

**Costs and Indices
for
Domestic Oil and Gas Field
Equipment and Production Operations
1994 Through 1997**

March 1998

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Preface

This is the Energy Information Administration's (EIA's) fifteenth report in the series on domestic costs and indices for oil and gas field equipment and production operations. The purpose of the series is to provide a continuing means of gauging changes in the oil and gas producing industry's costs. The cost data presented in this report are used by government agencies, the academic community, and the oil and gas industry. EIA gratefully acknowledges the cooperation received from personnel of service, supply, and production companies throughout the United States, without which this

study would not have been possible. General information about this publication may be obtained from John Wood (214/720-6150), Director of the Reserves and Production Division. Specific information regarding the preparation or contents of this publication may be obtained from Ralph Russell (214/720-6196, rrussell@eia.doe.gov) or Velton Funk (214/720-6171, vfunk@eia.doe.gov), both of whom are petroleum engineers in EIA's Dallas Field Office (fax: 214/720-6155).

All of the tables which appear in this report are available in machine-readable formats, i.e., Lotus 123 or Excel 5.0. Call Ralph Russell at 214/720-6196 or visit the EIA web site at <http://www.eia.doe.gov> (press Natural Gas in the Fuel Groups, then Other, then select the appropriate self-extracting file for downloading)

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Executive Summary

This report presents estimated costs and cost indices for domestic oil and natural gas field equipment and production operations for 1994, 1995, 1996, and 1997. The costs of all equipment and services are 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 the total number of oil wells to the total number of gas wells. The detail provided in this report is unavailable elsewhere. The body of this report contains summary tables, and the appendices contain detailed tables.

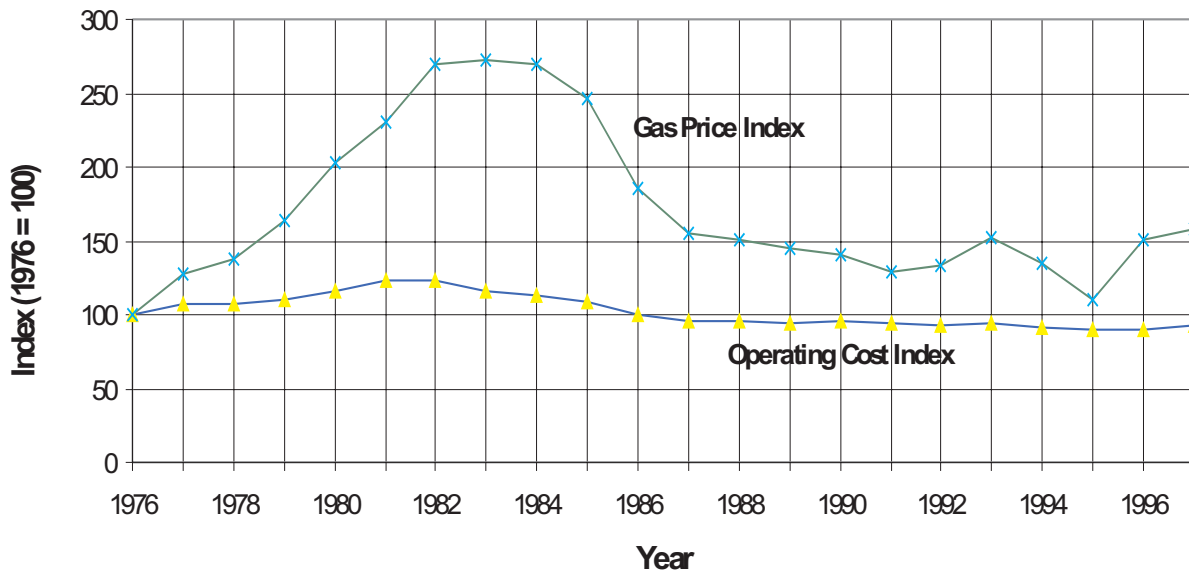
Price changes for oil and gas, changes in taxes on oil and gas revenues, and environmental factors (compliance costs and lease availability) have a significant impact on the number and cost of oil and gas wells drilled. These changes also impact the cost of oil and gas equipment and production operations.

Oil and gas prices rose from 1976 to the early 1980's, when deflated oil prices peaked at an index of about 260. In 1976, the average price of oil was \$8.19 per barrel and the average price of gas was \$0.58 per thousand cubic feet (Mcf). Deflated gas prices, which also rose to an index of about 270, were at a plateau from 1982 through 1984, before following oil prices downward. The 1995 oil price, after an increase from 1994, represents the second-lowest deflated oil price since 1976. By contrast, deflated gas prices have remained above 1976 prices, and, after heading downward in 1994 and 1995, rose in 1996 and 1997. Clearly, the price trends reflect fundamental differences between the markets for oil and gas.

Figure ES1, with gas prices and operating costs indexed to 1976, shows the variations in deflated gas prices and deflated operating costs for gas wells. The greatest difference between the two series was during 1984, and the current downward trend in product prices, coupled with declining operating costs, point to the fact that producer profitability is much more strongly affected by product prices than by increasing operating efficiency.

Gas activity has been spurred in recent years by favorable tax treatment (including tax credits for tight formations gas and

Figure ES1. Deflated Natural Gas Prices and Operating Cost Indices



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

coalbed methane). Environment-related costs for natural gas operations, generally less than for oil operations, may equal those for oil where coalbed methane leases are concerned as the main factor affecting operating costs in some coalbed methane regions is disposal of substantial amounts of formation water produced with the gas. No data have been collected on the environmental costs for gas wells.

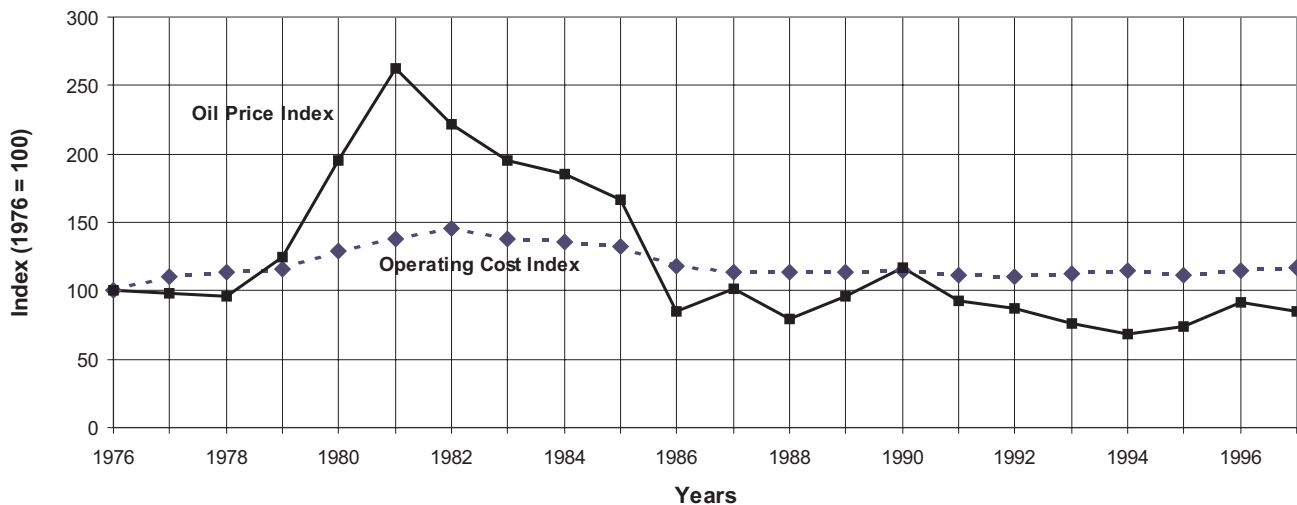
Figure ES2 similarly depicts deflated oil prices and operating costs indexed to 1976. There are two main differences between Figures ES1 and ES2. Gas prices have remained nearly 50 percent higher than those in the 1976 base year, while oil prices have rarely reached 1976 levels after the collapse of 1986. And, while deflated gas operating costs have remained below 1976 levels since 1986, deflated oil operating costs have never subsided to 1976 levels.

Oil production is an energy-intensive operation, and when fuel prices (natural gas prices) increase, so do oil production costs. Gas production is more labor intensive, with only

minor fuel costs. Therefore, high energy prices are a boon to gas producers, and the natural gas-producing industry has fared better than the oil-producing industry for the past decade. The change in gas prices has surpassed the change in gas well operating costs. Oil prices have fallen faster and farther than oil field operating costs since 1981, narrowing the profit margin and reducing the amount of internally raised capital available for investment in drilling and production operations.

Useful insights from the data in this report lie primarily in the differences that are presented. The costs for equipment and operations are different in each area, differing between primary and secondary operations and differing between gas and oil operations. Cost trends for some items vary widely from time to time, while others remain unchanged for years at a time. The summary tables in Chapter 3, Discussion of Results, indicate the overall trends while the Appendix tables provide the detail needed by many readers.

Figure ES2. Deflated Oil Price and Operating Cost Indices



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

1. Introduction

This report marks the continuation of the EIA series on equipment and operating costs and cost indices for oil and gas leases. In addition to cost comparisons within the petroleum industry, the data reported here are often used to assess the economic effects of specific plans and policies relating to the industry. No other source offers the detail of this report.

Only a few publications contain or have contained 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 cost statistics in their *Joint Association Survey of the U.S. Oil and Gas Producing Industry*.^{1,2} Section I of that publication pertains to drilling costs. Section II (discontinued after 1975) presented total U.S. expenditures for exploration, development, and production.

For several years, 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 after 1982.

Other than EIA's, no series of non-aggregated oil and gas field equipment and operating costs and subsequent indices has been published on a regional basis. Equipment and operating costs vary from region to region because of differences in fuel costs, labor rates, and other variables. (See Figures 1 and 2 for areas of oil and gas production.) Therefore, equipment and operating costs and cost indices are estimated by EIA on a regional basis for both oil and gas fields.

The costs and cost indices provided in this report are for representative lease operations with equipment and operating procedures designed by EIA staff engineers for representative 10-well oil leases producing by artificial lift or 1 flowing well per gas lease. The design criteria took into account the predominant methods of operation in each region. 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 presented in this report are current to their year and are not adjusted for inflation.

Freight costs and installation costs were determined on the basis of 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:

- A pumping unit
- Additional counter-weights
- Crank guards
- Belt guards, V-belts, and sheaves
- Freight costs
- Installation costs.

Conversion of primary oil-producing leases to secondary recovery (waterflood or water injection) involves:

- 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.

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. 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 (Mcf) of gas per day by depth and region.

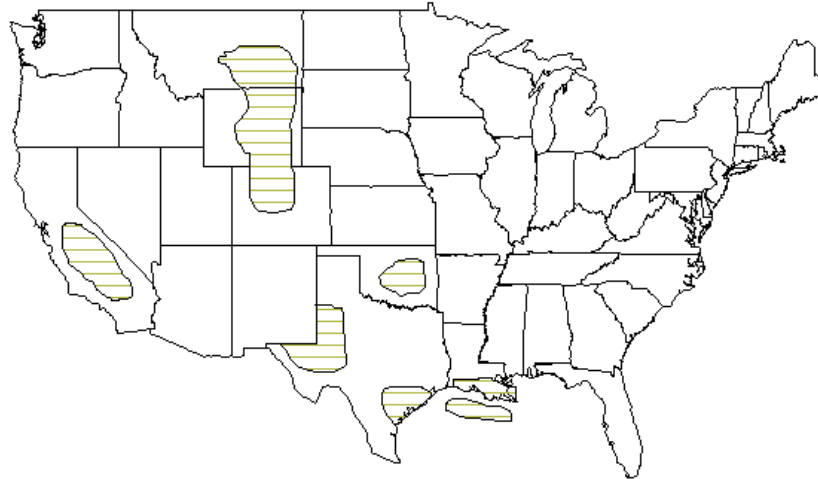
Equipment for gas wells does not cover hydrogen sulfide removal, compression, or special equipment for water removal. Tubing is also not included in the equipment list for gas wells.

¹American Petroleum Institute, Independent Petroleum Association of America, Mid-Continent Oil and Gas Association, *1995 Joint Association Survey on Drilling Costs*. (Washington, DC, November 1996), American Petroleum Institute.

²American 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.

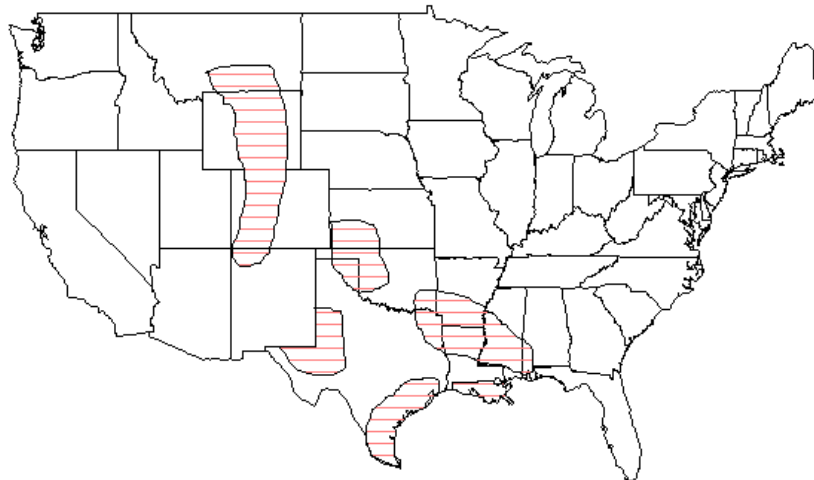
³U.S. Bureau of the Census, *Annual Survey of Oil and Gas, 1981*, Current Industrial Reports pub. MA-13K (81)-1, (Washington, DC, March 1983).

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 1997) for local June prices for their 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 indices in this report reflect changes in the costs of items, and their related transportation charges and associated installation costs on representative leases. The index numbers in this report are “pure” cost 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. Any equipment changes that may be made due to technological advances will be reflected in the composite indices.

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: $1997 \text{ index} = (1997 \text{ costs}/1976 \text{ costs}) \times 100$.

Annual percentage changes can be determined by dividing the last year's index by the prior year's index, subtracting one (1.0), and multiplying by 100. For example, to find the percent change from 1996 to 1997, divide the 1997 index by the 1996 index, subtract one (1.0), and multiply by 100.

The estimated region equipment costs for the representative oil leases were summed, averaged, and indexed by depth, providing a general measure of equipment expenditures relative to depth. The estimated region equipment costs for the representative gas leases were also summed, averaged, and indexed by depth and by production rate. 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 and 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. The data in this report should be considered as revised, except for the 1997 data, which are preliminary. Some of the revisions which appear in this report affected equipment costs for the entire series, beginning in 1976. Though these were small, in most cases, the equipment cost revisions reflected a minor change in operating costs. There were no major revisions. The following is a discussion of the composite costs and indices.

Overview

This report continues a data series begun in 1976, providing a history of equipment and operating costs for oil and gas leases from 1976 through 1997. (See Appendix N for both nominal and deflated full-series data). Figure 3 shows indices of the aggregate average costs for oil well equipment and operations, indicating general upward pressure on costs. The period of rapid cost increase which began before 1976 changed in 1982, the peak year for total equipment costs, which was followed by prices rising and falling within a range somewhat near the 1982 level. Operating costs

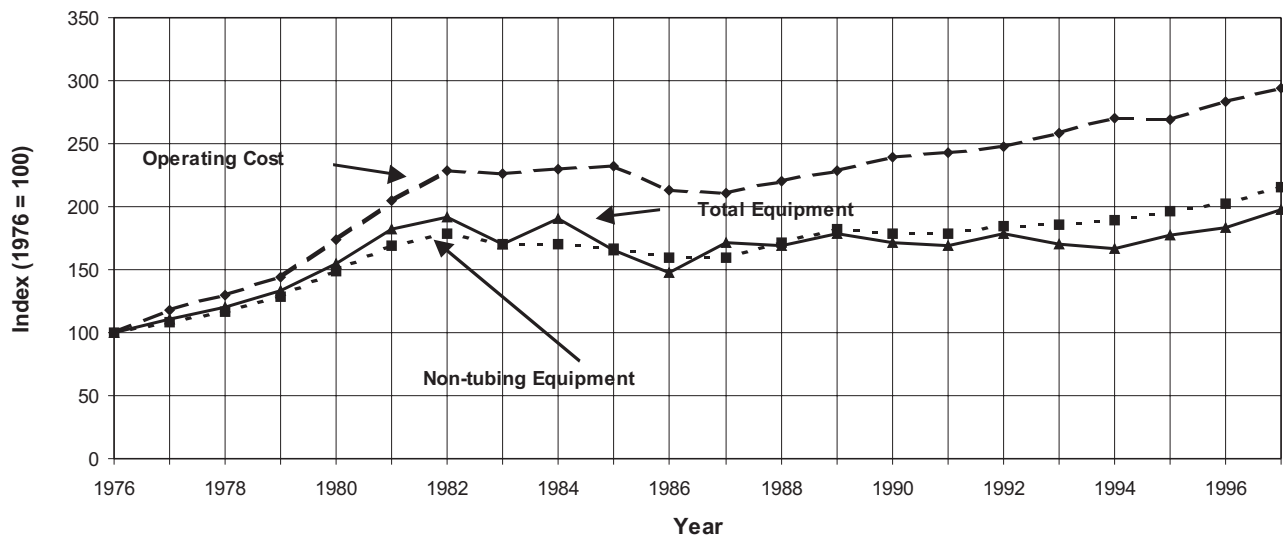
followed a different path. The post-1982 drop was minimal, and the 1982 level has been exceeded each year since 1989. Operating costs for 1997 are at the all-time peak. These have been largely influenced by energy costs (natural gas and electric power) and the costs of oil field services such as well servicing units and chemicals. Labor has also been a factor in many areas.

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 their price variations have been more extreme. Prices for 12,000-foot wells, which dropped from 1992 to 1994, have risen since. Costs for shallower wells have generally followed the same trend.

Figure 5 is a plot of oil lease equipment costs excluding tubing. Contrasting Figures 4 and 5 show that 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 declined from 1982 through 1987 and have generally increased since.

The 1997 index of non-tubing equipment cost for all depths is about 212, which is 112 percent higher than the 1976 cost. Since 1976, the non-tubing cost for 8,000-foot wells was exceeded by that for 12,000-foot wells about one-third of the

Figure 3. Aggregate Average Cost Indices for Primary Oil Recovery, 1976-1997



Source: Energy Information Administration, Office of Oil and Gas

time, 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 WSU 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 dropped to near 1976 levels, later counts show a modest increase. At the same time, available WSUs dropped to 1980 levels. Pressure on the well service industry was the result of overbuilding in the early 1980's. With a peak of about 8,000 WSU's available in 1985, the portion of WSUs at work was less than 60 percent. In 1986, working WSUs were only 40 percent of those available, and 1997 surveys reflect that 71 percent of the WSUs were working. Industry reports show that there are labor constraints that limit the current level of active WSUs, thus indicating industry-wide price increases to cover not only labor, but repair and replacement of equipment.

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 about 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 between 1990 and 1993, with a slight drop to 1994. The trend from 1994 to 1997 has been upward. Operating costs have set new highs beginning with 1990, and rose at a steadier pace than equipment costs because of recent changes in labor prices, which are a major influence on the overall costs of gas well operation. 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 operations in 6 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 7.5 percent in the period from 1996 to 1997. 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.

The annual increases are greater for deeper wells, as might be expected. Although there are regional differences in equipment costs for each depth of wells, the range of indexed values is larger for operating costs. The significant

fact is that costs for primary oil equipment and operations rose 7.5 percent and 3.9 percent, respectively.

Secondary Recovery

Table 2 summarizes the additional lease equipment costs and indices associated with secondary oil recovery (waterflood) from depths of 2,000, 4,000, and 8,000 feet in west Texas. This region was the focus of a substantial part of the early secondary recovery work in the country, and the differences between primary and secondary costs are presumed to be similar to those in other regions. The method used in this report is waterflooding. 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 18 percent for the 1996-1997 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 obscure the changes in other costs. The 1997 drilling costs reflect the end of over-capacity in the industry, and limitations of equipment, personnel, and auxiliary services add to constrain activity in some areas. Figure 9 shows the additional costs of waterflood equipment for depths of 2,000, 4,000, and 8,000 feet for 1994 through 1997.

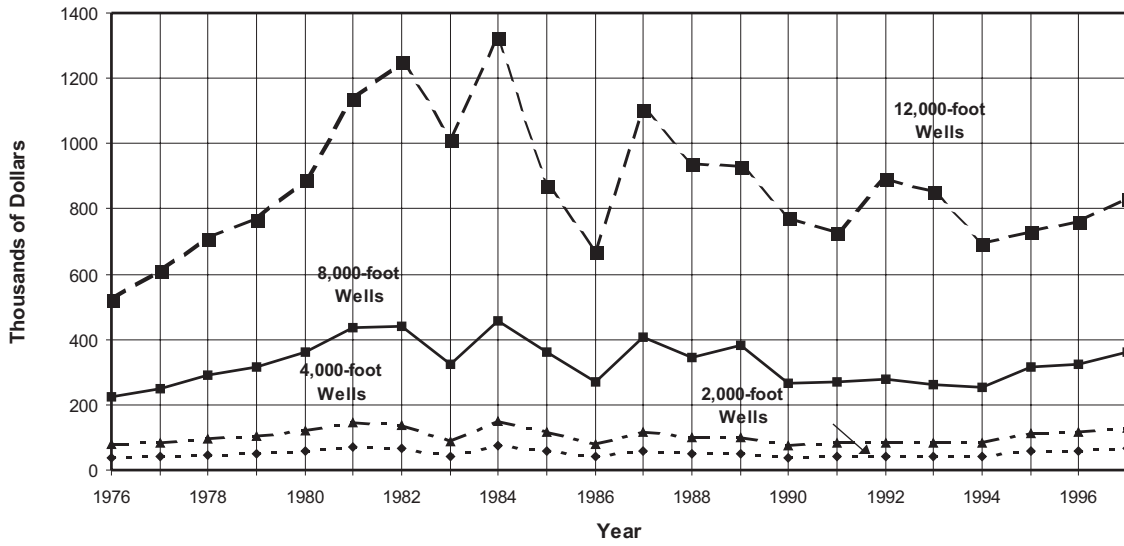
Operating Costs for Oil Leases

Primary Recovery

Table 3 is a summary of the annual operating costs and indices for primary oil recovery operations, which are shown in Figure 10, while those for secondary operations are shown in Figure 11. The average for the aggregate of the operating costs for the 6 regions and 4 depths was \$228,600 for the 10-well lease in 1997. This represents about a 3.9 percent increase over the average for 1996. Examination of Table 3 shows that most costs for oil operations rose from 1996 to 1997. The 1976 to 1997 history of aggregate operating costs is shown in Figure 3. The upward trend in operating costs began in 1988.

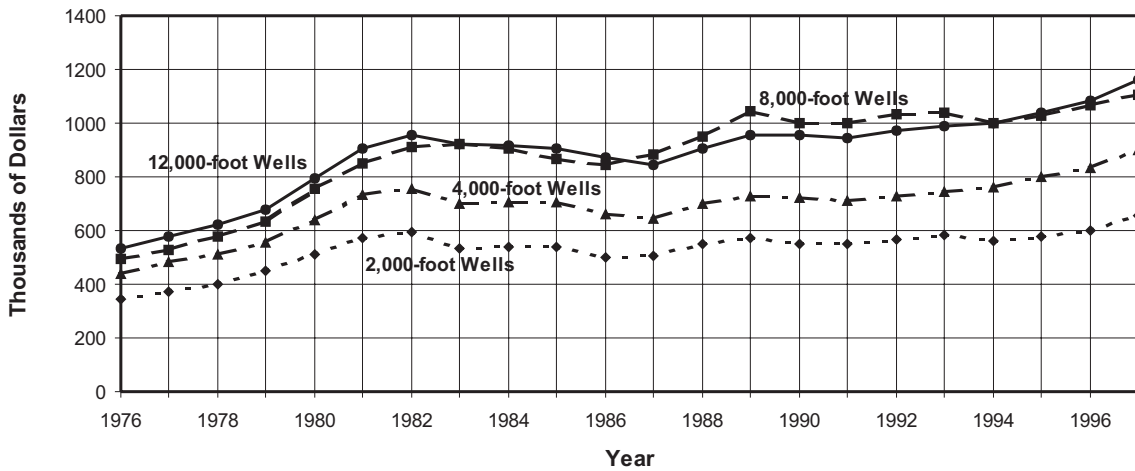
Changes in individual components of operating costs show large variations. Fuel, power and water costs comprise one of the most volatile components for oil leases, primarily due to changes in the average price of natural gas in the different regions. Overall costs for fuel, power and water ranged from increases of from 4 to 6 percent for the 1996-1997 period for all regions except California and the Rocky Mountains. The increase for the Rocky Mountain region was about 1 to 3 percent, while California costs dropped by 2 to 4 percent. Contrasted with the rest of the nation, the primary energy source for California and the Rocky Mountains regions is electricity. In the Rocky Mountains, electricity is generated by coal-fired plants and hydroelectric plants that have adequate water supplies. In California, hydroelectric plants

Figure 4. Tubing Costs for Oil Leases, 1976-1997 (10 Producing Wells)



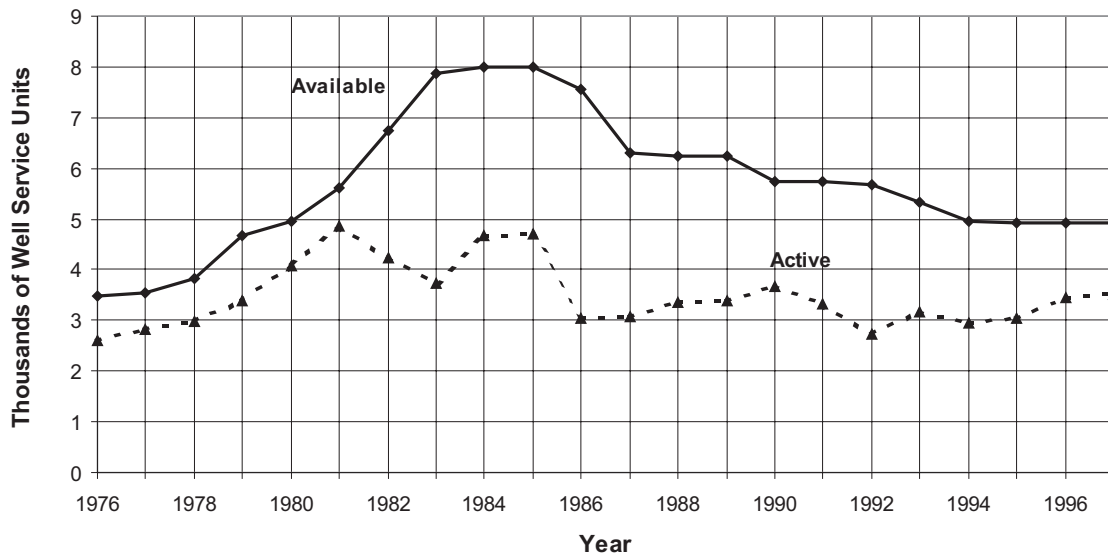
Source: Energy Information Administration, Office of Oil and Gas.

Figure 5. Non-tubing Equipment Costs for Oil Leases, 1976-1997 (10 Producing Wells)



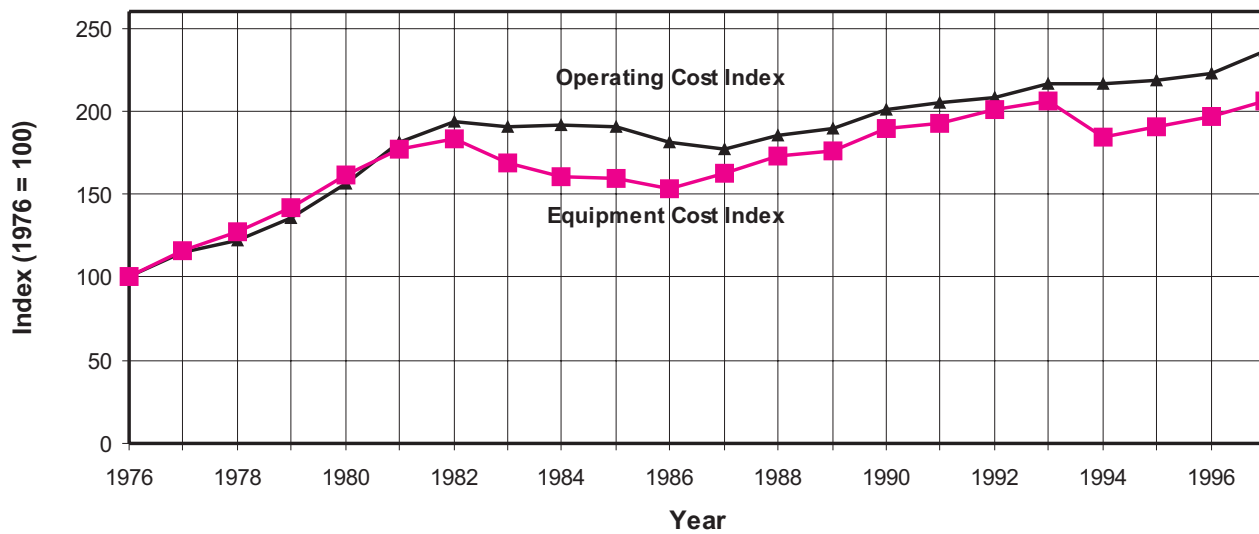
Source: Energy Information Administration, Office of Oil and Gas.

