7	312.9	19,400
Production Package.	159.5	161.9	164.3	166.7	7,000
Dehydrators	177.1	181.3	185.4	189.6	18,200
Storage Tanks..	201.8	196.4	203.6	208.9	11,700
Total or Index	**196.9**	**207.4**	**216.0**	**219.9**	**56,300**
	1 Million Cubic Feet Per Day				
Flowlines and Connections	255.8	300.0	321.2	321.2	16,700
Production Package.	120.0	143.0	146.0	149.0	14,900
Dehydrators	177.1	181.3	185.4	189.6	18,200
Storage Tanks	201.8	196.4	203.6	208.9	11,700
Total or Index.	**176.3**	**191.8**	**199.0**	**202.3**	**61,500**

Table K5. Lease Equipment Costs and Indices for Gas Production in North Louisiana
(1 Well Producing from 16,000 Feet)

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
	1 Million Cubic Feet Per Day				
Flowlines and Connections....	255.8	300.0	321.2	321.2	16,700
Production Package.	120.0	143.0	146.0	149.0	14,900
Dehydrators	177.1	181.3	185.4	189.6	18,200
Storage Tanks.	201.8	196.4	203.6	208.9	11,700
Total or Index.	**176.3**	**191.8**	**199.0**	**202.3**	**61,500**
	5 Million Cubic Feet Per Day				
Flowlines and Connections.	273.8	293.9	303.7	303.7	49,800
Production Package	127.3	143.6	147.3	150.0	16,500
Dehydrators	199.1	201.7	206.0	210.3	24,400
Storage Tanks.	201.8	196.4	203.6	208.9	11,700
Total or Index	**209.2**	**220.6**	**227.1**	**229.6**	**102,400**
	10 Million Cubic Feet Per Day				
Flowlines and Connections....	273.8	293.9	303.7	303.7	49,800
Production Package	127.3	143.6	147.3	150.0	16,500
Dehydrators	197.0	189.4	193.5	197.3	51,900
Storage Tanks..	201.8	196.4	203.6	208.9	11,700
Total or Index	**205.7**	**210.5**	**216.4**	**219.1**	**129,900**

Table K6. Direct Annual Operating Costs and Indices for Gas Production in North Louisiana
(1 Well Producing from 2,000 Feet)

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
	50 Thousand Cubic Feet Per Day				
Direct Labor & Overhead..	323.1	323.1	323.1	323.1	4,200
Fuel, Chemicals &Disposal..	250.0	300.0	300.0	300.0	600
Surface Maintenance	175.0	180.0	190.0	200.0	4,000
Subsurface Maintenance	166.7	150.0	166.7	166.7	1,000
Total or Index**	**224.4**	**226.8**	**234.1**	**239.0**	**9,800**
	250 Thousand Cubic Feet Per Day				
Direct Labor & Overhead..	323.1	323.1	323.1	323.1	4,200
Fuel, Chemicals & Disposal	220.0	220.0	220.0	220.0	2,200
Surface Maintenance	175.0	180.0	190.0	200.0	4,000
Subsurface Maintenance	166.7	150.0	166.7	166.7	1,000
Total or Index**	**222.4**	**222.4**	**228.6**	**232.7**	**11,400**

Table K7. Direct Annual Operating Costs and Indices for Gas Production in North Louisiana
(1 Well Producing from 4,000 Feet)

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
	250 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	335.7	335.7	335.7	335.7	4,700
Fuel, Chemicals & Disposal	220.0	220.0	220.0	220.0	4,400
Surface Maintenance	180.0	188.0	196.0	204.0	5,100
Subsurface Maintenance	175.0	175.0	175.0	175.0	1,400
Total or Index**	**223.9**	**226.9**	**229.9**	**232.8**	**15,600**
	500 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	335.7	335.7	335.7	335.7	4,700
Fuel, Chemicals & Disposal	179.2	183.3	191.7	195.8	4,700
Surface Maintenance	176.0	184.0	192.0	200.0	5,000
Subsurface Maintenance	175.0	175.0	175.0	175.0	1,400
Total or Index**	**208.5**	**212.7**	**218.3**	**222.5**	**15,800**

Table K8. Direct Annual Operating Costs and Indices for Gas Production in North Louisiana
(1 Well Producing from 8,000 Feet)

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
	250 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	311.8	317.6	317.6	317.6	5,400
Fuel, Chemicals & Disposal	225.6	228.2	228.2	228.2	8,900
Surface Maintenance	172.0	180.0	186.0	194.0	9,700
Subsurface Maintenance	191.7	191.7	191.7	191.7	2,300
Total or Index**	**211.9**	**216.9**	**219.5**	**222.9**	**26,300**
	500 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	311.8	317.6	317.6	317.6	5,400
Fuel, Chemicals &Disposal	188.5	192.3	200.0	207.7	5,400
Surface Maintenance	173.5	181.6	189.8	198.0	9,700
Subsurface Maintenance	191.7	191.7	191.7	191.7	2,300
Total or Index**	**201.9**	**207.7**	**213.5**	**219.2**	**22,800**

Table K9. Direct Annual Operating Costs and Indices for Gas Production in North Louisiana
(1 Well Producing from 12,000 Feet)

