

1990 Annual Review and Forecast of Utah Coal Production and Distribution

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August 1991



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Table of Contents

Introduction and Summary

Utah Coal Production Activity of 1990

Utah Coal Markets and Distribution of Coal in Utah

- Electric Utility Markets
 - Out-of-state markets
 - Utah markets

- Utah Coking Coal Markets and Coke Plants

- Other Industrial Coal Markets
 - Out-of-state markets
 - Utah markets

- Residential and Commercial Coal Markets
 - Out-of-state markets
 - Utah markets

- Coal Imports

- Coal Exports

Coal Operators Activities

Coal Leasing Activity in Utah

Outlook For the Utah Coal Industry

- Forecast for 1991
 - Prices
 - Production
 - Distribution

- Long-Term Forecast

Other Considerations

INTRODUCTION AND SUMMARY

Utah achieved the highest production for underground coal mining in the nation in 1990 primarily through the efforts of a hard-working, conscientious labor force and coal company management, willing to commit to a substantial long-term investment strategy to increase productivity and efficiency in Utah coal mines.

Utah coal production reached a record high of 22 million tons, with productivity of almost 34 tons per man day. In 1991, Utah will reach yet another all-time production high of 22.3 million tons and value of Utah coal production will surpass the one-half-billion-dollar mark. Productivity of mines will average 37 tons per man day, a level of productivity not attained by many states with surface coal mines.

The primary reason for the continued growth in Utah coal production is increased demand by the electric utility sector. Factors such as the recent doubling of the world oil prices preceding the Persian Gulf war, passage of the *Federal Clean Air Act of 1990 (Public Law 101-549)*, and potential changes in the federal coal royalty rate have only negligible impact on Utah coal production and distribution.

During 1990, distribution of Utah coal totaled 21.7 million tons. The lion's share of Utah coal production, 17.7 million tons, was shipped to the electric utility sector. Shipments to coal-fired electric power plants in Utah accounted for 71 percent, or 12.6 million tons. The remaining 29 percent, 5.1 million tons, was delivered to electric power plants and cogeneration facilities in Nevada, California, and the Pacific Rim countries such as Taiwan, Japan and Korea.

In 1991, distribution to the electric utility industry is projected to increase to 18.4 million tons. While the volume of shipments of Utah coal to Utah plants is expected to fall to 12.3 million tons in 1991, deliveries of electric utility coal to Nevada, California, and the Pacific Rim countries are anticipated to increase 21 percent to 6.1 million tons.

Distribution of Utah coal for coke plants totaled 617,000 tons in 1990 with the entire amount being shipped to the Geneva Work's steel mill in Orem, Utah. Utah coal distribution for *other industrial* users was 2.9 million tons with 612,000 tons delivered to firms in Utah and the remaining 2.3 million tons delivered out-of-state. The largest portion of this coal, 1.8 million tons, was delivered to cement and chemical plants in California. Demand for Utah coal by coke plants will increase by 2 percent in 1991 but for *other industrial* demand would decrease by 3 percent to 2.85 million tons from 2.94 million tons in 1990.

The residential and commercial end-use sector historically accounts for a relatively small share of the total distribution of Utah coal. In 1990, a total of 439,000 tons were distributed to this end-use sector with 380,000 tons delivered to consumers in Utah, and 59,000 tons shipped out-of-state, primarily to markets in the states of Washington and Idaho. While consumption by this sector has been steadily increasing since 1986, demand in 1991 is expected to fall from 1990 levels. As a result, distribution of Utah coal to the residential and commercial end-use sector is projected to decrease from 439,000 tons in 1990 to 428,000 tons in 1991.

On the strength of growth in out-of-state domestic electric utility and export markets, total distribution of Utah coal is projected to increase more than 2 percent in 1991, rising to another all-time record of 22.3 million tons.

UTAH COAL PRODUCTION ACTIVITY OF 1990

Production of coal in Utah broke through the 22-million-ton mark during 1990 and reached a new high for the seventh year in a row. Gross production was 22,502,000 tons, net production was 22,012,000 tons, and distribution was 21,680,000 tons. Each represented a new record high for Utah's coal industry (Table 1). It may appear ironic that the record production of 1990 was achieved by a relatively small number of coal miners compared to past years and at prices that were the lowest in a decade, but therein lies the reason for the success of the Utah coal industry.

During the decade of the '80s, productivity in Utah more than doubled. In 1990, Utah coal miners lead the entire nation in productivity from underground mines. In fact, Utah's underground mines were more productive than 15 of the 26 states with mines using surface-mining methods. This unparalleled accomplishment is the manifestation of Utah coal miner commitment to a high-standard work ethic.

Most of the increased production in 1990 came from the Wasatch Plateau coal field, the major coal-producing field during the '80s. However, the largest percentage increase in production over the previous year occurred in the Book Cliffs. This was also the case in 1989, and the same is expected to occur in 1991. Production from the Emery coal field was much lower than the previous year and production from the Coalville coal field completely halted in 1989 (Table 2).

The increase in production was more evenly distributed by county than by coal field. Both Carbon and Emery counties showed a healthy increase in the amount of coal production. Carbon county produced more than 10 million tons, for the first time ever and Emery over nine million tons; Sevier county showed a 6-percent decrease in production (Table 3).

During 1989, production from fee lands jumped 50 percent higher than 1988 levels and there was also production from county lands. Production from state lands went up by 43 percent and production from federal lands increased by more than one million tons (Table 4). The federal government collected a total of \$32.5 million in coal royalties from production on federal lands. Half of this amount, \$16.25 million, was turned over to the state.

During 1990, more coal was produced from federal lands in Utah than ever before, however, as a percentage of total state production, coal produced from federal lands actually fell from 82.5 percent to 77.8 percent of the total production. Production from state lands doubled in 1990. The amount and percentage of coal produced from county lands quadrupled, and production from fee lands increased both in tonnage and as a percent of total production.

UTAH COAL MARKETS AND DISTRIBUTION OF COAL IN UTAH

Distribution of Utah coal production increased almost 2 percent to 21,680,000 tons in 1990 and established a new record high for Utah's coal industry (Table 1). The distribution of Utah coal to end-users in the state surpassed 14 million tons, another record, the distribution to end-users in other states approached 5.8 million tons, and overseas exports of coal climbed above 1.7 million tons (Tables 1 and 5).

Electric Utility Markets

Out-of-State Markets - The electric utility industry is the largest consumer of Utah coal production. In 1990, a total of 3.4 million tons of Utah coal was shipped to coal-fired power plants and cogeneration facilities in Nevada and California, reversing a two-year decline in out-of-state shipments.

In Nevada, three electric power generation facilities burn bituminous or subbituminous coal; and two of these plants, Nevada Power Company's Reid Gardner Plant and Sierra Pacific Power Company's North Valmy Plant, burn Utah coal. The four units of the Nevada Power's Reid Gardner Plant with cumulative capacity of 612 Megawatt (MW) rely almost entirely on Utah coal. Shipments of coal to this plant totalled 1.6 million tons in 1990, a 14-percent increase over the 1.4 million tons delivered in 1989. All of the requirements of this plant are purchased from Utah through long-term contracts, many of which have been revised as recently as the last two years. There is little competition for this coal and the volume of Utah coal shipped to this plant should remain quite stable.

