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Costs and Indices for Domestic Oil and Gas Field Equipment and Production Operations

1996 Through 1999

March 2000

Energy Information Administration
Office of Oil and Gas
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Preface

This is the Energy Information Administration's (EIA's) seventeenth 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 press Data Publications and scroll down to select the appropriate self-extracting file for downloading)

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Executive Summary

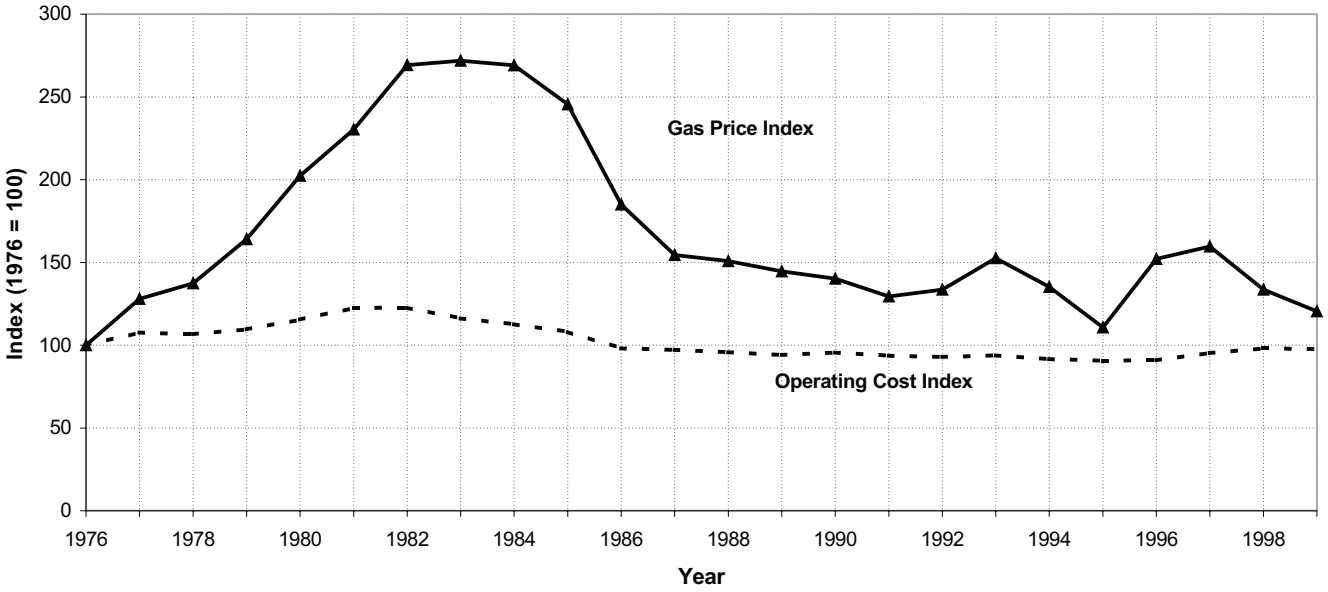
This report presents estimated costs and cost indices for domestic oil and natural gas field equipment and production operations for 1996, 1997, 1998, and 1999. The costs of all equipment and services are those in effect during June of each year. The sums (aggregates) of the costs for representative 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. This report contains summary tables as well as the appendices, which 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 1998 oil price, after dropping from 1996, represents the lowest deflated oil price since 1976. By contrast, deflated gas prices have remained above 1976 prices, but were at a low in 1995. Oil prices for 1999 moved upward from 1998 levels while 1999 gas prices moved down. Clearly, the price trends reflect fundamental differences between the markets for oil and gas.

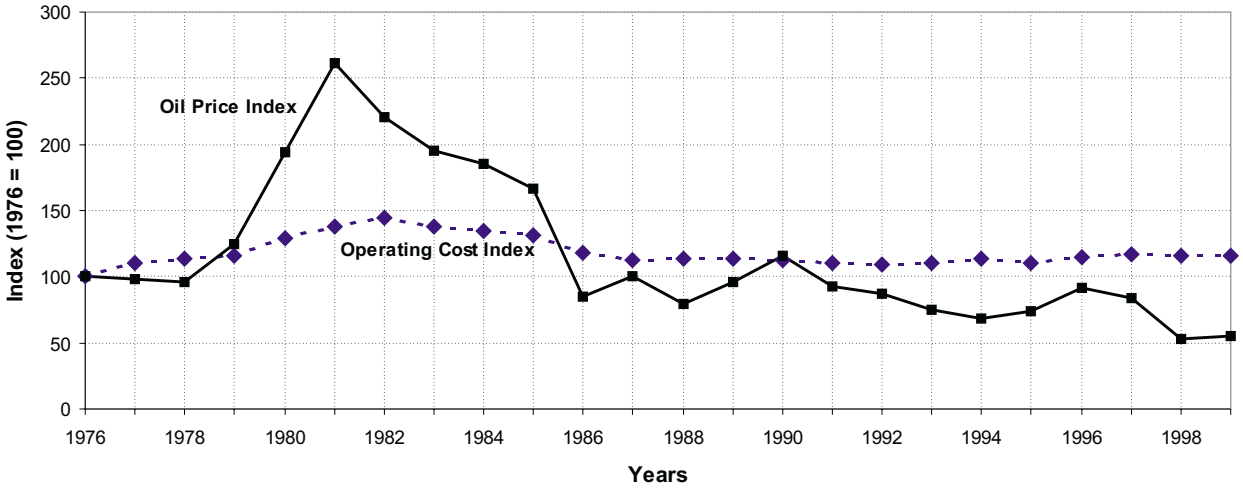
Figure ES1, with gas prices and operating costs indexed to 1976, shows the differences from 1976 values of deflated gas prices and deflated operating costs for gas wells. The greatest difference between the two series was during 1984, and the current downward trend in product prices, contrasted with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

Figure ES1. Deflated Natural Gas Prices and Operating Cost Indices



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

Figure ES2. Deflated Oil Price and Operating Cost Indices



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

Gas activity has been spurred in recent years by favorable tax treatment (including tax credits for tight gas formations and 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. First, the gas price index has remained above the 1976 base, while oil prices rose above the base only twice since 1986, in 1987 and 1990. The 1999 deflated oil prices are only 20 percent of the peak price in 1981. Second, the oil operating cost index values have remained above 1976 levels while gas operating index values fell below 1976 values in 1986, and have fluctuated within a relatively narrow range since. The 1999 operating index value for oil and gas dropped slightly.

Oil operating costs were studied by obtaining equipment and operating costs for representative oil leases for 6 onshore regions of the lower 48 States. Each lease consists of 10 wells producing by primary means (natural depletion) from depths of 2,000, 4,000, 8,000, and 12,000 feet. The aggregate average lease equipment costs for the six regions and four depths dropped slightly from 1997 to 1998 after rising from 1994. Since 1995, non-tubing costs have risen more than tubing prices, which dropped in 1998.

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. Costs and indices for additional waterflood oil recovery equipment and its operation were calculated for leases with well depths of 2,000, 4,000, and 8,000 feet in west Texas. Cost differentials between primary and secondary and primary operations in this region are presumed to be similar to those in other areas.

The aggregate average additional equipment cost for secondary recovery (waterflood) in 1999 was about 12 percent more than in 1996. Waterflood operating costs showed an increase of about 9 percent from 1996 to 1999 while primary oil recovery operating costs rose nearly 5 percent in the same period.

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, differ between primary and secondary operations and differ 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.

Data used in this work are revised for at least one year. Late arrival of data necessitates using estimates in some cases, and in other cases, small items have been grouped to reduce reporting burdens on data suppliers. In general, since 1976, data gathering has become more challenging, in part due to restructuring of the industry, and in part due to normal changes in product lists. Care is exercised in understanding the cost trends in the various supplier industry components, to avoid the use of prices which are not representative of the whole.

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 not adjusted for inflation.

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

- 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.

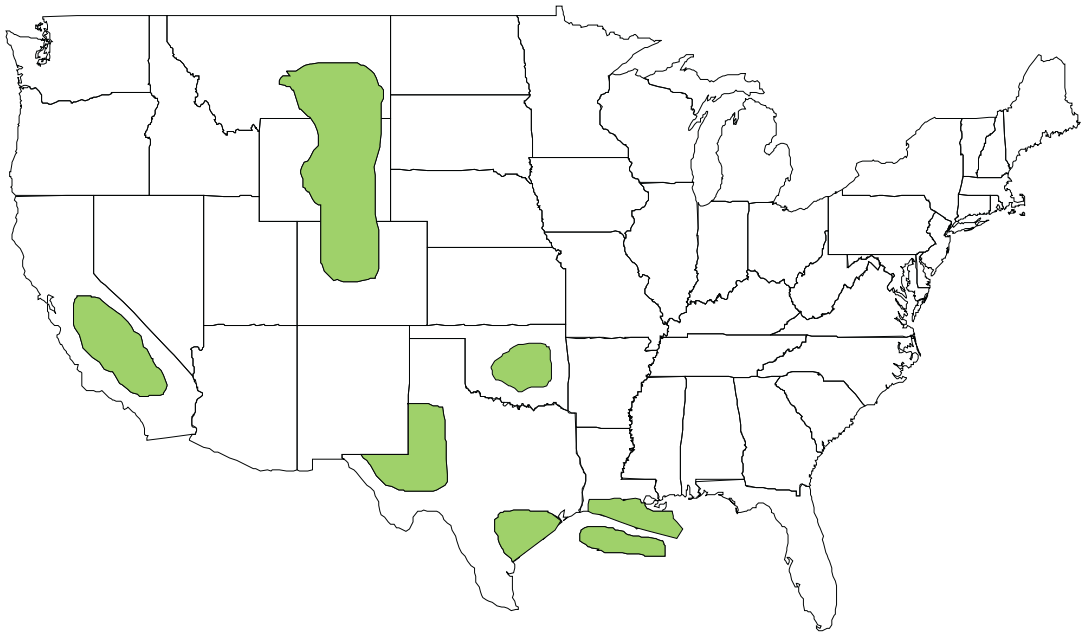
Equipment for gas wells does not cover hydrogen sulfide removal, compression, or special equipment for water removal. Tubing is also not included in the equipment list for gas wells.

[1] American Petroleum Institute, Independent Petroleum Association of America, Mid-Continent Oil and Gas Association, *1998 Joint Association Survey on Drilling Costs*. (Washington, DC, November 1999), American Petroleum Institute.

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

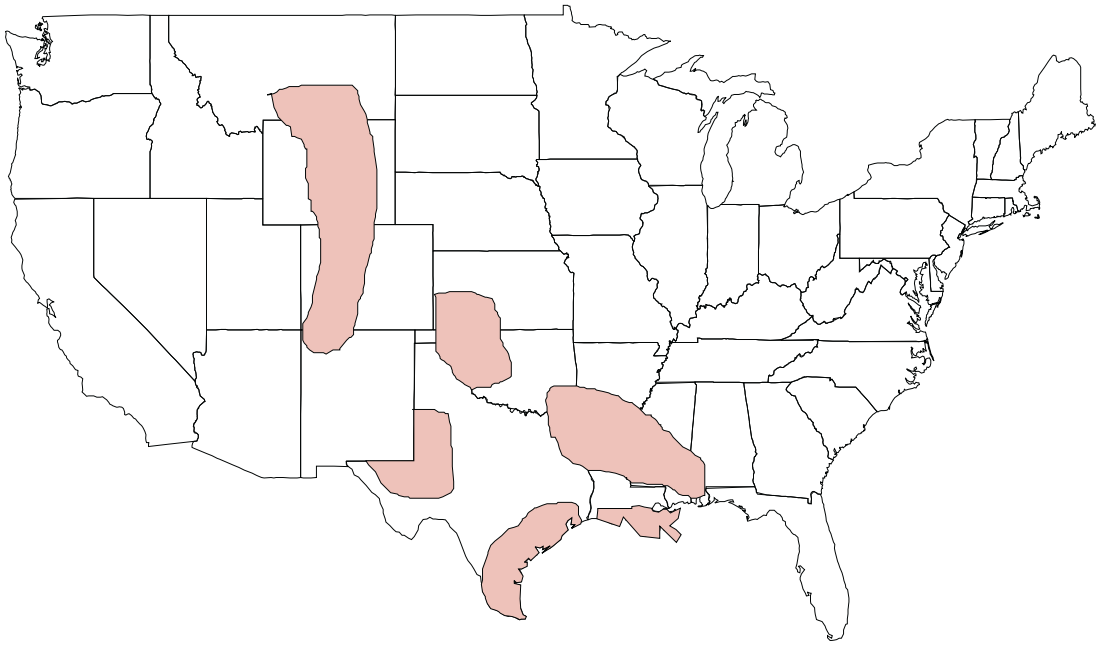
[3] U.S. Bureau of the Census, *Annual Survey of Oil and Gas, 1981*, Current Industrial Reports pub. MA-13K (81)-1, (Washington, DC, March 1983).

Figure 1. Geographical Regions for Oil Producing Leases



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

Figure 2. Geographical Regions for Gas Producing Leases



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

2. Indexing Procedure

The leading supply, service, and contracting companies (active in one or more of the regions) were contacted every year (1976 through 1999) 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:

1999 index = (1999 costs/1976 costs) x 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 1998 to 1999, divide the 1999 index by the 1998 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 1999 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 1999. (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 1999 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.

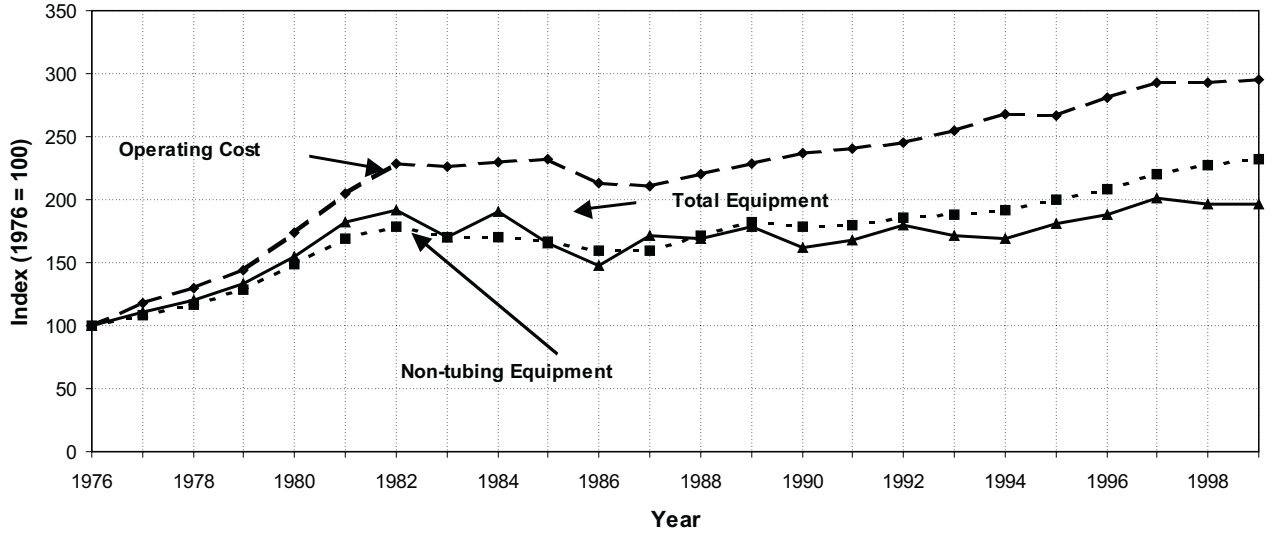
Figure 4 is a plot of tubing costs for 10-well oil leases. The type of tubing used for deeper wells not only costs more than that used for shallower wells, but price variations have been more extreme. Prices for 12,000-foot wells have fluctuated in a narrow range since 1994 and both 1998 and 1999 showed price drops. 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, 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 1999 index of non-tubing equipment cost for all depths is about 232, which is 132 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 time, an anomaly related to the mixture of pumping equipment types used for 8,000-foot wells.

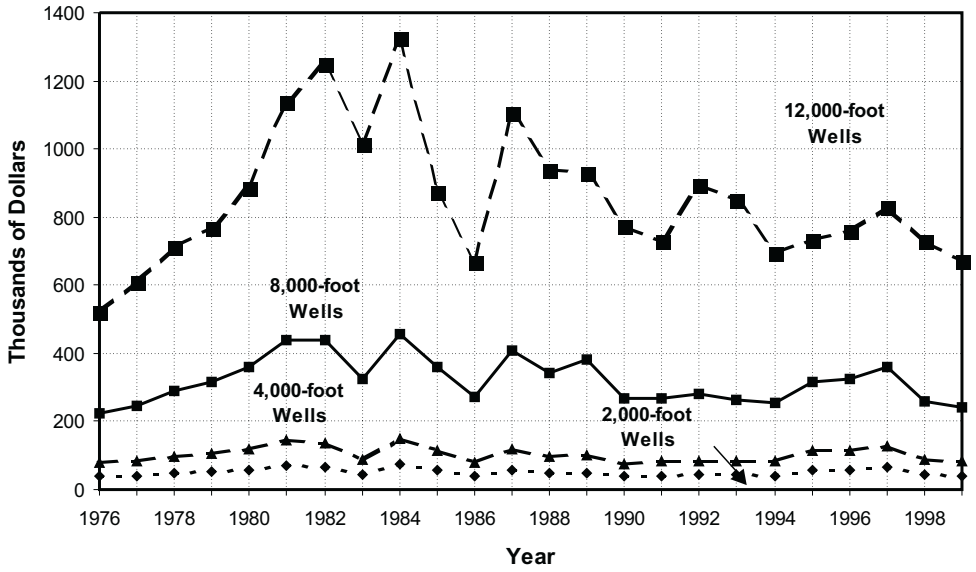
The availability of well service units (WSUs) is widely used as an indicator of price pressures on operating costs. When

Figure 3. Aggregate Average Cost Indices for Primary Oil Recovery, 1976-1999 (Operation and Equipment, With and Without Tubing Costs)



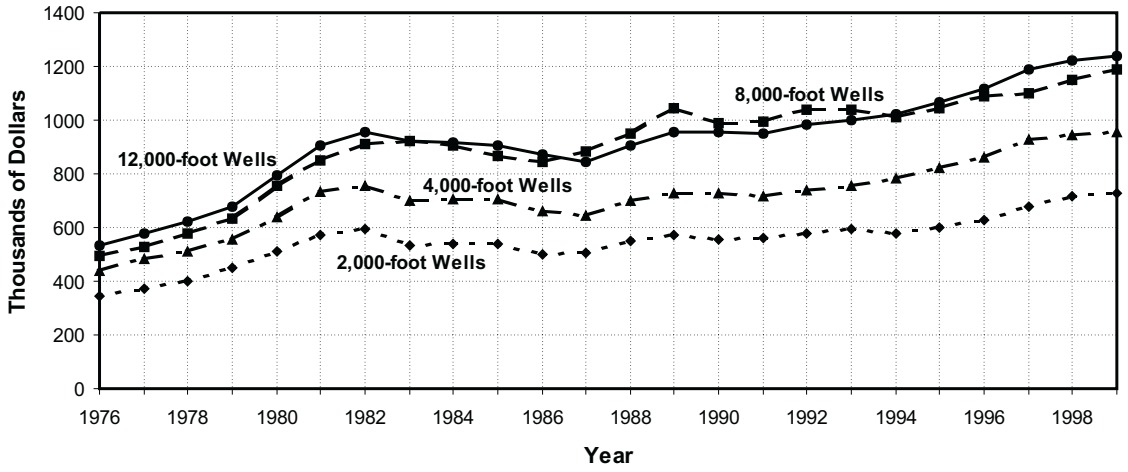
Source: Energy Information Administration, Office of Oil and Gas

Figure 4. Tubing Costs for Oil Leases, 1976-1999 (10 Producing Wells)



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

Figure 5. Non-tubing Equipment Costs for Oil Leases, 1976-1999 (10 Producing Wells)



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

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, except for 1998 and 1999, when it dropped. 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 1999 surveys reflect that 59 percent of the WSUs were working. Industry reports show that there are labor constraints that limit the current level of active WSUs in some areas, thus indicating a need for 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 1999 has been upward, although prices were flat from 1998 to 1999. 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 4.4percent in the period from 1996 to 1999. 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 4.4percent and 5.1 percent, respectively, from 1996 to 1999.

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 12 percent for the 1996-1999 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. 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. Low oil prices helped push drilling costs lower in 1998 and 1999. Figure 9 shows the additional costs of waterflood equipment for depths of 2,000, 4,000, and 8,000 feet for 1996 through 1999.

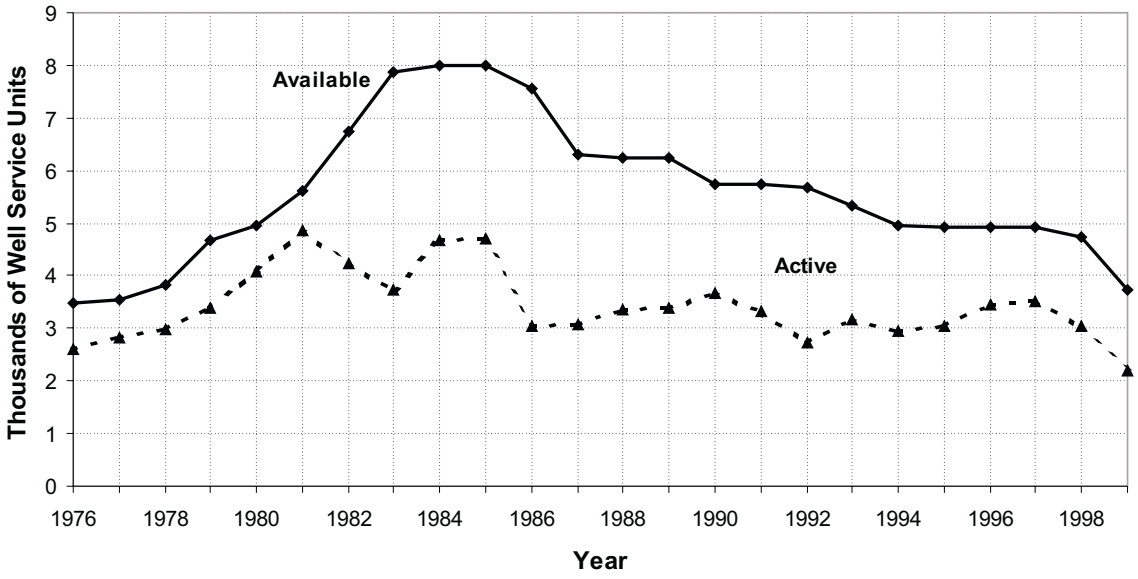
Operating Costs for Oil Leases

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 $229,700 for the 10-well lease in 1999. This represents about a 5.1 percent increase over 1996. Examination of Table 3 shows that most costs for oil operations rose from 1996 to 1999. The 1976 to 1997 history of aggregate operating costs is shown in Figure 3. The upward trend in operating costs began in 1988.

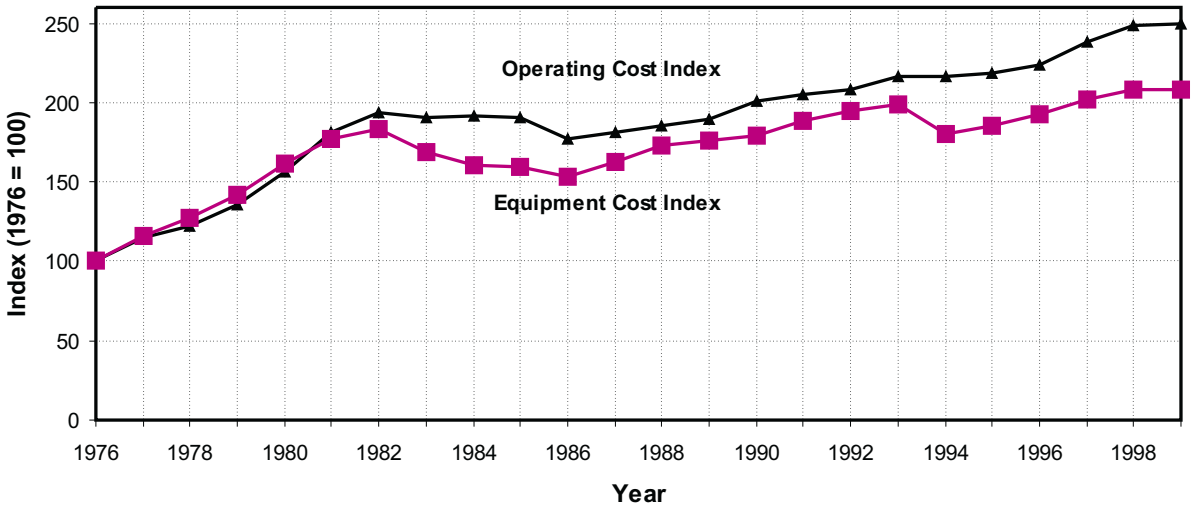
Changes in individual components of operating costs show large variations. Fuel, power and water costs comprise one of the most volatile components for oil leases, primarily due to changes in the average price of natural gas in the different regions. Overall costs for fuel, power and water ranged from drops of about 4 percent for the 1996-1999 period for California, from 6 to 17 percent for the Rocky Mountains, and from 20 to 25 percent in the other regions. 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 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.