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
	500 Thousand Cubic Feet Per Day				
Direct Labor & Overhead..	320.0	320.0	320.0	320.0	6,400
Fuel, Chemicals &Disposal.	183.3	190.0	196.7	200.0	6,000
Surface Maintenance	177.3	188.6	197.7	204.5	9,000
Subsurface Maintenance	183.3	179.2	183.3	183.3	4,400
Total or Index**	**204.2**	**209.3**	**215.3**	**218.6**	**25,800**
	1 Million Cubic Feet Per Day				
Direct Labor & Overhead..	320.0	320.0	320.0	320.0	6,400
Fuel, Chemicals & Disposal	190.2	195.1	201.6	206.6	12,600
Surface Maintenance	170.8	181.3	189.6	197.9	9,500
Subsurface Maintenance	183.3	179.2	183.3	183.3	4,400
Total or Index**	**200.0**	**204.6**	**210.5**	**215.0**	**32,900**

Table K10. Direct Annual Operating Costs and Indices for Gas Production in North Louisiana
(1 Well Producing from 16,000 Feet)

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
	1 Million Cubic Feet Per Day				
Direct Labor & Overhead..	320.0	320.0	320.0	320.0	6,400
Fuel, Chemicals & Disposal	188.7	211.3	215.5	221.1	15,700
Surface Maintenance.	168.8	181.3	189.6	195.8	9,400
Subsurface Maintenance	178.8	172.7	175.8	178.8	5,900
Total or Index**	**196.5**	**208.1**	**212.8**	**217.4**	**37,400**
	5 Million Cubic Feet Per Day				
Direct Labor & Overhead..	320.0	320.0	320.0	320.0	6,400
Fuel, Chemicals & Disposal	154.2	161.5	164.6	168.8	16,200
Surface Maintenance.	176.3	186.4	194.9	200.0	11,800
Subsurface Maintenance	128.6	122.9	128.6	128.6	4,500
Total or Index.**	**171.9**	**177.1**	**181.9**	**185.2**	**38,900**
	10 Million Cubic Feet Per Day				
Direct Labor & Overhead..	320.0	320.0	320.0	320.0	6,400
Fuel, Chemicals & Disposal.	149.7	143.6	146.0	149.7	24,40
Maintenance	175.4	182.6	189.9	194.2	13,400
Subsurface Maintenance...	128.6	122.9	128.6	128.6	4,500
Total or Index**	**165.2**	**162.7**	**166.6**	**169.7**	**48,700**

Table L1. Lease Equipment Costs and Indices for Gas Production in the Mid-Continent
(1 Well Producing from 2,000 Feet)

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
	50 Thousand Cubic Feet Per Day				
Flowlines and Connections....	230.8	238.5	246.2	261.5	3,400
Production Package.	150.0	152.9	152.9	158.8	5,400
Storage Tanks..	225.9	209.3	214.8	222.2	12,000
Total or Index.	**201.0**	**194.1**	**198.0**	**205.9**	**20,800**
	250 Thousand Cubic Feet Per Day				
Flowlines and Connections....	230.8	238.5	246.2	261.5	3,400
Production Package.	172.5	172.5	175.0	177.5	7,100
Storage Tanks	225.9	209.3	214.8	222.2	12,000
Total or Index	**206.5**	**199.1**	**203.7**	**210.3**	**22,500**

Table L2. Lease Equipment Costs and Indices for Gas Production in the Mid-Continent
(1 Well Producing from 4,000 Feet)

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
	50 Thousand Cubic Feet Per Day				
Flowlines and Connections	230.8	238.5	246.2	261.5	3,400
Production Package	150.0	152.9	152.9	158.8	5,400
Storage Tanks	225.9	209.3	214.8	222.2	12,000
Total or Index	**201.0**	**194.1**	**198.0**	**205.9**	**20,800**
	250 Thousand Cubic Feet Per Day				
Flowlines and Connections.	220.0	228.9	237.8	242.2	10,900
Production Package	194.3	194.3	197.1	200.0	7,000
Storage Tanks	225.9	209.3	214.8	222.2	12,000
Total or Index	**215.7**	**211.9**	**217.9**	**223.1**	**29,900**
	500 Thousand Cubic Feet Per Day				
Flowlines and Connections	213.2	226.3	234.2	239.5	9,100
Production Package	194.3	194.3	197.1	200.0	7,000
Storage Tanks	225.9	209.3	214.8	222.2	12,000
Total or Index	**213.4**	**210.2**	**215.7**	**221.3**	**28,100**

Table L3. Lease Equipment Costs and Indices for Gas Production in the Mid-Continent
(1 Well Producing from 8,000 Feet)

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
	250 Thousand Cubic Feet Per Day				
Flowlines and Connections....	218.8	225.0	229.2	233.3	11,200
Production Package	194.3	194.3	197.1	200.0	7,000
Dehydrators.	184.9	188.2	191.4	195.7	18,200
Storage Tanks.	225.9	209.3	214.8	222.2	12,000
Total or Index	**203.0**	**201.7**	**205.7**	**210.4**	**48,400**
	500 Thousand Cubic Feet Per Day				
Flowlines and Connections....	212.2	219.5	226.8	229.3	9,400
Production Package	172.5	172.5	175.0	177.5	7,100
Dehydrators	184.9	188.2	191.4	195.7	18,200
Storage Tanks.	225.9	209.3	214.8	222.2	12,000
Total or Index	**197.4**	**196.1**	**200.4**	**204.8**	**46,700**

