CROOK COUNTY PRELIMINARY
LAND USE PLAN

prepared by the Crook County Planning Commission
with assistance from the
Tri-County Planning Office
Newcastle, Wyoming

Approved by Crook County Planning Commission
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Approved by the ~~Niobrara~~ Crook County Board of County Commissioners

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Crook County Preliminary Land Use Plan

Introduction

Concern for the future of the County, in light of the rapid changes taking place in Wyoming, and the State Land Use Planning Act of 1975, which requires that all local governments develop land use plans by the end of 1977, have resulted in the Board of County Commissioners appointing a County Planning Commission. In turn, the Planning Commission has developed and recommended this Preliminary Crook County Land Use Plan to the County Commissioners. It is intended to aid the County Commissioners in establishing policy for land use and related activities in the County. As such, it will serve as a guideline for decisions relating to growth and development in the unincorporated areas of the County.

Time and again it is pointed out that planning is a process that must reflect change as it occurs. For this plan to be more than another paper exercise it must be reviewed and modified as conditions and the needs of the County change.

Land use planning, while not a pleasant task, offers one way for local people to have a very real involvement in the direction the County will take as it deals with the change that is occurring now and that will be with us for the foreseeable future. You are encouraged to join in the process and make your views known, because no land use plan will be better than the collective judgements of the people it serves.

This preliminary land use plan would not have been developed without the continuing efforts of the Crook County Planning Commission and the support of the Crook County Board of County Commissioners.

Crook County Preliminary Land Use Plan

Location

Crook County is located in the northeast corner of Wyoming. It is surrounded by Montana to the north, Campbell County to the west, Weston County to the south and South Dakota to the east. Hulett, Moorcroft and Sundance are the incorporated communities in the County, with Sundance the County seat. The closest larger urban areas are Gillette, 61 miles to the west and Rapid City, about 80 miles to the southeast. The County contains approximately 2,897 square miles or 1,854,080 acres.

Major highways serving Crook County include Interstate 90 bisecting the southern fourth of the County in an east/west direction, U.S. Route 16, which joins Interstate 90 from the south at Moorcroft, U.S. Route 14 which connects Devils Tower to Sundance and joins Interstate 90 there, U.S. Route 212 which bisects the northeast corner of the County connecting Colony with Broadus, Montana to the north and to Belle Fourche, South Dakota to the south. State Route 24, which circles from Moorcroft to Hulett to Aladdin before it enters South Dakota, and State Route 116 and 585, which connect Sundance with Upton and Newcastle, respectively, to the south

Rail facilities serving the County are the Burlington Northern Railroad, which passes through Moorcroft and the southwestern corner of the County. A rail spur serves the bentonite facilities at Colony in the northeastern corner of the County.

History

Until the mid 1870's, northeastern Wyoming had been reserved as "Indian Territory". The Custer Expedition explored the Black Hills in 1874, having discovered gold on French Creek, South Dakata on July 30, 1874. With the news of the discovery, miners poured into the territory, thus opening the Black Hills for settlement.

The Sundance Creek Valley was a favored hunting grounds for Indians, as an abundance of game, wild fruit, pasture and firewood was present. Sundance Mountain was the "temple of the Sioux" where Indians practiced their religious sun dance. With the suppression of the Indians in the 1870's and 1880's, ranchers settled in the valley. The Fourth Legislative Assembly in 1875 created Crook County, naming it for General George Crook, who commanded the second Powder River Expedition against the Indians. The County included all of the area now making up Crook, Campbell and Weston Counties. Sundance was incorporated in 1887 and Crook County originated in 1885 with Sundance as County seat. The community became a social, government and trading center.

During the World War I era, many homesteaders came into the area. Moisture was greater than on the surrounding plains and dry-land farming could be successful. The County grew and prospered from numerous small farms. May homesteaders soon left in despair, however, and the livestock industry prevailed.

Devil's Tower became the country's first National Monument when, on September 24, 1906, President Theodore Roosevelt set aside a 1,153 acre refuge. Devil's Tower thus became the prime attraction for Crook County's tourist industry. The area's large white tail deer and turkey population also attracted large numbers of out-of-state hunters to the area in the fall.

The heavily forested Bear Lodge Mountain became the source of timber for an increasingly important sawmill industry. Several small mills have operated in South Dakota and Wyoming, and made timbers for the Homestake mine and a coal mine near Aladdin.

Uranium was discovered in Crook County in 1949 and the Homestake Mining Company soon opened its Hauber Mine north of Hulett. Uranium exploration is continuing in the area.

In the late 1950's the United States Air Force established a radar installation powered by the world's first air transportable atomic power plant atop Warren Peak, northwest of Sundance. Air Force personnel contributed greatly to the local economy until

the facility was closed in 1963. In recent years Sundance and Moorcroft have received overflow population from energy development near Gillette.

Land

There are a number of reports indicating areas of land use by different categories. The areas used here derive from mapping done specifically for this study. The areas were determined by plotting data from ASCS aerial photographs on a base map at ½" equals 1 mile scale and then measuring the areas by category.

	RANGE				
	Open	Forested	Forested	Dry-Land Farming	Urban Built-up
Acres	1,319,330	125,660	287,620	99,150	22,320
% of Total	71.2%	6.8%	15.5%	5.3%	1.2%

Obviously the major land uses are agricultural in nature, with the dominant agricultural use livestock grazing, which represents 78 percent of the total County area. If dry-land farming is added to the range categories the total area devoted to agricultural use increases to 83.3 percent and if the forested area is added the total reaches 98.8 percent of the total County area. Forested land, the seconded largest category after "open-range" contains about 200,000 acres classified by the State as commercial timber. Indicative of the general lack of available water in the County is the absence of large areas under irrigation.