Figure 6. Well Service Units, 1976-1997



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

Figure 7. Aggregate Average Cost Indices for Gas Recovery, 1976-1997



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

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

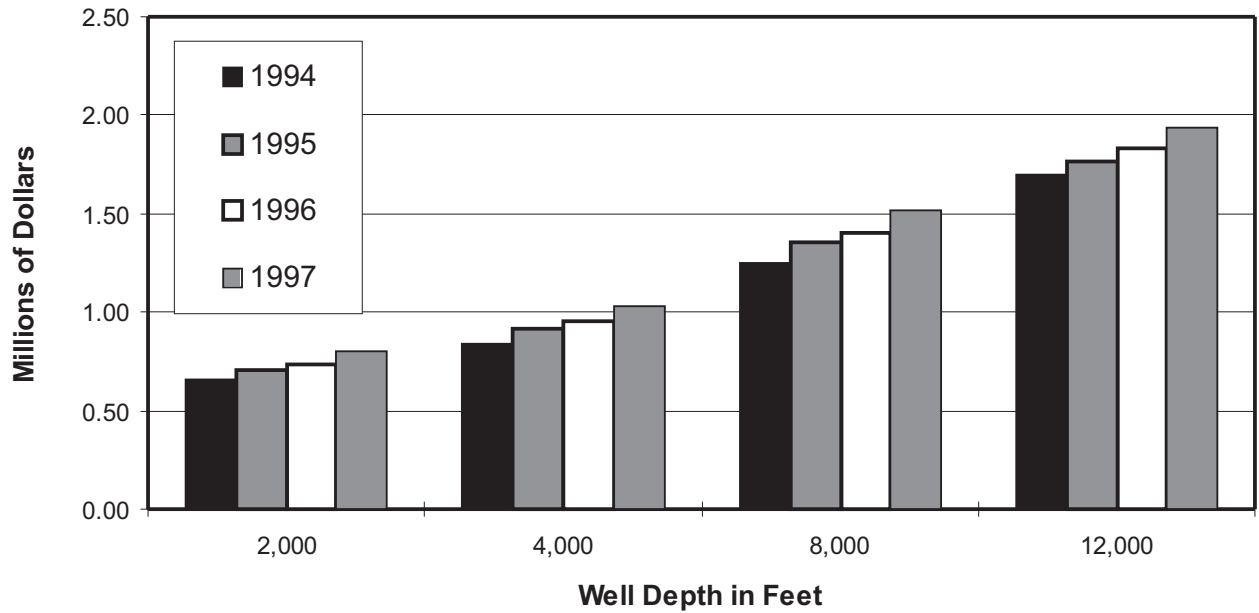
Area	Index (1976=100)				1997* Cost (dollars)
	1994	1995	1996	1997	
2,000-Foot Wells					
California.....	166.7	177.7	185.2	200.0	1,003,600
Oklahoma.....	174.1	185.1	191.9	210.4	736,100
South Louisiana.....	181.1	192.2	201.1	220.3	815,600
South Texas.....	179.3	190.1	196.6	213.8	760,000
West Texas.....	175.5	186.3	192.9	210.2	741,800
Rocky Mountains.....	171.8	181.8	189.3	211.5	745,500
Average or Index.....	174.3	185.1	192.4	210.4	800,400
4,000-Foot Wells					
California.....	146.7	158.0	165.0	177.7	1,247,900
Oklahoma.....	161.4	178.0	185.3	192.5	969,200
South Louisiana.....	192.0	204.2	212.7	241.2	1,027,300
South Texas.....	182.0	192.7	199.3	224.2	976,500
West Texas.....	160.1	176.4	183.5	189.6	963,900
Rocky Mountains.....	154.5	170.5	177.6	193.5	982,200
Average or Index.....	163.8	177.7	184.9	200.0	1,027,800
8,000-Foot Wells					
California.....	165.9	171.7	176.0	184.4	1,683,200
Oklahoma.....	175.1	190.4	197.6	210.3	1,541,000
South Louisiana.....	188.0	204.2	213.0	241.8	1,332,500
South Texas.....	175.0	189.2	195.9	220.7	1,246,300
West Texas.....	156.8	173.6	181.3	189.7	1,683,100
Rocky Mountains.....	144.8	158.9	165.9	182.5	1,639,100
Average or Index.....	165.3	178.7	185.5	200.7	1,520,900
12,000-Foot Wells					
California.....	163.3	169.6	175.0	182.8	2,058,400
Oklahoma.....	163.8	170.3	176.5	187.9	1,824,800
South Louisiana.....	169.1	176.3	184.4	197.6	2,040,100
South Texas.....	169.3	175.5	182.6	192.5	1,954,300
West Texas.....	164.7	171.1	177.1	187.2	1,860,600
Rocky Mountains.....	166.6	173.3	179.7	189.1	1,859,700
Average or Index.....	166.1	172.6	179.2	189.5	1,933,000
Aggregate Average.....	166.6	177.1	183.9	197.7	1,320,500

* Preliminary

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

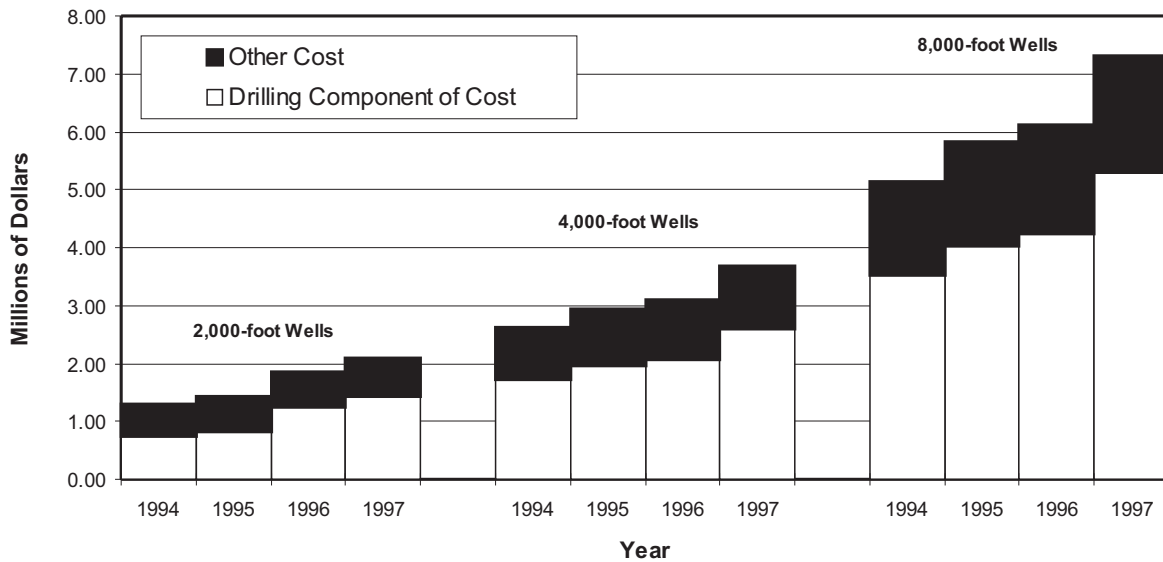
Source: Energy Information Administration, Office of Oil and Gas

Figure 8. Aggregate Average Lease Equipment Costs for Primary Oil Recovery,



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

Figure 9. Additional Cost of Lease Equipment for Secondary Recovery in West Texas



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

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

Component	Index (1976=100)				1997* Cost (dollars)
	1994	1995	1996	1997	
2,000-Foot Wells					
Injection Equipment.....	225.4	238.3	244.3	255.4	501,000
Producing Equipment.....	139.7	157.8	159.7	191.3	154,600
Injection Wells**.....	138.3	157.0	235.5	270.8	1,434,900
Total or Index.....	159.7	176.9	230.1	259.2	2,090,500
4,000-Foot Wells					
Injection Equipment.....	214.0	226.2	232.0	242.5	501,000
Producing Equipment.....	131.1	153.8	162.6	180.6	595,600
Injection Wells**.....	152.8	173.7	182.4	228.0	2,588,800
Total or Index.....	156.1	176.3	184.6	220.5	3,685,400
8,000-Foot Wells					
Injection Equipment.....	218.0	232.1	237.9	249.6	847,000
Producing Equipment.....	128.5	148.3	156.9	172.3	1,184,700
Injection Wells**.....	118.3	135.1	141.9	177.3	5,285,300
Total or Index.....	128.5	145.6	152.6	182.6	7,317,000
Aggregate Average.....	139.5	157.4	170.5	201.9	4,364,300

* Preliminary

**Costs from Joint Association Survey 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

operate at full generating capacity as long as there is an ample water supply. However, their water supply is weather-dependent with little or no reserve, so a dry winter can cause reduction in hydroelectric generation of electricity the following year. The reduction in hydroelectric capacity is made up by power from generators using alternate fuels, or is purchased from out-of-State sources. Therefore, electric rates can vary widely in California. Figure 12 depicts fuel, power, and water indices for 12,000-foot wells in the Rocky Mountains and California. Note that the fuel, power, and water costs decreased from 1994 to 1997 for California, while the Rocky Mountain region costs rose. Even with the recent cost increases in the Rocky Mountains, the period since 1984 shows costs have remained in a narrow range, unlike costs in California, which have trended upward since 1976.

Secondary Recovery

Table 4 provides a summary of the composite secondary oil recovery operating costs for west Texas. The average aggregated lease costs (10 producing and 11 injection wells) for all depths rose less than 2 percent from 1996 to 1997. Fuel, power, and water costs for secondary recovery operations increased by about 4 percent for the 1994-1997 period and costs for primary recovery operations in this region increased about 49 percent for the same period. 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. As an example, Figure 13 shows fuel, power, and

water cost indices for primary and secondary oil recovery in west Texas for 4,000-foot wells. Only 6 years of the 1976 to 1997 period indicated indices in excess of those for primary oil operation.

Offshore Operations

Table 5 presents a summary of annual operating costs and composite indices for offshore production operations in the Gulf of Mexico for wells with a true vertical depth of 10,500 feet. Production from offshore installations includes large gas volumes compared to the volumes in the average onshore lease, a fact that is reflected in operating costs. The aggregate average of costs at all water depths decreased by about 2 percent from 1996 to \$3,693,500 per platform in 1997.

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 Mcf of gas per day by depth and region. Figure 14 displays the average equipment costs by rate of production and well depth for 1997. There is a large difference between the equipment costs for some production rates and depths, such as wells of various depths producing 250 Mcf per day. This difference is the result of variations in the type and size of equipment needed in different regions, for different depths, 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 rose 4.8 percent for the 1996-1997 period. Table 6 shows that the overall aggregate average gas lease had an equipment cost of \$47,000 in 1997.

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 1996-1997 change in equipment costs ranged from an increase of 4 percent for wells producing 50 Mcf of gas per day to an increase of about 6 percent for wells flowing 5 MMcf of gas per day.

Table 13 contains gas lease equipment costs aggregated by depth. Changes in gas equipment costs from 1996 to 1997 were positive for all wells, and ranged from increases of 4.1 to 5.4 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 1994 through 1997 by production rate. The stair-step appearance of the costs for each production rate shows greater year-to-year variation for higher flow rates.

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 5.9 percent from 1996 to 1997, to \$25,000. 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 1996 to 1997, wells producing 5,000 and 10,000 Mcf per day exhibited an operating cost increase of about 4.6 percent, while costs for wells producing at a rate of 250 Mcf per day rose at about 6.5 percent.

Well depth has more effect on gas well operating costs than on equipment costs, since depth is a major factor in the cost of down-hole repairs, the amount of chemicals used, and other maintenance cost components. However, the changes in operating costs aggregated by depth from 1996 through 1997 show little variation across time. The annual changes ranged from 5.7 to 6.8 percent from 1996 to 1997. 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 1997. Operating costs decreased as the producing rate increased from 250 to 500 thousand cubic feet of gas per day in 8,000- and 12,000-foot wells. 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 considered to be 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 remove the well liquids which accumulate in the tubing. Either tubing displacement or corrosion 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, which are not always adequate to remove accumulated liquids from the well. Increasing liquid levels usually causes reduced gas production. Therefore, these wells were considered 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 the 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 corrosion 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. As a result, wells which produce less than 250 thousand cubic feet of gas per day have higher fuel, chemical and disposal costs, and higher surface maintenance

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

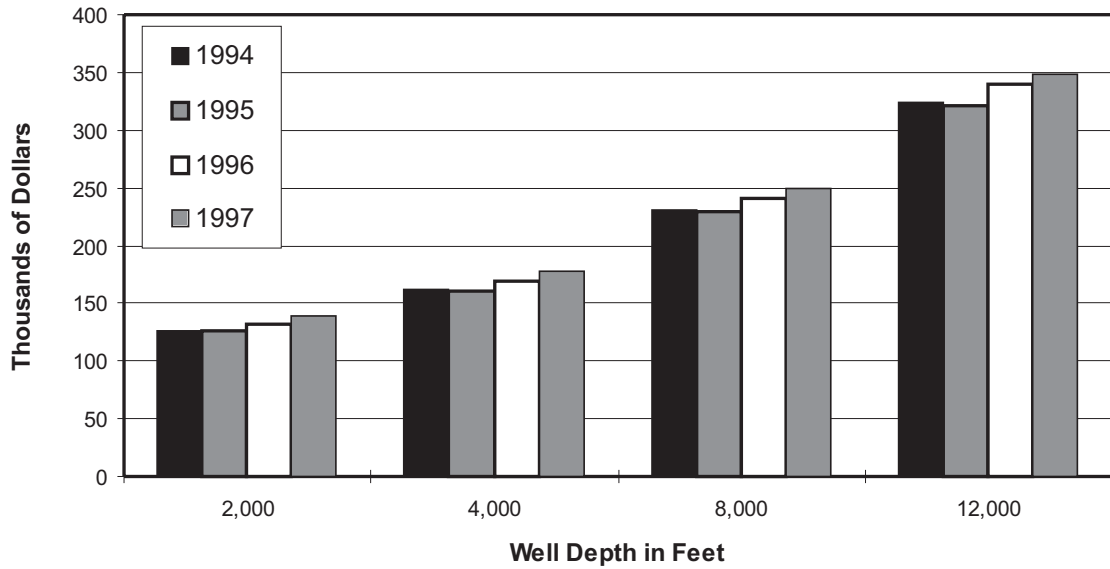
Area	Index (1976=100)				1997* Cost (dollars)
	1994	1995	1996	1997	
2,000-Foot Wells					
California.....	270.6	269.8	271.5	275.7	150,800
Oklahoma.....	247.9	247.2	266.5	285.4	127,000
South Louisiana.....	250.4	248.3	263.2	286.0	155,600
South Texas.....	245.4	245.4	256.1	262.1	143,900
West Texas.....	236.2	235.5	248.9	256.1	116,800
Rocky Mountains.....	219.4	220.8	232.7	247.4	137,800
Average or Index.....	245.2	244.8	256.4	268.8	138,700
4,000-Foot Wells					
California.....	291.9	287.5	288.0	289.6	199,800
Oklahoma.....	246.9	246.9	269.3	288.1	147,500
South Louisiana.....	246.7	243.0	261.8	290.9	227,500
South Texas.....	243.2	232.5	243.7	254.5	200,300
West Texas.....	233.6	233.8	248.9	256.8	136,100
Rocky Mountains.....	213.7	216.8	228.2	242.4	155,400
Average or Index.....	246.9	243.7	256.6	270.6	177,800
8,000-Foot Wells					
California.....	380.1	371.4	371.7	367.6	340,400
Oklahoma.....	293.0	295.2	322.6	336.6	254,100
South Louisiana.....	253.0	249.7	268.3	298.8	271,600
South Texas.....	240.8	238.6	252.6	264.4	245,400
West Texas.....	232.3	231.4	246.1	254.8	188,300
Rocky Mountains.....	207.6	209.8	213.6	224.3	198,300
Average or Index.....	268.7	266.7	279.5	291.4	249,700
12,000-Foot Wells					
California.....	395.4	384.2	385.6	379.6	494,600
Oklahoma.....	294.9	295.2	325.3	339.8	304,100
South Louisiana.....	274.2	270.6	292.1	308.7	354,400
South Texas.....	271.1	272.3	290.7	298.0	355,800
West Texas.....	269.5	269.8	292.3	300.0	283,200
Rocky Mountains.....	267.0	272.4	286.4	296.0	297,800
Average or Index.....	298.9	297.2	314.2	321.9	348,300
Aggregate Average.....	270.7	268.8	282.9	293.8	228,600

* Preliminary

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

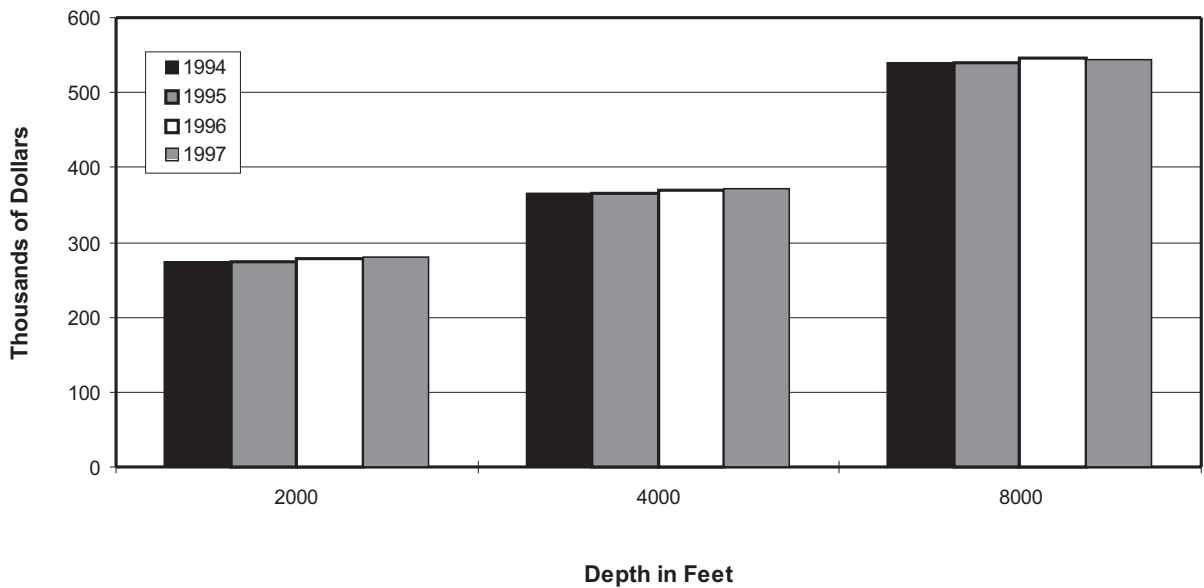
Source: Energy Information Administration, Office of Oil and Gas

Figure 10. Aggregate Operating Costs for Primary Oil Recovery Operations, 1994-1997



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

Figure 11. Annual Operating Costs for Secondary Oil Recovery in west Texas, 1994-1997



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

Table 4. Summary of Direct Annual Operating Costs and Composite Indices for Secondary Oil Recovery Operations in West Texas

Component	Index (1976=100)				1997* Cost (dollars)
	1994	1995	1996	1997	
2,000-Foot Wells					
Normal Daily.....	277.8	280.2	285.9	290.8	179,400
Surface Repair.....	226.3	223.5	225.8	228.1	49,500
Subsurface Repair.....	200.4	201.1	196.0	202.9	55,200
Total or Index.....	248.6	249.6	252.0	256.9	284,100
4,000-Foot Wells					
Normal Daily.....	274.9	277.0	281.3	285.4	215,800
Surface Repair.....	232.7	228.3	230.3	232.4	79,700
Subsurface Repair.....	196.6	197.5	193.4	199.8	81,500
Total or Index.....	244.1	244.4	245.9	250.2	377,000
8,000-Foot Wells					
Normal Daily.....	287.0	289.0	292.3	295.8	310,600
Surface Repair.....	236.6	232.4	234.2	236.1	89,700
Subsurface Repair.....	202.8	203.6	199.9	206.0	155,300
Total or Index.....	249.2	249.7	250.3	254.4	555,600
Aggregate Average.....	247.5	248.0	249.3	253.7	405,600

* 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)

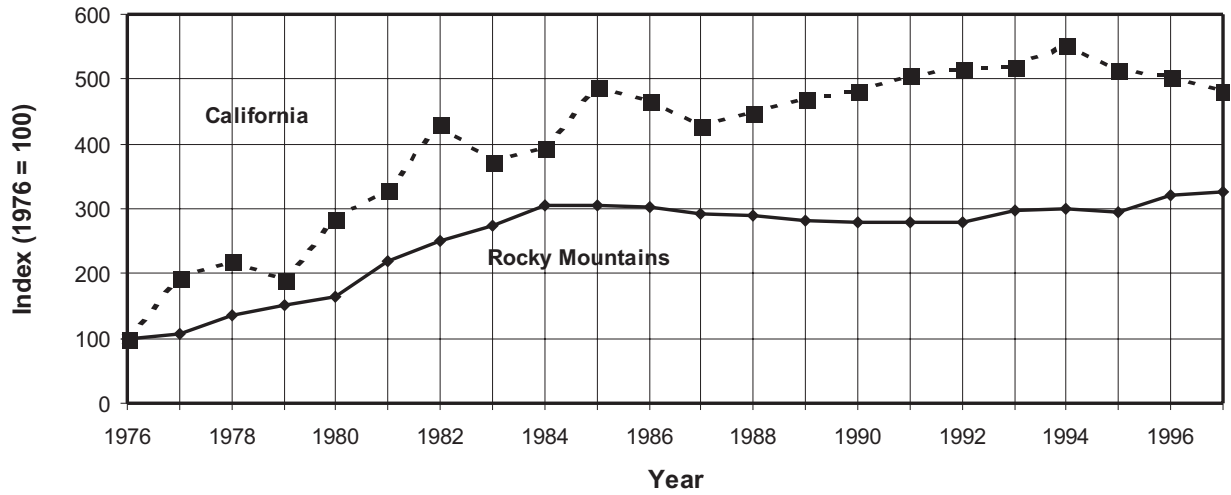
Water Depth	Index (1976=100)				1997* Cost (dollars)
	1994	1995	1996	1997	
12-Slot Platforms					
100 Foot.....	242.7	252.0	258.5	258.5	3,178,000
300 Foot.....	238.0	247.1	253.6	252.7	3,318,600
Average or Index.....	241.7	251.0	257.6	257.1	3,248,300
18-Slot Platforms					
100 Foot.....	234.6	244.2	251.8	246.9	3,818,100
300 Foot.....	227.1	236.5	244.2	239.0	3,882,300
600 Foot.....	222.9	233.8	240.7	231.4	4,270,680
Average or Index.....	230.5	240.5	248.0	241.3	3,990,360
Aggregate Average.....	234.4	244.2	251.3	246.7	3,693,500

* Preliminary

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

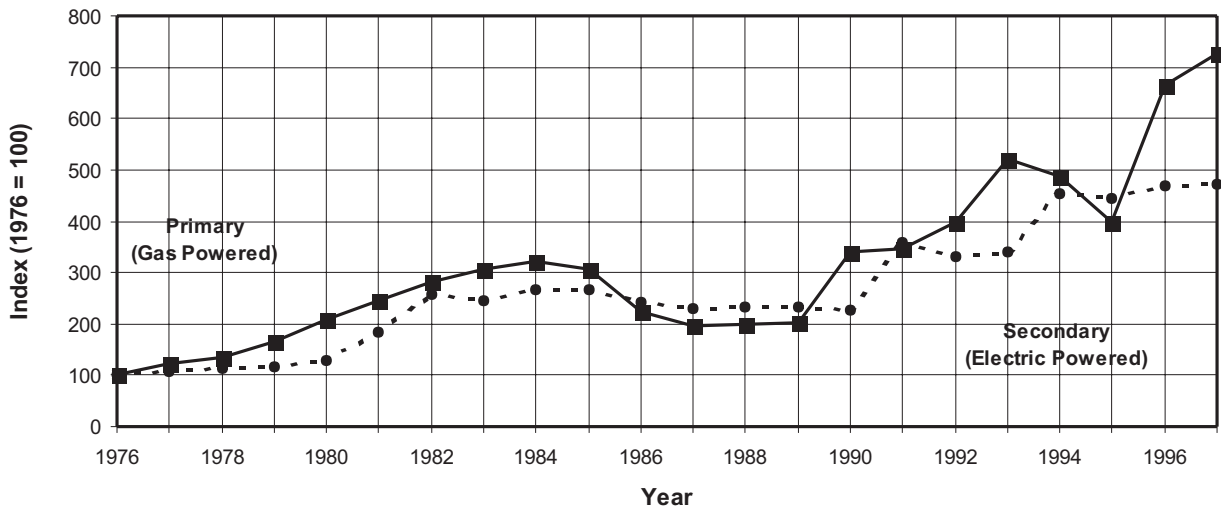
Source: Energy Information Administration, Office of Oil and Gas

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



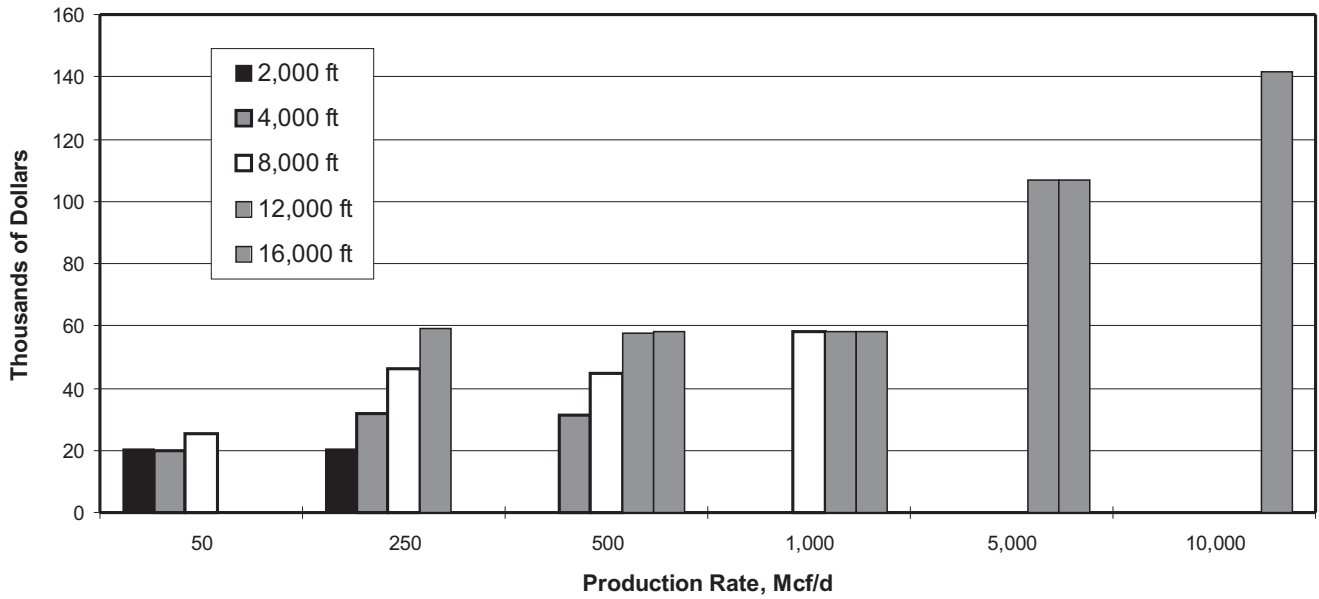
Source: Energy Information Administration, Office of Oil and Gas.