Table L4. Lease Equipment Costs and Indices for Gas Production in the Mid-Continent
(1 Well Producing from 12,000 Feet)

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
	250 Thousand Cubic Feet Per Day				
Flowlines and Connections	249.3	284.1	302.9	307.2	21,200
Production Package	172.5	172.5	175.0	177.5	7,100
Dehydrators	184.9	188.2	191.4	195.7	18,200
Storage Tanks	225.9	209.3	214.8	222.2	12,000
Total or Index	**209.0**	**216.0**	**223.8**	**228.5**	**58,500**
	500 Thousand Cubic Feet Per Day				
Flowlines and Connections...	248.4	288.7	309.7	312.9	19,400
Production Package	172.5	172.5	175.0	177.5	7,100
Dehydrators	184.9	188.2	191.4	195.7	18,200
Storage Tanks	225.9	209.3	214.8	222.2	12,000
Total or Index	**207.6**	**215.3**	**223.3**	**227.7**	**56,700**
	1 Million Cubic Feet Per Day				
Flowlines and Connections....	255.8	300.0	321.2	321.2	16,700
Production Package.	122.2	145.5	147.5	151.5	15,000
Dehydrator	184.9	188.2	191.4	195.7	18,200
Storage Tanks	225.9	209.3	214.8	222.2	12,000
Total or Index	**183.9**	**197.3**	**203.7**	**207.7**	**61,900**

Table L5. Lease Equipment Costs and Indices for Gas Production in the Mid-Continent
(1 Well Producing from 16,000 Feet)

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
	500 Thousand Cubic Feet Per Day				
Flowlines and Connections	255.8	300.0	321.2	321.2	16,700
Production Package	122.2	145.5	147.5	151.5	15,000
Dehydrators	184.9	188.2	191.4	195.7	18,200
Storage Tanks	225.9	209.3	214.8	222.2	12,000
Total or Index	**183.9**	**197.3**	**203.7**	**207.7**	**61,900**
	1 Million Cubic Feet Per Day				
Flowlines and Connections	255.8	300.0	321.2	321.2	16,700
Production Package.	122.2	145.5	147.5	151.5	15,000
Dehydrators	184.9	188.2	191.4	195.7	18,200
Storage Tanks	225.9	209.3	214.8	222.2	12,000
Total or Index	**183.9**	**197.3**	**203.7**	**207.7**	**61,900**
	5 Million Cubic Feet Per Day				
Flowlines and Connections	273.8	293.9	303.7	303.7	49,800
Production Package	130.6	147.2	149.1	152.8	16,500
Dehydrators	206.2	208.0	211.5	216.8	24,500
Storage Tanks	225.9	209.3	214.8	222.2	12,000
Total or Index	**215.3**	**225.3**	**231.0**	**234.2**	**102,800**

Table L6. Direct Annual Operating Costs and Indices for Gas Production in the Mid-Continent
(1 Well Producing from 2,000 Feet)

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
	50 Thousand Cubic Feet Per Day				
Direct Labor & Overhead..	250.0	250.0	241.7	225.0	2,700
Fuel, Chemicals &Disposal	250.0	300.0	300.0	300.0	600
Surface Maintenance	233.3	233.3	233.3	246.7	3,700
Subsurface Maintenance...	220.0	200.0	220.0	220.0	1,100
Total or Index**	**238.2**	**238.2**	**238.2**	**238.2**	**8,100**
	250 Thousand Cubic Feet Per Day				
Direct Labor & Overhead..	250.0	250.0	241.7	225.0	2,700
Fuel, Chemicals & Disposal.	220.0	220.0	220.0	220.0	2,200
Surface Maintenance.	230.0	230.0	230.0	245.0	4,900
Subsurface Maintenance	220.0	200.0	220.0	220.0	1,100
Total or Index.**	**231.9**	**229.8**	**229.8**	**231.9**	**10,900**

Table L7. Direct Annual Operating Costs and Indices for Gas Production in the Mid-Continent
(1 Well Producing from 4,000 Feet)

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
	50 Thousand Cubic Feet Per Day				
Direct Labor & Overhead..	242.9	235.7	228.6	221.4	3,100
Fuel, Chemicals & Disposal...	220.0	220.0	220.0	220.0	1,100
Surface Maintenance.	233.3	233.3	233.3	246.7	3,700
Subsurface Maintenance	175.0	175.0	175.0	175.0	1,400
Total or Index**	**223.8**	**221.4**	**219.0**	**221.4**	**9,300**
	250 Thousand Cubic Feet Per Day				
Direct Labor & Overhead..	242.9	235.7	228.6	221.4	3,100
Fuel, Chemicals & Disposal	220.0	220.0	220.0	220.0	4,400
Surface Maintenance	229.2	229.2	233.3	245.8	5,900
Subsurface Maintenance	175.0	175.0	175.0	175.0	1,400
Total or Index**	**222.7**	**221.2**	**221.2**	**224.2**	**14,800**
	500 Thousand Cubic Feet Per Day				
Direct Labor & Overhead..	242.9	235.7	228.6	221.4	3,100
Fuel, Chemicals & Disposal..	226.3	226.3	226.3	236.8	4,500
Surface Maintenance.	321.1	321.1	321.1	331.6	6,300
Subsurface Maintenance.	175.0	175.0	175.0	175.0	1,400
Total or Index**	**253.3**	**251.7**	**250.0**	**255.0**	**15,300**