The two units of Sierra Pacific Power Company's North Valmy plant have a combined generation capacity of 521 MW. This plant requires about 1.4 million tons of coal per year and relies on Utah mines to supply 60 percent of its coal requirements with Wyoming mines filling the remaining 40 percent. In 1990, Utah coal shipments to the North Valmy plant totalled about 850,000 tons, a decrease of 6 percent from 1989. The remainder of the plant's 1990 coal requirement of 570,000 tons was shipped from Wyoming. These two coals are similarly priced, of comparable quality, and are geographically of equal distance from the North Valmy plant. Neither one demonstrates a significant competitive advantage over the other to expect a change in the share each supplies to the North Valmy plant in the near future.

A third coal-fired plant, that does not burn Utah coal, is Southern California Edison Company's Mojave Power Plant near Laughlin, Nevada. The Mojave Power Plant has a combined nameplate generation capacity of 1,636 MW and consumes about 4.2 million tons of coal per year. This coal is currently shipped to the Mojave plant through a 273-mile 16-18 inch slurry pipeline from the Black Mesa-Kayenta coal mine complex near Kayenta, Arizona. At this time, Black Mesa coal is probably the only viable coal supply for shipment from the slurry plant in Kayenta, southeast of Page, Arizona. However, competition for a share of Mojave's coal supply could arise when coal from Utah's southern coal fields becomes available.

Besides Nevada, about one million tons of Utah coal went to cogeneration facilities in California. The Energy Information Administration, in adhering to a more restricted definition of *electric utility* and *other industrial* coal consumption, classifies cogeneration usage under the definition of *other*

industrial coal. For purposes of this report, coal shipped for use in cogeneration facilities is considered *electric utility* consumption, since the main purpose of this coal consumption is generation of electricity.

The electric utility market for Utah coal presently comprises seven coal-fired cogeneration units operating in Southern California. Stockton, California is the site of the first coal-fired cogeneration facility to burn Utah coal. This unit is operated by Air Products & Chemicals, Inc., and began commercial operation in March 1988. This 49.9 MW unit is capable of consuming 220,000 tons of coal per year to generate about 425 Gigawatt hour (GWh) of electricity. In 1990, all of this plant's coal requirements were met by coal produced in Utah. Some of the electricity and all of the steam by-product were utilized by an adjacent corn wet milling plant owned by Corn Product Company International. The remaining electricity was sold to Pacific Gas and Electric Company.

In May 1989, a second coal-fired cogeneration facility owned, by Mt. Poso Cogeneration Company, a consortium of Pyropower Development Corporation (Ahlstrom Development Corporation as of July 1, 1991), Pacific Generation Company, and Bechtel Enterprises, Inc., was commissioned. This 49.9 MW plant is located in the San Joaquin Valley and is operated by Pyropacific Operating Company and Pacific Generation Company. During 1990, this unit purchased 224,000 tons of Utah coal and burned 202,000 tons to generate 434 GWh of electricity that was sold to Pacific Generation Company. The steam by-product was used for enhanced oil recovery in Mt. Poso Field-West.

The largest coal-fired cogeneration facility in California, with 96 MW of installed electric generation capacity, is owned by ACE Cogeneration Company, which is owned by Pyropower Development Corporation, Constellation Holding, Inc., and Kerr McGee Chemical Company. This cogeneration unit located in Trona, California, started operation in September 1990 under Kerr McGee Chemical Company whose two soda ash plants adjacent to the ACE plant use the steam by-product. This unit has the capacity to burn 300,000-350,000 tons of coal per year to generate between 600-650 GWh of electricity. During the last four months of 1990, it used 83,000 tons of Utah coal. The electricity generated by this cogeneration unit is purchased by Southern California Edison Company.

GWF Power Systems L.P. started operating its 23-MW-capacity cogeneration unit during late 1990. This unit could burn 100,000 tons of coal to generate 220 GWh of electricity. The initial fuel used in this facility was Utah coal. But, for the time being, a mixture of petroleum coke and natural gas has replaced Utah coal as the primary source of fuel. The steam by-product and about 15 percent of the electricity is used at the "across the street" facility of Pirelli-Armstrong Tire & Rubber Company, and the remaining 85 percent of the electricity generated is sold to Pacific Gas and Electric Company. The prospect of this plant switching back to Utah coal for its primary fuel source is remote.

Ultra Power, Constellation and Hadson are the owners of a twin cogeneration plant in Bakersfield named Rio Bravo Poso and Rio Bravo Jasmin that started power generation during 1990. This plant burns Utah coal.

Another cogeneration plant, Energy Factor, is located in Stockton. This 45-MW cogeneration plant was purchased by Sithe Energy in January 1990. The steam by-product from this plant goes to various manufacturing facilities in the area. This plant can use about 200,000 tons of coal per year. During 1990, a total of 35,000 tons of coal was shipped to the plant from Utah.

Shipments of coal for use by electric power plants in Nevada will remain the same in 1991 as they were in 1990. Shipments to California could go up by about 600,000 tons. Should this occur, Utah coal distributed out-of-state to generate electricity would increase from 3.4 million tons in 1990 to about 4.0 million tons in 1991.

Utah Markets - Total coal consumed in Utah to generate electricity amounted to nearly 13.6 million tons in 1990 (coal distribution to the Electric Utility plants amounted to 14.053 million tons). This was a new record for coal consumed by coal-fired electric power plants in Utah. Utah Power's Hunter I, II, and III, with availability of 90 percent and utilized availability of 97 percent, consumed four million tons of coal to generate 9,030 GWh of electricity. This coal was produced by Cottonwood mine. Huntington I and II, with plant availability of about 90 percent and utilized availability of over 97 percent, consumed about 2.8 million tons of coal to generate 6,261 GWh of electricity. This coal was produced by Deer Creek mine. The Carbon Plant, with availability of about 89 percent and utilized availability of almost 95 percent, consumed more than 582,000 tons of coal to generate 1,262 GWh of electricity. The coal for this plant was purchased by competitive bids from various companies on the spot market. Going to the spot market to meet the coal needs of its Carbon plant has also helped to reduce coal costs. For the second half of 1991, Coastal States Energy will be the major supplier, with Cyprus Plateau Coal Company and Castle Valley Resources each having an equal share of the remainder to supply the Carbon plant.

It is very likely that the utilized plant availability for Utah Power may be slightly higher in 1991 than in 1990, and coal consumption could surpass 7.5 million tons. Coal production for distribution to Utah electric utilities is likely to decrease by half-a-million tons in 1991. Utah Power's Hunter and Huntington plants currently have large stockpiles of coal on-site. It is expected that these plants will reduce their receipts of Utah coal and draw a portion of their 1991 coal requirements from these stockpiles.

During 1990, the Intermountain Power Agency's (IPP) plants I and II operated at a cumulative capacity factor of 88.6 percent, with availability of 94.2 percent. The two units consumed nearly five million tons of coal to generate 13,070 GWh of electricity. About 80 percent of this coal was purchased through five long-term contracts and the remainder was purchased on the spot market. During 1991 the amount of coal used is not expected to change from 1990 levels, and generated electricity should be 13,100 GWh.

Deseret Generation and Transmission's Bonanza plant was the only coal-fired electric power plant not operating at or near full capacity in 1990. The plant with rated peak capacity of 420 MW had an availability of 95.3 percent during 1990, and a gross capacity factor of 70.7 percent. It consumed 1.25 million tons of Colorado coal to generate 2,742 GWh of electricity. This coal is purchased from the DeSerado mine located 36 miles away. During 1991, the percent of availability will decrease to 95 percent due to scheduled maintenance, and the gross capacity factor should be 73 percent. The plant is projected to consume 1.27 million tons of coal to generate 2,800 GWh of electricity.

