CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

4.1 INTRODUCTION

This Chapter discloses the potential environmental consequences that may result from implementing the Proposed Action for the Gold Mine Draw Exchange. The effect or impact of each consequence this action would have on the quality of the human environment is also discussed. For instance, the consequence of an action may be to greatly increase the number of roads in an area. If the number of roads in an area is increased, opportunities for road-based recreation would be increased but opportunities for primitive recreational activities and solitude would be decreased. Evaluation of the impact would depend on an individual's (or a group's) preferred use of that area.

If the Gold Mine Draw tract is exchanged for one or more of the eight selected tracts, the mining permit(s) and the MLA mining plan(s) for the affected mine(s) would have to be amended and approved before mining could be conducted.

Surface mining and reclamation have been ongoing in the PRB for over two decades. During this time, effective mining and reclamation technologies have been developed and continue to be refined. Mining and reclamation operations are regulated under SMCRA and Wyoming statutes. WDEQ technically reviews all mine permit application packages to ensure that the mining and reclamation plans comply with all state permitting requirements and that the proposed coal mining operations comply with the performance standards of the DOI-approved Wyoming program. There are a number of federal and state permit approvals that are required in order to conduct surface mining operations (Appendix A). The regulations are designed to ensure that surface coal mining impacts are mitigated. The impact assessment that follows considers all measures required by federal and state regulatory authorities as part of the Proposed Action.

The only proposed alternative is the No Action alternative, where the offered tract would not be exchanged as proposed. The No Action alternative has no impact on existing permitted mining activities at the Caballo Mine, Rawhide Mine or North Antelope Rochelle Mine.

Table 4.1 lists the maximum impacts of the Proposed Action on the subject mines.

4.2 DIRECT AND INDIRECT IMPACTS OF THE PROPOSED ACTION AND THE NO ACTION ALTERNATIVE

Impacts can range from beneficial to adverse, and they can be a primary result of an action (direct) or a secondary result (indirect). They can be permanent, long-term (persisting beyond the end of mine life and reclamation), or short-term (persisting during

mining and reclamation and through the time the reclamation bond is released). Impacts also vary in terms of significance. The basis for conclusions regarding significance are the criteria set forth by the Council on Environmental Quality (40 CFR 1508.27) and the professional judgment of the specialists doing the analyses. Impact significance may range from negligible to substantial; impacts can be significant during mining but be reduced to insignificance following completion of reclamation.

TABLE 4-1

COMPARISON OF PROPOSED ACTION AND NO ACTION

	No Action Alternative (existing leases)	Proposed Action			
		Caballo Mine	North Antelope Rochelle Mine	Rawhide Mine	Total
Change in lease area (acres)[1]	No change	- 920.946 + 448.577	+ 1855.72	+ 314.938	+ 1698.289
Change in estimated recoverable coal (mmt)	No change	- 58.1 + 55.2	+ 46.6	+ 34.6	+ 78.3
PRCC estimated change in employment (persons)	No change	0	0	0	0
PRCC estimated change in production rate (mmt/yr)	No change	0	0	0	0
PRCC estimated change in life of mine (years)	No change	1.5	0.6	1.6	---

Notes: [1]Includes federal coal leases only; does not include state and private coal within the permit area.

The No Action alternative will effectively reject the exchange application in its current form. However, the applicant is still entitled to a lease exchange, by law, and a new application or a modification of the current application would restart the exchange process. Under either action, the Gold Mine Draw tract would not be mined. Under the Proposed action, the lease on the Gold Mine Draw tract would be relinquished in exchange for new leases from one or more of the eight selected tracts.

Under either action, vegetation cover on most of the GMDX tract would not be impacted. However, some disturbance would be necessary to mine coal adjacent to the tract.

Therefore, the following discussions pertain only to the selected tracts that may be leased and subsequently mined.

4.2.1 Topography and Physiography

The topography of the selected tract(s) would be permanently altered if they are exchanged and subsequently mined. The selected tracts are adjacent to existing mining operations and impacts would occur as normal mining operations progress.

Topsoil would be removed from the land and stockpiled or placed directly on recontoured areas. Overburden would be blasted and stockpiled or placed directly into the already mined pit and coal would be removed. The existing topography on the selected tracts would be substantially changed during mining. A highwall with a vertical height equal to overburden plus coal thickness would exist in the active pits.

Typically, a direct permanent impact of coal mining and reclamation is topographic moderation. After reclamation, the restored land surfaces are generally gentler, with more uniform slopes and restored basic drainage networks. Following reclamation, the average surface elevation would be approximately 60 feet lower due to coal removal. (The removal of the coal would be partially offset by the swelling that occurs when the overburden and interburden are blasted and removed.) The land surface would be restored to the approximate original contour or to a configuration approved by WDEQ/LQD when the mining and reclamation permit(s) for the existing mine are revised to include coal removal from the selected tract(s).

Direct adverse impacts resulting from topographic moderation include a reduction in microhabitats (cutbank slopes) for some wildlife species and a reduction in habitat diversity, especially in slope-dependent shrub communities and associated habitat. A potential indirect impact may be a long-term reduction in big game carrying capacity. A direct beneficial impact of the lower and flatter terrain would be reduced water runoff, which would allow increased infiltration and result in a minor reduction in peak flows. This may help counteract the potential for increased erosion that could occur as a result of higher near-surface bulk density of the reclaimed soils. It may also increase vegetative productivity, and potentially accelerate recharge of groundwater. The approximate original drainage pattern would be restored, and stock ponds and playas would be replaced to provide livestock and wildlife watering sources. These topographic changes would not conflict with regional land use, and the postmining topography would adequately support anticipated land use.

4.2.2 GEOLOGY AND MINERALS

If any of the tracts are exchanged, the geology from the base of the coal to the land surface would be permanently changed on the selected tracts. The subsurface characteristics of these lands would be radically changed by mining. The replaced overburden and interburden (backfill) would be a mixture of the geologically distinct layers of sandstone, siltstone, and shales that currently exist. The resulting physical characteristics would also be significantly altered.

Drilling and sampling programs are conducted by all mine operators to identify overburden material that may be unsuitable for reclamation (material that is not suitable for use in reestablishing vegetation or that may affect groundwater quality due to high concentrations of certain constituents such as selenium or adverse pH levels). As part of the mine permitting process, each mine operator develops a management plan to ensure that this unsuitable material is not placed in areas where it may affect groundwater quality or revegetation success. Each mine operator also develops backfill monitoring plans as part of the mine permitting process to evaluate the quality of the replaced overburden. These plans are in place for the existing mines and would be developed for the selected tracts if they are exchanged for the Gold Mine Draw lands.

Under the No Action alternative, the selected tracts at NARM, Caballo and Rawhide would not be exchanged at this time. The No Action alternative may cause the NARM tracts (#1-6) to be bypassed by the current mining operations due to their location along the burn line and the timing of the adjacent mining operations. However, these tracts could be leased my modifying the adjacent leases at the request of the applicant. The South Sand Channel tract at the Rawhide Mine (#7) is relatively isolated between a mined out lease, a sand channel and the highway. This tract could also be added to the adjacent federal lease by modification at the request of the applicant or incorporated into a future LBA application. The selected tract at the Caballo Mine (#8) could be included in a future LBA application.

4.2.3 SOILS

Soils would be disturbed on the selected tract(s). The reclaimed soils would have different physical, biological, and chemical properties than the premining soils. They would be more uniform in type, thickness, and texture. Average topsoil thickness would be 12 to 18 inches across the entire reclaimed surface. Soil chemistry and soil nutrient distribution would be more uniform, and average topsoil quality would be improved because soil material that is not suitable to support plant growth would not be salvaged for use in reclamation. This would result in more uniform vegetative productivity on the reclaimed land. The replaced topsoil would support a stable and productive vegetation community adequate in quality and quantity to support the planned postmining land uses (wildlife habitat and rangeland).

