

## CHAPTER VI

### ALTERNATIVES TO THE PROPOSED ACTION

#### No Development

The no development alternative means no construction of a rail line to haul coal out of the basin. The spur line to the proposed Carter and Amax North mines is part of the mining plan and is considered in the approval required for the mining operation. Therefore, under this alternative the 12 miles of spur lines required for those mines would still be considered.

Acceptance of this alternative would mean that the environmental impacts analyzed in Chapters III and V of this part will not occur.

However, other impacts are likely to occur onsite as well as offsite. As there is a high demand and economic need for the coal, the coal mines will eventually be developed although probably delayed for a period of time until alternative means of transportation are developed. Therefore, the impacts associated with these mines as discussed in Parts I, III and V may still occur, although delayed for a period of time and probably at a lesser scale.

The majority of the coal to be hauled by the railroad is for shipment out of state to midwest and eastern points of demand. The basin coal is low in sulfur content and is required by these power plants in order to meet current EPA and state air pollution regulations. Without this coal these power plants will need to obtain coal of higher sulfur content from other areas of the nation. Use of coal with a higher sulfur content will result in increased air pollution in the power plant areas, or inability to

supply the electrical energy demands of their service areas with resultant environmental impacts created by lack of power, blackouts and brownouts.

Other means of transportation may have worse environmental consequences than the proposed rail line. These alternative means of transportation could include any combination of the following methods: trucks, conveyors, slurry pipelines, gasification plants and transportation of gas by pipelines and mine mouth power generating plants. Each of these methods is described in Alternative Section of Part I, Chapter VIII.

## Alternate Routes

There are a number of possible routes that the rail line could be constructed on. Topographic limitations do exist, however. Lack of major barriers would allow construction along a large number of alternate routes. Many of the potential impacts would not vary significantly between these routes.

Three alternate routes were selected for analysis. Selections were based on significant differences in location, type of terrain crossed and amount of construction which would be required. These are shown on Map 12, Appendix A, and are: (1) Eastern route, (2) Western route and (3) Douglas corridor.

An impact analysis matrix was prepared for the proposed and selected alternate routes, Figure 1. The net residual impacts of the individual routes were analyzed and rated in accordance to the following system:

- (O) - Negligible Impact
- (L) - Low Impact
- (M) - Medium Impact
- (H) - High Impact
- (+) - Beneficial Impact
- (-) - Adverse Impact

### Eastern route

#### Location Loop 1A

This route leaves the main line spur east of the Belle Ayr mine and goes generally east past Piney Ranch and across the Belle Fourche River to Four Horse Creek. It then turns generally south along the Campbell and

Figure 1

Analysis of Railroad Impacts  
Alternative Routes

Environmental Component	Proposed	Eastern Alternate	Western Alternate	Douglas Corridor
Air Quality	-L	-L	-L	-L
Topography	-M	-H	-M	-L
Soils	-L	-H	-L	-M
<b>Land Use</b>				
Coal	-M	0	-L	0
Grazing	-M	-H	-L	-M
Recreation	+M	-H	0	-M
<b>Hydrology</b>				
Water Supply	-L	-M	-L	-L
Water Quality	-M	-H	-L	-L
<b>Vegetation</b>				
Aquatic	0	-L	0	0
Terrestrial	-M	-M	-M	-M
<b>Wildlife</b>				
Deer	-L	-M	-L	0
Antelope	-M	-H	-L	0
Elk	0	-H	0	0
Upland Game	-L	-M	-L	-L
Birds	0	-L	0	0
Aquatic	0	-L	0	0
<b>Cultural Values</b>				
Archeological	-M	-H	-M	-M
Historical	0	0	0	-L
Aesthetics	-L	-H	-L	-L
<b>Socio-Economic Conditions</b>				
Population	-M	-M	-M	-M
Employment	+M	+M	+M	+M
Social Services	0	0	0	0
Living Conditions	0	0	0	-H

Weston County lines and east of the Rochelle Hills, crossing Black Thunder Creek below the confluence with Bacon Creek. It continues generally south, passing to the west of Rochelle and east of Dull Center. The route continues generally south along the Converse and Niobrara County line, staying east of the Miller Hills, thence turns southwest along Lightning Creek, passing to the northwest of Janet and then parallels the Walker Creek Road. It continues from Janet to Douglas to a point about one mile east of the Highway 59 - Walker Creek Road Junction. From this point, the route bears southeast down the west fork of Shawnee Creek about 12 miles to the point of confluence with the main fork of Shawnee Creek. Here the corridor forks, the eastern branch proceeding about five miles east to the BN/CNW main line at Shawnee and the southern branch going south about five miles to the BN/CNW main line two miles west of Fisher.