At this time no construction is under way on new coal-fired generation plants in Utah, and the plants that are shut down (with the exception of Gadsby No. III that is consuming natural gas) are not expected to reopen. Therefore, the distribution of electric utility coal in Utah will be around 13.8 million tons in 1991. It is expected to eventually increase to 14.0 million tons per year and remain at that level until new coal-fired generation capacity is built in Utah.

Utah Coking Coal Markets and Coke Plants

The market for Utah-produced coking coal is limited to Basic Manufacturing and Technology of Utah, Inc.'s Geneva Works steel mill, Orem, Utah. The total coal purchased by Geneva Works during 1990 amounted to 1.295 million tons. This plant consumed a total of 1.318 million tons for steel production with 23,000 tons of coal coming from stockpiles. Utah mines provided 617,000 tons of high-volatile coking coal, or 48 percent of the total requirements of this plant. The remaining 679,000 tons of coking coal required by Geneva Works, or 52 percent of the total, was purchased from outside Utah. About 96,000 tons of coking coal was purchased from Bear Coal Company, Inc. of Somerset, Colorado. The Bear Coal Company coal is mined from the same seam of coal as was previously purchased from the Somerset mine prior to its closure. Mid-Continent Resources, Inc. of Carbondale, Colorado, provided 525,000 tons of mid-volatile, hard coking coal to the plant in 1990. All this coal, in addition to 46,000 tons of stockpiled coal from Mid-Continent was consumed in 1990.

Mid-Continent experienced a mine fire on August 4, 1990 that led to a 60-day suspension of mining operations. The fire occurred in the mined-out section of the mine's upper seam that was being worked at the depth of 2,500 feet. The section was isolated with bulkheads and the fire was extinguished by flooding the isolated area with liquid carbon dioxide.

Mid-Continent's coal is the only mid-volatile, hard coking coal available in the western states. During the mine shut down, Geneva Works looked to the east to supplement its supply of low- and mid-volatile coal. Eventually it purchased about 26,000 tons of low-volatile coking coal from Cooney Brothers Coal Company of Cresson, Pennsylvania; about 18,000 tons of which was consumed in 1990. Geneva Works also bought 17,000 tons of mid-volatile coking coal from Jim Walter Resources, Inc. of Brookwood, Alabama, and more than 14,000 tons of mid-volatile coking coal from A. T. Massey Coal Company, Inc. of Richmond, Virginia, all of which was consumed in 1990. Mining at Mid-Continent was resumed at the end of September and, soon after, the shipment of coal to Utah started again.

The consumption of coking coal by Geneva Works should not change in 1991. It is expected that 630,000 tons of Utah coal, plus 700,000 tons of coal from other sources outside of Utah will be purchased and consumed by Geneva Works in 1991.

Other Industrial Coal Markets

Out-of-State Markets - Since 1987, shipment of coal to other states for industrial use increased each year. In 1990 this trend was reversed due to the June 5, 1989 closure of Castle Gate Coal Company. A total of eight operators shipped industrial coal out of the state in 1990, six of them shipped more than 100,000 tons. The primary end-use of industrial coal shipped out-of-state was for consumption by cement and chemical plants in California. Seventy-eight percent of Utah coal shipped out-of-state for industrial use went to California. The remaining coal was shipped to six other states. Nevada, received 8 percent, Washington, 5 percent, Wyoming, 4 percent, Colorado, 3 percent, and Montana and Idaho each about 1 percent.

California, as previously mentioned, received almost one million tons of electric utility coal to fuel cogeneration units. The steam by-product of some of these cogeneration units was used in the same facilities that purchased their industrial coal from Utah. While this tended to reduce the requirement of *industrial* steam coal for some of these plants, most of the cogeneration steam was

utilized to increase production of these industrial facilities rather than reduce industrial coal consumption.

In 1991, there will be a slight decrease in industrial coal purchased from Utah. The ACE Cogeneration facility in Trona will be in full operation, and its steam by-product will, to some extent, replace part of the industrial coal requirement of the adjacent soda ash plant of North American Chemical Company (previously Kerr McGee Chemical Company).

The shipment of Utah industrial coal to out-of-state customers in 1991 is expected to decrease to 2.1 million tons.

Utah Markets - Industrial consumption of coal in Utah declined to 619,000 tons in 1990, down 24 percent from its 1989 all-time high of 810,000 tons. There were two major changes in *industrial* coal consumption in 1990. First, Kennecott Copper Division of RTZ increased its consumption by 22 percent to 372,000 tons in 1990 to generate 801 GWh of electricity for its own consumption. (This plant will only use 216,000 tons of coal in 1991, since it will use natural gas for two months to stay in compliance with state emission control standards.) Second, the Devil Slide plant of Ideal Basic Industries, which manufactures cement near Morgan, used more than 45,000 tons of coal in 1989, but in 1990 switched to natural gas for all but 15 days in December. Natural gas service was interrupted by Mountain Fuel Supply Company in December due to extreme cold, and the cement plant purchased more than 2,000 tons of Wyoming coal for consumption during the 15-day natural gas-service interruption.

Ashgrove Cement, formerly Southwest Portland Cement, purchased and consumed similar amounts of coal in 1990 as it did in 1989. A number of lime and gypsum plants in the state used the remainder of the industrial coal in Utah, as well as 5,000 tons of coal from Colorado.

In 1991, industrial coal consumption in Utah is anticipated to increase to 733,000 tons.

Residential and Commercial Coal Markets

Out-of-State Markets - Coal consumption for residential and commercial purposes outside of Utah has been on the decline since the early '80s when consumption was about 300,000 tons per year. During the latter part of the '80s it declined to about 80,000 tons per year. In 1990 it stood at 59,000 tons. Idaho and Washington are the major recipients of Utah coal shipments for residential and commercial use. Colorado, Montana and Nevada also received small amounts (Table 5). Consumption of this type of coal will probably stay at this level or decrease slightly in the near future. In 1991, coal distributed out-of-state for use by the residential and commercial sector is projected to be about 53,000 tons.

Utah Markets - During 1990, the residential and commercial consumption of coal in Utah increased 18 percent to 382,000 tons, reaching a record high for this end-use sector.

All of Mountain Fuel Supply's natural gas customers on interruptible service and those firms wheeling their own gas directly from the wellhead and transporting it through the MFS distribution system had natural gas deliveries interrupted in mid-December 1990. Many of these interruptible customers use coal as a back-up fuel. This resulted in a much greater quantity of the residential and

commercial coal consumption in December of 1990 than during the same time of the previous year. MFS had not interrupted the flow of natural gas to its I-2, I-3 and I-4 customers since 1983. Barring another early winter cold spell of this severity, it is unlikely that the consumption of coal by the residential and commercial sector in Utah will go above 375,000 tons in 1991.

Coal Imports

Utah coal imports decreased in 1990 compared to 1989. This was expected due to the opening of Sunnyside mine on March 28, 1989, which allowed more Utah coking coal to be shipped to Geneva Works in 1990. During 1990, low- and mid-volatile coking coal was shipped to Utah from Pennsylvania, Alabama, and Virginia. In addition, mid-volatile hard coking coal came to Utah from the Mid-Continent Coal Company as well as from the Bear Coal Company of Colorado.