Figure 13. Fuel, Power, and Water Cost Indices for Primary and Secondary Operating Costs



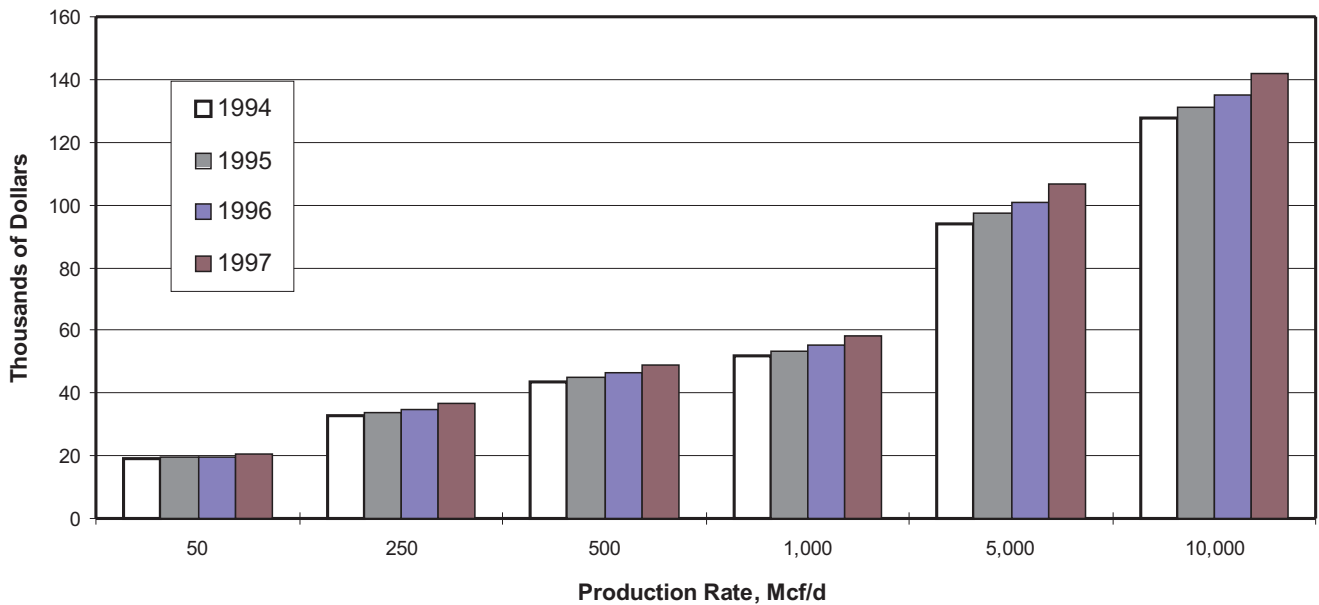
Source: Energy Information Administration, Office of Oil and Gas.

Figure 14. Annual Gas Well Equipment Costs by Well Depth and Production Rate (1997)



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

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



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

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

	Index (1976=100)				1997* Cost (dollars)
	1994	1995	1996	1997	
Aggregate average for all Production Rates.....	184.2	190.2	196.6	206.0	48,200

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

Area	Index (1976=100)				1997* Cost (dollars)
	1994	1995	1996	1997	
2,000-Foot Wells					
Mid-Continent.....	181.2	186.1	194.1	203.0	20,500
North Louisiana.....	172.4	178.1	185.7	195.2	20,500
South Louisiana.....	172.4	178.1	185.7	195.2	20,500
Rocky Mountains.....	177.7	182.1	189.3	197.3	22,100
South Texas.....	174.8	179.6	186.4	192.2	19,800
West Texas.....	180.2	185.1	168.3	173.3	17,500
Average or Index.....	175.2	181.0	183.8	192.4	20,200
4,000-Foot Wells					
Mid-Continent.....	181.2	186.1	194.1	203.0	20,500
South Louisiana.....	172.4	178.1	185.7	195.2	20,500
Rocky Mountains.....	177.7	182.1	189.3	197.3	22,100
South Texas.....	174.8	179.6	186.4	192.2	19,800
West Texas.....	180.2	185.1	168.3	173.3	17,500
Average or Index.....	177.9	182.7	185.6	193.3	20,100
8,000-Foot Wells					
West Texas.....	189.3	196.9	187.8	193.9	25,400
Aggregate Average for Production Rate.....	177.6	183.2	185.0	192.5	20,600

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

Area	Index (1976=100)				1997* Cost (dollars)
	1994	1995	1996	1997	
2,000-Foot Wells					
Mid-Continent.....	187.9	192.5	200.0	209.3	22,400
North Louisiana.....	172.4	178.1	185.7	195.2	20,500
South Louisiana.....	172.4	178.1	185.7	195.2	20,500
Rocky Mountains.....	177.7	182.1	189.3	197.3	22,100
South Texas.....	174.8	179.6	186.4	192.2	19,800
West Texas.....	180.2	185.1	168.3	173.3	17,500
Average or Index.....	176.4	182.1	184.9	193.4	20,500
4,000-Foot Wells					
Mid-Continent.....	193.3	202.2	207.5	217.9	29,200
North Louisiana.....	189.2	197.8	205.0	215.1	29,900
South Louisiana.....	186.3	194.2	203.6	213.7	29,700
Rocky Mountains.....	173.6	177.9	184.7	194.5	45,700
South Texas.....	187.7	194.2	202.9	209.4	28,900
West Texas.....	194.0	200.0	191.8	197.8	26,500
Average or Index.....	186.3	192.8	198.0	207.2	31,700
8,000-Foot Wells					
Mid-Continent.....	180.9	185.2	192.6	203.0	46,700
North Louisiana.....	173.1	177.7	185.3	195.8	46,600
South Louisiana.....	173.9	178.6	187.4	197.9	47,100
Rocky Mountains.....	147.0	149.3	155.1	162.5	48,100
South Texas.....	175.4	179.2	187.7	194.5	45,900
West Texas.....	179.1	182.6	181.3	188.3	43,300
Average or Index.....	170.2	174.3	180.4	189.0	46,300
12,000-Foot Wells					
Mid-Continent.....	207.4	214.1	225.0	236.7	60,600
Rocky Mountains.....	171.8	176.6	184.0	192.9	60,200
West Texas.....	204.7	210.9	212.5	221.5	56,700
Average or Index.....	192.7	198.5	205.5	215.3	59,200
Aggregate					
Average for Production Rate.....	180.3	185.2	190.7	200.0	36,600

* 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)				1997* Cost (dollars)
	1994	1995	1996	1997	
4,000-Foot Wells					
Mid-Continent.....	189.8	199.2	204.7	215.0	27,300
North Louisiana.....	174.0	179.8	188.5	197.1	20,500
Rocky Mountains.....	144.4	147.2	152.4	159.8	45,700
Average or Index.....	161.6	166.9	172.7	181.4	31,200
8,000-Foot Wells					
Mid-Continent.....	175.9	179.4	186.8	195.2	44,500
North Louisiana.....	168.9	173.2	182.1	192.3	45,200
South Louisiana.....	168.9	173.2	182.1	192.3	45,200
Rocky Mountains.....	144.8	147.6	153.1	160.4	46,200
South Texas.....	170.0	173.8	182.4	189.7	44,200
West Texas.....	173.2	176.8	175.4	182.5	41,600
Average or Index.....	166.4	169.7	176.3	184.6	44,500
12,000-Foot Wells					
Mid-Continent.....	206.4	212.9	224.1	235.7	58,700
North Louisiana.....	199.2	206.3	217.2	228.9	58,600
South Louisiana.....	199.2	206.3	217.2	228.9	58,600
Rocky Mountains.....	170.4	175.7	182.9	191.8	58,300
South Texas.....	200.4	207.1	217.7	226.8	57,600
West Texas.....	204.0	210.4	212.0	220.9	55,000
Average or Index.....	196.2	202.3	211.1	221.5	57,800
16,000-Foot Wells					
Mid-Continent.....	174.8	179.9	187.2	197.0	58,700
South Louisiana.....	199.2	206.3	217.2	228.9	58,600
West Texas.....	172.1	177.5	184.2	192.6	57,400
Average or Index.....	181.3	187.0	195.1	204.9	58,200
Aggregate					
Average for Production Rate.....	178.7	184.0	191.4	200.8	49,000

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

Area	Index (1976=100)				1997* Cost (dollars)
	1994	1995	1996	1997	
8,000-Foot Wells					
South Louisiana.....	170.4	175.7	182.9	192.8	58,600
South Texas.....	171.8	177.1	184.1	191.7	57,700
Average or Index.....	171.0	176.2	183.2	192.1	58,200
12,000-Foot Wells					
Mid-Continent.....	174.8	179.9	187.2	197.0	58,700
North Louisiana.....	170.4	175.7	182.9	192.8	58,600
South Louisiana.....	170.4	175.7	182.9	192.8	58,600
Rocky Mountains.....	170.4	175.7	182.9	191.8	58,300
South Texas.....	171.2	176.5	183.4	191.1	57,700
West Texas.....	172.1	177.5	184.2	192.6	57,400
Average or Index.....	171.5	176.5	183.8	192.7	58,200
16,000-Foot Wells					
Mid-Continent.....	174.8	179.9	187.2	197.0	58,700
North Louisiana.....	170.4	175.7	182.9	192.8	58,600
South Louisiana.....	170.4	175.7	182.9	192.8	58,600
West Texas.....	172.1	177.5	184.2	192.6	57,400
Average or Index.....	172.1	177.1	184.4	193.7	58,300
Aggregate					
Average for Production Rate.....	171.5	176.5	183.8	192.7	58,200

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

Area	Index (1976=100)				1997* Cost (dollars)
	1994	1995	1996	1997	
12,000-Foot Wells					
South Louisiana.....	211.2	219.1	226.2	240.1	107,100
South Texas.....	211.9	219.8	226.6	238.7	106,000
Average or Index.....	211.7	219.6	226.5	239.6	106,600
16,000-Foot Wells					
Mid-Continent.....	215.3	223.0	230.3	243.7	107,000
North Louisiana.....	211.2	219.1	226.2	240.1	107,100
South Louisiana.....	211.2	219.1	226.2	240.1	107,100
West Texas.....	213.2	221.0	227.8	240.3	105,500
Average or Index.....	212.4	220.3	227.3	240.9	106,700
Aggregate					
Average for Production Rate.....	212.4	220.3	227.3	240.6	106,600

* 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)				1997* Cost (dollars)
	1994	1995	1996	1997	
North Louisiana.....	215.0	221.1	227.7	239.1	141,800

* 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 13. Summary of Aggregate Average Gas Lease Equipment Costs by Well Depth (1994-1997)

Well Depth (feet)	Average Costs (dollars)			
	1994	1995	1996	1997
2,000.....	18,600	19,100	19,500	20,300
4,000.....	24,800	25,600	26,200	27,400
8,000.....	41,300	42,300	43,700	45,800
12,000.....	56,800	58,600	60,900	63,900
16,000.....	72,100	74,500	77,200	81,400

* 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)

Area	Index (1976=100)				1997* Cost (dollars)
	1994	1995	1996	1997	
Aggregate Average for all Production Rates.....	216.0	218.9	222.6	235.8	25,000

* 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

Area	Index (1976=100)				1997* Cost (dollars)
	1994	1995	1996	1997	
2,000-Foot Wells					
Mid-Continent.....	270.6	276.5	282.4	302.9	10,300
North Louisiana.....	222.0	229.3	229.3	251.2	10,300
South Louisiana.....	224.4	231.7	231.7	251.2	10,300
Rocky Mountains.....	220.8	222.9	225.0	241.7	11,600
South Texas.....	248.7	256.4	253.8	256.4	10,000
West Texas.....	250.0	252.9	250.0	252.9	8,600
Average or Index.....	235.0	240.0	240.0	255.0	10,200
4,000-Foot Wells					
Mid-Continent.....	250.0	254.8	259.5	278.6	11,700
South Louisiana.....	225.5	231.9	234.0	253.2	11,900
Rocky Mountains.....	216.1	221.4	221.4	239.3	13,400
South Texas.....	246.7	251.1	251.1	255.6	11,500
West Texas.....	248.8	251.2	253.7	258.5	10,600
Average or Index.....	237.0	241.3	243.5	256.5	11,800
8,000-Foot Wells					
West Texas.....	225.9	229.3	227.6	237.9	13,800
Aggregate Average for Production Rate.....	234.1	238.6	240.9	254.5	11,200

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

Area	Index (1976=100)				1997* Cost (dollars)
	1994	1995	1996	1997	
2,000-Foot Wells					
Mid-Continent.....	261.7	266.0	268.1	291.5	13,700
North Louisiana.....	218.4	224.5	224.5	242.9	11,900
South Louisiana.....	220.4	226.5	226.5	246.9	12,100
Rocky Mountains.....	217.9	219.6	221.4	239.3	13,400
South Texas.....	240.4	246.8	244.7	251.1	11,800
West Texas.....	240.5	242.9	240.5	247.6	10,400
Average or Index.....	233.3	239.6	239.6	254.2	12,200
4,000-Foot Wells					
Mid-Continent.....	247.0	251.5	254.5	274.2	18,100
North Louisiana.....	217.9	222.4	226.9	244.8	16,400
South Louisiana.....	222.4	228.4	229.9	249.3	16,700
Rocky Mountains.....	216.1	219.4	220.4	236.6	22,000
South Texas.....	232.3	235.4	235.4	241.5	15,700
West Texas.....	229.5	232.8	232.8	239.3	14,600
Average or Index.....	225.7	230.0	231.4	247.1	17,300
8,000-Foot Wells					
Mid-Continent.....	243.4	246.2	248.1	267.9	28,400
North Louisiana.....	214.4	218.6	220.3	239.0	28,200
South Louisiana.....	216.1	220.3	222.0	240.7	28,400
Rocky Mountains.....	215.2	216.0	220.0	236.0	29,500
South Texas.....	224.3	227.8	227.8	233.9	26,900
West Texas.....	225.5	228.3	227.4	236.8	25,100
Average or Index.....	221.7	225.2	227.0	241.7	27,800
12,000-Foot Wells					
Mid-Continent.....	236.8	239.8	241.4	260.2	34,600
Rocky Mountains.....	217.0	219.0	221.6	237.9	36,400
West Texas.....	220.0	223.7	223.0	231.9	31,300
Average or Index.....	225.0	227.9	228.6	243.6	34,100
Aggregate					
Average for Production Rate.....	224.1	227.6	228.7	243.7	21,200

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

Area	Index (1976=100)				1997* Cost (dollars)
	1994	1995	1996	1997	
4,000-Foot Wells					
Mid-Continent.....	263.3	266.7	270.0	291.7	17,500
North Louisiana.....	215.5	219.7	222.5	245.1	17,400
Rocky Mountains.....	211.6	213.7	217.9	234.7	22,300
Average or Index.....	228.0	230.7	234.7	254.7	19,100
8,000-Foot Wells					
Mid-Continent.....	257.8	261.4	262.7	285.5	23,700
North Louisiana.....	209.6	214.4	217.3	237.5	24,700
South Louisiana.....	212.5	217.3	220.2	241.3	25,100
Rocky Mountains.....	214.3	216.2	221.9	239.0	25,100
South Texas.....	192.7	195.5	197.3	196.4	21,600
West Texas.....	227.7	228.9	230.1	234.9	19,500
Average or Index.....	217.3	220.4	223.5	237.8	23,300
12,000-Foot Wells					
Mid-Continent.....	248.5	252.4	254.4	274.8	28,300
North Louisiana.....	205.1	211.0	213.6	232.2	27,400
South Louisiana.....	215.3	219.5	222.9	241.5	28,500
Rocky Mountains.....	215.7	217.3	222.0	238.6	30,300
South Texas.....	229.8	233.3	235.1	237.7	27,100
West Texas.....	219.0	222.9	223.8	227.6	23,900
Average or Index.....	221.9	225.4	228.1	242.1	27,600
16,000-Foot Wells					
Mid-Continent.....	237.3	239.0	243.2	262.7	31,000
South Louisiana.....	209.8	215.2	217.4	234.8	31,000
West Texas.....	217.5	220.8	222.5	227.5	27,300
Average or Index.....	222.0	225.2	228.5	242.3	29,800
Aggregate					
Average for Production Rate.....	220.2	224.0	226.9	241.3	25,100

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

Area	Index (1976=100)				1997* Cost (dollars)
	1994	1995	1996	1997	
8,000-Foot Wells					
South Louisiana.....	212.2	216.0	220.6	242.0	31,700
South Texas.....	248.8	250.4	252.8	255.1	32,400
Average or Index.....	230.2	233.3	236.4	248.8	32,100
12,000-Foot Wells					
Mid-Continent.....	247.4	249.6	254.1	275.2	36,600
North Louisiana.....	203.3	207.2	211.8	231.4	35,400
South Louisiana.....	213.7	217.6	222.2	241.8	37,000
Rocky Mountains.....	219.9	221.2	226.3	243.6	38,000
South Texas.....	207.4	210.1	212.8	214.8	32,000
West Texas.....	216.9	219.1	221.3	226.5	30,800
Average or Index.....	217.0	219.7	223.8	238.1	35,000
16,000-Foot Wells					
Mid-Continent.....	240.5	242.6	247.3	266.9	39,500
North Louisiana.....	205.2	208.7	212.8	230.8	39,700
South Louisiana.....	207.0	210.5	214.5	232.6	40,000
West Texas.....	217.3	220.7	222.0	227.3	34,100
Average or Index.....	216.1	219.3	223.0	237.9	38,300
Aggregate					
Average for Production Rate.....	219.6	222.3	226.4	240.5	35,600

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

Area	Index (1976=100)				1997* Cost (dollars)
	1994	1995	1996	1997	
12,000-Foot Wells					
South Louisiana.....	204.9	207.6	216.7	229.9	33,100
South Texas.....	195.8	199.4	206.0	210.2	34,900
Average or Index.....	200.0	203.2	211.0	219.4	34,000
16,000-Foot Wells					
Mid-Continent.....	187.2	189.8	197.4	209.7	41,100
North Louisiana.....	185.7	188.1	195.7	205.7	43,200
South Louisiana.....	185.6	188.5	195.2	204.8	42,800
West Texas.....	180.0	183.0	189.0	194.5	38,900
Average or Index.....	184.3	187.3	194.1	203.4	41,500
Aggregate					
Average for Production Rate.....	188.3	191.5	198.4	207.4	39,000

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

Area	Index (1976=100)				1997* Cost (dollars)
	1994	1995	1996	1997	
16,000-Foot Wells					
North Louisiana.....	180.1	180.8	189.2	197.9	56,800

* Preliminary

Note: This is the only area in which a 16,000-foot well producing 10 MMcf per day is reported.

Source: Energy Information Administration, Office of Oil and Gas

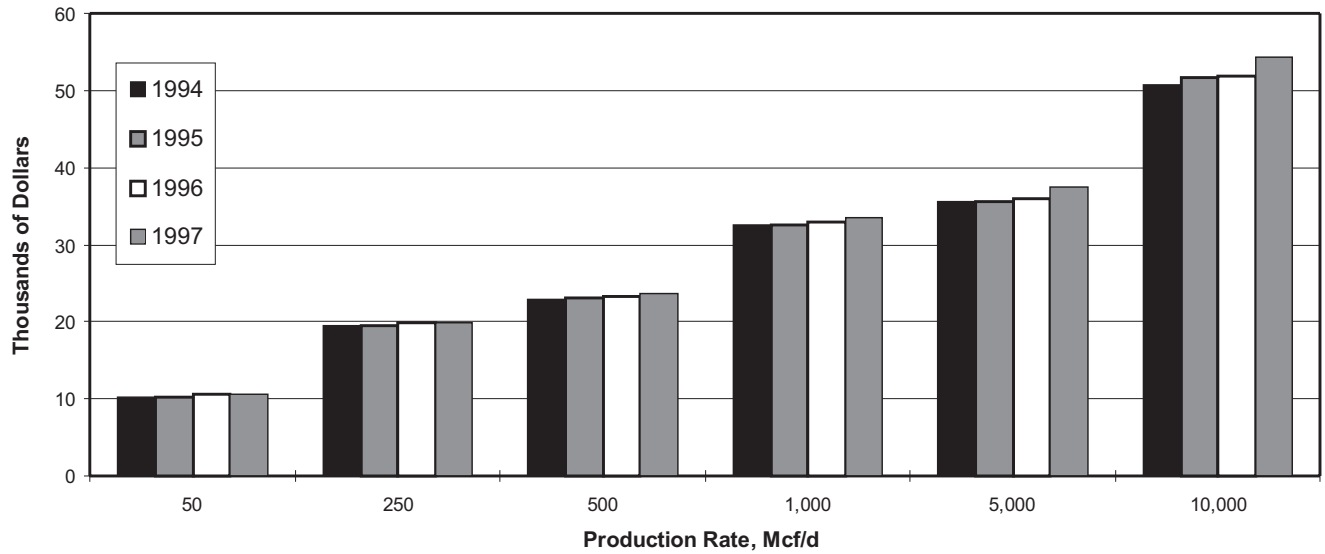
Table 21. Summary of Aggregate Average Gas Lease Operating Cost, by Well Depth (1994-97)

Well Depth (feet)	Average Cost, Dollars			
	1994	1995	1996	1997*
2,000.....	10,300	10,500	10,500	11,200
4,000.....	14,300	14,600	14,700	15,700
8,000.....	23,600	23,900	24,100	25,600
12,000.....	29,400	29,800	30,300	32,100
16,000.....	35,300	35,700	36,700	38,800

* Preliminary

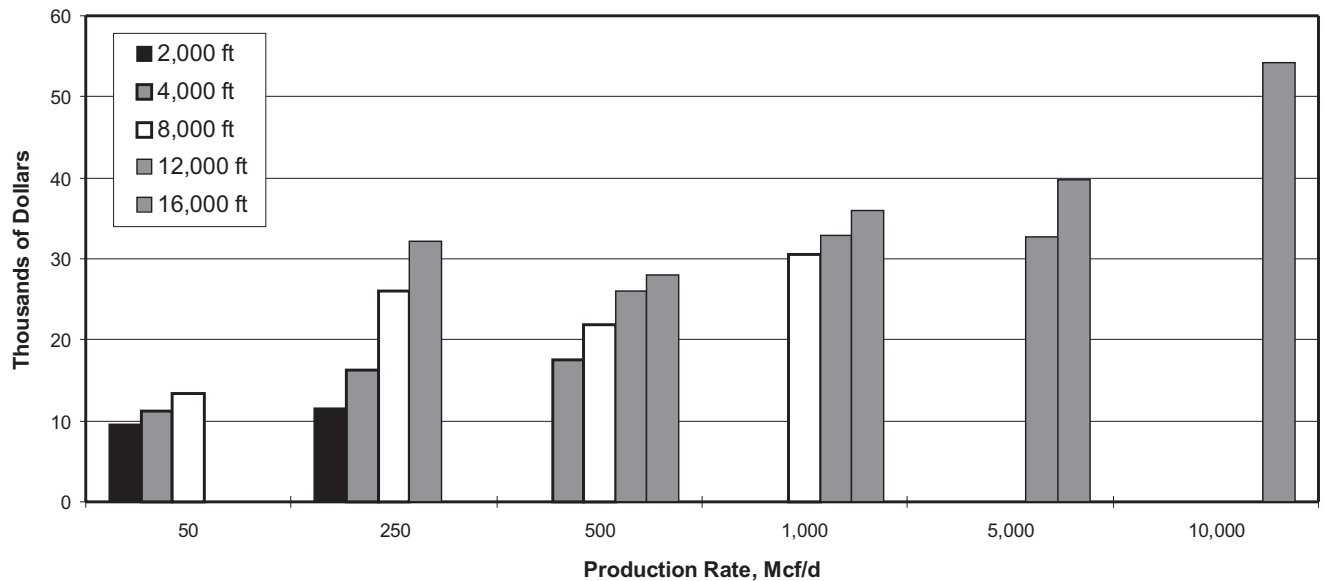
Source: Energy Information Administration, Office of Oil and Gas

Figure 16. Aggregate Average Annual Gas Well Operating Costs for a One-Well Gas Lease by



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

Figure 17. Annual Gas Well Operating Costs by Depth and Production Rate, 1997



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

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, reflecting all changes made to date.

Standardization of the data used has evolved during the past 19 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 MMcf per day in west Texas.

Estimated preliminary costs for the prior report were revised to reflect new data. Some of these changes and factors were:

- New projections of *Joint Association Survey (JAS)* data for west Texas were made to estimate 1997 drilling costs.
- Regional wellhead gas prices for 1994-1997 are from the latest edition of the *EIA Natural Gas Annual* (DOE/EIA-0131 96). These 1997 prices are estimated.

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 liquid per day per well for onshore primary operations. Tubing costs were included for information only. Note that 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 motors and natural gas engines. Table 22 details the type of lift and prime mover used in each region and depth.

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

Region	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
Rocky Mountains.....	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
Rocky Mountains.....	Rod	Motor	Hydraulic	Motor

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

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

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 liquid 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 liquid volumes assumed for secondary recovery production. Increases in operational costs for secondary oil recovery are indicated for the increased liquid lift of 290 barrels of liquid 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 in 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 MMcf cubic feet of gas per day per platform. Note that the 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,

communication costs, insurance costs for platform and production equipment and administrative expenses are included in normal production expenses. Crude oil and natural gas transportation costs to shore were excluded, as were water disposal costs.

Gas Recovery

Leases for gas wells were assumed to consist of one well producing into an onsite separator with 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, nor were equipment for disposal of produced water above nominal amounts of water entrained in the gas stream. Gas production rates of 50, 250, 500, 1,000, 5,000, and 10,000 Mcf 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 rate for each depth in each region. The equipment and operating costs for each of these average production rates were then 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 Mcf 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 MMcf per day usually require custom design 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 costs and cost indices for 1994 through 1997 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. They are: Appendix B--south Texas, Appendix C--south Louisiana, Appendix D--Oklahoma, Appendix E--Wyoming, Appendix F--California, and Appendix G--Gulf of Mexico.

