PART V

ANALYSIS OF PROPOSED ACTION

KERR-McGEE COAL CORPORATION

CHAPTER I

DESCRIPTION OF THE PROPOSED ACTION

Background and History

The proposed Jacobs Ranch mine of Kerr-McGee Coal Corporation is on 4,352 acres of federal coal land in Campbell County, Wyoming, (Figure 1) and is one of the proposed coal mines in the Eastern Powder River Basin whose cumulative impact is being considered in this environmental impact statement.

An application for a coal lease, W-7456, covering a portion of the present Kerr-McGee Lease was filed with the Bureau of Land Management on July 17, 1967. A Land Office decision on April 21, 1970, attached additional lands to the lease block and established that the lease would be offered for competitive bidding. The original application for coal lease was withdrawn on May 6, 1970, clearing the way for the competitive lease sale on the enlarged tract which was held on June 23, 1970. Kerr-McGee Corporation offered the high bid of $52.00 per acre during oral bidding and was awarded the lease on September 1, 1970. This lease was numbered W-23928 for that portion of the tract on public domain lands and W-24710 for that portion of the tract on acquired lands. Copies of both leases are in Appendix D.

These two leases with the Bureau of Land Management are continuing leases subject to reasonable readjustment of terms on a 20-year basis. They provide for a royalty of 17½ cents per short ton (2,000 pounds) of coal mined for the first 10 years and 20 cents per short ton of coal mined for the remainder of the first 20-year lease period. Annual rentals are set at $1.00 per acre for the first five years of the lease and $5.00 per acre for the sixth