As was previously mentioned, Mid-Continent experienced a mine fire in the mined-out section of its upper seam in a two-seam mine and could not mine coal from August 4, through the end of September 1990. This compelled Geneva Works to purchase about 60,000 tons of mid-volatile coal from the eastern and southern states. During 1991, Geneva Works is likely to rely more heavily on the eastern coal suppliers for its mid-volatile coal requirements than on Colorado coal companies.

Deseret Generation and Transmission Company's Bonanza plant purchased 1.4 million tons of coal from Colorado, and in 1991 is expected to purchase a similar amount.

The Ideal Basic Industries Devil's Slide plant in Morgan, Utah purchased a little more than 2,000 tons of Wyoming coal for emergency use in December of 1990. Otherwise, it used natural gas throughout the year. In 1991, it is not expected that Ideal Basic Industries will use any coal other than what it may under force majeure.

There were also about 2,000 tons of coal imports to the residential and commercial sector during 1990. There is no indication that any coal will be imported into Utah for use by this sector in 1991.

Altogether the imports of coal into Utah should stay the same in 1991 as it was in 1990. Imports are not expected to exceed 2.2 million tons.

Coal Exports

Utah coal exports to foreign markets during 1990, did not quite meet projections of last year's report. Still, it was greater than amounts exported during six of the last seven years.

The number of Utah coal companies exporting coal increased from five in 1989 to eight in 1990. Coal exports totaled 1.7 million tons in 1990 and was shipped to the traditional Pacific Rim countries of Taiwan, Japan, and Korea. Hong Kong is still a potential market for Utah coal.

Utah coal prices and cost of production are still relatively low and should stay at that level for the foreseeable future, not even increasing at the rate of inflation. This is the main cause for optimism concerning the volume of exports increasing from the current level of 1.7 to 2.1 million tons per year, to about five million tons per year toward the end of this decade. Other reasons for expected increased

exports is the improved competitive position of Utah coal with respect to our chief overseas competitor, Australia. Increased value of the Australian dollar and the increasing cost of coal production in that country should lead to greater demand for Utah coal among the Pacific Rim nations.

COAL OPERATORS' ACTIVITIES

PacifiCorp - PacifiCorp's Utah Power Division (Utah Power) just added a 1,500-ton-per-hour wash plant to its Cottonwood and Deer Creek operation. Together the two mines constitute the largest coal operation in Utah. During the 1990 production year, the Cottonwood Mine was the third largest producing underground coal mine in the nation. The Deer Creek mine was ranked seventh.

Utah Power has been very successful in reducing the costs of its mine operations during the past few years. In fact, one of the primary reasons the average price of Utah coal has been steadily declining in recent years has been Utah Power's ability to reduce its cost of operation through increased efficiency and streamlining their entire coal operation. Going to the spot market for the coal supply at its Carbon plant has also helped to reduce coal costs. An additional step in bringing down the cost of operation would be for Utah Power to go to full production and sell the excess production directly or indirectly on the international market.

Utah Power is also trying to increase its recoverable reserve. Presently Utah Power has filed a Lease By Application (LBA) with the Bureau of Land Management (BLM) for more than 7,000 acres of federal coal property.

Coastal States Energy Company - Coastal States Energy Company (Coastal), the owner of Skyline Mine and Sufco Mine is the second largest coal producer in Utah. The Skyline Mine, with one of the highest productivity rates among the underground coal mines in the world, ranked fifth in the nation in total underground mine coal production during 1990. Coastal is adding another longwall panel to its existing operation at Skyline. This should boost the production to a point where, in 1991, Skyline should become the second largest underground coal mine operation in the nation. The new longwall panel will go into operation as early as August. With a cutting height of 16 feet, this additional longwall panel will be the most productive operating underground coal mining machine in the world.

Coastal is also planning to construct a 2.5-mile-long conveyor belt from the Skyline Mine to their load-out facility where the coal is loaded onto a unit train in less than two hours.

Skyline's recoverable reserve base may also be increased in 1991. Coastal has filed a 2,000-acre LBA with BLM for the Winter Quarters federal lease tract.

The Sufco mine, which is among the top 20 largest underground coal mines in the nation, will also expand its operation in 1991.

In addition to being among the most productive mines in the nation, the Skyline and Sufco mines are also rated by Occupational Safety and Health, as the safest underground mines in the nation.

Beaver Creek Coal Company - During 1990, Beaver Creek Coal Company closed the Gorden Creek No. 8 mine, ending a decade of a productive operation in the Gorden Creek area. (The Gorden Creek No. 7 mine was closed in 1989.) Productivity, as measured in tons of coal produced per man-hour, from Gorden Creek No. 8 mine was the highest among the Utah coal mines employing continuous miners in 1990. Beaver Creek also obtained a new federal coal lease containing about 12 million tons of recoverable coal for \$6 million. This lease is adjacent to the existing Trail Mountain No. 9 mine.

During early 1991, Beaver Creek Coal Company merged with its sister company, West Elk Coal Company, located in Colorado, under the collective name of Mountain Coal Company. Mountain Coal Company is now in the process of commissioning a continuous haulage system at the Trail Mountain Mine that will deliver coal from the face to the section conveyor. This is an innovative technology that was originally developed in Canada and will improve the efficiency as well as the safety of this mine operation.

Sunnyside Coal Company - When Sunnyside Reclamation and Salvage Company (SRS) bought the Sunnyside operation of the bankrupt Kaiser Coal Company on April 2, 1989, the mine had idled for more than a year and had little minable reserve left. SRS negotiated the purchase of the adjoining B Canyon Mine with British Petroleum (BP) who had previously acquired SOHIO (the original owner of the mine). This transaction almost fell through when BP sold a major part of its coal holding to Zeigler Coal Company, including the option to purchase B Canyon Mine. However, Zeigler choose not to exercise its option to purchase the B Canyon Mine.

SRS later changed its name to Sunnyside Coal Company (Sunnyside) and is now seeking to expand its coal market beyond just the soft, high-volatile coking coal provided to Geneva Works. Sunnyside is increasing the capacity of its operation by installing an upgraded longwall system on a new panel. Production capacity should increase 50 percent to 100 percent above 1990 operations and enable Sunnyside to sell more coal to Geneva Works and increase its shipment for export and the domestic industrial coal market. Increased shipments to Geneva Works is due in part to the temporary closure of Mid-Continent's mine. However, it will be a small increase because the two coals are complimentary and compatible, but not competing.

Sun Coal Company - Sun Coal Company (Sun Coal) is planning to install a longwall section in its Soldier Creek Mine that may be implemented easier as a joint venture. This could push production capacity to over three million tons per year in 1991. For marketing this coal, there are also plans to build a coal preparation plant to improve the quality of coal sold to customers. Sun Coal is also considering upgrading the loading facility to increase the volume of coal that can be shipped from its mine operation. In order to sell the additional production from the Soldier Creek mine, Sun Coal will have to look to the export and local markets to sell this volume of coal production.

To ensure the availability of coal in future years, Sage Point Coal Company, (an official name for Soldier Creek Coal Company) has also filed for an LBA with BLM for a 1,000-acre federal coal lease.

Andalex Resources - On June 28, 1990 Amca Coal Leasing, on behalf of Andalex Resources, successfully bid \$1.67 million to obtain the 900-acre federal coal lease on the Centennial Tract in the Book Cliffs coal field. This lease is estimated to contain approximately eight million tons of coal.