In contrast to much of the rest of the State, the federal government owns only a little more than 15 percent of the total County area. Most of this is controlled by the Forest Service (9 percent) with the balance controlled by the Bureau of Land Management (63 percent). The State owns 8.4 percent of the land in the County.

Climate

The climate of Crook County is classified semi-arid. Fahrenheit temperatures show a wide range between summer and winter and between daily maximums and minimums. The average annual temperature is 43.6 degrees, with a range of average daily temperatures from 70 degrees in July to 20 degrees in January. The lowest temperature observed in Sundance was 31 degrees below zero in February and the highest was 101 degrees in July. It is interesting that the low temperature day occurs in February, while the low average month is January. The average length of the growing season is 110 days with the average date of the last freezing temperature in the spring, May 31, and the first freezing temperature in the fall is September 18. The temperatures and the length of growing season vary over the County, generally with lower temperatures and a shorter growing season at the higher elevations.

Topography

The County exhibits two distinct topography regions: the Black Hills Uplift, which dominates the western two thirds of the County and the rolling plains of the Powder River Basin, which covers the other third. Elevations vary from a high of 6,800 feet at Warren Peak to a low of 3,125 feet, the lowest point in Wyoming, where the Belle Fourche River enters South Dakota. Other major topographic features include Devil's Tower, a huge shaft of lava rock 865 feet high and the Belle Fourche drainage that winds its way around the Black Hills.

Geology

The geology of Crook County is dominated by the Black Hills Uplift, a massive batholithic uplift of igneous rock, affecting the eastern two thirds of the County, and the Powder River Basin, a broad structural intermountain basin that extends from the edge of the Black Hills Uplift westward over 100 miles to the Big Horn Mountains.

The Black Hills are somewhat eliptical in shape on the northwest-southeast axis. They extend about 125 miles in length

and about 55 miles in width. About half of the Black Hills geological uplift is located in Wyoming and half in South Dakota, but the South Dakota side is more densely forested and much more widely known to tourists.

The Bear Lodge Mountains are the northwestern portion of the Black Hills, but they are separated by surface features consisting of a broad treeless valley. Granite outcrops in many places, particularly in South Dakota and around Devil's Tower near Hulett. Much of the Wyoming side is covered with uplifted sedimentary rocks which have numerous outcrops and by a plain of redeposited tertiary sediments including gypsum. The Warren Peak is the highest in the Bear Lodge Mountains at 6,800 feet.

The Powder River Basin is a broad structural intermountain basin covering much of northeastern Wyoming. The Basin extends from the Black Hills Uplift some 120 miles westward where the Big Horn Mountains are uplifted. From the Laramie Mountains on the south perimeter, the Basin extends northward into Montana, a distance of over 150 miles. The Basin is over 12,000 feet deep which occurs near its west boundry. The east flank dips gently to the west. The Powder River Basin is an important oil, coal and uranium producing region. Oil production is primarily Cretaceous in age. Typically oil and gas production is prolific when discovered but depletes quite rapidly. Coal and uranium are predominately produced from the Fort Union and White River formations. Along the contact between the Black Hills Uplift and the Powder River Basin are numerous outcroppings of granite, limestone, bentonite, and other minerals.

Bentonite is produced at Colony, north of Hulett and a small coal mine had existed near Aladdin. The Hauber Uranium Mine, located north of Hulett had been the state's first and is owned by Homestake Mining Company. Northeastern Crook County has potential for sizable uranium production. The Bear Lodge Mountains are also highly mineralized and potential exists for metals mining.

Drainage

Crook County is in the Missouri River Basin and is drained by tributaries of the Little Missouri River and the Cheyenne River, which the Belle Fourche River joins in South Dakota. The

Little Missouri flows northeast entering Montana at about the center of the north boundary of the County. The Belle Fourche enters the County at its southwest corner, traverses the County in a northeasterly direction through most of the County until it reverses its direction northwest of Colony, then flows southeasterly to a point about one fourth of the way south of the County's northeast boundary, where it enters South Dakota leaving the County and the State. The majority of the other tributaries in the County are intermittent.

Soils

The types of soils within Crook County are many and varied, but there are general geographical areas that posses similar charcteristics due to origin and climate. The following description of these similar charcteristics use descriptive terms which are not the names of recognized soils series, families or groups.

The soils in the majority of the County are referred to as the Northern Plains Soils. There are two major divisions in this soil group: 1) Dark Colored Soils; and 2) Light Colored Soils.

The dark colored soils have a sandy texture and the horizons are very distinct in areas where the soil is maturely developed. Organic matter content is high but moisture content is irregular, making dry-land farming on these soils somewhat unpredictable. There are, however, some areas where this type of soil has supported fairly successful operations.

The light colored soils have a texture that ranges from loams to clays with very little sand. The structural development is very strong and the subsoil exhibits prominent horizons in areas where the soil is maturely developed. Despite the light color, the organic content is relatively high in these soils. As with the dark colored soils, there are soil moisture limitations, making dry-land farming a risky undertaking. The soil does support a good cover of midgrasses and short garsses and there are areas where crop land has been converted to grasses.

Mountain Meadow Soils are scattered throughout the County. These soils are divided into three major types: 1) Alpine Meadow Soils; 2) Forest and Mountain Parks and Meadow Soils, and; 3) Foothills and Brushland Soils.

Characteristics of the Alpine Meadow Soils are as follows:

1. Very cold with a mean annual soil temperature of less than 45°F. and a mean annual summer temperature of less than 50°F., both taken at a depth of 20 inches.
2. They have a thin, very dark colored acid turf.
3. They are usually rocky and sandy.
4. Microbiologic activity is limited primarily to fungus.
5. Vegetation is primarily dwarf plants including grasses, clovers, and willows.

The major uses of these soils are for watershed, summer range land and recreational purposes.