Figure 6. Active Well Service Units, 1976-1999



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

Figure 7. Aggregate Average Cost Indices for Gas Recovery, 1976-1999 (Operation and Non-tubing Equipment Costs)



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)

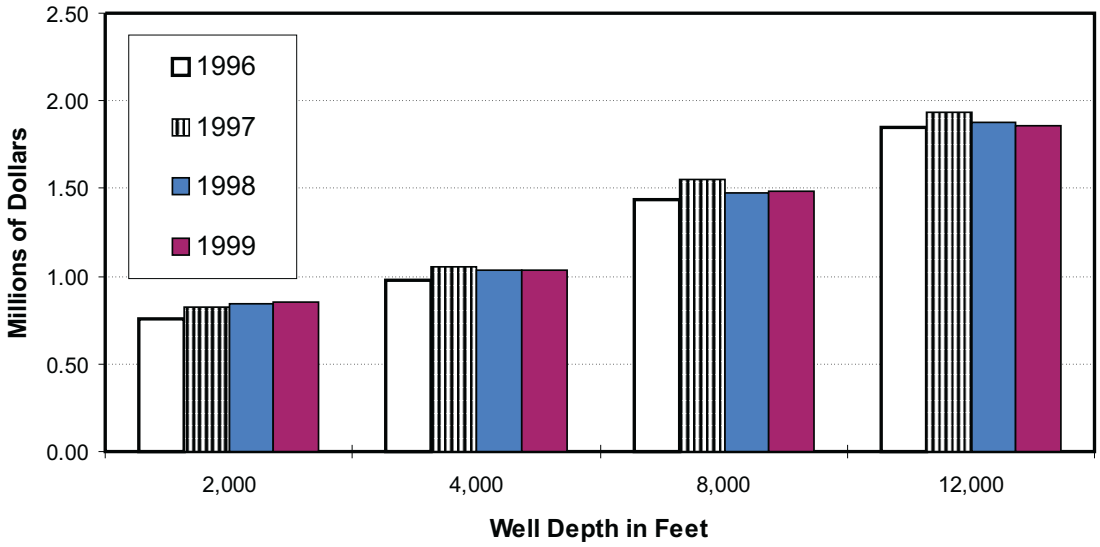
Area	Index (1976=100) 1996	1997	1998	1999	1999* Cost (dollars)
			2,000-Foot Wells		
California	187.8	203.2	201.7	208.5	1,046,700
Oklahoma	210.5	230.2	237.2	240.5	841,100
South Louisiana	205.5	225.3	230.4	231.6	857,300
South Texas	201.2	218.5	224.1	225.8	802,600
West Texas	196.5	214.1	221.7	223.6	789,200
Rocky Mountains	193.8	216.8	224.3	225.5	794,500
Average or Index	**198.5**	**217.1**	**221.9**	**224.8**	**855,200**
			4,000-Foot Wells		
California	167.0	180.2	175.6	180.0	1,264,500
Oklahoma	202.3	210.5	207.9	209.5	1,054,700
South Louisiana	218.0	245.8	241.0	237.3	1,010,700
South Texas	202.8	223.6	218.8	215.9	940,500
West Texas	186.0	192.4	190.3	190.6	969,000
Rocky Mountains	180.8	197.2	194.1	194.5	987,500
Average or Index	**190.3**	**205.2**	**201.5**	**201.9**	**1,037,800**
			8,000-Foot Wells		
California	173.5	182.6	172.1	177.5	1,620,500
Oklahoma	217.9	227.5	217.3	218.2	1,599,200
South Louisiana	218.0	246.6	237.0	232.6	1,281,900
South Texas	198.5	220.1	210.6	207.0	1,169,200
West Texas	182.8	191.4	184.6	186.2	1,651,700
Rocky Mountains	167.8	184.8	175.7	175.3	1,573,800
Average or Index	**189.8**	**204.4**	**195.2**	**195.7**	**1,482,700**
			12,000-Foot Wells		
California	172.9	181.4	175.1	175.5	1,976,300
Oklahoma	191.6	200.5	196.2	194.2	1,886,300
South Louisiana	186.0	196.2	190.9	187.9	1,939,300
South Texas	184.1	190.8	185.5	182.9	1,856,600
West Texas	174.4	181.3	178.5	176.5	1,754,300
Rocky Mountains	177.4	187.1	180.4	177.3	1,742,800
Average or Index	**180.9**	**189.4**	**184.2**	**182.2**	**1,859,300**
Aggregate Average	**187.7**	**200.6**	**196.0**	**195.9**	**1,308,800**

* Preliminary

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

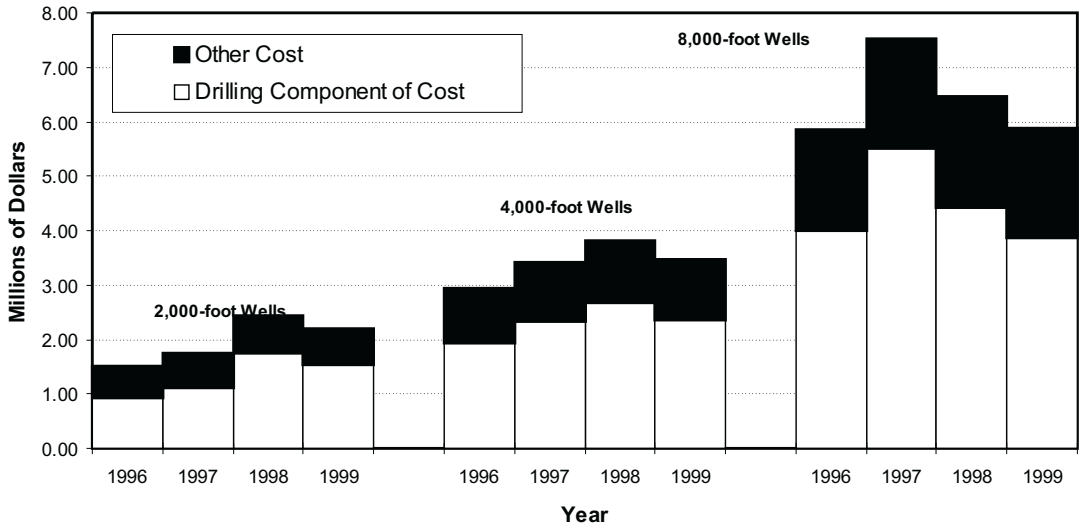
Source: Energy Information Administration, Office of Oil and Gas

Figure 8. Aggregate Average Lease Equipment Costs for Primary Oil Recovery, 1996-1999 (10 Producing Wells)



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

Figure 9. Additional Cost of Lease Equipment for Secondary Recovery in West Texas, 1996-1999 (10 Producing and 11 Injection Wells)



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) 1996	1997	1998	1999	1999* Cost (dollars)
			2,000-Foot Wells		
Injection Equipment	238.8	249.8	286.3	279.0	547,300
Producing Equipment	158.2	192.2	172.0	170.9	138,100
Injection Wells**	173.5	208.0	328.1	287.8	1,524,700
Total or Index	187.9	216.7	302.4	274.0	2,210,100
			4,000-Foot Wells		
Injection Equipment	226.8	237.3	271.7	264.7	546,800
Producing Equipment	162.2	180.9	170.4	169.5	559,100
Injection Wells**	169.5	205.6	236.2	207.2	2,351,600
Total or Index	**175.2**	**204.6**	**227.6**	**206.8**	**3,457,500**
			8,000-Foot Wells		
Injection Equipment	231.9	243.6	284.2	275.3	934,200
Producing Equipment	156.6	172.4	157.2	155.5	1,068,800
Injection Wells**	134.3	184.9	148.2	130.0	3,874,600
Total or Index	**146.4**	**187.8**	**161.3**	**146.7**	**5,877,600**
Aggregate Average	**159.0**	**195.7**	**195.9**	**178.0**	**3,848,400**

* 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

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.

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 about 9 percent from 1996 to 1999. The components present two different trends: the normal daily costs and surface repair costs rose from 1996 to 1999 while subsurface repair costs rose in 1997 and 1998, then dropped in 1999. The decrease was caused by lower WSU costs and lower equipment repair costs. Fuel, power, and water costs for secondary recovery operations decreased by about 1 percent for the 1996-1999 period and costs for primary recovery operations in this region decreased about 23 percent for the same period. The differences in the changes for fuel, power, and water costs occurred because engines powered by natural gas engines 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 7 years of the 1976 to 1999 period indicated indices in excess of those for primary oil operation. And, although 1999 was one of those years, it was also a time when the two index trends almost converged.

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 average onshore lease, and this is reflected in operating costs. The aggregate average of costs at all water depths increased by about 23 percent from 1996 to $4,658,900 per platform in 1999.

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 8.2 percent for the 1996-1999 period. Table 6 shows that the overall aggregate average gas lease has an equipment cost of $48,700 in 1999.

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 1996-1999 change in equipment costs ranged from an increase of 4 percent for wells producing 10,000 Mcf of gas per day to an increase of about 11 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 1999 were positive for all wells, and ranged from increases of 6.1 to 9.3 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 1996 through 1999 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 11.8 percent from 1996 to 1999, to $26,500. 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 1999, wells producing 10,000 Mcf per day exhibited an operating cost increase of about 5.7 percent, while costs for wells producing at a rate of 250 Mcf per day rose at about 13.6 percent.

Figure 16 shows the gas well operating cost by producing rate for the years from 1996 to 1999. From this depiction, the annual increase in operating cost from 1996 to 1997 stands out from the remaining periods.

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 1999 show moderate variation across time. The cost changes ranged from 9.8 to 14.5 percent from 1996 to 1999. 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 cause 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. Therefore, wells which produce less than 250 thousand cubic feet of gas per day have higher fuel, chemical and disposal costs, and higher surface maintenance costs.

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

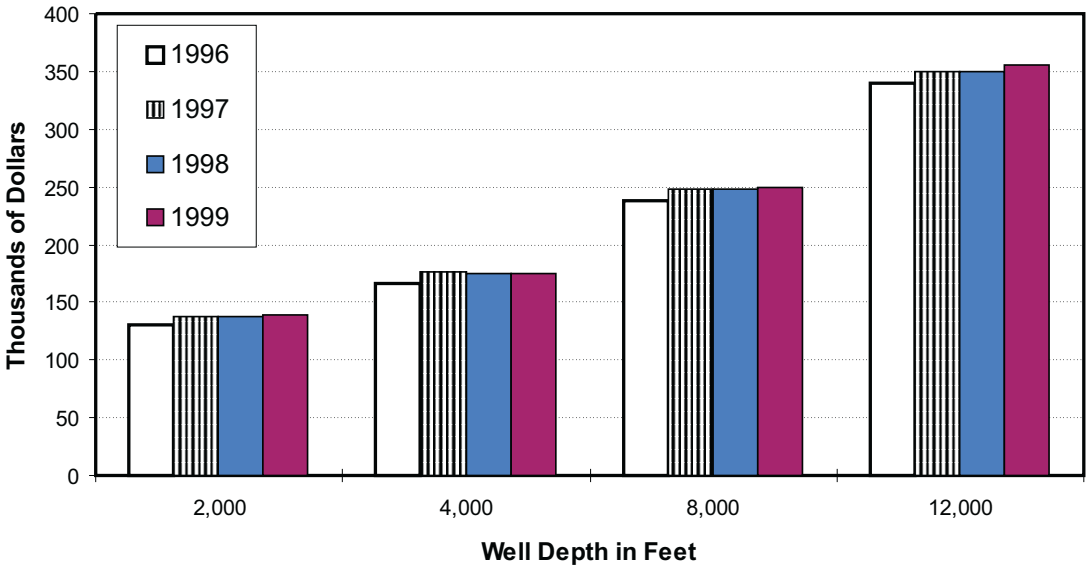
Area	Index (1976=100) 1996	1997	1998	1999	1999* Cost (dollars)
			2,000-Foot Wells		
California	267.1	278.4	281.2	282.3	154,400
Oklahoma	261.6	279.8	273.5	273.7	121,800
South Louisiana	260.3	284.6	279.4	280.1	152,400
South Texas	254.3	262.5	255.7	258.1	141,700
West Texas	243.2	253.1	258.1	261.6	119,300
Rocky Mountains	228.2	241.8	254.8	255.5	142,300
Average or Index	**252.5**	**266.7**	**267.2**	**268.8**	**138,700**
			4,000-Foot Wells		
California	284.5	291.9	294.6	295.9	204,200
Oklahoma	264.6	283.4	275.2	275.6	141,100
South Louisiana	260.1	286.6	278.8	275.6	215,500
South Texas	240.9	250.1	244.1	244.0	192,000
West Texas	244.2	254.7	257.2	259.2	137,400
Rocky Mountains	224.6	238.1	249.1	250.2	160,400
Average or Index	**253.3**	**267.6**	**266.5**	**266.5**	**175,100**
			8,000-Foot Wells		
California	369.7	370.2	374.0	377.4	349,500
Oklahoma	320.3	333.2	331.7	335.6	253,400
South Louisiana	267.2	294.6	286.6	284.2	258,300
South Texas	250.3	260.8	252.0	251.3	233,200
West Texas	243.4	255.1	253.5	252.9	186,900
Rocky Mountains	211.4	222.5	234.8	245.0	216,600
Average or Index	**277.4**	**289.6**	**289.0**	**291.4**	**249,700**
			12,000-Foot Wells		
California	384.6	382.0	387.3	392.0	510,800
Oklahoma	324.0	338.2	334.6	337.7	302,200
South Louisiana	293.2	309.9	306.9	311.3	357,400
South Texas	291.4	300.3	296.3	299.9	358,100
West Texas	290.8	300.3	300.3	305.2	288,100
Rocky Mountains	285.3	294.8	307.5	313.1	315,000
Average or Index	**313.8**	**322.7**	**323.9**	**328.4**	**355,300**
Aggregate Average	**280.8**	**292.7**	**292.8**	**295.2**	**229,700**

* Preliminary

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

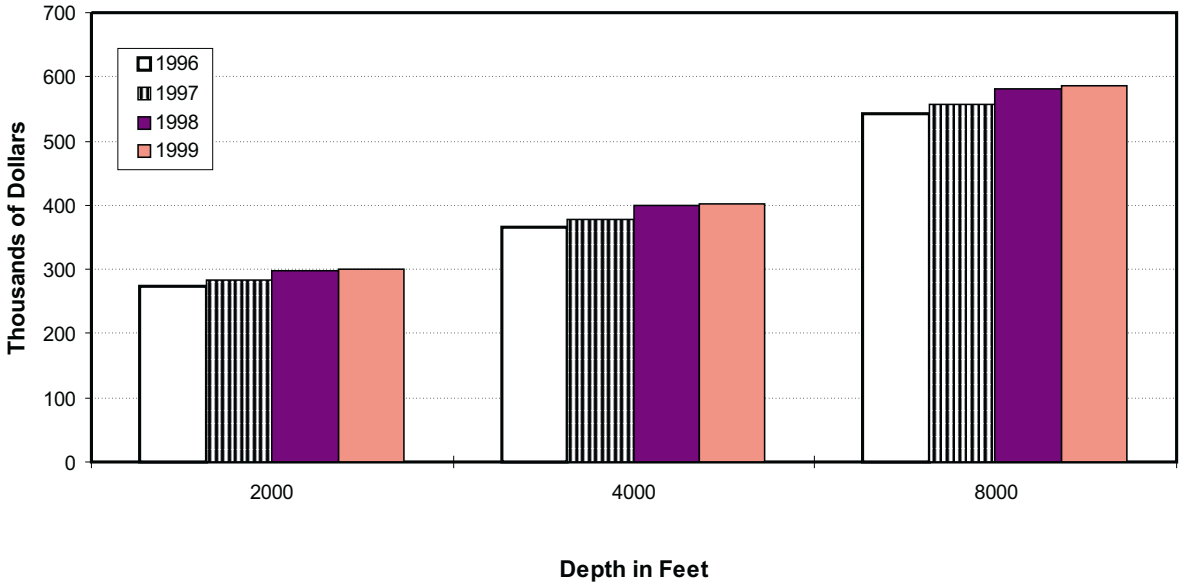
Source: Energy Information Administration, Office of Oil and Gas

Figure 10. Aggregate Operating Costs for Primary Oil Recovery Operations, 1996-1999



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

Figure 11. Annual Operating Costs for Secondary Oil Recovery in West Texas, 1996-1999 (10 Producing and 11 Injection Wells)



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) 1996	1997	1998	1999	1999* Cost (dollars)
			2,000-Foot Wells		
Normal Daily	272.0	283.6	296.1	299.2	184,600
Surface Repair	234.1	236.9	260.8	269.6	58,500
Subsurface Repair	198.2	205.1	214.0	206.6	56,200
Total or Index	**246.4**	**255.2**	**269.0**	**270.6**	**299,300**
			4,000-Foot Wells		
Normal Daily	269.6	279.4	293.1	297.2	224,700
Surface Repair	239.1	243.1	268.2	277.3	95,100
Subsurface Repair	194.1	201.2	209.3	202.5	82,600
Total or Index	**242.2**	**250.0**	**264.8**	**267.0**	**402,400**
			8,000-Foot Wells		
Normal Daily	283.9	292.2	301.4	305.4	320,700
Surface Repair	241.6	244.2	268.9	278.4	105,800
Subsurface Repair	202.7	209.2	216.8	210.7	158,900
Total or Index	**248.5**	**255.2**	**266.6**	**268.0**	**585,400**
Aggregate Average	**246.0**	**253.5**	**266.5**	**268.3**	**429,000**

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

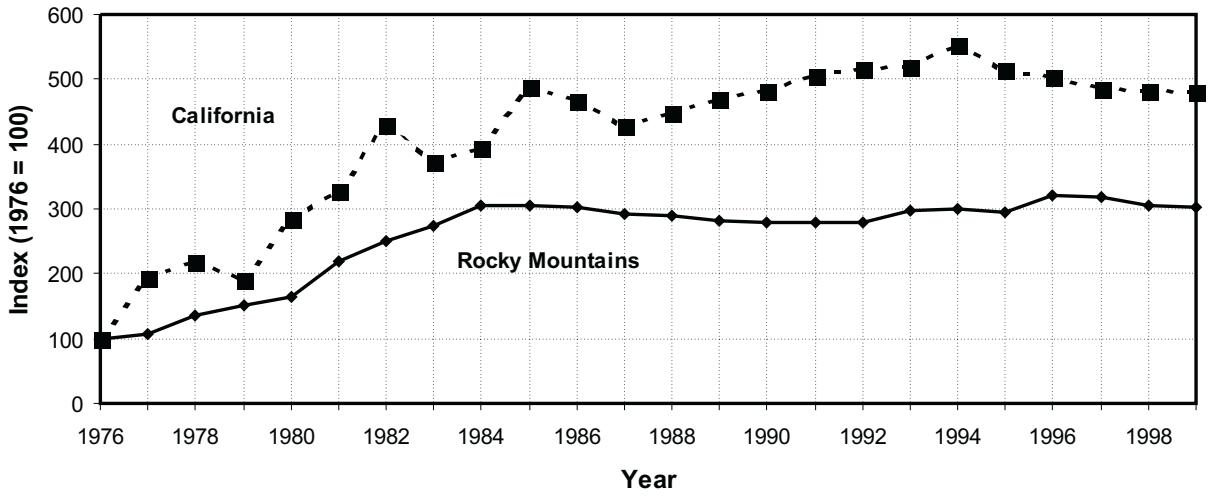
Water Depth	Index (1976=100) 1996	1997	1998	1999	1999* Cost (dollars)
			12-Slot Platforms		
100 Foot	262.0	331.5	337.0	323.7	3,979,300
300 Foot	255.8	322.2	328.3	314.5	4,131,000
Average or Index	**258.8**	**326.7**	**332.5**	**319.0**	**4,055,200**
			18-Slot Platforms		
100 Foot	253.2	321.0	328.7	313.6	4,849,100
300 Foot	250.6	317.0	325.4	309.6	5,030,320
600 Foot	236.5	293.9	300.1	287.5	5,305,000
Average or Index	**246.2**	**309.8**	**317.1**	**302.7**	**5,061,500**
Aggregate Average	**250.4**	**315.5**	**322.3**	**308.2**	**4,658,900**

* Preliminary

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

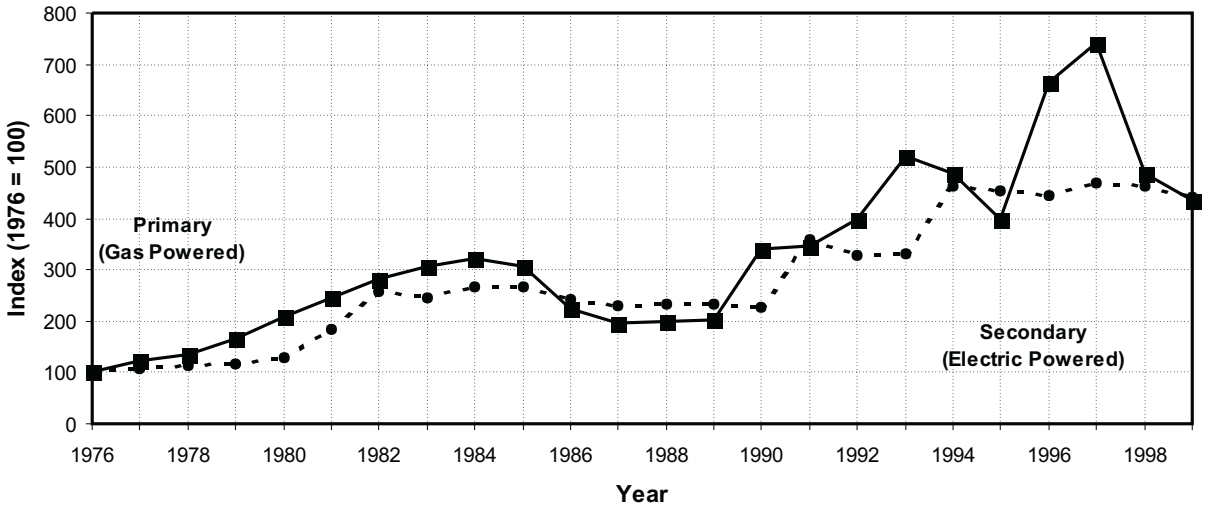
Source: Energy Information Administration, Office of Oil and Gas

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



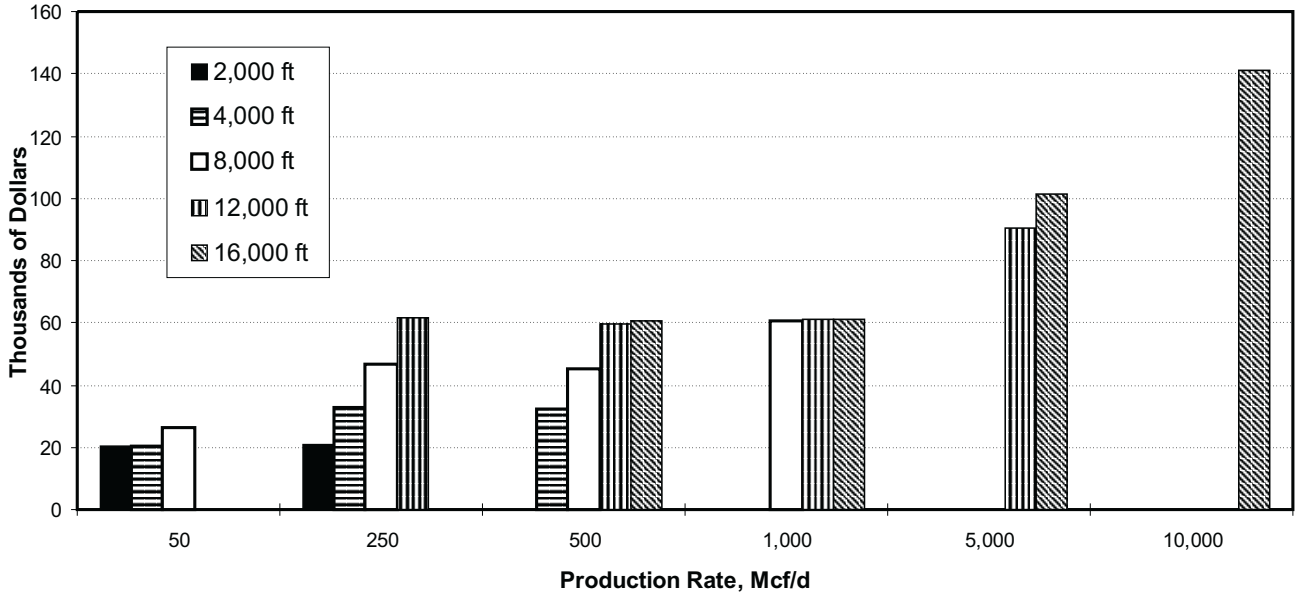
Source: Energy Information Administration, Office of Oil and Gas.

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



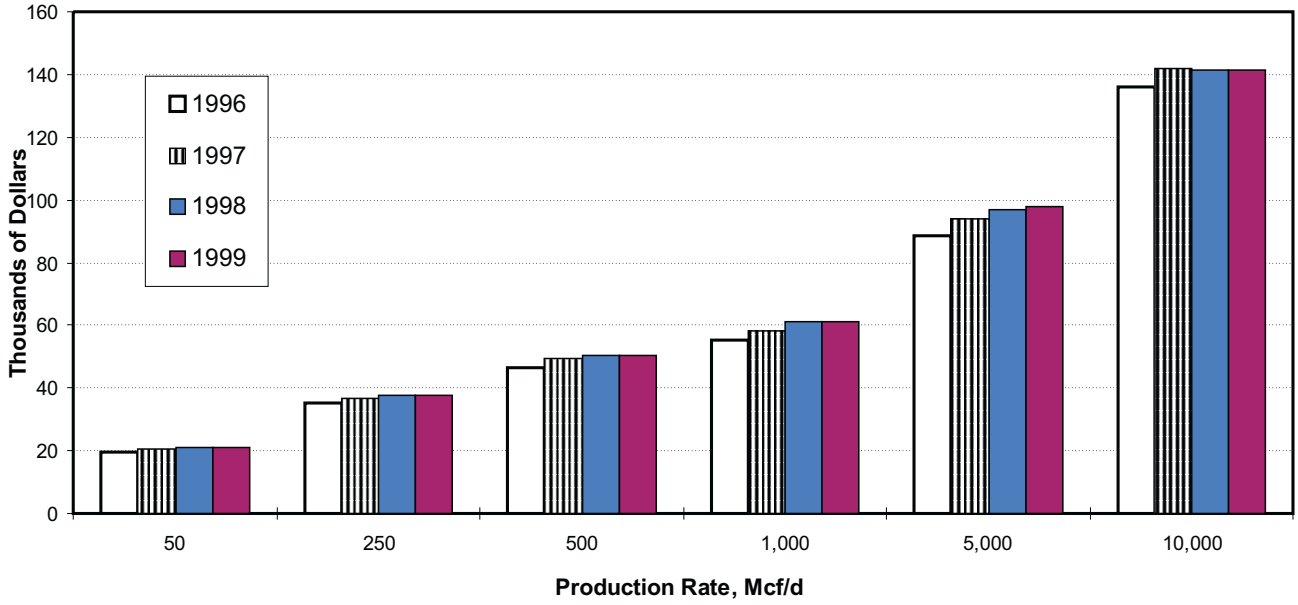
Source: Energy Information Administration, Office of Oil and Gas.