Andalex Resources is in the process of obtaining a mine permit to open an underground coal mine in the area of the Kaiparowits coal field known as the Smoky Hollow site. The project, called "Warm Springs" should be completed by mid-1994. An initial production of around half-a-million ton per year is anticipated, with production increasing to two million tons per year after two years of operation. The Warm Springs project will hire a good portion of the estimated 350 jobs available in mining, transportation and load-out facilities from the southern Utah labor market. The remainder will be filled by residents of Arizona and Nevada.

The Kaiparowits coal field is the largest coal field in Utah, and contains more than 7.6 billion tons of recoverable coal. The Warm Springs project represents the first time a coal company has seriously worked toward producing coal from the Kaiparowits coal field.

United States Fuel Company - On April 19, 1991, the United States Fuel Company (U.S. Fuel) laid off 134 miners from a total work force of 152. U.S. Fuel retained 18 miners to run one shift. Earlier in the year, U.S. Fuel was aware of the fact that it would not be shipping coal to the Utah Power's Carbon Plant. The export market was also unattractive price-wise, leaving a large stockpile of coal at the U.S. Fuel mine. With only two contracts to fill, one in Utah, and another in Nevada, the final decision was made that it would be more prudent to curtail operations until market conditions improved.

Nevada Electric Investment Company - During the second quarter of 1990, Nevada Electric Investment Company (NEICO), a subsidiary of Nevada Power, decided to set up a separate coal marketing subsidiary to handle the sale of the coal produced by its other subsidiary, Genwal Coal Company, and other coal suppliers. Castle Valley resources, with its head office in Wellington, Utah, was subsequently created and started operation. In mid-July, 1991, NEICO sold 50 percent of its Genwal operation to Intermountain Power Agency (IPA). A good portion of Genwal's production will probably be sold to IPA, but Castle Valley Resources will still have to market the remainder of the production to other customers.

Consolidation Coal Company - Consolidation Coal Company, the second largest coal producer in the country, decided to suspend its Utah operation as of May 31, 1990. Consolidation had a reasonable production during 1989, but could not secure adequate amounts of sales to justify continuing operations in Utah.

American Electric Power - American Electric Power is leaning toward selling the remainder of its coal reserve in the Book Cliffs, which contain as much as 110 million tons of recoverable coal. These reserves are typical high-BTU, low-sulfur Book Cliff compliance coal, and for the right price a customer may not be difficult to find.

COAL LEASING ACTIVITY IN UTAH

Two federal coal leases were sold during 1990 under the Leasing By Application (LBA) program. The sale was held on June 28, 1990. Beaver Creek Coal Company paid more than \$6 million, about 50 cents per ton, for 12 million tons of recoverable reserve existing on 2,600 acres of the

Trail Mountain Tract. Andalex Resources paid \$1.67 million, about 20 cents per ton, for eight million tons of recoverable reserve existing on the 900 acre Centennial Tract.

There were also two lease modifications. Soldier Creek Coal Company applied for and received a 40-acre lease adjustment to its Soldier Creek mine and Andalex Resources applied for and received a 40-acre lease adjustment to its Pinnacle mine.

There was also an application under LBA. On December 29, 1989, Mining and Energy Resource, Inc. (MERI) applied for about 3,500 acres of Crandall Canyon to develop a new mine there.

In 1991, there have been four coal lease by applications. On January 10, Coastal States Energy Company applied for 2,000 acres of Winter Quarters Canyon for the expansion of Skyline mine; on February 21, Sage Point Coal Company (Soldier Creek) applied for over 1,000 acres of Soldier Creek area for its Soldier Canyon mine; on February 26, PacifiCorp applied for nearly 8,000 acres in the Trail Mt./Cottonwood Creek area for its Cottonwood Mine; and finally on March 4, Genwal Coal Company applied for almost 2,000 acres in Crandall Canyon for its Crandall Canyon mine.

There was also one lease adjustment in 1991 that was for 50 acres by Cyprus Plateau Coal Company. Three applications were also filed during the early part of 1991 for coal exploration licenses on unleased federal land.

OUTLOOK FOR UTAH'S COAL INDUSTRY

Forecast for 1991

Prices - The decade of the 1980s proved to be very unpredictable as far as coal prices were concerned. Utah's coal prices peaked in 1982 at \$29.42 per ton and since then steadily declined to \$21.78 per ton in 1990. In real terms the actual price has declined much more. At least three mines have closed (or indefinitely suspended operation) in Utah during the last 18 months. While low coal prices were not the only reason for these mine closures, they were strongly influenced by the relatively low price paid for Utah coal.

As more mines, which are experiencing technical problems making it difficult to continue operations, choose to close, production capacity will drop and the Utah coal market will tighten slightly.

While the economy of the United States is still under the influence of a recession resulting in very low coal prices, prices are expected to rebound moderately in the coming year. An anticipated increase in the volume of Utah coal exports should also help firm up prices.

While generous rain fall during May and June of 1991 was a blessing for Utah's and other residents of western states suffering from four years of drought, the spring rains were not good for Utah's coal operators. The heavy rains helped to fill reservoirs in the northwest and will lead to a greater availability of hydroelectric power generation in 1991 and a reduction in the purchase of electricity generated from coal-fired electric power plants. This in turn will lead to a reduction in coal consumption. On the other hand, the coming winter season should not be as mild as the last winter (despite the unusually harsh December), which will have a tendency to increase demand for coal. On

the whole, coal prices should inch up further. Any interruption in the production or transportation of coal at home or around the globe, such as a strike by miners or railroad workers, could also push prices up.

Production - Utah's coal production in 1991 may not see as large an increase over 1990 production as was experienced between 1990 and 1989, still Utah coal production is projected to reach yet another all-time high of 22.3 million tons in 1991.

Growth in Utah production will slow down in 1991 in response to unusually large volumes of coal stockpiled at Utah Power's Hunter and Huntington power plants, and the effects of the recession during the first half of 1991. Production from Utah Power's Deer Creek and Cottonwood mines will be reduced as a result of the Hunter and Huntington plants drawing down excess coal stockpile at their plant sites. Still, 1991 total production by Utah's coal mines is expected to increase on the strength of increased demand from out-of-state electric utility markets and exports to the Pacific Rim.

Distribution - Total distribution of Utah coal is projected to increase more than 2 percent in 1991, rising to another all-time record of 22.3 million tons.

Utah Power's Cottonwood and Deer Creek mine operations will experience a moderate decrease in distribution of electric utility coal in 1991. The Hunter and Huntington plants are expected to consume slightly more coal than they did in 1990. However, they will draw a portion of their coal needs from stockpiled coal and reduce the volume received from the Deer Creek and Cottonwood mines. Intermountain Power Project will, on the other hand, experience a slight increase in deliveries. Sierra Pacific and Nevada Power companies' requirement for Utah coal will remain almost unchanged, while a greater amount of Utah's coal will be consumed by newly constructed cogeneration companies in California. The Nevada and California electric utility and cogeneration plants together would consume 18 percent more Utah coal in 1991 than in 1990, and the level of deliveries to this end-use sector could approach four million tons.

Geneva Steel Mill's receipts of Utah coking coal is projected to increase along with deliveries of industrial steam coal by the industrial sector in Utah during 1991. Combined consumption of Utah coal for these two end-use sectors could reach 1.4 million tons in 1991.