Table L8. Direct Annual Operating Costs and Indices for Gas Production in the Mid-Continent
(1 Well Producing from 8,000 Feet)

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
	250 Thousand Cubic Feet Per Day				
Direct Labor & Overhead..	243.8	243.8	231.3	218.8	3,500
Fuel, Chemicals & Disposal	225.6	225.6	228.2	228.2	8,900
Surface Maintenance.	220.5	220.5	220.5	233.3	9,100
Subsurface Maintenance	183.3	183.3	183.3	183.3	2,200
Total or Index**	**221.7**	**221.7**	**220.8**	**223.6**	**23,700**
	500 Thousand Cubic Feet Per Day				
Direct Labor & Overhead..	243.8	243.8	231.3	218.8	3,500
Fuel, Chemicals & Disposal.	233.3	233.3	233.3	242.9	5,100
Surface Maintenance	217.6	220.6	220.6	232.4	7,900
Subsurface Maintenance	183.3	183.3	183.3	183.3	2,200
Total or Index**	**221.7**	**222.9**	**220.5**	**225.3**	**18,700**

Table L9. Direct Annual Operating Costs and Indices for Gas Production in the Mid-Continent
(1 Well Producing from 12,000 Feet)

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
	250 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	252.6	247.4	236.8	226.3	4,300
Fuel, Chemicals & Disposal	220.0	222.0	224.0	224.0	11,200
Surface Maintenance	222.5	227.5	230.0	240.0	9,600
Subsurface Maintenance	175.0	170.8	175.0	179.2	4,300
Total or Index**	**217.3**	**218.0**	**218.8**	**221.1**	**29,400**
	500 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	252.6	247.4	236.8	226.3	4,300
Fuel, Chemicals & Disposal	220.0	224.0	224.0	232.0	5,800
Surface Maintenance	222.9	228.6	231.4	240.0	8,400
Subsurface Maintenance	175.0	170.8	175.0	179.2	4,300
Total or Index**	**216.5**	**217.5**	**217.5**	**221.4**	**22,800**
	1 Million Cubic Feet Per Day				
Direct Labor & Overhead	252.6	247.4	236.8	226.3	4,300
Fuel, Chemicals & Disposal	227.5	227.5	229.4	237.3	12,100
Surface Maintenance	207.7	215.4	217.9	228.2	8,900
Subsurface Maintenance	175.0	170.8	175.0	179.2	4,300
Total or Index**	**215.8**	**216.5**	**217.3**	**222.6**	**29,600**

Table L10. Direct Annual Operating Costs and Indices for Gas Production in the Mid-Continent
(1 Well Producing from 16,000 Feet)

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
	500 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	252.6	247.4	236.8	226.3	4,300
Fuel, Chemicals & Disposal	216.1	216.1	219.4	225.8	7,000
Surface Maintenance	207.7	215.4	217.9	228.2	8,900
Subsurface Maintenance	175.9	175.9	179.3	179.3	5,200
Total or Index**	**209.3**	**211.0**	**211.9**	**215.3**	**25,400**
	1 Million Cubic Feet Per Day				
Direct Labor & Overhead	252.6	247.4	236.8	226.3	4,300
Fuel, Chemicals & Disposal	218.0	218.0	219.7	226.2	13,800
Surface Maintenance	207.7	215.4	217.9	228.2	8,900
Subsurface Maintenance	175.9	175.9	179.3	179.3	5,200
Total or Index**	**211.5**	**212.8**	**213.5**	**217.6**	**32,200**
	5 Million Cubic Feet Per Day				
Direct Labor & Overhead	252.6	247.4	236.8	226.3	4,300
Fuel, Chemicals & Disposal	149.5	142.3	147.4	150.5	14,600
Surface Maintenance	224.5	230.6	232.7	242.9	11,900
Subsurface Maintenance	119.4	119.4	122.6	122.6	3,800
Total or Index**	**173.5**	**170.9**	**173.5**	**176.5**	**34,600**

Table M1. Lease Equipment Costs and Indices for Gas Production in the Rocky Mountains
(1 Well Producing from 2,000 Feet)

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
	50 Thousand Cubic Feet Per Day				
Flowlines and Connections	214.3	221.4	235.7	242.9	3,400
Production Package	164.3	178.6	183.3	185.7	7,800
Storage Tanks	212.5	203.6	208.9	212.5	11,900
Total or Index	**194.6**	**196.4**	**202.7**	**206.3**	**23,100**
	250 Thousand Cubic Feet Per Day				
Flowlines and Connections	214.3	221.4	235.7	242.9	3,400
Production Package	164.3	178.6	183.3	185.7	7,800
Storage Tanks	212.5	203.6	208.9	212.5	11,900
Total or Index	**194.6**	**196.4**	**202.7**	**206.3**	**23,100**