Specific impacts to soil resources would include an increase in the near-surface bulk density of the reclaimed soil resources. As a result, the average soil infiltration rates would generally decrease, which would increase the potential for runoff and soil erosion. Topographic moderation following reclamation would potentially decrease runoff, which would tend to offset this potential increase in runoff due to decreased soil infiltration capacity. The change in soil infiltration rates would not be permanent because revegetation and natural weathering action would form new soil structure in the reclaimed soils, and infiltration rates would gradually return to premining levels. The

reclaimed landscape would contain stable landforms and drainage systems that would support the postmining land uses. Reconstructed stream channels and floodplains would be designed and established to be erosionally stable.

Direct biological impacts to soil resources would include a short-term to long-term reduction in soil organic matter, microbial populations, seeds, bulbs, rhizomes, and live plant parts for soil resources that are stockpiled before placement.

Sediment control structures would be built to trap eroded soil; revegetation would reduce wind erosion. Soil or overburden materials containing potentially harmful chemical constituents (such as selenium) would be specially handled. These measures are required by state regulations and are considered part of the Proposed Action and the No Action Alternative.

4.2.4 AIR QUALITY

No additional air quality impacts are expected as a result of the Proposed Action because PRCC does not anticipate an increase in production at any of the three mines as a result of acquiring the selected tract(s). Mining of the selected tract(s) would be conducted utilizing existing methods at each of the mines. However, PRCC estimates that based on which tract(s) are exchanged, that the mine life of the Caballo Mine would be extended by up to 1.5 years, the mine life of the North Antelope Rochelle Mine would be extended by up to 0.6 years and the mine life of the Rawhide Mine would be extended by up to1.6 years. Therefore, it is expected that the existing air quality impacts would be extended for the duration of the mine life at the affected mine.

As discussed in Chapter 1, BLM does not authorize mining by issuing a lease for federal coal, but mining the selected tracts is considered to be a logical consequence of leasing the tracts. Thus, it is actually the impacts of mining on ambient air quality that are addressed in this section. The impacts to air quality of mining the tract in conjunction with other activities in the area are addressed in Section 4.5

4.2.5 WATER RESOURCES

4.2.5.1 Groundwater

Mining is not expected to impact the groundwater resource on the NARM East Burn and South Spur tracts because these tracts are located to the east of existing mining and CBNG operations. In the PRB, the coal outcrop typically acts as a recharge area for the coal aquifer. The groundwater flow then follows the dip of the coal, which is to the west. Since coal mining and CBNG have occurred to the west of these tracts, no new impact to groundwater rights or resources is anticipated.

The South Sand Channel and Caballo West tracts are located to the west of existing coal mining operations, but to the east of extensive CBNG operations. The coal in these two tracts has been dewatered by the CBNG operations. Therefore, no new impact to the groundwater resource is anticipated as a result of mining these tracts.

4.2.5.2 Surface Water

Changes in runoff characteristics and sediment discharges would occur during mining of the selected tracts as a result of the destruction and reconstruction of drainage channels as mining progresses. Erosion rates could reach high values on the disturbed area because of vegetation removal. However, both state and federal regulations require that all surface runoff from mined lands be treated as necessary to meet effluent standards. Generally, the surface runoff sediment is deposited in ponds or other sediment control devices inside the permit area.

During mining, hydrologic control will most likely consist of allowing runoff to accrue to the mine pit, where it will be treated and discharged according to the standards of WDEQ/WQD.

Sediment produced by large storms (greater than the 10-year, 24-hour storm) could adversely impact downstream areas. Since the tract would be mined as an extension of the existing mines, there would not be a large increase in the amount of area disturbed and not reclaimed at any given time. WDEQ/LQD would also require a monitoring program to assure that ponds would always have adequate space reserved for sediment accumulation.

The loss of soil structure would act to increase runoff rates on the selected tracts in reclaimed areas. The general decrease in average slope in reclaimed areas would tend to counteract the potential for an increase in runoff. Soil structure would gradually reform over time, and vegetation (after successful reclamation) would provide erosion protection from raindrop impact, retard surface flows, and control runoff at approximately premining levels.

After mining and reclamation are complete, surface water flow, quality, and sediment discharge from the selected tracts would approximate premining conditions. The impacts described above would be similar for both the Proposed Action and they are similar to the expected impacts for currently permitted mining.

4.2.6 ALLUVIAL VALLEY FLOORS (AVFs)

There are no AVF's on any of the selected tracts.

4.2.7 WETLANDS

As discussed in Chapter 3, wetlands inventories have been completed at each of the three mines. These inventories identified the acres of jurisdictional wetlands within the entire permit boundary of each mine, including all lands within the offered and selected tracts under the proposed action. A total of 4.6 acres of jurisdictional wetlands have been identified within the Gold Mine Draw tract. These wetlands would not be impacted under either action. However, 15.81 acres of jurisdictional wetlands have been identified on the selected tracts, and would be impacted by mining operations. These are located on NARM East Burn and South Spur tracts and on the Caballo West tract.

COE requires replacement of all impacted jurisdictional wetlands in accordance with section 404 of the Clean Water Act and determines the number of acres to be restored. COE considers the type and function of each jurisdictional wetland that will be impacted and may require restoration of additional acres if the type and function of the restored wetland will not completely replace the type and function of the original wetland. The wetland mitigation plan approved by COE becomes part of the WDEQ mining permit. WDEQ/LQD allows and sometimes requires mitigation of nonjurisdictional wetlands affected by mining, depending on the values associated with the wetland features. Replacement of nonjurisdictional and functional wetlands on privately owned surface may occur in accordance with agreements with the private landowners. During the period of time after mining and before replacement of wetlands, all wetland functions would be lost. The replaced wetlands may not duplicate the exact functions and landscape features of the premine wetlands, but replacement would be in accordance with the requirements of section 404 of the Clean Water Act.

4.2.8 VEGETATION

Mining the selected tracts would progressively remove the native vegetation on the area necessary to complete mining on the selected tract(s). Some the vegetation on the lands adjacent to the existing coal leases will be disturbed as a result of existing approved mining operations, and surface adjacent to the selected tracts would also be disturbed for layback, vehicular and equipment access and potential stockpiling. Short-

term impacts associated with this vegetation removal would include increased soil erosion and habitat loss for wildlife and livestock. Potential long-term impacts include loss of habitat for some wildlife species as a result of reduced species diversity, particularly big sagebrush, on reclaimed lands. However, grassland-dependent wildlife species and livestock would benefit from the increased grass cover and production.

Reclamation, including revegetation of these lands, would occur at the same time as mining on adjacent lands (for example, reclamation would begin once an area is mined). Estimates of the time elapsed from topsoil stripping through reseeding of any given area range from two to four years. This would be longer for areas occupied by stockpiles, haul-roads, sediment-control structures, and other mine facilities. Some roads and facilities would not be reclaimed until the end of mining. No new life-of-mine facilities would be located on the selected tracts under the Proposed Action. Grazing and farming restrictions prior to mining and during reclamation would remove up to 100% of the selected tracts from livestock grazing and agricultural crop production. This reduction in vegetative production would not seriously affect livestock and farm production in the region. Long-term productivity on the reclaimed land would return to premining levels within several years following seeding with the approved final seed mixture. Wildlife use of the area would not be restricted throughout the operations.

Re-established vegetation would be dominated by species mandated in the WDEQ-approved reclamation seed mixtures. The majority of the approved grassland and shrubland species are native to the selected tracts. The premining agricultural lands may be established as haylands, pasturelands, or croplands to replace the premining land uses. Initially, the reclaimed grassland would be dominated by grassland vegetation that would be less diverse than the premining vegetation. At least 20% of the native vegetation area would be reclaimed to native shrubs at a density of one per square meter as required by current regulations. Estimates for the time it would take to restore shrubs, including sagebrush, to premining density levels range from 20 to 100 years. This may delay the return of shrub dependent species, such as sage grouse, to the reclaimed areas. An indirect impact of this vegetative change could be decreased big game habitat carrying capacity. Following completion of reclamation (seeding with the final seed mixture) and before release of the reclamation bond (a minimum of ten years), a diverse, productive, and permanent vegetative cover would be established on the reclaimed area. The decrease in plant diversity would not seriously affect the potential productivity of the reclaimed areas. The proposed postmining land use (wildlife habitat, rangeland and agricultural lands) should be achieved even with the changes in vegetation composition and diversity.