#### Engineering notes

This route is approximately 137 miles in length and will require 17 bridges with a total bridge length of 3,080 feet. The total southbound distance on a compensated maximum grade of one percent is approximately 24 miles and also 23 miles of maximum compensated grade if the travel is northbound. This route will require 11,488,000 cubic yards of grading, and alignment will require 109 curves with maximum curvature equalling three degrees. This data also includes the engineering notes on the portion known as the Douglas corridor.

#### Surface estate

Ownership of the surface estate of the approximately 137 miles in this route, from the Belle Ayr terminal to the southern terminus at Fisher and Shawnee, is:

for about ten miles and Walker Creek for 15 miles. This will require many long, but low fills to cross these areas. The fills would not only be subject to damage from flash floods but, if not properly designed, would also direct large amounts of runoff into different channels, resulting in serious erosion.

The eastern route passes east of the coal outcrop and therefore does not have the potential impact on coal resources as does the proposed and western routes. However, longer spur lines would be required to reach the mine properties, i.e., 11 miles to Atlantic Richfield and 10 to 13 miles to Sun. These spurs can be located so as to miss the major strippable coal deposits.

Problems of compaction and destruction of land surface are more pronounced on this route. Roads suitable for heavy construction equipment are not available. The clay soil crossed by this route when wet creates difficult travel conditions. Many of these problems could be overcome by properly designing and constructing access roads. Natural scoria (clinker) suitable for road surfacing is available a short distance west of the right-of-way. Mining of this scoria would create additional impacts on soil and aesthetics.

This part of the basin has a higher scenic quality than the western portion. The area crossed by this route is more remote with less access than other parts. The cuts and fills required to maintain the one percent railroad grade and the intrusion of frequent trains and attendant noise to this remote area would greatly affect the outdoor experience that can be found here. The rail line will be a permanent, linear intrusion upon a scenic area and will either inhibit or restrict recreational users' access unless proper crossing facilities are provided.

This line would impact livestock grazing to greater degree than the proposed route. Many large ranches are crossed by this route, and grazing patterns and ranch operations would be disrupted more than along the

proposed route. Another impact on grazing would be the possibility of the route and required access roads providing a means for public access and creating increased public use of the area.

The eastern route has a greater potential for impacting the water quality than the routes further upstream because of more stream crossings, higher flows, increased turbidity and sedimentation.

The chance for an accidental coal spill into a major stream is also increased on this route. This would have a significant impact on water quality, aquatic life and attendant recreational use associated with this water resource.

A wider range of vegetative communities would be encountered on this route. (See vegetation type Map 8, Appendix A.) The impact on vegetation would be greater than the other routes because of the larger area which will be disturbed by construction (2,700 acres) and area permanently removed from vegetative growth (1,233 acres).

Wildlife populations and types are significantly different along this route than the proposed or western alternate route. Antelope habitat is similar to the other routes and total numbers are probably 30 to 40 percent less than the proposed route. The impact on antelope would be similar in nature and scope as discussed for proposed route. Since numbers are fewer, the impact could be less severe.

With the exception of the southernmost 20 miles, this alternative crosses high quality mule deer habitat. Exact quantification of numbers is not possible with existing information, but excellent deer populations are present and probably numbers 10 times the number along the proposed route.

Several herds of elk totaling about 90 head occupy three areas along the Campbell-Weston County line. Loop 1A would pass through two of

these areas. Loop 1B would pass within five miles of the elk herds. Elk have been able to survive in these areas of sparse escape cover only because rough topography and lack of roads have prevented significant human activity.

This area is habitat for upland game birds, particularly sage grouse and sharp-tailed grouse. The populations of these probably number 20 percent and 30 percent more than the proposed route.

There is a possibility that several prairie dog colonies could be located within the area of construction activity. Additional field work would be required to locate these colonies accurately, and also to determine if they contain any black-footed ferrets.

The impact on wildlife of this route will be essentially the same in type as the proposed route. The magnitude of impact will be significantly increased because of higher populations for everything but antelope. The impact on the elk herds would be severe, in fact survival of the herds would be very unlikely. It is not likely that the elk could tolerate the disturbance of human activity, noise resulting from train operations and increased access. Other areas of suitable habitat are not available for the elk to relocate in.

Construction of this route could possibly have a greater impact on archeological values than other alternatives for several reasons: disturbance of more land area and the chance of values occurring in this part of the basin is greater than in the western portion. Evidences have been found (pictographs, artifacts and associated campsites) adjacent to this route.