The distribution of industrial coal outside of Utah, to chemical and cement plants in California, is expected to decrease 10 percent during 1991 compared to the previous year and could drop to 2.1 million tons.

Export of Utah coal to the Pacific Rim countries that has tripled, since 1987, should experience another year of significant growth in 1991. The Soviet Union's coal exports to Europe and Japan may be significantly reduced in 1991, due to the lengthy coal miners' strike (nine weeks by end of April) and other economic and political problems plaguing the Soviet economy. In addition, Australia, a supplier of coal in the international export market and Utah's principal competitor in the Pacific Rim market, may have its own usual problems of strikes and/or natural disasters that could effect its ability to supply coal to the export market in 1991. Due to these events it is quite possible that in 1991, U.S. coal exports will increase over 1990 and, in particular, Utah coal exports to the Pacific Rim countries could increase by three-quarters of a million tons.

Long-Term Forecast

Over the course of the next decade, Utah's coal market will expand at a faster pace than the general domestic coal market. About 75 percent of Utah's coal is utilized in generating electricity within the country (mostly in Utah, Nevada and California). This market has a potential of growing at about 3 percent per year while the average growth rate of the entire U.S. electric utility market would probably be more than a full percentage point lower than this.

The *Clean Air Act*, could also play an important part in increasing Utah's coal production, though this may be realized more in the distant future rather than in the near term. In addition to considering installing expensive desulfurization units or clean-coal technology application alternatives to comply with provisions of the *Clean Air Act*, executives of electric utility plants will continue to look to switching to cleaner-burning fuels as a viable alternative for meeting clean air standards. In many cases fuel switching could be the least expensive alternative.

Nearly all of Utah coal has a very low-sulfur content; about 0.5 percent for over 12,300 BTU per pound. This is much cleaner (nearly 50 percent more) than, for example, Powder River Basin (PRB) coal that also has 0.5 percent sulfur. What we burn to generate electricity is BTU, not the pounds or tons of coal. Utah coal and PRB coal both contain 0.5 percent sulfur. So each pound of coal would release the same amount of sulfur dioxide when burned. But one pound of Utah coal contains, on the average, about 12,300 BTU while one pound of PRB coal contains 8,300 BTU. This means that while emitting the same amount of pollutants, Utah coal delivers 48 percent more power than the PRB coal. However, since PRB coal is very inexpensive and the transportation cost from PRB to the mid-west, which once was a good market for Utah coal, is very competitive, coal switching by mid-western states could positively affect the PRB production rather than Utah's coal production during the next few years.

Eventual entry of Utah coal into the mid-western compliance coal market will be enhanced by the recent merger (early 1989) of the Denver and Rio Grand West (D&RGW) and Southern Pacific (SP) Railroads. Transporting compliance coal to electric utilities in the mid-west would appear to be an attractive source of revenue for the newly merged companies. Accordingly, there may be an incentive for them to reduce their tariff to a point where the shipment of Utah's high BTU, low-sulfur coal to the mid-west becomes a viable compliance alternative for the electric utilities in that region.

The overseas export market offers additional opportunities to Utah coal production in the long term. By the end of this decade the demand of the Pacific Rim countries for bituminous steam coal will probably increase by 63 percent. With additional demand from Europe, due to closing of unprofitable, inefficient, mines in western and eastern Europe, traditional exporters to the Pacific Rim countries may not be able to fill this additional demand. A greater burden of supplying the Pacific Rim countries' demand in steam coal would perhaps shift onto the shoulders of the Utah coal operators. A welcomed burden they would be willing to bear.

Utah's coal future is very bright in terms of production, employment, and sales - not so in terms of price. The Utah coal market is not likely to see the prices of the early 1980s for another decade. However, Utah coal operations will be profitable. The combination of high productivity, low operating costs, and large volumes of coal produced by Utah's underground mines will ensure profitable operations in spite of lower prices. Forecasts by the Division of Energy call for the cost of Utah's coal production within the \$13 to \$16 range in the near term. Accomplishing this will not be

easy. But, the continued business acumen and foresight demonstrated by Utah's coal executives and the productivity of the miners will ensure the strength and continued success of Utah's coal industry.

OTHER CONSIDERATIONS

There are many issues promising to impact coal markets in the years to come. The Persian Gulf war reminded us of the vulnerability of our energy supplies and the importance of developing alternative domestic supplies of energy. In addition, one of the single most important issues facing this country and the world is that of energy consumption and its effects on the environment. Clean air and global warming are but two environmental issues that promise to influence coal markets in the next decade. The *Clean Air Act* will limit the major air pollutants from power plants, vehicles, and industry. And despite large uncertainties regarding potential climate change from burning fossil fuels such as coal, there is sufficient credible scientific concern to start acting to curb the buildup of greenhouse gases -- several of which are related to the use of coal.

All of these issues promise to affect prices and production of coal and structure of coal markets. Following are a number of considerations and observations of issues that may impact Utah's coal markets in the more distant future.

- The idea of alternative fuel to power automobiles has been around for a long time. As a matter of fact, electric cars were originally invented at the turn of the century, and the initial fuel to power the diesel engine envisioned by its inventor, Rudolf Diesel, was intended to be coal.

The Arab oil embargo and quadrupling of oil prices in 1973 brought about a more serious rethinking about alternative fuels. Since this process was more of a response to increasing oil prices with some national security consideration, the efforts subsided when fuel prices fell precipitously during the mid 1980s.

Today, alternative fuels are an important component of the national energy picture due to the *Clean Air Act* and national security concerns raised by the Persian Gulf conflict.

For these reasons alternative fuels are now being considered more seriously than ever before. Coal could play a significant future role in supplying clean fuels for the electric utility and transportation sectors of the economy.

- Since coal fuels 57 percent of the electric generation capacity in this country, any efforts that will increase demand for electricity will likely be beneficial to the coal industry. Electric vehicles represent one such opportunity. Electric vehicles are receiving more support from Congress, and this is what is required to get this electric powered vehicle production off the ground. In H.B. 1542, *Comprehensive Energy Policy Act of 1991* introduced in the House of Representatives by Norman F. Lent (R.NY), some credit is envisioned in the corporate average fuel economy (CAFE) for electric vehicles. The bill also encourages the creation of joint venture on a 50-50 cost-sharing basis, and seeks to authorize a \$20 million appropriation in each of the next two budget years.

- The basic oil-refining technique has changed very little since its inception over a century ago. It is true that the present distillation units have more trays and we can have a greater number of cuts from the same crude and we can even break down the longer hydrocarbon chains into smaller ones in our catalytic crackers, but the basic refining technique has not changed much and the ratio of the associated cost is still the same.

Over the past 50 years we have also tried to refine coal into transportation fuel with varying degrees of success. However, the associated cost has always been prohibitive. It has not been until recently that refining costs have been reduced to the point where an alternative transportation fuel obtained by refining coal could approach a price range that would make it competitive with petroleum. Nevertheless, there is reason enough for being optimistic about seeing costs of transportation fuels refined from coal being reduced further in the next decade.

This may not be the only way in which we can use coal as transportation fuel. At the time of this writing, General Electric Company is in the process of testing a full-scale locomotive equipped with a coal-fueled diesel engine. There are also many companies and individuals (some even in Utah) that are trying to burn some sort of coal slurry in regular internal combustion engines, such as the ones in our own automobiles.