The reclamation plans for the existing mines include steps to control invasion by weedy (invasive nonnative) plant species. The reclamation plans for the selected tracts would also include steps to control invasion from such species. Native vegetation from surrounding areas would gradually invade and become established on the reclaimed land.

The climatic record of the western US suggests that droughts could occur periodically

during the life of the mine. Such droughts would severely hamper revegetation efforts, since lack of sufficient moisture would reduce germination and could damage newly established plants. Same-aged vegetation would be more susceptible to disease than would plants of various ages. Severe thunderstorms could also adversely affect newly seeded areas. Once a stable vegetative cover is established, these events would have similar impacts as would occur on native vegetation.

Changes expected in the surface water network as a result of mining and reclamation would affect the reestablishment of vegetation patterns on the reclaimed areas to some extent. The postmining maximum slope would be 20% in accordance with WDEQ policy. The average reclaimed slope will not be known until WDEQ's technical review of the permit revision application is complete. No significant changes in average slope are predicted.

Following reclamation, the selected tracts would be primarily a variety of mixed prairie grasslands with graminoid/forb-dominated areas, shrublands, and haylands. The overall species diversity would be reduced, especially for the shrub component. After reclamation bond release (a minimum of ten years after seeding with the final seed mixture, as discussed above), management of the privately-owned surface would revert to the private surface owner, who would have the right to manipulate the reclaimed vegetation.

Jurisdictional wetlands would fall under the jurisdiction of the COE. Detailed wetland mitigation plans would be developed at the permitting stage to ensure no net loss of jurisdictional wetlands on the project area. Functional wetlands may be restored in accordance with the requirements of the surface landowner in areas of private ownership.

The decrease in plant diversity would not seriously affect productivity of the reclaimed areas regardless of the alternative selected. The proposed postmining land use (wildlife habitat and rangeland) would be achieved even with the changes in vegetative species composition and diversity.

4.2.8.1 THREATENED, ENDANGERED AND CANIDATE PLANT SPECIES

Ute ladies' - tresses
(Spiranthes diluvialis)

Mining the federal coal included in the selected tracts may affect, but is not likely to adversely affect, Ute ladies'-tresses.

Additional discussion can be found in Appendix D.

4.2.9 WILDLIFE

Local wildlife populations are directly and indirectly impacted by mining. These impacts are both short-term (until successful reclamation is achieved) and long-term (persisting beyond successful completion of reclamation). The direct impacts of surface coal mining on wildlife occur during mining and are therefore short-term. They include road kills by mine-related traffic, restrictions on wildlife movement created by fences, spoil piles and pits, and displacement of wildlife from active mining areas. Displaced animals may find equally suitable habitat that is not occupied by other animals, occupy suitable habitat that is already being used by other individuals, or occupy poorer quality habitat than that from which they were displaced. In the second and third situations, the animals may suffer from increased competition with other animals and are less likely to survive and reproduce. The indirect impacts are longer term and may include a reduction in big game carrying capacity and microhabitats on reclaimed land due to flatter topography, less diverse vegetative cover, and reduction in sagebrush density. Grassland and agricultural habits may be short term, but impacts to shrubland is long term.

These impacts are currently occurring on the existing coal leases at the Caballo, Rawhide and North Antelope Rochelle mines as mining occurs. If the selected tracts are exchanged under the Proposed Action, the area of mining disturbance would be extended onto the selected tracts and mining would be extended by up to1.5 years at the Caballo Mine, up to 0.6 years at the NARM, and up to 1.6 years at the Rawhide Mine.

Big game and other wildlife species would be displaced from portions of the selected tracts to adjacent ranges during mining. Pronghorn would be most affected; but none of the area within 2 miles of the selected tracts has been classified as crucial or critical pronghorn habitat. Mule deer would not be substantially impacted, given their infrequent use of these lands and the availability of suitable habitat in adjacent areas. Big game displacement would be incremental, occurring over several years and allowing for gradual changes in distribution patterns. Big game residing in the adjacent areas could be impacted by increased competition with displaced animals. Noise, dust, and associated human presence would cause some localized avoidance of foraging areas adjacent to mining activities. On the existing leases, big game have continued to occupy areas adjacent to and within active mine operations, suggesting that some animals may become habituated to such disturbances.

Road kills related to mine traffic would be extended in the area of the selected tracts for up to 1.6 years.

If the selected tracts are exchanged, mined, and reclaimed, alterations in the topography and vegetative cover, particularly the reduction in sagebrush density, would cause a decrease in carrying capacity and diversity. Sagebrush would gradually become reestablished on the reclaimed land, but the topographic changes would be permanent.

If the selected tracts are exchanged, the assessment of impacts to wildlife, including big and other species, that would be caused by mining the tracts would be addressed as part of the review of the mine permit applications by the WGFD and the WDEQ/LQD as part of the WDEQ/LQD's mining and reclamation permit approval process.

4.2.9.1 THREATENED, ENDANGERED AND PROPOSED WILDLIFE SPECIES

Bald eagle
(Haliaetus leucocephalus)

Mining the federal coal included in the selected tracts may affect, but is not likely to adversely affect, bald eagles or their habitat.

Black-footed ferret
(Mustela nigripes)

Mining the federal coal included in the selected tracts will have no effect on black-footed ferrets.

Additional discussion can be found in Appendix D.

4.2.10 LAND USE AND RECREATION

The major environmental consequences of leasing and mining the selected tracts on land use would be reduction of livestock grazing, loss of wildlife habitat, loss of agricultural cropland, hayland, and pastureland, and curtailment of oil and gas development on up to 2,619 additional acres. Wildlife (particularly big game) and livestock (cattle and sheep) use would be displaced while the tract is being mined and reclaimed.

Federal oil and gas ownership and federal oil and gas lessee information are presented in Chapter 3. If the selected tracts are exchanged, all of the oil and gas production and transportation facilities on the lease would have to be removed from the surface to the base of the coal prior to mining. There are currently no wells completed in producing zones below the coal; if such wells are drilled prior to mining operations, they would be capped in accordance with the requirements for abandoning wells. The selected tracts would not be accessible for development of subcoal oil and gas resources during active mining and prior to reclamation.

BLM has issued a policy statement on conflicts between CBNG and coal development (BLM 2003a). That policy advocates optimizing the recovery of both coal and CBNG resources to ensure that the public receives a reasonable return for the publicly owned resources. Royalties would be lost to both the state and federal governments if the CBNG is not recovered before mining occurs, or if coal is not recovered due to conflicts. State and federal governments can also lose bonus money when the costs of the

agreements between the lessees are factored into the fair market value determinations.

Hunting on the selected tracts would be eliminated during mining and reclamation. Pronghorn and mule deer occur on and adjacent to the tract.

Following reclamation, the land would be suitable for grazing, wildlife, and agricultural uses, which are the historic land uses. The reclamation standards required by SMCRA and Wyoming state law meet the standards and guidelines for healthy rangelands for public lands administered by the BLM in Wyoming. Following reclamation bond release, management of the surface estate that is privately owned would revert to the private surface owner.

4.2.11 CULTURAL RESOURCES

Each of the selected tracts have been subjected to a Class III inventory and assessment. Site 48CA1930 is located on the NARM South Spur tracts and is eligible for the NRHP. The site will be mitigated if it falls within the NARM mine disturbance limit boundary.

4.2.11.1 NATIVE AMERICAN CONCERNS

No sites of Native American religious or cultural importance have been identified on the selected tracts. If such sites or localities are identified at a later date, appropriate action must be taken to address concerns related to those sites. As indicated in Chapter 3, OSM completed Native American consultation on the lands within the analysis area in 2000. No comments were received.

4.2.12 PALEONTOLOGICAL RESOURCES

No unique or significant paleontological resources have been identified on the selected tracts, and the likelihood of encountering those resources is small. Potential impacts to paleontological resources as a result of surface-disturbing activities include losses of plant, invertebrate, and vertebrate fossil material, unauthorized collection and vandalism. A beneficial impact of surface disturbance can be the exposure of fossil materials for scientific examination and collection, which might never occur except as a result of overburden removal, exposure of rock strata, and mineral excavation. Lease and permit conditions require that should previously unknown, potentially significant paleontological sites be discovered, work in that area shall stop and measures be taken to assess and protect the site.