Figure 14. Annual Gas Well Equipment Costs by Well Depth and Production Rate (1999)



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

Figure 15. Aggregate Average Equipment Costs for a One-well Gas Lease by Production Rate, 1996-1999



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)				1999* Cost
	1996	1997	1998	1999	(dollars)
Aggregate average for all Production Rates	**192.3**	**202.1**	**208.1**	**208.1**	**48,700**

* Preliminary

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

Source: Energy Information Administration, Office of Oil and Gas

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

	Index (1976=100)				1999* Cost
Area	1996	1997	1998	1999	(dollars)
			2,000-Foot Wells		
Mid-Continent	195.0	204.0	207.9	208.9	21,100
North Louisiana	186.7	196.2	197.1	198.1	20,800
South Louisiana	186.7	196.2	197.1	198.1	20,800
Rocky Mountains	190.2	199.1	202.7	204.5	22,900
South Texas	186.4	194.2	195.1	197.1	20,300
West Texas	169.3	174.3	177.2	176.2	17,800
Average or Index	**184.8**	**193.3**	**195.2**	**196.2**	**20,600**
			4,000-Foot Wells		
Mid-Continent	195.0	204.0	207.9	208.9	21,100
South Louisiana	186.7	196.2	197.1	198.1	20,800
Rocky Mountains	190.2	199.1	202.7	204.5	22,900
South Texas	186.4	194.2	195.1	197.1	20,300
West Texas	169.3	174.3	177.2	176.2	17,800
Average or Index	**186.5**	**194.2**	**197.1**	**198.1**	**20,600**
			8,000-Foot Wells		
West Texas	187.8	194.7	200.0	202.3	26,500
Aggregate Average for Production Rate	**185.0**	**193.5**	**196.3**	**197.2**	**21,100**

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

Area	Index (1976=100) 1996	1997	1998	1999	1999* Cost (dollars)
			2,000-Foot Wells		
Mid-Continent	201.9	211.2	214.0	215.9	23,100
North Louisiana	186.7	196.2	197.1	198.1	20,800
South Louisiana	186.7	196.2	197.1	198.1	20,800
Rocky Mountains	190.2	199.1	202.7	204.5	22,900
South Texas	186.4	194.2	195.1	197.1	20,300
West Texas	169.3	174.3	177.2	176.2	17,800
Average or Index	**185.8**	**194.3**	**196.2**	**198.1**	**21,000**
			4,000-Foot Wells		
Mid-Continent	209.0	219.4	223.9	223.9	30,000
North Louisiana	205.0	215.8	218.7	219.4	30,500
South Louisiana	203.6	215.1	218.7	222.3	30,900
Rocky Mountains	185.1	195.3	200.4	196.6	46,200
South Texas	202.9	210.9	214.5	218.8	30,200
West Texas	191.8	198.5	204.5	206.7	27,700
Average or Index	**198.0**	**207.8**	**212.4**	**213.1**	**32,600**
			8,000-Foot Wells		
Mid-Continent	193.0	203.9	207.8	203.9	46,900
North Louisiana	185.3	196.2	198.7	195.0	46,400
South Louisiana	187.4	198.7	201.3	199.6	47,500
Rocky Mountains	155.1	163.2	172.0	168.9	50,000
South Texas	187.7	195.3	197.9	197.0	46,500
West Texas	181.3	188.7	193.9	191.7	44,100
Average or Index	**180.4**	**189.8**	**193.9**	**191.4**	**46,900**
			12,000-Foot Wells		
Mid-Continent	225.8	237.5	243.0	244.5	62,600
Rocky Mountains	184.0	193.6	203.8	202.9	63,300
West Texas	212.5	221.9	228.9	229.7	58,800
Average or Index	**205.5**	**215.6**	**223.6**	**224.0**	**61,600**
Aggregate Average for Production Rate	**191.3**	**200.5**	**205.5**	**204.9**	**37,500**

* Preliminary

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

Source: Energy Information Administration, Office of Oil and Gas

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

Area	Index (1976=100) 1996	1997	1998	1999	1999* Cost (dollars)
			4,000-Foot Wells		
Mid-Continent	205.5	216.5	221.3	220.5	28,000
North Louisiana	188.5	199.0	200.0	200.0	20,800
Rocky Mountains	152.4	160.5	168.9	165.7	47,400
Average or Index	**173.3**	**182.6**	**188.4**	**186.6**	**32,100**
			8,000-Foot Wells		
Mid-Continent	186.8	195.2	198.7	196.5	44,800
North Louisiana	182.1	193.2	195.7	193.6	45,500
South Louisiana	182.1	193.2	195.7	193.6	45,500
Rocky Mountains	153.1	161.1	169.4	166.3	47,900
South Texas	182.4	190.1	192.7	191.4	44,600
West Texas	175.4	182.9	188.2	185.5	42,300
Average or Index	**176.3**	**185.1**	**189.6**	**187.1**	**45,100**
			12,000-Foot Wells		
Mid-Continent	224.9	236.5	242.2	243.4	60,600
North Louisiana	217.2	229.7	234.4	235.2	60,200
South Louisiana	217.2	229.7	234.4	235.2	60,200
Rocky Mountains	182.9	192.4	202.6	201.6	61,300
South Texas	217.7	227.2	231.9	233.5	59,300
West Texas	212.0	221.3	228.5	228.9	57,000
Average or Index	**211.5**	**222.2**	**228.4**	**229.1**	**59,800**
			16,000-Foot Wells		
Mid-Continent	187.6	197.3	207.4	206.4	61,500
South Louisiana	217.2	229.7	234.4	235.2	60,200
West Texas	184.2	193.0	203.0	202.3	60,300
Average or Index	**195.4**	**205.6**	**214.1**	**213.7**	**60,700**
Aggregate Average for Production Rate	**191.4**	**201.6**	**207.4**	**206.6**	**50,400**

* Preliminary

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

Source: Energy Information Administration, Office of Oil and Gas

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

Area	Index (1976=100) 1996	1997	1998	1999	1999* Cost (dollars)
			8,000-Foot Wells		
South Louisiana	182.9	193.1	202.3	201.3	61,200
South Texas	184.1	192.0	201.3	200.7	60,400
Average or Index	**183.2**	**192.4**	**201.7**	**200.7**	**60,800**
			12,000-Foot Wells		
Mid-Continent	187.6	197.3	207.4	206.4	61,500
North Louisiana	182.9	193.1	202.3	201.3	61,200
South Louisiana	182.9	193.1	202.3	201.3	61,200
Rocky Mountains	182.9	192.4	202.6	201.6	61,300
South Texas	183.4	191.4	200.7	200.0	60,400
West Texas	184.2	193.0	203.0	202.3	60,300
Average or Index	**183.8**	**193.0**	**203.0**	**202.0**	**61,000**
			16,000-Foot Wells		
Mid-Continent	187.6	197.3	207.4	206.4	61,500
North Louisiana	182.9	193.1	202.3	201.3	61,200
South Louisiana	182.9	193.1	202.3	201.3	61,200
West Texas	184.2	193.0	203.0	202.3	60,300
Average or Index	**184.4**	**194.0**	**203.7**	**203.0**	**61,100**
Aggregate Average for Production Rate	**183.8**	**193.4**	**202.6**	**202.0**	**61,000**

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

Area	Index (1976=100) 1996	1997	1998	1999	1999* Cost (dollars)
			12,000-Foot Wells		
South Louisiana	184.8	196.9	202.5	204.3	91,100
South Texas	184.9	195.3	200.9	202.9	90,100
Average or Index	**184.9**	**196.2**	**201.8**	**203.6**	**90,600**
			16,000-Foot Wells		
Mid-Continent	188.6	200.2	206.6	208.2	91,400
North Louisiana	226.2	240.4	248.2	252.2	112,500
South Louisiana	226.2	240.4	248.2	252.2	112,500
West Texas	185.6	196.4	202.5	204.8	89,900
Average or Index	**206.5**	**219.2**	**226.4**	**229.3**	**101,600**
Aggregate Average for Production Rate	**199.5**	**211.7**	**218.5**	**221.0**	**97,900**

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

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

Area	Index (1976=100)				1999* Cost (dollars)
	1996	1997	1998	1999	
North Louisiana	229.2	239.3	238.3	238.1	141,200

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

Table 13. Summary of Aggregate Average Gas Lease Equipment Costs by Well Depth (1996-1999)

Well Depth (feet)	Average Costs (dollars)			
	1996	1997	1998	1999
	19,600	20,500	20,700	20,800
4,000	26,300	27,600	28,200	28,200
8,000	43,700	45,900	47,200	46,700
12,000	58,700	61,800	64,100	64,100
16,000	74,200	78,300	80,800	81,100

* Preliminary

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
Aggregate Average for all Production Rates	223.6	238.7	248.1	250.0	26,500

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

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

Area	Index (1976=100) 1996	1997	1998	1999	1999* Cost (dollars)
			2,000-Foot Wells		
Mid-Continent	273.5	300.0	305.9	308.8	10,500
North Louisiana	229.3	251.2	253.7	256.1	10,500
South Louisiana	229.3	251.2	253.7	256.1	10,500
Rocky Mountains	220.8	239.6	262.5	264.6	12,700
South Texas	248.7	251.3	256.4	261.5	10,200
West Texas	247.1	255.9	279.4	285.3	9,700
Average or Index	**237.5**	**252.5**	**265.0**	**267.5**	**10,700**
			4,000-Foot Wells		
Mid-Continent	252.4	276.2	285.7	290.5	12,200
South Louisiana	229.8	251.1	257.4	259.6	12,200
Rocky Mountains	217.9	237.5	260.7	262.5	14,700
South Texas	246.7	253.3	260.0	264.4	11,900
West Texas	251.2	261.0	282.9	287.8	11,800
Average or Index	**239.1**	**256.5**	**269.6**	**273.9**	**12,600**
			8,000-Foot Wells		
West Texas	229.3	239.7	258.6	256.9	14,900
Aggregate Average for Production Rate	**236.4**	**252.3**	**265.9**	**268.2**	**11,800**

* Preliminary

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

Source: Energy Information Administration, Office of Oil and Gas

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

Area	Index (1976=100) 1996	1997	1998	1999	1999* Cost (dollars)
			2,000-Foot Wells		
Mid-Continent	261.7	289.4	295.7	297.9	14,000
North Louisiana	224.5	246.9	251.0	253.1	12,400
South Louisiana	224.5	246.9	251.0	253.1	12,400
Rocky Mountains	217.9	237.5	258.9	260.7	14,600
South Texas	240.4	246.8	253.2	257.4	12,100
West Texas	238.1	250.0	271.4	276.2	11,600
Average or Index	**235.4**	**254.2**	**264.6**	**268.8**	**12,900**
			4,000-Foot Wells		
Mid-Continent	250.0	272.7	281.8	286.4	18,900
North Louisiana	228.4	247.8	255.2	258.2	17,300
South Louisiana	226.9	247.8	255.2	256.7	17,200
Rocky Mountains	218.3	235.5	258.1	259.1	24,100
South Texas	232.3	240.0	247.7	250.8	16,300
West Texas	231.1	242.6	262.3	263.9	16,100
Average or Index	**230.0**	**247.1**	**260.0**	**261.4**	**18,300**
			8,000-Foot Wells		
Mid-Continent	246.2	267.0	276.4	279.2	29,600
North Louisiana	225.4	244.1	253.4	255.1	30,100
South Louisiana	221.2	241.5	250.0	251.7	29,700
Rocky Mountains	218.4	234.4	253.6	255.2	31,900
South Texas	226.1	233.9	240.9	244.3	28,100
West Texas	227.4	237.7	257.5	259.4	27,500
Average or Index	**226.1**	**241.7**	**253.9**	**256.5**	**29,500**
			12,000-Foot Wells		
Mid-Continent	242.1	260.9	271.4	274.4	36,500
Rocky Mountains	222.9	237.9	256.2	256.9	39,300
West Texas	225.2	234.8	254.1	253.3	34,200
Average or Index	**230.0**	**245.0**	**260.7**	**262.1**	**36,700**
Aggregate Average for Production Rate	**228.7**	**244.8**	**257.5**	**259.8**	**22,600**

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

Area	Index (1976=100) 1996	1997	1998	1999	1999* Cost (dollars)
			4,000-Foot Wells		
Mid-Continent	265.0	290.0	300.0	303.3	18,200
North Louisiana	221.1	245.1	249.3	250.7	17,800
Rocky Mountains	215.8	232.6	252.6	252.6	24,000
Average or Index	**232.0**	**253.3**	**265.3**	**266.7**	**20,000**
			8,000-Foot Wells		
Mid-Continent	260.2	284.3	291.6	295.2	24,500
North Louisiana	217.3	238.5	243.3	246.2	25,600
South Louisiana	219.2	242.3	247.1	250.0	26,000
Rocky Mountains	220.0	236.2	256.2	258.1	27,100
South Texas	195.5	196.4	199.1	203.6	22,400
West Texas	230.1	236.1	260.2	263.9	21,900
Average or Index	**222.4**	**237.8**	**248.0**	**251.0**	**24,600**
			12,000-Foot Wells		
Mid-Continent	255.3	275.7	284.5	287.4	29,600
North Louisiana	215.3	235.6	241.5	244.9	28,900
South Louisiana	223.7	244.9	250.0	252.5	29,800
Rocky Mountains	222.8	238.6	256.7	259.1	32,900
South Texas	235.1	239.5	244.7	250.0	28,500
West Texas	226.7	231.4	254.3	253.3	26,600
Average or Index	**229.8**	**243.9**	**255.3**	**257.9**	**29,400**
			16,000-Foot Wells		
Mid-Continent	244.9	264.4	272.0	274.6	32,400
South Louisiana	218.2	237.9	243.9	247.0	32,600
West Texas	225.8	233.3	253.3	250.8	30,100
Average or Index	**230.1**	**245.5**	**256.9**	**257.7**	**31,700**
Aggregate Average for Production Rate	**226.9**	**242.3**	**253.8**	**255.8**	**26,600**

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

Area	Index (1976=100) 1996	1997	1998	1999	1999* Cost (dollars)
			8,000-Foot Wells		
South Louisiana	219.8	242.7	246.6	248.1	32,500
South Texas	251.2	255.1	259.8	264.6	33,600
Average or Index	**235.7**	**248.8**	**253.5**	**256.6**	**33,100**
			12,000-Foot Wells		
Mid-Continent	254.9	275.9	284.2	285.7	38,000
North Louisiana	214.4	234.6	239.9	241.2	36,900
South Louisiana	223.5	243.1	249.0	250.3	38,300
Rocky Mountains	226.9	242.9	261.5	262.8	41,000
South Texas	212.8	216.1	218.8	223.5	33,300
West Texas	223.5	229.4	250.0	250.7	34,100
Average or Index	**225.2**	**239.5**	**249.7**	**251.0**	**36,900**
			16,000-Foot Wells		
Mid-Continent	248.0	268.2	276.4	277.7	41,100
North Louisiana	216.3	235.5	240.7	241.9	41,600
South Louisiana	215.7	234.9	240.7	242.4	41,700
West Texas	225.3	232.7	252.7	252.7	37,900
Average or Index	**224.8**	**241.6**	**250.9**	**252.2**	**40,600**
Aggregate Average for Production Rate	**227.7**	**242.6**	**251.4**	**253.4**	**37,500**

* Preliminary

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

Source: Energy Information Administration, Office of Oil and Gas

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

Area	Index (1976=100) 1996	1997	1998	1999	1999* Cost (dollars)
			12,000-Foot Wells		
South Louisiana	220.8	235.4	238.2	239.6	34,500
South Texas	210.8	217.5	217.5	221.1	36,700
Average or Index	**215.5**	**225.8**	**227.1**	**229.7**	**35,600**
			16,000-Foot Wells		
Mid-Continent	205.1	217.3	220.4	221.9	43,500
North Louisiana	202.9	214.8	217.1	219.0	46,000
South Louisiana	202.9	214.4	216.7	218.7	45,700
West Texas	198.0	205.0	213.0	216.0	43,200
Average or Index	**202.0**	**212.7**	**216.7**	**218.6**	**44,600**
Aggregate Average for Production Rate	**205.3**	**216.0**	**219.1**	**221.3**	**41,600**

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

Area	Index (1976=100) 1996	1997	1998	1999	1999* Cost (dollars)
			16,000-Foot Wells		
North Louisiana	197.9	208.0	208.4	209.1	60,000

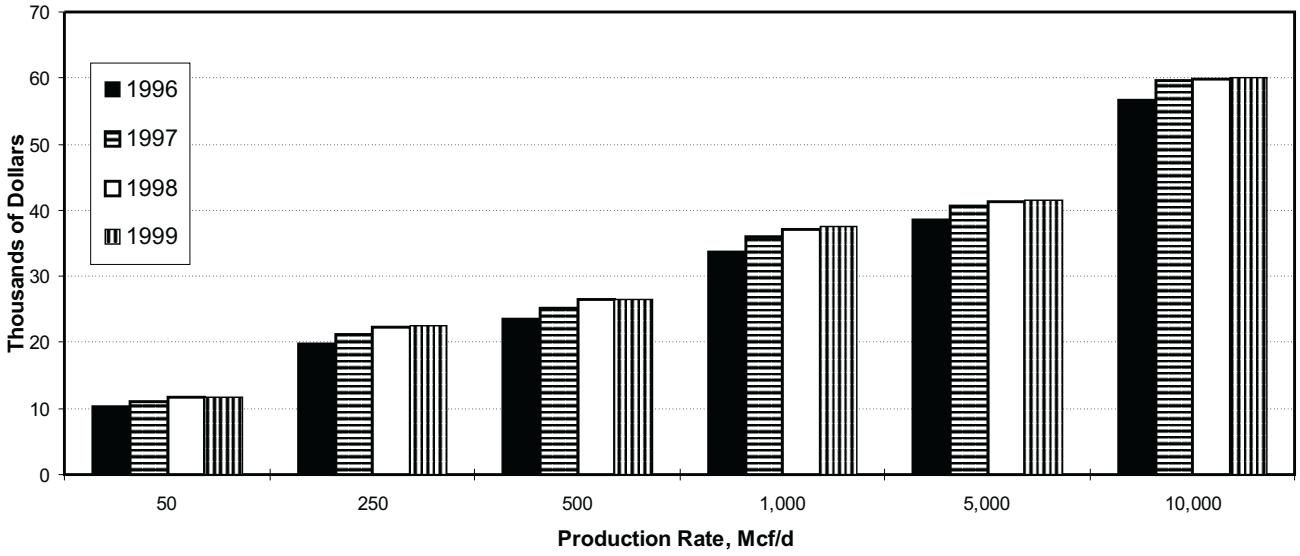
* Preliminary
Note: This is the only area in which a 16,000-foot well producing 10 MMcf per day is reported.
Source: Energy Information Administration, Office of Oil and Gas

Table 21. Summary of Aggregate Average Gas Lease Operating Cost, by Well Depth (1996-99)

Well Depth (feet)	Average Cost, Dollars 1996	1997	1998	1999*
2,000	10,400	11,200	11,600	11,800
4,000	14,500	15,700	16,500	16,600
8,000	24,100	25,600	26,800	27,000
12,000	30,500	32,400	33,800	34,100
16,000	37,600	39,900	41,100	41,300

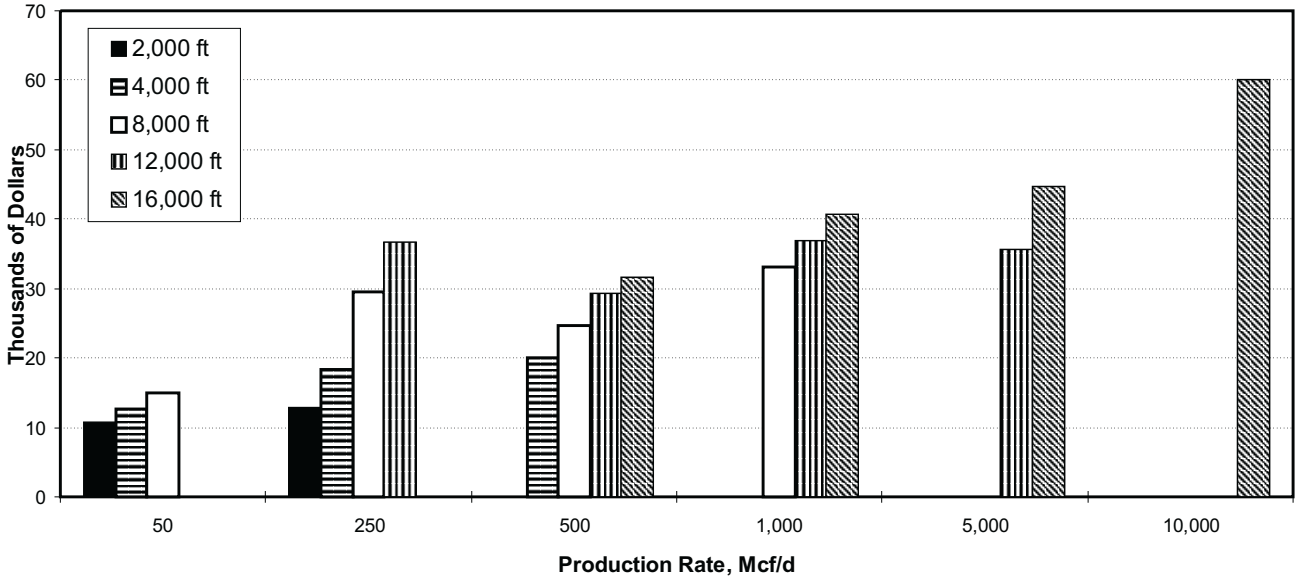
* Preliminary
Source: Energy Information Administration, Office of Oil and Gas

Figure 16. Aggregate Average Annual Gas Well Operating Costs for a One-Well Gas Lease by Production Rate, 1996-1999



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

Figure 17. Annual Gas Well Operating Costs by Depth and Production Rate, 1999



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 23 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 1999 drilling costs.
- Regional wellhead gas prices for 1996-1999 are from the latest edition of the EIA Natural Gas Annual (DOE/EIA-0131 99). These 1999 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

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.

used in each region and depth. Annual operating costs were estimated for daily production rates of 100 barrels of liquid (90 barrels of oil) 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 (90 barrels of oil) 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

of oil and gas in offshore operations but not 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

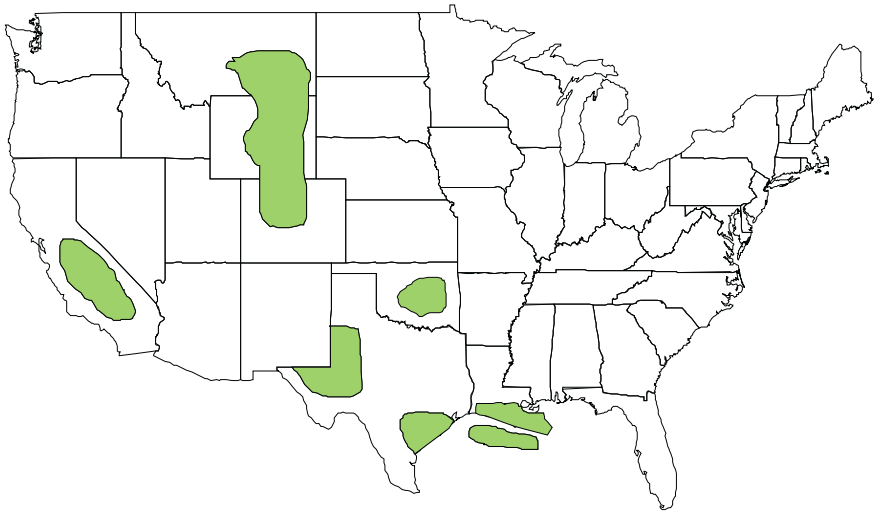
Appendices A Through G

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 1996 through 1999 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: • 1999 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)				1999* Cost (dollars)
	1996	1997	1998	1999	
Producing Equipment:					
Tubing	158.4	175.7	122.3	114.0	40,800
Rods	119.9	120.9	130.9	129.3	24,700
Pumps	157.1	166.7	172.6	172.6	14,500
Pumping Equipment	200.4	234.3	255.6	259.9	340,000
Subtotal or Index**	**182.8**	**209.4**	**215.1**	**216.4**	**420,000**
Gathering System:					
Flowlines	262.8	269.0	286.2	293.1	42,500
Manifold	278.0	291.7	315.9	322.7	42,600
Subtotal or Index**	**270.0**	**279.8**	**300.4**	**307.2**	**85,100**
Lease Equipment:					
Producing Separator	184.4	189.1	193.8	193.8	12,400
Test Separator	187.1	198.0	205.9	206.9	20,900
Heater Treater	151.0	154.8	160.6	162.6	25,200
Storage Tanks	203.3	207.4	224.4	228.0	76,600
Accessory Equipment	227.2	227.9	242.9	243.5	35,800
Disposal System	221.9	232.3	231.1	233.0	96,700
LACT Unit	171.0	171.0	177.4	177.4	16,500
Subtotal or Index**	**201.2**	**207.2**	**214.8**	**216.7**	**284,100**
Total or Index**	**196.5**	**214.1**	**221.7**	**223.6**	**789,200**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
Producing Equipment:					
Tubing	156.2	173.1	120.7	112.4	81,600
Rods	112.0	112.8	120.5	119.7	46,800
Pumps	174.4	185.4	191.5	191.5	15,700
Pumping Equipment	189.5	193.1	196.3	197.7	443,300
Subtotal or Index**	**173.3**	**179.6**	**171.6**	**170.7**	**587,400**
Gathering System:					
Flowlines	248.9	254.8	272.3	279.8	52,600
Manifold	278.0	291.7	315.9	322.7	42,600
Subtotal or Index**	**260.9**	**270.0**	**290.3**	**297.5**	**95,200**
Lease Equipment:					
Producing Separator	184.4	189.1	193.8	193.8	12,400
Test Separator	187.1	198.0	205.9	206.9	20,900
Heater Treater	151.0	154.8	160.6	162.6	25,200
Storage Tanks	203.3	207.4	224.4	228.0	76,600
Accessory Equipment	227.2	227.9	242.9	243.5	35,800
Disposal System	220.6	230.6	229.7	231.3	99,000
LACT Unit	171.0	171.0	177.4	177.4	16,500
Subtotal or Index**	**201.0**	**206.9**	**214.5**	**216.3**	**286,400**
Total or Index**	**186.0**	**192.4**	**190.3**	**190.6**	**969,000**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
Producing Equipment:					
Tubing	150.9	167.4	112.5	104.6	196,000
Rods	99.5	99.9	106.3	105.9	105,800
Pumps	187.8	197.8	204.4	204.4	18,400
Pumping Equipment	203.6	211.7	215.2	220.7	937,900
Subtotal or Index**	**175.3**	**184.5**	**173.3**	**174.5**	**1,258,100**
Gathering System:					
Flowlines	235.5	241.3	258.7	266.8	69,100
Manifold	278.0	291.7	315.9	322.7	42,600
Subtotal or Index**	**249.9**	**258.3**	**278.0**	**285.7**	**111,700**
Lease Equipment:					
Producing Separator	184.4	189.1	193.8	193.8	12,400
Test Separator	187.1	198.0	205.9	206.9	20,900
Heater Treater	151.0	154.8	160.6	162.6	25,200
Storage Tanks	203.3	207.4	224.4	228.0	76,600
Accessory Equipment	227.2	227.9	242.9	243.5	35,800
Disposal System	237.3	245.3	251.5	253.4	94,500
LACT Unit	171.0	171.0	177.4	177.4	16,500
Subtotal or Index**	**205.0**	**210.2**	**220.3**	**222.1**	**281,900**
Total or Index**	**182.8**	**191.4**	**184.6**	**186.2**	**1,651,700**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
Producing Equipment:					
Tubing	149.4	163.4	143.3	132.4	676,100
Pumps	280.0	280.0	292.7	306.8	229,800
Pumping Equipment	182.7	175.9	206.7	217.9	387,400
Subtotal or Index**	**170.0**	**177.7**	**172.7**	**169.4**	**1,293,300**
Gathering System:					
Flowlines	154.1	155.0	148.8	150.7	136,500
Manifold	278.0	291.7	315.9	322.7	42,600
Subtotal or Index**	**169.8**	**172.4**	**170.0**	**172.5**	**179,100**
Lease Equipment:					
Producing Separator	184.4	189.1	193.8	193.8	12,400
Test Separator	187.1	198.0	205.9	206.9	20,900
Heater Treater	151.0	154.8	160.6	162.6	25,200
Storage Tanks	203.3	207.4	224.4	228.0	76,600
Accessory Equipment	227.2	227.9	242.9	243.5	35,800
Disposal System	237.3	245.3	251.5	253.4	94,500
LACT Unit	171.0	171.0	177.4	177.4	16,500
Subtotal or Index**	**205.0**	**210.2**	**220.3**	**222.1**	**281,900**
Total or Index**	**174.4**	**181.3**	**178.5**	**176.5**	**1,754,300**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
Normal Daily Expense:					
Supervision and Overhead	298.3	328.3	345.0	361.7	21,700
Labor (pumper)	250.0	250.0	286.5	301.4	22,300
Auto Usage	284.6	296.2	300.0	303.8	7,900
Chemicals	203.7	214.8	233.3	233.3	6,300
Fuel, Power & Water	316.7	336.1	265.3	248.6	17,900
Operative Supplies	233.3	233.3	266.7	283.3	1,700
Subtotal or Index**	**277.4**	**291.7**	**289.4**	**293.6**	**77,800**
Surface Maintenance, Repair & Services:					
Labor (roustabout)	231.0	231.0	265.5	279.3	8,100
Supplies & Services	234.4	234.4	268.8	281.3	9,000
Equipment Usage	253.8	253.8	269.2	284.6	3,700
Other	173.3	173.3	173.3	173.3	2,600
Subtotal or Index**	**225.8**	**225.8**	**251.7**	**262.9**	**23,400**
Subsurface Maintenance, Repair & Services:					
Workover Rig Services	189.7	197.4	210.3	197.4	7,700
Remedial Services	156.3	156.3	162.5	162.5	2,600
Equipment Repair	155.6	164.4	164.4	164.4	7,400
Other	200.0	200.0	200.0	200.0	400
Subtotal or Index**	**169.6**	**176.5**	**182.4**	**177.5**	**18,100**
Total or Index**	**243.2**	**253.1**	**258.1**	**261.6**	**119,300**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
Normal Daily Expense:					
Supervision and Overhead	302.9	333.8	351.5	369.1	25,100
Labor (pumper)	250.0	250.0	286.5	301.4	22,300
Auto Usage	284.6	296.2	300.0	303.8	7,900
Chemicals	214.8	229.6	248.1	248.1	6,700
Fuel, Power & Water	318.2	338.6	265.9	248.9	21,900
Operative Supplies	250.0	250.0	283.3	300.0	1,800
Subtotal or Index**	**283.0**	**299.0**	**293.1**	**296.5**	**85,700**
Surface Maintenance, Repair & Services:					
Labor (roustabout)	231.0	231.0	265.5	279.3	8,100
Supplies & Services	238.2	238.2	270.6	282.4	9,600
Equipment Usage	261.5	261.5	284.6	300.0	3,900
Other	183.3	183.3	183.3	183.3	4,400
Subtotal or Index**	**226.0**	**226.0**	**250.0**	**260.0**	**26,000**
Subsurface Maintenance, Repair & Services:					
Workover Rig Services	189.4	195.5	206.1	195.5	12,900
Remedial Services	173.9	178.3	187.0	182.6	4,200
Equipment Repair	161.2	171.4	165.3	163.3	8,000
Other	200.0	200.0	200.0	200.0	600
Subtotal or Index**	**177.3**	**184.4**	**188.7**	**182.3**	**25,700**
Total or Index**	**244.2**	**254.7**	**257.2**	**259.2**	**137,400**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
Normal Daily Expense:					
Supervision and Overhead	311.4	344.3	363.3	382.3	30,200
Labor (pumper)	250.0	250.0	286.5	301.4	22,300
Auto Usage	284.6	296.2	300.0	303.8	7,900
Chemicals	196.6	210.3	224.1	227.6	6,600
Fuel, Power & Water	318.8	340.6	264.1	245.3	31,400
Operative Supplies	228.6	228.6	257.1	271.4	1,900
Subtotal or Index**	**287.5**	**305.2**	**291.0**	**292.4**	**100,300**
Surface Maintenance, Repair & Services:					
Labor (roustabout)	231.0	231.0	265.5	279.3	8,100
Supplies & Services	230.8	233.3	264.1	276.9	10,800
Equipment Usage	220.0	220.0	233.3	246.7	3,700
Other	176.7	176.7	176.7	176.7	5,300
Subtotal or Index**	**215.0**	**215.9**	**237.2**	**246.9**	**27,900**
Subsurface Maintenance, Repair & Services:					
Workover Rig Services	210.4	218.1	228.5	218.1	31,400
Remedial Services	192.9	201.4	210.0	205.7	14,400
Equipment Repair	191.7	201.7	188.3	185.0	11,100
Other	188.9	200.0	200.0	200.0	1,800
Subtotal or Index**	**201.4**	**209.9**	**214.5**	**207.4**	**58,700**
Total or Index**	**243.4**	**255.1**	**253.5**	**252.9**	**186,900**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
Normal Daily Expense:					
Supervision and Overhead	319.4	354.1	373.5	393.9	38,600
Labor (pumper)	250.0	250.0	286.5	301.4	22,300
Auto Usage	284.6	296.2	300.0	303.8	7,900
Chemicals	190.9	203.0	218.2	218.2	7,200
Fuel, Power & Water	318.2	339.8	261.9	243.2	42,800
Operative Supplies	280.0	280.0	310.0	320.0	3,200
Subtotal or Index**	**293.3**	**312.2**	**292.6**	**292.6**	**122,000**
Surface Maintenance, Repair & Services:					
Labor (roustabout)	231.0	231.0	265.5	279.3	8,100
Supplies & Services	213.9	209.9	231.7	237.6	24,000
Equipment Usage	220.0	220.0	233.3	246.7	3,700
Other	183.3	200.0	200.0	200.0	1,200
Subtotal or Index**	**216.6**	**214.6**	**237.1**	**245.0**	**37,000**
Subsurface Maintenance, Repair & Services:					
Workover Rig Services	189.4	192.4	197.0	192.4	12,700
Remedial Services	200.8	210.1	217.6	215.1	25,600
Equipment Repair	450.8	451.4	470.9	493.3	88,300
Other	200.0	200.0	208.3	208.3	2,500
Subtotal or Index**	**317.8**	**321.5**	**334.3**	**343.4**	**129,100**
Total or Index**	**290.8**	**300.3**	**300.3**	**305.2**	**288,100**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
Injection Equipment:					
Supply Wells	196.4	214.6	294.3	270.2	197,500
Plant	310.7	320.5	335.0	340.9	114,900
Distribution Lines	178.7	182.7	190.0	182.9	77,200
Header	272.0	281.2	291.8	295.2	61,100
Electrical Service	334.3	339.2	351.7	364.5	96,600
Subtotal or Index**	**238.8**	**249.8**	**286.3**	**279.0**	**547,300**
Producing Equipment:					
Tubing Replacement	143.6	158.2	116.8	109.2	42,800
Rods & Pumps	120.8	124.2	129.9	128.9	41,000
Pumping Equipment	337.8	549.0	529.6	554.1	54,300
Subtotal or Index**	**158.2**	**192.2**	**172.0**	**170.9**	**138,100**
Injection Wells:***					
Subtotal or Index**	**173.5**	**208.0**	**328.1**	**287.8**	**1,524,700**
Total or Index**	**187.8**	**216.6**	**302.3**	**273.9**	**2,210,100**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
Injection Equipment:					
Supply Wells	196.4	214.8	294.3	270.2	197,500
Plant	307.1	316.9	330.5	336.1	113,600
Distribution Lines	178.7	182.7	190.0	182.9	77,200
Header	272.0	281.2	291.8	295.2	61,100
Electrical Service	243.2	246.7	255.4	264.7	97,400
Subtotal or Index**	**226.8**	**237.3**	**271.7**	**264.7**	**546,800**
Producing Equipment:					
Tubing Replacement	160.2	176.8	127.7	119.0	90,800
Rods & Pumps	113.3	115.4	120.9	120.2	63,200
Pumping Equipment	176.0	199.8	199.8	201.8	405,100
Subtotal or Index**	**162.3**	**181.0**	**170.5**	**169.6**	**559,100**
Injection Wells:***					
Subtotal or Index**	**169.5**	**205.6**	**236.2**	**207.2**	**2,351,600**
Total or Index**	**175.2**	**204.7**	**227.6**	**206.9**	**3,457,500**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
Injection Equipment:					
Supply Wells	197.9	217.9	306.2	278.5	361,500
Plant	322.3	332.7	348.2	354.5	234,000
Distribution Lines	178.9	183.0	190.2	183.1	116,100
Header	253.9	259.9	270.0	271.9	72,600
Electrical Service	255.0	259.6	270.1	280.4	150,000
Subtotal or Index**	**231.9**	**243.6**	**284.2**	**275.3**	**934,200**
Producing Equipment:					
Tubing Replacement	153.3	169.6	116.7	108.7	209,700
Rods & Pumps	100.3	101.4	106.2	106.1	125,700
Pumping Equipment	175.9	196.2	193.8	194.9	733,400
Subtotal or Index**	**156.5**	**172.4**	**157.1**	**155.4**	**1,068,800**
Injection Wells:***					
Subtotal or Index**	**134.3**	**184.9**	**148.2**	**130.0**	**3,874,600**
Total or Index**	**146.4**	**187.7**	**161.3**	**146.7**	**5,877,600**