Characteristics of the Forest and Mountain Parks and Meadow Soils are as follows:

1. Spatter patterns of coniferous forest and open parks of mountain and water-living grasses and sagebrush.
2. Forest soils have a light colored, mildly acid topsoil and a yellowish yet vincolored subsoil, both usually cold and moist.
3. Park Soils are generally neutral in reaction and distinguished by a very thin semi-turf and a dark color that extends to a considerable depth.
4. Meadow Soils occupy wet areas and have a peaty surface with a grayish colored subsoil.

The Forest Soil areas are used for timber products, watershed, wildlife, and recreational purposes. Major uses of Mountain Park Soils are summer range, wildlife and recreation purposes; while Meadow Soils provide summer range land and water storage with slow release, and wildlife habitat.

Characteristics of Foothill Brushland Soils are as follows:

1. They have a dark colored surface soil relatively high in organic content.
2. Textures range from sand to clays, depending on bedrock types.
3. The soil pH is neutral to moderately alkaline.
4. Its major uses are for range lands, wildlife habitat and recreation purposes.

Water

Precipitation

Precipitation ranges from an average of 12 inches per year in southeastern Crook County to more than 18 inches in the Black Hills in the eastern portion of the County. Approximately 70 percent of the annual precipitation falls during the growing season. Snowfall varies from 30 to 65 inches on the plains to much more in the mountains.

Surface Water

Surface water availability is limited because most of the drainage in the County is intermittent and up to 80 percent of total out flow occurs during May, June and July in the form of spring runoff. Since crops water needs are greatest during July and August, the need to control and store runoff is important.

Ground Water

In the absence of adequate surface water, ground water is of critical importance. Most of the ground water available to wells in the County is in bedrock formations. This is due to the great thickness and extent of the consolidated bedrock acquifers compared to the relatively thin, unconsolidated acquifers of limited extent found in flood plain alluvium. Even though much more ground water is stored in bedrock than in unconsolidated material, the unconsolidated material usually yields water at a greater rate and accepts recharge faster. Only a small amount of ground water is benefically consumed annually by man's activity. Most of the natural recharge to unconsolidated acquifers discharges as base flows of surface streams, recharges consolidated acquifers, and evaporates. The quality of ground water affects its availability for a specific use.

Water quality is better near the outcrop (recharge) areas and deteriorates towards the center of geologic basins. Generally speaking, the quality of ground water in the County is fair at best and poor in many cases. Exceptions are the good-quality waters from mountain springs and the well water flowing or pumped from acquifers close to outcrop (recharge) areas.

Hydrologic characteristics of acquifers also affect the availability of ground water. One of the most important is permeability. Therefore, acquifers that are capable of supporting large-yield wells usually have thick saturated materials.

Ground water is used for domestic, stock, industrial, irrigation and other purposes. Domestic and stock wells are normally low-yield, intermittent producers. Water for such uses is found at depths above 1,000 feet.

Timber

Of the 287,000 plus acres shown on the land use map as forested, some 200,000 acres have been identified as commercial forest land (that land which is producing, or is capable of producing, usable crops of timber). Most of these lands are owned and controlled by the U.S. Forest Service, and are located on the Black Hills National Forest. The major commercial forest type is Ponderosa Pine.

There were three sawmills operating in Crook County during 1974 and their total cut from surrounding timberlands was 14,950 million board foot (MBF) or about 7 percent of the total cut for that year in the state. The major product produced was rough lumber.

Minerals

The Geological Survey of Wyoming listed the following mineral occurrences in Crook County:

Alum	Manganese
Barite	Nepheline - syenite
Bentonite	Oil and Gas
Calcite	Quartz - agates
Coal	Tripolite
Columbite	Silver
Copper	Sandstone
Fluorite	Stone - marble
Garnet	Titanite
Gold	Tourmaline
Gypsum	Uranium
Iron - pyrite	Rare Earths
Lead	Vanadium
Limestone	Zinc

Agriculture

Agriculture plays a vital role in the County's economy. The major crops are oats, barley, wheat and hay. Cattle and sheep are the County's major agricultural product, with cattle numbering 78,000 head in 1975, up from 44,600 in 1950, and sheep numbering 49,000 head in 1975, up from 41,000 head in 1950, but considerably below the 1964 high of 92,600 head.

The increase in cattle was generally steady during the 25 year period reflecting increasing demands for beef. However, due to the weak market for cattle in recent years it appears that this increasing trend will not continue or at least continue at a decreasing rate.

It appears that the decreasing trend in sheep will continue due to predators, imports of foreign wool, competitive fibers, lack of labor and low returns; however, the trend should stabilize at a lower level than at present if predators are controlled.

Environmental Quality

Crook County is fortunate to have very high air, water and land quality. Its low population desity and the relative absence of heavy industrial development are significant contributing factors to this.

Relatively minor air quality problems relate to bentonite processing at Colony, lumber mills around Hulett and Sundance and agricultural operations.

Water quality problems may result from municipal sewage treatment systems at Moorcroft, Sundance and Hulett, but a greater problem is in the area of non-point pollution, primarily soil erosion, which is characteristic of the sparsely vegetated range land, particularly during spring runoff. There may be some minor water quality problems related to oil and gas production.

Land quality problems are also minor. These may result from solid waste disposal, oil and gas exploration and production activities, bentonite mining, and some farm and ranch operations.

Economic Analysis

Employment Trends and Current Estimates

Generally Crook County is rebounding from a 15 year decline in employment, population and households. Significant gains have been achieved in all three areas over the past few years. The population and employment in Crook County has continued to increase at a modest yet steady rate of 2 to 3 percent a year.

Unlike other counties and the region as a whole, Crook County experienced a net gain in employment of 120 jobs in the 1965 - 1975 period -- an average annual increase of 0.4 percent. Since 1970 employment has risen at an average annual rate of 4.1 percent.