4.2.13 VISUAL RESOURCES

Mining activities of the NARM selected tracts (#1-6) would be visible from Highway 59, Mackey, Antelope and Road 31 county roads. Mining operations on the South Sand Channel tract (#7) would be visible from US 14-16 and Wyoming 59. Mining activities of the Caballo West tract (#8) would be visible from Bishop Road.

Mining would affect landscapes classified by BLM as Class IV. This classification would not be altered by leasing and subsequent mining of the selected tracts. Landscape character would not be significantly changed following reclamation. No unique visual resources have been identified on or near the selected tracts.

Reclaimed terrain would be almost indistinguishable from the surrounding undisturbed terrain. Slopes might appear smoother (less intricately dissected) than undisturbed terrain to the north and west, and sagebrush would not be as abundant for several years. Within a few years after reclamation, the mined land would not be distinguishable from the surrounding undisturbed terrain except by someone very familiar with landforms and vegetation.

4.2.14 NOISE

Noise levels on the selected tracts would be increased considerably by mining activities (blasting, loading, hauling, and possibly in-pit crushing). Since the selected tracts would be mined as an extension of existing operations under the Proposed Action, no rail car loading would take place.

The Noise Control Act of 1972 indicates that a 24-hour equivalent level of less than 70 dBA prevents hearing loss and that a level below 55 dBA, in general, does not constitute an adverse impact. OSM prepared a noise impact report for the Caballo Rojo Mine (OSM 1980) which determined that the noise level from crushers and a conveyor would not exceed 45 dBA at a distance of 1,500 feet. Explosives would be used during mining to fragment the overburden and coal and facilitate their excavation. The air overpressure created by such blasting is estimated to be 123 dBA at the location of the blast. At a distance of about 2,500 feet (about 0.47 miles), the intensity of this blast would be reduced to 55 dBA. Occupied dwellings were identified within 0.2 miles of the Caballo selected tract and just over ½ mile from the Rawhide selected tract.

Because of the remoteness of the site and because mining is already ongoing in the area, noise would have little off-site effect. Wildlife in the immediate vicinity of mining may be adversely affected. However, observations at other surface coal mines in the area indicate that wildlife generally adapt to increased noise associated with surface coal mining. After mining and reclamation are completed, noise would return to premining levels.

4.2.15 TRANSPORTATION FACILITIES

No new or reconstructed transportation facilities would be required under the Proposed Action. Essentially all of the coal mined on the selected tracts would be transported by rail. Vehicular traffic to and from the mine would continue at existing or slightly higher levels for an additional 0.6 to 1.6 years, depending on the selected tract(s).

Any relocation of pipelines would be handled according to specific agreements between the coal lessee and the pipeline owners. The Wyoming Department of Transportation routinely monitors traffic volumes on area highways, and if traffic exceeds design standards improvements are made. Burlington Northern-Santa Fe has upgraded and will continue to upgrade their rail capacities to handle the increasing coal volume projected from the PRB with or without leasing the selected tracts.

4.2.16 SOCIOECONOMICS

This exchange would at most increase the mine life of the Caballo Mine by 1.5 years, the North Antelope Rochelle Mine by 0.6 years and the Rawhide Mine by 1.6 years.

Prices for PRB coal increased in 2001 and 2002, and are projected to remain stable or decrease slightly from 2004 through 2008 (WGS 2003). Conservatively assuming a price of $4.00 per ton, the total revenue from the sale of the recoverable coal from the selected tracts would total $313 million for the Proposed Action (78.3 million tons of coal). Some of this money from the sale of this federal coal would be paid to federal, state, and local governments in the form of taxes and federal production royalties.

The federal government will receive lease rental at the time a new lease is issued and annually while the lease is in effect. In addition, the federal government will receive royalty payments at the time the coal is produced from a tract.

According to a study done by the University of Wyoming (UW 1994), the state of Wyoming received about $1.10 per ton from the sale of PRB coal produced in 1991. The taxes and royalties included in this calculation were severance taxes, ad valorem taxes, sales and use taxes, and the state's share of federal royalty payments on production. Under this scenario, the estimated total direct return to the state of Wyoming from the production of this federal coal, in current dollars, would be $86 million under the Proposed Action.

If the tracts are exchanged under the Proposed Action, PRCC does not anticipate that employment or production would be impacted. No additional demands on the existing county or city infrastructure or services would be expected because no influx of new residents would be needed to fill new jobs. The economic stability of the community of Gillette would benefit by having the mines active for an additional 0.6 to 1.6 years.

Issues relating to the social, cultural, and economic well-being and health of minorities

and low-income groups, including Native American tribes, are termed environmental justice issues. In reviewing the impacts of the Proposed Action on socioeconomic resources, surface water and groundwater quality, air quality, hazardous materials, or other elements of the human environment in this Chapter, it was determined that potentially adverse impacts would not disproportionately affect Native American tribes, minority groups, or low-income groups. The analysis area includes no tribal lands or Native American communities. No treaty rights or Native American trust resources are known to exist for this area.

4.2.17 HAZARDOUS AND SOLID WASTE

The wastes that would be generated in the course of mining the tract(s) would be similar to the wastes that are currently being generated by the existing mining operations. The procedures that are used for handling hazardous and solid waste at the existing mines are described in Chapter 2. Wastes generated by mining the selected tract(s) would be handled in accordance with the existing regulations using the procedures currently in use at the three mines.

4.3 REGULATORY COMPLIANCE, MITIGATION, AND MONITORING

In the case of surface coal mining, various federal and state law require mitigation and monitoring designed to ensure that reclamation standards are met following mining. The major mitigation measures and monitoring measures that are required by state or federal regulation are summarized in Table 4-2.

Measures that are required by regulation are considered to be part of the Proposed Action. These requirements, mitigation plans, and monitoring plans are in place as part of the current approved mining and reclamation plan for the existing three. If the tracts are exchanged, these requirements, mitigation plans, and monitoring plans would be included in the mining and reclamation plan amendment required for the tracts. This mining and reclamation plan would have to be approved before mining could occur on the tracts. The major mitigation and monitoring measures that are required by state or federal regulation are summarized in Table 4-2.

If impacts are identified during the leasing process that are not mitigated by existing required mitigation measures, BLM can include additional mitigation measures (stipulations) on the new lease within the limits of its regulatory authority. In general, the levels of mitigation and monitoring required for surface coal mining by SMCRA and Wyoming state law are more extensive than those required for other surface disturbing activities; however, concerns are periodically identified that are not monitored or mitigated under existing procedures.

An example of this type of issue is the concern about the release of NO_x from blasting, and the resulting formation of low-lying orange clouds that can be carried outside the

mine permit areas by wind. After this was identified as a potential health concern in the area of the Wyoming PRB surface coal mines, a monitoring study designed to measure NO_2 concentrations in areas accessible to the public near PRB coal mining operations was conducted in 1999. In addition, WDEQ has directed some PRB mines to take steps designed to mitigate the effects of NO_2 emissions occurring from overburden blasting. The steps that may be required, which are described in the Air Quality Section of Chapter 3, include: notifying the public via warning signs along public roadways, temporarily closing public roadways near a mine during and after a blast; establishing safe set-back distances from blasting areas; prohibiting blasting when wind direction is toward a neighbor; prohibiting blasting during temperature inversions; establishing monitoring plans; estimating NO_2 concentrations; and developing blasting procedures that will protect public safety and health.

After reviewing the required mitigation and monitoring in the current mines' mining and reclamation permit and the historical monitoring results in the mines' annual reports, the BLM has not identified additional special stipulations that should be added to the BLM lease or areas where additional or increased monitoring measures are recommended.

4.4 RESIDUAL IMPACTS

Residual impacts are unavoidable impacts that cannot be mitigated and would therefore remain following mining and reclamation.

4.4.1 Topography and Physiography

Topographic moderation is a permanent consequence of mining. The indirect impacts on wildlife habitat diversity would also be considered permanent.

4.4.2 Geology and Minerals

Geology from the base of the coal to the surface would be subject to significant, permanent change. CBNG resources not recovered prior to mining would be permanently lost.

4.4.3 Soils

Existing soils would be mixed and redistributed, and soil-forming processes would be disturbed by mining. This would result in long-term alteration of soil characteristics.