## Western route

### Location

This route leaves the main line spur at the Belle Ayr mine and goes southwest approximately nine miles to a point adjacent to Highway 59 about 20 miles south of Gillette. It then turns generally south and parallels Highway 59 to a point approximately 11 miles northeast of Douglas. From this point the route bears southeast down the west fork of Shawnee Creek about 12 miles to the point of confluence with the main fork of the creek. Here the corridor forks, the eastern branch proceeding about five miles east to the BN/CNW main line at Shawnee and the southern branch going south about five miles to the BN/CNW main line two miles west of Fisher.

### Engineering notes

This route is approximately 112 miles in length and will require 18 bridges with a total bridge length of 4,255 feet. The total southbound distance on a compensated maximum grade of one percent is approximately 35 miles and 25.2 miles of compensated maximum grade if the travel is northbound. This route will require 27,538,000 cubic yards of grading and alignment will require 51 curves with maximum curvature equalling three degrees.

This information also includes the engineering notes on the portion known as the Douglas corridor.

### Surface estate

The ownership of the surface estate of the 112 miles in this route, from the Belle Ayr terminus to the southern terminus at Shawnee and Fisher, is tabulated as follows:

<u>Private</u>	<u>State of Wyoming</u>	<u>BLM</u>	<u>USFS</u>	<u>Total Miles</u>
90	10	2.0	10	112

This alternate route (112 miles) is approximately the same as the proposed route and the impact on air quality would be similar. Because of less land area disturbance and shorter operating distance, the impact may be slightly less than the proposed route.

The western route follows the same route as the proposed route along Highway 59 and Shawnee Creek. It would probably cause the least environmental disruption during construction because it is adjacent to Highway 59 for most of the route. Maintenance would be easier, and fewer and shorter access roads would be required.

#### Impacts

Impact on grazing and other land uses would be less than the proposed route from the junction of the Amax spur to Bill since this route would be located in an already disturbed access corridor and severance of ranches less severe. The western route would cross coal under less than 200 feet of overburden for only about two miles as compared to 14 miles of the proposed route. This would greatly reduce the amounts of mineable coal covered by the railroad. This route would cover large tonnages of coal under less than 500 feet of overburden, which could become mineable in the future, as does the proposed route. Construction of this route would require spurs of slightly longer length (one mile to Sun and nine miles to Atlantic Richfield) than the proposed route, but of shorter length than the eastern alternate. These spurs would cross additional economically mineable coal but could not be moved to allow for coal mining.

The western alternate route paralleling Wyoming Highway 59 would result in considerable larger amounts of construction grading in the Antelope Creek and Dry Fork of the Cheyenne Valley areas. The route would cross the divide between the two valleys at a higher elevation than the proposed route which takes advantage of a natural low point in the divide by following Logan Draw. A minor adjustment can be made by diverting the western alternate line to the proposed route, bypassing the upper reaches of the Antelope Creek-Dry Fork drainages and then swinging back westward to the western alternate in the vicinity of Porcupine Creek. This would minimize impact on recreational use as it follows an already established access corridor and construction of crossings for county roads would provide for access across the rail right-of-way. The impact on aesthetics may be slightly worse than the proposed route, mainly due to the fact it will be in view of more people. However, general sightseeing use could be enhanced with increased unit train operation viewing opportunities.

Water quality impact would be slightly less than the proposed route and far less than the eastern alternative. As this route is more or less located on the backbone of the basin, fewer major streams will have to be crossed and drainage crossings will be smaller. Impact from turbidity and sediment load will be less than the proposed route.

Vegetative impacts would be the same as for the proposed route. The main line for the western alternative would involve disturbance of 2,200 acres. The spurs would be slightly longer involving more area than the spurs from the proposed line. However, the net result would be about equal in terms of vegetative disturbance. Soil impacts would be the same as for the proposed route.

This route would be slightly more detrimental than the proposed route to mule deer, cottontail rabbits, raptors and other birds and a variety of animals associated with the drainage bottom habitats. It infringes upon drainage bottom habitat at 18 or 15 sites as compared to nine sites along the proposed route. However, this route would have a significantly less severe impact upon antelope than the proposed route since it closely parallels the highway. Wyoming Game and Fish Department personnel report that the existing highway and right-of-way fencing presently creates an effective barrier to antelope movement east and west through the basin. The present antelope distribution and movement patterns appear to have, over time, adapted to this barrier. Construction of the railroad along this same barrier line would not create additional adverse impacts to antelope which will be associated with disruption of traditional and/or necessary use patterns and movements imposed by the proposed route creating a second new barrier line through 60 miles of antelope range.

There is little difference between impact from this route on archeological values than the proposed route.