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

Component	Index (1976=100)				1999* Cost (dollars)
	1996	1997	1998	1999	
Normal Daily Expense:					
Supervision and Overhead	308.3	335.9	351.0	366.2	53,100
Labor (pumper)	287.5	287.5	330.8	347.5	41,700
Chemicals	200.0	211.4	222.9	222.9	7,800
Fuel, Power & Water	256.3	265.6	263.6	255.6	77,200
Operative Supplies	280.0	280.0	313.3	320.0	4,800
Subtotal or Index**	**272.0**	**283.6**	**296.1**	**299.2**	**184,600**
Surface Maintenance, Repair & Services:					
Labor (roustabout)	231.9	231.9	266.7	279.7	19,300
Supplies & Services	231.8	237.3	258.2	263.6	29,000
Equipment Usage	282.6	282.6	304.3	321.7	7,400
Other	186.7	186.7	186.7	186.7	2,800
Subtotal or Index**	**234.1**	**236.9**	**260.8**	**269.6**	**58,500**
Subsurface Maintenance, Repair & Services:					
Workover Rig Services	221.0	229.4	240.6	229.4	32,800
Remedial Services	200.0	207.3	214.6	212.2	8,700
Equipment Repair	132.1	137.7	145.3	137.7	7,300
Other	202.9	205.7	208.6	211.4	7,400
Subtotal or Index**	**198.2**	**205.1**	**214.0**	**206.6**	**56,200**
Total or Index**	**246.4**	**255.2**	**269.0**	**270.6**	**299,300**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
Normal Daily Expense:					
Supervision and Overhead	308.3	335.9	351.0	366.2	53,100
Labor (pumper)	287.8	287.8	331.1	347.8	62,600
Chemicals	206.3	218.8	234.4	234.4	7,500
Fuel, Power & Water	252.5	260.1	257.9	251.5	93,800
Operative Supplies	250.0	257.7	284.6	296.2	7,700
Subtotal or Index**	**269.6**	**279.4**	**293.1**	**297.2**	**224,700**
Surface Maintenance, Repair & Services:					
Labor (roustabout)	234.2	234.2	269.3	282.5	32,200
Supplies & Services	225.7	233.3	253.8	259.1	44,300
Equipment Usage	313.0	315.2	339.1	354.3	16,300
Other	191.7	191.7	191.7	191.7	2,300
Subtotal or Index**	**239.1**	**243.1**	**268.2**	**277.3**	**95,100**
Subsurface Maintenance, Repair & Services:					
Workover Rig Services	216.9	224.2	233.8	224.2	46,400
Remedial Services	205.9	217.6	227.9	222.1	15,100
Equipment Repair	128.6	133.3	139.3	133.3	11,200
Other	193.9	198.0	200.0	202.0	9,900
Subtotal or Index**	**194.1**	**201.2**	**209.3**	**202.5**	**82,600**
Total or Index**	**242.2**	**250.0**	**264.8**	**267.0**	**402,400**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
Normal Daily Expense:					
Supervision and Overhead	311.8	343.8	362.1	381.1	64,400
Labor (pumper)	287.8	287.8	331.1	347.8	62,600
Chemicals	206.3	218.8	234.4	234.4	7,500
Fuel, Power & Water	280.6	284.9	281.2	277.6	178,500
Operative Supplies	253.8	257.7	284.6	296.2	7,700
Subtotal or Index**	**283.9**	**292.2**	**301.4**	**305.4**	**320,700**
Surface Maintenance, Repair & Services:					
Labor (roustabout)	234.2	234.2	269.3	282.5	32,200
Supplies & Services	234.7	240.1	261.7	266.5	44,500
Equipment Usage	270.8	271.9	292.1	306.7	27,300
Other	180.0	180.0	180.0	180.0	1,800
Subtotal or Index**	**241.6**	**244.2**	**268.9**	**278.4**	**105,800**
Subsurface Maintenance, Repair & Services:					
Workover Rig Services	211.1	217.0	225.4	217.0	88,100
Remedial Services	273.9	286.6	297.8	293.3	39,300
Equipment Repair	116.5	120.1	125.9	120.1	16,700
Other	189.3	193.3	194.7	197.3	14,800
Subtotal or Index**	**202.7**	**209.2**	**216.8**	**210.7**	**158,900**
Total or Index**	**248.5**	**255.2**	**266.6**	**268.0**	**585,400**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
Producing Equipment:					
Tubing	158.8	176.2	122.7	114.3	40,800
Rods	121.4	125.9	133.3	133.3	26,800
Pumps	157.1	166.7	172.6	172.6	14,500
Pumping Equipment	201.8	235.6	256.1	260.4	339,800
Subtotal or Index**	**183.7**	**210.4**	**215.4**	**216.7**	**421,900**
Gathering System:					
Flowlines	319.5	323.5	326.8	330.9	49,300
Manifold	278.4	291.8	314.9	322.4	43,200
Subtotal or Index**	**300.0**	**308.5**	**321.2**	**326.9**	**92,500**
Lease Equipment:					
Producing Separator	189.1	192.2	193.8	193.8	12,400
Test Separator	191.1	201.0	205.9	205.9	20,800
Heater Treater	157.4	160.0	160.6	161.9	25,100
Storage Tanks	209.3	212.2	227.5	229.9	77,000
Accessory Equipment	230.6	229.9	242.2	242.9	35,700
Disposal System	225.9	236.1	232.4	234.7	100,700
LACT Unit	171.0	171.0	177.4	177.4	16,500
Subtotal or Index**	**205.9**	**211.1**	**216.1**	**217.7**	**288,200**
Total or Index**	**201.2**	**218.5**	**224.1**	**225.8**	**802,600**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
Producing Equipment:					
Tubing	154.3	171.1	118.5	110.2	79,800
Valves and Mandrels	399.2	568.4	609.5	609.5	154,200
Pumping Equipment	176.1	195.5	195.5	187.8	196,100
Subtotal or Index**	**196.2**	**233.4**	**219.7**	**212.8**	**430,100**
Gathering System:					
Flowlines	202.3	209.8	206.5	204.5	176,500
Manifold	278.4	291.8	314.9	322.4	43,200
Subtotal or Index**	**212.5**	**220.9**	**221.1**	**220.4**	**219,700**
Lease Equipment:					
Producing Separator	189.1	192.2	193.8	193.8	12,400
Test Separator	191.1	201.0	205.9	205.9	20,800
Heater Treater	157.4	160.0	160.6	161.9	25,100
Storage Tanks	209.3	212.2	227.5	229.9	77,000
Accessory Equipment	230.6	229.9	242.2	242.9	35,700
Disposal System	224.6	234.8	231.2	233.0	103,200
LACT Unit	171.0	171.0	177.4	177.4	16,500
Subtotal or Index**	**205.7**	**210.9**	**215.8**	**217.3**	**290,700**
Total or Index**	**202.8**	**223.6**	**218.8**	**215.9**	**940,500**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
Producing Equipment:					
Tubing	154.5	171.4	118.7	110.3	159,500
Valves and Mandrels	399.2	568.6	609.6	609.6	215,800
Pumping Equipment	174.2	193.5	193.5	185.9	196,100
Subtotal or Index**	**192.1**	**228.8**	**207.2**	**200.1**	**571,400**
Gathering System:					
Flowlines	198.2	205.8	202.2	200.1	271,000
Manifold	278.4	291.8	314.9	322.4	43,200
Subtotal or Index**	**205.4**	**213.5**	**212.4**	**211.2**	**314,200**
Lease Equipment:					
Producing Separator	189.1	192.2	193.8	193.8	12,400
Test Separator	191.1	201.0	205.9	205.9	20,800
Heater Treater	157.4	160.0	160.6	161.9	25,100
Storage Tanks	209.3	212.2	227.5	229.9	77,000
Accessory Equipment	230.6	229.9	242.2	242.9	35,700
Disposal System	222.5	229.6	233.3	235.0	96,100
LACT Unit	171.0	171.0	177.4	177.4	16,500
Subtotal or Index**	**204.5**	**208.7**	**216.1**	**217.5**	**283,600**
Total or Index**	**198.5**	**220.1**	**210.6**	**207.0**	**1,169,200**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
Producing Equipment:					
Tubing	150.0	163.9	143.8	132.9	676,400
Pumps	280.0	280.0	292.7	306.8	229,800
Pumping Equipment	189.8	181.3	206.6	216.5	385,000
Subtotal or Index**	**172.0**	**179.4**	**173.1**	**169.5**	**1,291,200**
Gathering System:					
Flowlines	231.0	235.7	218.7	216.5	236,600
Manifold	278.4	291.8	314.9	322.4	43,200
Subtotal or Index**	**236.2**	**271.5**	**257.3**	**256.0**	**279,800**
Lease Equipment:					
Producing Separator	189.1	192.2	193.8	193.8	12,400
Test Separator	191.1	201.0	205.9	205.9	20,800
Heater Treater	157.4	160.0	160.6	161.9	25,100
Storage Tanks	209.3	212.2	227.5	229.9	77,000
Accessory Equipment	230.6	229.9	242.2	242.9	35,700
Disposal System	224.6	230.2	235.3	237.0	98,100
LACT Unit	171.0	171.0	177.4	177.4	16,500
Subtotal or Index**	**205.3**	**208.9**	**216.8**	**218.2**	**285,600**
Total or Index**	**184.1**	**190.8**	**185.5**	**182.9**	**1,856,600**

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

Component	Index (1976=100)				1999* Cost (dollars)
	1996	1997	1998	1999	
Normal Daily Expense:					
Supervision and Overhead	298.3	328.3	345.0	361.7	21,700
Labor (pumper)	317.4	317.4	317.4	325.6	28,000
Auto Usage	296.0	308.0	312.0	316.0	7,900
Chemicals	207.4	218.5	233.3	233.3	6,300
Fuel, Power & Water	301.4	320.5	252.1	230.1	16,800
Operative Supplies	254.5	254.5	254.5	254.5	2,800
Subtotal or Index**	**294.3**	**307.8**	**295.4**	**296.1**	**83,500**
Surface Maintenance, Repair & Services:					
Labor (roustabout)	221.1	221.1	221.1	228.2	16,200
Supplies & Services	218.2	216.4	216.4	223.6	12,300
Equipment Usage	226.1	208.7	208.7	208.7	4,800
Other	316.7	300.0	300.0	308.3	3,700
Subtotal or Index**	**228.0**	**223.6**	**223.6**	**229.8**	**37,000**
Subsurface Maintenance, Repair & Services:					
Workover Rig Services	184.9	207.5	205.7	205.7	10,900
Remedial Services	173.1	176.9	180.8	184.6	4,800
Equipment Repair	208.0	212.0	204.0	204.0	5,100
Other	200.0	200.0	200.0	200.0	400
Subtotal or Index**	**187.7**	**200.9**	**199.1**	**200.0**	**21,200**
Total or Index**	**254.3**	**262.5**	**255.7**	**258.1**	**141,700**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
Normal Daily Expense:					
Supervision and Overhead	302.9	333.8	351.5	369.1	25,100
Labor (pumper)	317.4	317.4	317.4	325.6	28,000
Auto Usage	296.0	308.0	312.0	316.0	7,900
Chemicals	218.5	229.6	244.4	244.4	6,600
Fuel, Power & Water	233.3	248.7	194.0	176.9	20,700
Operative Supplies	212.5	218.8	218.8	218.8	7,000
Subtotal or Index**	**268.5**	**281.7**	**268.5**	**268.5**	**95,300**
Surface Maintenance, Repair & Services:					
Labor (roustabout)	221.1	221.1	221.1	228.2	16,200
Supplies & Services	206.7	215.4	215.4	213.0	53,900
Equipment Usage	225.0	204.2	204.2	204.2	4,900
Other	337.5	325.0	325.0	331.3	5,300
Subtotal or Index**	**216.5**	**220.6**	**220.6**	**220.6**	**80,300**
Subsurface Maintenance, Repair & Services:					
Workover Rig Services	247.6	271.4	271.4	271.4	5,700
Remedial Services	214.3	222.9	228.6	228.6	8,000
Equipment Repair	244.4	266.7	244.4	233.3	2,100
Other	200.0	200.0	200.0	200.0	600
Subtotal or Index**	**227.9**	**242.6**	**242.6**	**241.2**	**16,400**
Total or Index**	**240.9**	**250.1**	**244.1**	**244.0**	**192,000**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
Normal Daily Expense:					
Supervision and Overhead	315.4	348.7	366.7	385.9	30,100
Labor (pumper)	317.4	317.4	317.4	325.6	28,000
Auto Usage	296.0	308.0	312.0	316.0	7,900
Chemicals	214.8	225.9	240.7	240.7	6,500
Fuel, Power & Water	301.5	321.8	248.9	227.8	30,300
Operative Supplies	225.7	231.4	231.4	231.4	8,100
Subtotal or Index**	**294.5**	**310.4**	**290.1**	**288.8**	**110,900**
Surface Maintenance, Repair & Services:					
Labor (roustabout)	221.1	221.1	221.1	228.2	16,200
Supplies & Services	223.5	233.1	233.1	230.2	64,700
Equipment Usage	228.0	208.0	208.0	208.0	5,200
Other	315.0	300.0	300.0	305.0	6,100
Subtotal or Index**	**228.0**	**232.7**	**232.7**	**232.2**	**92,200**
Subsurface Maintenance, Repair & Services:					
Workover Rig Services	236.4	254.5	254.5	254.5	8,400
Remedial Services	175.6	182.2	186.7	187.8	16,900
Equipment Repair	226.7	253.3	206.7	200.0	3,000
Other	188.9	200.0	200.0	200.0	1,800
Subtotal or Index**	**195.2**	**206.8**	**204.8**	**204.8**	**30,100**
Total or Index**	**250.3**	**260.8**	**252.0**	**251.3**	**233,200**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
Normal Daily Expense:					
Supervision and Overhead	319.4	354.1	373.5	393.9	38,600
Labor (pumper)	317.4	317.4	317.4	325.6	28,000
Auto Usage	296.0	308.0	312.0	316.0	7,900
Chemicals	206.5	216.1	229.0	229.0	7,100
Fuel, Power & Water	295.2	315.5	242.8	222.5	41,600
Operative Supplies	300.0	292.9	300.0	307.1	4,300
Subtotal or Index**	**298.9**	**316.3**	**291.2**	**289.1**	**127,500**
Surface Maintenance, Repair & Services:					
Labor (roustabout)	221.1	221.1	221.1	228.2	16,200
Supplies & Services	216.7	212.5	221.7	225.8	27,100
Equipment Usage	228.0	208.0	208.0	208.0	5,200
Other	183.3	200.0	200.0	200.0	1,200
Subtotal or Index**	**218.5**	**214.4**	**219.4**	**223.9**	**49,700**
Subsurface Maintenance, Repair & Services:					
Workover Rig Services	201.4	212.9	212.9	212.9	14,900
Remedial Services	261.7	273.2	278.8	279.9	75,300
Equipment Repair	450.8	450.8	470.9	492.7	88,200
Other	184.6	184.6	192.3	192.3	2,500
Subtotal or Index**	**315.6**	**323.0**	**332.8**	**340.7**	**180,900**
Total or Index**	**291.4**	**300.3**	**296.3**	**299.9**	**358,100**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
Producing Equipment:					
Tubing	157.8	175.1	121.0	112.5	39,700
Rods	122.5	126.5	134.3	135.8	27,700
Pumps	157.1	166.7	172.6	172.6	14,500
Pumping Equipment	204.0	238.4	260.2	264.6	340,000
Subtotal or Index**	**184.8**	**211.8**	**217.5**	**219.1**	**421,900**
Gathering System:					
Flowlines	295.5	316.1	312.7	308.8	101,900
Manifold	278.2	291.7	315.8	323.3	43,000
Subtotal or Index**	**290.5**	**309.1**	**313.6**	**313.0**	**144,900**
Lease Equipment:					
Producing Separator	184.4	193.8	195.3	193.8	12,400
Test Separator	188.1	202.0	206.9	206.9	20,900
Heater Treater	152.9	161.3	161.9	161.9	25,100
Storage Tanks	210.4	219.1	234.3	236.4	79,200
Accessory Equipment	227.9	230.6	242.9	242.9	35,700
Disposal System	229.2	243.5	238.8	240.9	100,700
LACT Unit	171.0	171.0	177.4	177.4	16,500
Subtotal or Index**	**205.8**	**215.4**	**220.1**	**221.2**	**290,500**
Total or Index**	**205.5**	**225.3**	**230.4**	**231.6**	**857,300**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
Producing Equipment:					
Tubing	154.3	171.1	118.0	109.6	78,600
Pumps	449.0	639.5	685.4	685.4	173,400
Pumping Equipment	170.6	196.9	196.9	188.3	196,600
Subtotal or Index**	**199.8**	**243.3**	**230.2**	**222.7**	**448,600**
Gathering System:					
Flowlines	274.6	294.7	290.9	286.7	225,600
Manifold	278.2	291.7	315.8	323.3	43,000
Subtotal or Index**	**275.1**	**294.2**	**294.5**	**292.0**	**268,600**
Lease Equipment:					
Producing Separator	184.4	193.8	195.3	193.8	12,400
Test Separator	188.1	202.0	206.9	206.9	20,900
Heater Treater	152.9	161.3	161.9	161.9	25,100
Storage Tanks	210.4	219.1	234.3	236.4	79,200
Accessory Equipment	227.9	230.6	242.9	242.9	35,700
Disposal System	229.5	244.0	239.1	241.2	103,700
LACT Unit	171.0	171.0	177.4	177.4	16,500
Subtotal or Index**	**206.1**	**215.8**	**220.4**	**221.5**	**293,500**
Total or Index**	**218.0**	**245.8**	**241.0**	**237.3**	**1,010,700**