TABLE 4-2
REQUIRED MITIGATION AND MONITORING MEASURES

RESOURCE	REGULATORY COMPLIANCE OR MITIGATION REQUIRED BY STIPULATIONS, STATE, OR FEDERAL LAW[1]	MONITORING[1]
Topography & Physiography	Restoring to approximate original contour or other approved topographic configuration.	LQD checks as-built vs. approved topography with each annual report.
Geology & Minerals	Identifying and selectively placing or mixing chemically or physically unsuitable overburden materials to minimize adverse effects to vegetation or groundwater.	LQD requires monitoring in advance of mining to detect unsuitable overburden.
Air Quality	Dispersion modeling of mining plans for annual average particulate pollution impacts on ambient air; Using particulate pollution control technologies; Using work practices designed to minimize fugitive particulate emissions; Using EPA- or state-mandated BACT, including: Fabric filtration or wet scrubbing of coal storage silo and conveyor vents, Watering or using chemical dust suppression on haul roads and exposed soils, Containment of truck dumps and primary crushers; Covering of conveyors, Prompt revegetation of exposed soils, High efficiency baghouses on the crusher, conveyor transfer, storage bin and train loadout, meeting a standard of 0.01 grains per dry standard cubic foot of exit volume, Watering of active work areas, Reclamation plan to minimize surface disturbances subject to wind erosion, Paving of access roads, Haul truck speed limits, Limited material drop heights for shovels and draglines. Following voluntary and required measures to avoid exposing the public to NO_2 from blasting clouds, including: Phone notification of neighbors and workers prior to blasting, Monitoring weather and atmospheric conditions prior to decisions to blast, Timing blasts to avoid temperature inversions and to minimize inconvenience to neighbors, Closing public roads when appropriate to protect the public, Minimizing blast sizes, Posting signs on major public roads.	On-site air quality monitoring for PM_{10} or TSP; Off-site ambient monitoring for PM_{10} or TSP; On-site compliance inspections.

TABLE 4-2
REQUIRED MITIGATION AND MONITORING MEASURES

RESOURCE	REGULATORY COMPLIANCE OR MITIGATION REQUIRED BY STIPULATIONS, STATE, OR FEDERAL LAW[1]	MONITORING[1]
Soil	Salvaging soil suitable to support plant growth for use in reclamation; Protecting soil stockpiles from disturbance and erosional influences; Selectively placing at least four feet of suitable overburden on the graded backfill surface below replaced topsoil to meet guidelines for vegetation root zones.	Monitoring vegetation growth on reclaimed areas to determine need for soil amendments. Sampling regraded overburden for compliance with root zone criteria.
Surface Water	Building and maintaining sediment control ponds or other devices during mining; Restoring approximate original drainage patterns during reclamation; Restoring stock ponds and playas during reclamation.	Monitoring storage capacity in sediment ponds; monitoring quality of discharges; monitoring stream flows and water quality.
Groundwater	Evaluating cumulative impacts to water quantity and quantity associated with proposed mining; Replacing existing water rights that are interrupted, discontinued, or diminished by mining with water of equivalent quantity quality.	Monitoring wells track water levels in overburden, coal, interburden, underburden, and backfill.
Alluvial Valley Floors	Identifying all alluvial valley floors that would be affected by mining; Determining significance to agriculture of all identified alluvial valley floors affected by mining (WDEQ); Protecting downstream alluvial valley floors during mining; Restoring essential hydrologic function of all alluvial valley floors affected by mining.	Monitoring to determine restoration of essential hydrologic functions of any declared AVF.
Wetlands	Identifying all wetlands that would be affected by mining; Identifying jurisdictional wetlands (COE); Replacing all jurisdictional wetlands that would be disturbed by mining Replacing functional wetlands as required by surface managing agency, surface land owner, or WDEQ/LQD.	Monitoring reclaimed wetlands using same procedures used to identify premining jurisdictional wetlands.
Threatened, Endangered, & Proposed Species	Avoiding bald eagle disturbance; Restoring bald eagle foraging areas disturbed by mining; Restoring mountain plover habitat disturbed by mining; Using raptor safe power lines; Surveying for Ute ladies' tresses; Surveying for mountain plover; Searching for black-footed ferrets if prairie dogs move onto tract.	Baseline and annual wildlife monitoring surveys.

TABLE 4-2
REQUIRED MITIGATION AND MONITORING MEASURES

RESOURCE	REGULATORY COMPLIANCE OR MITIGATION REQUIRED BY STIPULATIONS, STATE, OR FEDERAL LAW[1]	MONITORING[1]
Vegetation	Permanently revegetate reclaimed areas according to a comprehensive revegetation plan using approved permanent reclamation seed mixtures consisting predominantly of species native to the area; Reclaiming 20% of reclaimed area with native shrubs at a density of one per square meter; Controlling erosion on reclaimed lands prior to seeding with final seed mixture using mulching, cover crops, or other approved measures; Chemically and mechanically controlling weed infestation; Direct hauling of topsoil, whenever possible; Selectively planting shrubs in riparian areas; Planting sagebrush; Creating depressions and rock piles; Using special planting procedures around rock piles; Posting reclamation bond covering the cost of reclamation.	Monitoring revegetation growth and diversity until release of final reclamation bond (minimum 10 years). Monitoring erosion to determine need for corrective action during establishment of vegetation. Using controlled grazing during revegetation evaluation to determine suitability for postmining land uses.
Wildlife	Restoring premining topography to the maximum extent possible; Planting a diverse mixture of grasses, forbs and shrubs in configurations beneficial to wildlife; Designing fences to permit wildlife passage; Raptor-proofing power transmission poles; Creating artificial raptor nest sites; Increasing habitat diversity by creating rock clusters and shallow depressions on reclaimed land; Cottonwood plantings along reclaimed drainages; Replacing drainages, wetlands and alluvial valley floors disturbed by mining; Reducing vehicle speed limits to minimize mortality; Instructing employees not to harass or disturb wildlife; Preparing raptor mitigation plans.	Baseline and annual wildlife monitoring surveys; Monitoring for MBHFI.
Cultural Resources	Conducting Class I and III surveys to identify cultural properties on all state and federal lands and on private lands affected by federal undertakings; Consulting with SHPO to evaluate eligibility of cultural properties for the NRHP; Avoiding or recovering data from significant cultural properties identified by surveys, according to an approved plan; Notifying appropriate federal personnel if historic or prehistoric materials are uncovered during mining operations; Instructing employees of the importance of and regulatory obligations to protect cultural resources.	Monitoring mining activities during topsoil stripping; cessation of activities and notification of authorities if unidentified sites are encountered during topsoil removal.

TABLE 4-2
REQUIRED MITIGATION AND MONITORING MEASURES

RESOURCE	REGULATORY COMPLIANCE OR MITIGATION REQUIRED BY STIPULATIONS, STATE, OR FEDERAL LAW[1]	MONITORING[1]
Land Use	Suitably restoring reclaimed area for historic uses (grazing and wildlife).	Monitoring controlled grazing prior to bond release evaluation.
Native American Concerns	Notifying Native American tribes with known interest in this area of leasing action and request for help in identifying potentially significant religious or cultural sites.	No specific monitoring program.
Paleontological Resources	Notifying appropriate federal personnel if potentially significant paleontological sites are discovered during mining.	No specific monitoring program.
Visual Resources	Restoring landscape character during reclamation through return to approximate original contour and revegetation with native species.	No specific monitoring program.
Noise	Protecting employees from hearing loss.	MSHA inspections.
Transportation Facilities	Relocating existing pipelines, if necessary, in accordance with specific agreement between pipeline owner and coal lessee.	No specific monitoring program.
Socioeconomics	Paying royalty and taxes as required by federal, state, and local regulations.	Surveying and reporting to document volume of coal removed.
Hazardous & Solid Waste	Disposing of solid waste and sewage within permit boundaries according to approved plans; Storing and recycling used oil; Maintaining of files containing Material Safety Data Sheets for all chemicals, compounds, and/or substances used during course of mining; Ensuring that all production, use, storage, transport, and disposal of hazardous waste is in accordance with applicable existing or hereafter promulgated federal, state, and government requirements; Complying with emergency reporting requirements for releases of hazardous materials as established in CERCLA, as amended; Preparing and implementing spill prevention control and countermeasure plans, spill response plans, inventories of hazardous chemical categories pursuant to section 312 of SARA, as amended; Preparing emergency response plans.	No specific monitoring other than required by these other regulations and response plans.