The leading employment sectors between 1965 and 1975 have been construction and trade. Between 1965 and 1970, construction employment grew from 20 jobs to 70 jobs - an average annual gain of 50 percent. Between 1970 and 1975 employment in construction increased from 70 jobs to 140 jobs - an average annual increase of 20 percent. Employment in trade increased from 110 jobs in 1965 to 170 jobs in 1970, an annual average increase of 10.9 percent. Between 1970 and 1975, employment in trade grew from 170 jobs to 240 jobs, an average annual gain of 8.2 percent.

Overall, employment levels in Crook County increased by 130 new jobs -- a net gain of 6.3 percent. Employment gains in the 1965 through 1975 period did not occur evenly. As of 1974, total employment in Crook County was 1,970, approximately 4 percent below the total employment level of 2,050 in 1965. By the end of 1975, total employment in Crook County had risen to 2,170 or an annual gain of 200 or slightly more than 10 percent.

Employment in agriculture and construction and, to some degree, manufacturing in Crook County represent the leading employment sectors. Percent of employed individuals in agriculture in Crook County is 180 percent higher than the percent of employed individuals in agriculture for the entire State. The share of employment is 98 percent higher than the State as a whole, and the share of employment in manufacturing is 32 percent higher in Crook County.

In 1970, the distribution of employment by sex indicated that males accounted for 78.9 percent of all employment in Crook County.

Labor force participation (the percent of total population employed) in Crook County in the period 1960 to 1970 increased from 34.8 percent in 1960 to 44.1 percent in 1970, compared to a national average of 43 percent for 1970.

Between 1967 and 1972, the number of manufacturing concerns in Crook County changed. In 1967 there were 11 lumber and wood products manufacturers in Crook County. By 1972, Crook County experienced a decline of 5 establishments. Crook County lost its only machinery manufacturer and its only stone, clay and glass manufacturer by 1972, but still had its printing and publishing concern.

A survey of major employers in Crook County indicated that as of Fall 1976, the employment outlook is towards modest but continued growth. Belle Fourche Pipeline anticipates continued employment increases and there is a high probability of start-up of uranium mining in the near future.

Population Trends and Current Estimates

Crook County experienced a modest decrease in population between 1960 and 1970 -- a decline of 3.5 percent. As of 1970, 51.9 percent of the population in the County resided in either Sundance, Moorcroft or Hulett.

The age of the population in Crook County shows a high concentration in the bracket of under 14 and between 25 and 54 years of age. This is similar to the national average except those under 14 years of age is 11 to 12 percent above the national average. Population in the age bracket of 55 years and over is nearly 10 percent below national average.

As of 1970, slightly more than 30 percent of the population had not been residing in the County prior to 1965.

As of 1975, population in Crook County was estimated at 4,950 compared to 4,535 in 1970. This growth has occurred steadily since 1970.

Household Trends and Current Estimates

Changes in the number of households in Crook County between 1960 and 1970 parallels population and employment, increasing slightly during the 10 year period, rising by 1.9 percent or 26 households in total.

There has been a decline in the average household size in Crook County from 3.7 persons per household in 1960 to 3.22 in 1970. This reflects the national trend.

Since 1970, the average income of households has increased substantially -- faster than the national overall rate of inflation of 39.8 percent. Average household income in Crook County was $7,474 in 1970. Measured in terms of wages and salaries earned, average household income in Crook County rose by 56 percent. This reflects the relatively large employment in manufacturing, construction and mining.

Summary Findings -- Factors Affecting Future Growth

Three crucial economic factors have been examined. These are: (1) trends and outlook for agricultural employment and production, (2) trends and outlook for mining activity and, (3) potential employment spill-over from coal mining activities in Campbell County. Based on extensive discussions with State officials and local operators as well as extensive research on the Tri-County area, these three areas are judged to be those which will dominantly influence future growth and development within the Tri-County area. These are considered for the purposes of this analysis, to be the principal "growth generators" in the Tri-County area. From the performance of each of these factors, additional growth and development in the Tri-County area in sectors such as retailing, wholesaling, services and government are likely to follow in the years ahead.

In summary, principal findings regarding the current and prospective outlook of each of these "growth generators" are as follows:

1. Agriculture

   While Crook County has experienced a significant increase in agricultural productivity -- principally increases in terms of the number of

livestock on farms and ranches and substantially higher yields from small grains such as winter and spring wheat -- employment in agriculture has declined by 9 percent since 1965, but increased by 6.9 percent between 1970 and 1975. The decline may be somewhat exaggerated because of a change in collecting the data after 1965.

In the foreseeable future, agriculture is anticiapted to remain a principal economic force -- though the total percentage of individuals employed directly or indirectly in agriculture is likely to decline. The best evidence available indicates that productivity on farms and ranches in Crook County is likely to remain stable or slightly increase over the next ten years. At the same time, employment directly in agricultural activities (farming and ranching) is more than likely to continue its historic decline as agri-operations continue to substitute technology for labor.

2. Mining

Mining activity and associated employment can be expected to continue its major role in Crook County. Existing and potential mining activity in the County already contributes substantially to the economic structure. As of 1975, employment in mining represented 8.3 percent of all employment in the County. Since 1965, employment in mining in Crook County has increased by 28.6 percent.

Petroleum and natural gas production -- the historic mining activity in Crook County -- are expected to remain stable as older fields decrease in production and deeper drilling in new fields yields supplementary reserves.

Bentonite production in Crook County will be a continued source of growth. Between 1970 and 1974, bentonite production in Crook County increased by over one million tons. Production is conservatively estimated to remain stable and is very likely to increase -- though not at the 41 percent gain achieved between 1973 and 1974. According to State officials and company representativies, it is likely that a new bentonite mine and mill will open, possibly in Crook County, within the next five to ten years.

Uranium mining in Crook County offers an additional source of future economic growth. Currently, active exploration of uranium reserves is occurring. Should the price level of uranium remain at the current price level of $41 per ton,

then there is an estimated 2.5 million tons of recoverable uranium reserves in Crook County.