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

Component	Index (1976=100)				1999* Cost (dollars)
	1996	1997	1998	1999	
Producing Equipment:					
Tubing	154.4	171.4	118.2	109.7	157,100
Pumps	449.2	639.8	685.9	685.9	242,800
Pumping Equipment	168.8	194.9	194.9	186.4	196,600
Subtotal or Index**	**196.5**	**238.5**	**217.4**	**210.0**	**596,500**
Gathering System:					
Flowlines	270.5	290.5	286.6	282.2	348,500
Manifold	278.2	291.7	315.8	323.3	43,000
Subtotal or Index**	**271.3**	**290.6**	**289.5**	**286.2**	**391,500**
Lease Equipment:					
Producing Separator	184.4	193.8	195.3	193.8	12,400
Test Separator	188.1	202.0	206.9	206.9	20,900
Heater Treater	152.9	161.3	161.9	161.9	25,100
Storage Tanks	210.4	219.1	234.3	236.4	79,200
Accessory Equipment	227.9	230.6	242.9	242.9	35,700
Disposal System	239.7	252.7	253.7	256.4	104,100
LACT Unit	171.0	171.0	177.4	177.4	16,500
Subtotal or Index**	**208.8**	**218.0**	**224.6**	**225.9**	**293,900**
Total or Index**	**218.0**	**246.6**	**237.0**	**232.6**	**1,281,900**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
Producing Equipment:					
Tubing	150.0	164.1	143.8	132.7	669,800
Pumps	280.0	280.0	292.7	306.8	229,800
Pumping Equipment	186.7	185.4	210.7	220.0	391,100
Subtotal or Index**	**171.5**	**180.5**	**174.2**	**170.4**	**1,290,700**
Gathering System:					
Flowlines	232.9	249.8	235.6	231.8	306,900
Manifold	278.2	291.7	315.8	323.3	43,000
Subtotal or Index**	**237.1**	**253.6**	**243.0**	**240.2**	**349,900**
Lease Equipment:					
Producing Separator	184.4	193.8	195.3	193.8	12,400
Test Separator	188.1	202.0	206.9	206.9	20,900
Heater Treater	152.9	161.3	161.9	161.9	25,100
Storage Tanks	210.4	219.1	234.3	236.4	79,200
Accessory Equipment	227.9	230.6	242.9	242.9	35,700
Disposal System	254.5	269.6	270.9	273.6	108,900
LACT Unit	171.0	171.0	177.4	177.4	16,500
Subtotal or Index**	**213.2**	**223.0**	**229.7**	**231.0**	**298,700**
Total or Index**	**186.0**	**196.2**	**190.9**	**187.9**	**1,939,300**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
Normal Daily Expense:					
Supervision and Overhead	293.3	323.3	340.0	358.3	21,500
Labor (pumper)	265.1	295.9	295.9	295.9	50,900
Auto Usage	296.0	308.0	312.0	316.0	7,900
Chemicals	207.4	222.2	237.0	237.0	6,400
Fuel, Power & Water	418.0	434.0	352.0	326.0	16,300
Operative Supplies	228.6	257.1	271.4	271.4	1,900
Subtotal or Index**	**289.4**	**315.2**	**307.9**	**307.6**	**104,900**
Surface Maintenance, Repair & Services:					
Labor (roustabout)	215.8	244.7	244.7	244.7	9,300
Supplies & Services	227.8	255.6	255.6	255.6	9,200
Equipment Usage	350.0	393.8	381.3	381.3	6,100
Subtotal or Index**	**244.4**	**275.6**	**273.3**	**273.3**	**24,600**
Subsurface Maintenance, Repair & Services:					
Workover Rig Services	206.7	225.0	225.0	233.3	14,000
Remedial Services	161.5	169.2	173.1	173.1	4,500
Equipment Repair	156.0	168.0	160.0	160.0	4,000
Other	200.0	200.0	200.0	200.0	400
Subtotal or Index**	**185.0**	**199.1**	**198.2**	**202.7**	**22,900**
Total or Index**	**260.3**	**284.6**	**279.4**	**280.1**	**152,400**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
Normal Daily Expense:					
Supervision and Overhead	298.5	329.4	347.1	366.2	24,900
Labor (pumper)	265.1	295.9	295.9	295.9	50,900
Auto Usage	296.0	308.0	312.0	316.0	7,900
Chemicals	218.5	237.0	251.9	251.9	6,800
Fuel, Power & Water	473.4	492.4	397.5	365.8	28,900
Operative Supplies	206.9	237.9	237.9	231.0	6,700
Subtotal or Index**	**306.5**	**333.0**	**318.5**	**315.3**	**126,100**
Surface Maintenance, Repair & Services:					
Labor (roustabout)	215.8	244.7	244.7	244.7	9,300
Supplies & Services	205.5	234.8	235.2	229.6	58,100
Equipment Usage	341.2	388.2	370.6	370.6	6,300
Subtotal or Index**	**214.3**	**244.5**	**243.8**	**239.3**	**73,700**
Subsurface Maintenance, Repair & Services:					
Workover Rig Services	211.1	225.9	225.9	233.3	6,300
Remedial Services	180.0	185.7	188.6	191.4	6,700
Equipment Repair	244.4	266.7	244.4	233.3	2,100
Other	200.0	200.0	200.0	200.0	600
Subtotal or Index**	**200.0**	**210.8**	**209.5**	**212.2**	**15,700**
Total or Index**	**260.1**	**286.6**	**278.8**	**275.6**	**215,500**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
Normal Daily Expense:					
Supervision and Overhead	307.6	340.5	359.5	379.7	30,000
Labor (pumper)	265.1	295.9	295.9	295.9	50,900
Auto Usage	296.0	308.0	312.0	316.0	7,900
Chemicals	263.6	281.8	300.0	300.0	6,600
Fuel, Power & Water	471.1	490.0	394.4	364.4	32,800
Operative Supplies	225.0	256.3	256.3	250.0	8,000
Subtotal or Index**	**316.0**	**342.9**	**327.1**	**324.3**	**136,200**
Surface Maintenance, Repair & Services:					
Labor (roustabout)	215.8	244.7	244.7	244.7	9,300
Supplies & Services	226.7	259.4	259.4	253.4	71,200
Equipment Usage	366.7	416.7	405.6	405.6	7,300
Subtotal or Index**	**232.9**	**266.2**	**265.6**	**260.5**	**87,800**
Subsurface Maintenance, Repair & Services:					
Workover Rig Services	287.2	310.3	310.3	320.5	12,500
Remedial Services	171.1	182.2	184.4	188.9	17,000
Equipment Repair	242.9	271.4	221.4	214.3	3,000
Other	188.9	200.0	200.0	200.0	1,800
Subtotal or Index**	**208.6**	**224.3**	**221.1**	**225.7**	**34,300**
Total or Index**	**267.2**	**294.6**	**286.6**	**284.2**	**258,300**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
Normal Daily Expense:					
Supervision and Overhead	316.3	352.0	371.4	392.9	38,500
Labor (pumper)	265.1	295.9	295.9	295.9	50,900
Auto Usage	296.0	308.0	312.0	316.0	7,900
Chemicals	228.6	242.9	260.7	260.7	7,300
Fuel, Power & Water	462.7	482.2	388.1	357.6	42,200
Operative Supplies	221.4	228.6	235.7	242.9	3,400
Subtotal or Index**	**325.5**	**351.6**	**333.0**	**330.1**	**150,200**
Surface Maintenance, Repair & Services:					
Labor (roustabout)	215.8	244.7	244.7	244.7	9,300
Supplies & Services	211.3	217.9	228.3	230.2	24,400
Equipment Usage	366.7	416.7	405.6	405.6	7,300
Subtotal or Index**	**229.6**	**246.3**	**251.9**	**253.1**	**41,000**
Subsurface Maintenance, Repair & Services:					
Workover Rig Services	193.4	202.6	202.6	207.9	15,800
Remedial Services	193.3	207.8	209.3	215.6	58,000
Equipment Repair	472.4	472.4	493.1	516.7	89,900
Other	200.0	200.0	208.3	208.3	2,500
Subtotal or Index**	**284.9**	**293.6**	**301.3**	**313.0**	**166,200**
Total or Index**	**293.2**	**309.9**	**306.9**	**311.3**	**357,400**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
Producing Equipment:					
Tubing	157.1	174.3	120.6	112.1	39,700
Rods	113.7	115.2	123.0	125.5	25,600
Pumps	157.1	166.7	172.6	172.6	14,500
Pumping Equipment	200.6	235.1	255.8	260.0	339,000
Subtotal or Index**	**181.7**	**208.5**	**213.7**	**215.2**	**418,800**
Gathering System:					
Flowlines	615.1	642.9	677.8	727.8	91,700
Manifold	278.8	292.4	316.7	324.2	42,800
Subtotal or Index**	**443.0**	**463.6**	**493.0**	**521.3**	**134,500**
Lease Equipment:					
Producing Separator	181.3	189.1	190.6	189.1	12,100
Test Separator	186.1	198.0	204.0	204.0	20,600
Heater Treater	148.4	156.1	157.4	157.4	24,400
Storage Tanks	206.0	215.8	231.0	233.4	78,200
Accessory Equipment	226.5	227.9	240.8	240.8	35,400
Disposal System	242.6	254.9	250.6	252.1	100,600
LACT Unit	171.0	171.0	177.4	177.4	16,500
Subtotal or Index**	**207.4**	**216.2**	**221.4**	**222.4**	**287,800**
Total or Index**	**210.5**	**230.2**	**237.2**	**240.5**	**841,100**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
Producing Equipment:					
Tubing	154.0	170.9	117.8	109.5	78,600
Rods	109.1	110.1	116.8	118.3	47,900
Pumps	174.4	185.4	191.5	191.5	15,700
Pumping Equipment	190.0	194.2	196.8	197.8	441,400
Subtotal or Index**	**172.6**	**179.2**	**170.7**	**169.8**	**583,600**
Gathering System:					
Flowlines	620.9	649.1	685.3	738.7	120,400
Manifold	278.8	292.4	316.7	324.2	42,800
Subtotal or Index**	**467.8**	**489.5**	**520.3**	**553.2**	**163,200**
Lease Equipment:					
Producing Separator	181.3	189.1	190.6	189.1	12,100
Test Separator	186.1	198.0	204.0	204.0	20,600
Heater Treater	148.4	156.1	157.4	157.4	24,400
Storage Tanks	206.0	215.8	231.0	233.4	78,200
Accessory Equipment	226.5	227.9	240.8	240.8	35,400
Disposal System	284.1	298.3	293.4	295.1	120,700
LACT Unit	171.0	171.0	177.4	177.4	16,500
Subtotal or Index**	**220.7**	**230.1**	**235.0**	**236.1**	**307,900**
Total or Index**	**202.3**	**210.5**	**207.9**	**209.5**	**1,054,700**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
Producing Equipment:					
Tubing	169.9	188.7	142.6	132.4	377,300
Pumps	280.0	280.0	292.7	306.8	229,800
Pumping Equipment	196.5	192.6	221.5	232.3	355,000
Subtotal or Index**	**193.9**	**203.2**	**188.1**	**187.7**	**962,100**
Gathering System:					
Flowlines	364.9	376.5	367.3	376.7	279,100
Manifold	278.8	292.4	316.7	324.2	42,800
Subtotal or Index**	**351.9**	**363.8**	**359.7**	**368.7**	**321,900**
Lease Equipment:					
Producing Separator	181.3	189.1	190.6	189.1	12,100
Test Separator	186.1	198.0	204.0	204.0	20,600
Heater Treater	148.4	156.1	157.4	157.4	24,400
Storage Tanks	206.0	215.8	231.0	233.4	78,200
Accessory Equipment	226.5	227.9	240.8	240.8	35,400
Disposal System	285.3	298.8	294.2	294.9	128,000
LACT Unit	171.0	171.0	177.4	177.4	16,500
Subtotal or Index**	**222.3**	**231.5**	**236.4**	**237.2**	**315,200**
Total or Index**	**217.9**	**227.5**	**217.3**	**218.2**	**1,599,200**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
Producing Equipment:					
Tubing	149.5	163.6	143.3	132.3	669,500
Pumps	280.0	280.0	292.7	306.8	229,800
Pumping Equipment	180.8	178.1	204.1	213.2	379,000
Subtotal or Index**	**169.7**	**178.5**	**172.3**	**168.5**	**1,278,300**
Gathering System:					
Flowlines	364.9	376.5	367.3	376.7	279,100
Manifold	278.8	292.4	316.7	324.2	42,800
Subtotal or Index**	**351.9**	**363.8**	**359.7**	**368.7**	**321,900**
Lease Equipment:					
Producing Separator	181.3	189.1	190.6	189.1	12,100
Test Separator	186.1	198.0	204.0	204.0	20,600
Heater Treater	148.4	156.1	157.4	157.4	24,400
Storage Tanks	206.0	215.8	231.0	233.4	78,200
Accessory Equipment	226.5	227.9	240.8	240.8	35,400
Disposal System	262.2	271.9	273.6	274.7	98,900
LACT Unit	171.0	171.0	177.4	177.4	16,500
Subtotal or Index**	**212.0**	**219.8**	**227.1**	**228.0**	**286,100**
Total or Index**	**191.6**	**200.5**	**196.2**	**194.2**	**1,886,300**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
Normal Daily Expense:					
Supervision and Overhead	290.0	311.7	325.0	340.0	20,400
Labor (pumper)	223.0	248.6	255.4	255.4	18,900
Auto Usage	296.0	308.0	312.0	316.0	7,900
Chemicals	203.7	218.5	233.3	233.3	6,300
Fuel, Power & Water	585.2	601.9	503.7	470.4	25,400
Operative Supplies	233.3	250.0	266.7	266.7	1,600
Subtotal or Index**	**324.4**	**344.3**	**330.5**	**327.2**	**80,500**
Surface Maintenance, Repair & Services:					
Labor (roustabout)	220.7	244.8	248.3	248.3	7,200
Supplies & Services	234.4	259.4	265.6	265.6	8,500
Equipment Usage	292.3	346.2	361.5	361.5	4,700
Subtotal or Index**	**239.2**	**268.9**	**275.7**	**275.7**	**20,400**
Subsurface Maintenance, Repair & Services:					
Workover Rig Services	143.5	153.2	153.2	166.1	10,300
Remedial Services	175.0	175.0	181.3	187.5	3,000
Equipment Repair	151.1	160.0	160.0	160.0	7,200
Other	200.0	200.0	200.0	200.0	400
Subtotal or Index**	**151.2**	**159.2**	**160.0**	**167.2**	**20,900**
Total or Index**	**261.6**	**279.8**	**273.5**	**273.7**	**121,800**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
Normal Daily Expense:					
Supervision and Overhead	294.1	316.2	329.4	345.6	23,500
Labor (pumper)	223.0	248.6	255.4	255.4	18,900
Auto Usage	296.0	308.0	312.0	316.0	7,900
Chemicals	244.4	263.0	277.8	277.8	7,500
Fuel, Power & Water	559.1	577.3	481.8	447.0	29,500
Operative Supplies	233.3	266.7	266.7	266.7	1,600
Subtotal or Index**	**333.8**	**354.9**	**338.3**	**334.2**	**88,900**
Surface Maintenance, Repair & Services:					
Labor (roustabout)	220.7	244.8	248.3	248.3	7,200
Supplies & Services	238.2	261.8	267.6	270.6	9,200
Equipment Usage	300.0	361.5	376.9	376.9	4,900
Subtotal or Index**	**242.1**	**272.4**	**278.9**	**280.3**	**21,300**
Subsurface Maintenance, Repair & Services:					
Workover Rig Services	164.9	175.5	175.5	188.3	17,700
Remedial Services	179.2	187.5	191.7	195.8	4,700
Equipment Repair	158.0	168.0	160.0	158.0	7,900
Other	300.0	300.0	300.0	300.0	600
Subtotal or Index**	**166.5**	**176.5**	**174.7**	**181.8**	**30,900**
Total or Index**	**264.6**	**283.4**	**275.2**	**275.6**	**141,100**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
Normal Daily Expense:					
Supervision and Overhead	301.3	325.3	339.2	355.7	28,100
Labor (pumper)	223.0	248.6	255.4	255.4	18,900
Auto Usage	296.0	308.0	312.0	316.0	7,900
Chemicals	179.3	193.1	206.9	206.9	6,000
Fuel, Power & Water	522.3	541.5	452.1	414.9	39,000
Operative Supplies	300.0	312.5	325.0	325.0	2,600
Subtotal or Index**	**337.9**	**358.6**	**338.5**	**331.7**	**102,500**
Surface Maintenance, Repair & Services:					
Labor (roustabout)	220.7	244.8	248.3	248.3	7,200
Supplies & Services	223.4	229.9	240.3	241.6	18,600
Equipment Usage	293.3	346.7	360.0	360.0	5,400
Subtotal or Index**	**231.4**	**247.9**	**257.0**	**257.9**	**31,200**
Subsurface Maintenance, Repair & Services:					
Workover Rig Services	183.6	191.8	191.8	198.4	12,100
Remedial Services	200.0	210.1	216.5	224.1	17,700
Equipment Repair	453.4	453.4	472.5	494.9	88,100
Other	242.9	257.1	257.1	257.1	1,800
Subtotal or Index**	**336.6**	**340.9**	**352.9**	**368.3**	**119,700**
Total or Index**	**320.3**	**333.2**	**331.7**	**335.6**	**253,400**

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

Component	Index (1976=100)				1999* Cost (dollars)
	1996	1997	1998	1999	
Normal Daily Expense:					
Supervision and Overhead	308.2	332.7	349.0	366.3	35,900
Labor (pumper)	223.0	248.6	255.4	255.4	18,900
Auto Usage	296.0	308.0	312.0	316.0	7,900
Chemicals	190.9	206.1	218.2	218.2	7,200
Fuel, Power & Water	500.8	520.5	435.4	396.9	50,400
Operative Supplies	333.3	355.6	366.7	366.7	3,300
Subtotal or Index**	**347.0**	**368.3**	**346.2**	**337.7**	**123,600**
Surface Maintenance, Repair & Services:					
Labor (roustabout)	220.7	244.8	248.3	248.3	7,200
Supplies & Services	232.0	244.7	248.5	248.5	25,600
Equipment Usage	293.3	346.7	360.0	360.0	5,400
Subtotal or Index**	**236.1**	**255.1**	**259.9**	**259.9**	**38,200**
Subsurface Maintenance, Repair & Services:					
Workover Rig Services	187.9	195.6	195.6	202.2	18,400
Remedial Services	272.8	285.4	291.3	302.9	31,200
Equipment Repair	450.8	451.4	470.9	493.3	88,300
Other	266.7	266.7	277.8	277.8	2,500
Subtotal or Index**	**335.9**	**341.4**	**352.4**	**367.5**	**140,400**
Total or Index**	**324.0**	**338.2**	**334.6**	**337.7**	**302,200**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
Producing Equipment:					
Tubing	149.3	165.6	114.9	106.9	40,100
Rods	93.3	94.9	102.8	102.8	26,100
Pumps	157.1	166.7	172.6	172.6	14,500
Pumping Equipment	190.2	248.2	273.4	276.1	271,100
Subtotal or Index**	**165.0**	**202.9**	**207.8**	**207.6**	**351,800**
Gathering System:					
Flowlines	273.0	294.7	311.2	312.5	47,500
Manifold	275.9	289.5	313.5	320.3	42,600
Subtotal or Index**	**274.4**	**292.3**	**312.3**	**316.1**	**90,100**
Lease Equipment:					
Producing Separator	185.9	192.2	196.9	196.9	12,600
Test Separator	188.1	200.0	207.9	207.9	21,000
Heater Treater	112.0	117.1	120.7	120.7	26,200
Storage Tanks	200.0	208.1	225.7	228.1	76,400
Accessory Equipment	227.9	229.3	244.2	244.2	35,900
Disposal System	268.8	284.1	282.7	283.8	98,200
LACT Unit	171.0	171.0	177.4	177.4	16,500
Electrification	250.6	254.8	263.9	273.0	65,800
Subtotal or Index**	**210.5**	**218.2**	**226.2**	**228.4**	**352,600**
Total or Index**	**193.8**	**216.8**	**224.3**	**225.5**	**794,500**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
Producing Equipment:					
Tubing	146.4	162.5	112.2	104.3	79,300
Rods	99.8	100.9	108.0	108.0	48,500
Pumps	174.4	185.4	191.5	191.5	15,700
Pumping Equipment	172.5	200.4	199.9	201.7	375,000
Subtotal or Index**	**155.9**	**176.7**	**165.4**	**164.6**	**518,500**
Gathering System:					
Flowlines	260.1	282.3	299.0	300.0	59,400
Manifold	275.9	289.5	313.5	320.3	42,600
Subtotal or Index**	**266.5**	**285.2**	**304.8**	**308.2**	**102,000**
Lease Equipment:					
Producing Separator	185.9	192.2	196.9	196.9	12,600
Test Separator	188.1	200.0	207.9	207.9	21,000
Heater Treater	112.0	117.1	120.7	120.7	26,200
Storage Tanks	200.0	208.1	225.7	228.1	76,400
Accessory Equipment	227.9	229.3	244.2	244.2	35,900
Disposal System	270.9	286.3	285.2	285.8	100,300
LACT Unit	171.0	171.0	177.4	177.4	16,500
Electrification	249.8	253.0	262.7	272.1	78,100
Subtotal or Index**	**212.2**	**219.6**	**227.8**	**230.1**	**367,000**
Total or Index**	**180.8**	**197.2**	**194.1**	**194.5**	**987,500**

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

Component	Index (1976=100)				1999* Cost (dollars)
	1996	1997	1998	1999	
Producing Equipment:					
Tubing	143.0	158.7	106.3	98.8	193,900
Rods	101.4	101.9	107.1	107.2	117,300
Pumps	187.8	197.8	204.4	204.4	18,400
Pumping Equipment	168.4	195.3	193.5	194.9	721,100
Subtotal or Index**	**150.6**	**169.9**	**154.8**	**153.5**	**1,050,700**
Gathering System:					
Flowlines	248.7	271.4	287.9	289.0	78,900
Manifold	275.9	289.5	313.5	320.3	42,600
Subtotal or Index**	**257.6**	**277.3**	**296.3**	**299.3**	**121,500**
Lease Equipment:					
Producing Separator	185.9	192.2	196.9	196.9	12,600
Test Separator	188.1	200.0	207.9	207.9	21,000
Heater Treater	112.0	117.1	120.7	120.7	26,200
Storage Tanks	200.0	208.1	225.7	228.1	76,400
Accessory Equipment	227.9	229.3	244.2	244.2	35,900
Disposal System	265.8	280.9	280.4	279.8	105,500
LACT Unit	171.0	171.0	177.4	177.4	16,500
Electrification	251.0	254.3	265.1	274.2	107,500
Subtotal or Index**	**214.5**	**221.8**	**230.2**	**232.7**	**401,600**
Total or Index**	**167.8**	**184.8**	**175.7**	**175.3**	**1,573,800**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
Producing Equipment:					
Tubing	143.4	156.9	137.5	127.0	672,200
Pumps	280.0	280.0	292.7	306.8	229,800
Pumping Equipment	223.2	226.3	242.0	251.7	347,300
Subtotal or Index**	**172.0**	**182.2**	**172.6**	**168.3**	**1,249,300**
Gathering System:					
Flowlines	147.9	155.8	142.7	139.6	109,600
Manifold	275.9	289.5	313.5	320.3	42,600
Subtotal or Index**	**166.4**	**175.2**	**167.4**	**165.8**	**152,200**
Lease Equipment:					
Producing Separator	185.9	192.2	196.9	196.9	12,600
Test Separator	188.1	200.0	207.9	207.9	21,000
Heater Treater	112.0	117.1	120.7	120.7	26,200
Storage Tanks	200.0	208.1	225.7	228.1	76,400
Accessory Equipment	227.9	229.3	244.2	244.2	35,900
Disposal System	269.0	283.8	283.0	284.1	107,100
LACT Unit	171.0	171.0	177.4	177.4	16,500
Electrification	264.6	269.0	279.1	288.6	45,600
Subtotal or Index**	**211.0**	**219.0**	**226.9**	**228.8**	**341,300**
Total or Index**	**177.4**	**187.1**	**180.4**	**177.3**	**1,742,800**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
Normal Daily Expense:					
Supervision and Overhead	261.4	282.9	295.7	308.6	21,600
Labor (pumper)	287.4	317.2	373.6	373.6	32,500
Auto Usage	296.0	308.0	312.0	316.0	7,900
Chemicals	214.8	229.6	248.1	248.1	6,700
Fuel, Power & Water	360.9	350.7	308.7	300.0	20,700
Operative Supplies	228.6	242.9	271.4	271.4	1,900
Subtotal or Index**	**291.2**	**306.0**	**318.9**	**320.4**	**91,300**
Surface Maintenance, Repair & Services:					
Labor (roustabout)	212.2	234.1	263.4	263.4	10,800
Supplies & Services	219.4	241.9	271.0	271.0	8,400
Equipment Usage	235.3	247.1	264.7	264.7	4,500
Subtotal or Index**	**219.1**	**239.3**	**266.3**	**266.3**	**23,700**
Subsurface Maintenance, Repair & Services:					
Workover Rig Services	126.1	135.7	144.3	144.3	16,600
Remedial Services	128.6	133.3	138.1	138.1	2,900
Equipment Repair	155.6	164.4	164.4	164.4	7,400
Other	200.0	200.0	200.0	200.0	400
Subtotal or Index**	**134.4**	**143.2**	**149.2**	**149.2**	**27,300**
Total or Index**	**228.2**	**241.8**	**254.8**	**255.5**	**142,300**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
Normal Daily Expense:					
Supervision and Overhead	272.7	296.1	309.1	324.7	25,000
Labor (pumper)	287.4	317.2	373.6	373.6	32,500
Auto Usage	296.0	308.0	312.0	316.0	7,900
Chemicals	225.9	244.4	263.0	263.0	7,100
Fuel, Power & Water	331.9	325.5	293.6	287.2	27,000
Operative Supplies	228.6	242.9	285.7	285.7	2,000
Subtotal or Index**	**291.2**	**306.0**	**318.0**	**320.2**	**101,500**
Surface Maintenance, Repair & Services:					
Labor (roustabout)	212.2	234.1	263.4	263.4	10,800
Supplies & Services	225.0	246.9	275.0	275.0	8,800
Equipment Usage	233.3	250.0	261.1	261.1	4,700
Subtotal or Index**	**220.9**	**241.8**	**267.0**	**267.0**	**24,300**
Subsurface Maintenance, Repair & Services:					
Workover Rig Services	122.5	131.1	139.1	139.1	21,000
Remedial Services	158.6	165.5	172.4	175.9	5,100
Equipment Repair	158.0	168.0	160.0	158.0	7,900
Other	200.0	200.0	200.0	200.0	600
Subtotal or Index**	**135.6**	**144.2**	**148.5**	**148.5**	**34,600**
Total or Index**	**224.6**	**238.1**	**249.1**	**250.2**	**160,400**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
Normal Daily Expense:					
Supervision and Overhead	278.9	303.3	278.9	333.3	30,000
Labor (pumper)	287.4	317.2	278.9	373.6	32,500
Auto Usage	296.0	308.0	278.9	316.0	7,900
Chemicals	206.9	220.7	278.9	241.4	7,000
Fuel, Power & Water	313.1	309.0	278.9	284.8	41,300
Operative Supplies	228.6	257.1	278.9	285.7	2,000
Subtotal or Index**	**288.5**	**301.8**	**278.9**	**315.1**	**120,700**
Surface Maintenance, Repair & Services:					
Labor (roustabout)	212.2	234.1	278.9	263.4	10,800
Supplies & Services	224.2	245.5	278.9	275.8	9,100
Equipment Usage	242.1	263.2	278.9	278.9	5,300
Subtotal or Index**	**222.6**	**244.1**	**278.9**	**271.0**	**25,200**
Subsurface Maintenance, Repair & Services:					
Workover Rig Services	128.3	136.8	278.9	144.6	37,300
Remedial Services	240.0	251.3	278.9	271.3	21,700
Equipment Repair	191.7	201.7	278.9	185.0	11,100
Other	170.0	180.0	278.9	180.0	1,800
Subtotal or Index**	**160.5**	**169.9**	**278.9**	**176.2**	**71,900**
Total or Index**	**222.5**	**234.8**	**278.9**	**246.4**	**217,800**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
Normal Daily Expense:					
Supervision and Overhead	284.8	310.7	325.9	342.0	38,300
Labor (pumper)	287.4	317.2	373.6	373.6	32,500
Auto Usage	296.0	308.0	312.0	316.0	7,900
Chemicals	197.0	212.1	230.3	230.3	7,600
Fuel, Power & Water	322.1	319.1	304.0	301.5	60,000
Operative Supplies	230.0	240.0	270.0	270.0	2,700
Subtotal or Index**	**294.4**	**306.9**	**316.7**	**319.7**	**149,000**
Surface Maintenance, Repair & Services:					
Labor (roustabout)	212.2	234.1	263.4	263.4	10,800
Supplies & Services	235.0	245.0	261.7	265.0	15,900
Equipment Usage	242.1	263.2	278.9	278.9	5,300
Subtotal or Index**	**228.3**	**244.2**	**265.0**	**266.7**	**32,000**
Subsurface Maintenance, Repair & Services:					
Workover Rig Services	138.2	144.1	148.0	148.0	15,100
Remedial Services	198.4	207.9	220.5	221.3	28,100
Equipment Repair	450.8	451.4	470.9	493.3	88,300
Other	200.0	200.0	208.3	208.3	2,500
Subtotal or Index**	**291.4**	**296.0**	**309.3**	**319.0**	**134,000**
Total or Index**	**285.3**	**294.8**	**307.5**	**313.1**	**315,000**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
Producing Equipment:					
Tubing	146.2	162.4	108.7	101.2	48,700
Rods	111.9	113.3	117.1	117.1	33,500
Pumps	142.0	150.4	157.1	157.1	18,700
Pumping Equipment	158.5	188.7	187.5	189.4	318,700
Subtotal or Index**	**150.3**	**173.6**	**163.5**	**163.3**	**419,600**
Gathering System:					
Flowlines	250.5	254.4	251.6	248.0	69,700
Manifold	276.1	289.6	313.4	320.9	43,000
Subtotal or Index**	**258.8**	**265.8**	**271.6**	**271.6**	**112,700**
Lease Equipment:					
Producing Separator	176.1	183.6	185.1	185.1	12,400
Test Separator	188.1	200.0	205.9	206.9	20,900
Free water knockout	144.0	149.3	154.7	157.3	11,800
Heater Treater	250.3	259.7	271.2	323.6	190,900
Storage Tanks	191.1	195.7	210.4	213.0	73,900
Accessory Equipment	227.9	229.3	242.2	242.9	35,700
Disposal System	219.5	231.4	224.6	225.8	79,700
LACT Unit	171.0	171.0	177.4	177.4	16,500
Electrification	255.3	258.4	267.6	277.1	72,600
Subtotal or Index**	**220.8**	**227.9**	**235.5**	**252.8**	**514,400**
Total or Index**	**187.8**	**203.2**	**201.7**	**208.5**	**1,046,700**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
Producing Equipment:					
Tubing	143.0	158.9	106.1	98.6	96,300
Rods	106.3	107.4	111.3	111.3	61,900
Pumps	140.0	146.9	153.1	153.1	19,900
Pumping Equipment	134.7	156.0	155.4	156.8	426,900
Subtotal or Index**	**133.1**	**150.2**	**138.7**	**138.0**	**605,000**
Gathering System:					
Flowlines	235.8	239.4	236.1	232.5	90,200
Manifold	276.1	289.6	313.4	320.9	43,000
Subtotal or Index**	**246.2**	**252.3**	**255.9**	**255.2**	**133,200**
Lease Equipment:					
Producing Separator	176.1	183.6	185.1	185.1	12,400
Test Separator	188.1	200.0	205.9	206.9	20,900
Free water knockout	144.0	149.3	154.7	157.3	11,800
Heater Treater	250.3	259.7	271.2	323.6	190,900
Storage Tanks	191.1	195.7	210.4	213.0	73,900
Accessory Equipment	227.9	229.3	242.2	242.9	35,700
Disposal System	215.2	226.6	220.1	220.9	81,500
LACT Unit	171.0	171.0	177.4	177.4	16,500
Electrification	233.2	235.4	243.9	252.1	82,700
Subtotal or Index**	**217.7**	**224.5**	**232.0**	**248.6**	**526,300**
Total or Index**	**167.0**	**180.2**	**175.6**	**180.0**	**1,264,500**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
Producing Equipment:					
Tubing	114.4	129.8	98.2	95.6	374,200
Pumps	280.0	280.0	292.7	306.8	229,800
Pumping Equipment	215.1	218.1	228.6	239.7	330,800
Subtotal or Index**	**157.9**	**168.6**	**152.1**	**154.7**	**934,800**
Gathering System:					
Flowlines	165.1	168.0	153.3	151.9	146,400
Manifold	276.1	289.6	313.4	320.9	43,000
Subtotal or Index**	**178.7**	**182.9**	**172.9**	**172.5**	**189,400**
Lease Equipment:					
Producing Separator	176.1	183.6	185.1	185.1	12,400
Test Separator	188.1	200.0	205.9	206.9	20,900
Free water knockout	144.0	149.3	154.7	157.3	11,800
Heater Treater	250.3	259.7	271.2	323.6	190,900
Storage Tanks	191.1	195.7	210.4	213.0	73,900
Accessory Equipment	227.9	229.3	242.2	242.9	35,700
Disposal System	213.2	224.1	217.5	218.2	86,200
LACT Unit	171.0	171.0	177.4	177.4	16,500
Electrification	253.4	257.5	266.7	275.9	48,000
Subtotal or Index**	**217.8**	**225.1**	**232.4**	**249.5**	**496,300**
Total or Index**	**173.5**	**182.6**	**172.1**	**177.5**	**1,620,500**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
Producing Equipment:					
Tubing	129.5	141.6	124.2	114.7	671,800
Pumps	280.0	280.0	292.7	306.8	229,800
Pumping Equipment	221.9	225.0	236.6	247.4	378,700
Subtotal or Index**	**160.7**	**170.0**	**160.8**	**157.3**	**1,280,300**
Gathering System:					
Flowlines	165.1	168.0	153.3	151.9	146,400
Manifold	276.1	289.6	313.4	320.9	43,000
Subtotal or Index**	**178.7**	**182.9**	**172.9**	**172.5**	**189,400**
Lease Equipment:					
Producing Separator	176.1	183.6	185.1	185.1	12,400
Test Separator	188.1	200.0	205.9	206.9	20,900
Free water knockout	144.0	149.3	154.7	157.3	11,800
Heater Treater	250.3	259.7	271.2	323.6	190,900
Storage Tanks	191.1	195.7	210.4	213.0	73,900
Accessory Equipment	227.9	229.3	242.2	242.9	35,700
Disposal System	213.2	224.1	217.5	218.2	86,200
LACT Unit	171.0	171.0	177.4	177.4	16,500
Electrification	258.7	266.5	273.8	283.0	58,300
Subtotal or Index**	**219.0**	**226.5**	**233.6**	**250.7**	**506,600**
Total or Index**	**172.9**	**181.4**	**175.1**	**175.5**	**1,976,300**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
Normal Daily Expense:					
Supervision and Overhead	296.7	325.0	338.3	353.3	21,200
Labor (pumper)	276.0	302.1	318.8	327.1	31,400
Auto Usage	296.0	308.0	312.0	316.0	7,900
Chemicals	221.1	236.8	247.4	247.4	4,700
Fuel, Power & Water	402.7	407.1	397.3	386.7	43,700
Operative Supplies	225.0	225.0	225.0	225.0	1,800
Subtotal or Index**	**321.5**	**338.0**	**343.0**	**344.9**	**110,700**
Surface Maintenance, Repair & Services:					
Labor (roustabout)	207.4	207.4	207.4	207.4	11,200
Supplies & Services	241.4	241.4	241.4	244.8	7,100
Equipment Usage	221.4	221.4	221.4	221.4	3,100
Subtotal or Index**	**219.6**	**219.6**	**219.6**	**220.6**	**21,400**
Subsurface Maintenance, Repair & Services:					
Workover Rig Services	173.8	178.7	178.7	178.7	10,900
Remedial Services	171.4	171.4	171.4	171.4	1,200
Equipment Repair	159.3	169.5	167.8	166.1	9,800
Other	200.0	200.0	200.0	200.0	400
Subtotal or Index**	**167.4**	**174.4**	**173.6**	**172.9**	**22,300**
Total or Index**	**267.1**	**278.4**	**281.2**	**282.3**	**154,400**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
Normal Daily Expense:					
Supervision and Overhead	300.0	329.4	344.1	360.3	24,500
Labor (pumper)	276.0	302.1	318.8	327.1	31,400
Auto Usage	296.0	308.0	312.0	316.0	7,900
Chemicals	219.0	233.3	247.6	247.6	5,200
Fuel, Power & Water	461.1	454.9	448.6	441.7	77,300
Operative Supplies	225.0	225.0	225.0	237.5	1,900
Subtotal or Index**	**359.8**	**370.0**	**374.8**	**377.1**	**148,200**
Surface Maintenance, Repair & Services:					
Labor (roustabout)	207.4	207.4	207.4	207.4	11,200
Supplies & Services	235.5	235.5	235.5	235.5	7,300
Equipment Usage	220.0	220.0	220.0	220.0	3,300
Subtotal or Index**	**218.0**	**218.0**	**218.0**	**218.0**	**21,800**
Subsurface Maintenance, Repair & Services:					
Workover Rig Services	174.0	179.0	179.0	179.0	17,900
Remedial Services	200.0	207.7	207.7	215.4	2,800
Equipment Repair	154.3	160.5	160.5	159.3	12,900
Other	200.0	200.0	200.0	200.0	600
Subtotal or Index**	**168.0**	**173.6**	**173.6**	**173.6**	**34,200**
Total or Index**	**284.5**	**291.9**	**294.6**	**295.9**	**204,200**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
Normal Daily Expense:					
Supervision and Overhead	307.6	338.0	354.4	370.9	29,300
Labor (pumper)	276.0	302.1	318.8	327.1	31,400
Auto Usage	296.0	308.0	312.0	316.0	7,900
Chemicals	216.7	230.0	246.7	246.7	7,400
Fuel, Power & Water	503.1	486.6	483.8	480.2	172,400
Operative Supplies	209.1	209.1	209.1	218.2	2,400
Subtotal or Index**	**412.7**	**412.2**	**416.3**	**418.0**	**250,800**
Surface Maintenance, Repair & Services:					
Labor (roustabout)	207.4	207.4	207.4	207.4	11,200
Supplies & Services	264.7	264.7	267.6	270.6	18,400
Equipment Usage	237.5	237.5	231.3	231.3	3,700
Subtotal or Index**	**239.1**	**239.1**	**239.9**	**241.3**	**33,300**
Subsurface Maintenance, Repair & Services:					
Workover Rig Services	189.5	189.5	189.5	189.5	3,600
Remedial Services	233.3	240.4	243.9	247.4	14,100
Equipment Repair	418.4	421.4	428.2	445.6	45,900
Other	188.9	200.0	200.0	200.0	1,800
Subtotal or Index**	**328.2**	**332.4**	**337.2**	**347.9**	**65,400**
Total or Index**	**369.7**	**370.2**	**374.0**	**377.4**	**349,500**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
Normal Daily Expense:					
Supervision and Overhead	314.3	346.9	364.3	382.7	37,500
Labor (pumper)	276.0	302.1	318.8	327.1	31,400
Auto Usage	296.0	308.0	312.0	316.0	7,900
Chemicals	208.6	220.0	234.3	234.3	8,200
Fuel, Power & Water	503.4	485.1	483.1	480.9	267,400
Operative Supplies	208.3	208.3	208.3	208.3	2,500
Subtotal or Index**	**431.1**	**426.5**	**429.9**	**431.8**	**354,900**
Surface Maintenance, Repair & Services:					
Labor (roustabout)	207.4	207.4	207.4	207.4	11,200
Supplies & Services	244.2	244.2	246.5	248.8	21,400
Equipment Usage	237.5	237.5	231.3	231.3	3,700
Subtotal or Index**	**230.8**	**230.8**	**231.4**	**232.7**	**36,300**
Subsurface Maintenance, Repair & Services:					
Workover Rig Services	196.4	196.4	196.4	196.4	5,500
Remedial Services	194.3	199.0	201.9	204.8	21,500
Equipment Repair	460.3	460.3	480.4	503.4	90,100
Other	184.6	184.6	192.3	192.3	2,500
Subtotal or Index**	**340.6**	**342.2**	**354.5**	**368.0**	**119,600**
Total or Index**	**384.6**	**382.0**	**387.3**	**392.0**	**510,800**