Table M2. Lease Equipment Costs and Indices for Gas Production in the Rocky Mountains
(1 Well Producing from 4,000 Feet)

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
	50 Thousand Cubic Feet Per Day				
Flowlines and Connections	214.3	221.4	235.7	242.9	3,400
Production Package	164.3	178.6	183.3	185.7	7,800
Storage Tanks	212.5	203.6	208.9	212.5	11,900
Total or Index	**194.6**	**196.4**	**202.7**	**206.3**	**23,100**
	250 Thousand Cubic Feet Per Day				
Flowlines and Connections	215.2	223.9	234.8	237.0	10,900
Production Package	183.8	186.5	191.9	191.9	7,100
Dehydrators	181.3	185.4	189.6	192.7	18,500
Storage Tanks	212.5	203.6	208.9	212.5	11,900
Total or Index	**195.7**	**197.4**	**203.4**	**206.0**	**48,400**
	500 Thousand Cubic Feet Per Day				
Flowlines and Connections	208.8	214.7	223.5	223.5	7,600
Production Package	122.0	145.0	148.0	150.0	15,000
Dehydrators	181.3	185.4	189.6	192.7	18,500
Storage Tanks	212.5	203.6	208.9	212.5	11,900
Total or Index	**169.9**	**178.3**	**182.9**	**185.3**	**53,000**

Table M3. Lease Equipment Costs and Indices for Gas Production in the Rocky Mountains
(1 Well Producing from 8,000 Feet)

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
	250 Thousand Cubic Feet Per Day‘				
Flowlines and Connections	211.4	213.6	218.2	218.2	9,600
Production Package.	122.0	145.0	148.0	150.0	15,000
Dehydrators	181.3	185.4	189.6	192.7	18,500
Storage Tanks	212.5	203.6	208.9	212.5	11,900
Total or Index	**171.6**	**179.4**	**183.4**	**185.8**	**55,000**
	500 Thousand Cubic Feet Per Day				
Flowlines and Connections	208.3	213.9	216.7	216.7	7,800
Production Package	122.0	145.0	148.0	150.0	15,000
Dehydrators	181.3	185.4	189.6	192.7	18,500
Storage Tanks	212.5	203.6	208.9	212.5	11,900
Total or Index.	**170.1**	**178.5**	**182.3**	**184.7**	**53,200**

Table M4. Lease Equipment Costs and Indices for Gas Production in the Rocky Mountains
(1 Well Producing from 12,000 Feet)

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
	250 Thousand Cubic Feet Per Day				
Flowlines and Connections	251.7	288.3	308.3	308.3	18,500
Production Package	122.0	145.0	148.0	150.0	15,000
Dehydrators	181.3	185.4	189.6	192.7	18,500
Storage Tanks	212.5	203.6	208.9	212.5	11,900
Total or Index	**181.4**	**195.5**	**202.6**	**204.8**	**63,900**
	500 Thousand Cubic Feet Per Day				
Flowlines and Connections	255.8	300.0	321.2	321.2	16,700
Production Package	122.0	145.0	148.0	150.0	15,000
Dehydrators	181.3	185.4	189.6	192.7	18,500
Storage Tanks	212.5	203.6	208.9	212.5	11,900
Total or Index	**180.3**	**195.1**	**202.0**	**204.3**	**62,100**
	1 Million Cubic Feet Per Day				
Flowlines and Connections	255.8	300.0	321.2	321.2	16,700
Production Package	122.0	145.0	148.0	150.0	15,000
Dehydrators	181.3	185.4	189.6	192.7	18,500
Storage Tanks	212.5	203.6	208.9	212.5	11,900
Total or Index	**180.3**	**195.1**	**202.0**	**204.3**	**62,100**

Table M5. Direct Annual Operating Costs and Indices for Gas Production in the Rocky Mountains
(1 Well Producing from 2,000 Feet)

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
	50 Thousand Cubic Feet Per Day				
Direct Labor & Overhead..	261.5	269.2	269.2	269.2	3,500
Fuel, Chemicals &Disposal	250.0	300.0	300.0	300.0	600
Surface Maintenance.	163.0	166.7	166.7	166.7	4,500
Subsurface Maintenance	133.3	150.0	150.0	150.0	900
Total or Index**	**189.6**	**197.9**	**197.9**	**197.9**	**9,500**
	250 Thousand Cubic Feet Per Day				
Direct Labor & Overhead..	261.5	269.2	269.2	269.2	3,500
Fuel, Chemicals & Disposal	210.0	220.0	220.0	220.0	2,200
Surface Maintenance	222.2	166.7	166.7	166.7	4,500
Subsurface Maintenance	133.3	150.0	150.0	150.0	900
Total or Index*	**219.6**	**198.2**	**198.2**	**198.2**	**11,100**

Table M6. Direct Annual Operating Costs and Indices for Gas Production in the Rocky Mountains
(1 Well Producing from 4,000 Feet)