Chance of flood damage and resulting impact would be less than the proposed route as it crosses drainages closer to their headwaters. Chance of impaired water quality resulting from accidental spills would also be lessened.

#### Douglas corridor

##### Location

The Douglas Corridor starts at a point approximately one mile east of the junction of Highway 59 and Walker Creek Road, this point being about 11 miles northeast of Douglas. From this point the corridor goes west across

Highway 59 and then bears southwest to a point on the BN/CNW main line track about two miles northwest of Douglas. The corridor roughly parallels Highway 59, ranging between one-half and 1-1/2 miles to the northwest of the highway.

#### Engineering notes

Not available. Based on map measurement, this corridor is approximately 12 miles in length.

#### Surface estate

The surface estate this corridor crosses is 100 percent privately owned.

#### Impacts

The Douglas corridor is a short stretch of some 12 miles. From a point north of Douglas, all of the other discussed routes could connect with the Douglas corridor. Therefore, this discussion will be limited to just this short stretch of rail line and impacts which would be different than those discussed for the other alternatives.

Use of this route for the main line would result in the shortest route possible when used in connection with the western alternate.

The impact on wildlife would be slightly less than the same segment of the proposed route. This is due to the fact it is shorter and would result in 200 to 300 acres less habitat lost and impaired for the species involved. The impact on mule deer would be even more reduced as it would bypass mule deer habitat completely.

There would be a significant impact on a large overnight campground located at the edge of Douglas near the North Platte. Increased unit train operation through this area would create severe noise pollution for campground users.

## Branch route

### Location

This route leaves the main line spur east of the Belle Ayr mine and follows the route previously described for the railroad location proposed by the Burlington Northern and Chicago and North Western. Instead of continuing south to a connection at Douglas it would terminate at the community of Tekla (T72N, R71W) and would constitute a branch rather than a main line. Through connecting spur trackage the branch would be able to transport coal from the Belle Fourche, Jacobs Ranch, Black Thunder, and Rochelle coal mine.

### Operational notes

This route is approximately 37 miles in length. By terminating the line at Tekla, the branch would not provide a direct connection to any main or branch lines on the Chicago and North Western system. Since the route as applied for was to be jointly constructed by both participating railroads, the approval of the branch route may precipitate the filing of a construction application by the C&NW for a separate route, most likely similar to the eastern route alternative. Coal traffic on the branch would be directed north to Gillette and then over existing mainlines to consumptive points. This route traverses approximately 69 percent less mileage than the through route and would result in a proportional reduction in yards of grading, mileage of compensated grades, and bridge and culvert construction.

### Impacts

The impacts on soil disturbance, drainage patterns, cuts and fills, and other land related factors would be of the same nature as those previously described for the applied for route. They would however be quantitatively reduced because of the shorter distance of the branch line.

Identified impacts on wildlife movements would be reduced. The line would no longer constitute an enclosed barrier for deer and antelope populations which may otherwise be confined between Route 59 and the applied for route. West-east migration would thus be possible across the area to the south of Tekla. North-south movement however may continue to be impaired due to the presence of connecting spur lines.

Termination at the community of Tekla may inhibit coal resource development from areas to the south which are covered by federal lease, prospecting permits, or pending preference right leases (see Map 5, Appendix A). These areas may be deprived of direct rail access for coal exportation. Development dependent upon coal slurry exportation or in-situ power conversion (such as power or gasification plants) would be essentially unaffected by this alternative.

If through service were to be available to Douglas, it was anticipated that coal traffic generated from the Rochelle, A.R.Co., and Kerr-McGee mines would be routed through Douglas to the convergence of the two Burlington Northern main lines at Alliance, Nebraska. Production from mines to the north of the three mentioned would be routed through Gillette regardless of the availability of a southern routing.

A branch status would thus involve more circuitous travel for coal from the three mines. The increase in rail mileage to Alliance would be approximately 51 miles for Kerr-McGee and A.R.Co. mines and 69 miles for the Rochelle mine. Using estimated 1980 export tonnage as a base point, routing through Gillette would increase ton-miles traveled by 510, 510, and 759 million respective, or a net increase of 1.779 billion ton-miles. This circuitry would result in an estimated increase in fuel consumption of 8,096,300 gallons over the energy requirement for a connection through Douglas. In addition, the

circuitry would result in an estimated annual increase in air emissions as follows:

<u>Pollutant</u>	<u>Total in Pounds</u>
Carbon Monoxide	587,070
Hydrocarbons	425,960
Nitro Oxides	<u>1,754,470</u>
Total	2,767,500

There should be similar increases in emissions of particulates and sulfur dioxide. The above numbers likewise represent the net increase in emissions which would be expected from operations as previously defined for the applied for route.