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)				1999* Cost
	1996	1997	1998	1999	(dollars)
Labor	283.3	307.4	321.3	334.1	771,700
Supervision	283.8	307.8	321.7	334.7	115,800
Payroll Overhead	377.8	409.8	428.4	445.4	355,000
Food Expense	199.2	199.2	199.2	199.2	79,300
Labor Transportation	280.0	489.4	436.3	395.0	698,400
Surface Equipment	241.8	252.1	262.6	264.6	131,000
Operating Supplies	241.4	252.5	262.6	264.6	26,200
Workover	322.9	466.5	498.2	437.7	1,196,600
Communications	679.1	772.1	904.7	1009.3	43,400
Administrative	275.2	296.6	309.7	320.3	371,600
Insurance	101.4	86.2	84.5	88.8	190,300
Total or Index**	**262.0**	**331.5**	**337.0**	**323.7**	**3,979,300**

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)				1999* Cost
	1996	1997	1998	1999	(dollars)
Labor	283.3	307.4	321.3	334.1	771,700
Supervision	283.8	307.8	321.7	334.7	115,800
Payroll Overhead	377.8	409.8	428.4	445.4	355,000
Food Expense	199.2	199.2	199.2	199.2	79,300
Labor Transportation	282.2	476.4	431.6	389.1	747,000
Surface Equipment	242.0	252.2	262.6	264.8	132,400
Operating Supplies	242.0	252.0	263.0	265.0	26,500
Workover	328.0	472.7	505.6	444.8	1,272,100
Communications	118.7	125.9	137.0	146.2	44,600
Administrative	275.1	296.3	309.5	320.0	372,200
Insurance	100.7	85.6	83.9	88.0	214,400
Total or Index**	**255.8**	**322.2**	**328.3**	**314.5**	**4,131,000**

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)				1999* Cost
	1996	1997	1998	1999	(dollars)
Labor	274.3	297.6	311.0	323.5	850,700
Supervision	274.6	298.0	311.4	323.9	127,600
Payroll Overhead	365.4	396.5	414.3	430.9	391,300
Food Expense	199.1	199.1	199.1	199.1	90,600
Labor Transportation	280.0	489.4	436.3	395.0	698,400
Surface Equipment	218.6	228.0	237.4	239.4	132,400
Operating Supplies	218.0	227.0	236.9	238.7	26,500
Workover	328.0	473.7	506.0	444.5	1,794,900
Communications	271.5	319.5	385.4	438.2	53,900
Administrative	263.8	284.3	297.0	307.3	403,800
Insurance	100.6	85.5	83.8	88.0	279,000
Total or Index**	**253.2**	**321.0**	**328.7**	**313.6**	**4,849,100**

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)				1999* Cost
	1996	1997	1998	1999	(dollars)
Labor	274.3	297.6	311.0	323.5	850,700
Supervision	274.6	298.0	311.4	323.9	127,600
Payroll Overhead	365.8	396.9	414.8	431.4	391,300
Food Expense	199.1	199.1	199.1	199.1	90,600
Labor Transportation	282.2	476.4	431.6	389.1	747,020
Surface Equipment	216.3	225.6	234.9	236.9	132,400
Operating Supplies	216.1	225.0	234.8	236.6	26,500
Workover	332.7	479.5	512.9	451.2	1,908,100
Communications	124.6	140.3	162.0	179.0	54,600
Administrative	263.0	283.5	296.1	306.4	403,800
Insurance	99.6	84.7	83.0	87.1	297,700
Total or Index**	**250.6**	**317.0**	**325.4**	**309.6**	**5,030,320**

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)				1999* Cost
	1996	1997	1998	1999	(dollars)
Labor	274.3	297.6	311.0	323.5	850,700
Supervision	274.6	298.0	311.4	323.9	127,600
Payroll Overhead	365.8	396.9	414.8	431.4	391,300
Food Expense	199.1	199.1	199.1	199.1	90,600
Labor Transportation	273.5	455.5	405.5	372.5	762,100
Surface Equipment	244.3	254.8	265.2	267.4	150,800
Operating Supplies	244.2	254.0	264.6	267.3	30,200
Workover	322.4	463.4	494.5	436.3	1,955,400
Communications	110.4	121.9	137.7	150.3	55,000
Administrative	268.5	289.2	302.0	312.4	412,700
Insurance	105.7	89.9	88.1	92.5	478,600
Total or Index**	**236.5**	**293.9**	**300.1**	**287.5**	**5,305,000**

Section II

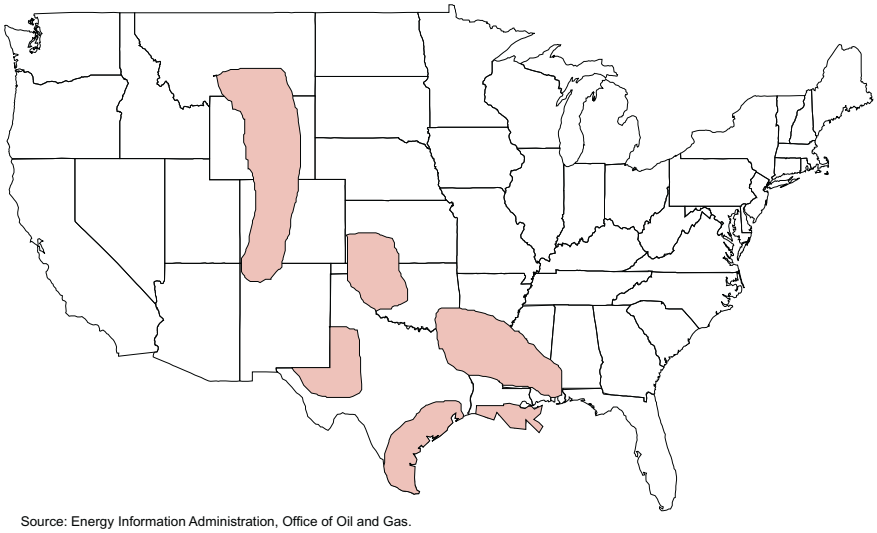
Appendices H Through M

Costs and Indices for Domestic Oil Field Equipment and Production Operations

Appendices H Through M

Costs and Indices for Domestic Oil 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 1999 costs and indices for 1996 through 1999 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: • 1999 data are preliminary and are marked with a single asterisk (*). • 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)				1999* Cost (dollars)
	1996	1997	1998	1999	
	50 Thousand Cubic Feet Per Day				
Flowlines and Connections	276.9	284.6	276.9	284.6	3,700
Production Package	114.7	114.7	120.6	114.7	3,900
Storage Tanks	177.8	185.2	188.9	188.9	10,200
Total or Index	**169.3**	**174.3**	**177.2**	**176.2**	**17,800**
	250 Thousand Cubic Feet Per Day				
Flowlines and Connections	276.9	284.6	276.9	284.6	3,700
Production Package	114.7	114.7	120.6	114.7	3,900
Storage Tanks	177.8	185.2	188.9	188.9	10,200
Total or Index	**169.3**	**174.3**	**177.2**	**176.2**	**17,800**

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

Component	Index (1976=100)				1999* Cost (dollars)
	1996	1997	1998	1999	
	50 Thousand Cubic Feet Per Day				
Flowlines and Connections	276.9	284.6	276.9	284.6	3,700
Production Package	114.7	114.7	120.6	114.7	3,900
Storage Tanks	177.8	185.2	188.9	188.9	10,200
Total or Index	**169.3**	**174.3**	**177.2**	**176.2**	**17,800**
	250 Thousand Cubic Feet Per Day				
Flowlines and Connections	233.3	244.4	251.1	262.2	11,800
Production Package	160.0	160.0	168.6	162.9	5,700
Storage Tanks	177.8	185.2	188.9	188.9	10,200
Total or Index	**191.8**	**198.5**	**204.5**	**206.7**	**27,700**

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

Component	Index (1976=100)				1999* Cost (dollars)
	1996	1997	1998	1999	
	50 Thousand Cubic Feet Per Day				
Flowlines and Connections	231.3	241.7	247.9	258.3	12,400
Production Package	134.5	134.5	141.4	134.5	3,900
Storage Tanks	177.8	185.2	188.9	188.9	10,200
Total or Index	**187.8**	**194.7**	**200.0**	**202.3**	**26,500**
	250 Thousand Cubic Feet Per Day				
Flowlines and Connections	231.3	241.7	247.9	258.3	12,400
Production Package	160.0	160.0	168.6	162.9	5,700
Dehydrators	165.6	174.2	178.5	169.9	15,800
Storage Tanks	177.8	185.2	188.9	188.9	10,200
Total or Index	**181.3**	**188.7**	**193.9**	**191.7**	**44,100**
	500 Thousand Cubic Feet Per Day				
Flowlines and Connections	229.3	241.5	248.8	258.5	10,600
Production Package	140.0	140.0	147.5	142.5	5,700
Dehydrators	165.6	174.2	178.5	169.9	15,800
Storage Tanks	177.8	185.2	188.9	188.9	10,200
Total or Index	**175.4**	**182.9**	**188.2**	**185.5**	**42,300**

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

Component	Index (1976=100)				1999* Cost (dollars)
	1996	1997	1998	1999	
	250 Thousand Cubic Feet Per Day				
Flowlines and Connections	344.9	362.3	375.4	392.8	27,100
Production Package	140.0	140.0	147.5	142.5	5,700
Dehydrators	165.6	174.2	178.5	169.9	15,800
Storage Tanks	177.8	185.2	188.9	188.9	10,200
Total or Index	**212.5**	**221.9**	**228.9**	**229.7**	**58,800**
	500 Thousand Cubic Feet Per Day				
Flowlines and Connections	358.1	375.8	390.3	408.1	25,300
Production Package	140.0	140.0	147.5	142.5	5,700
Dehydrators	165.6	174.2	178.5	169.9	15,800
Storage Tanks	177.8	185.2	188.9	188.9	10,200
Total or Index	**212.0**	**221.3**	**228.5**	**228.9**	**57,000**
	1 Million Cubic Feet Per Day				
Flowlines and Connections	367.3	386.5	405.8	425.0	22,100
Production Package	109.1	113.1	127.3	123.2	12,200
Dehydrators	165.6	174.2	178.5	169.9	15,800
Storage Tanks	177.8	185.2	188.9	188.9	10,200
Total or Index	**184.2**	**193.0**	**203.0**	**202.3**	**60,300**

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

Component	Index (1976=100)				1999* Cost (dollars)
	1996	1997	1998	1999	
	500 Thousand Cubic Feet Per Day				
Flowlines and Connections	367.3	386.5	405.8	425.0	22,100
Production Package	109.1	113.1	127.3	123.2	12,200
Dehydrators	165.6	174.2	178.5	169.9	15,800
Storage Tanks	177.8	185.2	188.9	188.9	10,200
Total or Index	**184.2**	**193.0**	**203.0**	**202.3**	**60,300**
	1 Million Cubic Feet Per Day				
Flowlines and Connections	367.3	386.5	405.8	425.0	22,100
Production Package	109.1	113.1	127.3	123.2	12,200
Dehydrators	165.6	174.2	178.5	169.9	15,800
Storage Tanks	177.8	185.2	188.9	188.9	10,200
Total or Index	**184.2**	**193.0**	**203.0**	**202.3**	**60,300**
	5 Million Cubic Feet Per Day				
Flowlines and Connections	229.9	241.5	253.0	265.9	43,600
Production Package	120.4	124.1	127.8	131.5	14,200
Dehydrators	187.6	205.3	207.1	193.8	21,900
Storage Tanks	177.8	185.2	188.9	188.9	10,200
Total or Index	**185.6**	**196.4**	**202.5**	**204.8**	**89,900**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
	50 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	283.3	300.0	325.0	341.7	4,100
Fuel, Chemicals & Disposal	300.0	300.0	300.0	300.0	600
Surface Maintenance	233.3	233.3	266.7	280.0	4,200
Subsurface Maintenance	180.0	200.0	200.0	160.0	800
Total or Index	**247.1**	**255.9**	**279.4**	**285.3**	**9,700**
	250 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	283.3	300.0	325.0	341.7	4,100
Fuel, Chemicals & Disposal	220.0	240.0	250.0	250.0	2,500
Surface Maintenance	233.3	233.3	266.7	280.0	4,200
Subsurface Maintenance	180.0	200.0	200.0	160.0	800
Total or Index	**238.1**	**250.0**	**271.4**	**276.2**	**11,600**

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

Component	Index (1976=100)				1999* Cost (dollars)
	1996	1997	1998	1999	
	50 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	278.6	292.9	314.3	328.6	4,600
Fuel, Chemicals & Disposal	220.0	240.0	260.0	260.0	1,300
Surface Maintenance	266.7	266.7	300.0	320.0	4,800
Subsurface Maintenance	185.7	200.0	200.0	157.1	1,100
Total or Index	**251.2**	**261.0**	**282.9**	**287.8**	**11,800**
	250 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	278.6	292.9	314.3	328.6	4,600
Fuel, Chemicals & Disposal	220.0	235.0	250.0	250.0	5,000
Surface Maintenance	225.0	230.0	260.0	270.0	5,400
Subsurface Maintenance	185.7	200.0	200.0	157.1	1,100
Total or Index**	**231.1**	**242.6**	**262.3**	**263.9**	**16,100**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
	50 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	281.3	300.0	325.0	337.5	5,400
Fuel, Chemicals & Disposal	220.0	240.0	250.0	250.0	2,500
Surface Maintenance	225.0	225.0	255.0	265.0	5,300
Subsurface Maintenance	175.0	183.3	183.3	141.7	1,700
Total or Index	**229.3**	**239.7**	**258.6**	**256.9**	**14,900**
	250 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	281.3	300.0	325.0	337.5	5,400
Fuel, Chemicals & Disposal	228.2	243.6	259.0	259.0	10,100
Surface Maintenance	220.5	223.1	251.3	264.1	10,300
Subsurface Maintenance	175.0	183.3	183.3	141.7	1,700
Total or Index	**227.4**	**237.7**	**257.5**	**259.4**	**27,500**
	500 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	281.3	300.0	325.0	337.5	5,400
Fuel, Chemicals & Disposal	238.1	242.9	271.4	281.0	5,900
Surface Maintenance	220.6	220.6	250.0	261.8	8,900
Subsurface Maintenance	175.0	183.3	183.3	141.7	1,700
Total or Index**	**230.1**	**236.1**	**260.2**	**263.9**	**21,900**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
	250 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	294.7	310.5	336.8	352.6	6,700
Fuel, Chemicals & Disposal	222.0	238.0	254.0	254.0	12,700
Surface Maintenance	215.0	217.5	245.0	257.5	10,300
Subsurface Maintenance	196.2	200.0	207.7	173.1	4,500
Total or Index	**225.2**	**234.8**	**254.1**	**253.3**	**34,200**
	500 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	294.7	310.5	336.8	352.6	6,700
Fuel, Chemicals & Disposal	224.0	228.0	256.0	260.0	6,500
Surface Maintenance	214.3	214.3	242.9	254.3	8,900
Subsurface Maintenance	196.2	200.0	207.7	173.1	4,500
Total or Index	**226.7**	**231.4**	**254.3**	**253.3**	**26,600**
	1 Million Cubic Feet Per Day				
Direct Labor & Overhead	294.7	310.5	336.8	352.6	6,700
Fuel, Chemicals & Disposal	228.8	234.6	255.8	261.5	13,600
Surface Maintenance	200.0	202.6	228.2	238.5	9,300
Subsurface Maintenance	196.2	200.0	207.7	173.1	4,500
Total or Index**	**223.5**	**229.4**	**250.0**	**250.7**	**34,100**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
	500 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	294.7	310.5	336.8	352.6	6,700
Fuel, Chemicals & Disposal	225.8	235.5	254.8	258.1	8,000
Surface Maintenance	217.9	220.5	248.7	259.0	10,100
Subsurface Maintenance	193.5	200.0	206.5	171.0	5,300
Total or Index	**225.8**	**233.3**	**253.3**	**250.8**	**30,100**
	1 Million Cubic Feet Per Day				
Direct Labor & Overhead	294.7	310.5	336.8	352.6	6,700
Fuel, Chemicals & Disposal	224.6	232.8	252.5	259.0	15,800
Surface Maintenance	217.9	220.5	248.7	259.0	10,100
Subsurface Maintenance	193.5	200.0	206.5	171.0	5,300
Total or Index	**225.3**	**232.7**	**252.7**	**252.7**	**37,900**
	5 Million Cubic Feet Per Day				
Direct Labor & Overhead	294.7	310.5	336.8	352.6	6,700
Fuel, Chemicals & Disposal	177.8	183.8	180.8	180.8	17,900
Surface Maintenance	238.8	244.9	269.4	277.6	13,600
Subsurface Maintenance	142.4	148.5	154.5	151.5	5,000
Total or Index**	**198.0**	**205.0**	**213.0**	**216.0**	**43,200**

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 XH
Heater rating: 250,000 BTU per hour
Size: 16 inches by 8 feet
Working pressure: 1,000 pounds per square inch

Dehydrator/Reconcentrator

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

Storage Tanks (2)

Size: 10 feet 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)				1999* Cost (dollars)
	1996	1997	1998	1999	
	50 Thousand Cubic Feet Per Day				
Flowlines and Connections	276.9	292.3	284.6	292.3	3,800
Production Package	171.4	177.1	177.1	180.0	6,300
Storage Tanks	174.5	181.8	185.5	185.5	10,200
Total or Index	**186.4**	**194.2**	**195.1**	**197.1**	**20,300**
	250 Thousand Cubic Feet Per Day				
Flowlines and Connections	276.9	292.3	284.6	292.3	3,800
Production Package	171.4	177.1	177.1	180.0	6,300
Storage Tanks	174.5	181.8	185.5	185.5	10,200
Total or Index	**186.4**	**194.2**	**195.1**	**197.1**	**20,300**

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

Component	Index (1976=100)				1999* Cost (dollars)
	1996	1997	1998	1999	
	50 Thousand Cubic Feet Per Day				
Flowlines and Connections	276.9	292.3	284.6	292.3	3,800
Production Package	171.4	177.1	177.1	180.0	6,300
Storage Tanks	174.5	181.8	185.5	185.5	10,200
Total or Index	**186.4**	**194.2**	**195.1**	**197.1**	**20,300**
	250 Thousand Cubic Feet Per Day				
Flowlines and Connections	230.4	241.3	247.8	258.7	11,900
Production Package	210.8	216.2	216.2	218.9	8,100
Storage Tanks	174.5	181.8	185.5	185.5	10,200
Total or Index	**202.9**	**210.9**	**214.5**	**218.8**	**30,200**