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
	50 Thousand Cubic Feet Per Day				
Direct Labor & Overhead..	253.3	260.0	260.0	260.0	3,900
Fuel, Chemicals & Disposal	200.0	220.0	220.0	220.0	1,100
Surface Maintenance	222.2	166.7	166.7	166.7	4,500
Subsurface Maintenance	166.7	177.8	177.8	188.9	1,700
Total or Index**	**219.6**	**198.2**	**198.2**	**200.0**	**11,200**
	250 Thousand Cubic Feet Per Day				
Direct Labor & Overhead..	253.3	260.0	260.0	260.0	3,900
Fuel, Chemicals & Disposal	210.0	220.0	220.0	220.0	4,400
Surface Maintenance	222.4	118.4	120.4	120.4	5,900
Subsurface Maintenance	166.7	177.8	177.8	188.9	1,700
Total or Index**	**219.4**	**168.8**	**169.9**	**171.0**	**15,900**
	500 Thousand Cubic Feet Per Day				
Direct Labor & Overhead..	253.3	260.0	260.0	260.0	3,900
Fuel, Chemicals & Disposal.	184.0	184.0	184.0	184.0	4,600
Surface Maintenance.	215.2	156.5	158.7	158.7	7,300
Subsurface Maintenance	166.7	177.8	177.8	188.9	1,700
Total or Index**	**208.4**	**182.1**	**183.2**	**184.2**	**17,500**

Table M7. Direct Annual Operating Costs and Indices for Gas Production in the Rocky Mountains
(1 Well Producing from 8,000 Feet)

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
	250 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	258.8	264.7	264.7	264.7	4,500
Fuel, Chemicals & Disposal	209.8	224.4	224.4	224.4	9,200
Surface Maintenance	215.1	167.9	169.8	169.8	9,000
Subsurface Maintenance	171.4	178.6	178.6	185.7	2,600
Total or Index**	**214.4**	**200.8**	**201.6**	**202.4**	**25,300**
	500 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	258.8	264.7	264.7	264.7	4,500
Fuel, Chemicals & Disposal	185.7	185.7	189.3	189.3	5,300
Surface Maintenance	215.2	169.6	171.7	171.7	7,900
Subsurface Maintenance	171.4	178.6	178.6	185.7	2,600
Total or Index**	**208.6**	**190.5**	**192.4**	**193.3**	**20,300**

Table M8. Direct Annual Operating Costs and Indices for Gas Production in the Rocky Mountains
(1 Well Producing from 12,000 Feet)

Component	Index (1976 = 100)				1993 Cost (dollars)*
	1990	1991	1992	1993	
	250 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	265.0	270.0	270.0	275.0	5,500
Fuel, Chemicals & Disposal	211.8	223.5	225.5	225.5	11,500
Surface Maintenance	214.8	174.1	175.9	175.9	9,500
Subsurface Maintenance	165.5	165.5	172.4	172.4	5,000
Total or Index**	**211.0**	**201.3**	**203.9**	**204.5**	**31,500**
	500 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	265.0	270.0	270.0	275.0	5,500
Fuel, Chemicals & Disposal	187.1	190.3	193.5	193.5	6,000
Surface Maintenance	217.0	176.6	178.7	178.7	8,400
Subsurface Maintenance	165.5	165.5	172.4	172.4	5,000
Total or Index**	**205.5**	**192.1**	**195.3**	**196.1**	**24,900**
	1 Million Cubic Feet Per Day				
Direct Labor & Overhead	265.0	270.0	270.0	275.0	5,500
Fuel, Chemicals & Disposal	191.7	193.3	195.0	195.0	11,700
Surface Maintenance	217.0	176.6	178.7	178.7	8,400
Subsurface Maintenance	165.5	165.5	172.4	172.4	5,000
Total or Index**	**203.8**	**192.9**	**195.5**	**196.2**	**30,600**

Section III

Appendix N

Equipping and Operating Cost Indices and Other Economic Indicators

Appendix N

Equipping and Operating Cost Indices and Other Economic Indicators

Appendix N contains a general overview of oil and gas equipping and operating costs in nominal and real (i.e., deflated terms) from 1976 through 1993.

Unweighted aggregates of equipping and operating costs from the summary tables were indexed with 1976 as the base year. The Gross Domestic Product (GDP) Implicit Price Deflator was used to deflate these indices and the Producer Price Indices (PPI). The deflated indices would equal 100 if the changes in costs matched the changes in the GDP. The results appear in Tables N1 and N2, and are illustrated in Figures N1 and N2.

Even though the aggregate average costs may not be the average costs for all oil and gas wells in the United States, it is possible to make some meaningful observations.

The deflated indices for oil lease equipment peaked in 1981 at 120.5 and continued to decline to a value of 79.4 in 1986. In 1987 the deflated oil indices increased 12.6 percent to 89.4 but declined 4.5 percent in 1988. A new low was set in 1992 with an index of 73.4, a 3.3 percent decrease from 1991. New equipment for oil leases is competing with both imported and used equipment which explains why new equipment costs are still 25 percent below the deflated costs of 1976. Volatile tubing prices have been the largest part of the changing equipment costs. However, the large annual decreases have stopped and in the next few years relatively stable or slightly positive growth in oil lease equipment cost is expected. This may be inferred from the trend in gas well equipment prices, as shown in Figure N1. The oil equipment price trend is not easily classified as upward in spite of the increase from 1992 to 1993.