Notes: • 1997 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. • Entries 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)				1997* Cost (dollars)
	1994	1995	1996	1997	
Producing Equipment:					
Tubing.....	110.9	155.0	157.8	175.1	62,700
Rods.....	122.0	122.0	122.5	120.4	23,000
Pumps.....	147.6	152.4	157.1	166.7	14,000
Pumping Equipment.....	175.9	188.1	199.6	233.3	305,100
Subtotal or Index**.....	157.4	173.9	182.5	208.6	404,800
Gathering System:					
Flowlines.....	251.0	254.5	260.0	268.3	38,900
Manifold.....	263.6	266.7	273.5	290.2	38,300
Subtotal or Index**.....	257.0	260.3	266.4	278.7	77,200
Lease Equipment:					
Producing Separator.....	173.4	173.4	182.8	187.5	12,000
Test Separator.....	189.1	188.1	187.1	198.0	20,000
Heater Treater.....	136.8	145.8	150.3	154.8	24,000
Storage Tanks.....	193.2	198.2	203.0	207.4	69,700
Accessory Equipment.....	212.9	220.4	227.2	227.9	33,500
Disposal System.....	189.9	193.5	196.4	204.1	84,700
LACT Unit.....	174.2	171.0	171.0	171.0	15,900
Subtotal or Index**.....	185.0	189.1	192.9	198.2	259,800
Total or Index**.....	175.5	186.3	192.9	210.2	741,800

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
Producing Equipment:					
Tubing.....	109.2	152.9	155.8	172.6	125,300
Rods.....	113.3	113.6	113.6	112.3	43,900
Pumps.....	134.1	154.9	174.4	185.4	15,200
Pumping Equipment.....	158.4	177.6	188.9	192.4	431,400
Subtotal or Index**.....	142.3	164.6	173.0	179.0	615,800
Gathering System:					
Flowlines.....	238.8	242.0	246.8	253.7	47,700
Manifold.....	263.6	266.7	273.5	290.2	38,300
Subtotal or Index**.....	249.1	252.2	257.8	268.8	86,000
Lease Equipment:					
Producing Separator.....	173.4	173.4	182.8	187.5	12,000
Test Separator.....	189.1	188.1	187.1	198.0	20,000
Heater Treater.....	136.8	145.8	150.3	154.8	24,000
Storage Tanks.....	193.2	198.2	203.0	207.4	69,700
Accessory Equipment.....	212.9	220.4	227.2	227.9	33,500
Disposal System.....	189.5	193.0	195.8	203.3	87,000
LACT Unit.....	174.2	171.0	171.0	171.0	15,900
Subtotal or Index**.....	185.0	189.0	192.7	198.0	262,100
Total or Index**.....	160.1	176.4	183.5	189.6	963,900

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
Producing Equipment:					
Tubing.....	111.5	147.6	150.6	167.1	313,000
Rods.....	100.1	100.1	100.2	99.6	99,500
Pumps.....	157.8	172.2	187.8	197.8	17,800
Pumping Equipment.....	173.0	190.3	203.1	211.1	897,000
Subtotal or Index**.....	146.7	166.5	175.0	184.1	1,327,300
Gathering System:					
Flowlines.....	226.6	229.7	234.0	240.5	62,300
Manifold.....	263.6	266.7	273.5	290.2	38,300
Subtotal or Index**.....	239.1	242.2	247.3	257.3	100,600
Lease Equipment:					
Producing Separator.....	173.4	173.4	182.8	187.5	12,000
Test Separator.....	189.1	188.1	187.1	198.0	20,000
Heater Treater.....	136.8	145.8	150.3	154.8	24,000
Storage Tanks.....	193.2	198.2	203.0	207.4	69,700
Accessory Equipment.....	212.9	220.4	227.2	227.9	33,500
Disposal System.....	203.5	207.5	209.7	214.7	80,100
LACT Unit.....	174.2	171.0	171.0	171.0	15,900
Subtotal or Index**.....	188.9	193.1	196.7	201.1	255,200
Total or Index**.....	156.8	173.6	181.3	189.7	1,683,100

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
Producing Equipment:					
Tubing.....	136.6	144.1	149.2	163.1	832,900
Pumps.....	250.5	261.7	280.0	280.0	209,700
Pumping Equipment.....	171.7	176.2	182.7	194.2	345,300
Subtotal or Index**.....	155.9	163.1	169.8	181.8	1,387,900
Gathering System:					
Flowlines.....	190.3	192.9	196.7	197.8	179,200
Manifold.....	263.6	266.7	273.5	290.2	38,300
Subtotal or Index**.....	199.6	202.3	206.5	209.5	217,500
Lease Equipment:					
Producing Separator.....	173.4	173.4	182.8	187.5	12,000
Test Separator.....	189.1	188.1	187.1	198.0	20,000
Heater Treater.....	136.8	145.8	150.3	154.8	24,000
Storage Tanks.....	193.2	198.2	203.0	207.4	69,700
Accessory Equipment.....	212.9	220.4	227.2	227.9	33,500
Disposal System.....	203.5	207.5	209.7	214.7	80,100
LACT Unit.....	174.2	171.0	171.0	171.0	15,900
Subtotal or Index**.....	188.9	193.1	196.7	201.1	255,200
Total or Index**.....	164.7	171.1	177.1	187.2	1,860,600

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
Normal Daily Expense:					
Supervision and Overhead.....	316.7	336.7	340.0	355.0	21,300
Labor (pumper).....	255.4	255.4	255.4	255.4	18,900
Auto Usage.....	261.5	273.1	284.6	296.2	7,700
Chemicals.....	203.7	203.7	203.7	214.8	5,800
Fuel, Power & Water.....	266.7	237.5	316.7	330.6	23,800
Operative Supplies.....	233.3	233.3	233.3	233.3	1,400
Subtotal or Index**.....	267.2	264.9	288.3	297.7	78,900
Surface Maintenance, Repair & Services:					
Labor (roustabout).....	231.0	231.0	231.0	231.0	6,700
Supplies & Services.....	234.4	234.4	234.4	234.4	7,500
Equipment Usage.....	253.8	253.8	253.8	253.8	3,300
Other.....	173.3	173.3	173.3	173.3	2,600
Subtotal or Index**.....	225.8	225.8	225.8	225.8	20,100
Subsurface Maintenance, Repair & Services:					
Workover Rig Services.....	197.4	197.4	189.7	197.4	7,700
Remedial Services.....	137.5	137.5	137.5	143.8	2,300
Equipment Repair.....	144.4	151.1	155.6	164.4	7,400
Other.....	200.0	200.0	200.0	200.0	400
Subtotal or Index**.....	164.7	167.6	166.7	174.5	17,800
Total or Index**.....	236.2	235.5	248.9	256.1	116,800

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
Normal Daily Expense:					
Supervision and Overhead.....	316.2	335.3	339.7	355.9	24,200
Labor (pumper).....	255.4	255.4	255.4	255.4	18,900
Auto Usage.....	261.5	273.1	284.6	296.2	7,700
Chemicals.....	218.5	218.5	214.8	229.6	6,200
Fuel, Power & Water.....	265.9	236.4	318.2	334.1	29,400
Operative Supplies.....	250.0	250.0	250.0	250.0	1,500
Subtotal or Index**.....	269.9	266.4	293.1	304.2	87,900
Surface Maintenance, Repair & Services:					
Labor (roustabout).....	231.0	231.0	231.0	231.0	6,700
Supplies & Services.....	231.0	231.0	231.0	231.0	6,700
Equipment Usage.....	261.5	261.5	261.5	261.5	3,400
Other.....	183.3	183.3	183.3	183.3	4,400
Subtotal or Index**.....	225.0	225.0	226.0	226.0	22,600
Subsurface Maintenance, Repair & Services:					
Workover Rig Services.....	195.5	195.5	189.4	195.5	12,900
Remedial Services.....	156.5	160.9	160.9	165.2	3,800
Equipment Repair.....	128.6	149.0	161.2	171.4	8,400
Other.....	166.7	166.7	166.7	166.7	500
Subtotal or Index**.....	165.2	173.0	174.5	181.6	25,600
Total or Index**.....	233.6	233.8	248.9	256.8	136,100

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

Component	Index (1976=100)				1997* Cost (dollars)
	1994	1995	1996	1997	
Normal Daily Expense:					
Supervision and Overhead.....	319.0	339.2	343.0	359.5	28,400
Labor (pumper).....	255.4	255.4	255.4	255.4	18,900
Auto Usage.....	261.5	273.1	284.6	296.2	7,700
Chemicals.....	200.0	196.6	196.6	210.3	6,100
Fuel, Power & Water.....	264.1	232.8	318.8	335.2	42,900
Operative Supplies.....	228.6	228.6	228.6	228.6	1,600
Subtotal or Index**.....	268.5	262.1	295.9	307.9	105,600
Surface Maintenance, Repair & Services:					
Labor (roustabout).....	231.0	231.0	231.0	231.0	6,700
Supplies & Services.....	230.8	230.8	230.8	233.3	9,100
Equipment Usage.....	220.0	220.0	220.0	220.0	3,300
Other.....	176.7	176.7	176.7	176.7	5,300
Subtotal or Index**.....	215.0	215.0	215.0	215.9	24,400
Subsurface Maintenance, Repair & Services:					
Workover Rig Services.....	218.1	218.1	210.4	218.1	31,400
Remedial Services.....	180.0	182.9	181.4	188.6	13,200
Equipment Repair.....	163.3	183.3	191.7	201.7	12,100
Other.....	166.7	177.8	177.8	177.8	1,600
Subtotal or Index**.....	195.4	200.7	198.2	206.0	58,300
Total or Index**.....	232.3	231.4	246.1	254.8	188,300

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
Normal Daily Expense:					
Supervision and Overhead.....	320.4	341.8	344.9	362.2	35,500
Labor (pumper).....	255.4	255.4	255.4	255.4	18,900
Auto Usage.....	261.5	273.1	284.6	296.2	7,700
Chemicals.....	190.9	190.9	190.9	203.0	6,700
Fuel, Power & Water.....	261.4	230.1	318.2	334.1	58,800
Operative Supplies.....	280.0	280.0	280.0	290.0	2,900
Subtotal or Index**.....	269.1	261.6	300.2	312.9	130,500
Surface Maintenance, Repair & Services:					
Labor (roustabout).....	231.0	231.0	231.0	231.0	6,700
Supplies & Services.....	212.9	212.9	214.9	220.8	22,300
Equipment Usage.....	220.0	220.0	220.0	220.0	3,300
Other.....	216.7	216.7	216.7	233.3	1,400
Subtotal or Index**.....	217.2	217.2	218.5	223.2	33,700
Subsurface Maintenance, Repair & Services:					
Workover Rig Services.....	192.4	192.4	189.4	192.4	12,700
Remedial Services.....	187.4	189.1	188.2	195.8	23,300
Equipment Repair.....	403.9	421.8	450.8	451.4	80,800
Other.....	175.0	175.0	175.0	183.3	2,200
Subtotal or Index**.....	291.0	300.0	313.0	316.5	119,000
Total or Index**.....	269.5	269.8	292.3	300.0	283,200

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
Injection Equipment:					
Supply Wells.....	175.0	203.4	210.9	228.2	166,800
Plant.....	290.2	299.7	311.0	321.4	108,300
Distribution Lines.....	180.6	178.4	178.7	182.7	77,100
Header.....	258.9	265.2	272.5	284.5	58,900
Electrical Service.....	327.2	330.6	334.3	339.2	89,900
Subtotal or Index**.....	225.4	238.3	244.3	255.4	501,000
Producing Equipment:					
Tubing Replacement.....	120.4	143.1	145.7	157.7	61,800
Rods & Pumps.....	119.8	121.1	122.6	123.6	39,300
Pumping Equipment.....	281.6	335.7	335.7	545.9	53,500
Subtotal or Index**.....	139.7	157.8	159.7	191.3	154,600
Injection Wells:***					
Subtotal or Index**.....	138.3	157.0	235.5	270.8	1,434,900
Total or Index**.....	159.6	176.8	230.1	259.1	2,090,500

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
Injection Equipment:					
Supply Wells.....	175.0	203.3	210.9	228.2	166,800
Plant.....	286.4	296.2	307.1	317.8	107,400
Distribution Lines.....	180.6	178.4	178.7	182.7	77,100
Header.....	258.9	265.2	272.5	284.5	58,900
Electrical Service.....	238.0	240.5	243.2	246.7	90,800
Subtotal or Index**.....	214.0	226.2	232.0	242.5	501,000
Producing Equipment:					
Tubing Replacement.....	117.2	158.7	161.3	176.3	134,500
Rods & Pumps.....	112.9	113.9	114.6	115.2	60,600
Pumping Equipment.....	141.4	162.5	175.8	199.6	400,500
Subtotal or Index**.....	131.2	153.9	162.7	180.7	595,600
Injection Wells:***					
Subtotal or Index**.....	152.8	173.7	182.4	228.0	2,588,800
Total or Index**.....	156.1	176.3	184.7	220.5	3,685,400

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
Injection Equipment:					
Supply Wells.....	174.9	206.3	214.3	233.2	302,700
Plant.....	302.4	312.4	322.6	333.8	220,300
Distribution Lines.....	181.1	178.9	178.9	183.1	116,100
Header.....	237.5	243.1	249.4	258.4	69,000
Electrical Service.....	252.5	253.5	255.0	259.6	138,900
Subtotal or Index**	218.0	232.1	237.9	249.6	847,000
Producing Equipment:					
Tubing Replacement.....	116.1	151.1	154.0	169.3	326,800
Rods & Pumps.....	102.3	101.5	100.9	101.4	120,100
Pumping Equipment.....	143.1	161.6	175.8	196.1	737,800
Subtotal or Index**	128.5	148.3	156.8	172.3	1,184,700
Injection Wells:***					
Subtotal or Index**	118.3	135.1	141.9	177.3	5,285,300
Total or Index**	128.5	145.6	152.6	182.6	7,317,000

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
Normal Daily Expense:					
Supervision and Overhead.....	320.0	339.3	343.4	357.9	51,900
Labor (pumper).....	295.0	295.0	295.0	295.0	35,400
Chemicals.....	202.9	200.0	200.0	211.4	7,400
Fuel, Power & Water.....	259.9	256.3	265.6	267.2	80,700
Operative Supplies.....	266.7	260.0	266.7	266.7	4,000
Subtotal or Index**	277.8	280.2	285.9	290.8	179,400
Surface Maintenance, Repair & Services:					
Labor (roustabout).....	231.9	231.9	231.9	231.9	16,000
Supplies & Services.....	216.4	210.9	215.5	220.0	24,200
Equipment Usage.....	282.6	282.6	282.6	282.6	6,500
Other.....	186.7	186.7	186.7	186.7	2,800
Subtotal or Index**	226.3	223.5	225.8	228.1	49,500
Subsurface Maintenance, Repair & Services:					
Workover Rig Services.....	229.4	229.4	221.0	229.4	32,800
Remedial Services.....	187.8	190.2	190.2	197.6	8,100
Equipment Repair.....	137.7	137.7	132.1	137.7	7,300
Other.....	191.4	194.3	197.1	200.0	7,000
Subtotal or Index**	200.4	201.1	196.0	202.9	55,200
Total or Index**	248.6	249.6	252.0	256.9	284,100

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
Normal Daily Expense:					
Supervision and Overhead.....	320.0	339.3	343.4	357.9	51,900
Labor (pumper).....	295.0	295.0	295.0	295.0	53,100
Chemicals.....	209.4	209.4	206.3	218.8	7,000
Fuel, Power & Water.....	255.5	252.5	260.1	261.4	97,500
Operative Supplies.....	242.3	238.5	238.5	242.3	6,300
Subtotal or Index**.....	274.9	277.0	281.3	285.4	215,800
Surface Maintenance, Repair & Services:					
Labor (roustabout).....	234.2	234.2	234.2	234.2	26,700
Supplies & Services.....	212.9	204.1	208.2	211.7	36,200
Equipment Usage.....	313.0	313.0	313.0	315.2	14,500
Other.....	191.7	191.7	191.7	191.7	2,300
Subtotal or Index**.....	232.7	228.3	230.3	232.4	79,700
Subsurface Maintenance, Repair & Services:					
Workover Rig Services.....	224.2	224.2	216.9	224.2	46,400
Remedial Services.....	198.5	201.5	201.5	208.8	14,200
Equipment Repair.....	133.3	133.3	128.6	133.3	11,200
Other.....	185.7	189.8	193.9	198.0	9,700
Subtotal or Index**.....	196.6	197.5	193.4	199.8	81,500
Total or Index**.....	244.1	244.4	245.9	250.2	377,000

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
Normal Daily Expense:					
Supervision and Overhead.....	317.8	337.9	342.0	357.4	60,400
Labor (pumper).....	295.0	295.0	295.0	295.0	53,100
Chemicals.....	209.4	209.4	206.3	218.8	7,000
Fuel, Power & Water.....	282.3	280.6	284.8	285.7	183,700
Operative Supplies.....	246.2	238.5	242.3	246.2	6,400
Subtotal or Index**.....	287.0	289.0	292.3	295.8	310,600
Surface Maintenance, Repair & Services:					
Labor (roustabout).....	234.2	234.2	234.2	234.2	26,700
Supplies & Services.....	223.4	213.8	218.0	221.6	37,000
Equipment Usage.....	270.8	270.8	270.8	271.9	24,200
Other.....	180.0	180.0	180.0	180.0	1,800
Subtotal or Index**.....	236.6	232.4	234.2	236.1	89,700
Subsurface Maintenance, Repair & Services:					
Workover Rig Services.....	217.0	217.0	211.1	217.0	88,100
Remedial Services.....	257.5	259.7	258.2	268.7	36,000
Equipment Repair.....	120.1	120.1	116.5	120.1	16,700
Other.....	181.3	185.3	189.3	193.3	14,500
Subtotal or Index**.....	202.8	203.6	199.9	206.0	155,300
Total or Index**.....	249.2	249.7	250.3	254.4	555,600

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 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 (20,000 feet)

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

Rod Pump (10)

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

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 (2,000 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 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 8,000-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)

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

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 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: N-80
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
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

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 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)				1997* Cost (dollars)
	1994	1995	1996	1997	
Producing Equipment:					
Tubing.....	111.2	155.5	158.5	175.6	62,700
Rods.....	118.9	119.4	119.4	124.9	25,100
Pumps.....	147.6	152.4	157.1	166.7	14,000
Pumping Equipment.....	177.3	189.5	201.0	234.6	306,100
Subtotal or Index**	157.9	174.4	182.9	209.5	407,900
Gathering System:					
Flowlines.....	308.1	311.4	316.8	322.1	48,000
Manifold.....	263.4	266.4	273.1	289.6	38,800
Subtotal or Index**	286.9	290.1	296.1	306.7	86,800
Lease Equipment:					
Producing Separator.....	173.4	173.4	182.8	187.5	12,000
Test Separator.....	189.1	188.1	187.1	198.0	20,000
Heater Treater.....	136.8	145.8	150.3	154.8	24,000
Storage Tanks.....	198.8	203.9	208.7	211.9	71,000
Accessory Equipment.....	216.3	223.8	229.9	229.9	33,800
Disposal System.....	192.3	195.8	198.6	206.5	88,600
LACT Unit.....	174.2	171.0	171.0	171.0	15,900
Subtotal or Index**	187.7	191.7	195.4	200.4	265,300
Total or Index**	179.3	190.1	196.6	213.8	760,000

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
Producing Equipment:					
Tubing.....	107.5	151.1	154.0	170.9	123,700
Valves and Mandrels.....	390.1	394.5	399.2	568.4	143,800
Pumping Equipment.....	163.9	169.9	176.0	212.0	221,300
Subtotal or Index**	172.0	191.3	196.0	241.9	488,800
Gathering System:					
Flowlines.....	184.1	186.0	201.7	209.6	180,900
Manifold.....	263.4	266.4	273.1	289.6	38,800
Subtotal or Index**	194.8	196.8	211.3	220.4	219,700
Lease Equipment:					
Producing Separator.....	173.4	173.4	182.8	187.5	12,000
Test Separator.....	189.1	188.1	187.1	198.0	20,000
Heater Treater.....	136.8	145.8	150.3	154.8	24,000
Storage Tanks.....	198.8	203.9	208.7	211.9	71,000
Accessory Equipment.....	216.3	223.8	229.9	229.9	33,800
Disposal System.....	192.1	195.5	198.2	206.1	91,300
LACT Unit.....	174.2	171.0	171.0	171.0	15,900
Subtotal or Index**	187.7	191.6	195.3	200.3	268,000
Total or Index**	182.0	192.7	199.3	224.2	976,500

**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	Index (1976=100)				1997* Cost (dollars)
	1994	1995	1996	1997	
Producing Equipment:					
Tubing.....	107.6	151.4	154.2	171.1	247,400
Valves and Mandrels.....	390.4	394.9	399.2	568.6	201,300
Pumping Equipment.....	162.2	168.2	174.1	209.8	221,300
Subtotal or Index**	162.8	187.8	191.9	234.7	670,000
Gathering System:					
Flowlines.....	180.2	182.6	197.8	205.5	278,200
Manifold.....	263.4	266.4	273.1	289.6	38,800
Subtotal or Index**	187.7	190.1	204.6	213.0	317,000
Lease Equipment:					
Producing Separator.....	173.4	173.4	182.8	187.5	12,000
Test Separator.....	189.1	188.1	187.1	198.0	20,000
Heater Treater.....	136.8	145.8	150.3	154.8	24,000
Storage Tanks.....	198.8	203.9	208.7	211.9	71,000
Accessory Equipment.....	216.3	223.8	229.9	229.9	33,800
Disposal System.....	191.2	194.6	196.8	202.0	82,600
LACT Unit.....	174.2	171.0	171.0	171.0	15,900
Subtotal or Index**	187.3	191.3	194.8	198.8	259,300
Total or Index**	175.0	189.2	195.9	220.7	1,246,300

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

Component	Index (1976=100)				1997* Cost (dollars)
	1994	1995	1996	1997	
Producing Equipment:					
Tubing.....	137.0	144.6	149.7	163.7	832,900
Pumps.....	250.5	261.7	280.0	280.0	209,700
Pumping Equipment.....	178.7	183.3	189.8	199.6	354,900
Subtotal or Index**	157.9	165.2	171.9	183.5	1,397,500
Gathering System:					
Flowlines.....	214.9	216.7	230.6	235.5	257,400
Manifold.....	263.4	266.4	273.1	289.6	38,800
Subtotal or Index**	220.2	222.1	235.2	271.0	296,200
Lease Equipment:					
Producing Separator.....	173.4	173.4	182.8	187.5	12,000
Test Separator.....	189.1	188.1	187.1	198.0	20,000
Heater Treater.....	136.8	145.8	150.3	154.8	24,000
Storage Tanks.....	198.8	203.9	208.7	211.9	71,000
Accessory Equipment.....	216.3	223.8	229.9	229.9	33,800
Disposal System.....	193.2	196.9	199.3	202.7	83,900
LACT Unit.....	174.2	171.0	171.0	171.0	15,900
Subtotal or Index**	187.9	192.0	195.6	199.1	260,600
Total or Index**	169.3	175.5	182.6	192.5	1,954,300

**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	Index (1976=100)				1997* Cost (dollars)
	1994	1995	1996	1997	
Normal Daily Expense:					
Supervision and Overhead.....	316.7	336.7	340.0	355.0	21,300
Labor (pumper).....	317.4	317.4	317.4	317.4	27,300
Auto Usage.....	272.0	284.0	296.0	308.0	7,700
Chemicals.....	211.1	207.4	207.4	218.5	5,900
Fuel, Power & Water.....	258.9	227.4	301.4	315.1	23,000
Operative Supplies.....	254.5	254.5	254.5	254.5	2,800
Subtotal or Index**.....	285.5	282.3	303.2	312.1	88,000
Surface Maintenance, Repair & Services:					
Labor (roustabout).....	221.1	221.1	221.1	221.1	15,700
Supplies & Services.....	218.2	218.2	218.2	216.4	11,900
Equipment Usage.....	239.1	239.1	239.1	217.4	5,000
Other.....	316.7	316.7	316.7	300.0	3,600
Subtotal or Index**.....	229.8	229.8	229.8	224.8	36,200
Subsurface Maintenance, Repair & Services:					
Workover Rig Services.....	175.5	184.9	184.9	207.5	11,000
Remedial Services.....	153.8	157.7	157.7	161.5	4,200
Equipment Repair.....	140.0	152.0	152.0	164.0	4,100
Other.....	200.0	200.0	200.0	200.0	400
Subtotal or Index**.....	162.3	170.8	170.8	185.8	19,700
Total or Index**.....	245.4	245.4	256.1	262.1	143,900

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
Normal Daily Expense:					
Supervision and Overhead.....	316.2	335.3	339.7	355.9	24,200
Labor (pumper).....	317.4	317.4	317.4	317.4	27,300
Auto Usage.....	272.0	284.0	296.0	308.0	7,700
Chemicals.....	222.2	222.2	218.5	229.6	6,200
Fuel, Power & Water.....	273.5	173.5	233.3	244.4	28,600
Operative Supplies.....	206.3	209.4	212.5	228.1	7,300
Subtotal or Index**.....	282.3	254.1	275.5	285.4	101,300
Surface Maintenance, Repair & Services:					
Labor (roustabout).....	221.1	221.1	221.1	221.1	15,700
Supplies & Services.....	199.2	202.8	206.7	225.7	57,100
Equipment Usage.....	237.5	237.5	237.5	216.7	5,200
Other.....	337.5	337.5	337.5	325.0	5,200
Subtotal or Index**.....	212.1	214.6	217.3	228.6	83,200
Subsurface Maintenance, Repair & Services:					
Workover Rig Services.....	233.3	247.6	247.6	271.4	5,700
Remedial Services.....	191.4	194.3	200.0	205.7	7,200
Equipment Repair.....	211.1	244.4	244.4	266.7	2,400
Other.....	166.7	166.7	166.7	166.7	500
Subtotal or Index**.....	205.9	216.2	219.1	232.4	15,800
Total or Index**.....	243.2	232.5	243.7	254.5	200,300

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
Normal Daily Expense:					
Supervision and Overhead.....	323.1	343.6	347.4	364.1	28,400
Labor (pumper).....	317.4	317.4	317.4	317.4	27,300
Auto Usage.....	272.0	284.0	296.0	308.0	7,700
Chemicals.....	218.5	214.8	214.8	225.9	6,100
Fuel, Power & Water.....	269.9	220.3	301.5	316.5	42,100
Operative Supplies.....	217.1	220.0	225.7	240.0	8,400
Subtotal or Index**.....	283.1	270.8	301.0	312.5	120,000
Surface Maintenance, Repair & Services:					
Labor (roustabout).....	221.1	221.1	221.1	221.1	15,700
Supplies & Services.....	214.9	219.2	223.5	244.5	68,700
Equipment Usage.....	248.0	248.0	248.0	228.0	5,700
Other.....	315.0	315.0	315.0	300.0	6,000
Subtotal or Index**.....	223.2	226.2	229.2	242.1	96,100
Subsurface Maintenance, Repair & Services:					
Workover Rig Services.....	224.2	236.4	236.4	254.5	8,400
Remedial Services.....	160.0	164.4	166.7	172.2	15,500
Equipment Repair.....	193.3	226.7	226.7	253.3	3,800
Other.....	166.7	177.8	177.8	177.8	1,600
Subtotal or Index**.....	178.2	187.8	189.1	199.3	29,300
Total or Index**.....	240.8	238.6	252.6	264.4	245,400

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
Normal Daily Expense:					
Supervision and Overhead.....	320.4	341.8	344.9	361.2	35,400
Labor (pumper).....	317.4	317.4	317.4	317.4	27,300
Auto Usage.....	272.0	284.0	296.0	308.0	7,700
Chemicals.....	206.5	206.5	206.5	216.1	6,700
Fuel, Power & Water.....	244.4	213.4	295.2	310.2	58,000
Operative Supplies.....	300.0	300.0	300.0	300.0	4,200
Subtotal or Index**.....	276.2	268.5	304.5	315.9	139,300
Surface Maintenance, Repair & Services:					
Labor (roustabout).....	221.1	221.1	221.1	221.1	15,700
Supplies & Services.....	215.8	216.7	217.5	221.7	26,600
Equipment Usage.....	248.0	248.0	248.0	228.0	5,700
Other.....	216.7	216.7	216.7	233.3	1,400
Subtotal or Index**.....	221.2	221.6	222.1	222.5	49,400
Subsurface Maintenance, Repair & Services:					
Workover Rig Services.....	195.7	201.4	201.4	212.9	14,900
Remedial Services.....	240.9	245.0	247.6	257.6	69,300
Equipment Repair.....	403.4	421.2	450.8	450.8	80,700
Other.....	161.5	161.5	161.5	169.2	2,200
Subtotal or Index**.....	287.8	296.6	307.9	314.7	167,100
Total or Index**.....	271.1	272.3	290.7	298.0	355,800

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
Producing Equipment:					
Tubing.....	110.2	155.0	158.1	175.4	61,900
Rods.....	123.0	123.0	123.0	127.0	25,900
Pumps.....	147.6	152.4	157.1	166.7	14,000
Pumping Equipment.....	179.1	191.4	203.2	237.4	305,100
Subtotal or Index**	159.1	175.8	184.4	211.3	406,900
Gathering System:					
Flowlines.....	263.0	269.1	294.5	315.8	104,200
Manifold.....	264.7	267.7	274.4	291.0	38,700
Subtotal or Index**	263.5	268.7	288.8	308.6	142,900
Lease Equipment:					
Producing Separator.....	173.4	173.4	182.8	187.5	12,000
Test Separator.....	189.1	188.1	187.1	198.0	20,000
Heater Treater.....	136.8	145.8	150.3	154.8	24,000
Storage Tanks.....	196.7	203.3	209.9	218.8	73,300
Accessory Equipment.....	212.9	220.4	227.2	227.9	33,500
Disposal System.....	184.9	189.7	195.9	208.4	87,100
LACT Unit.....	174.2	171.0	171.0	171.0	15,900
Subtotal or Index**	184.4	189.2	194.5	202.4	265,800
Total or Index**	181.1	192.2	201.1	220.3	815,600

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
Producing Equipment:					
Tubing.....	107.4	151.5	154.3	171.3	122,800
Pumps.....	390.1	394.5	399.2	568.4	143,800
Pumping Equipment.....	163.9	169.9	176.0	212.0	221,300
Subtotal or Index**	172.2	191.6	196.3	242.3	487,900
Gathering System:					
Flowlines.....	242.8	251.0	274.2	294.7	231,900
Manifold.....	264.7	267.7	274.4	291.0	38,700
Subtotal or Index**	246.0	253.4	274.2	294.1	270,600
Lease Equipment:					
Producing Separator.....	173.4	173.4	182.8	187.5	12,000
Test Separator.....	189.1	188.1	187.1	198.0	20,000
Heater Treater.....	136.8	145.8	150.3	154.8	24,000
Storage Tanks.....	196.7	203.3	209.9	218.8	73,300
Accessory Equipment.....	212.9	220.4	227.2	227.9	33,500
Disposal System.....	185.6	190.2	197.0	209.5	90,100
LACT Unit.....	174.2	171.0	171.0	171.0	15,900
Subtotal or Index**	184.6	189.4	194.9	202.9	268,800
Total or Index**	192.0	204.2	212.7	241.2	1,027,300