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

Component	Index (1976=100)				1999* Cost (dollars)
	1996	1997	1998	1999	
	250 Thousand Cubic Feet Per Day				
Flowlines and Connections	228.6	238.8	244.9	255.1	12,500
Production Package	210.8	216.2	216.2	218.9	8,100
Dehydrators	165.3	172.6	173.7	165.3	15,700
Storage Tanks	174.5	181.8	185.5	185.5	10,200
Total or Index	**187.7**	**195.3**	**197.9**	**197.0**	**46,500**
	500 Thousand Cubic Feet Per Day				
Flowlines and Connections	229.3	241.5	248.8	258.5	10,600
Production Package	185.7	190.5	190.5	192.9	8,100
Dehydrators	165.3	172.6	173.7	165.3	15,700
Storage Tanks	174.5	181.8	185.5	185.5	10,200
Total or Index	**182.4**	**190.1**	**192.7**	**191.4**	**44,600**
	1 Million Cubic Feet Per Day				
Flowlines and Connections	367.3	386.5	405.8	425.0	22,100
Production Package	110.0	113.0	128.0	124.0	12,400
Dehydrators	165.3	172.6	173.7	165.3	15,700
Storage Tanks	177.8	185.2	188.9	188.9	10,200
Total or Index	**184.1**	**192.0**	**201.3**	**200.7**	**60,400**

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

Component	Index (1976=100)				1999* Cost (dollars)
	1996	1997	1998	1999	
	500 Thousand Cubic Feet Per Day				
Flowlines and Connections	358.1	375.8	390.3	408.1	25,300
Production Package	185.7	190.5	190.5	192.9	8,100
Dehydrators	165.3	172.6	173.7	165.3	15,700
Storage Tanks	174.5	181.8	185.5	185.5	10,200
Total or Index	**217.7**	**227.2**	**231.9**	**233.5**	**59,300**
	1 Million Cubic Feet Per Day				
Flowlines and Connections	367.3	386.5	405.8	425.0	22,100
Production Package	110.0	113.0	128.0	124.0	12,400
Dehydrators	165.3	172.6	173.7	165.3	15,700
Storage Tanks	174.5	181.8	185.5	185.5	10,200
Total or Index	**183.4**	**191.4**	**200.7**	**200.0**	**60,400**
	5 Million Cubic Feet Per Day				
Flowlines and Connections	229.9	241.5	253.0	265.9	43,600
Production Package	120.9	124.5	128.2	131.8	14,500
Dehydrators	187.0	203.5	203.5	189.6	21,800
Storage Tanks	174.5	181.8	185.5	185.5	10,200
Total or Index	**184.9**	**195.3**	**200.9**	**202.9**	**90,100**

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

Component	Index (1976=100)				1999* Cost (dollars)
	1996	1997	1998	1999	
	50 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	276.9	284.6	300.0	307.7	4,000
Fuel, Chemicals & Disposal	300.0	300.0	300.0	300.0	600
Surface Maintenance	236.8	231.6	231.6	236.8	4,500
Subsurface Maintenance	200.0	220.0	220.0	220.0	1,100
Total or Index	**248.7**	**251.3**	**256.4**	**261.5**	**10,200**
	250 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	276.9	284.6	300.0	307.7	4,000
Fuel, Chemicals & Disposal	220.0	240.0	250.0	250.0	2,500
Surface Maintenance	236.8	231.6	231.6	236.8	4,500
Subsurface Maintenance	200.0	220.0	220.0	220.0	1,100
Total or Index**	**240.4**	**246.8**	**253.2**	**257.4**	**12,100**

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

Component	Index (1976=100)				1999* Cost (dollars)
	1996	1997	1998	1999	
	50 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	285.7	300.0	314.3	321.4	4,500
Fuel, Chemicals & Disposal	220.0	240.0	260.0	260.0	1,300
Surface Maintenance	236.8	231.6	231.6	236.8	4,500
Subsurface Maintenance	214.3	228.6	228.6	228.6	1,600
Total or Index	**246.7**	**253.3**	**260.0**	**264.4**	**11,900**
	250 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	285.7	300.0	314.3	321.4	4,500
Fuel, Chemicals & Disposal	220.0	235.0	250.0	250.0	5,000
Surface Maintenance	216.7	212.5	212.5	216.7	5,200
Subsurface Maintenance	214.3	228.6	228.6	228.6	1,600
Total or Index**	**232.3**	**240.0**	**247.7**	**250.8**	**16,300**

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

Component	Index (1976=100)				1999* Cost (dollars)
	1996	1997	1998	1999	
	250 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	276.5	294.1	300.0	311.8	5,300
Fuel, Chemicals & Disposal	225.6	243.6	259.0	259.0	10,100
Surface Maintenance	210.6	206.4	208.5	212.8	10,000
Subsurface Maintenance	216.7	225.0	225.0	225.0	2,700
Total or Index	**226.1**	**233.9**	**240.9**	**244.3**	**28,100**
	500 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	276.5	294.1	300.0	311.8	5,300
Fuel, Chemicals & Disposal	140.0	137.5	140.0	142.5	5,700
Surface Maintenance	209.8	204.9	207.3	212.2	8,700
Subsurface Maintenance	216.7	225.0	225.0	225.0	2,700
Total or Index	**195.5**	**196.4**	**199.1**	**203.6**	**22,400**
	1 Million Cubic Feet Per Day				
Direct Labor & Overhead	276.5	294.1	300.0	311.8	5,300
Fuel, Chemicals & Disposal	288.5	292.3	298.1	301.9	15,700
Surface Maintenance	208.7	206.5	210.9	215.2	9,900
Subsurface Maintenance	216.7	225.0	225.0	225.0	2,700
Total or Index**	**251.2**	**255.1**	**259.8**	**264.6**	**33,600**

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

Component	Index (1976=100)				1999* Cost (dollars)
	1996	1997	1998	1999	
	500 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	285.0	305.0	315.0	330.0	6,600
Fuel, Chemicals & Disposal	217.2	217.2	224.1	224.1	6,500
Surface Maintenance	221.4	216.7	221.4	226.2	9,500
Subsurface Maintenance	229.2	241.7	241.7	245.8	5,900
Total or Index	**235.1**	**239.5**	**244.7**	**250.0**	**28,500**
	1 Million Cubic Feet Per Day				
Direct Labor & Overhead	285.0	305.0	315.0	330.0	6,600
Fuel, Chemicals & Disposal	181.7	180.0	180.0	181.7	10,900
Surface Maintenance	208.7	206.5	210.9	215.2	9,900
Subsurface Maintenance	229.2	241.7	241.7	245.8	5,900
Total or Index	**212.8**	**216.1**	**218.8**	**223.5**	**33,300**
	5 Million Cubic Feet Per Day				
Direct Labor & Overhead	285.0	305.0	315.0	330.0	6,600
Fuel, Chemicals & Disposal	191.2	198.2	191.2	189.5	10,800
Surface Maintenance	204.8	204.8	207.9	212.7	13,400
Subsurface Maintenance	211.5	223.1	223.1	226.9	5,900
Total or Index**	**210.8**	**217.5**	**217.5**	**221.1**	**36,700**

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

Component	Index (1976=100)				1999* Cost (dollars)
	1996	1997	1998	1999	
	50 Thousand Cubic Feet Per Day				
Flowlines and Connections	264.3	278.6	271.4	278.6	3,900
Production Package	174.3	182.9	182.9	182.9	6,400
Storage Tanks	175.0	183.9	187.5	187.5	10,500
Total or Index	**186.7**	**196.2**	**197.1**	**198.1**	**20,800**
	250 Thousand Cubic Feet Per Day				
Flowlines and Connections	264.3	278.6	271.4	278.6	3,900
Production Package	174.3	182.9	182.9	182.9	6,400
Storage Tanks	175.0	183.9	187.5	187.5	10,500
Total or Index	**186.7**	**196.2**	**197.1**	**198.1**	**20,800**

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

Component	Index (1976=100)				1999* Cost (dollars)
	1996	1997	1998	1999	
	50 Thousand Cubic Feet Per Day				
Flowlines and Connections	264.3	278.6	271.4	278.6	3,900
Production Package	174.3	182.9	182.9	182.9	6,400
Storage Tanks	175.0	183.9	187.5	187.5	10,500
Total or Index	**186.7**	**196.2**	**197.1**	**198.1**	**20,800**
	250 Thousand Cubic Feet Per Day				
Flowlines and Connections	230.4	243.5	250.0	260.9	12,000
Production Package	213.5	227.0	227.0	227.0	8,400
Storage Tanks	175.0	183.9	187.5	187.5	10,500
Total or Index	**203.6**	**215.1**	**218.7**	**222.3**	**30,900**

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

Component	Index (1976=100)				1999* Cost (dollars)
	1996	1997	1998	1999	
	250 Thousand Cubic Feet Per Day				
Flowlines and Connections	228.6	240.8	246.9	257.1	12,600
Production Package	213.5	227.0	227.0	227.0	8,400
Dehydrators	163.5	175.0	176.0	166.7	16,000
Storage Tanks	175.0	183.9	187.5	187.5	10,500
Total or Index	**187.4**	**198.7**	**201.3**	**199.6**	**47,500**
	500 Thousand Cubic Feet Per Day				
Flowlines and Connections	229.3	241.5	248.8	258.5	10,600
Production Package	188.1	200.0	200.0	200.0	8,400
Dehydrators	163.5	175.0	176.0	166.7	16,000
Storage Tanks	175.0	183.9	187.5	187.5	10,500
Total or Index	**182.1**	**193.2**	**195.7**	**193.6**	**45,500**
	1 Million Cubic Feet Per Day				
Flowlines and Connections	367.3	386.5	405.8	425.0	22,100
Production Package	110.0	115.0	130.0	126.0	12,600
Dehydrators	163.5	175.0	176.0	166.7	16,000
Storage Tanks	175.0	183.9	187.5	187.5	10,500
Total or Index	**182.9**	**193.1**	**202.3**	**201.3**	**61,200**

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

Component	Index (1976=100)				1999* Cost (dollars)
	1996	1997	1998	1999	
	500 Thousand Cubic Feet Per Day				
Flowlines and Connections	358.1	375.8	390.3	408.1	25,300
Production Package	188.1	200.0	200.0	200.0	8,400
Dehydrators	163.5	175.0	176.0	166.7	16,000
Storage Tanks	175.0	183.9	187.5	187.5	10,500
Total or Index	**217.2**	**229.7**	**234.4**	**235.2**	**60,200**
	1 Million Cubic Feet Per Day				
Flowlines and Connections	367.3	386.5	405.8	425.0	22,100
Production Package	110.0	115.0	130.0	126.0	12,600
Dehydrators	163.5	175.0	176.0	166.7	16,000
Storage Tanks	175.0	183.9	187.5	187.5	10,500
Total or Index	**182.9**	**193.1**	**202.3**	**201.3**	**61,200**
	5 Million Cubic Feet Per Day				
Flowlines and Connections	229.9	241.5	253.0	265.9	43,600
Production Package	121.8	128.2	131.8	135.5	14,900
Dehydrators	185.3	205.2	205.2	190.5	22,100
Storage Tanks	175.0	183.9	187.5	187.5	10,500
Total or Index	**184.8**	**196.9**	**202.5**	**204.3**	**91,100**

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

Component	Index (1976=100)				1999* Cost (dollars)
	1996	1997	1998	1999	
	500 Thousand Cubic Feet Per Day				
Flowlines and Connections	358.1	375.8	390.3	408.1	25,300
Production Package	188.1	200.0	200.0	200.0	8,400
Dehydrators	163.5	175.0	176.0	166.7	16,000
Storage Tanks	175.0	183.9	187.5	187.5	10,500
Total or Index	**217.2**	**229.7**	**234.4**	**235.2**	**60,200**
	1 Million Cubic Feet Per Day				
Flowlines and Connections	367.3	386.5	405.8	425.0	22,100
Production Package	110.0	115.0	130.0	126.0	12,600
Dehydrators	163.5	175.0	176.0	166.7	16,000
Storage Tanks	175.0	183.9	187.5	187.5	10,500
Total or Index	**182.9**	**193.1**	**202.3**	**201.3**	**61,200**
	5 Million Cubic Feet Per Day				
Flowlines and Connections	342.7	359.8	377.4	396.3	65,000
Production Package	121.8	128.2	131.8	135.5	14,900
Dehydrators	185.3	205.2	205.2	190.5	22,100
Storage Tanks	175.0	183.9	187.5	187.5	10,500
Total or Index	**226.2**	**240.4**	**248.2**	**252.2**	**112,500**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
	50 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	269.2	300.0	307.7	315.4	4,100
Fuel, Chemicals & Disposal	300.0	300.0	300.0	300.0	600
Surface Maintenance	210.0	235.0	235.0	235.0	4,700
Subsurface Maintenance	183.3	183.3	183.3	183.3	1,100
Total or Index	**229.3**	**251.2**	**253.7**	**256.1**	**10,500**
	250 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	269.2	300.0	307.7	315.4	4,100
Fuel, Chemicals & Disposal	220.0	240.0	250.0	250.0	2,500
Surface Maintenance	210.0	235.0	235.0	235.0	4,700
Subsurface Maintenance	183.3	183.3	183.3	183.3	1,100
Total or Index**	**224.5**	**246.9**	**251.0**	**253.1**	**12,400**

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

Component	Index (1976=100)				1999* Cost (dollars)
	1996	1997	1998	1999	
	50 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	285.7	314.3	321.4	328.6	4,600
Fuel, Chemicals & Disposal	220.0	240.0	260.0	260.0	1,300
Surface Maintenance	210.0	235.0	235.0	235.0	4,700
Subsurface Maintenance	187.5	187.5	200.0	200.0	1,600
Total or Index	**229.8**	**251.1**	**257.4**	**259.6**	**12,200**
	250 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	285.7	314.3	321.4	328.6	4,600
Fuel, Chemicals & Disposal	220.0	235.0	250.0	250.0	5,000
Surface Maintenance	212.0	240.0	240.0	240.0	6,000
Subsurface Maintenance	187.5	187.5	200.0	200.0	1,600
Total or Index**	**226.9**	**247.8**	**255.2**	**256.7**	**17,200**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
	250 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	276.5	300.0	311.8	323.5	5,500
Fuel, Chemicals & Disposal	225.6	243.6	259.0	259.0	10,100
Surface Maintenance	202.0	226.0	228.0	228.0	11,400
Subsurface Maintenance	208.3	216.7	225.0	225.0	2,700
Total or Index	**221.2**	**241.5**	**250.0**	**251.7**	**29,700**
	500 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	276.5	300.0	311.8	323.5	5,500
Fuel, Chemicals & Disposal	215.4	242.3	246.2	246.2	6,400
Surface Maintenance	204.1	228.6	230.6	232.7	11,400
Subsurface Maintenance	208.3	216.7	225.0	225.0	2,700
Total or Index	**219.2**	**242.3**	**247.1**	**250.0**	**26,000**
	1 Million Cubic Feet Per Day				
Direct Labor & Overhead	276.5	300.0	311.8	323.5	5,500
Fuel, Chemicals & Disposal	218.5	244.4	244.4	244.4	13,200
Surface Maintenance	204.2	227.1	231.3	231.3	11,100
Subsurface Maintenance	208.3	216.7	225.0	225.0	2,700
Total or Index**	**219.8**	**242.7**	**246.6**	**248.1**	**32,500**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
	500 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	285.0	315.0	325.0	335.0	6,700
Fuel, Chemicals & Disposal	213.3	236.7	240.0	240.0	7,200
Surface Maintenance	213.6	238.6	240.9	243.2	10,700
Subsurface Maintenance	204.2	208.3	216.7	216.7	5,200
Total or Index	**223.7**	**244.9**	**250.0**	**252.5**	**29,800**
	1 Million Cubic Feet Per Day				
Direct Labor & Overhead	285.0	315.0	325.0	335.0	6,700
Fuel, Chemicals & Disposal	218.0	239.3	242.6	242.6	14,800
Surface Maintenance	204.2	227.1	231.3	231.3	11,100
Subsurface Maintenance	225.0	225.0	237.5	237.5	5,700
Total or Index	**223.5**	**243.1**	**249.0**	**250.3**	**38,300**
	5 Million Cubic Feet Per Day				
Direct Labor & Overhead	285.0	315.0	325.0	335.0	6,700
Fuel, Chemicals & Disposal	202.4	209.8	202.4	200.0	8,200
Surface Maintenance	217.5	238.6	242.1	243.9	13,900
Subsurface Maintenance	207.7	207.7	219.2	219.2	5,700
Total or Index**	**220.8**	**235.4**	**238.2**	**239.6**	**34,500**

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

Component	Index (1976=100)				1999* Cost (dollars)
	1996	1997	1998	1999	
	500 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	285.0	315.0	325.0	335.0	6,700
Fuel, Chemicals & Disposal	205.7	228.6	234.3	234.3	8,200
Surface Maintenance	213.6	238.6	240.9	243.2	10,700
Subsurface Maintenance	197.0	200.0	209.1	212.1	7,000
Total or Index	**218.2**	**237.9**	**243.9**	**247.0**	**32,600**
	1 Million Cubic Feet Per Day				
Direct Labor & Overhead	285.0	315.0	325.0	335.0	6,700
Fuel, Chemicals & Disposal	212.7	233.8	238.0	238.0	16,900
Surface Maintenance	204.2	227.1	231.3	231.3	11,100
Subsurface Maintenance	197.0	200.0	209.1	212.1	7,000
Total or Index	**215.7**	**234.9**	**240.7**	**242.4**	**41,700**
	5 Million Cubic Feet Per Day				
Direct Labor & Overhead	285.0	315.0	325.0	335.0	6,700
Fuel, Chemicals & Disposal	182.1	187.4	185.3	185.3	17,600
Surface Maintenance	210.2	230.5	233.9	235.6	13,900
Subsurface Maintenance	200.0	202.9	211.4	214.3	7,500
Total or Index**	**202.9**	**214.4**	**216.7**	**218.7**	**45,700**

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

Component	Index (1976=100)				1999* Cost (dollars)
	1996	1997	1998	1999	
	50 Thousand Cubic Feet Per Day				
Flowlines and Connections	264.3	278.6	271.4	278.6	3,900
Production Package	174.3	182.9	182.9	182.9	6,400
Storage Tanks	175.0	183.9	187.5	187.5	10,500
Total or Index	**186.7**	**196.2**	**197.1**	**198.1**	**20,800**
	250 Thousand Cubic Feet Per Day				
Flowlines and Connections	264.3	278.6	271.4	278.6	3,900
Production Package	174.3	182.9	182.9	182.9	6,400
Storage Tanks	175.0	183.9	187.5	187.5	10,500
Total or Index	**186.7**	**196.2**	**197.1**	**198.1**	**20,800**

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

Component	Index (1976=100)				1999* Cost (dollars)
	1996	1997	1998	1999	
	250 Thousand Cubic Feet Per Day				
Flowlines and Connections	230.4	243.5	250.0	260.9	12,000
Production Package	218.9	229.7	227.0	216.2	8,000
Storage Tanks	175.0	183.9	187.5	187.5	10,500
Total or Index	**205.0**	**215.8**	**218.7**	**219.4**	**30,500**
	500 Thousand Cubic Feet Per Day				
Flowlines and Connections	316.7	333.3	316.7	316.7	1,900
Production Package	188.1	200.0	200.0	200.0	8,400
Storage Tanks	175.0	183.9	187.5	187.5	10,500
Total or Index	**188.5**	**199.0**	**200.0**	**200.0**	**20,800**

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

Component	Index (1976=100)				1999* Cost (dollars)
	1996	1997	1998	1999	
	250 Thousand Cubic Feet Per Day				
Flowlines and Connections	228.6	240.8	246.9	257.1	12,600
Production Package	200.0	210.8	210.8	197.3	7,300
Dehydrators	163.5	175.0	176.0	166.7	16,000
Storage Tanks	175.0	183.9	187.5	187.5	10,500
Total or Index	**185.3**	**196.2**	**198.7**	**195.0**	**46,400**
	500 Thousand Cubic Feet Per Day				
Flowlines and Connections	229.3	241.5	248.8	258.5	10,600
Production Package	188.1	200.0	200.0	200.0	8,400
Dehydrators	163.5	175.0	176.0	166.7	16,000
Storage Tanks	175.0	183.9	187.5	187.5	10,500
Total or Index	**182.1**	**193.2**	**195.7**	**193.6**	**45,500**

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

Component	Index (1976=100)				1999* Cost (dollars)
	1996	1997	1998	1999	
	500 Thousand Cubic Feet Per Day				
Flowlines and Connections	358.1	375.8	390.3	408.1	25,300
Production Package	188.1	200.0	200.0	200.0	8,400
Dehydrators	163.5	175.0	176.0	166.7	16,000
Storage Tanks	175.0	183.9	187.5	187.5	10,500
Total or Index	**217.2**	**229.7**	**234.4**	**235.2**	**60,200**
	1 Million Cubic Feet Per Day				
Flowlines and Connections	367.3	386.5	405.8	425.0	22,100
Production Package	110.0	115.0	130.0	126.0	12,600
Dehydrators	163.5	175.0	176.0	166.7	16,000
Storage Tanks	175.0	183.9	187.5	187.5	10,500
Total or Index	**182.9**	**193.1**	**202.3**	**201.3**	**61,200**

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

Component	Index (1976=100)				1999* Cost (dollars)
	1996	1997	1998	1999	
	1 Million Cubic Feet Per Day				
Flowlines and Connections	367.3	386.5	405.8	425.0	22,100
Production Package	110.0	115.0	130.0	126.0	12,600
Dehydrators	163.5	175.0	176.0	166.7	16,000
Storage Tanks	175.0	183.9	187.5	187.5	10,500
Total or Index	**182.9**	**193.1**	**202.3**	**201.3**	**61,200**
	5 Million Cubic Feet Per Day				
Flowlines and Connections	342.7	359.8	377.4	396.3	65,000
Production Package	121.8	128.2	131.8	135.5	14,900
Dehydrators	185.3	205.2	205.2	190.5	22,100
Storage Tanks	175.0	183.9	187.5	187.5	10,500
Total or Index	**226.2**	**240.4**	**248.2**	**252.2**	**112,500**
	10 Million Cubic Feet Per Day				
Flowlines and Connections	342.7	359.8	377.4	396.3	65,000
Production Package	121.8	128.2	131.8	135.5	14,900
Dehydrators	214.8	222.4	206.8	193.2	50,800
Storage Tanks	175.0	183.9	187.5	187.5	10,500
Total or Index	**229.2**	**239.3**	**238.3**	**238.1**	**141,200**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
	50 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	269.2	300.0	307.7	315.4	4,100
Fuel, Chemicals & Disposal	300.0	300.0	300.0	300.0	600
Surface Maintenance	210.0	235.0	235.0	235.0	4,700
Subsurface Maintenance	183.3	183.3	183.3	183.3	1,100
Total or Index	**229.3**	**251.2**	**253.7**	**256.1**	**10,500**
	250 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	269.2	300.0	307.7	315.4	4,100
Fuel, Chemicals & Disposal	220.0	240.0	250.0	250.0	2,500
Surface Maintenance	210.0	235.0	235.0	235.0	4,700
Subsurface Maintenance	183.3	183.3	183.3	183.3	1,100
Total or Index**	**224.5**	**246.9**	**251.0**	**253.1**	**12,400**

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

Component	Index (1976=100)				1999* Cost (dollars)
	1996	1997	1998	1999	
	250 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	285.7	314.3	321.4	328.6	4,600
Fuel, Chemicals & Disposal	220.0	235.0	250.0	250.0	5,000
Surface Maintenance	216.0	240.0	240.0	244.0	6,100
Subsurface Maintenance	187.5	187.5	200.0	200.0	1,600
Total or Index	**228.4**	**247.8**	**255.2**	**258.2**	**17,300**
	500 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	285.7	314.3	321.4	328.6	4,600
Fuel, Chemicals & Disposal	208.3	233.3	237.5	237.5	5,700
Surface Maintenance	208.0	236.0	236.0	236.0	5,900
Subsurface Maintenance	187.5	187.5	200.0	200.0	1,600
Total or Index**	**221.1**	**245.1**	**249.3**	**250.7**	**17,800**

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

Component	Index (1976=100)				1999* Cost (dollars)
	1996	1997	1998	1999	
	250 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	276.5	300.0	311.8	323.5	5,500
Fuel, Chemicals & Disposal	228.2	243.6	259.0	259.0	10,100
Surface Maintenance	204.0	228.0	230.0	230.0	11,500
Subsurface Maintenance	233.3	233.3	250.0	250.0	3,000
Total or Index	**225.4**	**244.1**	**253.4**	**255.1**	**30,100**
	500 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	276.5	300.0	311.8	323.5	5,500
Fuel, Chemicals & Disposal	196.2	219.2	219.2	219.2	5,700
Surface Maintenance	204.1	228.6	230.6	232.7	11,400
Subsurface Maintenance	233.3	233.3	250.0	250.0	3,000
Total or Index**	**217.3**	**238.5**	**243.3**	**246.2**	**25,600**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
	500 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	285.0	315.0	325.0	335.0	6,700
Fuel, Chemicals & Disposal	210.0	233.3	240.0	240.0	7,200
Surface Maintenance	213.6	238.6	240.9	243.2	10,700
Subsurface Maintenance	166.7	166.7	175.0	179.2	4,300
Total or Index	**215.3**	**235.6**	**241.5**	**244.9**	**28,900**
	1 Million Cubic Feet Per Day				
Direct Labor & Overhead	285.0	315.0	325.0	335.0	6,700
Fuel, Chemicals & Disposal	218.0	241.0	244.3	242.6	14,800
Surface Maintenance	204.2	227.1	231.3	231.3	11,100
Subsurface Maintenance	166.7	166.7	175.0	179.2	4,300
Total or Index**	**214.4**	**234.6**	**239.9**	**241.2**	**36,900**