4.4.4 Air Quality

No residual impacts to air quality would occur following mining.

4.4.5 Water Resources

The area where groundwater drawdowns and replacement of coal and overburden with backfill occur would be increased under the alternatives compared to what would occur without the addition of the selected tracts. The postmining backfill may take in excess of 100 years to reach equilibrium water levels and water quality. Less time would be required near the mining boundaries. Water level and water quality in the backfill would be suitable to provide water to wells for livestock use, but it would be different from premining conditions.

4.4.6 Alluvial Valley Floors

No residual impacts to alluvial valley floors would occur following mining.

4.4.7 Wetlands

Replaced wetlands (jurisdictional or functional) may not duplicate the exact function and landscape features of the premining wetland, but all wetland replacement plans would be approved by COE.

4.4.8 Vegetation

Reclaimed vegetative communities may never completely match the surrounding native plant community.

4.4.9 Wildlife

Although the selected tracts would be reclaimed to be as near original condition as possible, there would be some residual wildlife impacts. The topographic moderation would result in a permanent loss of habitat diversity and a potential decrease in slope-dependent shrub communities. This would reduce the carrying capacity of the land for shrub-dependent species. Reclamation standards may limit replacement of habitat for some species such as mountain plover. Some species, such as sage grouse, may repopulate reclaimed areas, but populations may not attain premining levels.

4.4.9.1 Threatened, Endangered, and Proposed Wildlife Species

No direct residual impacts are expected to T&E, proposed, or candidate species or to Forest Service sensitive species. If habitats are not restored for listed, proposed, candidate, or sensitive species, future repopulation of reclaimed areas by those species could be delayed or potential future population levels of those species in reclaimed

areas could be affected. Residual impacts anticipated to BLM sensitive species include limited replacement of plover habitat and long term impacts to greater sage grouse populations.

4.4.10 Land Use and Recreation

No residual impacts to land use and recreation are expected.

4.4.11 Cultural Resources

Cultural sites that are determined to be eligible for the NRHP and that cannot be avoided would be destroyed by surface coal mining after data from those sites is recovered. Sites not eligible for the NRHP would be lost.

4.4.12 Native American Concerns

No residual impacts to Native American concerns have been identified.

4.4.13 Paleontological Resources

No residual impacts to significant paleontological resources are expected.

4.4.14 Visual Resources

No residual impacts to visual resources are expected.

4.4.15 Noise

No residual noise impacts are expected.

4.4.16 Transportation Facilities

No residual impacts to transportation facilities are expected.

4.4.17 Socioeconomics

No residual socioeconomic impacts are expected.

4.5 CUMULATIVE IMPACTS

Cumulative impacts result from the incremental impacts of an action added to other past, present, and reasonably foreseeable future actions, regardless of who is responsible for such actions. Cumulative impacts can result from individually minor, but collectively significant, actions occurring over time.

This section summarizes the cumulative impacts that are occurring as a result of existing development in the Wyoming PRB, where the tracts being considered for exchange are located, and considers how those impacts would change if the exchange is completed, in which case, some or all of the selected tracts would be leased and mined and the lease rights to the offered tract would be relinquished.

This section describes how the cumulative impacts would change as a result of the proposed lease exchange, and the relationship between the proposed lease exchange action and regional activity.

BLM completed three regional EISs evaluating the potential cumulative impacts of surface coal development in the 1970s and early 1980s (BLM, 1974, 1979, and 1981). A draft document for a fourth regional EIS was prepared and released in 1984 (BLM 1984).

More recently, BLM has considered cumulative impacts in a number of NEPA analyses evaluating coal leasing actions and oil and gas development in the PRB. The Powder River Federal Coal Region was decertified as a federal coal production region in 1990. Since that time, the BLM's Wyoming State Office has held 23 competitive coal lease sales and issued 17 new federal coal leases containing approximately 5.184 billion tons of coal using the LBA process (Table 4-3 and Figure 1-1). As part of the leasing process, BLM prepared NEPA analyses evaluating each of those leasing actions. Most recently, in 2003, the BLM completed two EISs evaluating the effects of coal leasing actions in the Wyoming PRB:

- The South Powder River Basin Coal EIS addressed leasing five lease tracts to four different mines in the group of mines south of Wright, WY.

- The West Hay Creek EIS addressed leasing one tract to one of the mines north of Gillette WY.

BLM also issued the Final Powder River Basin Oil and Gas EIS in 2003. Each of these EISs included an analysis of cumulative impacts in the area where the Gold Mine Draw lease exchange tracts are located.

The Wyoming BLM has pending applications for seven additional maintenance tracts for existing mines containing about 2.164 billion tons of coal (Table 4-4). Three of the seven pending applications have been reviewed and recommended for processing by the Powder River RCT.

As can be seen in Figure 4-1, federal coal leasing activity has paralleled production since decertification. This is consistent with the Powder River RCT's objective at the time of decertification, which was to use the LBA process to lease tracts of federal coal to maintain production at existing mines.

BLM has also completed two exchanges in the Wyoming PRB since decertification:

- Belco Exchange – a coal lease exchange authorized by Public Law 95-554, completed in 2000. EOG Resources (formerly Belco) received a federal lease for a 106-million ton portion of the former Hay Creek tract adjacent to the Buckskin Mine in exchange for the rights to a 170-million ton coal lease near Buffalo, Wyoming that became unmineable when Interstate 90 was constructed (BLM 1999b). The Buckskin Mine has since acquired this lease.

- Pittsburg and Midway Coal Mining Company (P&M) Exchange: -an exchange of federal coal in Sheridan County, Wyoming, for land and mineral rights in Lincoln, Carbon, and Sheridan counties, Wyoming, completed in 2004.

This EA addresses a proposed coal lease exchange with Powder River Coal Company. As discussed in Chapter 2, under the proposed action for this EA, lease rights underlying an AVF at the Caballo Mine, which can't be mined, would be exchanged for lease rights of equal value adjacent to existing federal leases at Powder River Coal Company's North Antelope Rochelle, Rawhide or Caballo mines.

There are currently 13 active surface coal mines and one inactive mine in the Wyoming PRB, as shown in Figure 1-1 and Table 4-5. These mines are all located in Campbell and Converse Counties, just west of the outcrop of the Wyodak coal, where the coal is at the shallowest depth. Recently active surface coal mines in Sheridan County, (the Big Horn Coal Mine) and southern Converse County (the Dave Johnston Mine) have ended mining operations, relinquished their federal coal leases, and are reclaiming areas of disturbance. The current status and ownership of the mines are shown in Table 4-5. As indicated in Table 4-5, there have been numerous changes in mine ownership during the last decade, and this has resulted in mine consolidations and mine closings within the PRB.

There are existing permits for other surface-coal mining-related operations in the PRB.

These include the Ash Creek and Welch mine permits in Sheridan County and the IZITA mine permit in Campbell County. Operations at these sites are completed and disturbed areas have been reclaimed, but monitoring of the reclaimed areas is ongoing. The KFx Mine (on privately owned coal) is inactive.