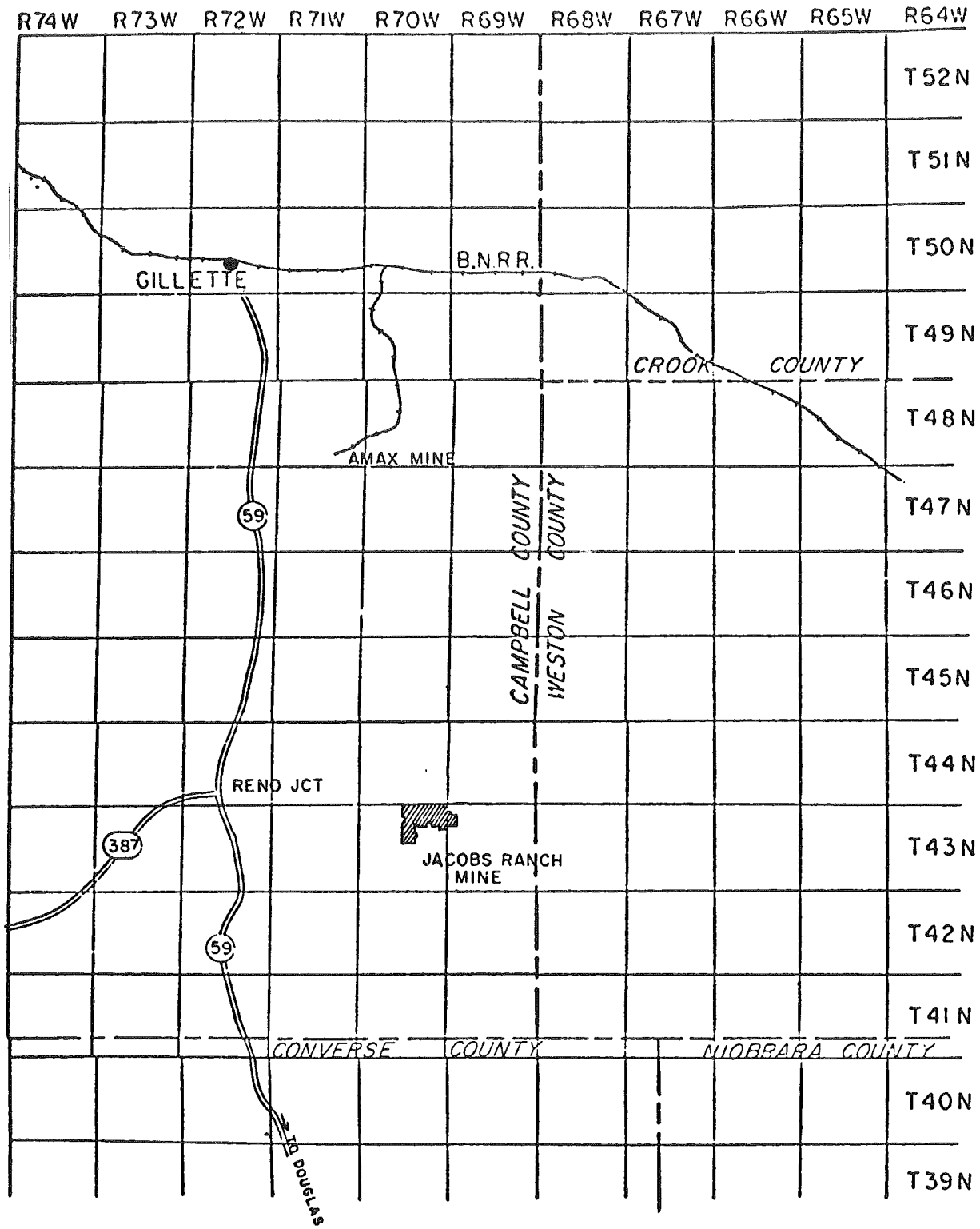

Figure 1

Location of the Jacobs Ranch Coal Property of the Kerr-McGee Coal Corporation

Cambell County, Wyoming

and each succeeding year. Annual rentals after the sixth lease year revert to $1.00 per acre if the production royalty for the lease year equals or exceeds $5.00 per acre.

Following acquisition of the leases, Kerr-McGee Corporation initiated an extensive exploration program to define the physical and chemical characteristics of the coal. Projected reserves of 300 million tons of low ash, low-sulfur coal under relatively shallow overburden were defined. Approximately 3,624 acres of mineable coal underlie the Jacobs Ranch mine lease. Drilling to finally delineate location of the burnline began February 25, 1974.

Surface and coal ownership in acres is given below:

	Surface	Coal
United States	640*	4,352
Kerr-McGee	320	0
Others (Private)	3,392	
Total	4,352	4,352

*Forest Service

Purpose of proposed project

Development of the Jacobs Ranch mine is planned to meet low-sulfur coal supply contract commitments. In 1973, three 20-year sales contracts and options were signed for a total of 250 million tons of coal. Purchasers include Arkansas Power and Light Company, Central Louisiana Electric Company, and Gulf States Utilities. Contract commitments require a coal production schedule as follows:

Year	Million Tons
1976 (March-December)	1
1977	1.2
1978	5
1979	9.2

Under this schedule, it is planned to begin construction of surface facilities and initial overburden removal in early 1975. A mining and reclamation plan for this proposed mine was submitted to the U.S. Geological Survey on December 20, 1973, and is being reviewed by the G.S., the Forest Service and the Bureau of Land Management to determine what additional stipulations will be required. The plans have also been available for public inspection in Billings, Montana, at the office of the Area Mining Supervisor, U.S.G.S.

Site location

The proposed Jacobs Ranch mine to be operated by Kerr-McGee Coal Corporation is located in T43N, R69 and 70W, Campbell County, Wyoming. A description of the lands contained in federal leases W-23928 and W-24710 is shown diagramatically in Figures 1 and 2.

Gillette (population 7,194 - 1970 census), the county seat of Campbell County, is 42 miles north-northwest of the minesite, and Douglas (population 2,677 - 1970 census), the county seat of Converse County, is 65 miles south. Reno Junction, the intersection of State Highways 387 and 59, is 13 miles northwest. The small community of Hilight, 10 miles north-northwest of the minesite, is a residential settlement of mobile homes adjacent to a gas pumping station.