According to officials questioned at the Wyoming Geological Survey and the Energy Research and Development Agency, it is highly probable that at least one uranium mine and mill will open in Crook County in the late 1970's or early 1980's. Additional new mines thereafter will depend on the long term price of uranium and the quality of reserves in Crook County.

3. Spill-Over Growth From Energy Development

Population growth from employment opportunities in energy development -- principally coal mining activities in Campbell County, could represent a significant source of future growth for Crook County. Because of existing and planned transportation routes, Crook County is expected to be a principal location of spill-over growth from the start-up of coal mining activities in Campbell County.

Based on projections prepared from a survey of major energy companies presently or expected to be operating in Campbell County, estimates of spill-over growth to Crook County have been prepared. The estimates are stated in terms of a probable range -- low to high -- and reflect the start-up of energy activities in three principal areas in Campbell County and the Reno Junction area. Further, estimates are stated in terms of the number of permanent employees living in Crook County and working in coal mining operations in Campbell County.

Up to 1980, only a modest share of the total employment occurring as a result of coal mining activities is likely to reside in Crook County -- either at the low or high range projection. Between 1976 and 1980, approximately 20 percent of the employment associated with mining activities in Campbell County is anticipated to spill-over to Crook and Weston Counties. Based on the present size of communities in Crook County and the travel distance to mines which are expected to open prior to 1980, a total of 375 to 500 employees in energy mining activities in Campbell County could be residing in either Crook or Weston Counties. Crook County communities experiencing spill-over growth are expected to be Moorcroft with 80 - 115 Campbell County employees and Sundance with 25 - 40 employees for a combined total of 105 Campbell County mining employees at the low range and 155 at the high end of the range.

After 1980, overall spill-over potentials to Crook and Weston Counties from mining operations in Campbell County are estimated to represent approximately 24 percent of all new employment occurring at mines during this period. The major location of spill-over growth is likely to be Weston County. A slightly lower share of the spill-over growth will reach into Crook County. Estimated spill-over growth potentials in Moorcroft and Sundance in the 1981 and 1985 period, are 55 - 110 and 10 - 25 mining employees, respectively.

Population Estimates

Table 1, below, summarizes how each of the "growth generators" is expected to influence the economic outlook in Crook County. Identified in Table 1 is the expected performance of "growth generators" in two ranges. The first range is labeled "minimum scenario". The second range is identified as the "maximum scenario". These two scenarios form the framework from which judgements and technical calculations have been made regarding the expected rate and level of growth in Crook County, and can be considered the parameters of future growth in terms of minimum (not less than) and maximum (not greater than) limits. The "minimum scenario" is based on an extrapolation of trends adjusted to the past five years. The "maximum scenario" is based on tracing the impact of all identifiable "growth generators" at their maximum and deriving the relationship between employment increases and spill-over population increases.

Population gains in Crook County are projected to increase to not less than 5,400 and not more than 5,800 by 1980. Between 1981 and 1985, population in Crook County is projected to grow to at least 5,900 and to 6,700 at the most. If Crook County population reaches no more than the minimum level in 1980 -- a gain of more than 850 will have been achieved since 1970, and almost return to the 1940 level of 5,463, the County's highest level in the past. On the other hand, should the maximum level be attained, the population of Crook County would be surpassing its 1940 population level by more than 300 persons. Continued population growth in Crook County to 1985, even at the minimum level would raise the population to 5,800 -- 6.2 percent above the 1940

level. Population growth in Crook County is a continuation of the long-term trend of moderate but steady gains. Future population growth is expected to be within a range similar to the experience of the past 15 years.

TABLE 1 ECONOMIC OUTLOOK IN CROOK COUNTY
ALTERNATIVE GROWTH SCENARIOS
BY SOURCE OF GROWTH

Minimum Scenario	Maximum Scenario
--Agricultural production and employment remain stable. Slight short-run decline in cattle and calves on farms and ranches. Long term outlook is for stable production.	--Agricultural production experiences additional gains due to increased land productivity. A rise in the retail price of beef and veal and stabilization of the farm to retail price spread.
--Bentonite mining experiences a continued increase to 2.5 million tons annually by 1980, but no new mines or mills. Bentonite demand remains stable.	--Bentonite mining increases by 20 to 40 percent. A new mine and mill opened in the late 1970's. Another mine opens in the early 1980's. Bentonite demand remains strong.
--Oil and natural gas exploration continues. New discoveries offset production declines at existing wells.	--Moderate increase in oil and natural gas production. Exploration continues and additional reserves discovered.
--Uranium exploration continues. Recoverable deposits identified but no mine or mill constructed.	--Recoverable uranium reserves identified. Uranium mine and mill opened and production begins in late 1970's.
--Spill-over growth from energy development at low range projection or 150 employees. Sundance and Moorcroft are the dominate communities affected.	--Spill-over growth from energy development at high range of 200 employees. Sundance and Moorcroft dominately affected.

Source: Gladstone Associates

Household Trends

As indicated in Table 2, below, the number of households in Crook County in 1985 is projected to be 1,950 at the minimum and 2,200 at the maximum. Household increases in Crook County when compared to Weston County reflect a more substantial growth in local base employment. However, additional bentonite mining employment expected in the County may result in a lower number of

resident households -- due to access and location. Other basic employment increases, such as in uranium mining, will generate a greater local household increase. This increase will be independent of the level of coal mining spill-over population growth which may occur.