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
Producing Equipment:					
Tubing.....	107.5	151.7	154.5	171.5	245,600
Pumps.....	390.4	394.9	399.2	568.6	201,300
Pumping Equipment.....	162.2	168.2	174.1	209.8	221,300
Subtotal or Index**.....	163.1	188.1	192.3	235.2	668,200
Gathering System:					
Flowlines.....	238.8	247.4	270.3	290.5	358,800
Manifold.....	264.7	267.7	274.4	291.0	38,700
Subtotal or Index**.....	241.3	249.4	270.7	290.6	397,500
Lease Equipment:					
Producing Separator.....	173.4	173.4	182.8	187.5	12,000
Test Separator.....	189.1	188.1	187.1	198.0	20,000
Heater Treater.....	136.8	145.8	150.3	154.8	24,000
Storage Tanks.....	196.7	203.3	209.9	218.8	73,300
Accessory Equipment.....	212.9	220.4	227.2	227.9	33,500
Disposal System.....	191.4	197.8	206.2	217.0	88,100
LACT Unit.....	174.2	171.0	171.0	171.0	15,900
Subtotal or Index**.....	186.4	191.7	197.7	205.1	266,800
Total or Index**.....	188.0	204.2	213.0	241.8	1,332,500

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
Producing Equipment:					
Tubing.....	137.3	144.9	150.0	164.1	828,100
Pumps.....	250.5	261.7	280.0	280.0	209,700
Pumping Equipment.....	173.8	179.2	186.5	203.7	362,200
Subtotal or Index**.....	157.1	164.5	171.5	184.9	1,400,000
Gathering System:					
Flowlines.....	207.8	215.3	232.7	249.7	330,600
Manifold.....	264.7	267.7	274.4	291.0	38,700
Subtotal or Index**.....	213.0	220.0	236.5	253.5	369,300
Lease Equipment:					
Producing Separator.....	173.4	173.4	182.8	187.5	12,000
Test Separator.....	189.1	188.1	187.1	198.0	20,000
Heater Treater.....	136.8	145.8	150.3	154.8	24,000
Storage Tanks.....	196.7	203.3	209.9	218.8	73,300
Accessory Equipment.....	212.9	220.4	227.2	227.9	33,500
Disposal System.....	204.5	210.3	218.8	231.4	92,100
LACT Unit.....	174.2	171.0	171.0	171.0	15,900
Subtotal or Index**.....	190.4	195.5	201.5	209.4	270,800
Total or Index**.....	169.1	176.3	184.4	197.6	2,040,100

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
Normal Daily Expense:					
Supervision and Overhead.....	305.0	323.3	326.7	341.7	20,500
Labor (pumper).....	257.0	261.0	265.1	295.9	50,900
Auto Usage.....	272.0	284.0	296.0	308.0	7,700
Chemicals.....	203.7	203.7	203.7	218.5	5,900
Fuel, Power & Water.....	376.0	292.0	418.0	438.0	21,900
Operative Supplies.....	228.6	228.6	228.6	257.1	1,800
Subtotal or Index**.....	279.2	273.0	295.0	318.8	108,700
Surface Maintenance, Repair & Services:					
Labor (roustabout).....	205.3	210.5	215.8	244.7	9,300
Supplies & Services.....	216.7	222.2	227.8	255.6	9,200
Equipment Usage.....	331.3	350.0	350.0	393.8	6,300
Subtotal or Index**.....	232.2	240.0	244.4	275.6	24,800
Subsurface Maintenance, Repair & Services:					
Workover Rig Services.....	206.7	206.7	206.7	225.0	13,500
Remedial Services.....	142.3	146.2	150.0	153.8	4,000
Equipment Repair.....	144.0	152.0	156.0	168.0	4,200
Other.....	200.0	200.0	200.0	200.0	400
Subtotal or Index**.....	177.9	180.5	182.3	195.6	22,100
Total or Index**.....	250.4	248.3	263.2	286.0	155,600

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
Normal Daily Expense:					
Supervision and Overhead.....	305.9	325.0	327.9	342.6	23,300
Labor (pumper).....	257.0	261.0	265.1	295.9	50,900
Auto Usage.....	272.0	284.0	296.0	308.0	7,700
Chemicals.....	214.8	214.8	214.8	229.6	6,200
Fuel, Power & Water.....	425.3	326.6	473.4	497.5	39,300
Operative Supplies.....	196.6	203.4	206.9	244.8	7,100
Subtotal or Index**.....	292.3	279.0	311.3	336.3	134,500
Surface Maintenance, Repair & Services:					
Labor (roustabout).....	205.3	210.5	215.8	244.7	9,300
Supplies & Services.....	193.7	199.6	205.5	245.5	62,100
Equipment Usage.....	323.5	341.2	341.2	388.2	6,600
Subtotal or Index**.....	202.3	208.8	214.3	253.2	78,000
Subsurface Maintenance, Repair & Services:					
Workover Rig Services.....	211.1	211.1	211.1	225.9	6,100
Remedial Services.....	160.0	162.9	165.7	171.4	6,000
Equipment Repair.....	211.1	244.4	244.4	266.7	2,400
Other.....	166.7	166.7	166.7	166.7	500
Subtotal or Index**.....	185.1	190.5	191.9	202.7	15,000
Total or Index**.....	246.7	243.0	261.8	290.9	227,500

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
Normal Daily Expense:					
Supervision and Overhead.....	310.1	330.4	332.9	349.4	27,600
Labor (pumper).....	257.0	261.0	265.1	295.9	50,900
Auto Usage.....	272.0	284.0	296.0	308.0	7,700
Chemicals.....	259.1	259.1	259.1	277.3	6,100
Fuel, Power & Water.....	422.2	324.4	471.1	495.6	44,600
Operative Supplies.....	212.5	218.8	225.0	268.8	8,600
Subtotal or Index**.....	300.0	285.7	320.5	346.4	145,500
Surface Maintenance, Repair & Services:					
Labor (roustabout).....	205.3	210.5	215.8	244.7	9,300
Supplies & Services.....	213.9	220.3	226.7	271.5	76,300
Equipment Usage.....	344.4	361.1	366.7	416.7	7,500
Subtotal or Index**.....	219.9	226.7	232.9	276.3	93,100
Subsurface Maintenance, Repair & Services:					
Workover Rig Services.....	287.2	287.2	287.2	310.3	12,100
Remedial Services.....	158.9	160.0	162.2	172.2	15,500
Equipment Repair.....	207.1	242.9	242.9	271.4	3,800
Other.....	166.7	177.8	177.8	177.8	1,600
Subtotal or Index**.....	196.7	201.3	202.6	217.1	33,000
Total or Index**.....	253.0	249.7	268.3	298.8	271,600

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
Normal Daily Expense:					
Supervision and Overhead.....	313.3	334.7	336.7	354.1	34,700
Labor (pumper).....	257.0	261.0	265.1	295.9	50,900
Auto Usage.....	272.0	284.0	296.0	308.0	7,700
Chemicals.....	196.4	196.4	196.4	210.7	5,900
Fuel, Power & Water.....	415.3	317.8	462.7	488.1	57,600
Operative Supplies.....	214.3	214.3	221.4	235.7	3,300
Subtotal or Index**.....	305.9	287.5	327.9	351.9	160,100
Surface Maintenance, Repair & Services:					
Labor (roustabout).....	205.3	210.5	215.8	244.7	9,300
Supplies & Services.....	206.6	209.4	211.3	227.4	24,100
Equipment Usage.....	344.4	361.1	366.7	416.7	7,500
Subtotal or Index**.....	221.6	226.5	229.6	252.5	40,900
Subsurface Maintenance, Repair & Services:					
Workover Rig Services.....	193.4	193.4	193.4	202.6	15,400
Remedial Services.....	183.3	184.4	185.5	199.3	53,600
Equipment Repair.....	423.0	441.4	472.4	472.4	82,200
Other.....	175.0	175.0	175.0	183.3	2,200
Subtotal or Index**.....	263.1	269.7	280.4	288.9	153,400
Total or Index**.....	274.2	270.6	292.1	308.7	354,400

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
Producing Equipment:					
Tubing.....	109.3	154.0	157.1	174.3	61,700
Rods.....	112.3	112.3	113.2	114.7	23,400
Pumps.....	147.6	152.4	157.1	166.7	14,000
Pumping Equipment.....	176.1	188.3	199.8	234.1	305,300
Subtotal or Index**.....	156.0	172.5	181.1	207.8	404,400
Gathering System:					
Flowlines.....	259.5	264.3	271.4	278.6	35,100
Manifold.....	264.4	268.2	274.2	290.9	38,400
Subtotal or Index**.....	262.0	266.3	272.9	284.9	73,500
Lease Equipment:					
Producing Separator.....	173.4	173.4	182.8	187.5	12,000
Test Separator.....	189.1	188.1	187.1	198.0	20,000
Heater Treater.....	136.8	145.8	150.3	154.8	24,000
Storage Tanks.....	195.2	200.9	205.4	215.5	72,200
Accessory Equipment.....	212.9	220.4	227.2	227.9	33,500
Disposal System.....	184.0	187.7	191.7	202.0	80,600
LACT Unit.....	174.2	171.0	171.0	171.0	15,900
Subtotal or Index**.....	183.7	187.9	192.0	199.5	258,200
Total or Index**.....	174.1	185.1	191.9	210.4	736,100

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
Producing Equipment:					
Tubing.....	107.0	151.1	153.9	170.8	122,600
Rods.....	108.1	108.1	108.9	109.6	44,400
Pumps.....	134.1	154.9	174.4	185.4	15,200
Pumping Equipment.....	158.7	178.0	189.4	193.5	431,700
Subtotal or Index**.....	141.4	163.6	172.1	178.7	613,900
Gathering System:					
Flowlines.....	244.2	248.5	255.2	261.3	42,600
Manifold.....	264.4	268.2	274.2	290.9	38,400
Subtotal or Index**.....	253.2	257.3	263.7	274.6	81,000
Lease Equipment:					
Producing Separator.....	173.4	173.4	182.8	187.5	12,000
Test Separator.....	189.1	188.1	187.1	198.0	20,000
Heater Treater.....	136.8	145.8	150.3	154.8	24,000
Storage Tanks.....	195.2	200.9	205.4	215.5	72,200
Accessory Equipment.....	212.9	220.4	227.2	227.9	33,500
Disposal System.....	215.4	219.8	224.4	236.4	96,700
LACT Unit.....	174.2	171.0	171.0	171.0	15,900
Subtotal or Index**.....	193.6	198.0	202.3	210.4	274,300
Total or Index**.....	161.4	178.0	185.3	192.5	969,200

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
Producing Equipment:					
Tubing.....	133.2	163.8	169.8	188.6	537,200
Pumps.....	250.5	261.7	280.0	280.0	209,700
Pumping Equipment.....	183.9	189.0	196.5	213.5	326,300
Subtotal or Index**	165.5	185.6	193.9	209.4	1,073,200
Gathering System:					
Flowlines.....	193.1	197.0	202.3	203.2	150,600
Manifold.....	264.4	268.2	274.2	290.9	38,400
Subtotal or Index**	203.9	207.8	213.2	216.5	189,000
Lease Equipment:					
Producing Separator.....	173.4	173.4	182.8	187.5	12,000
Test Separator.....	189.1	188.1	187.1	198.0	20,000
Heater Treater.....	136.8	145.8	150.3	154.8	24,000
Storage Tanks.....	195.2	200.9	205.4	215.5	72,200
Accessory Equipment.....	212.9	220.4	227.2	227.9	33,500
Disposal System.....	213.6	217.5	221.9	233.2	101,200
LACT Unit.....	174.2	171.0	171.0	171.0	15,900
Subtotal or Index**	193.4	197.7	201.9	209.8	278,800
Total or Index**	175.1	190.4	197.6	210.3	1,541,000

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
Producing Equipment:					
Tubing.....	136.7	144.3	149.4	163.5	826,900
Pumps.....	250.5	261.7	280.0	280.0	209,700
Pumping Equipment.....	169.7	174.3	180.8	196.3	349,100
Subtotal or Index**	155.7	162.9	169.7	182.7	1,385,700
Gathering System:					
Flowlines.....	193.1	197.0	202.3	203.2	150,600
Manifold.....	264.4	268.2	274.2	290.9	38,400
Subtotal or Index**	203.9	207.8	213.2	216.5	189,000
Lease Equipment:					
Producing Separator.....	173.4	173.4	182.8	187.5	12,000
Test Separator.....	189.1	188.1	187.1	198.0	20,000
Heater Treater.....	136.8	145.8	150.3	154.8	24,000
Storage Tanks.....	195.2	200.9	205.4	215.5	72,200
Accessory Equipment.....	212.9	220.4	227.2	227.9	33,500
Disposal System.....	187.2	190.8	194.2	201.4	72,500
LACT Unit.....	174.2	171.0	171.0	171.0	15,900
Subtotal or Index**	184.6	188.8	192.7	199.3	250,100
Total or Index**	163.8	170.3	176.5	187.9	1,824,800

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
Normal Daily Expense:					
Supervision and Overhead.....	300.0	320.0	331.7	346.7	20,800
Labor (pumper).....	223.0	223.0	223.0	248.6	18,400
Auto Usage.....	272.0	284.0	296.0	308.0	7,700
Chemicals.....	207.4	203.7	203.7	218.5	5,900
Fuel, Power & Water.....	492.6	451.9	585.2	613.0	33,100
Operative Supplies.....	233.3	233.3	233.3	250.0	1,500
Subtotal or Index**.....	304.5	301.2	334.6	355.3	87,400
Surface Maintenance, Repair & Services:					
Labor (roustabout).....	220.7	220.7	220.7	244.8	7,100
Supplies & Services.....	234.4	234.4	234.4	259.4	8,300
Equipment Usage.....	284.6	292.3	284.6	346.2	4,500
Subtotal or Index**.....	237.8	239.2	237.8	268.9	19,900
Subsurface Maintenance, Repair & Services:					
Workover Rig Services.....	140.3	140.3	145.2	153.2	9,500
Remedial Services.....	150.0	156.3	156.3	162.5	2,600
Equipment Repair.....	140.0	146.7	151.1	160.0	7,200
Other.....	200.0	200.0	200.0	200.0	400
Subtotal or Index**.....	142.4	145.6	149.6	157.6	19,700
Total or Index**.....	247.9	247.2	266.5	285.4	127,000

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
Normal Daily Expense:					
Supervision and Overhead.....	297.1	317.6	330.9	345.6	23,500
Labor (pumper).....	223.0	223.0	223.0	248.6	18,400
Auto Usage.....	272.0	284.0	296.0	308.0	7,700
Chemicals.....	248.1	244.4	244.4	263.0	7,100
Fuel, Power & Water.....	465.2	422.7	559.1	589.4	38,900
Operative Supplies.....	233.3	233.3	233.3	266.7	1,600
Subtotal or Index**.....	309.4	304.9	343.2	365.4	97,200
Surface Maintenance, Repair & Services:					
Labor (roustabout).....	220.7	220.7	220.7	244.8	7,100
Supplies & Services.....	235.3	238.2	238.2	261.8	8,900
Equipment Usage.....	300.0	300.0	300.0	361.5	4,700
Subtotal or Index**.....	240.8	242.1	242.1	272.4	20,700
Subsurface Maintenance, Repair & Services:					
Workover Rig Services.....	161.7	161.7	167.0	175.5	16,500
Remedial Services.....	158.3	162.5	170.8	175.0	4,200
Equipment Repair.....	126.0	146.0	158.0	168.0	8,400
Other.....	250.0	250.0	250.0	250.0	500
Subtotal or Index**.....	151.8	158.2	165.9	174.1	29,600
Total or Index**.....	246.9	246.9	269.3	288.1	147,500

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
Normal Daily Expense:					
Supervision and Overhead.....	298.7	320.3	332.9	348.1	27,500
Labor (pumper).....	223.0	223.0	223.0	248.6	18,400
Auto Usage.....	272.0	284.0	296.0	308.0	7,700
Chemicals.....	179.3	179.3	179.3	193.1	5,600
Fuel, Power & Water.....	425.5	380.9	522.3	553.2	52,000
Operative Supplies.....	300.0	300.0	300.0	312.5	2,500
Subtotal or Index**.....	305.8	298.7	346.0	368.0	113,700
Subsurface Maintenance, Repair & Services:					
Labor (roustabout).....	220.7	220.7	220.7	244.8	7,100
Supplies & Services.....	222.1	223.4	224.7	237.7	18,300
Equipment Usage.....	286.7	293.3	286.7	346.7	5,200
Subtotal or Index**.....	229.8	231.4	231.4	252.9	30,600
Subsurface Maintenance,					
Workover Rig Services.....	183.6	183.6	185.2	191.8	11,700
Remedial Services.....	179.7	182.3	191.1	200.0	15,800
Equipment Repair.....	404.5	423.6	453.4	453.4	80,700
Other.....	214.3	228.6	228.6	228.6	1,600
Subtotal or Index**.....	304.3	315.7	334.5	337.8	109,800
Total or Index**.....	293.0	295.2	322.6	336.6	254,100

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
Normal Daily Expense:					
Supervision and Overhead.....	298.0	320.4	333.7	349.0	34,200
Labor (pumper).....	223.0	223.0	223.0	248.6	18,400
Auto Usage.....	272.0	284.0	296.0	308.0	7,700
Chemicals.....	193.9	190.9	190.9	206.1	6,800
Fuel, Power & Water.....	403.1	356.7	500.8	533.1	67,700
Operative Supplies.....	333.3	333.3	333.3	355.6	3,200
Subtotal or Index**.....	309.0	299.5	353.8	377.0	138,000
Surface Maintenance, Repair & Services:					
Labor (roustabout).....	220.7	220.7	220.7	244.8	7,100
Supplies & Services.....	232.0	233.0	233.0	245.6	25,300
Equipment Usage.....	286.7	293.3	286.7	346.7	5,200
Subtotal or Index**.....	235.4	236.7	236.1	255.8	37,600
Subsurface Maintenance, Repair & Services:					
Workover Rig Services.....	186.8	186.8	190.1	195.6	17,800
Remedial Services.....	241.7	244.7	260.2	268.9	27,700
Equipment Repair.....	403.4	421.8	450.8	451.4	80,800
Other.....	233.3	233.3	233.3	244.4	2,200
Subtotal or Index**.....	304.2	313.6	332.2	336.4	128,500
Total or Index**.....	294.9	295.2	325.3	339.8	304,100

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
Producing Equipment:					
Tubing.....	104.3	146.4	149.1	165.3	62,000
Rods.....	90.9	91.7	92.5	94.5	24,000
Pumps.....	147.6	152.4	157.1	166.7	14,000
Pumping Equipment.....	160.7	172.9	190.0	247.9	243,400
Subtotal or Index**	137.1	153.9	164.7	202.6	343,400
Gathering System:					
Flowlines.....	261.8	265.1	271.1	294.1	44,700
Manifold.....	261.7	264.7	271.4	288.0	38,300
Subtotal or Index**	261.8	264.9	271.2	291.2	83,000
Lease Equipment:					
Producing Separator.....	173.4	173.4	182.8	187.5	12,000
Test Separator.....	189.1	188.1	187.1	198.0	20,000
Heater Treater.....	102.3	108.8	112.0	116.6	25,300
Storage Tanks.....	189.9	194.9	199.4	208.1	69,700
Accessory Equipment.....	213.6	221.1	227.9	229.3	33,700
Disposal System.....	219.1	224.0	228.3	234.4	81,100
LACT Unit.....	174.2	171.0	171.0	171.0	15,900
Electrification.....	244.4	247.3	250.6	254.8	61,400
Subtotal or Index**	193.2	197.2	201.1	206.7	319,100
Total or Index**	171.8	181.8	189.3	211.5	745,500

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
Producing Equipment:					
Tubing.....	101.8	143.6	146.2	162.2	123,300
Rods.....	98.0	98.7	99.3	100.4	45,100
Pumps.....	134.1	154.9	174.4	185.4	15,200
Pumping Equipment.....	137.9	159.5	172.2	200.2	372,100
Subtotal or Index**	123.4	146.9	155.6	176.4	555,700
Gathering System:					
Flowlines.....	250.5	253.5	258.6	281.3	55,700
Manifold.....	261.7	264.7	271.4	288.0	38,300
Subtotal or Index**	255.0	258.0	263.7	284.0	94,000
Lease Equipment:					
Producing Separator.....	173.4	173.4	182.8	187.5	12,000
Test Separator.....	189.1	188.1	187.1	198.0	20,000
Heater Treater.....	102.3	108.8	112.0	116.6	25,300
Storage Tanks.....	189.9	194.9	199.4	208.1	69,700
Accessory Equipment.....	213.6	221.1	227.9	229.3	33,700
Disposal System.....	221.9	226.8	230.8	237.3	83,300
LACT Unit.....	174.2	171.0	171.0	171.0	15,900
Electrification.....	242.5	245.6	249.8	253.0	72,600
Subtotal or Index**	195.0	199.1	203.0	208.5	332,500
Total or Index**	154.5	170.5	177.6	193.5	982,200

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
Producing Equipment:					
Tubing.....	105.6	139.9	142.8	158.5	311,200
Rods.....	100.5	100.8	101.1	101.7	111,300
Pumps.....	157.8	172.2	187.8	197.8	17,800
Pumping Equipment.....	142.0	155.4	168.1	195.0	721,500
Subtotal or Index**	125.1	142.5	150.4	169.7	1,161,800
Gathering System:					
Flowlines.....	240.7	243.2	247.3	270.7	73,900
Manifold.....	261.7	264.7	271.4	288.0	38,300
Subtotal or Index**	247.5	250.2	255.2	276.4	112,200
Lease Equipment:					
Producing Separator.....	173.4	173.4	182.8	187.5	12,000
Test Separator.....	189.1	188.1	187.1	198.0	20,000
Heater Treater.....	102.3	108.8	112.0	116.6	25,300
Storage Tanks.....	189.9	194.9	199.4	208.1	69,700
Accessory Equipment.....	213.6	221.1	227.9	229.3	33,700
Disposal System.....	220.4	224.7	228.6	235.5	88,800
LACT Unit.....	174.2	171.0	171.0	171.0	15,900
Electrification.....	245.7	248.0	251.0	254.3	99,700
Subtotal or Index**	198.7	202.4	206.1	211.5	365,100
Total or Index**	144.8	158.9	165.9	182.5	1,639,100

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
Producing Equipment:					
Tubing.....	131.1	138.4	143.2	156.7	829,300
Pumps.....	250.5	261.7	280.0	280.0	209,700
Pumping Equipment.....	205.3	213.0	223.2	226.3	312,300
Subtotal or Index**	157.0	164.7	171.9	182.1	1,351,300
Gathering System:					
Flowlines.....	189.7	192.6	197.1	205.2	161,100
Manifold.....	261.7	264.7	271.4	288.0	38,300
Subtotal or Index**	200.1	203.1	207.8	217.2	199,400
Lease Equipment:					
Producing Separator.....	173.4	173.4	182.8	187.5	12,000
Test Separator.....	189.1	188.1	187.1	198.0	20,000
Heater Treater.....	102.3	108.8	112.0	116.6	25,300
Storage Tanks.....	189.9	194.9	199.4	208.1	69,700
Accessory Equipment.....	213.6	221.1	227.9	229.3	33,700
Disposal System.....	223.3	228.1	231.6	238.5	89,900
LACT Unit.....	174.2	171.0	171.0	171.0	15,900
Electrification.....	262.0	262.7	264.6	269.0	42,500
Subtotal or Index**	193.8	197.7	201.2	207.1	309,000
Total or Index**	166.6	173.3	179.7	189.1	1,859,700

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
Normal Daily Expense:					
Supervision and Overhead.....	277.1	288.6	300.0	312.9	21,900
Labor (pumper).....	287.4	287.4	287.4	317.2	27,600
Auto Usage.....	272.0	284.0	296.0	308.0	7,700
Chemicals.....	214.8	214.8	214.8	229.6	6,200
Fuel, Power & Water.....	311.6	294.2	360.9	369.6	25,500
Operative Supplies.....	228.6	228.6	228.6	242.9	1,700
Subtotal or Index**.....	281.1	280.7	300.7	317.9	90,600
Surface Maintenance, Repair & Services:					
Labor (roustabout).....	212.2	212.2	212.2	234.1	9,600
Supplies & Services.....	219.4	219.4	219.4	241.9	7,500
Equipment Usage.....	235.3	235.3	235.3	247.1	4,200
Subtotal or Index**.....	219.1	219.1	219.1	239.3	21,300
Subsurface Maintenance, Repair & Services:					
Workover Rig Services.....	116.5	120.9	126.1	135.7	15,600
Remedial Services.....	109.5	114.3	119.0	119.0	2,500
Equipment Repair.....	144.4	151.1	155.6	164.4	7,400
Other.....	200.0	200.0	200.0	200.0	400
Subtotal or Index**.....	123.5	128.4	133.3	141.5	25,900
Total or Index**.....	219.4	220.8	232.7	247.4	137,800

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
Normal Daily Expense:					
Supervision and Overhead.....	284.4	296.1	307.8	322.1	24,800
Labor (pumper).....	287.4	287.4	287.4	317.2	27,600
Auto Usage.....	272.0	284.0	296.0	308.0	7,700
Chemicals.....	229.6	229.6	225.9	244.4	6,600
Fuel, Power & Water.....	291.5	279.8	331.9	338.3	31,800
Operative Supplies.....	228.6	228.6	228.6	242.9	1,700
Subtotal or Index**.....	280.4	280.8	299.7	316.1	100,200
Surface Maintenance, Repair & Services:					
Labor (roustabout).....	212.2	212.2	212.2	234.1	9,600
Supplies & Services.....	225.0	225.0	225.0	246.9	7,900
Equipment Usage.....	233.3	233.3	233.3	250.0	4,500
Subtotal or Index**.....	220.9	220.9	220.9	241.8	22,000
Subsurface Maintenance, Repair & Services:					
Workover Rig Services.....	113.9	118.5	122.5	131.1	19,800
Remedial Services.....	137.9	144.8	148.3	155.2	4,500
Equipment Repair.....	126.0	146.0	158.0	168.0	8,400
Other.....	166.7	166.7	166.7	166.7	500
Subtotal or Index**.....	120.2	128.3	133.9	142.5	33,200
Total or Index**.....	213.7	216.8	228.2	242.4	155,400

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
Normal Daily Expense:					
Supervision and Overhead.....	284.4	296.7	308.9	323.3	29,100
Labor (pumper).....	287.4	287.4	287.4	317.2	27,600
Auto Usage.....	272.0	284.0	296.0	308.0	7,700
Chemicals.....	210.3	206.9	206.9	220.7	6,400
Fuel, Power & Water.....	282.1	274.5	313.1	317.2	46,000
Operative Supplies.....	228.6	228.6	228.6	257.1	1,800
Subtotal or Index**.....	276.8	277.3	295.6	309.7	118,600
Surface Maintenance, Repair & Services:					
Labor (roustabout).....	212.2	212.2	212.2	234.1	9,600
Supplies & Services.....	224.2	224.2	224.2	245.5	8,100
Equipment Usage.....	242.1	242.1	242.1	263.2	5,000
Subtotal or Index**.....	222.6	222.6	222.6	244.1	22,700
Subsurface Maintenance, Repair & Services:					
Workover Rig Services.....	120.5	124.4	128.3	136.8	35,300
Remedial Services.....	205.0	215.0	227.5	238.8	19,100
Equipment Repair.....	163.3	183.3	191.7	201.7	12,100
Other.....	150.0	160.0	160.0	160.0	1,600
Subtotal or Index**.....	144.1	151.7	157.8	166.9	68,100
Total or Index**.....	209.8	213.6	224.3	236.9	209,400