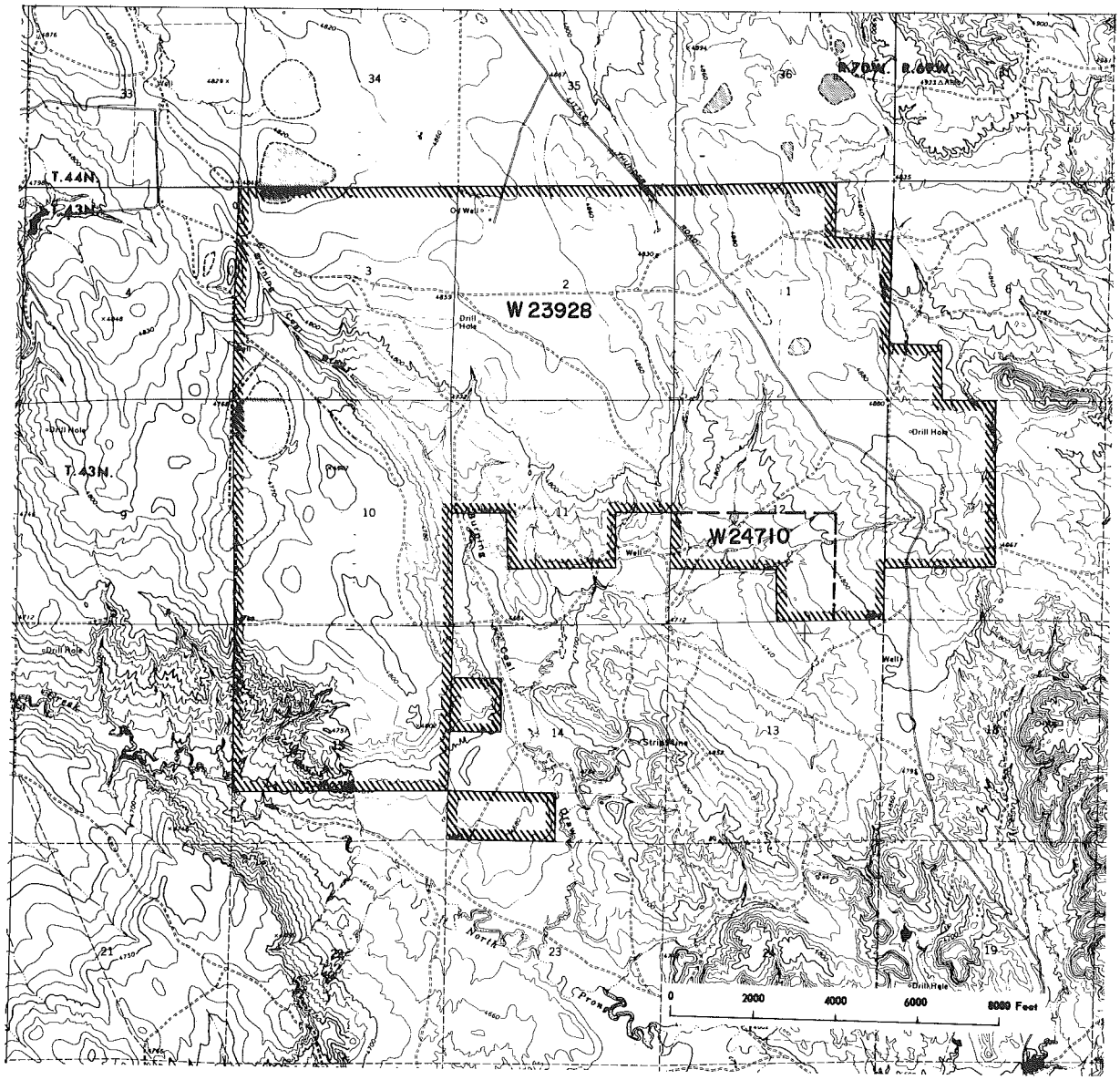

Figure 2

Location of Kerr-McGee Corporation's Federal Coal Lease W-23928 and W-24710 Showing Topography and Geography

Gillette is served by a main line of the Burlington Northern railroad. A spur line, the Gillette Branch, extends southward from this main line to the Belle Ayr mine, of Amax Coal Company, in T48N, R71W. Douglas is served by two main lines, the Burlington Northern railroad and the Chicago North Western Transportation Company.

The main east-west highway serving northeastern Wyoming is the partially completed Interstate Highway 90 with U.S. Highway 14-16 connecting the completed sections.

Partially completed Interstate Highway 25 is the main north-south highway through eastern Wyoming and completed sections are connected by U.S. Highway 87.

State Highway 59 is the main connecting route between Douglas and Gillette; it passes about 11 miles west of the mine site. There are several unpaved roads near the proposed mine.

Stages of Implementation

The following description of mining and reclamation activities is taken, with modification, from the mining and reclamation plan submitted by Kerr-McGee Corporation.

Proposed mining procedures and equipment

Initial mining is proposed for the SE¼ of section 15 (1976-1977) and the SE¼ of section 11 (1978) on lease W-23928 (Figure 3). The mine areas will be opened by conventional open pit methods.

Topsoil removal

Topsoil removal, storage and placement will be determined by: (1) analyses of topsoils on the leases to determine their capacity to support desired plant species; (2) amenability of other overburden materials to support revegetation efforts if the surface soils in certain areas are determined to be toxic or of poor quality; (3) the results of consultations with the County Agent, local Forest Service rangers, and other appropriate representatives of federal and state agencies; and (4) results of test plots and past reclamation efforts both on and offsite. Topsoil suitable for supporting desired vegetation will be removed from mine areas prior to stripping or construction and placed on graded spoils or in stockpiles separate from overburden. Some existing topsoils in dry lake areas are highly saline sodic or clayey and may not be suitable for revegetation.

In such cases, other overburden material that has been determined by soil analysis to be suitable for revegetation will be utilized in lieu of topsoil. Topsoils with high salinity will be buried with other overburden wastes.