The new coal refinery that is being built in Wyoming will produce clean liquid fuels as well as clean solids. This clean solid could be used also as future transportation fuel. This is why I firmly believe that it is up to us, the entire coal industry to join together to change the image of the dirty, inefficient fuel of the past to one of coal being a clean, efficient, reliable, cheap, abundant fuel for the future, and for which we neither need to export our badly needed hard earned capital to other countries of the world, nor do we need to go to war for it.

- In the last week of March 1991, the ground-breaking of the Rosebud Syncoal project in Montana took place. This advanced coal upgrading plant, with a total cost of about \$70 million (half of which was funded by the U.S. Department of Energy) should be able to handle 300,000 tons of upgraded coal per year. The 8,600 BTU/lb of Powder River Basin coal can be upgraded to 11,500 BTU/lb bituminous type coal.

- As was mentioned in last year's report, the main environmental problem associated with fossil-fuel burning is not SO₂ or other air-polluting gases, but the emission of the gases that would contribute to the global-warming process. The *Clean Air Act* does not control CO₂ emission which is one of the major greenhouse gases responsible for global warming. The high-efficiency coal combustion technique could reduce CO₂ emissions by as much as one-third. Reducing CO₂ emissions by one-third, would allow us to produce 50 percent more power while emitting the same amount of CO₂. We cannot stop the process of burning fossil fuel and creating CO₂, at least not in the near future. And we have not found a way, if a way is at all possible, to decompose the CO₂ into its original carbon and oxygen elements by using less energy than was created when the two were combined.

Fossil fuels are important to the welfare and economy of the United States. They are burned to keep in motion the wheels of our industry, as well as our modes of transportation, and to heat and cool our houses, schools, churches, shopping centers and factories. Some scientists argue that in order to reverse the global warming process, we need to reduce our carbon dioxide emission rate by 60 to 80 percent. And then they contend that since this would considerably impact our living standard and

greatly alter our lifestyle, we therefore should put up with the consequences of global warming and do nothing about it. Presenting the solution to such an important problem in terms of an "all-or-nothing" package is simplistic. In controlling global warming, every ton of CO₂ not emitted is important. The solution to the problem does not start by avoiding to emit today 60 percent of what we emitted yesterday, but by trying to avoid the emission of the first ton of CO₂ today, through wiser management of our resources.

TABLE 1 HISTORICAL PRODUCTION, DISTRIBUTION AND CONSUMPTION OF COAL IN UTAH. VALUES, WHERE APPLICABLE ARE IN 1000 SHORT TONS.

| NO | YEAR | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 |
|----|-------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1 | PRODUCTION | 13808 | 16912 | 11829 | 12259 | 12831 | 14269 | 16521 | 18164 | 20517 | 22012 | 22344 |
| 2 | DISTRIBUTION | 14627 | 15397 | 12188 | 12074 | 14361 | 13243 | 16989 | 18244 | 21289 | 21680 | 22332 |
| 3 | E U OUTSID UTAH | 2688 | 3643 | 3404 | 3730 | 3746 | 2989 | 3182 | 2797 | 2623 | 3373 | 3991 |
| 4 | E U IN UTAH | 4837 | 6153 | 5220 | 4912 | 7385 | 7614 | 11677 | 12533 | 12963 | 14053 | 13793 |
| 5 | C P OUTSID UTAH | 779 | 859 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | C P IN UTAH | 1297 | 831 | 886 | 1392 | 1328 | 868 | 291 | 1259 | 1277 | 1296 | 1330 |
| 7 | IND OUTSIDE UTAH | 1645 | 1349 | 1091 | 1542 | 1866 | 1745 | 1813 | 1996 | 2401 | 2327 | 2131 |
| 8 | IND IN UTAH | 591 | 812 | 664 | 551 | 450 | 374 | 349 | 739 | 810 | 619 | 733 |
| 9 | R/C OUTSIDE UTAH | 180 | 233 | 292 | 311 | 312 | 81 | 83 | 88 | 84 | 59 | 53 |
| 10 | R/C IN UTAH | 197 | 177 | 191 | 258 | 252 | 191 | 204 | 236 | 323 | 382 | 375 |
| 11 | EXPORTS | 3472 | 2177 | 1346 | 849 | 625 | 551 | 555 | 1044 | 2175 | 1708 | 2136 |
| 12 | TOTAL IMPORTS | 1136 | 797 | 937 | 1539 | 1580 | 1145 | 1165 | 2448 | 2367 | 2137 | 2210 |
| 13 | IMPORTS E U | 8 | 18 | 0 | 224 | 193 | 659 | 905 | 1300 | 1400 | 1449 | 1500 |
| 14 | IMPORTS C P | 1030 | 695 | 854 | 1229 | 1289 | 383 | 160 | 1088 | 922 | 679 | 700 |
| 15 | IMPORTS IND | 98 | 84 | 83 | 85 | 98 | 103 | 100 | 60 | 45 | 7 | 10 |
| 16 | IMPORTS R/C | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 0 |
| 17 | COAL OPERATORS | 16 | 16 | 15 | 15 | 15 | 16 | 16 | 14 | 14 | 13 | 12 |
| 18 | ACTIVE MINES | 28 | 29 | 25 | 24 | 22 | 21 | 20 | 17 | 20 | 18 | 18 |
| 19 | EMPLOYEES | 4166 | 4296 | 2707 | 2525 | 2563 | 2881 | 2650 | 2559 | 2471 | 2791 | 2701 |
| 20 | PRODUCTIVITY, MH | 1.99 | 2.05 | 2.59 | 2.94 | 2.8 | 3.08 | 3.25 | 3.69 | 4.42 | 4.22 | 4.67 |
| 21 | AVERAGE PRICE \$/TON | 26.87 | 29.42 | 28.32 | 29.2 | 27.69 | 27.64 | 25.67 | 22.85 | 22.01 | 21.78 | 22.39 |
| 22 | TOTAL VALUE \$1,000,000 | 371 | 498 | 335 | 358 | 355 | 394 | 417 | 415 | 451 | 479 | 500 |

VALUES FOR 1991 ARE FORECAST. ALL DISTRIBUTIONS INCLUDE IMPORTS.

Table 2 Utah Coal Production by Coal Field
Thousand Short Tons

| Year | Wasatch Plateau | Book Cliffs | Emery | Sego | Coalville | Others | Total |
|--------------------------|-----------------|-------------|-------|-------|-----------|--------|---------|
| 1870-1981 | 166,404 | 234,547 | 5,723 | 2,654 | 4,262 | 2,332 | 415,922 |
| 1982 | 12,342 | 3,718 | 852 | 0 | 0 | 0 | 16,912 |
| 1983 | 10,173 | 1,568 | 88 | 0 | 0 | 0 | 11,829 |
| 1984 | 10,266 | 1,993 | 0 | 0 | 0 | 0 | 12,259 |
| 1985 | 9,386 | 2,805 | 640 | 0 | 0 | 0 | 12,831 |
| 1986 | 10,906 | 2,860 | 503 | 0 | 0 | 0 | 14,269 |
| 1987 | 13,871 | 2,348 | 269 | 0 | 33 | 0 | 16,521 |
| 1988 | 15,218 | 2,363 | 548 | 0 | 35 | 0 | 18,164 |
| 1989 | 17,146 | 2,785 | 586 | 0 | 0 | 0 | 20,517 |
| 1990 | 18,591 | 3,085 | 336 | 0 | 0 | 0 | 22,012 |
| Cumulative Production | 284,303 | 258,072 | 9,545 | 2,654 | 4,330 | 2,332 | 561,236 |