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
Normal Daily Expense:					
Supervision and Overhead.....	283.9	297.3	308.9	324.1	36,300
Labor (pumper).....	287.4	287.4	287.4	317.2	27,600
Auto Usage.....	272.0	284.0	296.0	308.0	7,700
Chemicals.....	200.0	197.0	197.0	212.1	7,000
Fuel, Power & Water.....	299.5	294.0	322.1	325.1	64,700
Operative Supplies.....	230.0	230.0	230.0	240.0	2,400
Subtotal or Index**.....	283.5	284.8	300.2	312.7	145,700
Surface Maintenance, Repair & Services:					
Labor (roustabout).....	212.2	212.2	212.2	234.1	9,600
Supplies & Services.....	231.7	233.3	235.0	246.7	14,800
Equipment Usage.....	242.1	242.1	242.1	263.2	5,000
Subtotal or Index**.....	226.7	227.5	228.3	245.0	29,400
Subsurface Maintenance, Repair & Services:					
Workover Rig Services.....	133.3	135.3	138.2	144.1	14,700
Remedial Services.....	167.7	178.0	188.2	196.9	25,000
Equipment Repair.....	403.9	421.8	450.8	451.4	80,800
Other.....	175.0	175.0	175.0	183.3	2,200
Subtotal or Index**.....	260.2	271.4	287.6	292.1	122,700
Total or Index**.....	267.0	272.4	286.4	296.0	297,800

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
Producing Equipment:					
Tubing.....	107.9	143.0	145.9	162.0	77,900
Rods.....	110.8	111.2	111.5	112.9	32,300
Pumps.....	153.8	147.9	142.0	150.4	17,900
Pumping Equipment.....	127.6	146.5	158.1	187.9	316,300
Subtotal or Index**.....	123.3	142.0	149.9	173.0	444,400
Gathering System:					
Flowlines.....	242.3	224.9	247.7	250.2	70,300
Manifold.....	261.9	264.9	271.6	288.1	38,600
Subtotal or Index**.....	248.7	237.8	255.4	262.4	108,900
Lease Equipment:					
Producing Separator.....	165.7	165.7	174.6	179.1	12,000
Test Separator.....	189.1	188.1	187.1	198.0	20,000
Free water knockout.....	133.3	134.7	141.3	146.7	11,000
Heater Treater.....	231.7	243.2	249.0	256.4	151,300
Storage Tanks.....	181.0	185.9	190.2	194.8	67,600
Accessory Equipment.....	212.9	220.4	227.2	227.9	33,500
Disposal System.....	183.6	187.0	193.5	202.3	71,400
LACT Unit.....	174.2	171.0	171.0	171.0	15,900
Electrification.....	247.3	250.8	255.3	258.0	67,600
Subtotal or Index**.....	204.8	210.4	215.5	221.3	450,300
Total or Index**.....	166.7	177.7	185.2	200.0	1,003,600

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
Producing Equipment:					
Tubing.....	105.5	140.0	142.9	158.6	155,000
Rods.....	105.6	105.8	106.1	107.0	59,500
Pumps.....	153.1	146.2	140.0	146.9	19,100
Pumping Equipment.....	108.9	124.4	134.3	155.3	422,800
Subtotal or Index**.....	109.1	126.1	132.8	149.7	656,400
Gathering System:					
Flowlines.....	228.9	210.8	233.2	235.1	91,200
Manifold.....	261.9	264.9	271.6	288.1	38,600
Subtotal or Index**.....	237.4	224.7	243.1	248.7	129,800
Lease Equipment:					
Producing Separator.....	165.7	165.7	174.6	179.1	12,000
Test Separator.....	189.1	188.1	187.1	198.0	20,000
Free water knockout.....	133.3	134.7	141.3	146.7	11,000
Heater Treater.....	231.7	243.2	249.0	256.4	151,300
Storage Tanks.....	181.0	185.9	190.2	194.8	67,600
Accessory Equipment.....	212.9	220.4	227.2	227.9	33,500
Disposal System.....	180.8	183.5	190.2	198.6	73,300
LACT Unit.....	174.2	171.0	171.0	171.0	15,900
Electrification.....	225.9	229.3	232.9	235.1	77,100
Subtotal or Index**.....	202.2	207.6	212.6	218.1	461,700
Total or Index**.....	146.7	158.0	165.0	177.7	1,247,900

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
Producing Equipment:					
Tubing.....	107.0	112.7	114.2	129.5	506,600
Pumps.....	250.5	261.7	280.0	280.0	209,700
Pumping Equipment.....	196.5	203.8	213.9	215.7	297,600
Subtotal or Index**	145.2	152.0	157.5	167.8	1,013,900
Gathering System:					
Flowlines.....	206.7	209.2	203.6	203.9	196,600
Manifold.....	261.9	264.9	271.6	288.1	38,600
Subtotal or Index**	213.5	216.0	211.9	214.2	235,200
Lease Equipment:					
Producing Separator.....	165.7	165.7	174.6	179.1	12,000
Test Separator.....	189.1	188.1	187.1	198.0	20,000
Heater Treater.....	133.3	134.7	141.3	146.7	11,000
Free water knockout.....	231.7	243.2	249.0	256.4	151,300
Storage Tanks.....	181.0	185.9	190.2	194.8	67,600
Accessory Equipment.....	212.9	220.4	227.2	227.9	33,500
Disposal System.....	180.5	182.0	189.6	197.7	78,100
LACT Unit.....	174.2	171.0	171.0	171.0	15,900
Electrification.....	250.6	251.7	253.4	256.9	44,700
Subtotal or Index**	202.2	207.2	212.4	218.3	434,100
Total or Index**	165.9	171.7	176.0	184.4	1,683,200

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
Producing Equipment:					
Tubing.....	118.4	125.0	129.4	141.5	828,900
Pumps.....	250.5	261.7	280.0	280.0	209,700
Pumping Equipment.....	202.9	210.5	220.7	222.5	340,600
Subtotal or Index**	146.4	153.6	160.4	169.5	1,379,200
Gathering System:					
Flowlines.....	206.7	209.2	203.6	203.9	196,600
Manifold.....	261.9	264.9	271.6	288.1	38,600
Subtotal or Index**	213.5	216.0	211.9	214.2	235,200
Lease Equipment:					
Producing Separator.....	165.7	165.7	174.6	179.1	12,000
Test Separator.....	189.1	188.1	187.1	198.0	20,000
Heater Treater.....	133.3	134.7	141.3	146.7	11,000
Free water knockout.....	231.7	243.2	249.0	256.4	151,300
Storage Tanks.....	181.0	185.9	190.2	194.8	67,600
Accessory Equipment.....	212.9	220.4	227.2	227.9	33,500
Disposal System.....	180.5	182.0	189.6	197.7	78,100
LACT Unit.....	174.2	171.0	171.0	171.0	15,900
Electrification.....	258.7	258.3	258.3	265.0	54,600
Subtotal or Index**	203.8	208.6	213.5	219.7	444,000
Total or Index**	163.3	169.6	175.0	182.8	2,058,400

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
Normal Daily Expense:					
Supervision and Overhead.....	313.3	333.3	338.3	353.3	21,200
Labor (pumper).....	276.0	276.0	276.0	284.4	27,300
Auto Usage.....	272.0	284.0	296.0	308.0	7,700
Chemicals.....	226.3	221.1	221.1	236.8	4,500
Fuel, Power & Water.....	423.0	404.4	402.7	392.0	44,300
Operative Supplies.....	225.0	225.0	225.0	225.0	1,800
Subtotal or Index**.....	330.2	328.0	329.3	332.7	106,800
Surface Maintenance, Repair & Services:					
Labor (roustabout).....	200.0	200.0	207.4	207.4	11,200
Supplies & Services.....	231.0	234.5	241.4	241.4	7,000
Equipment Usage.....	221.4	221.4	228.6	250.0	3,500
Subtotal or Index**.....	212.4	213.4	220.6	223.7	21,700
Subsurface Maintenance, Repair & Services:					
Workover Rig Services.....	170.5	172.1	173.8	178.7	10,900
Remedial Services.....	142.9	157.1	157.1	157.1	1,100
Equipment Repair.....	164.4	164.4	159.3	169.5	10,000
Other.....	150.0	150.0	150.0	150.0	300
Subtotal or Index**.....	165.9	167.4	165.9	172.9	22,300
Total or Index**.....	270.6	269.8	271.5	275.7	150,800

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
Normal Daily Expense:					
Supervision and Overhead.....	311.8	333.8	336.8	351.5	23,900
Labor (pumper).....	276.0	276.0	276.0	284.4	27,300
Auto Usage.....	272.0	284.0	296.0	308.0	7,700
Chemicals.....	223.8	219.0	219.0	233.3	4,900
Fuel, Power & Water.....	494.9	466.3	461.1	445.7	78,000
Operative Supplies.....	225.0	225.0	225.0	225.0	1,800
Subtotal or Index**.....	375.6	367.2	366.2	365.4	143,600
Surface Maintenance, Repair & Services:					
Labor (roustabout).....	200.0	200.0	207.4	207.4	11,200
Supplies & Services.....	225.8	225.8	235.5	235.5	7,300
Equipment Usage.....	220.0	220.0	226.7	246.7	3,700
Subtotal or Index**.....	211.0	211.0	219.0	222.0	22,200
Subsurface Maintenance, Repair & Services:					
Workover Rig Services.....	171.0	173.0	174.0	179.0	17,900
Remedial Services.....	184.6	184.6	192.3	200.0	2,600
Equipment Repair.....	156.8	158.0	154.3	160.5	13,000
Other.....	166.7	166.7	166.7	166.7	500
Subtotal or Index**.....	166.0	167.5	167.0	172.6	34,000
Total or Index**.....	291.9	287.5	288.0	289.6	199,800

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
Normal Daily Expense:					
Supervision and Overhead.....	312.7	335.4	339.2	354.4	28,000
Labor (pumper).....	276.0	276.0	276.0	284.4	27,300
Auto Usage.....	272.0	284.0	296.0	308.0	7,700
Chemicals.....	220.0	220.0	216.7	230.0	6,900
Fuel, Power & Water.....	551.8	515.0	503.1	482.2	173,100
Operative Supplies.....	200.0	200.0	209.1	209.1	2,300
Subtotal or Index**.....	441.5	423.0	416.8	408.8	245,300
Surface Maintenance, Repair & Services:					
Labor (roustabout).....	200.0	200.0	207.4	207.4	11,200
Supplies & Services.....	255.9	258.8	266.2	266.2	18,100
Equipment Usage.....	231.3	231.3	237.5	262.5	4,200
Subtotal or Index**.....	231.2	232.6	239.9	242.8	33,500
Subsurface Maintenance, Repair & Services:					
Workover Rig Services.....	184.2	189.5	189.5	189.5	3,600
Remedial Services.....	214.0	219.3	224.6	229.8	13,100
Equipment Repair.....	368.9	392.2	418.4	421.4	43,400
Other.....	166.7	166.7	166.7	166.7	1,500
Subtotal or Index**.....	293.6	308.5	324.5	327.7	61,600
Total or Index**.....	380.1	371.4	371.7	367.6	340,400

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
Normal Daily Expense:					
Supervision and Overhead.....	313.3	336.7	339.8	356.1	34,900
Labor (pumper).....	276.0	276.0	276.0	284.4	27,300
Auto Usage.....	272.0	284.0	296.0	308.0	7,700
Chemicals.....	208.6	208.6	208.6	220.0	7,700
Fuel, Power & Water.....	552.0	513.7	503.4	482.0	268,000
Operative Supplies.....	191.7	200.0	208.3	208.3	2,500
Subtotal or Index**.....	462.9	440.3	434.2	423.5	348,100
Surface Maintenance, Repair & Services:					
Labor (roustabout).....	200.0	200.0	207.4	207.4	11,200
Supplies & Services.....	236.0	238.4	244.2	245.3	21,100
Equipment Usage.....	231.3	231.3	237.5	262.5	4,200
Subtotal or Index**.....	223.1	224.4	230.8	234.0	36,500
Subsurface Maintenance, Repair & Services:					
Workover Rig Services.....	192.9	192.9	196.4	196.4	5,500
Remedial Services.....	179.0	183.8	187.6	191.4	20,100
Equipment Repair.....	411.7	430.2	460.3	460.3	82,400
Other.....	153.8	153.8	153.8	153.8	2,000
Subtotal or Index**.....	307.4	319.1	337.2	338.5	110,000
Total or Index**.....	395.4	384.2	385.6	379.6	494,600

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

Component	Index (1976=100)				1997* Cost (dollars)
	1994	1995	1996	1997	
Labor.....	261.9	272.4	272.4	283.3	654,500
Supervision.....	262.4	272.8	272.8	283.8	98,200
Payroll Overhead.....	349.3	363.2	363.2	377.8	301,100
Food Expense.....	153.8	183.7	189.7	199.2	79,300
Labor Transportation.....	259.4	259.4	259.4	280.0	495,100
Surface Equipment.....	227.7	224.6	229.3	233.9	115,800
Operating Supplies.....	227.3	224.2	229.3	234.3	23,200
Workover.....	282.8	286.4	313.6	312.8	855,300
Communications.....	479.1	479.1	479.1	479.1	20,600
Administrative.....	255.3	263.0	264.0	273.6	317,400
Insurance.....	123.3	144.9	144.9	101.4	217,500
Total or Index**	242.7	252.0	258.5	258.5	3,178,000

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

Component	Index (1976=100)				1997* Cost (dollars)
	1994	1995	1996	1997	
Labor.....	261.9	272.4	272.4	283.3	654,500
Supervision.....	262.4	272.8	272.8	283.8	98,200
Payroll Overhead.....	349.3	363.2	363.2	377.8	301,100
Food Expense.....	153.8	183.7	189.7	199.2	79,300
Labor Transportation.....	263.2	263.2	263.2	282.2	541,900
Surface Equipment.....	227.8	224.6	229.4	234.0	117,000
Operating Supplies.....	228.0	225.0	229.0	234.0	23,400
Workover.....	288.3	291.8	319.5	318.7	911,600
Communications.....	93.1	93.1	93.1	93.1	28,400
Administrative.....	255.1	262.8	263.8	273.4	318,000
Insurance.....	122.4	143.9	143.9	100.7	245,200
Total or Index**	238.0	247.1	253.6	252.7	3,318,600

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

Component	Index (1976=100)				1997* Cost (dollars)
	1994	1995	1996	1997	
Labor.....	253.6	263.8	263.8	274.3	721,400
Supervision.....	254.1	264.2	264.2	274.6	108,200
Payroll Overhead.....	337.9	351.4	351.4	365.4	331,800
Food Expense.....	153.6	183.5	189.5	199.1	90,600
Labor Transportation.....	259.4	259.4	259.4	259.4	458,600
Surface Equipment.....	205.8	203.1	207.2	211.6	117,000
Operating Supplies.....	205.4	202.7	206.3	210.8	23,400
Workover.....	287.2	290.9	318.5	317.7	1,282,900
Communications.....	167.5	167.5	167.5	167.5	20,600
Administrative.....	244.6	252.2	253.0	262.3	344,700
Insurance.....	122.3	143.6	143.6	100.6	318,900
Total or Index**	234.6	244.2	251.8	246.9	3,818,100

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

Component	Index (1976=100)				1997* Cost (dollars)
	1994	1995	1996	1997	
Labor.....	253.6	263.8	263.8	274.3	721,400
Supervision.....	254.1	264.2	264.2	274.6	108,200
Payroll Overhead.....	338.3	351.8	351.8	365.8	331,800
Food Expense.....	153.6	183.5	189.5	199.1	90,600
Labor Transportation.....	213.1	213.1	213.1	213.1	409,200
Surface Equipment.....	203.6	200.9	205.0	209.3	117,000
Operating Supplies.....	203.6	200.9	204.5	208.9	23,400
Workover.....	292.5	296.0	324.1	323.3	1,367,300
Communications.....	93.1	93.1	93.1	93.1	28,400
Administrative.....	243.9	251.4	252.3	261.5	344,700
Insurance.....	121.1	142.3	142.3	99.6	340,300
Total or Index**.....	227.1	236.5	244.2	239.0	3,882,300

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

Component	Index (1976=100)				1997* Cost (dollars)
	1994	1995	1996	1997	
Labor.....	253.6	263.8	263.8	274.3	721,400
Supervision.....	254.1	264.2	264.2	274.6	108,200
Payroll Overhead.....	338.3	351.8	351.8	365.8	331,800
Food Expense.....	153.6	183.5	189.5	199.1	90,600
Labor Transportation.....	255.7	255.7	255.7	255.7	523,080
Surface Equipment.....	230.0	227.0	231.6	236.3	133,300
Operating Supplies.....	229.2	226.5	231.0	236.3	26,700
Workover.....	282.2	286.6	313.5	313.1	1,403,500
Communications.....	88.3	88.3	88.3	88.3	32,300
Administrative.....	249.1	256.5	257.5	266.9	352,600
Insurance.....	128.6	151.1	151.1	105.7	547,200
Total or Index**.....	222.9	233.8	240.7	231.4	4,270,680

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 1997 costs and indices for 1994 through 1997 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: • 1997 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)				1997* Cost (dollars)
	1994	1995	1996	1997	
50 Thousand Cubic Feet Per Day					
Flowlines and Connections.....	261.5	269.2	269.2	284.6	3,700
Production Package.....	170.6	170.6	114.7	114.7	3,900
Storage Tanks.....	166.7	174.1	177.8	183.3	9,900
Total or Index.....	180.2	185.1	168.3	173.3	17,500
250 Thousand Cubic Feet Per Day					
Flowlines and Connections.....	261.5	269.2	269.2	284.6	3,700
Production Package.....	170.6	170.6	114.7	114.7	3,900
Storage Tanks.....	166.7	174.1	177.8	183.3	9,900
Total or Index.....	180.2	185.1	168.3	173.3	17,500

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

Component	Index (1976=100)				1997* Cost (dollars)
	1994	1995	1996	1997	
50 Thousand Cubic Feet Per Day					
Flowlines and Connections.....	261.5	269.2	269.2	284.6	3,700
Production Package.....	170.6	170.6	114.7	114.7	3,900
Storage Tanks.....	166.7	174.1	177.8	183.3	9,900
Total or Index.....	180.2	185.1	168.3	173.3	17,500
250 Thousand Cubic Feet Per Day					
Flowlines and Connections.....	211.1	222.2	233.3	244.4	11,000
Production Package.....	214.3	211.4	160.0	160.0	5,600
Storage Tanks.....	166.7	174.1	177.8	183.3	9,900
Total or Index.....	194.0	200.0	191.8	197.8	26,500

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

Component	Index (1976=100)				1997* Cost (dollars)
	1994	1995	1996	1997	
50 Thousand Cubic Feet Per Day					
Flowlines and Connections.....	208.3	220.8	231.3	241.7	11,600
Production Package.....	200.0	200.0	134.5	134.5	3,900
Storage Tanks.....	166.7	174.1	177.8	183.3	9,900
Total or Index.....	189.3	196.9	187.8	193.9	25,400
250 Thousand Cubic Feet Per Day					
Flowlines and Connections.....	208.3	220.8	231.3	241.7	11,600
Production Package.....	214.3	211.4	160.0	160.0	5,600
Dehydrators.....	158.1	157.0	165.6	174.2	16,200
Storage Tanks.....	166.7	174.1	177.8	183.3	9,900
Total or Index.....	179.1	182.6	181.3	188.3	43,300
500 Thousand Cubic Feet Per Day					
Flowlines and Connections....	202.4	217.1	229.3	241.5	9,900
Production Package.....	187.5	185.0	140.0	140.0	5,600
Dehydrators.....	158.1	157.0	165.6	174.2	16,200
Storage Tanks.....	166.7	174.1	177.8	183.3	9,900
Total or Index.....	173.2	176.8	175.4	182.5	41,600

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

Component	Index (1976=100)				1997* Cost (dollars)
	1994	1995	1996	1997	
250 Thousand Cubic Feet Per Day					
Flowlines and Connections.....	307.2	327.5	344.9	362.3	25,000
Production Package.....	187.5	185.0	140.0	140.0	5,600
Dehydrators.....	158.1	157.0	165.6	174.2	16,200
Storage Tanks.....	166.7	174.1	177.8	183.3	9,900
Total or Index.....	204.7	210.9	212.5	221.5	56,700
500 Thousand Cubic Feet Per Day					
Flowlines and Connections.....	316.1	338.7	358.1	375.8	23,300
Production Package.....	187.5	185.0	140.0	140.0	5,600
Dehydrators.....	158.1	157.0	165.6	174.2	16,200
Storage Tanks.....	166.7	174.1	177.8	183.3	9,900
Total or Index.....	204.0	210.4	212.0	220.9	55,000
1 Million Cubic Feet Per Day					
Flowlines and Connections.....	323.1	348.1	367.3	386.5	20,100
Production Package.....	109.1	109.1	109.1	113.1	11,200
Dehydrators.....	158.1	157.0	165.6	174.2	16,200
Storage Tanks.....	166.7	174.1	177.8	183.3	9,900
Total or Index.....	172.1	177.5	184.2	192.6	57,400

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

Component	Index (1976=100)				1997* Cost (dollars)
	1994	1995	1996	1997	
500 Thousand Cubic Feet Per Day					
Flowlines and Connections.....	323.1	348.1	367.3	386.5	20,100
Production Package.....	109.1	109.1	109.1	113.1	11,200
Dehydrators.....	158.1	157.0	165.6	174.2	16,200
Storage Tanks.....	166.7	174.1	177.8	183.3	9,900
Total or Index.....	172.1	177.5	184.2	192.6	57,400
1 Million Cubic Feet Per Day					
Flowlines and Connections.....	323.1	348.1	367.3	386.5	20,100
Production Package.....	109.1	109.1	109.1	113.1	11,200
Dehydrators.....	158.1	157.0	165.6	174.2	16,200
Storage Tanks.....	166.7	174.1	177.8	183.3	9,900
Total or Index.....	172.1	177.5	184.2	192.6	57,400
5 Million Cubic Feet Per Day					
Flowlines and Connections.....	301.2	323.8	342.7	359.8	59,000
Production Package.....	129.6	123.1	120.4	124.1	13,400
Dehydrators.....	187.6	187.6	187.6	205.3	23,200
Storage Tanks.....	166.7	174.1	177.8	183.3	9,900
Total or Index.....	213.2	221.0	227.8	240.3	105,500

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
50 Thousand Cubic Feet Per Day					
Direct Labor & Overhead.....	283.3	291.7	291.7	300.0	3,600
Fuel, Chemicals & Disposal.....	300.0	300.0	300.0	300.0	600
Surface Maintenance.....	240.0	240.0	233.3	233.3	3,500
Subsurface Maintenance.....	180.0	180.0	180.0	180.0	900
Total or Index**.....	250.0	252.9	250.0	252.9	8,600
250 Thousand Cubic Feet Per Day					
Direct Labor & Overhead.....	283.3	291.7	291.7	300.0	3,600
Fuel, Chemicals & Disposal.....	220.0	220.0	220.0	240.0	2,400
Surface Maintenance.....	240.0	240.0	233.3	233.3	3,500
Subsurface Maintenance.....	180.0	180.0	180.0	180.0	900
Total or Index**.....	240.5	242.9	240.5	247.6	10,400

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
50 Thousand Cubic Feet Per Day					
Direct Labor & Overhead.....	271.4	278.6	285.7	292.9	4,100
Fuel, Chemicals & Disposal.....	220.0	220.0	220.0	240.0	1,200
Surface Maintenance.....	266.7	266.7	266.7	266.7	4,000
Subsurface Maintenance.....	185.7	185.7	185.7	185.7	1,300
Total or Index**.....	248.8	251.2	253.7	258.5	10,600
250 Thousand Cubic Feet Per Day					
Direct Labor & Overhead.....	271.4	278.6	285.7	292.9	4,100
Fuel, Chemicals & Disposal.....	220.0	220.0	220.0	235.0	4,700
Surface Maintenance.....	225.0	230.0	225.0	225.0	4,500
Subsurface Maintenance.....	185.7	185.7	185.7	185.7	1,300
Total or Index**.....	229.5	232.8	232.8	239.3	14,600

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
50 Thousand Cubic Feet Per Day					
Direct Labor & Overhead.....	275.0	287.5	287.5	300.0	4,800
Fuel, Chemicals & Disposal.....	220.0	220.0	220.0	240.0	2,400
Surface Maintenance.....	225.0	225.0	220.0	225.0	4,500
Subsurface Maintenance.....	166.7	166.7	166.7	175.0	2,100
Total or Index**.....	225.9	229.3	227.6	237.9	13,800
250 Thousand Cubic Feet Per Day					
Direct Labor & Overhead.....	275.0	287.5	287.5	300.0	4,800
Fuel, Chemicals & Disposal.....	228.2	228.2	228.2	243.6	9,500
Surface Maintenance.....	220.5	223.1	220.5	223.1	8,700
Subsurface Maintenance.....	166.7	166.7	166.7	175.0	2,100
Total or Index**.....	225.5	228.3	227.4	236.8	25,100
500 Thousand Cubic Feet Per Day					
Direct Labor & Overhead.....	275.0	287.5	287.5	300.0	4,800
Fuel, Chemicals & Disposal.....	238.1	233.3	238.1	242.9	5,100
Surface Maintenance.....	220.6	220.6	220.6	220.6	7,500
Subsurface Maintenance.....	166.7	166.7	166.7	175.0	2,100
Total or Index**.....	227.7	228.9	230.1	234.9	19,500

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
250 Thousand Cubic Feet Per Day					
Direct Labor & Overhead.....	278.9	294.7	294.7	305.3	5,800
Fuel, Chemicals & Disposal.....	222.0	222.0	222.0	238.0	11,900
Surface Maintenance.....	215.0	217.5	215.0	217.5	8,700
Subsurface Maintenance.....	180.8	184.6	184.6	188.5	4,900
Total or Index**.....	220.0	223.7	223.0	231.9	31,300
500 Thousand Cubic Feet Per Day					
Direct Labor & Overhead.....	278.9	294.7	294.7	305.3	5,800
Fuel, Chemicals & Disposal.....	220.0	220.0	224.0	228.0	5,700
Surface Maintenance.....	214.3	214.3	214.3	214.3	7,500
Subsurface Maintenance.....	180.8	184.6	184.6	188.5	4,900
Total or Index**.....	219.0	222.9	223.8	227.6	23,900
1 Million Cubic Feet Per Day					
Direct Labor & Overhead.....	278.9	294.7	294.7	305.3	5,800
Fuel, Chemicals & Disposal.....	225.0	223.1	228.8	234.6	12,200
Surface Maintenance.....	200.0	200.0	200.0	202.6	7,900
Subsurface Maintenance.....	180.8	184.6	184.6	188.5	4,900
Total or Index**.....	216.9	219.1	221.3	226.5	30,800

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
500 Thousand Cubic Feet Per Day					
Direct Labor & Overhead.....	278.9	294.7	294.7	305.3	5,800
Fuel, Chemicals & Disposal.....	222.6	219.4	225.8	232.3	7,200
Surface Maintenance.....	215.4	217.9	217.9	220.5	8,600
Subsurface Maintenance.....	177.4	180.6	180.6	183.9	5,700
Total or Index**.....	217.5	220.8	222.5	227.5	27,300
1 Million Cubic Feet Per Day					
Direct Labor & Overhead.....	278.9	294.7	294.7	305.3	5,800
Fuel, Chemicals & Disposal.....	219.7	219.7	223.0	229.5	14,000
Surface Maintenance.....	215.4	217.9	217.9	220.5	8,600
Subsurface Maintenance.....	177.4	180.6	180.6	183.9	5,700
Total or Index**.....	217.3	220.7	222.0	227.3	34,100
5 Million Cubic Feet Per Day					
Direct Labor & Overhead.....	278.9	294.7	294.7	305.3	5,800
Fuel, Chemicals & Disposal.....	153.5	153.5	163.6	167.7	16,600
Surface Maintenance.....	230.6	234.7	238.8	244.9	12,000
Subsurface Maintenance.....	127.3	130.3	130.3	136.4	4,500
Total or Index**.....	180.0	183.0	189.0	194.5	38,900

**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 inch H
 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 by 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)				1997* Cost (dollars)
	1994	1995	1996	1997	
50 Thousand Cubic Feet Per Day					
Flowlines and Connections.....	261.5	269.2	276.9	284.6	3,700
Production Package.....	160.0	160.0	171.4	177.1	6,200
Storage Tanks.....	163.6	170.9	174.5	180.0	9,900
Total or Index.....	174.8	179.6	186.4	192.2	19,800
250 Thousand Cubic Feet Per Day					
Flowlines and Connections.....	261.5	269.2	276.9	284.6	3,700
Production Package.....	160.0	160.0	171.4	177.1	6,200
Storage Tanks.....	163.6	170.9	174.5	180.0	9,900
Total or Index.....	174.8	179.6	186.4	192.2	19,800