TABLE 2

ESTIMATED HOUSEHOLDS IN THE TRI-COUNTY AREA
BY COUNTY AND GROWTH RANGE
1980 AND 1985

Tri-County Jurisdiction	Minimum Range 1980	Minimum Range 1985	Maximum Range 1980	Maximum Range 1985
Crook County	1,420	1,950	1,890	2,200
Weston County	2,150	2,320	2,520	3,100
Niobrara County	1,110	1,150	1,110	1,150
TOTAL Tri-County Area	4,680	5,420	5,520	6,450

Employment Projections

Employment in Crook County is projected to increase at a healthy pace over the next 15 years at either the minimum or maximum range. In part, employment gains will result from increases in "basic" employment in bentonite or uranium mining. Employment gains in base sectors will in turn generate additional employment through the classical "multiplier effect". A large proportion of future employment gains will also result from the spill-over population growth from mining activities in Campbell County. Population growth in Crook County can be expected to generate additional employment as a result of increased spending.

By 1980, employment in Crook County is projected to rise to 2,320 at the minimum and as high as 2,510 at the maximum. In 1985, total at-place employment in the County is projected to be a minimum of 2,460 and maximum of 2,840.

Population Growth in Communities

As a refinement of population projections, future growth has been allocated to major communities in Crook County. The allocation of future growth has been limited to population.

In general, major communities can be expected to absorb much of the population growth. Table 3, below, indicates estimated

population in Weston County communities by range of possible growth.

In 1980, the population residing in major communities is projected to account for 47 to 85 percent of the total population of the County. By 1985, the share of total population in major communities is projected to increase to 50 to 85 percent.

TABLE 3

ESTIMATED POPULATION IN CROOK COUNTY COMMUNITIES BY GROWTH RANGE 1980-1985

	Minimum Range		Maximum Range	
	1980	1985	1980	1985
Sundance	1,200	1,450	1,400	1,550
Moorcroft	1,350	1,550	1,650	2,200
Balance of County	2,850	2,900	2,800	2,950
TOTAL	5,400	5,900	5,850	6,700

Source: Gladstone Associates

Current Land Use Patterns

The general land use patterns in Crook County can be characterized by the dominance of agricultural uses, primarly open range encircling the Bear Lodge Mountains portion of the Black Hills National Forest and skirting the other portion of the Black Hills National Forest in the southeastern corner of the County. As mentioned previously, the forested portion of the County is mostly in the Black Hills National Forest. Dry-land farming intermingles with the open range and to a lesser degree in the forested areas, being generally more intense as it approaches the forest and less intense in the western and far northeastern portion of the County.

Urban uses may be found in and around the three incorporated communities of Moorcroft, Hulett and the County seat, Sundance. Smaller urban areas include the unincorporated communities of Alva, Aladdin, Beulah, Colony and Devil's Tower Junction. Urban

type uses are also occurring around Keyhole Reservoir, with a large portion of this area developing as recreation oriented seasonal housing. Some relatively large lot subdivision is occurring around Moorcroft, Sundance, and Keyhole and along State Route 585 towards Four Corners.

Community Services and Facilities

Community services and facilities provided by Crook County, as with all counties in the state, are limited to police protection, fire protection and roads and bridges. These services are furnished on a demand basis and are adequate for the present.

CROOK COUNTY PRELIMINARY GOALS, POLICIES AND GUIDELINES

Introduction

At its first meeting the Crook County Planning Commission established some overall guidelines to direct its efforts as it developed the land use plan required by State law. These are:

1. A person's right to do with his private property as he sees fit as long as he does not damage another's rights is the cornerstone of our country and will not be abridged.
2. Local control of local affairs is the only fair and efficient approach to government and must be jealously guarded and maintained.
3. The County today is the result of the independent individual actions of its residents over time. There is no better form of development and this freedom of action must be supported and encouraged in the future.
4. While freedom of action is critical, so is responsibility. The County expects any development to be of high quality and to bear its fair share of costs related to it.
5. "Areas of Critical or More Than Local Concern" for the purposes of the State Land Use Commission should be limited to those areas whose problems cannot be resolved by the local governments with jurisdiction over the area or portions of the area in question.

It is the intent of the Crook County Commissioners that these goals, policies and objectives comply with the requirements of the State Land Use Planning Act of 1975 and the requirements of the State Land Use Commission, while maintaining local control of local affairs.

1. Citizen Participation: Goal: To provide the citizens of Crook County with information and opportunities to participate in the local planning process.
   * Policy: A. Establish a citizen participation program as part of the Crook County Land Use Planning process.
     Objectives: 1) Establish and maintain a Crook County Planning Commission representing the interests and population of the County.

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*Required by the State Land Use Planning Act.

2) Have the Crook County Planning Commission meet regularly, and at least once a year with each of the other planning commissions in the County to discuss matters of mutual concern.

3) When considering action of concern to specific localities in the County, meet in that area of the County.

4) Special efforts will be made by the Planning Commission to meet in different areas of the County when holding public hearings about the Crook County Land Use Plan or amendments to it.

Policy: B. Crook County will develop and maintain a public information program about land use planning.

Objectives: 1) Make the Planning Commission available to meet with community groups or organizations, upon request, to present information on land use planning.

2) Use all types of media to honestly inform local residents about land use planning.

3) Announce land use planning meetings in advance and report after such meetings in local media.

Policy: C. Crook County will make relevant planning materials available to the public.

Objectives: 1) Place planning materials in the Crook County Library System.

2) Place planning materials in the Crook County Court House and the Moorcroft, Hulett and Sundance Town Halls.

3) Place planning materials in the Moorcroft, Hulett and Sundance High Schools.

2. Environmental Quality: Goal: To maintain or improve the quality of Crook County's air, water and land resources.

* Policy: A. Crook County's land use planning decisions making process will include evaluation of the effects of land use decisions on air, water and land quality.

Objectives: 1) Adoption of Crook County Land Use Plan will include consideration of the effects of the land use on envirnomental quality.

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*Required by the State Land Use Planning Act.

2) Changes in land use that will result in degradation of Crook County's environment will be discouraged.