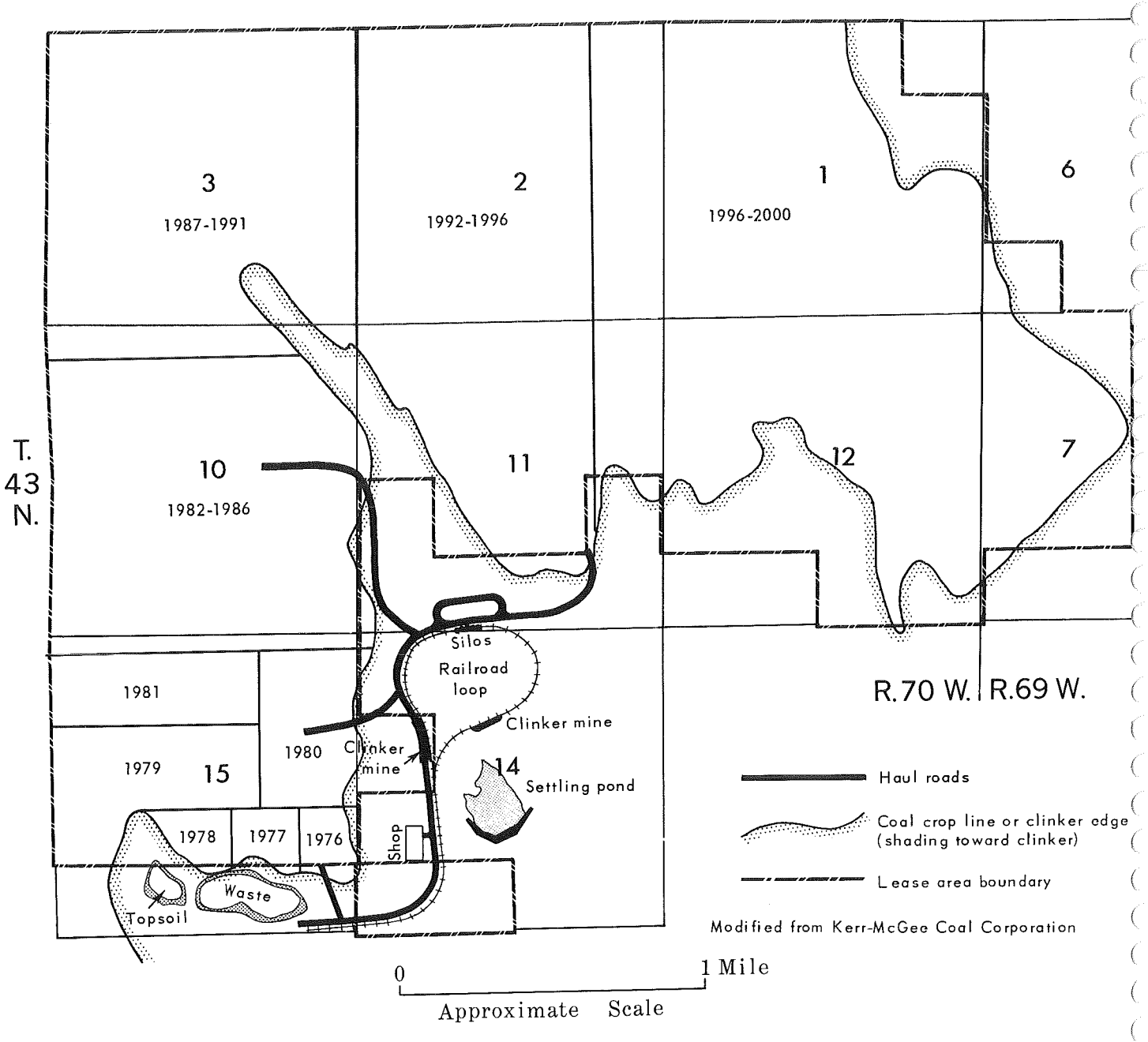

Figure 3

Kerr-McGee Corporation Proposed Jacobs Ranch Mine Plant Layout and Development Plan Using Trucks and Shovels for Overburden Removal

Wheel-tractor scrapers will be used for removal of topsoil from the immediate areas scheduled for overburden removal and for placement of topsoil materials on disturbed areas where revegetation is planned. Scrapers may also be used for cleaning of dirt or slack coal from the surface of coal seams.

Overburden removal

Three different methods of overburden removal are currently undergoing evaluation by the company: shovel and truck system, dragline, and wheel-tractor scrapers.

The shovel and truck system, similar to those shown in Figures 6 and 7, Chapter III, Part I, but without the dragline, will be used for initial mine entry, and detailed plans are being made to enable the mine to be developed completely with trucks and shovels. With this method, the overburden will be removed in strips of sufficient length to allow a 1,300-foot strip of coal to be available for mining. The initial block of overburden, approximately 1,500 feet by 2,000 feet in size, will be hauled outside the mine area and permanently deposited on land underlain by no mineable coal outside the burnline (Figure 3).