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

Component	Index (1976=100)				1997* Cost (dollars)
	1994	1995	1996	1997	
50 Thousand Cubic Feet Per Day					
Flowlines and Connections.....	261.5	269.2	276.9	284.6	3,700
Production Package.....	160.0	160.0	171.4	177.1	6,200
Storage Tanks.....	163.6	170.9	174.5	180.0	9,900
Total or Index.....	174.8	179.6	186.4	192.2	19,800
250 Thousand Cubic Feet Per Day					
Flowlines and Connections.....	208.7	219.6	230.4	239.1	11,000
Production Package.....	197.3	197.3	210.8	216.2	8,000
Storage Tanks.....	163.6	170.9	174.5	180.0	9,900
Total or Index.....	187.7	194.2	202.9	209.4	28,900

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

Component	Index (1976=100)				1997* Cost (dollars)
	1994	1995	1996	1997	
250 Thousand Cubic Feet Per Day					
Flowlines and Connections.....	206.1	218.4	228.6	236.7	11,600
Production Package.....	197.3	197.3	210.8	216.2	8,000
Dehydrators.....	157.9	156.8	165.3	172.6	16,400
Storage Tanks.....	163.6	170.9	174.5	180.0	9,900
Total or Index.....	175.4	179.2	187.7	194.5	45,900
500 Thousand Cubic Feet Per Day					
Flowlines and Connections.....	202.4	217.1	229.3	241.5	9,900
Production Package.....	173.8	173.8	185.7	190.5	8,000
Dehydrators.....	157.9	156.8	165.3	172.6	16,400
Storage Tanks.....	163.6	170.9	174.5	180.0	9,900
Total or Index.....	170.0	173.8	182.4	189.7	44,200
1 Million Cubic Feet Per Day					
Flowlines and Connections.....	323.1	348.1	367.3	386.5	20,100
Production Package.....	109.0	109.0	110.0	113.0	11,300
Dehydrators.....	157.9	156.8	165.3	172.6	16,400
Storage Tanks.....	166.7	174.1	177.8	183.3	9,900
Total or Index.....	171.8	177.1	184.1	191.7	57,700

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

Component	Index (1976=100)				1997* Cost (dollars)
	1994	1995	1996	1997	
500 Thousand Cubic Feet Per Day					
Flowlines and Connections.....	316.1	338.7	358.1	375.8	23,300
Production Package.....	173.8	173.8	185.7	190.5	8,000
Dehydrators.....	157.9	156.8	165.3	172.6	16,400
Storage Tanks.....	163.6	170.9	174.5	180.0	9,900
Total or Index.....	200.4	207.1	217.7	226.8	57,600
1 Million Cubic Feet Per Day					
Flowlines and Connections.....	323.1	348.1	367.3	386.5	20,100
Production Package.....	109.0	109.0	110.0	113.0	11,300
Dehydrators.....	157.9	156.8	165.3	172.6	16,400
Storage Tanks.....	163.6	170.9	174.5	180.0	9,900
Total or Index.....	171.2	176.5	183.4	191.1	57,700
5 Million Cubic Feet Per Day					
Flowlines and Connections.....	301.2	323.8	342.7	359.8	59,000
Production Package.....	129.1	123.6	120.9	124.5	13,700
Dehydrators.....	187.0	187.0	187.0	203.5	23,400
Storage Tanks.....	163.6	170.9	174.5	180.0	9,900
Total or Index.....	211.9	219.8	226.6	238.7	106,000

**Table 15. Direct Annual Operating Costs and Indices for Gas Production in South Texas
(1 Well Producing from 2,000 Feet)**

Component	Index (1976=100)				1997* Cost (dollars)
	1994	1995	1996	1997	
50 Thousand Cubic Feet Per Day					
Direct Labor & Overhead.....	276.9	292.3	292.3	300.0	3,900
Fuel, Chemicals & Disposal.....	300.0	300.0	300.0	300.0	600
Surface Maintenance.....	236.8	242.1	236.8	231.6	4,400
Subsurface Maintenance.....	200.0	200.0	200.0	220.0	1,100
Total or Index**	248.7	256.4	253.8	256.4	10,000
250 Thousand Cubic Feet Per Day					
Direct Labor & Overhead.....	276.9	292.3	292.3	300.0	3,900
Fuel, Chemicals & Disposal.....	220.0	220.0	220.0	240.0	2,400
Surface Maintenance.....	236.8	242.1	236.8	231.6	4,400
Subsurface Maintenance.....	200.0	200.0	200.0	220.0	1,100
Total or Index**	240.4	246.8	244.7	251.1	11,800

**Table 16. Direct Annual Operating Costs and Indices for Gas Production in South Texas
(1 Well Producing from 4,000 Feet)**

Component	Index (1976=100)				1997* Cost (dollars)
	1994	1995	1996	1997	
50 Thousand Cubic Feet Per Day					
Direct Labor & Overhead.....	292.9	300.0	307.1	314.3	4,400
Fuel, Chemicals & Disposal.....	220.0	220.0	220.0	240.0	1,200
Surface Maintenance.....	236.8	242.1	236.8	231.6	4,400
Subsurface Maintenance.....	200.0	200.0	200.0	214.3	1,500
Total or Index**	246.7	251.1	251.1	255.6	11,500
250 Thousand Cubic Feet Per Day					
Direct Labor & Overhead.....	292.9	300.0	307.1	314.3	4,400
Fuel, Chemicals & Disposal.....	220.0	220.0	220.0	235.0	4,700
Surface Maintenance.....	216.7	220.8	216.7	212.5	5,100
Subsurface Maintenance.....	200.0	200.0	200.0	214.3	1,500
Total or Index**	232.3	235.4	235.4	241.5	15,700

**Table 17. Direct Annual Operating Costs and Indices for Gas Production in South Texas
(1 Well Producing from 8,000 Feet)**

Component	Index (1976=100)				1997* Cost (dollars)
	1994	1995	1996	1997	
250 Thousand Cubic Feet Per Day					
Direct Labor & Overhead.....	276.5	288.2	294.1	300.0	5,100
Fuel, Chemicals & Disposal.....	225.6	225.6	225.6	243.6	9,500
Surface Maintenance.....	210.6	212.8	210.6	206.4	9,700
Subsurface Maintenance.....	200.0	208.3	208.3	216.7	2,600
Total or Index**.....	224.3	227.8	227.8	233.9	26,900
500 Thousand Cubic Feet Per Day					
Direct Labor & Overhead.....	276.5	288.2	294.1	300.0	5,100
Fuel, Chemicals & Disposal.....	137.5	137.5	140.0	137.5	5,500
Surface Maintenance.....	209.8	209.8	209.8	204.9	8,400
Subsurface Maintenance.....	200.0	208.3	208.3	216.7	2,600
Total or Index**.....	192.7	195.5	197.3	196.4	21,600
1 Million Cubic Feet Per Day					
Direct Labor & Overhead.....	276.5	288.2	294.1	300.0	5,100
Fuel, Chemicals & Disposal.....	286.5	284.6	288.5	292.3	15,200
Surface Maintenance.....	206.5	208.7	208.7	206.5	9,500
Subsurface Maintenance.....	200.0	208.3	208.3	216.7	2,600
Total or Index**.....	248.0	250.4	252.8	255.1	32,400

**Table 18. Direct Annual Operating Costs and Indices for Gas Production in South Texas
(1 Well Producing from 12,000 Feet)**

Component	Index (1976=100)				1997* Cost (dollars)
	1994	1995	1996	1997	
500 Thousand Cubic Feet Per Day					
Direct Labor & Overhead.....	285.0	295.0	300.0	310.0	6,200
Fuel, Chemicals & Disposal.....	217.2	213.8	217.2	217.2	6,300
Surface Maintenance.....	219.0	221.4	221.4	216.7	9,100
Subsurface Maintenance.....	208.3	216.7	216.7	229.2	5,500
Total or Index**.....	229.8	233.3	235.1	237.7	27,100
1 Million Cubic Feet Per Day					
Direct Labor & Overhead.....	285.0	295.0	300.0	310.0	6,200
Fuel, Chemicals & Disposal.....	178.3	176.7	181.7	180.0	10,800
Surface Maintenance.....	206.5	208.7	208.7	206.5	9,500
Subsurface Maintenance.....	208.3	216.7	216.7	229.2	5,500
Total or Index**.....	207.4	210.1	212.8	214.8	32,000
5 Million Cubic Feet Per Day					
Direct Labor & Overhead.....	285.0	295.0	300.0	310.0	6,200
Fuel, Chemicals & Disposal.....	163.2	163.2	177.2	180.7	10,300
Surface Maintenance.....	198.4	201.6	204.8	204.8	12,900
Subsurface Maintenance.....	192.3	200.0	200.0	211.5	5,500
Total or Index**.....	195.8	199.4	206.0	210.2	34,900

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

Component	Index (1976=100)				1997* Cost (dollars)
	1994	1995	1996	1997	
50 Thousand Cubic Feet Per Day					
Flowlines and Connections.....	242.9	250.0	257.1	278.6	3,900
Production Package.....	160.0	162.9	174.3	182.9	6,400
Storage Tanks.....	162.5	169.6	175.0	182.1	10,200
Total or Index.....	172.4	178.1	185.7	195.2	20,500
250 Thousand Cubic Feet Per Day					
Flowlines and Connections.....	242.9	250.0	257.1	278.6	3,900
Production Package.....	160.0	162.9	174.3	182.9	6,400
Storage Tanks.....	162.5	169.6	175.0	182.1	10,200
Total or Index.....	172.4	178.1	185.7	195.2	20,500

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

Component	Index (1976=100)				1997* Cost (dollars)
	1994	1995	1996	1997	
50 Thousand Cubic Feet Per Day					
Flowlines and Connections.....	242.9	250.0	257.1	278.6	3,900
Production Package.....	160.0	162.9	174.3	182.9	6,400
Storage Tanks.....	162.5	169.6	175.0	182.1	10,200
Total or Index.....	172.4	178.1	185.7	195.2	20,500
250 Thousand Cubic Feet Per Day					
Flowlines and Connections.....	206.5	219.6	230.4	243.5	11,200
Production Package.....	197.3	200.0	213.5	224.3	8,300
Storage Tanks.....	162.5	169.6	175.0	182.1	10,200
Total or Index.....	186.3	194.2	203.6	213.7	29,700

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

Component	Index (1976=100)				1997* Cost (dollars)
	1994	1995	1996	1997	
250 Thousand Cubic Feet Per Day					
Flowlines and Connections.....	204.1	218.4	228.6	240.8	11,800
Production Package.....	197.3	200.0	213.5	224.3	8,300
Dehydrators.....	156.3	155.2	163.5	175.0	16,800
Storage Tanks.....	162.5	169.6	175.0	182.1	10,200
Total or Index.....	173.9	178.6	187.4	197.9	47,100
500 Thousand Cubic Feet Per Day					
Flowlines and Connections.....	202.4	217.1	229.3	241.5	9,900
Production Package.....	173.8	176.2	188.1	197.6	8,300
Dehydrators.....	156.3	155.2	163.5	175.0	16,800
Storage Tanks.....	162.5	169.6	175.0	182.1	10,200
Total or Index.....	168.9	173.2	182.1	192.3	45,200
1 Million Cubic Feet Per Day					
Flowlines and Connections.....	323.1	348.1	367.3	386.5	20,100
Production Package.....	109.0	109.0	110.0	115.0	11,500
Dehydrators.....	156.3	155.2	163.5	175.0	16,800
Storage Tanks.....	162.5	169.6	175.0	182.1	10,200
Total or Index.....	170.4	175.7	182.9	192.8	58,600

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

Component	Index (1976=100)				1997* Cost (dollars)
	1994	1995	1996	1997	
500 Thousand Cubic Feet Per Day					
Flowlines and Connections.....	316.1	338.7	358.1	375.8	23,300
Production Package.....	173.8	176.2	188.1	197.6	8,300
Dehydrators.....	156.3	155.2	163.5	175.0	16,800
Storage Tanks.....	162.5	169.6	175.0	182.1	10,200
Total or Index.....	199.2	206.3	217.2	228.9	58,600
1 Million Cubic Feet Per Day					
Flowlines and Connections.....	323.1	348.1	367.3	386.5	20,100
Production Package.....	109.0	109.0	110.0	115.0	11,500
Dehydrators.....	156.3	155.2	163.5	175.0	16,800
Storage Tanks.....	162.5	169.6	175.0	182.1	10,200
Total or Index.....	170.4	175.7	182.9	192.8	58,600
5 Million Cubic Feet Per Day					
Flowlines and Connections.....	301.2	323.8	342.7	359.8	59,000
Production Package.....	129.1	123.6	121.8	128.2	14,100
Dehydrators.....	185.3	185.3	185.3	205.2	23,800
Storage Tanks.....	162.5	169.6	175.0	182.1	10,200
Total or Index.....	211.2	219.1	226.2	240.1	107,100

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

Component	Index (1976=100)				1997* Cost (dollars)
	1994	1995	1996	1997	
500 Thousand Cubic Feet Per Day					
Flowlines and Connections.....	316.1	338.7	358.1	375.8	23,300
Production Package.....	173.8	176.2	188.1	197.6	8,300
Dehydrators.....	156.3	155.2	163.5	175.0	16,800
Storage Tanks.....	162.5	169.6	175.0	182.1	10,200
Total or Index.....	199.2	206.3	217.2	228.9	58,600
1 Million Cubic Feet Per Day					
Flowlines and Connections.....	323.1	348.1	367.3	386.5	20,100
Production Package.....	109.0	109.0	110.0	115.0	11,500
Dehydrators.....	156.3	155.2	163.5	175.0	16,800
Storage Tanks.....	162.5	169.6	175.0	182.1	10,200
Total or Index.....	170.4	175.7	182.9	192.8	58,600
5 Million Cubic Feet Per Day					
Flowlines and Connections.....	301.2	323.8	342.7	359.8	59,000
Production Package.....	129.1	123.6	121.8	128.2	14,100
Dehydrators.....	185.3	185.3	185.3	205.2	23,800
Storage Tanks.....	162.5	169.6	175.0	182.1	10,200
Total or Index.....	211.2	219.1	226.2	240.1	107,100

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
50 Thousand Cubic Feet Per Day					
Direct Labor & Overhead.....	269.2	284.6	284.6	307.7	4,000
Fuel, Chemicals & Disposal.....	300.0	300.0	300.0	300.0	600
Surface Maintenance.....	205.0	210.0	210.0	235.0	4,700
Subsurface Maintenance.....	166.7	166.7	166.7	166.7	1,000
Total or Index**.....	224.4	231.7	231.7	251.2	10,300
250 Thousand Cubic Feet Per Day					
Direct Labor & Overhead.....	269.2	284.6	284.6	307.7	4,000
Fuel, Chemicals & Disposal.....	220.0	220.0	220.0	240.0	2,400
Surface Maintenance.....	205.0	210.0	210.0	235.0	4,700
Subsurface Maintenance.....	166.7	166.7	166.7	166.7	1,000
Total or Index**.....	220.4	226.5	226.5	246.9	12,100

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
50 Thousand Cubic Feet Per Day					
Direct Labor & Overhead.....	285.7	292.9	300.0	321.4	4,500
Fuel, Chemicals & Disposal.....	220.0	220.0	220.0	240.0	1,200
Surface Maintenance.....	205.0	210.0	210.0	235.0	4,700
Subsurface Maintenance.....	175.0	187.5	187.5	187.5	1,500
Total or Index**.....	225.5	231.9	234.0	253.2	11,900
250 Thousand Cubic Feet Per Day					
Direct Labor & Overhead.....	285.7	292.9	300.0	321.4	4,500
Fuel, Chemicals & Disposal.....	220.0	220.0	220.0	235.0	4,700
Surface Maintenance.....	204.0	212.0	212.0	240.0	6,000
Subsurface Maintenance.....	175.0	187.5	187.5	187.5	1,500
Total or Index**.....	222.4	228.4	229.9	249.3	16,700

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

Component	Index (1976=100)				1997* Cost (dollars)
	1994	1995	1996	1997	
250 Thousand Cubic Feet Per Day					
Direct Labor & Overhead.....	270.6	282.4	288.2	305.9	5,200
Fuel, Chemicals & Disposal.....	225.6	225.6	225.6	243.6	9,500
Surface Maintenance.....	196.0	200.0	202.0	226.0	11,300
Subsurface Maintenance.....	191.7	200.0	200.0	200.0	2,400
Total or Index**.....	216.1	220.3	222.0	240.7	28,400
500 Thousand Cubic Feet Per Day					
Direct Labor & Overhead.....	270.6	282.4	288.2	305.9	5,200
Fuel, Chemicals & Disposal.....	211.5	211.5	215.4	242.3	6,300
Surface Maintenance.....	198.0	202.0	204.1	228.6	11,200
Subsurface Maintenance.....	191.7	200.0	200.0	200.0	2,400
Total or Index**.....	212.5	217.3	220.2	241.3	25,100
1 Million Cubic Feet Per Day					
Direct Labor & Overhead.....	270.6	282.4	288.2	305.9	5,200
Fuel, Chemicals & Disposal.....	213.0	213.0	218.5	244.4	13,200
Surface Maintenance.....	195.8	200.0	204.2	227.1	10,900
Subsurface Maintenance.....	191.7	200.0	200.0	200.0	2,400
Total or Index**.....	212.2	216.0	220.6	242.0	31,700

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
500 Thousand Cubic Feet Per Day					
Direct Labor & Overhead.....	280.0	290.0	295.0	315.0	6,300
Fuel, Chemicals & Disposal.....	206.7	206.7	213.3	233.3	7,000
Surface Maintenance.....	206.8	211.4	213.6	238.6	10,500
Subsurface Maintenance.....	187.5	191.7	191.7	195.8	4,700
Total or Index**.....	215.3	219.5	222.9	241.5	28,500
1 Million Cubic Feet Per Day					
Direct Labor & Overhead.....	280.0	290.0	295.0	315.0	6,300
Fuel, Chemicals & Disposal.....	209.8	209.8	216.4	239.3	14,600
Surface Maintenance.....	195.8	200.0	204.2	227.1	10,900
Subsurface Maintenance.....	204.2	212.5	212.5	216.7	5,200
Total or Index**.....	213.7	217.6	222.2	241.8	37,000
5 Million Cubic Feet Per Day					
Direct Labor & Overhead.....	280.0	290.0	295.0	315.0	6,300
Fuel, Chemicals & Disposal.....	178.0	168.3	190.2	195.1	8,000
Surface Maintenance.....	205.3	212.3	217.5	238.6	13,600
Subsurface Maintenance.....	188.5	196.2	196.2	200.0	5,200
Total or Index**.....	204.9	207.6	216.7	229.9	33,100

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
500 Thousand Cubic Feet Per Day					
Direct Labor & Overhead.....	280.0	290.0	295.0	315.0	6,300
Fuel, Chemicals & Disposal.....	200.0	202.9	205.7	225.7	7,900
Surface Maintenance.....	206.8	211.4	213.6	238.6	10,500
Subsurface Maintenance.....	181.8	187.9	187.9	190.9	6,300
Total or Index**.....	209.8	215.2	217.4	234.8	31,000
1 Million Cubic Feet Per Day					
Direct Labor & Overhead.....	280.0	290.0	295.0	315.0	6,300
Fuel, Chemicals & Disposal.....	205.6	205.6	211.3	232.4	16,500
Surface Maintenance.....	195.8	200.0	204.2	227.1	10,900
Subsurface Maintenance.....	181.8	187.9	187.9	190.9	6,300
Total or Index**.....	207.0	210.5	214.5	232.6	40,000
5 Million Cubic Feet Per Day					
Direct Labor & Overhead.....	280.0	290.0	295.0	315.0	6,300
Fuel, Chemicals & Disposal.....	158.9	156.8	166.3	170.5	16,200
Surface Maintenance.....	198.3	205.1	210.2	230.5	13,600
Subsurface Maintenance.....	182.9	188.6	191.4	191.4	6,700
Total or Index**.....	185.6	188.5	195.2	204.8	42,800

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

Component	Index (1976=100)				1997* Cost (dollars)
	1994	1995	1996	1997	
50 Thousand Cubic Feet Per Day					
Flowlines and Connections.....	242.9	250.0	257.1	278.6	3,900
Production Package.....	160.0	162.9	174.3	182.9	6,400
Storage Tanks.....	162.5	169.6	175.0	182.1	10,200
Total or Index.....	172.4	178.1	185.7	195.2	20,500
250 Thousand Cubic Feet Per Day					
Flowlines and Connections.....	242.9	250.0	257.1	278.6	3,900
Production Package.....	160.0	162.9	174.3	182.9	6,400
Storage Tanks.....	162.5	169.6	175.0	182.1	10,200
Total or Index.....	172.4	178.1	185.7	195.2	20,500

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

Component	Index (1976=100)				1997* Cost (dollars)
	1994	1995	1996	1997	
250 Thousand Cubic Feet Per Day					
Flowlines and Connections.....	206.5	219.6	230.4	243.5	11,200
Production Package.....	208.1	213.5	218.9	229.7	8,500
Storage Tanks.....	162.5	169.6	175.0	182.1	10,200
Total or Index.....	189.2	197.8	205.0	215.1	29,900
500 Thousand Cubic Feet Per Day					
Flowlines and Connections.....	283.3	300.0	316.7	333.3	2,000
Production Package.....	173.8	176.2	188.1	197.6	8,300
Storage Tanks.....	162.5	169.6	175.0	182.1	10,200
Total or Index.....	174.0	179.8	188.5	197.1	20,500

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

Component	Index (1976=100)				1997* Cost (dollars)
	1994	1995	1996	1997	
250 Thousand Cubic Feet Per Day					
Flowlines and Connections.....	204.1	218.4	228.6	240.8	11,800
Production Package.....	191.9	194.6	200.0	210.8	7,800
Dehydrators.....	156.3	155.2	163.5	175.0	16,800
Storage Tanks.....	162.5	169.6	175.0	182.1	10,200
Total or Index.....	173.1	177.7	185.3	195.8	46,600
500 Thousand Cubic Feet Per Day					
Flowlines and Connections.....	202.4	217.1	229.3	241.5	9,900
Production Package.....	173.8	176.2	188.1	197.6	8,300
Dehydrators.....	156.3	155.2	163.5	175.0	16,800
Storage Tanks.....	162.5	169.6	175.0	182.1	10,200
Total or Index.....	168.9	173.2	182.1	192.3	45,200

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

Component	Index (1976=100)				1997* Cost (dollars)
	1994	1995	1996	1997	
500 Thousand Cubic Feet Per Day					
Flowlines and Connections.....	316.1	338.7	358.1	375.8	23,300
Production Package.....	173.8	176.2	188.1	197.6	8,300
Dehydrators.....	156.3	155.2	163.5	175.0	16,800
Storage Tanks.....	162.5	169.6	175.0	182.1	10,200
Total or Index.....	199.2	206.3	217.2	228.9	58,600
1 Million Cubic Feet Per Day					
Flowlines and Connections.....	323.1	348.1	367.3	386.5	20,100
Production Package.....	109.0	109.0	110.0	115.0	11,500
Dehydrators.....	156.3	155.2	163.5	175.0	16,800
Storage Tanks.....	162.5	169.6	175.0	182.1	10,200
Total or Index.....	170.4	175.7	182.9	192.8	58,600

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

Component	Index (1976=100)				1997* Cost (dollars)
	1994	1995	1996	1997	
1 Million Cubic Feet Per Day					
Flowlines and Connections.....	323.1	348.1	367.3	386.5	20,100
Production Package.....	109.0	109.0	110.0	115.0	11,500
Dehydrators.....	156.3	155.2	163.5	175.0	16,800
Storage Tanks.....	162.5	169.6	175.0	182.1	10,200
Total or Index.....	170.4	175.7	182.9	192.8	58,600
5 Million Cubic Feet Per Day					
Flowlines and Connections.....	301.2	323.8	342.7	359.8	59,000
Production Package.....	129.1	123.6	121.8	128.2	14,100
Dehydrators.....	185.3	185.3	185.3	205.2	23,800
Storage Tanks.....	162.5	169.6	175.0	182.1	10,200
Total or Index.....	211.2	219.1	226.2	240.1	107,100
10 Million Cubic Feet Per Day					
Flowlines and Connections.....	301.2	323.8	342.7	359.8	59,000
Production Package.....	129.1	123.6	121.8	128.2	14,100
Dehydrators.....	208.4	208.7	211.4	222.4	58,500
Storage Tanks.....	162.5	169.6	175.0	182.1	10,200
Total or Index.....	215.0	221.1	227.7	239.1	141,800

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
50 Thousand Cubic Feet Per Day					
Direct Labor & Overhead.....	269.2	284.6	284.6	307.7	4,000
Fuel, Chemicals & Disposal.....	250.0	250.0	250.0	300.0	600
Surface Maintenance.....	205.0	210.0	210.0	235.0	4,700
Subsurface Maintenance.....	166.7	166.7	166.7	166.7	1,000
Total or Index**.....	222.0	229.3	229.3	251.2	10,300
250 Thousand Cubic Feet Per Day					
Direct Labor & Overhead.....	269.2	284.6	284.6	307.7	4,000
Fuel, Chemicals & Disposal.....	210.0	210.0	210.0	220.0	2,200
Surface Maintenance.....	205.0	210.0	210.0	235.0	4,700
Subsurface Maintenance.....	166.7	166.7	166.7	166.7	1,000
Total or Index**.....	218.4	224.5	224.5	242.9	11,900

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
250 Thousand Cubic Feet Per Day					
Direct Labor & Overhead.....	285.7	292.9	300.0	321.4	4,500
Fuel, Chemicals & Disposal.....	205.0	205.0	205.0	220.0	4,400
Surface Maintenance.....	204.0	208.0	216.0	240.0	6,000
Subsurface Maintenance.....	175.0	187.5	187.5	187.5	1,500
Total or Index**	217.9	222.4	226.9	244.8	16,400
500 Thousand Cubic Feet Per Day					
Direct Labor & Overhead.....	285.7	292.9	300.0	321.4	4,500
Fuel, Chemicals & Disposal.....	200.0	200.0	204.2	229.2	5,500
Surface Maintenance.....	204.0	208.0	208.0	236.0	5,900
Subsurface Maintenance.....	175.0	187.5	187.5	187.5	1,500
Total or Index**	215.5	219.7	222.5	245.1	17,400

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
250 Thousand Cubic Feet Per Day					
Direct Labor & Overhead.....	270.6	282.4	288.2	305.9	5,200
Fuel, Chemicals & Disposal.....	212.8	212.8	212.8	228.2	8,900
Surface Maintenance.....	196.0	200.0	202.0	228.0	11,400
Subsurface Maintenance.....	216.7	225.0	225.0	225.0	2,700
Total or Index**	214.4	218.6	220.3	239.0	28,200
500 Thousand Cubic Feet Per Day					
Direct Labor & Overhead.....	270.6	282.4	288.2	305.9	5,200
Fuel, Chemicals & Disposal.....	188.5	188.5	192.3	215.4	5,600
Surface Maintenance.....	198.0	202.0	204.1	228.6	11,200
Subsurface Maintenance.....	216.7	225.0	225.0	225.0	2,700
Total or Index**	209.6	214.4	217.3	237.5	24,700

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
500 Thousand Cubic Feet Per Day					
Direct Labor & Overhead.....	280.0	290.0	295.0	315.0	6,300
Fuel, Chemicals & Disposal.....	200.0	203.3	206.7	226.7	6,800
Surface Maintenance.....	206.8	211.4	213.6	238.6	10,500
Subsurface Maintenance.....	145.8	154.2	154.2	158.3	3,800
Total or Index**	205.1	211.0	213.6	232.2	27,400
1 Million Cubic Feet Per Day					
Direct Labor & Overhead.....	280.0	290.0	295.0	315.0	6,300
Fuel, Chemicals & Disposal.....	206.6	206.6	213.1	236.1	14,400
Surface Maintenance.....	195.8	200.0	204.2	227.1	10,900
Subsurface Maintenance.....	145.8	154.2	154.2	158.3	3,800
Total or Index**	203.3	207.2	211.8	231.4	35,400

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
1 Million Cubic Feet Per Day					
Direct Labor & Overhead.....	280.0	290.0	295.0	315.0	6,300
Fuel, Chemicals & Disposal.....	202.8	202.8	208.5	229.6	16,300
Surface Maintenance.....	193.8	197.9	202.1	225.0	10,800
Subsurface Maintenance.....	181.8	187.9	187.9	190.9	6,300
Total or Index**	205.2	208.7	212.8	230.8	39,700
5 Million Cubic Feet Per Day					
Direct Labor & Overhead.....	280.0	290.0	295.0	315.0	6,300
Fuel, Chemicals & Disposal.....	160.4	157.3	168.8	172.9	16,600
Surface Maintenance.....	196.6	203.4	208.5	230.5	13,600
Subsurface Maintenance.....	182.9	188.6	191.4	191.4	6,700
Total or Index**	185.7	188.1	195.7	205.7	43,200
10 Million Cubic Feet Per Day					
Direct Labor & Overhead.....	280.0	290.0	295.0	315.0	6,300
Fuel, Chemicals & Disposal.....	155.8	152.1	163.8	168.1	27,400
Surface Maintenance.....	207.2	213.0	217.4	237.7	16,400
Subsurface Maintenance.....	182.9	188.6	191.4	191.4	6,700
Total or Index**	180.1	180.8	189.2	197.9	56,800