Policy: B. Crook County will require that waste disposal facilities are planned in accordance with applicable state and federal permit requirements before approval of proposed development.

Objectives: 1) All sewage disposal systems should function properly and meet applicable health and sanitation standards.

2) Solid waste disposal sites should be developed and maintained in accordance with applicable state and federal regulations.

3. Economic Analysis: Goal: To coordinate land use decisions with economic factors.

* Policy: A. Crook County, in its land use planning process, will analyze the condition and trends of its economy and identify the land and facilities necessary for DESIRED economic development.

Objectives: 1) The Crook County Land Use Plan will include consideration of the County's major industries, future employment levels and land needs.

2) Consideration of land for development will include analysis of public costs related to such development with attention to available public facilities, services and the resources necessary to support the development.

4. Agricultural/Rural Lands: Goal: To plan for the continuing use, protection and enhancement of Crook County's agricultural - rural lands and to give careful consideration to any changes in the use of these lands.

* Policy: A. Crook County will identify its agricultural - rural lands in the Crook County Land Use Plan.

Objectives: 1) Define agricultural - rural lands considering how the land has been used, is being used, and may be used.

2) Avoid the disruption of rural lands by inappropriate development.

Policy: B. Crook County encourages the development and maintenance of agricultural - rural lands for agricultural purposes.

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*Required by the State Land Use Planning Act.

Objectives: 1) Assure the continuance of agriculture and the rural nature of Crook County as the backbone of the County's economy and special life style.

2) Keep land use restrictions on agricultural lands at the absolute minimum commensurate with protection of these lands from external exploitation.

3) Seek ways to enhance and maintain agricultural - rural land uses.

Policy: C. Crook County is opposed to the conversion of agricultural - rural lands to non-agricultural use. Any proposal for such conversion will require consideration of the social economic and environmental consequences for the owner and the community.

Objectives: 1) Allow such conversion in land use only when it has been demonstrated by the proponent with a preponderance of evidence that the best interests of the County and its residents will not be damaged by such conversion.

2) Assure that proponents of such conversion bear any public costs resulting from their proposal.

3) Make determinations concerning such conversion in public hearing, after giving proper notice.

5. Public Lands: Goal: To provide a cooperative process for land use planning between Crook County and state, local and federal agencies so that the plans of each will reflect the needs of the other.

* Policy: A. Crook County's land use plan will include all the land within its physical boundaries.

Objectives: 1) Other governmental agencies will have every opportunity to participate in the preparation of the Crook County Land Use Plan.

2) Crook County will, where possible, participate in the preparation of other governmental agencies land use plans and studies.

Policy: B. Crook County in implementing its land use plan, will try to assure that public agencies recognize and cooperate

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*Required by the State Land Use Planning Act.

with the County's efforts to secure equal consideration for private as well as public owners.

Objectives: 1) Coordinate County planning activities with other governmental agencies particularly the United States Forest Service, the United States Geological Survey and the Bureau of Land Management.

2) Keep other governmental agencies aware of the County's planning so that these agencies will recognize the County's desires as they develop their own plans.

3) Inform other agencies of the potential impact of their decisions on Crook County planning.

Policy: C. Crook County will carefully evaluate access to public lands in its land use planning to minimize adverse effects of access on public and private lands.

Objectives: 1) Assure that plans for roads are made with a clear understanding of the impacts that could result from the access and loss of agricultural - rural lands resulting from such roads.

2) Avoid providing access to public lands where such access may result in disrupting the use of such lands.

3) Plan for access to public lands where such access is clearly in the best interests of the County and its residents.

6. Water: Goal: To conserve water and relate its use and development to desired land use.

Policy: Crook County will consider the quantity and quality of surface and underground water in its land use planning process, including consideration of the availability of water in evaluating proposed new land uses prior to their approval.

Objectives: 1) Assure that adequate water is available for present as well as proposed land uses.

2) Maintain and enhance the County's water resources.

3) Give special attention to the water needs of agriculture and existing communities in the County.

4) Be aware of the total commitments of the County's water resources to avoid over allocating this valuable resource.

Policy: B. Crook County will actively pursue opportunities to make its concerns about water known to other governmental agencies particularly when such agencies are considering actions relating to the County's water.

Objectives: 1) Assure that the County's concerns about water are fully understood by other governmental agencies, particularly when they are considering action on policy that could effect the County's water.

2) Keep the County's residents informed about actions that could effect local water.

3) Participate in decisions concerning water right transfers or water development.

7. Natural Resources: Goal: To plan land use consistent with the orderly development, use and conservation of Crook County's renewable and nonrenewable natural resources.

Policy: A. Crook County will inventory its natural resources and use the data as a basis for its land use planning process.

Objectives: 1) Consider the County's natural resources, particularly those related to agriculture, forestry, and mining.

2) Map the County's basic natural resource areas.

3) Investigate what is needed to maintain the County's natural resources.

4) Seek ways to enhance and maintain the County's natural resources.

Policy: B. Crook County will consider the effects on its natural resources of any proposed changes in land use.

Objectives: 1) Protect the County's natural resources by discouraging development that would endanger them.

2) Give full consideration to development controls that lead towards the wise use and conservation of the County's natural resources.

3) Require proponents of changes in land use to provide adequate natural resource data to evaluate the effects of their proposal.

8. Natural Hazards: Goal: To minimize the loss of life and property from natural hazards.

Policy: A. Crook County will identify its known natural hazards and use the information in its land use planning process.

Objectives: 1) Identify natural hazards occurring in the County.

2) Consider identified natural hazards in the County's land use planning process.

3) Plan land uses to minimuze risk of harm to persons or property.

4) Inform other agencies of the presence of natural hazards so their plans can reflect any hazards in the area.

Policy: B. Crook County will consider natural hazards in the evaluation of proposals to change land uses.

Objectives: 1) Assure that natural hazards are considered in land use proposals.