The gas lease equipment indices for deflated dollars peaked in 1980 at 117.7 and declined through 1986 to a value of 82.6. The index for 1993 shows an increase of 5 percent from 1986. This reflects the reduction of much of the gas equipment inventories, and a small positive growth in equipment cost will probably occur for the next few years.

The deflated indices for operating costs for both oil and gas leases peaked in 1982 at 142.5 and 120.6, respectively, and declined 29 percent for oil leases and 27 percent for gas leases by 1993. This decline was primarily a reflection of the decrease in drilling activity and workovers which caused the service companies to cut prices drastically to stay in business.

Table N1. Indices and Gross Domestic Product Deflated Indices of Equipping Costs for Oil and Gas Fields and the Producer Price Index

Year	Indices			Gross Domestic Product Deflated Indices		
	Oil	Gas	PPI[a]	Oil[R]	Gas[R]	PPI[R]
1976	100.0	100.0	100.0	100.0	100.0	100.0
1977	R110.2	116.1	106.4	103.1	108.6	99.5
1978	R120.7	127.3	114.8	104.7	110.4	99.6
1979	133.0	142.2	124.8	106.2	113.5	99.6
1980	154.4	161.4	138.2	112.6	117.7	100.8
1981	R181.8	176.7	152.3	120.5	117.1	101.0
1982	R191.6	183.4	161.0	119.6	114.5	100.5
1983	170.2	168.9	165.5	102.1	101.3	99.3
1984	190.0	160.5	169.4	109.2	92.2	97.4
1985	165.4	159.3	173.1	91.6	88.3	95.9
1986	147.1	153.0	176.7	79.4	82.6	95.4
1987	R170.9	162.4	179.9	89.4	84.9	94.1
1988	R169.6	172.6	184.1	85.4	86.9	92.7
1989	R178.0	176.1	R191.3	85.8	84.9	92.2
1990	170.9	189.3	197.9	79.0	87.5	91.4
1991	169.6	192.3	204.0	75.9	85.4	90.6
1992	178.0	200.9	207.9	73.4	86.9	89.9
1993	169.9	206.4	211.3	75.1	87.1	89.2

[a]Producer Price Index (Capital Equipment) obtained from the Bureau of Labor Statistics, U.S. Department of Labor publication, Producer Prices and Price Indexes, Annual Supplement.

R=Revised.

Notes: These aggregate average costs are the average of the costs from the summary tables and do not represent the average costs of all wells in the United States.

Table N2. The Gross Domestic Product Implicit Price Deflator and the Gross Domestic Product Deflated Indices of Operating Costs for Oil and Gas Fields

Year	GNP Implicit Price Deflator[a]	Indices		Gross Domestic Product Deflated Indices	
		Oil	Gas	Oil[R]	Gas[R]
1976	100.0	100.0	100.0	100.0	100.0
1977	106.9	117.5	114.6	109.9	107.2
1978	115.3	130.3	121.8	113.0	105.6
1979	125.2	144.0	135.8	115.0	108.4
1980	137.1	174.2	156.4	127.1	114.1
1981	150.9	204.2	181.5	135.4	120.3
1982	160.2	228.4	193.2	142.5	120.6
1983	166.7	226.2	190.8	135.7	114.4
1984	174.0	230.1	192.0	132.2	110.3
1985	180.5	232.2	190.7	128.6	105.7
1986	185.3	212.9	182.1	114.9	98.3
1987	191.2	R210.5	R172.9	110.1	90.4
1988	198.7	R220.1	R181.4	110.8	91.3
1989	207.5	R229.1	R186.4	110.4	89.8
1990	216.4	243.4	201.9	112.5	93.3
1991	225.2	220.1	205.7	97.7	91.3
1992	231.2	229.1	205.7	99.1	89.0
1993	236.9	238.7	207.5	100.8	87.6