The active mines can be grouped into three subregions, as shown in Figure 1-1 and

Table 4-3
Leases Issued Since Decertification, Powder River Basin, Wyoming

LBA Name (Lease Number) Applicant Mine Current Lessee Effective Date	Acres Leased[1]	Mineable Tons of Coal[1]	Successful Bid
Jacobs Ranch LBA (WYW117924) Jacobs Ranch Mine Jacobs Ranch Coal Co. 10/1/1992	1,708.620	147,423,560	$20,114,930.00
West Black Thunder LBA (WYW118907) Black Thunder Mine Thunder Basin Coal Co. 10/1/1992	3,492.495	429,048,216	$71,909,282.69
North Antelope/Rochelle LBA (WYW119554) North Antelope & Rochelle Mines Powder River Coal Co. 10/1/1992	3,064.040	403,500,000	$86,987,765.00
West Rocky Butte LBA (WYW122586) No Existing Mine[2] Caballo Coal Co. 1/1/1993	463.205	56,700,000	$16,500,000.00
Eagle Butte LBA (WYW124783) Eagle Butte Mine Foundation Wyoming Land Co. 8/1/1995	1,059.180	166,400,000	$18,470,400.00
Antelope LBA (WYW128322) Antelope Mine Antelope Coal Co. 2/1/1997	617.200	60,364,000	$9,054,600.00
North Rochelle LBA (WYW127221) North Rochelle Mine Ark Land Co. 1/1/1998	1,481.930	157,610,000	$30,576,340.00
Powder River LBA (WYW136142) North Antelope Rochelle Mine Powder River Coal Co. 9/1/1998	4,224.225	532,000,000	$109,596,500.00
Thundercloud LBA (WYW136458) Jacobs Ranch Mine Thunder Basin Coal Co., LLC 1/1/1999	3,545.503	412,000,000	$158,000,008.50
Horse Creek LBA (WYW141435) Antelope Mine Antelope Coal Co. 12/1/2000	2,818.695	275,577,000	$91,220,120.70
North Jacobs Ranch LBA (WYW146744) Jacobs Ranch Mine Jacobs Ranch Coal Co. 5/1/2002	4,982.240	537,542,000	$379,504,652.00
NARO South LBA (WYW154001) North Antelope Rochelle Mine BTU Western Resources, Inc. 9/1/2004	2,956.725	297,469,000	$274,117,684.00

Table 4-3
Leases Issued Since Decertification, Powder River Basin, Wyoming

West Hay Creek LBA (WYW151634) Buckskin Mine Kiewit Mining Properties, Inc. 1/1/2005	921.158	142,698,000	$42,809,400.00
Little Thunder LBA (WYW150318) Black Thunder Mine Ark Land LT Co. 3/1/2005	5,083.500	718,719,000	$610,999,949.80
West Antelope LBA (WYW151643) Antelope Mine Antelope Coal Co. 3/1/2005	2,809.130	194,961,000	$146,311,000.00
NARO North LBA (WYW150210) **North Antelope Rochelle Mine** **BTU Western Resources, Inc.** **3/1/2005**	2,369.380	324,627,000	$299,143,785.00
West Roundup LBA (WYW151134) North Rochelle Mine West Roundup Resources, Inc 5/1/2005	2,812.51	327,186,000	$317,697,610.00
TOTALS	**44,409.731**	**5,183,824,776**	**$2,683,014,027.69**

[1] Information from Sale Notice.
[2] The West Rocky Butte LBA was originally leased to Northwestern Resources Co..

Table 4-4

Pending LBAs, Powder River Basin, Wyoming

LBA (CASE FILE NUMBER) APPLICANT MINE	APPLICATION DATE	ACRES AS APPLIED FOR	ESTIMATED AS APPLIED FOR COAL (mm tons)	STATUS
Maysdorf[1] (WYW154432) Cordero Rojo	9/20/2001 Modified 11/8/2004	2,219.39	230.30	PRRCT Review 5/30/2002 EIS in Preparation Requested Sale Date in 2007
Eagle Butte West[2] (WYW155132) Eagle Butte	12/28/2001 Modified 10/16/2003	1,397.64	231.00	PRRCT Review 5/30/2002 EIS In Preparation Requested Sale Date in 2007
Belle Ayr North[2] (WYW161248) Belle Ayr	7/06/2004	1,578.76	200.00	PRRCT Review 4/27/2005 Requested Sale Date in 2013
West Antelope II[3] (WYW163340) Antelope	4/06/2005	4,108.60	429.70	PRRCT Review 4/27/2005 Requested Sale Date in 2009
Hilight Field[2] (WYW164812) Black Thunder	10/07/2005	4,590.19	588.20	PRRCT Review Pending Sale Date Not Specified
West Hilight Field[2] (WYW172388) Black Thunder	1/17/2006	2,370.52	428.00	PRRCT Review Pending Sale Date Not Specified
West Coal Creek[2] (WYW172585) Coal Creek	2/10/2006	1,151.26	57.00	PRRCT Review Pending Sale Date Not Specified
Total		**17,416.36**	**2,164.20**	

[1] Estimated tons of mineable coal reported in the application.

[2] Estimated tons of recoverable coal reported in the applicant

[3] Estimated tons of in place coal reported in the application.

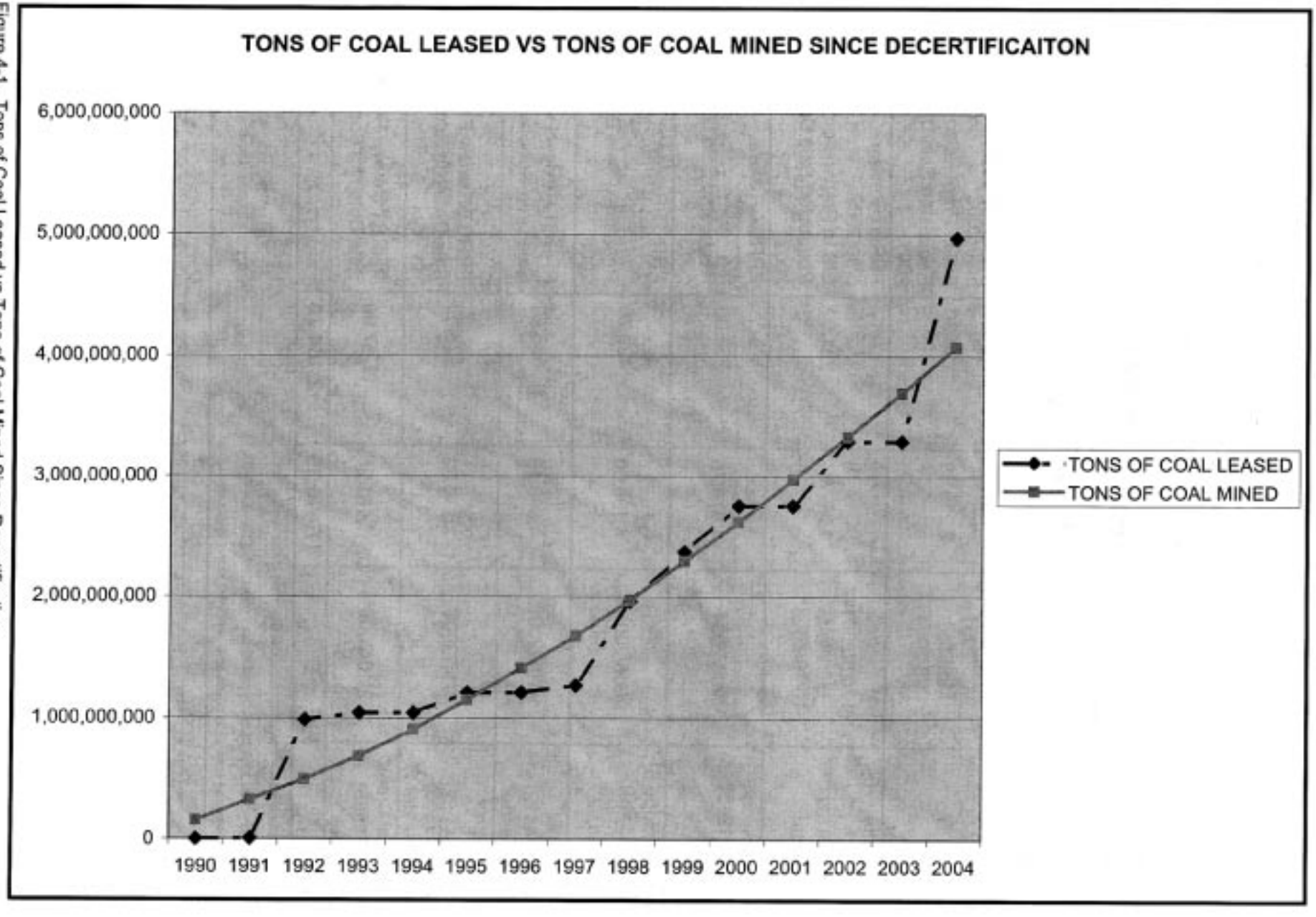

Figure 4-1. Tons of Coal Leased vs Tons of Coal Mined Since Decertification.