As coal is mined from the block, the overburden removed by advancing the pit will be placed in the mined out area. This pattern will be continued until all economically mineable coal has been removed from the lease area. The shovel-truck method will allow selective placement of overburden and parting materials in the backfill area. Reclamation will advance as an integral part of the backfilling operation because of the continuous leveling and grading of the area where the trucks dump. Use of wheel-tractor scrapers for overburden removal would require equipment for service, maintenance and coal removal operations of approximately the same size, type and quantity as used for truck-shovel and dragline operations.

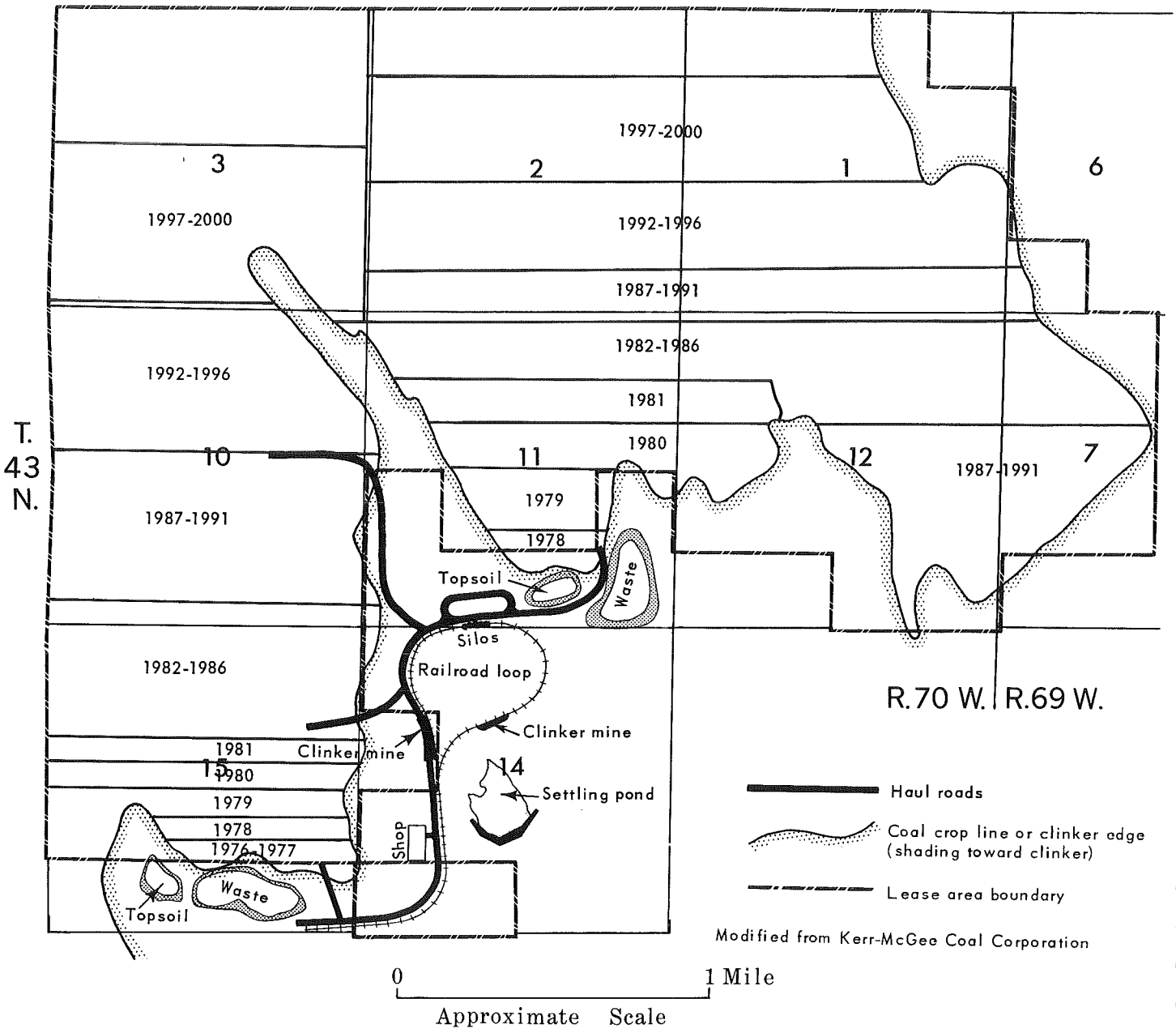

Figure 4

Proposed Alternate Mining Plan Utilizing a Dragline for Overburden Removal

The dragline operation for overburden removal may follow the initial shovel-truck method in three to four years. Thickness of coalbeds would necessitate some rehandling of approximately 35 percent of the overburden with this method. The dragline system would strip overburden in a series of cuts 100 to 150 feet wide and approximately one mile in length. Mining would progress from the burnline on the south toward the north lease boundary. The overburden from each cut will be placed into the mined out portion of the previous cut. Two areas may be opened for mining and operated at the same time to provide flexibility of coal production and land reclamation activities (Figure 4). Overburden and parting will probably require drilling and blasting prior to removal. All blasting will be done in accordance with applicable safety regulations.