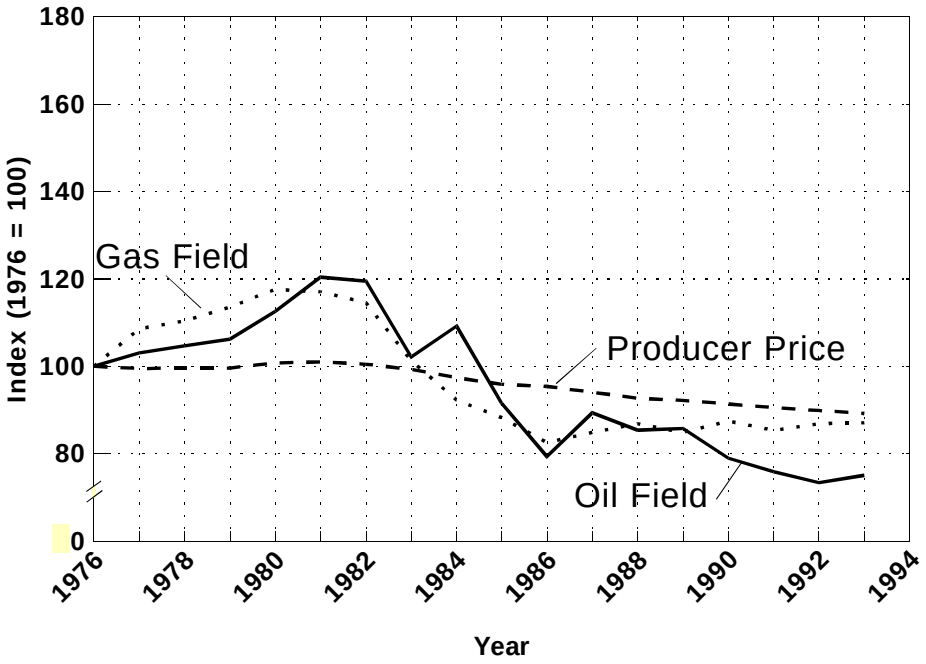
[a]Gross Domestic Product Implicit Price Deflators were obtained from the Bureau of Economic Analysis, U.S. Department of Commerce.

R=Revised.

Notes: These aggregate average costs are the average of the costs from the summary tables and do not represent the average costs.

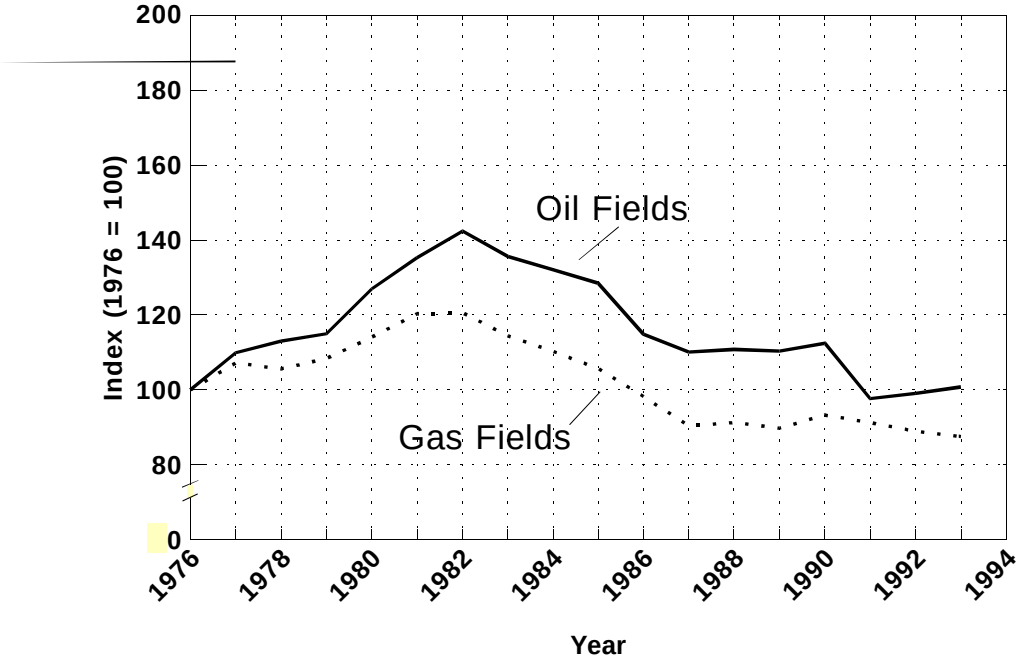
Source: Energy Information Administration, Office of Oil and Gas. Gross Domestic Product Implicit Price Deflator substituted for Gross National Producer Implicit Price Deflator.

Figure N1. Gross Domestic Product Deflated Producer Price Indices, and Oil and Gas Field Equipping Cost Indices



Source: Table N1.

Figure N2. Gross Domestic Product Deflated Operating Cost Indices for Oil and Gas Fields



Source: Table N2.

Glossary

Glossary

Additional oil recovery: Recovery which follows primary, or natural depletion recovery, and usually based on processes which involve capital expenditures.

ad valorem: The basis for taxation of oil and gas operating properties, and usually computed by expert assessment of current value.

API: American Petroleum Institute.

EIA: Energy Information Administration.

IPAA: Independent Petroleum Association of America.

JAS: Joint Association Survey, a survey of the cost of drilling wells in the U. S., conducted by the API, IPAA and MCOGA staffs.

Mcf: One thousand cubic feet.

MCOGA: Mid-Continent Oil and Gas Association, one of a number of regional associations of independent oil and gas operators.

Natural depletion: Means of recovery of oil or gas. Originally, accomplished by use of pressure in reservoir rocks to expel substances to surface facilities for treatment and sale.

Secondary recovery: See additional recovery. One common type is by means of waterflood or water injection.

Stripper well: A well that produces 90 Mcf per day or less of gas-well gas for a period of three consecutive months while producing at its maximum rate of flow. A stripper oil well is one which produces less than 15 barrels per day at its maximum rate of production for a period of three consecutive months.

WSU: Well service unit. Equipment used to maintain oil and gas wells. Usually mounted on vehicles for movement over roads.