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

Component	Index (1976=100)				1999* Cost (dollars)
	1996	1997	1998	1999	
	1 Million Cubic Feet Per Day				
Direct Labor & Overhead	285.0	315.0	325.0	335.0	6,700
Fuel, Chemicals & Disposal	215.5	236.6	239.4	239.4	17,000
Surface Maintenance	202.1	225.0	229.2	227.1	10,900
Subsurface Maintenance	197.0	200.0	209.1	212.1	7,000
Total or Index	**216.3**	**235.5**	**240.7**	**241.9**	**41,600**
	5 Million Cubic Feet Per Day				
Direct Labor & Overhead	285.0	315.0	325.0	335.0	6,700
Fuel, Chemicals & Disposal	183.3	188.5	186.5	186.5	17,900
Surface Maintenance	208.5	230.5	233.9	235.6	13,900
Subsurface Maintenance	200.0	202.9	211.4	214.3	7,500
Total or Index	**202.9**	**214.8**	**217.1**	**219.0**	**46,000**
	10 Million Cubic Feet Per Day				
Direct Labor & Overhead	285.0	315.0	325.0	335.0	6,700
Fuel, Chemicals & Disposal	177.9	183.4	181.0	180.4	29,400
Surface Maintenance	218.8	237.7	237.7	237.7	16,400
Subsurface Maintenance	200.0	202.9	211.4	214.3	7,500
Total or Index**	**197.9**	**208.0**	**208.4**	**209.1**	**60,000**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
	50 Thousand Cubic Feet Per Day				
Flowlines and Connections	284.6	300.0	300.0	307.7	4,000
Production Package	179.4	188.2	191.2	191.2	6,500
Storage Tanks	183.3	190.7	196.3	196.3	10,600
Total or Index	**195.0**	**204.0**	**207.9**	**208.9**	**21,100**
	250 Thousand Cubic Feet Per Day				
Flowlines and Connections	284.6	300.0	300.0	307.7	4,000
Production Package	200.0	210.0	210.0	212.5	8,500
Storage Tanks	183.3	190.7	196.3	196.3	10,600
Total or Index	**201.9**	**211.2**	**214.0**	**215.9**	**23,100**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
	50 Thousand Cubic Feet Per Day				
Flowlines and Connections	284.6	300.0	300.0	307.7	4,000
Production Package	179.4	188.2	191.2	191.2	6,500
Storage Tanks	183.3	190.7	196.3	196.3	10,600
Total or Index	**195.0**	**204.0**	**207.9**	**208.9**	**21,100**
	250 Thousand Cubic Feet Per Day				
Flowlines and Connections	237.8	248.9	255.6	266.7	12,000
Production Package	211.4	225.7	225.7	211.4	7,400
Storage Tanks	183.3	190.7	196.3	196.3	10,600
Total or Index	**209.0**	**219.4**	**223.9**	**223.9**	**30,000**
	500 Thousand Cubic Feet Per Day				
Flowlines and Connections	231.6	244.7	252.6	263.2	10,000
Production Package	211.4	225.7	225.7	211.4	7,400
Storage Tanks	183.3	190.7	196.3	196.3	10,600
Total or Index	**205.5**	**216.5**	**221.3**	**220.5**	**28,000**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
		250 Thousand Cubic Feet Per Day			
Flowlines and Connections	233.3	245.8	254.2	264.6	12,700
Production Package	211.4	225.7	225.7	211.4	7,400
Dehydrators	171.0	181.7	183.9	174.2	16,200
Storage Tanks	183.3	190.7	196.3	196.3	10,600
Total or Index	**193.0**	**203.9**	**207.8**	**203.9**	**46,900**
		500 Thousand Cubic Feet Per Day			
Flowlines and Connections	229.3	241.5	248.8	258.5	10,600
Production Package	185.0	185.0	185.0	185.0	7,400
Dehydrators	171.0	181.7	183.9	174.2	16,200
Storage Tanks	183.3	190.7	196.3	196.3	10,600
Total or Index	**186.8**	**195.2**	**198.7**	**196.5**	**44,800**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
		250 Thousand Cubic Feet Per Day			
Flowlines and Connections	347.8	365.2	378.3	395.7	27,300
Production Package	200.0	210.0	210.0	212.5	8,500
Dehydrators	171.0	181.7	183.9	174.2	16,200
Storage Tanks	183.3	190.7	196.3	196.3	10,600
Total or Index	**225.8**	**237.5**	**243.0**	**244.5**	**62,600**
		500 Thousand Cubic Feet Per Day			
Flowlines and Connections	358.1	375.8	390.3	408.1	25,300
Production Package	200.0	210.0	210.0	212.5	8,500
Dehydrators	171.0	181.7	183.9	174.2	16,200
Storage Tanks	183.3	190.7	196.3	196.3	10,600
Total or Index	**224.9**	**236.5**	**242.2**	**243.4**	**60,600**
		1 Million Cubic Feet Per Day			
Flowlines and Connections	367.3	386.5	405.8	425.0	22,100
Production Package	111.1	116.2	131.3	127.3	12,600
Dehydrators	171.0	181.7	183.9	174.2	16,200
Storage Tanks	183.3	190.7	196.3	196.3	10,600
Total or Index	**187.6**	**197.3**	**207.4**	**206.4**	**61,500**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
	500 Thousand Cubic Feet Per Day				
Flowlines and Connections	367.3	386.5	405.8	425.0	22,100
Production Package	111.1	116.2	131.3	127.3	12,600
Dehydrators	171.0	181.7	183.9	174.2	16,200
Storage Tanks	183.3	190.7	196.3	196.3	10,600
Total or Index	**187.6**	**197.3**	**207.4**	**206.4**	**61,500**
	1 Million Cubic Feet Per Day				
Flowlines and Connections	367.3	386.5	405.8	425.0	22,100
Production Package	111.1	116.2	131.3	127.3	12,600
Dehydrators	171.0	181.7	183.9	174.2	16,200
Storage Tanks	183.3	190.7	196.3	196.3	10,600
Total or Index	**187.6**	**197.3**	**207.4**	**206.4**	**61,500**
	5 Million Cubic Feet Per Day				
Flowlines and Connections	229.9	241.5	253.0	265.9	43,600
Production Package	125.0	130.6	135.2	138.0	14,900
Dehydrators	192.0	211.5	212.4	197.3	22,300
Storage Tanks	183.3	190.7	196.3	196.3	10,600
Total or Index	**188.6**	**200.2**	**206.6**	**208.2**	**91,400**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
	50 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	258.3	283.3	291.7	300.0	3,600
Fuel, Chemicals & Disposal	300.0	300.0	300.0	300.0	600
Surface Maintenance	300.0	333.3	340.0	340.0	5,100
Subsurface Maintenance	220.0	240.0	240.0	240.0	1,200
Total or Index	**273.5**	**300.0**	**305.9**	**308.8**	**10,500**
	250 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	258.3	283.3	291.7	300.0	3,600
Fuel, Chemicals & Disposal	220.0	240.0	250.0	250.0	2,500
Surface Maintenance	295.0	330.0	335.0	335.0	6,700
Subsurface Maintenance	220.0	240.0	240.0	240.0	1,200
Total or Index**	**261.7**	**289.4**	**295.7**	**297.9**	**14,000**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
	50 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	250.0	271.4	285.7	292.9	4,100
Fuel, Chemicals & Disposal	220.0	240.0	260.0	260.0	1,300
Surface Maintenance	300.0	333.3	340.0	340.0	5,100
Subsurface Maintenance	187.5	200.0	200.0	212.5	1,700
Total or Index	**252.4**	**276.2**	**285.7**	**290.5**	**12,200**
	250 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	250.0	271.4	285.7	292.9	4,100
Fuel, Chemicals & Disposal	220.0	235.0	250.0	250.0	5,000
Surface Maintenance	295.8	329.2	333.3	337.5	8,100
Subsurface Maintenance	187.5	200.0	200.0	212.5	1,700
Total or Index	**250.0**	**272.7**	**281.8**	**286.4**	**18,900**
	500 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	250.0	271.4	285.7	292.9	4,100
Fuel, Chemicals & Disposal	278.9	305.3	315.8	315.8	6,000
Surface Maintenance	294.7	326.3	336.8	336.8	6,400
Subsurface Maintenance	187.5	200.0	200.0	212.5	1,700
Total or Index**	**265.0**	**290.0**	**300.0**	**303.3**	**18,200**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
	250 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	256.3	281.3	287.5	300.0	4,800
Fuel, Chemicals & Disposal	228.2	243.6	259.0	259.0	10,100
Surface Maintenance	276.9	305.1	312.8	312.8	12,200
Subsurface Maintenance	191.7	200.0	200.0	208.3	2,500
Total or Index	**246.2**	**267.0**	**276.4**	**279.2**	**29,600**
	500 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	256.3	281.3	287.5	300.0	4,800
Fuel, Chemicals & Disposal	281.0	309.5	319.0	319.0	6,700
Surface Maintenance	273.5	300.0	308.8	308.8	10,500
Subsurface Maintenance	191.7	200.0	200.0	208.3	2,500
Total or Index**	**260.2**	**284.3**	**291.6**	**295.2**	**24,500**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
	250 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	268.4	289.5	300.0	310.5	5,900
Fuel, Chemicals & Disposal	222.0	238.0	254.0	254.0	12,700
Surface Maintenance	285.0	315.0	322.5	325.0	13,000
Subsurface Maintenance	191.7	195.8	200.0	204.2	4,900
Total or Index	**242.1**	**260.9**	**271.4**	**274.4**	**36,500**
	500 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	268.4	289.5	300.0	310.5	5,900
Fuel, Chemicals & Disposal	264.0	288.0	300.0	300.0	7,500
Surface Maintenance	285.7	314.3	322.9	322.9	11,300
Subsurface Maintenance	191.7	195.8	200.0	204.2	4,900
Total or Index	**255.3**	**275.7**	**284.5**	**287.4**	**29,600**
	1 Million Cubic Feet Per Day				
Direct Labor & Overhead	268.4	289.5	300.0	310.5	5,900
Fuel, Chemicals & Disposal	272.5	298.0	305.9	303.9	15,500
Surface Maintenance	264.1	289.7	300.0	300.0	11,700
Subsurface Maintenance	191.7	195.8	200.0	204.2	4,900
Total or Index**	**254.9**	**275.9**	**284.2**	**285.7**	**38,000**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
	500 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	268.4	289.5	300.0	310.5	5,900
Fuel, Chemicals & Disposal	258.1	280.6	287.1	287.1	8,900
Surface Maintenance	264.1	289.7	300.0	300.0	11,700
Subsurface Maintenance	189.7	196.6	200.0	203.4	5,900
Total or Index	**244.9**	**264.4**	**272.0**	**274.6**	**32,400**
	1 Million Cubic Feet Per Day				
Direct Labor & Overhead	268.4	289.5	300.0	310.5	5,900
Fuel, Chemicals & Disposal	259.0	282.0	290.2	288.5	17,600
Surface Maintenance	264.1	289.7	300.0	300.0	11,700
Subsurface Maintenance	189.7	196.6	200.0	203.4	5,900
Total or Index	**248.0**	**268.2**	**276.4**	**277.7**	**41,100**
	5 Million Cubic Feet Per Day				
Direct Labor & Overhead	268.4	289.5	300.0	310.5	5,900
Fuel, Chemicals & Disposal	178.4	183.5	182.5	181.4	17,600
Surface Maintenance	277.6	304.1	312.2	314.3	15,400
Subsurface Maintenance	135.5	141.9	145.2	148.4	4,600
Total or Index**	**205.1**	**217.3**	**220.4**	**221.9**	**43,500**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
	50 Thousand Cubic Feet Per Day				
Flowlines and Connections	264.3	278.6	278.6	285.7	4,000
Production Package	188.1	197.6	202.4	204.8	8,600
Storage Tanks	173.2	180.4	183.9	183.9	10,300
Total or Index	**190.2**	**199.1**	**202.7**	**204.5**	**22,900**
	250 Thousand Cubic Feet Per Day				
Flowlines and Connections	264.3	278.6	278.6	285.7	4,000
Production Package	188.1	197.6	202.4	204.8	8,600
Storage Tanks	173.2	180.4	183.9	183.9	10,300
Total or Index	**190.2**	**199.1**	**202.7**	**204.5**	**22,900**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
	50 Thousand Cubic Feet Per Day				
Flowlines and Connections	264.3	278.6	278.6	285.7	4,000
Production Package	188.1	197.6	202.4	204.8	8,600
Storage Tanks	173.2	180.4	183.9	183.9	10,300
Total or Index	**190.2**	**199.1**	**202.7**	**204.5**	**22,900**
	250 Thousand Cubic Feet Per Day				
Flowlines and Connections	230.4	243.5	252.2	263.0	12,100
Production Package	200.0	210.8	216.2	202.7	7,500
Dehydrators	164.6	175.0	179.2	169.8	16,300
Storage Tanks	173.2	180.4	183.9	183.9	10,300
Total or Index	**185.1**	**195.3**	**200.4**	**196.6**	**46,200**
	500 Thousand Cubic Feet Per Day				
Flowlines and Connections	208.8	220.6	229.4	241.2	8,200
Production Package	110.0	115.0	130.0	126.0	12,600
Dehydrators	164.6	175.0	179.2	169.8	16,300
Storage Tanks	173.2	180.4	183.9	183.9	10,300
Total or Index	**152.4**	**160.5**	**168.9**	**165.7**	**47,400**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
	250 Thousand Cubic Feet Per Day				
Flowlines and Connections	213.6	225.0	236.4	245.5	10,800
Production Package	110.0	115.0	130.0	126.0	12,600
Dehydrators	164.6	175.0	179.2	169.8	16,300
Storage Tanks	173.2	180.4	183.9	183.9	10,300
Total or Index	**155.1**	**163.2**	**172.0**	**168.9**	**50,000**
	500 Thousand Cubic Feet Per Day				
Flowlines and Connections	211.1	222.2	230.6	241.7	8,700
Production Package	110.0	115.0	130.0	126.0	12,600
Dehydrators	164.6	175.0	179.2	169.8	16,300
Storage Tanks	173.2	180.4	183.9	183.9	10,300
Total or Index	**153.1**	**161.1**	**169.4**	**166.3**	**47,900**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
	250 Thousand Cubic Feet Per Day				
Flowlines and Connections	348.3	366.7	385.0	401.7	24,100
Production Package	110.0	115.0	130.0	126.0	12,600
Dehydrators	164.6	175.0	179.2	169.8	16,300
Storage Tanks	173.2	180.4	183.9	183.9	10,300
Total or Index	**184.0**	**193.6**	**203.8**	**202.9**	**63,300**
	500 Thousand Cubic Feet Per Day				
Flowlines and Connections	367.3	386.5	405.8	425.0	22,100
Production Package	110.0	115.0	130.0	126.0	12,600
Dehydrators	164.6	175.0	179.2	169.8	16,300
Storage Tanks	173.2	180.4	183.9	183.9	10,300
Total or Index	**182.9**	**192.4**	**202.6**	**201.6**	**61,300**
	1 Million Cubic Feet Per Day				
Flowlines and Connections	367.3	386.5	405.8	425.0	22,100
Production Package	110.0	115.0	130.0	126.0	12,600
Dehydrators	164.6	175.0	179.2	169.8	16,300
Storage Tanks	173.2	180.4	183.9	183.9	10,300
Total or Index	**182.9**	**192.4**	**202.6**	**201.6**	**61,300**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
	50 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	261.5	276.9	300.0	307.7	4,000
Fuel, Chemicals & Disposal	300.0	300.0	300.0	300.0	600
Surface Maintenance	211.1	233.3	263.0	263.0	7,100
Subsurface Maintenance	150.0	166.7	166.7	166.7	1,000
Total or Index	**220.8**	**239.6**	**262.5**	**264.6**	**12,700**
	250 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	261.5	276.9	300.0	307.7	4,000
Fuel, Chemicals & Disposal	220.0	240.0	250.0	250.0	2,500
Surface Maintenance	211.1	233.3	263.0	263.0	7,100
Subsurface Maintenance	150.0	166.7	166.7	166.7	1,000
Total or Index**	**217.9**	**237.5**	**258.9**	**260.7**	**14,600**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
	50 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	253.3	273.3	300.0	306.7	4,600
Fuel, Chemicals & Disposal	220.0	240.0	260.0	260.0	1,300
Surface Maintenance	211.1	233.3	263.0	263.0	7,100
Subsurface Maintenance	177.8	188.9	188.9	188.9	1,700
Total or Index	**217.9**	**237.5**	**260.7**	**262.5**	**14,700**
	250 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	253.3	273.3	300.0	306.7	4,600
Fuel, Chemicals & Disposal	225.0	240.0	255.0	255.0	5,100
Surface Maintenance	212.2	230.6	259.2	259.2	12,700
Subsurface Maintenance	177.8	188.9	188.9	188.9	1,700
Total or Index	**218.3**	**235.5**	**258.1**	**259.1**	**24,100**
	500 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	253.3	273.3	300.0	306.7	4,600
Fuel, Chemicals & Disposal	244.0	260.0	276.0	272.0	6,800
Surface Maintenance	195.7	213.0	237.0	237.0	10,900
Subsurface Maintenance	177.8	188.9	188.9	188.9	1,700
Total or Index**	**215.8**	**232.6**	**252.6**	**252.6**	**24,000**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
	250 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	258.8	282.4	305.9	317.6	5,400
Fuel, Chemicals & Disposal	236.6	248.8	261.0	258.5	10,600
Surface Maintenance	201.9	220.8	247.2	247.2	13,100
Subsurface Maintenance	178.6	185.7	192.9	200.0	2,800
Total or Index	**218.4**	**234.4**	**253.6**	**255.2**	**31,900**
	500 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	258.8	282.4	305.9	317.6	5,400
Fuel, Chemicals & Disposal	246.4	260.7	275.0	271.4	7,600
Surface Maintenance	202.2	219.6	245.7	245.7	11,300
Subsurface Maintenance	178.6	185.7	192.9	200.0	2,800
Total or Index**	**220.0**	**236.2**	**256.2**	**258.1**	**27,100**

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)				1999* Cost (dollars)
	1996	1997	1998	1999	
	250 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	289.5	310.5	336.8	347.4	6,600
Fuel, Chemicals & Disposal	235.3	249.0	260.8	258.8	13,200
Surface Maintenance	211.1	229.6	257.4	257.4	13,900
Subsurface Maintenance	179.3	186.2	193.1	193.1	5,600
Total or Index	**222.9**	**237.9**	**256.2**	**256.9**	**39,300**
	500 Thousand Cubic Feet Per Day				
Direct Labor & Overhead	289.5	310.5	336.8	347.4	6,600
Fuel, Chemicals & Disposal	237.5	253.1	265.6	265.6	8,500
Surface Maintenance	212.8	231.9	257.4	259.6	12,200
Subsurface Maintenance	179.3	186.2	193.1	193.1	5,600
Total or Index	**222.8**	**238.6**	**256.7**	**259.1**	**32,900**
	1 Million Cubic Feet Per Day				
Direct Labor & Overhead	289.5	310.5	336.8	347.4	6,600
Fuel, Chemicals & Disposal	241.0	257.4	273.8	272.1	16,600
Surface Maintenance	212.8	231.9	257.4	259.6	12,200
Subsurface Maintenance	179.3	186.2	193.1	193.1	5,600
Total or Index**	**226.9**	**242.9**	**261.5**	**262.8**	**41,000**

Section III

Appendices N

Equiping and Operating Costs and Indices and Other Economic Indicators

Appendices N

Equiping and Operating Costs and Indices and Other Economic Indicators

Appendix N contains a general overview of oil and gas economics from 1976 through 1999.

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, N2, and N3.

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)

	Indices				Gross Domestic Product Deflated Indices		
Year	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	106.5	103.5	109.1	100.0
1978	120.7	127.3	114.8	114.2	105.7	111.5	100.5
1979	133.0	142.2	124.8	124.0	107.3	114.7	100.7
1980	154.4	161.4	138.2	135.4	114.0	119.2	102.0
1981	181.8	176.7	152.3	148.2	122.7	119.3	102.8
1982	191.6	183.4	161.0	157.5	121.6	116.4	102.2
1983	170.2	168.9	165.5	164.2	103.6	102.8	100.8
1984	190.0	160.5	169.4	170.4	111.5	94.2	99.4
1985	165.4	159.3	173.1	176.3	93.8	90.4	98.2
1986	147.1	153.0	176.7	180.9	81.3	84.6	97.7
1987	170.9	162.4	179.9	186.4	91.7	87.1	96.5
1988	169.6	172.6	184.1	193.3	87.8	89.3	95.2
1989	178.0	176.1	191.3	201.4	88.4	87.4	95.0
1990	161.6	179.1	197.9	210.2	76.9	85.2	94.2
1991	167.6	188.5	204.0	218.5	76.7	86.3	93.4
1992	180.2	194.4	207.9	224.5	80.3	86.6	92.6
1993	171.6	198.7	211.6	230.4	74.5	86.2	91.8
1994	169.6	180.3	215.9	235.9	71.9	76.4	91.5
1995	180.5	185.9	220.1	241.3	74.8	77.0	91.2
1996	187.7	192.3	222.7	245.9	76.3	78.2	90.6
1997	200.6	202.1	228.7	250.5	80.1	80.7	91.3
1998	196.0	208.1	233.8	253.0	77.5	82.3	92.4
1999	195.9	208.1	235.6	256.2	76.5	81.2	92.0

[a]Producer Price Index (Capital Equipment) obtained from the Bureau of Labor Statistics, U.S. Department of Labor.
[b]Gross 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 Domest Product Deflated Indices of Operating Costs for Oil and Gas Fields

		Indices		Gross Domestic Product Deflated Indices	
Year	GDP Implicit Price Deflator a	Oil	Gas	Oil	Gas
1976	100.0	100.0	100.0	100.0	100.0
1977	106.5	117.5	114.6	110.4	107.7
1978	114.2	130.3	121.8	114.1	106.6
1979	124.0	144.0	135.8	116.2	109.5
1980	135.4	174.2	156.4	128.6	115.5
1981	148.2	204.2	181.5	137.8	122.5
1982	157.5	228.4	193.2	145.0	122.6
1983	164.2	226.2	190.8	137.7	116.2
1984	170.4	230.1	192.0	135.0	112.7
1985	176.3	232.2	190.7	131.7	108.2
1986	180.9	212.9	177.4	117.7	98.0
1987	186.4	210.5	181.1	112.9	97.2
1988	193.3	220.1	184.9	113.9	95.7
1989	201.4	229.1	189.6	113.8	94.1
1990	210.2	236.6	200.9	112.6	95.6
1991	218.5	240.9	204.7	110.3	93.7
1992	224.5	245.8	208.5	109.5	92.9
1993	230.4	255.1	216.0	110.7	93.8
1994	235.9	268.1	216.0	113.7	91.6
1995	241.3	266.3	218.9	110.3	90.7
1996	245.9	280.8	223.6	114.2	90.9
1997	250.5	292.7	238.7	116.9	95.3
1998	253.0	292.8	248.1	115.7	98.1
1999	256.2	295.2	250.0	115.3	97.6

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

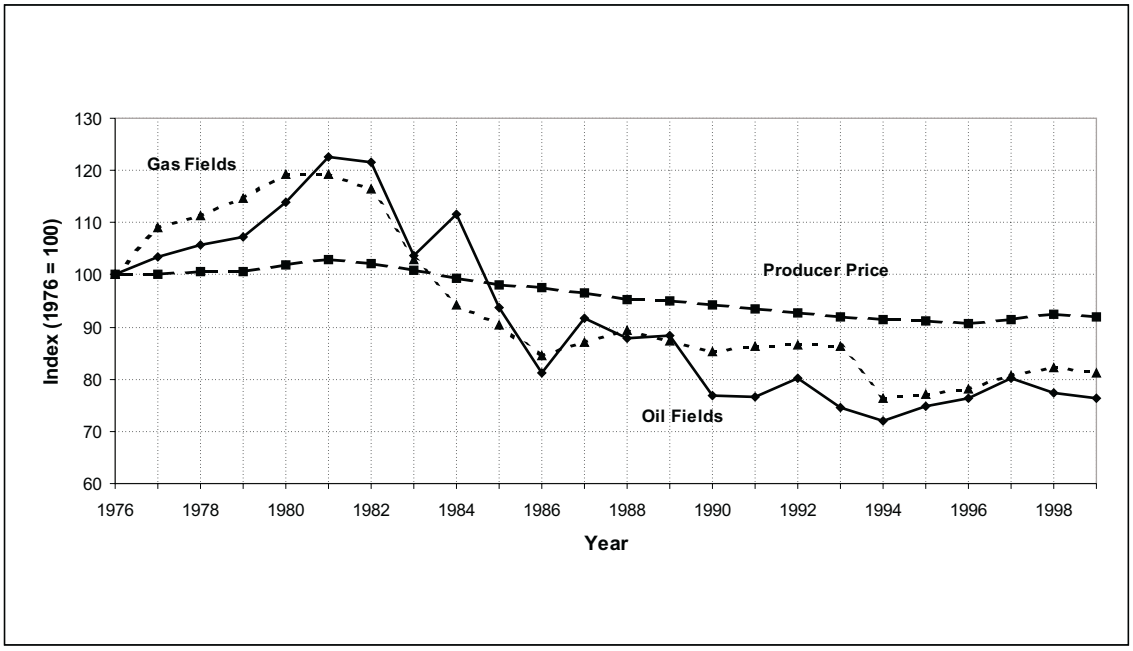
Notes: The aggregate average costs are the average of the costs from summary Tables 3 and 14 and do not represent the ave of all wells in the United States.
Source: Energy Information Administration, Office of Oil and Gas.

Table N3. The Gross Domestic Product Implicit Price Deflator, the Gross Domestic Product Deflated Indices of Operating Costs for Oil and Gas Fields and the Gr Domestic Product Deflated Oil and Gas Product Price Indices

		Gross Domestic Product Deflated Indices			
		Operating Costs		Product Pric	
Year	GDP Implicit Price Deflator [a]	Oil	Gas	Oil	Gas
1976	100.0	100.0	100.0	100.0	100.0
1977	106.5	110.4	107.7	98.3	128.0
1978	114.2	114.1	106.6	96.2	137.4
1979	124.0	116.2	109.5	124.5	164.1
1980	135.4	128.6	115.5	194.6	202.4
1981	148.2	137.8	122.5	261.8	230.4
1982	157.5	145.0	122.6	221.1	269.2
1983	164.2	137.7	116.2	194.7	271.9
1984	170.4	135.0	112.7	185.4	269.1
1985	176.3	131.7	108.2	166.8	245.5
1986	180.9	117.7	98.0	84.4	184.9
1987	186.4	112.9	97.2	100.9	154.4
1988	193.3	113.9	95.7	79.5	150.8
1989	201.4	113.8	94.1	96.1	144.7
1990	210.2	112.6	95.6	116.4	140.3
1991	218.5	110.3	93.7	92.4	129.4
1992	224.5	109.5	92.9	87.0	133.6
1993	230.4	110.7	93.8	75.5	152.6
1994	235.9	113.7	91.6	68.3	135.2
1995	241.3	110.3	90.7	74.0	110.7
1996	245.9	114.2	90.9	91.7	152.2
1997	250.5	116.9	95.3	84.0	159.7
1998	253.0	115.7	98.1	52.5	133.6
1999	256.2	115.3	97.6	55.3	120.5

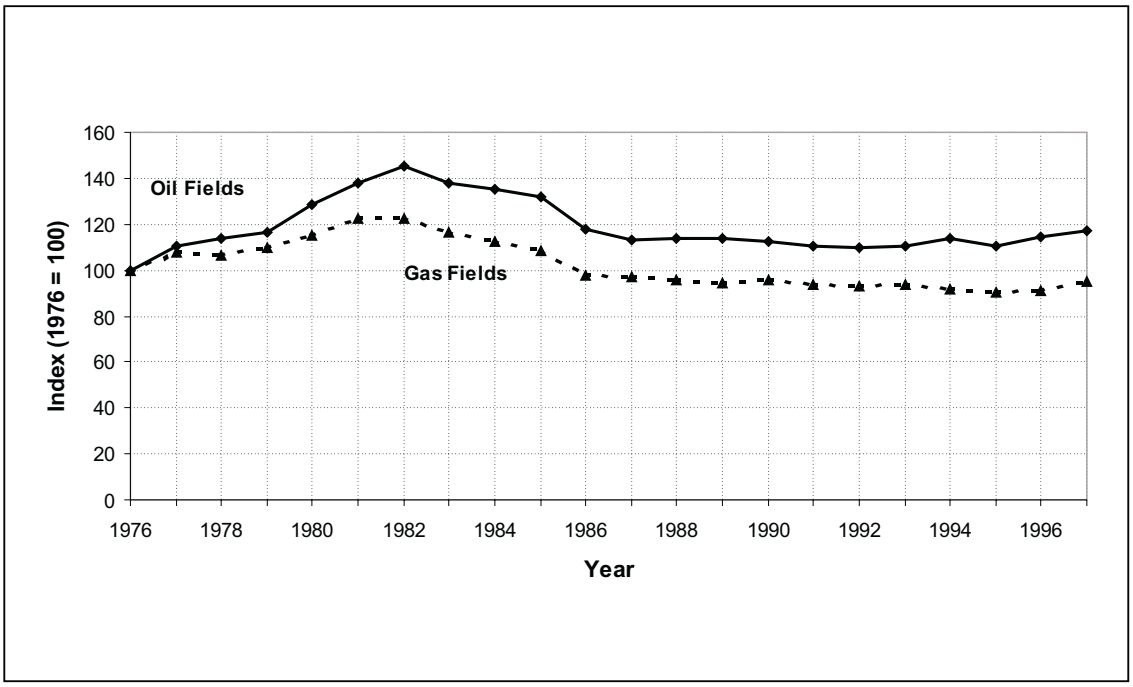
[a]Gross Domestic Product Implicit Price Deflators were obtained from the Bureau of Economic Analysis, U.S. Department of Co
Notes: The aggregate average costs are the average of the costs from summary Tables 3 and 14 and do not represent the ave of all wells in the United States.
Source: Energy Information Administration, Office of Oil and Gas.

Figure N1. Gross Domestic Product Deflated Producer Price Indices, and Oil and Gas 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 thouand (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.