Material from the two parting zones which separate the three coalbeds will be removed by front end loaders or shovels, and trucks or scrapers. Any overburden material determined by soil analysis to be toxic will be buried in the spoil areas. The spoil piles will be graded to conform with surrounding topography in accordance with the reclamation plan.

Clinker removed in the course of mine development will be used, when suitable, for constructing haul roads, shop area parking, and access roads. Quantities required for these purposes have not been determined. Two large clinker outcrops in Section 14 on private land will be contoured for the railroad right-of-way. A portable crushing plant will be leased or contracted to size the clinker for use as base aggregate.

Coal removal

Three continuous or nearly continuous coalbeds are found on the leases. The uppermost bed, the Upper Wyodak, averages 8.1 feet in thickness and is separated from the middle bed by a shale and/or sandstone parting which ranges in thickness from 0 to 45 feet. The middle bed, the Lower Wyodak 1, averages about 43 feet in thickness and is separated from the lower bed by a shale parting which ranges in thickness from 0 to 73 feet. The lowest bed, the Lower Wyodak 2, averages nearly six feet in thickness. In areas where the parting between Lower Wyodak 1 and Lower Wyodak 2 beds is thick, causing the Lower Wyodak 2 coal to be uneconomical, the parting and coal will not be mined.

After overburden has been removed, coal will be cleaned of any dirt or slack coal and will be drilled and blasted prior to loading. Coal will be loaded into trucks by either front end loader or shovel and hauled to the crushing facility. Coal will be stored in silos prior to loading into unit trains.

Reclamation

All reclamation work will be conducted in accordance with the provisions set forth in the federal coal leases (W-23928 and W-24710), the Wyoming Environmental Quality Act of 1973, and in agreement with the United States Geological Survey, the Bureau of Land Management and Forest Service. It is the policy of the Interior Department that all operations on leases be conducted in accordance with the most stringent laws and regulations whether federal or state. Surface disturbance as a result of mining operations will range from 100 to 150 acres per year over the projected 22 year life of the mine.

Spoil reclamation

Waste dumps south of the two initial entry areas will be rounded to conform with surrounding topography, the topsoil will be replaced, and planting will be completed as soon as backfill space is available in the pits. In the inpit spoil areas, where waste has been placed by draglines, trucks, or scrapers, several variations in the shape of spoil piles will result.

Where a dragline system is used to uncover the coal, a series of high parallel ridges 100 to 150 feet apart will result. The peaks of these ridges will be dozed or hauled into the intervening valleys, resulting in a gently rolling topography. Where the shovel-truck system is used, selective placement of overburden and parting material will take place, and for efficient truck operations, continuous leveling and grading of the surface of the dump area will be required. The resultant topography would be more level than with the dragline system. The scraper system also allows for selective placement of overburden in fill areas.

Once an area has been rough graded, topsoil will be placed by wheeled scrapers and the area will be ready for revegetation. Grading will run concurrently with the mining as the above sequence is repeated.

In disposing of the final highwall, a method will be sought by Kerr-McGee Coal Corporation which will be agreeable to the adjacent lease holders at that time and to the concerned state and Federal Government agencies.

Final disposal of haul roads will consist of scarifying to mix and bury the roadbed material, final regrading to a rolling shape, topsoiling, and seeding.

Drainage control

An adequate drainage system will be built into the final graded area so that runoff can be controlled and contained in a minimum of places. Catchment basins will be built where required and will serve as settling basins, evaporation ponds, and livestock watering ponds. Overflow water from the basins can be directed into natural stream channels.

To protect the mine area from collecting excess water during periods of heavy precipitation and runoff, a perimeter ditch will be established around the high sides of the active mine. These ditches will carry the water to settling ponds where the suspended material will settle. Overflow from the ponds will be directed to a natural stream channel.

All diversion ditches and dams will be constructed generally as shown in Figure 11, Chapter III, Part I.

Ground water that collects in the pit will be collected in sumps and pumped through pipelines to the settling pond near the railroad loop, which is shown on Figure 3. At this point the suspended material will settle out and if further treatment is necessary, the required facilities will be constructed.

Culverts will be installed under all roads or railroads to insure unrestricted flow of all water courses.

All water discharges must satisfy the requirements set forth in the Federal Water Quality Acts and the Wyoming Water Quality Standards.