TABLE 4-5
STATUS AND OWNERSHIP OF WYOMING POWDER RIVER BASIN COAL MINES

2005 Mine	1994 Mine Owner	2005 Mine Owner	2003 Actual Coal Production[1] (mm Tons)	2003 Permitted Coal Production[2] (mm Tons)	Status/Comments
SUBREGION 1 (North Gillette)					
Buckskin	SMC (Zeigler)	Kiewit Mining Properties	17.5	27.5	Active
Dry Fork	Phillips/WFA & Fort Union Ltd	WFA	4.3	15	Active (Includes former Fort Union Mine)
Eagle Butte	Cyprus-Amax	Foundation Coal West	24.7	35	Active
Rawhide	Carter (Exxon)	Peabody Holding Co	3.7	24	Active
Wyodak	Wyodak Resources	Wyodak Resources	4.8	12	Active (Includes former Clovis Point Mine)
Total			**55.0**	**122.9**	
SUBREGION 2 (South Gillette)					
Belle Ayr	Cyprus-Amax	Foundation Coal West	17.9	35	Active
Caballo	Carter (Exxon) & Western Energy	Peabody Holding Co	22.7	40	Active (Includes former Rocky Butte & West Rocky Butte leases)
Cordero Rojo	Kennecott & Drummond	Kennecott Energy Co	36.0	65	Active (Consolidation of former Cordero & Caballo Rojo Mines)
Coal Creek	ARCO	Arch Coal Inc	0	25	Inactive--Operations scheduled to resume in 2006
Total			**76.6**	**165**	
SUBREGION 3 (Wright)					
Antelope	Kennecott	Kennecott Energy Co	29.5	32	Active
Black Thunder	ARCO	Arch Coal	62.6	90	Active (Consolidation with North Rochelle in progress)
Jacobs Ranch	Kerr-McGee	Kennecott Energy Co	35.7	55	Active
N. Antelope/ Rochelle	Peabody	Peabody Holding Co	80.1	85-105	Active (Consolidation of former North Antelope & Rochelle Mines)
N. Rochelle	SMC (Zeigler)	Arch Coal Inc	23.9	35	Active (Consolidation with Black Thunder and partial transfer of ownership to Peabody in progress.)
Total			**231.8**	**297-317**	
TOTAL FOR 3 MINE GROUPS			**363.4**	**584.9-604.9**	

[1] – BLM, 2005
[2] - WDEQ/LQD

Table 4-5. A fourth subregion includes former and proposed mines in Sheridan County, Wyoming and existing mines just north of Sheridan County, in Montana.

The surface coal mines listed in Table 4-5 currently produce over 96% of the coal produced in Wyoming each year. Since 1989, coal production in the Powder River Basin has increased by an average of 6 percent per year. The increasing production is primarily due to increasing sales of low-sulfur, low-cost PRB coal to electric utilities who must comply with phase I requirements of Title III of the 1990 Clean Air Act Amendments. Electric utilities account for 97 percent of Wyoming's coal sales. In 2002, approximately 33 percent of the coal mined in the United States came from the Wyoming PRB.

BLM estimates that the surface coal mines listed in Table 4-5 currently have almost 121,200 acres of federal coal leased in Campbell and Converse counties. This represents approximately 3.97 percent of Campbell County, where the majority of the leases are located. If all of the Gold Mine Draw selected tracts were leased and the lease on the offered tract relinquished, this would increase the acres under lease by at most 1,699 net acres, representing a 1.4% increase in leased federal acres. This would represent a maximum increase because the value of the coal that the federal government exchanges must be equal to the value of the coal in the Gold Mine Draw AVF tract and the selected lands are expected to contain more than adequate coal reserves to equalize the coal value in the offered tract. As a result, it is unlikely that all of the selected lands would be included in the exchange, if it is completed.

The coal operations shown in Figure 1-1 had disturbed an estimated 68,794 acres as of 2003. Approximately 24,097 of those acres of disturbance were occupied by “permanent” mine facilities (roads, buildings, and coal handling facilities) and are unavailable for reclamation. Of the remaining 44,697 acres, which represents areas of disturbance available for reclamation, approximately 21,238 acres had been permanently reclaimed as of 2003. This information is compiled from BLM lease and WDEQ/LQD mining and reclamation permit databases.

The selected tracts being considered for exchange are adjacent to three existing operating mines in the Wyoming Powder River Basin. The offered tract is also adjacent to one of these operating mines. Under either action, the offered tract would not be disturbed. However, portions of the surface of the selected tracts would be disturbed in any event in order to recover the coal in the existing adjacent leases.

The selected tracts at the NARM are positioned such that, if not leased at this time, they may be bypassed by the current operations and would not be economic to mine at a later date due to the small and scattered nature of the coal reserves they contain. In that case, the surface of those tracts would be disturbed to recover the coal in the adjacent existing leases, but the coal would be left in place and wasted as a commercial commodity.

The AVF lands adjacent to the Caballo mine include approximately 66.8 million tons of

coal that cannot be mined. At the 2004 production rate of 26.4 mmtpy, this represents approximately two and one half years of production.

If the lease rights to the selected tract adjacent to the Caballo Mine (#8) are exchanged for the lease rights to the AVF lands, the net reserves at the Caballo Mine would decrease by 11.6 million tons, which represents a net decrease of about five months of production at the 2004 annual production rate.

If the lease rights to all of the selected lands adjacent to the North NARM are exchanged for the lease rights to the AVF lands, the net reserves at this mine would increase by about 47.6 million tons, which would increase the mine life by about seven months at the 2004 annual production rate of 82.5 mmtpy.

If the lease rights to the tract adjacent to the Rawhide mine are exchanged for the lease rights to the AVF lands, the net reserves at this mine would increase by 34.6 million tons. At the 2004 production rate of 6.9 mmtpy, this represents approximately five years of mine life.

It is unlikely that all of the selected lands would be included in the exchange, because the exchange must be on an equal value basis, and the selected lands are expected to contain more than adequate coal reserves to equalize the coal value in the offered tract.

CBNG wells have been drilled west of the three operating mines adjacent to the selected tracts. The CBNG development near the Rawhide and Caballo mines occurred fairly early in the CBNG play, but development in the vicinity of the North Antelope Rochelle Mine is more recent. CBNG development would potentially continue in the areas around all three mines, including on the selected tracts adjacent to the Rawhide and Caballo mines, which are located west of those mines. The South Spur and East Burn tracts are located east of the mining operations and the CBNG development is occurring west of the existing mining operations. As a result, no CBNG development is anticipated on the selected tracts. Due to the proximity of the coal mining and CBNG production operations, cumulative impacts to groundwater, surface water, air quality, and wildlife have occurred and are likely to continue as CBNG development continues adjacent to existing surface coal mining operations.

Other mineral development activities in the Wyoming PRB include bentonite mines, in situ uranium mines, and scoria quarries. The areas where bentonite and uranium are mined are not in the general vicinity of the existing surface coal mines. Scoria quarries are frequently located adjacent to, and generally east of, the existing coal mining operations.

Other proposed projects in the southern portion of the Wyoming Powder River Basin that have advanced to the planning and permitting stages and that could be completed in the foreseeable future include: the Wygen II coal-fired power plant at the Black Hills Corporation energy complex near the Wyodak Mine site in Gillette, Wyoming; the Two Elk coal-fired power plant, proposed by the North American Power Group (NAPG),

which would be located east of the Black Thunder Mine; a coal-fired power plant proposed by Basin Electric Power Cooperative that would be located near the town of Gillette, and a railroad line from the Powder River Basin to Minnesota proposed by Dakota, Minnesota, and Eastern Railroad (DM&E). The impacts of mining the selected tract adjacent to the Caballo Mine would not be expected to overlap with the impacts of building and/or operating these projects. The impacts of mining the selected tracts adjacent to the NARM could potentially have some minor overlapping impacts with the construction and operation of the proposed Two Elk power plant and DM&E railroad line. The impacts of mining the selected tract adjacent to the Rawhide Mine could potentially have some overlapping impacts with the construction and operation of the Wygen II and Basin Electric power plants. .