2) Encourage minimizing the risk of harm to persons or property in changes in land use.

3) Ensure that proponents of land use changes are aware of natural hazards.

4) Limit development by the degree of the hazard or consider methods of lessening or eliminating the hazard.

9. Scenic, Historic and Recreational Lands: Goal: To conserve, protect and, where appropriate, develop Crook County's scenic, historic and recreational lands.

Policy: A. Crook County will identify and consider its significant scenic, historic and recreational resources and use this information in its land use planning process.

Objectives: 1) Inventory and map the County's significant scenic, historic and recreational resources in the land use planning process.

2) Consider the County's significant scenic, historic and recreational resources in the land use planning process.

Policy: B. Crook County will plan for the use of and access to its scenic, historic and recreational resources.

Objectives: 1) Consider scenic, historic and recreational resources in decisions about land use to assure proper care is given them.

2) Protect scenic, hostoric and recreational resources from disruption or degradation from changes of land use.

3) Support development of scenic, historic and recreational resources when it is in the best interests of the County and its residents.

4) Inform other agencies of the County's concerns when others are contemplating development of scenic, historic and recreational resources in the County.

Policy: C. Crook County will consider and plan for rural recreational needs and facilities in the County in its land use planning process.

Objectives: 1) Avoid disruption of rural lands uses and life styles resulting from improper rural recreation.

2) Take advantage of unique local opportunities for rural recreation.

0. Large Scale Development: Goal: To mitigate the social, economic, and environmental impacts on Crook County from rapid or large scale growth and development.

Policy: A. In the event of rapid or large scale development Crook County will prepare and maintain plans to accommodate it, minimizing harmful impacts on County residents.

Objectives: 1) Avoid the disruption that can occur from rapid growth in unprepared areas.

2) Develop alternatives to minimize anticipated impacts in the County.

3) Direct growth to locations best suited to cope with it.

4) Avoid over reacting at the first signs of change.

Policy: B. Crook County will consider private and public financial capability relative to provision of services in response to projected growth and development.

Objectives: 1) Assure that financial capability exists to provide services required as a result of rapid growth and development.

2) Provide that the developers bear their fair share of public costs related to their activities.

3) Be aware of the long term financial commitments that can accrue as a result of rapid growth and development.

4) Inform state and federal agencies of the financial impacts their decisions relating to growth can have on the County.

Policy: C. Crook County will do all it can to assure that decisions relating to growth inducing actions made by the state and federal government will reflect clear knowledge of the probable results in Crook County.

Objectives: 1) Keep informed about pending decisions by other governmental agencies.

2) Have maximum benficial impact on decisions concerning growth and development being made by other governmental agencies.

3) Keep County residents informed about such actions.

Policy: D. Crook County will inform other governmental agencies of its land use plan and planning process so they can adjust their growth inducing plans to reflect the County's plans.

Objectives: 1) Cause other governmental agencies to recognize Crook County's rights to plan for its future.

2) Provide other governmental agencies an opportunity to cooperate with the County's planning efforts.

3) Develop the groundwork to support legal efforts to force recognition of the County's planning efforts.

11. Public Facilities and Services: Goal: To plan for the provision of public facilities and services in coordination with Crook County's Land Use Plan.

Policy: A. Crook County will coordinate the types and locations of all public facilities and services with existing and proposed land uses.

Objectives: 1) Assure efficient provision of required public services.

2) Limit urban type growth and development to urban areas preferably incorporated towns.

3) Discourage development that requires public facilities and services in rural areas.

4) Require developers to provide for any public facilities and services necessary for their developments.

Policy: B. Crook County will plan public facilities and services, including state and federal, to minimize adverse effects on present and future land uses and locate them consistent with the County's goals, policies and objectives.

Objectives: 1) Avoid disrupting existing land uses, particularly agriculture, with the development of public roads and facilities.

2) Cause coordination between providers of public facilities and services.

3) Encourage efficient and attractive design of public facilities systems.

12. Urban Lands: Goal: To have urban lands in Crook County planned for by their adjacent towns.

Policy: A. Urban lands in Crook County should be incorporated.

Objectives: 1) Limit urban development to incorporated towns.

2) Avoid placing the County in a position of furnishing urban services which can be more effectively provided by a town.

3) Maintain the rural nature of the County.

Policy: B. Crook County will identify urban areas and attempt to have plans for these areas made by the city or town to which such areas could annex.

Objectives: 1) Have Sundance, Moorcroft and Hulett plan for their respective urban fringe areas.

2) Avoid having random urban type enclaves develop in the County.

13. Residential Lands: Goal: To provide suitable land to meet the housing needs of all Crook County residents.

Policy: A. Crook County will identify land most suitable for residential use, considering public costs and the disruption of natural resources and agricultural - rural lands.

Objectives: 1) Limit non-agricultural residential development to urban and urbanizing areas.

2) Avoid the disruption of rural land patterns by inappropriate residential development.

3) Keep public services provided by the County to the minimum.

Policy: B. Crook County will identify sites for temporary housing when such housing is necessary.

Objectives: 1) Minimize impacts from temporary housing needs resulting from rapid growth and development.

2) Encourage location of urban type uses in urban areas.

3) Protect rural life style.

4) Minimize costs of County government.

Policy: C. Crook County discourages the development of recreational or seasonal housing in the unincorporated areas of the County.

Objectives: 1) Maintain the integrity of traditional land use in the County.

2) Avoid provision of costly public services to inefficient land uses.

3) Require that such development not become a burden on the County.

4) Carefully control such development.

14. Energy Conservation: Goal: To plan land uses in Crook County that encourage energy conservation.

Policy: A. Crook County will consider energy conservation in designating land uses in the County land use plan.

Objectives: 1) Encourage new development to locate in existing urban areas.

2) Develop farm to market roads to minimize energy needs for transprotation.