Seeding and planting

The objective of the mined land reclamation program will be to return the area to its present use, which is livestock grazing. Vegetation which is selected for planting will be chosen under advisement of the County Agriculture

Extension Agent, the Bureau of Land Management, the Forest Service, and recommendations of the State of Wyoming Department of Environmental Quality.

When grading of the spoil piles has been completed and the topsoil material has been spread, soil tests will be taken to determine if and to what extent fertilizers or other nutrients are necessary to sustain plant growth. An experimental program will be instituted to determine which of the desirable legumes and grasses are most adaptable to this particular region.

Standard farm equipment will be used to prepare the soil for planting. A grain drill will be used to plant the seed and will generally follow a pattern along the contour of the land. This will tend to prevent water from forming channels and will hold soil erosion to a minimum. Seeding will be done in the fall or spring when the ground is free of frost.

Surface facilities

The location of proposed surface facilities of the Jacobs Ranch Mine is shown on Figure 3. Buildings and other surface facilities not used for ranching will be removed and the areas reclaimed.

Roads

Access and main haulage roads will be designed to support the coal haul trucks. Grades will be restricted, where possible, to less than eight percent for efficient truck operation. Roads will be constructed using clinker from the burn areas and will be watered to minimize dust and continuously maintained by graders. Drainage ditches and culverts will be installed adjacent to and beneath the roads to allow water movement and prevent erosion and washout of the roadways.

Railroad spur

A standard gauge railroad spur and mine loop will be constructed, possibly using clinker as ballast. Railroad grades will be maintained at a maximum of one percent. Cross drainage beneath the roadbed will be provided by culverts. Final railroad spur location is dependent upon location of the main access spur.

Power

Electric power will be required for mine shops, electric shovels, crushing station, loading facilities, and other electric-powered equipment. Tri-County REA will supply power through an extension of an existing 69.5-kv line near Hilight. Main service lines will bring electric power to the mine site; however, location of the power line has not been fixed, and the location of the power substation at the mine site has yet to be determined. Total power requirements for the Jacobs Ranch mine will be approximately 10 Mva.

Office and shop

Office and shop facilities will be required at the mine site but specifications as to size and type of structure have not been determined. Sewage from surface facilities will be treated in a septic tank and discharged into a drain field and sand filter bed. Waste from the office and shop facilities will be buried under spoil piles in the mine. Little burning of waste is anticipated, but if necessary, it will be done under controlled conditions.

Mining equipment

Potential mining equipment for the three mining systems under consideration for use at the Jacobs Ranch mine includes the following:

Dragline or Shovel-Truck System

Equipment	Size	Use
Electric Shovels (3)	20-30 cu.yd.	Overburden Stripping
Electric Shovels (2)	25-35 cu.yd.	Coal Loading
End Dump Trucks (12)	120-175 tons	Overburden Hauling
Coal Haul Trucks (8)	120-200 tons	Coal Haulage
Rubber Tired Dozers (4)	Cat 834 or Equivalent	Constuction, Shovel support, and Cleanup
Crawler Dozers (5)	Cat D8, D9 or Equivalent	Spoil, Grading, Construction, & Coal Handling
Rubber Tired Front End Loaders (3)	15-25 cu.yd.	Coal and Parting Handling
Track Mounted Pit Drills (3)	9 in. Diameter	Blast Hole Drilling
Graders (2)	Cat 14 or Equivalent	Road Maintenance
Wheel Tractor Scrapers (2)	24-35 cu.yd.	Topsoil Handling & Road Construction
Dragline or Backhoe (1)	3 cu.yd.	Ditching
Self Powered Water Wagon (1)	8,000 to 12,000 Gal. with Pump Discharge	Dust & Fire Control
Fuel Truck (1)		Equipment Fueling
Lube Truck (1)		Equipment Maintenance
Portable Crushing Plant (1)		Clinker Production
300 ft. Boom Draglines (2)	55 cu.yd.	Overburden Removal
200-250 ft. Boom Draglines (2)	35 cu.yd.	Overburden Removal
Rubber Tired Dozers (2)	Cat 834 or Equivalent	Construction & Cleanup

Rubber tired front end loaders may be used in place of 25-cu.yd. shovels for coal loading.

Loading equipment

Coal will be hauled from the mine to the crushing facility by 120- to 200-ton off-highway trucks. Coal will be dumped directly into the crusher or will be placed in stockpiles and moved to the crusher by front end loaders. Final site location and specifications for crusher and stockpile areas remain to be established.

Storage facilities

Storage facilities for crushed coal will include enclosed storage to feed the rail car loading system. Final determination on location, size, and capacity of storage silos and rail car loading system is dependent on final location and configuration of the railroad loop.