Table 3 Utah Coal Production by County
Thousand Short Tons

| Year | Carbon | Emery | Sevier | Summit | Iron | Kane | Others | Total |
|--------------------------|---------|---------|--------|--------|------|------|--------|---------|
| 1870-1959 | 211,028 | 49,166 | 4,046 | 4,012 | 521 | 45 | 2,846 | 271,664 |
| 1960 | 3,698 | 1,137 | 49 | 20 | 50 | 0 | 1 | 4,955 |
| 1961 | 3,916 | 1,124 | 47 | 20 | 52 | 0 | 0 | 5,159 |
| 1962 | 3,105 | 1,077 | 49 | 20 | 46 | 0 | 0 | 4,297 |
| 1963 | 3,493 | 752 | 47 | 18 | 48 | 1 | 0 | 4,359 |
| 1964 | 3,752 | 848 | 47 | 17 | 54 | 2 | 0 | 4,720 |
| 1965 | 3,779 | 1,101 | 61 | 13 | 36 | 2 | 0 | 4,992 |
| 1966 | 3,380 | 1,170 | 65 | 15 | 4 | 2 | 0 | 4,635 |
| 1967 | 2,971 | 1,113 | 72 | 13 | 3 | 2 | 0 | 4,175 |
| 1968 | 3,062 | 1,167 | 70 | 13 | 3 | 2 | 0 | 4,316 |
| 1969 | 3,367 | 1,200 | 72 | 12 | 4 | 2 | 0 | 4,657 |
| 1970 | 3,349 | 1,292 | 79 | 13 | 0 | 0 | 0 | 4,733 |
| 1971 | 3,347 | 1,097 | 158 | 12 | 0 | 12 | 0 | 4,626 |
| 1972 | 2,956 | 1,656 | 184 | 6 | 0 | 0 | 0 | 4,802 |
| 1973 | 2,866 | 2,445 | 339 | 0 | 0 | 0 | 0 | 5,650 |
| 1974 | 2,754 | 2,901 | 391 | 0 | 0 | 0 | 0 | 6,046 |
| 1975 | 2,984 | 3,126 | 827 | 0 | 0 | 0 | 0 | 6,937 |
| 1976 | 3,868 | 3,057 | 1,043 | 0 | 0 | 0 | 0 | 7,968 |
| 1977 | 4,390 | 3,107 | 1,337 | 0 | 0 | 0 | 4 | 8,838 |
| 1978 | 4,005 | 3,640 | 1,558 | 0 | 0 | 0 | 50 | 9,253 |
| 1979 | 5,292 | 5,147 | 1,657 | 0 | 0 | 0 | 0 | 12,096 |
| 1980 | 5,096 | 6,319 | 1,821 | 0 | 0 | 0 | 0 | 13,236 |
| 1981 | 6,123 | 5,609 | 2,076 | 0 | 0 | 0 | 0 | 13,808 |
| 1982 | 8,335 | 6,329 | 2,248 | 0 | 0 | 0 | 0 | 16,912 |
| 1983 | 4,194 | 5,404 | 2,231 | 0 | 0 | 0 | 0 | 11,829 |
| 1984 | 5,293 | 4,825 | 2,141 | 0 | 0 | 0 | 0 | 12,259 |
| 1985 | 6,518 | 4,516 | 1,797 | 0 | 0 | 0 | 0 | 12,831 |
| 1986 | 6,505 | 5,404 | 2,360 | 0 | 0 | 0 | 0 | 14,269 |
| 1987 | 7,495 | 6,765 | 2,228 | 33 | 0 | 0 | 0 | 16,521 |
| 1988 | 7,703 | 7,801 | 2,625 | 35 | 0 | 0 | 0 | 18,164 |
| 1989 | 8,927 | 8,531 | 3,059 | 0 | 0 | 0 | 0 | 20,517 |
| 1990 | 10,022 | 9,103 | 2,887 | 0 | 0 | 0 | 0 | 22,012 |
| Cumulative Production | 357,573 | 157,929 | 37,671 | 4,272 | 821 | 70 | 2,901 | 561,236 |

Table 4 Utah Coal Production by Landownership
Thousand Short Tons

| Year | Federal Land | | State Land | | County Land | | Fee Land | | Total |
|------|--------------|------------|------------|------------|-------------|------------|------------|------------|--------|
| | Production | Percentage | Production | Percentage | Production | Percentage | Production | Percentage | |
| 1980 | 8,663 | 65.5% | 1,105 | 8.3% | 0 | 0.0% | 3,468 | 26.2% | 13,236 |
| 1981 | 8,719 | 63.1% | 929 | 6.7% | 0 | 0.0% | 4,160 | 30.1% | 13,808 |
| 1982 | 10,925 | 64.6% | 998 | 5.9% | 0 | 0.0% | 4,989 | 29.5% | 16,912 |
| 1983 | 6,725 | 56.9% | 419 | 3.5% | 0 | 0.0% | 4,685 | 39.6% | 11,829 |
| 1984 | 8,096 | 66.0% | 285 | 2.3% | 0 | 0.0% | 3,878 | 31.6% | 12,259 |
| 1985 | 9,178 | 71.5% | 510 | 4.0% | 0 | 0.0% | 3,143 | 24.5% | 12,831 |
| 1986 | 11,075 | 77.6% | 502 | 3.5% | 0 | 0.0% | 2,692 | 18.9% | 14,269 |
| 1987 | 13,343 | 80.8% | 488 | 3.0% | 0 | 0.0% | 2,690 | 16.3% | 16,521 |
| 1988 | 15,887 | 87.5% | 263 | 1.4% | 0 | 0.0% | 2,014 | 11.1% | 18,164 |
| 1989 | 16,931 | 82.5% | 375 | 1.8% | 153 | 0.7% | 3,058 | 14.9% | 20,517 |
| 1990 | 17,136 | 77.8% | 794 | 3.6% | 606 | 2.8% | 3,476 | 15.8% | 22,012 |

Table 5 **DISTRIBUTION OF UTAH COAL 1990**
By Destination and End-Use, Thousand Short Tons

| Destination | Electric Utilities | Coke Plants | Other Industrial | Residential & Commercial | TOTAL |
|-------------|-----------------------|----------------|---------------------|-----------------------------|--------|
| Arizona | 0 | 0 | 93 | 0 | 93 |
| California | 925 | 0 | 1,827 | 0 | 2,752 |
| Colorado | 0 | 0 | 0 | 2 | 2 |
| Idaho | 0 | 0 | 35 | 25 | 60 |
| Indiana | 0 | 0 | 0 | 0 | 0 |
| Illinois | 0 | 0 | 0 | 0 | 0 |
| Iowa | 0 | 0 | 0 | * | * |
| Montana | 0 | 0 | 30 | 1 | 31 |
| Nevada | 2,448 | 0 | 165 | 2 | 2,615 |
| UTAH | 12,604 | 617 | 612 | 380 | 14,213 |
| Washington | 0 | 0 | 100 | 29 | 129 |
| Wyoming | 0 | 0 | 77 | 0 | 77 |
| Pacific Rim | 1,708 | 0 | 0 | 0 | 1,708 |
| Total | 17,685 | 617 | 2,939 | 439 | 21,680 |

* Amount is less than 500 tons.