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
50 Thousand Cubic Feet Per Day					
Flowlines and Connections.....	269.2	276.9	284.6	300.0	3,900
Production Package.....	164.7	164.7	176.5	185.3	6,300
Storage Tanks.....	170.4	177.8	183.3	190.7	10,300
Total or Index.....	181.2	186.1	194.1	203.0	20,500
250 Thousand Cubic Feet Per Day					
Flowlines and Connections.....	269.2	276.9	284.6	300.0	3,900
Production Package.....	185.0	185.0	195.0	205.0	8,200
Storage Tanks.....	170.4	177.8	183.3	190.7	10,300
Total or Index.....	187.9	192.5	200.0	209.3	22,400

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
50 Thousand Cubic Feet Per Day					
Flowlines and Connections.....	269.2	276.9	284.6	300.0	3,900
Production Package.....	164.7	164.7	176.5	185.3	6,300
Storage Tanks.....	170.4	177.8	183.3	190.7	10,300
Total or Index.....	181.2	186.1	194.1	203.0	20,500
250 Thousand Cubic Feet Per Day					
Flowlines and Connections.....	213.3	226.7	235.6	248.9	11,200
Production Package.....	202.9	208.6	208.6	220.0	7,700
Storage Tanks.....	170.4	177.8	183.3	190.7	10,300
Total or Index.....	193.3	202.2	207.5	217.9	29,200
500 Thousand Cubic Feet Per Day					
Flowlines and Connections.....	205.3	221.1	231.6	244.7	9,300
Production Package.....	202.9	208.6	208.6	220.0	7,700
Storage Tanks.....	170.4	177.8	183.3	190.7	10,300
Total or Index.....	189.8	199.2	204.7	215.0	27,300

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
250 Thousand Cubic Feet Per Day					
Flowlines and Connections.....	210.4	222.9	233.3	245.8	11,800
Production Package.....	202.9	208.6	208.6	220.0	7,700
Dehydrators.....	163.4	161.3	171.0	181.7	16,900
Storage Tanks.....	170.4	177.8	183.3	190.7	10,300
Total or Index.....	180.9	185.2	192.6	203.0	46,700
500 Thousand Cubic Feet Per Day					
Flowlines and Connections.....	202.4	217.1	229.3	241.5	9,900
Production Package.....	185.0	185.0	185.0	185.0	7,400
Dehydrators.....	163.4	161.3	171.0	181.7	16,900
Storage Tanks.....	170.4	177.8	183.3	190.7	10,300
Total or Index.....	175.9	179.4	186.8	195.2	44,500

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
250 Thousand Cubic Feet Per Day					
Flowlines and Connections.....	308.7	330.4	347.8	365.2	25,200
Production Package.....	185.0	185.0	195.0	205.0	8,200
Dehydrators.....	163.4	161.3	171.0	181.7	16,900
Storage Tanks.....	170.4	177.8	183.3	190.7	10,300
Total or Index.....	207.4	214.1	225.0	236.7	60,600
500 Thousand Cubic Feet Per Day					
Flowlines and Connections.....	316.1	338.7	358.1	375.8	23,300
Production Package.....	185.0	185.0	195.0	205.0	8,200
Dehydrators.....	163.4	161.3	171.0	181.7	16,900
Storage Tanks.....	170.4	177.8	183.3	190.7	10,300
Total or Index.....	206.4	212.9	224.1	235.7	58,700
1 Million Cubic Feet Per Day					
Flowlines and Connections.....	323.1	348.1	367.3	386.5	20,100
Production Package.....	110.1	110.1	110.1	115.2	11,400
Dehydrators.....	163.4	161.3	171.0	181.7	16,900
Storage Tanks.....	170.4	177.8	183.3	190.7	10,300
Total or Index.....	174.8	179.9	187.2	197.0	58,700

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
500 Thousand Cubic Feet Per Day					
Flowlines and Connections.....	323.1	348.1	367.3	386.5	20,100
Production Package.....	110.1	110.1	110.1	115.2	11,400
Dehydrators.....	163.4	161.3	171.0	181.7	16,900
Storage Tanks.....	170.4	177.8	183.3	190.7	10,300
Total or Index.....	174.8	179.9	187.2	197.0	58,700
1 Million Cubic Feet Per Day					
Flowlines and Connections.....	323.1	348.1	367.3	386.5	20,100
Production Package.....	110.1	110.1	110.1	115.2	11,400
Dehydrators.....	163.4	161.3	171.0	181.7	16,900
Storage Tanks.....	170.4	177.8	183.3	190.7	10,300
Total or Index.....	174.8	179.9	187.2	197.0	58,700
5 Million Cubic Feet Per Day					
Flowlines and Connections.....	301.2	323.8	342.7	359.8	59,000
Production Package.....	131.5	125.0	123.1	127.8	13,800
Dehydrators.....	192.0	192.0	192.0	211.5	23,900
Storage Tanks.....	170.4	177.8	183.3	190.7	10,300
Total or Index.....	215.3	223.0	230.3	243.7	107,000

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
50 Thousand Cubic Feet Per Day					
Direct Labor & Overhead.....	258.3	275.0	283.3	300.0	3,600
Fuel, Chemicals & Disposal.....	300.0	300.0	300.0	300.0	600
Surface Maintenance.....	300.0	300.0	300.0	333.3	5,000
Subsurface Maintenance.....	200.0	200.0	220.0	220.0	1,100
Total or Index**.....	270.6	276.5	282.4	302.9	10,300
250 Thousand Cubic Feet Per Day					
Direct Labor & Overhead.....	258.3	275.0	283.3	300.0	3,600
Fuel, Chemicals & Disposal.....	220.0	220.0	220.0	240.0	2,400
Surface Maintenance.....	300.0	300.0	295.0	330.0	6,600
Subsurface Maintenance.....	200.0	200.0	220.0	220.0	1,100
Total or Index**.....	261.7	266.0	268.1	291.5	13,700

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
50 Thousand Cubic Feet Per Day					
Direct Labor & Overhead.....	250.0	264.3	271.4	285.7	4,000
Fuel, Chemicals & Disposal.....	220.0	220.0	220.0	240.0	1,200
Surface Maintenance.....	300.0	300.0	300.0	333.3	5,000
Subsurface Maintenance.....	175.0	175.0	187.5	187.5	1,500
Total or Index**.....	250.0	254.8	259.5	278.6	11,700
250 Thousand Cubic Feet Per Day					
Direct Labor & Overhead.....	250.0	264.3	271.4	285.7	4,000
Fuel, Chemicals & Disposal.....	220.0	220.0	220.0	235.0	4,700
Surface Maintenance.....	291.7	295.8	295.8	329.2	7,900
Subsurface Maintenance.....	175.0	175.0	187.5	187.5	1,500
Total or Index**.....	247.0	251.5	254.5	274.2	18,100
500 Thousand Cubic Feet Per Day					
Direct Labor & Overhead.....	250.0	264.3	271.4	285.7	4,000
Fuel, Chemicals & Disposal.....	278.9	278.9	278.9	305.3	5,800
Surface Maintenance.....	294.7	294.7	294.7	326.3	6,200
Subsurface Maintenance.....	175.0	175.0	187.5	187.5	1,500
Total or Index**.....	263.3	266.7	270.0	291.7	17,500

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
250 Thousand Cubic Feet Per Day					
Direct Labor & Overhead.....	256.3	268.8	275.0	293.8	4,700
Fuel, Chemicals & Disposal.....	228.2	225.6	228.2	243.6	9,500
Surface Maintenance.....	274.4	276.9	276.9	305.1	11,900
Subsurface Maintenance.....	175.0	183.3	183.3	191.7	2,300
Total or Index**.....	243.4	246.2	248.1	267.9	28,400
500 Thousand Cubic Feet Per Day					
Direct Labor & Overhead.....	256.3	268.8	275.0	293.8	4,700
Fuel, Chemicals & Disposal.....	281.0	281.0	281.0	309.5	6,500
Surface Maintenance.....	273.5	273.5	273.5	300.0	10,200
Subsurface Maintenance.....	175.0	183.3	183.3	191.7	2,300
Total or Index**.....	257.8	261.4	262.7	285.5	23,700

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
250 Thousand Cubic Feet Per Day					
Direct Labor & Overhead.....	257.9	273.7	278.9	300.0	5,700
Fuel, Chemicals & Disposal.....	222.0	222.0	222.0	238.0	11,900
Surface Maintenance.....	282.5	285.0	285.0	315.0	12,600
Subsurface Maintenance.....	175.0	175.0	179.2	183.3	4,400
Total or Index**.....	236.8	239.8	241.4	260.2	34,600
500 Thousand Cubic Feet Per Day					
Direct Labor & Overhead.....	257.9	273.7	278.9	300.0	5,700
Fuel, Chemicals & Disposal.....	264.0	264.0	264.0	288.0	7,200
Surface Maintenance.....	282.9	285.7	285.7	314.3	11,000
Subsurface Maintenance.....	175.0	175.0	179.2	183.3	4,400
Total or Index**.....	248.5	252.4	254.4	274.8	28,300
1 Million Cubic Feet Per Day					
Direct Labor & Overhead.....	257.9	273.7	278.9	300.0	5,700
Fuel, Chemicals & Disposal.....	268.6	266.7	272.5	298.0	15,200
Surface Maintenance.....	261.5	261.5	264.1	289.7	11,300
Subsurface Maintenance.....	175.0	175.0	179.2	183.3	4,400
Total or Index**.....	248.1	249.6	254.1	275.2	36,600

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
500 Thousand Cubic Feet Per Day					
Direct Labor & Overhead.....	257.9	273.7	278.9	300.0	5,700
Fuel, Chemicals & Disposal.....	251.6	248.4	254.8	277.4	8,600
Surface Maintenance.....	261.5	261.5	264.1	289.7	11,300
Subsurface Maintenance.....	175.9	175.9	182.8	186.2	5,400
Total or Index**.....	237.3	239.0	244.1	262.7	31,000
1 Million Cubic Feet Per Day					
Direct Labor & Overhead.....	257.9	273.7	278.9	300.0	5,700
Fuel, Chemicals & Disposal.....	252.5	252.5	257.4	280.3	17,100
Surface Maintenance.....	261.5	261.5	264.1	289.7	11,300
Subsurface Maintenance.....	175.9	175.9	182.8	186.2	5,400
Total or Index**.....	240.5	242.6	247.3	266.9	39,500
5 Million Cubic Feet Per Day					
Direct Labor & Overhead.....	257.9	273.7	278.9	300.0	5,700
Fuel, Chemicals & Disposal.....	152.6	152.6	163.9	169.1	16,400
Surface Maintenance.....	269.4	273.5	277.6	304.1	14,900
Subsurface Maintenance.....	122.6	122.6	129.0	132.3	4,100
Total or Index**.....	187.2	189.8	198.0	209.7	41,100

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
50 Thousand Cubic Feet Per Day					
Flowlines and Connections.....	250.0	257.1	264.3	278.6	3,900
Production Package.....	176.2	176.2	185.7	195.2	8,200
Storage Tanks.....	160.7	167.9	173.2	178.6	10,000
Total or Index.....	177.7	182.1	189.3	197.3	22,100
250 Thousand Cubic Feet Per Day					
Flowlines and Connections.....	250.0	257.1	264.3	278.6	3,900
Production Package.....	176.2	176.2	185.7	195.2	8,200
Storage Tanks.....	160.7	167.9	173.2	178.6	10,000
Total or Index.....	177.7	182.1	189.3	197.3	22,100

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
50 Thousand Cubic Feet Per Day					
Flowlines and Connections.....	250.0	257.1	264.3	278.6	3,900
Production Package.....	176.2	176.2	185.7	195.2	8,200
Storage Tanks.....	160.7	167.9	173.2	178.6	10,000
Total or Index.....	177.7	182.1	189.3	197.3	22,100
250 Thousand Cubic Feet Per Day					
Flowlines and Connections.....	208.7	221.7	230.4	243.5	11,200
Production Package.....	191.9	194.6	197.3	208.1	7,700
Dehydrators.....	157.3	156.3	164.6	175.0	16,800
Storage Tanks.....	160.7	167.9	173.2	178.6	10,000
Total or Index.....	173.6	177.9	184.7	194.5	45,700
500 Thousand Cubic Feet Per Day					
Flowlines and Connections.....	185.3	200.0	208.8	220.6	7,500
Production Package.....	109.0	109.0	110.0	114.0	11,400
Dehydrators.....	157.3	156.3	164.6	175.0	16,800
Storage Tanks.....	160.7	167.9	173.2	178.6	10,000
Total or Index.....	144.4	147.2	152.4	159.8	45,700

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
250 Thousand Cubic Feet Per Day					
Flowlines and Connections.....	193.2	202.3	213.6	225.0	9,900
Production Package.....	109.0	109.0	110.0	114.0	11,400
Dehydrators.....	157.3	156.3	164.6	175.0	16,800
Storage Tanks.....	160.7	167.9	173.2	178.6	10,000
Total or Index.....	147.0	149.3	155.1	162.5	48,100
500 Thousand Cubic Feet Per Day					
Flowlines and Connections.....	186.1	200.0	211.1	222.2	8,000
Production Package.....	109.0	109.0	110.0	114.0	11,400
Dehydrators.....	157.3	156.3	164.6	175.0	16,800
Storage Tanks.....	160.7	167.9	173.2	178.6	10,000
Total or Index.....	144.8	147.6	153.1	160.4	46,200

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
250 Thousand Cubic Feet Per Day					
Flowlines and Connections.....	310.0	330.0	348.3	366.7	22,000
Production Package.....	109.0	109.0	110.0	114.0	11,400
Dehydrators.....	157.3	156.3	164.6	175.0	16,800
Storage Tanks.....	160.7	167.9	173.2	178.6	10,000
Total or Index.....	171.8	176.6	184.0	192.9	60,200
500 Thousand Cubic Feet Per Day					
Flowlines and Connections.....	323.1	348.1	367.3	386.5	20,100
Production Package.....	109.0	109.0	110.0	114.0	11,400
Dehydrators.....	157.3	156.3	164.6	175.0	16,800
Storage Tanks.....	160.7	167.9	173.2	178.6	10,000
Total or Index.....	170.4	175.7	182.9	191.8	58,300
1 Million Cubic Feet Per Day					
Flowlines and Connections.....	323.1	348.1	367.3	386.5	20,100
Production Package.....	109.0	109.0	110.0	114.0	11,400
Dehydrators.....	157.3	156.3	164.6	175.0	16,800
Storage Tanks.....	160.7	167.9	173.2	178.6	10,000
Total or Index.....	170.4	175.7	182.9	191.8	58,300

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
50 Thousand Cubic Feet Per Day					
Direct Labor & Overhead.....	261.5	269.2	276.9	292.3	3,800
Fuel, Chemicals & Disposal.....	300.0	300.0	300.0	300.0	600
Surface Maintenance.....	214.8	214.8	211.1	233.3	6,300
Subsurface Maintenance.....	133.3	133.3	150.0	150.0	900
Total or Index**.....	220.8	222.9	225.0	241.7	11,600
250 Thousand Cubic Feet Per Day					
Direct Labor & Overhead.....	261.5	269.2	276.9	292.3	3,800
Fuel, Chemicals & Disposal.....	220.0	220.0	220.0	240.0	2,400
Surface Maintenance.....	214.8	214.8	211.1	233.3	6,300
Subsurface Maintenance.....	133.3	133.3	150.0	150.0	900
Total or Index**.....	217.9	219.6	221.4	239.3	13,400

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
50 Thousand Cubic Feet Per Day					
Direct Labor & Overhead.....	253.3	266.7	273.3	286.7	4,300
Fuel, Chemicals & Disposal.....	220.0	220.0	220.0	240.0	1,200
Surface Maintenance.....	214.8	214.8	211.1	233.3	6,300
Subsurface Maintenance.....	155.6	166.7	166.7	177.8	1,600
Total or Index**.....	216.1	221.4	221.4	239.3	13,400
250 Thousand Cubic Feet Per Day					
Direct Labor & Overhead.....	253.3	266.7	273.3	286.7	4,300
Fuel, Chemicals & Disposal.....	225.0	225.0	225.0	240.0	4,800
Surface Maintenance.....	212.2	212.2	212.2	230.6	11,300
Subsurface Maintenance.....	155.6	166.7	166.7	177.8	1,600
Total or Index**.....	216.1	219.4	220.4	236.6	22,000
500 Thousand Cubic Feet Per Day					
Direct Labor & Overhead.....	253.3	266.7	273.3	286.7	4,300
Fuel, Chemicals & Disposal.....	236.0	232.0	244.0	264.0	6,600
Surface Maintenance.....	195.7	195.7	195.7	213.0	9,800
Subsurface Maintenance.....	155.6	166.7	166.7	177.8	1,600
Total or Index**.....	211.6	213.7	217.9	234.7	22,300

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
250 Thousand Cubic Feet Per Day					
Direct Labor & Overhead.....	258.8	270.6	276.5	294.1	5,000
Fuel, Chemicals & Disposal.....	231.7	229.3	236.6	251.2	10,300
Surface Maintenance.....	201.9	201.9	201.9	220.8	11,700
Subsurface Maintenance.....	164.3	164.3	171.4	178.6	2,500
Total or Index**	215.2	216.0	220.0	236.0	29,500
500 Thousand Cubic Feet Per Day					
Direct Labor & Overhead.....	258.8	270.6	276.5	294.1	5,000
Fuel, Chemicals & Disposal.....	235.7	232.1	246.4	267.9	7,500
Surface Maintenance.....	200.0	202.2	202.2	219.6	10,100
Subsurface Maintenance.....	164.3	164.3	171.4	178.6	2,500
Total or Index**	214.3	216.2	221.9	239.0	25,100

**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)				1997* Cost (dollars)
	1994	1995	1996	1997	
250 Thousand Cubic Feet Per Day					
Direct Labor & Overhead.....	284.2	294.7	300.0	321.1	6,100
Fuel, Chemicals & Disposal.....	231.4	229.4	233.3	251.0	12,800
Surface Maintenance.....	209.3	211.1	211.1	229.6	12,400
Subsurface Maintenance.....	162.1	165.5	169.0	175.9	5,100
Total or Index**	217.0	219.0	221.6	237.9	36,400
500 Thousand Cubic Feet Per Day					
Direct Labor & Overhead.....	284.2	294.7	300.0	321.1	6,100
Fuel, Chemicals & Disposal.....	231.3	225.0	237.5	256.3	8,200
Surface Maintenance.....	210.6	212.8	212.8	231.9	10,900
Subsurface Maintenance.....	162.1	165.5	169.0	175.9	5,100
Total or Index**	215.7	217.3	222.0	238.6	30,300
1 Million Cubic Feet Per Day					
Direct Labor & Overhead.....	284.2	294.7	300.0	321.1	6,100
Fuel, Chemicals & Disposal.....	234.4	231.1	241.0	260.7	15,900
Surface Maintenance.....	210.6	212.8	212.8	231.9	10,900
Subsurface Maintenance.....	162.1	165.5	169.0	175.9	5,100
Total or Index**	219.9	221.2	226.3	243.6	38,000

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 economics from 1976 through 1997.

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). Each deflated index would equal 100 if the change in cost matched the change in the GDP for that index. The results appear in Tables N1 and N2 and are illustrated in Figures N1 and N2.

Although 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 122.8 and continued in a general decline to a low of 70.8 in 1994. Volatile tubing prices have been the largest part of the

changing equipment costs for much of the time but are less so than non-tubing equipment costs in the period 1994-1997. Gas well equipment prices, as shown in Figure N1, changed less than oil equipment prices, but only slightly. Equipment price trends are upward from 1994 to 1997.

The deflated indices for operating costs for both oil and gas leases peaked in 1982 at 145.2 and 122.8, respectively, and declined until 1992 for oil leases and 1996 for gas leases, followed by increases through 1997. The decline was primarily a reflection of the decrease in drilling activity and workovers which caused service companies to cut prices and their own costs drastically to stay in business. During 1997, both drilling and well service activity reached levels believed by some observers to be limited by either equipment or personnel.

Table N1. Indices and Gross Domestic Product Deflated Indices of the Aggregate Average Equipping Costs for Oil and Gas Fields and the Producer Price Index (PPI) (Capital Equipment)

Year	Indices				Gross Domestic Product Deflated Indices		
	Oil	Gas	PPI ^a	Deflator ^b	Oil	Gas	PPI
1976	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1977	110.2	116.1	106.4	106.4	103.6	109.1	100.0
1978	120.7	127.3	114.8	114.1	105.7	111.5	100.6
1979	133.0	142.2	124.8	123.9	107.4	114.8	100.7
1980	154.4	161.4	138.2	135.3	114.1	119.3	102.1
1981	181.8	176.7	152.3	148.0	122.8	119.4	102.9
1982	191.6	183.4	161.0	157.3	121.8	116.6	102.4
1983	170.2	168.9	165.5	164.0	103.8	103.0	100.9
1984	190.0	160.5	169.4	170.2	111.7	94.3	99.6
1985	165.4	159.3	173.1	176.0	94.0	90.5	98.3
1986	147.1	153.0	176.7	180.6	81.4	84.7	97.8
1987	170.9	162.4	179.9	186.2	91.8	87.2	96.6
1988	169.6	172.6	184.1	193.0	87.9	89.4	95.4
1989	178.0	176.1	191.3	201.0	88.5	87.6	95.2
1990	170.9	189.3	197.9	209.8	81.4	90.2	94.3
1991	169.6	192.3	204.0	218.1	77.8	88.2	93.5
1992	178.0	200.9	207.9	224.3	79.4	89.6	92.7
1993	169.9	206.4	211.6	230.1	73.8	89.7	92.0
1994	166.6	184.2	215.9	235.4	70.8	78.2	91.7
1995	177.1	190.2	220.1	241.7	73.3	78.7	91.1
1996	183.9	196.6	222.7	247.2	74.4	79.5	90.1
1997	197.7	206.0	222.5	252.3	78.3	81.6	88.2

^aProducer Price Index (Capital Equipment) obtained from the Bureau of Labor Statistics, U.S. Department of Labor.

^bGross Domestic Implicit Price Deflators were obtained from the Bureau of Economic Analysis, U.S. Department of Commerce.

Notes: The aggregate average costs are the average of the costs from summary Tables 1 and 6 and do not represent the average costs of all wells in the United States.

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

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

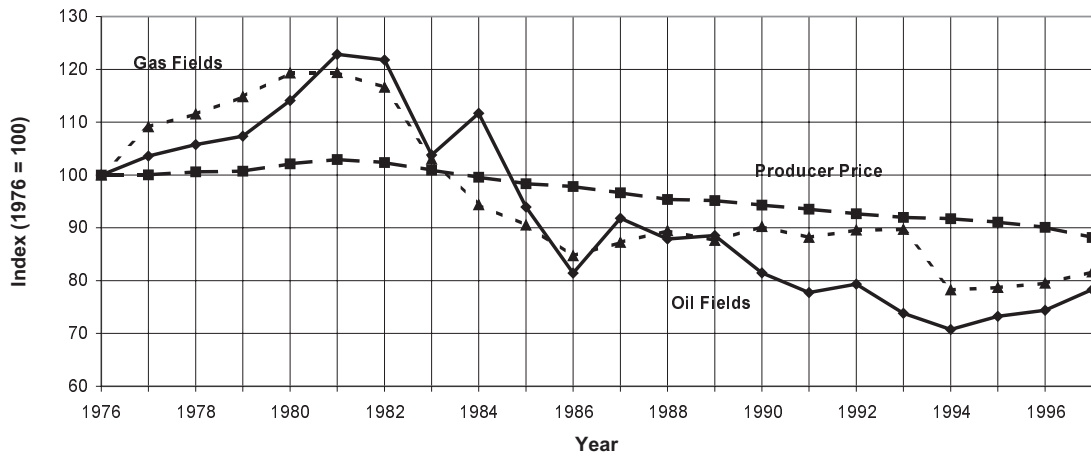
Year	GDP Implicit Price Deflator ^a	Indices		Gross Domestic Product Deflated Indices	
		Oil	Gas	Oil	Gas
1976	100.0	100.0	100.0	100.0	100.0
1977	106.4	117.5	114.6	110.4	107.7
1978	114.1	130.3	121.8	114.1	106.7
1979	123.9	144.0	135.8	116.2	109.6
1980	135.3	174.2	156.4	128.7	115.6
1981	148.0	204.2	181.5	138.0	122.6
1982	157.3	228.4	193.2	145.2	122.8
1983	164.0	226.2	190.8	137.9	116.3
1984	170.2	230.1	192.0	135.2	112.8
1985	176.0	232.2	190.7	131.9	108.3
1986	180.6	212.9	181.1	117.9	100.3
1987	186.2	210.5	177.4	113.1	95.3
1988	193.0	220.1	184.9	114.0	95.8
1989	201.0	229.1	189.6	114.0	94.3
1990	209.8	239.6	200.9	114.2	95.8
1991	218.1	242.9	204.7	111.4	93.9
1992	224.3	247.9	208.5	110.5	93.0
1993	230.1	257.8	216.0	112.1	93.9
1994	235.4	270.7	216.0	115.0	91.8
1995	241.7	268.8	218.9	111.2	90.6
1996	247.2	282.9	222.6	114.4	90.1
1997	252.3	293.8	235.8	116.4	93.5

^aGross Domestic Product Implicit Price Deflators were obtained from the Bureau of Economic Analysis, U.S. Department of Commerce.

Notes: The aggregate average costs are the average of the costs from summary Tables 3 and 14 and do not represent the average costs of all wells in the United States.

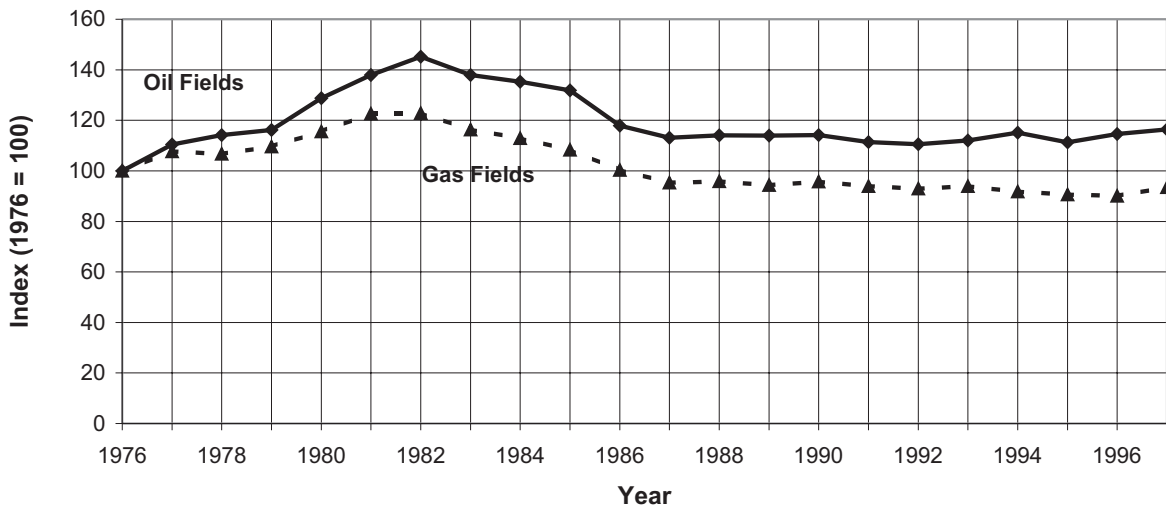
Source: Energy Information Administration, Office of Oil and Gas.

Figure N1. Gross Domestic Product Deflated Producer Price Indices, and Oil and Gas Field Equiping 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 is usually based on the application of processes which involve capital expenditures.

***ad valorem*:** The basis for taxation of oil and gas operating properties, 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.

LACT: Lease automatic custody transfer, generally refers to unattended metering of oil sales from leases.

Mcf: One thousand (standard) 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 recovering oil or gas relying on natural pressure in the reservoir rocks to expel substances to surface facilities for treatment and sale.

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

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 or an oil well which produces less than 15 barrels of oil 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.