Crushing and processing equipment

Coal processing will entail crushing of coal to a size satisfactory to the customers. Washing or other processing will not be required. Crusher size remains to be determined along with enclosing structure. A dust collecting system is planned for both crushing and storage facilities to meet health and safety requirements.

Mining sequence

Mining is planned to begin at the edge of the burned coal in Section 15 in 1976 and progress in a westerly direction until 1978. Mining will then be concentrated in the N½ of Section 15 until 1981. Figure 3 shows the annual mine extensions from 1976 through 1981 and the proposed five-year extension blocks after 1981. Present plans call for coal to be mined out of Section 15 by 1981, Sections 3 and 10 by 1991, and coal in Sections 1, 2, 11 and 12 by the year 2000. Additional coal purchase contracts for uncommitted reserves on the lease could accelerate this development schedule.

Stripping of overburden is planned to begin in mid-1975 at the burnline in Section 15. Coal removal using shovel-truck equipment will closely follow overburden stripping. The three coalbeds will be mined over most of the lease. Overburden increases in thickness from south to north and east to west. Increasing overburden and increasing parting thickness between the Lower Wyodak 1 and Lower Wyodak 2 bed limit the area from which the Lower Wyodak 2 bed can be mined. The economic limit of mining of the lower Wyodak 2 bed is shown on Figure 6, Chapter II.

Monitoring

A variety of monitoring equipment is planned for the Jacobs Ranch mine. Ten hydrologic monitoring wells have been completed on the lease. These wells will allow determinations of ground water flow and water quality and quantity. A standard climatological station is to be located on the mine property; however, the specific site has yet to be determined. This station will allow continuous monitoring of temperature, wind velocity and

direction, and precipitation, and it may be equipped to determine dust concentrations, and barometric readings.

Coal sampling and weighing equipment will be installed at the rail loading facility to maintain average quality of the shipped product and accurate weights for royalty payments and customer billings. A rail scale will be installed after the loading silos to permit in-motion weighing of unit trains. The scale will be equipped for unattended automatic operation. An automatic car identification system with calendar clock will also be installed. It is also anticipated that a belt scale will be installed to check daily production.

A laboratory will be constructed and equipped to analyze for Btu, moisture, ash, sulfur and volatile matter, both for pit control and unit train shipments.

Monitoring of surface water quality is planned for the settling ponds prior to discharge of water to local drainages. If water treatment is necessary, a continuous monitoring system controlling automatic treatment equipment may be installed or settling ponds may be converted to evaporation ponds for water disposal.

Such additional monitoring equipment as may be required to maintain environmental quality will be installed as conditions warrant.

Transportation and marketing

Coal from the Jacobs Ranch mine will be loaded into 120 to 200 ton off highway trucks and hauled to the crushing and train loading facility over main haul roads. The rail loading complex is located on the mine loop on a spur of the Burlington Northern railroad.

Coal will leave the mine via trains to the main line of the Burlington Northern or Chicago North Western for shipment to the purchaser's power plants in Arkansas and Louisiana. Additional purchase contract commitments may be made

for remaining coal reserves. Transportation to additional markets would most likely be via railroad.

Utilization

Some 300 million tons of strippable coal reserves have been identified on the Jacobs Ranch mine leases. Of this reserve, 250 million tons have been committed by sales contracts and options to three utility companies for electrical power generation. The remaining 50 million tons of coal is uncommitted at present, however, additional coal sales contracts are being sought by Kerr-McGee Corporation.

Arkansas Power and Light Company has signed a purchase contract for 100 million tons of coal to be delivered over a 20-year period beginning in July 1977. This power company holds a 10-year option for the purchase of an additional 50 million tons of coal. Arkansas Power and Light plans to use the coal at its electrical generating station to be constructed near Redfield, Arkansas. Construction of the first 700-megawatt (MW) generating unit is scheduled to begin in November 1974. Planned capacity of this station is two 700 MW generating units.

Central Louisiana Electric Company has signed a purchase agreement for 34 million tons of coal to be delivered over a 20-year period beginning in July 1978, and it holds a 10-year option for the purchase of an additional 16 million tons of coal. Central Louisiana Electric Company plans to use the coal for electric power generation at its Boyce, Louisiana generating station which is currently under construction. This station has a planned generating capacity of 450 MW from a single generating unit.

Gulf States Utilities has signed a purchase contract for 50 million tons of coal to be delivered over a 20-year period beginning in March 1977. Options

for additional coal are not held as part of the coal sales contract. Gulf States Utilities plans to use the coal for electric power generation at a power plant to be constructed in the Lake Charles area of Louisiana. This power plant is to house two 550 MW generating units.

A total of 184 million tons of coal is committed to direct sales contracts with an additional 66 million tons held on option.